

# RESTORE NATIVE ECOSYSTEMS ALTERNATIVE

## Submitted to the Bureau of Land Management Sixteen-state Vegetation Management Plan Draft Environmental Impact Statement

Revised 26 August 2002  
in response to Bureau of Land Management comments  
and to conform to the preferred DEIS outline

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# RESTORE NATIVE ECOSYSTEMS ALTERNATIVE

## I. OVERVIEW

### GOAL OVR 1: ECOLOGICAL INTEGRITY

Enhance the ecological integrity of BLM land by restoring natural processes, native species, ecosystem function, and resilience of plant and animal communities (see Endnote 1)

#### Action-OVR 1

Give approximately equal overall effort to vegetation treatments that

- a. **Prevent** conditions that favor vegetation problems; and
- b. **Restore** ecological integrity on sites with vegetation problems.

#### Action-OVR 2

Base treatments on the **best available science** and knowledge.

- a. Assess the likelihood that a proposed treatment will contribute to long-term ecological integrity, citing documented, relevant case examples where possible.
- b. If a treatment has not previously been attempted, cite scientific evidence that the treatment could be expected to contribute to long-term ecological integrity.

#### Action-OVR 3

State objectives, standards and guidelines in **clear, measurable terms**, then measure the outcomes of treatments so that they can be held accountable to long-term and treatment goals.

#### Action-OVR 4

Perform restoration in a **precautionary** manner, recognizing that our understanding of complex ecosystems and the consequences of our activities is limited.

#### Action-OVR 5

Include realistic and dedicated funding for, and an institutional commitment to, **assessment, monitoring and appropriate response** to monitoring results. Design and implement assessment (including the gathering of baseline data) and monitoring systems before activities commence.

#### Action-OVR 6

Encourage and facilitate **public participation** by local, regional and national stakeholders in such activities as assessment, monitoring, early detection of invading species, provision of new and scientific information, review of assessment and monitoring protocols, and analysis of alternatives for actions.

#### Action-OVR 7

Provide:

- a. clear and significant incentives (e.g., awards, grants, budgets) for prevention of vegetation problems and restoration of ecological integrity; and
- b. disincentives for activities that encourage vegetation problems and delay recovery of ecological integrity.

Action-OVR 8

Ensure that treatments are **accountable to public funding**. Rely on best available science, awarding contracts on the basis of "best value" for ecological integrity, avoid treatments of symptoms, and use local community workforces whenever feasible.

**II. DEFINITIONS OF TERMS USED IN THE RESTORE NATIVE ECOSYSTEMS ALTERNATIVE**

**Actions** Activities needed to achieve desired outcomes (goals, objectives, standards), including actions to restore or protect land health. These actions include proactive measures as well as criteria that shall be applied to guide day-to-day activities occurring on public land.

**Active Restoration Treatments**

Actions other than suspension of activities to restore ecological integrity or native species populations. Includes, but is not limited to

1. Road and off-road vehicle route removal
2. Culvert removal
3. Prescribed burning
4. Use of biological control introductions, cultural methods, mechanical methods, chemical methods, and prescribed fire to directly act on invasive exotic species
5. Fish and wildlife habitat rehabilitation
6. Reintroduction of extirpated species
7. Planting and care of native seeds and plants
8. Reintroduction of soil biota required by native species, when necessary
9. Other necessary activities based on priorities established in the ecological restoration assessment.

**Conservation** Protection of landscape, ecological, and native genetic diversity and the processes that maintain them.

**Ecological Integrity** The ability of an ecosystem to support and maintain a balanced, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitats within the region.

**Goals** Goals are broad statements of desired outcomes (e.g., maintain ecosystem health and productivity).

**Historical Fire Regimes** The historical range of variation of fire intervals, seasons, intensities by which native vegetation and wildlife have been shaped and to which they have adapted prior to the arrival of Euro-American settlers.

**Invasive Species** Exotic species shown by observation and/or scientific evidence to aggressively expand their occupancy of land, whether or not they are viewed as directly impacting economic activities, or have been listed on formal "noxious weed" lists. "Invasive species" does not include native species that increase in response to particular human activities (e.g., juniper, mesquite, sagebrush).

**Objectives** Objectives identify specific desired conditions for resources and have established timeframes for achievement and are usually quantifiable and measurable.

**Passive Restoration Treatments**

Suspension of activities that cause the loss of ecological integrity or native species populations in a specific area Passive restoration treatments may include:

1. Area , road, and off-road vehicle route closures
2. Voluntary livestock permit retirement
3. Retirement of vacant livestock allotments
4. Livestock grazing exclosures (e.g., in aggressive weed infestations, uplands “at risk” of weed infestation, riparian areas, habitat of threatened or endangered species, springs, wetlands)
5. Restrictions of logging activities
6. Restrictions of oil and gas and mineral development, including allowing expired leases to remain expired
7. Restrictions on other human activities, as relevant
8. Prescribed natural fire (i.e., allowing fires to burn under predefined circumstances)

**Prevention Treatments** Actions that avoid causing conditions that favor the presence of invasive species. Prevention is not limited to prevention of the *introduction* of invasive species.

**Restoration** Actions to regain ecological integrity.

**Standards** Standards are limitations placed on management activities to ensure compliance with applicable laws and regulations or to limit the discretion authority in project decision-making. Compliance with relevant standards is mandatory.

