Uncompahgre Mesas Forest Restoration and Demonstration Project
Uncompahgre Plateau, CO

Mission Statement:

To enhance the resiliency, diversity and productivity of the native ecosystem in the Uncompahgre Mesas area of the Uncompaghre Plateau, CO using best available science and collaboration.

A Need for Restoration:

Many forest community types in Colorado have been altered during the last 120 years by logging, grazing, proliferation of roads and vehicular traffic, fire exclusion and other activities. The changes to these forests have, in some cases, increased the potential for catastrophic fire and adversely affected many biological processes and aesthetic values. Changes include:

- Disruption of natural fire regimes;
- Dramatic increases in dense stands of small diameter, stressed trees;
- Increased mortality from insect infestations and diseases;
- Fragmentation of habitat and vegetation;
- Disruption of vital watershed functions;
- And diminished native herbaceous understory.

Therefore, this collaborative group seeks to restore the ecosystem to a more natural condition, consistent with the historical ranges of variability for the various vegetation community types, and to reduce the risk of unnatural crown fires both within stands and across the landscape.

Key Stakeholders:

- Colorado Forest Restoration Institute – Colorado State University
- US Forest Service – Grand Mesa, Uncompahgre and Gunnison National Forest
- Colorado Division of Wildlife
- US Fish & Wildlife Service
- Forest Product Industry
- Conservation Groups
- Permittees/Range
- Interested Community
- Motorized and Non-Motorized Recreation Users
    - OHV Community
    - Hunter Community
    - Hikers/Bikers/Campers
- Cultural Resource Stakeholders
- Colorado State Forest Service
- UP Project

Goals:

1. **Collaborate**. The partnership seeks to bring together individuals with different perspectives, experiences, and expertise to develop innovative resource management alternatives. Landscape scale assessment, project design, analysis, implementation and monitoring should be carried out collaboratively by actively engaging a balanced, diverse and complete group of stakeholders. Whenever feasible, stakeholders should strive for consensus in making decisions about the project.

2. **Restore ecosystem structure, composition and function.** The protection and restoration of ecosystem structure, composition and function encourages viable populations

of all native species in natural patterns of abundance and distribution. Using passive and active management techniques, vegetation communities should be moved toward conditions that are more consistent with their historical ranges of variability. The establishment and maintenance of more natural patterns of vegetation diversity and abundance are integral to ecological restoration.

3. **Develop and establish research demonstration sites.** Research demonstration sites aid in the development of environmentally sound, economically sustainable and socially acceptable approaches to forest ecosystem restoration. Specifically, research should be aimed at determining pre-European settlement conditions and the effect of different treatment techniques on various vegetation types and the possibility of using commercial forest products to offset the costs of restoration activities.

Objectives/Restoration Principles:

Objectives for "Goal 1: Collaborate"

1. **Develop a collaborative process that can serve as a model for other forest ecosystem restoration projects.** It is understood that collaboration is critical to the formulation of innovative solutions to forest health problems. The partnership seeks to share its process and lessons learned with other collaborative efforts.

Objectives for "Goal 2: Restore ecosystem structure, composition and function"

1. **Develop reference and current conditions and identify departures.** Landscape-scale and site-specific ecological data can provide information on the natural range of variability for key forest attributes, such as tree age structure and fire regimes that furnish "reference conditions" for restoration design. These references conditions can be used to develop desired future conditions. By analyzing and comparing the current and desired future conditions, the degree of departure can be determined. A variety of constraints prevent the development of site-specific historical information on every acre of land needing restoration, therefore, a combination of landscape-scale GIS data and on-the-ground assessments should be used. The general goal should be to restore ecological integrity and function.

2. **Plan for restoration using a landscape perspective that recognizes cumulative effects**. Forest restoration projects should be linked to landscape information that identify historical range of variability (reference condition), current condition, restoration targets, and cumulative effects of management. The landscape perspective captures these complex relationships by linking resources and processes to the larger forest ecosystem. Forest restoration projects should incorporate plans for long-term maintenance of ecological processes.