**Vegetation Treatments**

Actions which, based on scientific evidence, will:

- (1) affect the "conservation and restoration of vegetation communities, watersheds and wildlife habitats." They include:
  - (a) prevention treatments that result in
    1. measurable soil, hydrological, and vegetation changes that resist invasive exotic species; or
    2. forests with understory vegetation and fire regimes that resist dense tree growth;
  - (b) prevention treatments of vegetation that pose fire hazards to important ecological values or unique ecological features; and
  - (c) active and passive restoration treatments that restore native vegetation and/or conditions favorable to native communities.
- (2) affect the protection of human lives or property threatened by fuels, via necessary thinning/fuels reduction, or other treatments.

**Wildlands-Urban Interface** The area next to a home where fires most directly threaten structures and community space where there are flammable community values. Defensible community space should be created (e.g., some thinning) within a treatment zone up to 500 meters (which includes a more intensive home-site treatment zone up to 60 meters) for firefighter safety and protection of other flammable community values.

### III. VEGETATION TREATMENT PLANNING

#### GOAL-PLAN 1

Vegetation treatments are based on assessments of (1) the condition of vegetation; (2) major human causes of degraded conditions of the vegetation; (3) opportunities for prevention of soil disturbance and vegetation problems; (4) opportunities for conservation of native vegetation ; (5) results of past restoration treatments; and (6) comparative likelihood of treatment options for achieving long-term restoration.

#### Action-PLAN 1

Using existing information initially, map habitats within ecoregions, watersheds, and subwatersheds of the 16 western states:

1. key areas of native vegetation and high ecological integrity; areas of mixed native and exotic vegetation and condition; and areas of low ecological integrity
2. suitable and critical habitat for habitat-specialist terrestrial and aquatic wildlife species
3. suitable habitat for wide-ranging species (e.g., bull trout and sage grouse) that require use of extensive or temporally diverse (e.g., winter/summer habitat) areas within the ecoregion
4. hotspots of plant and wildlife biodiversity
5. habitats “at risk” of further fragmentation or degradation
6. important aquatic areas, such as riparian areas, steep/unstable slopes, wet meadows, and aquatic species’ strongholds
7. areas where restoration will increase potential for habitat connectivity
8. areas that could benefit from improved management or restoration to maintain or enhance ecological integrity.

#### Action-PLAN 2

Consult conservation center databases and other sources of information and scientists on species occurrence. Lack of data may mean no reliable inventories have been conducted.

#### Action-PLAN 3

Identify spatial and temporal association of particular vegetation problems and compare and contrast with the spatial and temporal occurrence of past and continuing human activities.

#### Action-PLAN 4

Overlay the ecoregion habitat maps with:

1. a grazing allotment assessment with the goal of phasing out grazing in sensitive areas over time. These include degraded areas, key habitats, and areas where grazing is clearly incompatible with native vegetation and habitat recovery.
2. a logging assessment with the goal of ceasing logging in areas where there is a high risk that it would thwart the recovery of native vegetation or increase existing levels of degradation.

3. a roads and off-road vehicle routes assessment with the goal of closing and decommissioning roads and off-road vehicle routes in ecologically sensitive areas including riparian areas, unstable slopes, sensitive watersheds, and wildlife migration corridors (see Endnote 2).
4. an amphibian assessment. Avoid herbicide use in amphibian habitats, as many amphibians are highly vulnerable to herbicide applications and drift.

Action-PLAN 5

Using existing data, prepare and update every three years, maps of:

1. invasive exotic species concentrations within each watershed and subwatershed.
2. exotic species plantings on BLM lands, and, when available, adjacent private and public lands.

Action-PLAN 6

Prior to implementing site-specific vegetation treatments, prepare goals based on:

1. vegetation conditions, including invasive species concentrations
2. vulnerable wildlife and plant species and habitats
3. habitat important for threatened, endangered, and sensitive species and carnivores; connectivity for habitat-specialist wildlife
4. past and present activities within the watershed leading to vegetation problems
5. passive and active restoration needs
6. feasible restoration goals

## IV. SITE SELECTION AND TREATMENT PRIORITIES

### A. General

Action-PRIORITIES 1

Prioritize treatments shown to have a high probability of restoring natural processes and natural biotic communities (based on previous experiments or operational use) over treatments without this kind of documentation.

Action- PRIORITIES 2

Prioritize vegetation treatments based on scientific evidence of efficacy as follows:

1. cessation of activities that impede natural recovery (i.e., passive restoration)
2. active restoration treatments that incorporate passive restoration
3. active restoration treatments to restore ecological integrity.

Action- PRIORITIES 3

Vegetation prevention and restoration treatments must utilize:

1. a precautionary approach, which, in the face of uncertain outcomes, proceeds experimentally and cautiously
2. best available science and experiential and indigenous knowledge where applicable
3. an adaptive process that regularly incorporates revisions from monitoring and evaluation
4. a public process
5. the least intrusive techniques available to restore ecological integrity
6. the least risky interventions that are likely to provide the greatest ecological benefit
7. recovery plans for threatened and endangered species, or improvements on such plans

8. prevention strategies to reduce the need for chemical and mechanical treatments, and prescribed fire, so that the number of acres treated annually with these methods will decline over the life of the EIS.

Action- PRIORITIES 4

Herbicide treatments must be of lower priority than non-chemical treatments, and shall be used only in conjunction with:

1. elimination or reduction of the conditions that have favored the presence of invasive species
2. encouragement of conditions that resist invasive species (see Endnote 3).

Action- PRIORITIES 5

Prior to implementing a site-specific treatment:

1. identify and prioritize restoration options
2. select the least intrusive/intensive methods that will effectively move the site toward the stated goals of ecological integrity
3. identify riparian conservation areas, consisting of the riparian community and hydrological energy zones; and an outer zone that provides buffers for the riparian conservation area and considers slope stability and soil erosion.

Action- PRIORITIES 6

State for all site-specific restoration projects and activities:

1. measurable conservation and restoration objectives
2. specific indicators and measures for determining results
3. timelines for analysis of whether goals, objectives and standards have been met
4. decision making processes that will be used to respond to analysis of results.

**B. Invasive Species Treatments**

GOAL- PRIORITIES 1

The ecological impact of invasive species shall be minimized through conservation and restoration of native vegetation communities, watersheds and wildlife habitats.

Action- PRIORITIES 7

Give priority to two facets of the control of invasive species as defined in Executive Order No. 13112, "Invasive Species":

1. prevent the spread of invasive species from areas where they are present
2. restore native species and habitats to reduce the effects of invasive species and to prevent further invasions.

Action- PRIORITIES 8

Give treatment priority to areas in which exotic plant invasions have adverse ecological impacts on native plant communities, watersheds, and wildlife habitats.

Action- PRIORITIES 9

Develop, with the input of knowledgeable scientists and citizens, a long-term (e.g., 100-year) plan for prevention and minimization of unwanted exotic vegetation within the planning area, and restoration of ecological integrity, including native vegetation. Short-term plans (e.g., 1, 5, or 10 year horizons) will be integrated within the 100-year plan; all shall emphasize experimentation and adaptation.

Action- PRIORITIES 10

The long term vegetation management plan for integrated agency action shall include:

1. identification and lessening of the **conditions** that cause or favor the introduction, establishment, and spread of invasive species, and methods to ameliorate those conditions
2. plans for preservation or restoration of historical disturbance regimes
3. restoration of the native vegetation community, via seeding and planting, to increase resistance to invasion
4. active vegetation treatments to reduce the abundance of invasive exotic species populations.

**C. Prescribed Fire, Wildfire, and Fire Suppression Treatments**

GOAL- PRIORITIES 2

Natural fire regimes and native vegetation types will be restored, wherever feasible.

Action- PRIORITIES 11

Collect baseline data on historical fire regimes and plant and animal communities to use as a guide for restoration activities.

Action- PRIORITIES 1 2

Base fire management decisions on the 1995 Wildland Fire Policy, the updated 2001 Wildland Fire Policy, and current science. As required by the Fire Policy, create Fire Management Plans for every burnable acre.

Action- PRIORITIES 13

Through an open process that fully includes the public and utilizes the best available science, develop Fire Management Plans that:

1. allow certain remote wildland areas to burn under carefully prescribed conditions where ecological benefits would result
2. prescribe “Minimum Impact Suppression Tactics” where they would be most appropriate
3. prohibit aggressive soil-disturbing suppression methods where they would be damaging (e.g. bulldozers in roadless areas, chemical retardants in riparian areas)
4. determine ecological risks of fire – exotic species, population impacts - in all areas covered by plans, and carefully weigh benefits and risks as part of this process.

Action- PRIORITIES 14

Based on Fire Management Plans, use fire suppression to protect:

1. areas of high ecological values that may be at risk from exotic species invasion following fire
2. areas where human life, developed property or irreplaceable ecological values or cultural resources (e.g., rare forest types, a major portion of the population of an endangered species, or pictographs) are at stake
3. areas that should be protected until prescribed burning or other treatments can reduce excess fuels
4. important wildlife habitats (e.g., within 2 miles of sage grouse leks, big game winter ranges)

Action- PRIORITIES 15

Fire fighting shall be avoided in:

1. areas where nearby natural fire barriers such as bodies of water or rocky ridges are likely to extinguish the fire
2. Wilderness Areas, Wilderness Study Areas, roadless areas/potential wilderness areas, Wild and Scenic Rivers, and Research Natural Areas, except when fire threatens to escape from these areas or permanently impair ecological or cultural values.

Action- PRIORITIES 16

Mechanical fire suppression (i.e., with bulldozers) shall be avoided in riparian zones, steep slopes and other ecologically sensitive areas..

**D. Fuels Reduction**

GOAL- PRIORITIES 3

Human lives and property will be protected from wildfire and natural processes will be restored.

Action- PRIORITIES 17

Distinguish between fuels treatments intended to restore ecological integrity and those primarily intended to protect property and human life.

Action- PRIORITIES 18

Fuels reduction funds under the National Fire Plan shall be used:

1. only in the wildlands urban interface to protect lives and property
2. for strategic fire management planning and firefighter training to maximize the safety, ecological soundness, and effectiveness of fire and fuels management actions including prescribed fire, wildland fire use, and fire suppression.

Action- PRIORITIES 19

Fuels reduction shall, except for restoration or conservation necessity:

1. minimize or avoid road construction and reconstruction
2. avoid roadless areas, old growth, endangered species habitat, riparian areas, ecological sensitive areas and other areas of high ecological integrity
3. avoid habitat of threatened and endangered species.

Action- PRIORITIES 20

Fuels reduction treatments shall not:

1. increase motorized vehicle use or livestock access
2. supply biomass plants
3. increase fire risk through accumulation of activity fuels
4. include chaining
5. include clearcutting
6. limit native plant recovery through chipping or ground disturbing activities.

Action- PRIORITIES 21

Use positive economic incentives that encourage ecologically based restoration activities and eliminate incentives that encourage activities that are ecologically degrading.

1. contracts for fuels reduction/thinning for wildlands urban interface or restoration shall not include:
  - a) commercial timber sales
  - b) “goods for services” stewardship contracts

2. all fuel reduction projects shall be paid for by appropriated dollars and any material of commercial value shall be sold in a separate contract and all revenues shall be returned to the treasury or used to support monitoring.