3. **Restore ecological processes.** Natural processes, including fire, insect outbreaks, and droughts, are irreplaceable shapers of the forest. These ecosystem processes are key regulators of tree species composition and structure. Where fire exclusion has allowed fire intolerant trees to become unnaturally abundant in historical ponderosa pine forests, treatments should seek to restore natural patterns and distribution of more fire-resistant species including ponderosa pine and Douglas-fir. However, fire intolerant species sometimes make up the only remaining large tree component in a stand. Retention of these large trees is important to canopy dependent wildlife species.

   A key priority should be to restore stands to a more natural condition and to reduce the risk of unnatural crown fires both within stands and across landscapes. Specific restoration strategies should vary based upon forest vegetation type, fire regime, local conditions, and local management objectives. Forests and woodlands characterized by infrequent and mixed-severity fire should be managed toward a structure consistent with their historical ranges of variability—including, in some cases, high-density, continuous stands. Deviation from a restoration objective may be appropriate to meet resource and community protection objectives, but will not be referred to as "restoration" to avoid confusion.

4. **Prioritize and strategically target treatment areas**. Key considerations for prioritizing restoration treatment areas are: degree of unnatural crown fire risk; proximity to human developments and municipal watersheds; protection of old-growth forests and habitats of federally threatened, endangered, or listed sensitive species; and

strategic positioning to break up landscape-scale continuity of hazardous fuels. Planning and treatments should be designed to have an impact at a landscape scale to decrease forest vulnerability to undesirable stand-replacing fire. This priority-setting should take place during fire management and land management planning.

5. **Develop new approaches to maximize the efficiency and effectiveness of the planning process**. As federal budgets continue to tighten, the need to plan and implement projects on a larger scale becomes apparent. The partnership should explore and test innovative approaches to collaborative, landscape-level ecosystem restoration projects.

6. **Economic Resources:** Forest ecosystem restoration projects should be environmentally sound, economically sustainable and socially acceptable. Treatment emphasis should be on restoring or maintaining forest ecosystem health while providing commercial wood products to support our existing timber industry as well as develop new products where needed to meet restoration goals and objectives. Commercial harvesting of timber may be utilized to offset the costs of restoration treatments. Appropriate commercial uses for restoration byproducts such as small-diameter trees should also be sought.

7. **Cultural Resources**. Treatment areas should be designed to protect significant cultural resources. All requirements should be met and cultural surveys completed on areas prior to treatment activities.

8. **Utilize existing forest structure.** Restoration efforts should incorporate and build upon valuable existing forest structures, such as large trees, and groups of trees of any size with interlocking crowns excluding aspen. These features are important for some wildlife species and should not be removed completely just to recreate specific historical tree locations. Since evidence of long-term stability of precise tree locations is lacking, the selection of "leave" trees and tree clusters in restoration treatments can be based on the contemporary spatial distribution of trees, rather than pre-1900 tree positions. Maximizing the use of existing forest structure can restore historical forest structure conditions more quickly. Leaving some relatively dense within-stand patches of trees need not compromise efforts to reduce undesirable landscape-scale crown fire risk.

9. **Protect and maintain watershed, vegetation and soil integrity through the use of low impact techniques.** Low impact treatments will minimize sedimentation, disruption of surface runoff, and other detrimental ecosystem effects. Equipment and techniques should be managed according to soil and water conservation handbook guidelines that are applicable to site-specific soil types, physiography and hydrological functions.

   Restoration treatments should strive to use the least disruptive techniques that still provide the necessary intensity and extensiveness of treatments. In many areas, conservative initial treatments would be the minimum necessary to adequately reduce the threat of unnatural crown fire. Wildland fire use or management-ignited fires may be sufficient to reestablish natural conditions in many locations. Where feasible, commercial and/or mechanical thinning of trees may need to be used before the introduction of prescribed fire.

   Treatments should not create new permanent roads which further fragment habitat. Where unavoidable, temporary roads may be constructed. These roads, especially the entrance and staging areas, should be designed for effective closure upon completion of sale activities. Reconstruction, maintenance, or decommissioning of unnecessary or poorly designed existing roads should be carried out when possible.

Managing forest structure and composition to avoid uncharacteristically intense wildfire events will reduce the likelihood of catastrophic post-fire soil erosion and nutrient depletion from forested landscapes. Soil productivity should be protected and maintained by avoiding soil loss and compaction, and managing for on-site nutrient retention. Repeated whole tree biomass removal from the forest should be avoided to maximize nutrient retention. Whenever feasible, green foliage should be recycled by scattering on site; followed by prescribed burning to release stored nutrients.