## **V. PREVENTION VEGETATION TREATMENTS**

### **A. General**

#### Action-PREVENTION 1

The BLM shall not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species unless the agency has determined and made public its determination that the public benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

### **B. Invasive Species**

#### Action- PREVENTION 2

Develop and implement comprehensive, science-based protocols designed to prevent the spread of invasive species in relation to all activities on BLM lands that have been identified in the scientific literature as primary facilitators of the establishment and spread of invasive species, watershed degradation, and loss of native species.

#### **1. Livestock Grazing**

#### GOAL- PREVENTION 1

The introduction, establishment, and spread of invasive species due to livestock grazing shall be minimized.

#### Action- PREVENTION 3

Reduce spread of invasive weeds caused by domestic livestock grazing:

1. retire domestic livestock grazing permits at earliest opportunity where grazing has been found to promote invasion or persistence of invasive species
2. prioritize invasives prevention and restoration activities for areas where domestic livestock grazing has been permanently ended
3. manage livestock movement patterns to insure animals are not moving seeds of invasive species from infested to uninfested areas
4. suspend livestock grazing on non-cohesive soils in perennially saturated meadows.
5. manage livestock grazing to favor native species
6. avoid grazing in systems still containing a strong component of native perennials, biological soil crusts, or other features known to act as natural barriers to invasion or increase of invasive exotic species.

#### **2. Roads and Off-Road Vehicles**

#### GOAL- PREVENTION 2

Invasive species introduction, establishment and spread due to road, fire break, and off-road vehicle route construction, use, and maintenance shall be minimized.

Action- PREVENTION 4

Develop GIS maps and databases of all system (authorized and constructed) and non-system (user-created) roads and routes.

Action- PREVENTION 5

Precede all road or off-road vehicle route reconstruction, and any consideration of adding existing or illegal user-created roads and off-road vehicle routes to the transportation system, by NEPA analyses of their impacts, including potential to facilitate the spread of invasive species into native ecosystems.

Action- PREVENTION 6

Close or restrict non-essential, designated routes for motorized vehicle travel in areas of high risk for spread of invasive species.

Action- PREVENTION 7

Implement measures that reduce the likelihood of weed seed dispersal, such as educating equipment operators, implementing appropriate protocols for vehicle and equipment washing, restricting recreational access and seasonal travel. Consider restricting road grading activities in areas with high populations of invasive species.

Action- PREVENTION 8

Implement full area closures that prohibit all motorized travel on lands outside of designated and NEPA analyzed transportation system roads and off-road vehicle routes.

Action- PREVENTION 9

Identify and designate for obliteration non-essential system and non-system roads and off-road vehicle routes that do not comply with native vegetation protection goals.

Action- PREVENTION 10

Cease new road construction and most road reconstruction in riparian areas

Action- PREVENTION 11

Reclaim obliterated roads to native vegetation.

### **3. Fire Suppression**

Action- PREVENTION 12

Utilize Minimum Impact Suppression Techniques and fully reclaim fire lines with native vegetation after fire emergency situations have ended, in order to prevent the spread of invasive species into the disturbed fire line corridors and to prevent the use of fire line corridors as illegal off-road vehicle travelways.

### **4. Wildland-Urban Interface**

Action- PREVENTION 13

Home-site treatments in the wildland-urban interface (e.g., thinning, pruning, and mowing of vegetation) must be undertaken primarily within a 20 - 60 meter (66-200 feet) intensive treatment zone where fires most directly threaten structures and human life.

Action- PREVENTION 14

Defensible community space that may include public and private lands may be created within an additional treatment zone up to 500 meters (which includes the 60 meter home-site treatment zone) for fire fighter safety and protection of other flammable community values.

Action- PREVENTION 15

Treatments to create defensible space may include thinning small diameter trees, pruning, mowing, roof cleaning , as well as replacement of flammable landscape and building materials.

Action- PREVENTION 16

Long-term maintenance activities within the wildland-urban interface (i.e., prescribed burning, mechanical brush removal, etc.) as well as monitoring plans must be considered and a funding commitment secured before any action is undertaken.

Guideline- PREVENTION 1

Management of the wildland-urban interface zone should be a cooperative partnership between relevant agencies, tribes, communities, and homeowners. Cooperation shall extend from the initial risk assessment and following through to future maintenance and should account for appropriate access to structures for fire fighting as well as fire resistant landscaping and consideration of construction standards and proper zoning laws for all land ownerships.

Action- PREVENTION 17

Restoration priorities must be identified through a restoration assessment before any restoration fuels reduction activities take place.

**5. Timber**

GOAL- PREVENTION 3

The introduction, establishment, and spread of invasive species due to timber sales shall be minimized.

Action- PREVENTION 18

Maintain old-growth vegetation communities as bulwarks of vegetational resistance to invasion; minimize disturbance of old-growth or late seral vegetation communities; and, whenever possible, maintain intact forest canopies adjacent to areas such as roads and clearcuts where invasive species are abundant.

Action- PREVENTION 19

Design and plan timber sales for maximum prevention of introduction, spread, and establishment of invasive species, including pathogens.

**6. Altered Hydrological Regimes**

GOAL- PREVENTION 4

The introduction, establishment, and spread of invasive species due to altered flow regimes of rivers and streams will be minimized.

Action- PREVENTION 20

Prioritize treatments of riparian areas where restoration is likely to be successful; e.g., areas where the natural historic flow regime is extant.

Action PREVENTION 21

Restore native historical flow regimes whenever it is possible to do so.

**7. Oil, Gas, and Mineral Exploration and Development**

GOAL- PREVENTION 5

The introduction, establishment, and spread of invasive species due to oil, gas, and mineral exploration and development will be minimized.

Action- PREVENTION 22

Prohibit surface disturbance associated with oil and gas exploration, development, and production activities in areas with

1. endangered, threatened, candidate, sensitive, or rare plant species
2. steep slopes.

Action- PREVENTION 23

Minimize surface disturbance associated with oil and gas exploration, development, and production activities in areas with sensitive soils.

Action- PREVENTION 24

In areas where seismic exploration activities are permitted best available technologies must be used (i.e. helicopter shot-hole technologies over the use of 65,000 pound thumper trucks.

Action- PREVENTION 25

Locate wells and associated roads and pipelines on slopes less than 25% to avoid or minimize surface disturbance; on slopes greater than 25%, prohibit surface disturbing activities

Action- PREVENTION 26

Keep removal and disturbance of vegetation to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites etc.) on both individual well locations and within oil and gas project areas.

Action- PREVENTION 27

Limit vehicular traffic to the running surface of roads and well locations as authorized in Application's for Permit to Drill (APD's) and Right of Ways (ROWs) thus prohibiting all traffic on two-tracks and trails near oil and gas well location and within oil and gas project areas.

Action- PREVENTION 28

Require that all gravel and other surfacing materials used for the project are free of noxious weeds.

Action- PREVENTION 29

Complete a survey for any and all endangered, threatened, candidate, sensitive, or rare plant species prior to allowing any surface-disturbing activities involved with oil and gas exploration, development, and production activities.

Action- PREVENTION 30

Adopt a "No Net Loss" policy for all special status plant species.

Action- PREVENTION 31

Each operator must submit a Surface Use Plan containing appropriate erosion control and revegetation measures (e.g., reintroduction of biological soil crust or mycorrhizae) with each APD request.

Action- PREVENTION 32

Grading and landscaping shall be used during and after construction activities are completed to minimize slopes, and water bars shall be installed on disturbed slopes in areas with unstable soils where seeding alone may not adequately control erosion.

Action- PREVENTION 33

Upon the completion of the drilling phase, require immediate reclamation of all portions of the pad that can be reclaimed using the soils originally removed during construction.

Action- PREVENTION 34

With each APD request, the oil and gas operators must submit a reclamation plan that includes, but shall not be limited to:

1. identification of lands to be disturbed
2. detailed description of the baseline condition and resources on the land including existing uses, soil characteristics, slope, topography, vegetative cover, and productivity
3. methods to control erosion
4. plans to revegetate and restore the areas disturbed
5. measures that address steep slopes, sensitive soils, recontouring requirements, short-term seedbed preparation measures, seeding mixtures and methods, and long-term reclamation goals
6. steps to be taken to comply with federal, state, and local environmental laws, regulations, and policies.

## **8. Disturbance to Biological Soil Crusts**

GOAL- PREVENTION 6

Biological soil crusts shall be maintained as a partial shield preventing establishment or spread of invasive exotic species (See Endnote 4).

Action- PREVENTION 35

Using existing data, map and describe the presence and integrity of biological soil crusts at the ecoregion and watershed levels within the 16 western states; locally develop maps at the subwatershed level.

Action- PREVENTION 36

Prepare and implement a general plan for damaged biological soil crusts.

Action- PREVENTION 37

Prohibit livestock grazing for at least five years following a fire in areas capable of maintaining biological soil crusts. Return of livestock will be delayed past five years if significant recovery of the biological soil crust has not occurred.

## **C. Prevention of Excess Fuels**

Goal-PREVENTION 7

Shrub and tree establishment shall be maintained at historical densities to prevent excess fuels.

Action-PREVENTION 38

Reduce or eliminate livestock grazing in forests and shrublands where:

1. historical grass and forb competition to tree and shrub seedlings density has been or can be diminished by grazing
2. historical understory necessary to carry "cooler" fires has been or can be diminished by grazing.

Action- PREVENTION 39

Exclude livestock for at least five years from forest and shrubland areas following fuels reduction treatments (e.g., burning, thinning), and until pre-determined native vegetation composition, density, and ground cover have been attained.

Action- PREVENTION 40

Allow wildland fire and consider prescribed burning in order to maintain capacity for cooler, understory fires within shrublands and forests.

## **VI. RESTORATION VEGETATION TREATMENTS**

### **A. Direct Treatments of Invasive Species**

Action-RESTORATION 1

Use the least intrusive/extensive/risky vegetation treatment methods to enhance wildlife habitat and populations.

Action- RESTORATION 2

Analyze potential effects of site-specific treatments on an array of species; reliance on assessments of effects only on umbrella species is not sufficient (see Endnote 5).

Action- RESTORATION 3

Direct treatments of invasive species shall be part of an over-all ecologically based restoration plan and may include:

1. Biological control
2. Cultural (manual) practices
3. Mechanical treatments
4. Chemical treatments
5. Prescribed fire

Action- RESTORATION 4

Base the selection of direct treatment methods on:

- a. ecological priorities for restoration rather than potential economic benefits
- b. size of the proposed treatment area, its location, and the biology of the target invasive species.

Action- RESTORATION 5

Except for treatment of small infestations without motorized equipment, prescribe direct treatments within designated wilderness or wilderness study areas only in conjunction with efforts to halt avoidable spread of invasive species into the wilderness from outside these areas.

Guideline- RESTORATION 1

Adopt the Carhart Model (Arthur Carhart National Wilderness Training Center) for completing minimum requirement analyses and minimum-impact tool analysis. The model assists managers in making administrative decisions concerning wilderness.