10. **Preserve old or large trees while maintaining structural diversity and resilience.** Large and old trees, especially those established before ecosystem disruption by Euro-American settlement, are important forest components and critical to functionality of ecosystem processes. Their size and structural complexity provide critical wildlife habitat by broadly contributing crown cover, influencing understory vegetation patterns, and providing future snags. Therefore, the largest and oldest trees (or in some cases the trees with old-growth morphology regardless of size) should be protected when feasible from cutting and crown fires, focusing treatments on excess numbers of small young trees where this condition is inconsistent with HRV conditions. Commercial harvesting may target larger, merchantable timber while excluding any old growth trees.

    Treatments should focus on achievement of spatial forest diversity by managing for variable densities. Overall, forest densities should be managed to maintain tree vigor and stand resiliency to natural disturbances. Disease conditions should be managed to retain some presence of native forest pathogens on the landscape, but constrained so that forest sustainability is not jeopardized. Guidelines must provide opportunities to apply differing site-specific management strategies to work towards attainment of these goals, and recognize that achievement may sometimes require more than one entry.

    Treatments should also focus on achievement of horizontal and vertical diversity consistent with HRV conditions. Overall, forest structure should be managed toward HRV conditions, which is expected to maintain tree vigor and stand resiliency to natural disturbances.

11. **Control and avoid introducing non-native species.** Restoration treatments should routinely incorporate early actions to control the establishment and spread of invasive species.

    Seeding of non-native grasses and forbs should be discouraged as they are ecologically incompatible with good restoration. Once established, non-native species can be difficult or impossible to remove. Seeding should be conducted with certified or weed free seeds to reduce the risk of contamination by non-native species or varieties.

    In general, it is ecologically desirable to allow native herbaceous vegetation to recover incrementally unless there is potential for serious soil erosion or the potential for establishment of invasive plants. If enhancement of herbaceous vegetation is needed, especially for road closures and recovery, using locally sourced native seeds or transplanting individuals from nearby areas into treatments is ecologically desirable.

12. **Protect sensitive communities**. Certain ecological communities embedded within ponderosa pine or other types of forests and some riparian areas, could be adversely affected by on-site prescribed burning or mechanical thinning. Restoration efforts should protect these and other underrepresented or sensitive habitats, such as wetlands and cottonwood stands, which are often hotspots of biological diversity, particularly those that are declining in abundance and quality in the region.

13. **Reestablish meadows and open parks**. Due to fire exclusion and other human activities, the occurrence and extent of meadows and open parks has declined. These vegetative communities are an integral part of overall ecosystem diversity. The enhancement and restoration of these areas enhances productivity by encouraging viable populations of native species (particularly grasses and forbs) in natural patterns of abundance and distribution.

14. **Manage herbivory**. Grass, forbs, and shrub understories are essential to plant and animal diversity and soil stability. Robust understories are also necessary to restore natural fire regimes and to limit excessive tree seedling establishment. Where possible, defer livestock grazing after treatment until the herbaceous layer has established its potential structure, composition, and function. The partnership will seek to work with the Colorado Division of Wildlife to manage big game populations to levels that will contribute to successful restoration treatments.

Objectives for "Goal 3: Develop and establish research demonstration sites"

1. **Establish demonstration monitoring and research programs and implement adaptive management**. Well-designed monitoring, research, and documentation are essential to evaluate and adapt ongoing restoration efforts. Monitoring programs should be in place prior to treatment to evaluate responses of key ecosystem components and processes at multiple scales. Research and monitoring results from a variety of sources should be used to adjust and develop future restoration treatments.

2. **Research the balance between economically sustainable and environmentally sound treatment strategies**. The preservation of forest product industries is important to the local economy and the feasibility of future forest restoration efforts. Therefore, the partnership seeks to research the possibility of using existing commercial forest products to offset the costs of restoration activities. Additionally, research should focus on commercial uses for new restoration byproducts such as small-diameter trees.

3. **Generate scientific publications.** As more land managers seek to mitigate the risk of unnatural crown fires across landscapes through active treatment strategies, the need for comprehensive research becomes imperative. The knowledge gained during this effort would be synthesized and distributed. The partnership seeks to develop treatment techniques that can be used by other forest ecosystem restoration projects.