Action- RESTORATION 6

Prioritize nonchemical methods, unless shown to be ineffective, over chemical methods.

Action- RESTORATION 7

Small infestations have higher priority for active restoration treatments than large-scale infestations, with the exception of biological control. Use seasonal employees to detect and treat small infestations.

Action- RESTORATION 8

Use only those biological control agents that have been demonstrated to pose no threat to native species.

Action- RESTORATION 9

Use cultural treatments that have been shown effective in restoring native vegetation in scientific studies (e.g., use of properly timed fire, properly timed and managed goat grazing, mulching, and hand pulling) and conduct operational research to develop new, effective cultural treatments.

Action- RESTORATION 10

Plant and seed appropriate native species to compete with exotic species.

Action- RESTORATION 11

Use mechanical treatments that have been shown to be effective in restoring native vegetation in scientific studies (e.g., mowing, spot fire (flamer), mastication, weed eaters, mulching, and weed wrenches) and conduct operational research to develop new, effective mechanical treatments.

Action- RESTORATION 12

For chemical treatments, use application methods that minimize exposure to people, wildlife, and native plants. Spot treatment methods shall be preferred over broadcast methods.

Action- RESTORATION 13

Do not use broadcast herbicide treatments within 500 feet of endangered, threatened, candidate, sensitive, or rare plants. If herbicides are necessary for protection of a rare species, allow only application methods that apply herbicides only to the target plants.

Action- RESTORATION 14

Avoid application of herbicides and prohibit broadcast spraying in riparian conservation areas. Avoid application of herbicides (e.g. atrazine) with adverse effects on aquatic species and amphibians.

Action-RESTORATION 15

Prohibit the use of herbicides in known aquatic and terrestrial amphibian habitat, including breeding, rearing, and overland dispersal areas.

Action- RESTORATION 16

Only herbicides that minimize adverse effects on environmental and human health, based on knowledge of all ingredients in the formulation, shall be utilized for chemical control.

Action- RESTORATION 17

Prohibit use of sulfonyleurea herbicides and other acetolactate synthase-inhibiting herbicides due to their demonstrated ability to damage off-site native and crop species.

Action- RESTORATION 18

Design treatments to account for wildlife habitat needs, for instance, by the timing and location of activities. Avoid treatments during nesting season for migratory birds, and during identified sensitive periods for wildlife (e.g., critical wintering habitat for big game or sage grouse).

**B. Prescribed Fire**

Action- RESTORATION 19

Use prescribed fire to restore native vegetation, historical fire regimes, and native ecosystem; and to mitigate human safety threats, but only in concert with a restoration assessment with clear objectives, and where it will not increase invasive species.

Action- RESTORATION 20

Consideration of the following must be documented prior to prescribed burns, if relevant:

1. long-term damage to biological soil crusts
2. soil erosion through wind and runoff events
3. long-term loss of nutrients from already nutrient-deficient landscapes
4. loss of populations and habitat of special status species
5. risk of spread of invasive species
6. the levels of nuclear testing radionuclides in the immediate and adjacent area
7. interrelation between prescribed burning projects on adjacent Federal/state lands
8. indigenous uses of plants that may be impacted.
9. impacts on air quality
10. lethal effects on mature ponderosa pine, particularly from fire damage of roots

Action- RESTORATION 21

Burned areas (natural or prescribed) must be protected from livestock grazing for at least five years and until measurable recovery criteria are met.

Action- RESTORATION 22

Prescribed burning teams shall:

1. use existing roads
2. limit ground disturbance
3. address risk of fire spreading beyond the project area and onto surrounding lands.

**C. Fuels Reduction**

Action- RESTORATION 23

Fuels reduction to restore natural fire processes shall be based on comprehensive restoration assessments with clear objectives, in conjunction with other active or passive methods.

Action- RESTORATION 24

Following fire, all standing trees shall be left for wildlife habitat, soil stability, and nutrient cycling, except where removal is necessary to maintain public safety or to restore ecological integrity (e.g., possible removal of small green trees that "should" have burned, so that future fires can burn more naturally).

**D. Fire Suppression**

Action- RESTORATION 25

Minimize introduction of invasive species during and after fire suppression operations:

1. clean equipment of invasive species seeds before moving equipment off roads to build fire breaks
2. seal all firebreaks to prevent off-road vehicle access.

Action- RESTORATION 26

Minimize post-fire disturbance to burned areas to allow natural recovery.

Action- RESTORATION 27

Monitor all fire camps and helicopter spots for invasive species following fire.

**E. Forage Enhancement**

Action- RESTORATION 28

Conduct forage enhancement projects only if they incorporate ecological principles to encourage native species, and will not result in any net loss of native plant communities.

**VII. REVEGETATION**

Action-REVEGETATION 1

In revegetation efforts, whenever it is possible to do so, use native seed and seedlings that have been grown from seeds of locally adapted populations.

Action- REVEGETATION 2

If native seeds/plants are not available, revegetation projects will rarely be undertaken until native plant seed or plants become available. Non-native plant species will be used only in extremely degraded/severely altered systems as an intermediate step toward/placeholder for native restoration, accompanied by a full commitment to complete restoration of native species. This commitment must include funds set aside as part of the project, with specific deadlines for accomplishment.

Action- REVEGETATION 3

When reseeding with non-native species, certification must be provided that only species that have been documented as non-persistent are present in the seeding mixture.

Action- REVEGETATION 4

Assure availability of native seed and plants:

1. establish BLM contracting systems that will provide growers the necessary assurance their native, locally-adapted seed/plants will be purchased if grown
2. establish sufficient storage facilities for native seeds for major revegetation efforts.

Action- REVEGETATION 5

Determine, in landscape, watershed, and subwatershed vegetation assessments, the feasibility of providing habitat for wildlife and plant species that have been extirpated or nearly extirpated.

Action- REVEGETATION 6

Prepare a public report on potential reintroduction of extirpated species, including foreseeable human activities or developments that would foreclose options for such reintroductions.

Action- REVEGETATION 7

Collaborate with federal, state, local and private land managers to reduce sale and planting of exotic invasive species, and increase availability and use of appropriate native species, with particular attention to inholdings and other lands adjacent to BLM lands.

Action- REVEGETATION 8

Focus invasive species public education programs on 10-20 of the most ecologically problematic local invasive species and those that have the potential to invade a given District. Include information about how these species are introduced to public lands.

Action- REVEGETATION 9

Following fire or other disturbances, do not propose reseeding unless it can be shown that natural regeneration is unlikely. Use native species unless they are not available. Always use certified weed-free seed.

## **VIII. MONITORING AND EVALUATION**

Action-MONITOR 1

Before resources are committed to modify a plant community, gather baseline data to reflect existing conditions. If treatments are initiated, data shall be collected to substantiate whether or not any of the goals, objectives, and standards have been met. If baseline and post-treatment evaluation monies are not available, then the project shall not be approved (see Endnote 6).

Action-MONITOR 2

Monitoring must be used to:

1. inventory baseline conditions at the landscape, watershed, subwatershed, and project site levels
2. measure whether positive goals for native ecosystem recovery, conservation, and integrity are being attained
3. track biodiversity and health using an increaser/decreaser species procedure (including biological soil crusts, wildlife, and endemic/sensitive species).
4. practice precaution, retain flexibility, and respond to change, unforeseen harm, failure to reach objectives, and/or new information
5. quantify invasive species population changes
6. establish success/problems with specific prevention and restoration treatments in a variety of sites.

Action-MONITOR 3

Monitoring and evaluation of vegetation treatments shall:

1. relate to the clearly stated objectives of all restoration projects
2. be an integral component of each restoration project
3. be incorporated into the essential costs of each project

4. use scientific principles of experimental design including replication and measurements from untreated control areas for comparison with treated locations
5. use a process responsive to all-party and scientific input
6. encourage involvement of local, regional and national stakeholders
7. be documented in a sixteen-state central database with assessments, objectives, monitoring procedures, and analyses in comparable formats
8. outline clear procedures for responding to monitoring and evaluation results

Action-MONITOR 4

Monitoring methods shall be:

1. Relevant: evaluates progress toward stated objectives
2. Sensitive: quickly detects change, shows trends, identifies critical features
3. Available: inexpensive, easily applied
4. Measurable: accurately quantifiable with acceptable methods
5. Defensible: minimally subject to individual bias
6. Verifiable: allows others applying the same methods to achieve similar results
7. Inclusive: avoids reductionism, where feasible
8. Scheduled: monitoring interval firmly scheduled.

Action-MONITOR 5

Goals, objectives, and standards must be written for all projects tied to this EIS. All projects must be monitored to determine if their goals, objections, standards, and guidelines are being met on schedule.

Action-MONITOR 6

Objectives and standards must be written in such a manner as to be measurable with concrete ecosystem indicators. Reliance on "professional judgment" without evidence should be minimized, so that conclusions and ecosystem conditions can be independently verified.

Action-MONITOR 7

Each District must prepare an annual monitoring report of all vegetation restoration projects (passive and active). These reports should be available at a central BLM location (see Endnote 7).

Action-MONITOR 8

Each District must annually report whether goals, objectives, and standards are being met. For those that are not being met, indicate plans for meeting them.

Action-MONITOR 9

All proposals to undertake a vegetation restoration activity must include a description of the monitoring that will be necessary to determine the compatibility of the activity with specific goals, objectives, and standards; and the treatment efficacy.

Action- MONITOR 10

Require the submission of an annual monitoring plan at or near any and all locations disturbed by oil and gas activities before granting approval of an Application for Permit to Drill.

Action-MONITOR 11

Annually monitor for five years all firelines, fire camps, helicopter spots, and fire retardant-treated areas for invasive species; eliminate introduced invasive species.

Action- MONITOR 12

Monitor progress toward attainment of long term health and integrity of the watershed, aquatic, riparian, native vegetation and soil resources.

**IX. TRIBAL RELATIONS FOR VEGETATION TREATMENTS**

GOAL-TRIBES 1

Native American Indian concerns and issues relative to vegetation prevention and restoration treatments are addressed and mitigated in full collaboration with Native Tribal people.

Action-TRIBES 1

Consultation and collaboration with Native Tribes shall take place throughout the process of developing and implementing this EIS in accordance with Executive Order No. 13084, Consultation and Coordination with Indian Tribal Governments.

Action-TRIBES 2

Contact Native Tribal representatives from Tribal governments and organizations when vegetation treatments are being planned. Give particular attention to consultation and collaboration with local Tribal people when activities may affect Native cultural resources, hunting, fishing and gathering areas, sacred sites, or Tribal trust lands.

Action-TRIBES 3

Analyze treatment proposals pursuant to Executive Order No. 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Action-TRIBES 4

In collaboration with Tribal people, identify culturally significant plants used for food, basketweaving and other fibers, medicine, and ceremonial purposes.

Action-TRIBES 5

Develop protocols for enhancement and protection of culturally significant plants :

1. utilize traditional indigenous knowledge and wisdom to protect and enhance native vegetation communities, native resources, and ecosystems.
2. prioritize treatments that will enhance and preserve culturally significant plants and animals.
3. use minimal impact vegetation treatments where culturally significant species are known to occur. Vegetation treatments will not result in net loss of native species of importance to indigenous people for subsistence or cultural purposes.

Action-TRIBES 6

Establish herbicide-free zones to protect culturally significant plant and wildlife resources.

Action-TRIBES 7

Provide notification to Indian communities of the exact locations, dates, and times that herbicide applications will take place, via letters of notification and posting in prominent locations (such as community bulletin boards and local post offices).

Action-TRIBES 8

Monitor the impacts of different vegetation treatments upon the viability and health of culturally significant plants and animals. Adapt treatment approaches as necessary to ensure culturally significant plant and animal resources are protected for seven generations.

**X. COORDINATION, EDUCATION, AND PUBLIC AWARENESS**

Action-CEPA 1

Identify activities that prevent, minimize, or reverse (as well as facilitate) the introduction, establishment, spread, and reinvasion of specific invasive exotic plant species (e.g., cheatgrass, ventanata, starthistle) on BLM lands.

Action- CEPA2

Incorporate findings of the analysis (CEPA-1) in all site-specific treatment decisions.

Action- CEPA 3

Develop and maintain a central web site featuring prevention and passive and active restoration treatments, including:

1. scientific literature on treatment outcomes of relevance to BLM lands
2. BLM projects that have resulted in reestablishment of native vegetation, reintroduction of extirpated species, increase in sensitive species populations, reduction in acres needing restoration treatments, or reestablishment of natural fire regimes
3. successful BLM projects or programs to alter activities that have facilitated the introduction, establishment and spread of invasive species.

Action- CEPA 4

Establish annual awards to BLM employees, Districts, and inholding landowners for accomplishments such as:

1. successful passive and active restoration of native vegetation
2. equality of effort to prevention and restoration treatments
3. exemplary monitoring
4. significant involvement of NGOs, students, and other volunteers in conservation and restoration activities..

Action- CEPA 5

Eliminate funding based on acres of vegetation directly treated the previous year without (a) documented alteration of the conditions that favored the presence of the vegetation that was directly treated and (b) restoration programs to restore the site to native vegetation.

Guideline- CEPA 1

Offer simple invasive exotic species reporting forms to BLM lands visitors in order to encourage the reporting of locations in which particular invasive species are present

Action- CEPA 6

Educate the public, including owners of lands neighboring BLM lands, about:

1. the natural role of fire and protecting their homes from fire through the Fire Wise Program
2. prevention of invasive species introduction, establishment, and spread.

## Endnotes

1. Vegetation (and thus ecosystem) problems on BLM lands in sixteen western U.S. states include fragmentation; simplified ecosystems; invasive exotic species; altered fire regimes; compacted and otherwise heavily-disturbed soils; and impaired watersheds, with disturbed upland and riparian systems.
2. The three most common activities on public lands managed by the BLM that continue to contribute to declining watershed health are:
  - *Livestock grazing*, which has caused severe, widespread, long-lasting damage to soils, vegetation, riparian areas, streams, and associated species;
  - *Roads*, which damage water quality, riparian areas, the quantity and timing of water flows, aquatic and riparian flora and fauna, and the overall hydrologic and ecological functions of watersheds; and
  - *Logging*, which has contributed to degradation of water quality, riparian areas, soils, vegetation, and aquatic resources.

These activities lead to elevated sedimentation, degraded soils, degraded riparian areas, and altered stream flows within much of the BLM-managed landscape. Fire in watersheds, a natural process, plays a far smaller role in watershed degradation than these activities.

3. This prioritization is essential, as herbicides can (1) have numerous adverse toxic effects on workers; nearby residents; beneficial soil organisms; and native plant, aquatic, terrestrial and avian species; (2) simplify the vegetation community; and (3) render the treated site more vulnerable to return of invasive species. Herbicides alone do not address the conditions that favor the introduction, establishment and spread of invasive species, and yet they are often used as stand-alone technological “fixes.”
4. These crusts of lower plants and cyanobacteria cover soil surfaces between individual plants in healthy arid grasslands, shrublands, and dry woodlands. While they fix nitrogen, increase soil fertility, improve water infiltration, stabilize soils, and enhance the establishment of vascular plants, they also may provide a shield that reduces or prevents establishment and spread of exotic species. Biological soil crusts are particularly susceptible to damage from physical disturbance.
5. An example of the insufficiency of analysis for effects solely on an umbrella species involves sagebrush canopy “thinning” for sage grouse. This may negatively impact nesting cover for migratory bird species of concern.
6. There is an obvious, admitted, ongoing, and institutional failure to adequately monitor, survey, and document the impacts of human activities on habitats, native vegetation, and native wildlife on federal public lands. Even when monitoring has occurred, land managers have rarely translated the findings into management improvements. Good intentions and monitoring plans have been insufficient to direct sufficient funding, staff, or attention to the outcomes of vegetation and other restoration treatments, among other human activities. It is essential that both the continuation and initiation of vegetation restoration activities be dependent upon prior adequate baseline and post-treatment monitoring. “We do what we get funded for” is neither a legally sufficient nor an ecologically responsible approach to the required, continuous, finding of compatibility of treatment activities with the goals, objectives, standards, and guidelines of this EIS.
7. Monitoring needs to be documented so that it can be independently reviewed by non-BLM scientists, the scientifically literate public, and others who are concerned about the ecological health of the nation’s federal public lands.