Restore Native Ecosystems Alternative

December 24, 2002
An Alternative for Consideration in the
Region 6 Forest Service Invasive Species
Environmental Impact Statement

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RESTORE NATIVE ECOSYSTEMS ALTERNATIVE

I. OVERVIEW

GOAL OVR 1: ECOLOGICAL INTEGRITY

Enhance the ecological integrity of Pacific Northwest national forest lands 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 invasive species treatments that
a. **Prevent** conditions that favor invasive species; and
b. **Restore** ecological integrity on sites with invasive species (Endnote 2).

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 and native species vegetation, 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 and native species vegetation.

Action-OVR 3

State objectives, standards and guidelines in **clear, measurable terms**, then measure and monitor the longterm outcomes of treatments so that they can be held accountable to both 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 always 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 informed **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 treatment alternatives and outcomes.

Action-OVR 7

Provide:
1. clear and significant incentives (e.g., awards, grants, budgets) for prevention of invasive species and restoration of ecological integrity
2. disincentives for activities that encourage invasive species and delay restoration of native vegetation and 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 restoration of native vegetation, avoid treatments of symptoms in the absence of addressing causes, 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, native species
7. Planting and care of native seeds and plants
8. Reintroduction of soil biota required by native species, when necessary

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).

Invasive Species Treatments

Actions, which, based on scientific evidence, will effect the conservation and restoration of native vegetation communities. They include:

a. treatments that result in measurable soil, hydrological, and vegetation changes that resist invasive exotic species; and
b. active and passive restoration treatments that restore native vegetation and/or conditions favorable to native communities.

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 The regaining of 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.

Wildlands-Urban Interface

The area next to a home where fires most directly threaten structures and community space where there are flammable community values.

III. INVASIVE SPECIES TREATMENT PLANNING

GOAL-PLAN 1

Invasive species treatments are based on assessments of (1) the condition of vegetation; (2) major human causes of invasive species introduction, establishment or spread; (3) opportunities for prevention of soil disturbance and invasive species; (4) opportunities for conservation of native vegetation; (5) results of past invasive species treatments; and (6) comparative likelihood of treatment options for achieving restoration of ecological integrity and native vegetation.

Action-PLAN 1

Using existing information initially, map vegetation within Region 6:

1. key areas of native vegetation and high ecological integrity; areas of mixed native and exotic vegetation and condition; and areas of significant invasive plant concentrations
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" for exotic plant introduction, establishment, or spread

Action-PLAN 2

Refine maps by consulting conservation center databases and other sources of information and scientists on species occurrence.

Action-PLAN 3

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

Action-PLAN 4

Using overlays, identify those grazing allotments, proposed logging areas, and system and off-road vehicle roads that would facilitate invasive species introduction, establishment, and/or spread.

Action-PLAN 5

Using existing data, prepare and update, on an ongoing basis, maps of:

1. invasive exotic species concentrations; and
2. exotic species plantings on national forest lands, and, when available, adjacent private and public lands.

Action-PLAN 6

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

1. vegetation conditions, including invasive species concentrations
2. vulnerable wildlife and plant species and habitats (e.g., amphibian habitat, as many amphibians are highly vulnerable to herbicide applications and drift)

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 exotic plant invasions
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 invasive plant treatments based on scientific evidence of efficacy as follows:
1. cessation of activities that facilitate exotic plant invasions (i.e., passive restoration)
2. active restoration treatments that incorporate passive restoration
3. active restoration treatments to restore ecological integrity and native vegetation

Action- PRIORITIES 3

Invasive plant prevention and native vegetation 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

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. preventing the spread of invasive species from areas where they are present
2. restoring native species and habitats

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 invasive species 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 of intact ecosystems from invasions
3. plans for preservation or restoration of historical disturbance regimes
4. restoration of the native vegetation community, via seeding and planting, to increase resistance to invasion

5. active vegetation treatments to reduce the abundance of invasive exotic species populations

C. Prescribed fire and fire suppression for invasive species prevention

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 12

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 native vegetation would benefit
2. prescribe "Minimum Impact Suppression Tactics" where they would be most appropriate
3. prohibit aggressive soil-disturbing suppression methods where they would favor invasive species (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 13

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 14

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 15

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

Action- PRIORITIES 16

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 17

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

V. MANAGEMENT AND TREATMENTS FOR PREVENTION OF INVASIVE SPECIES

A. General

Action-PREVENTION 1

In accordance with Executive Order 13112, Region 6 Forest Service 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.

Action- PREVENTION 2

Develop and implement comprehensive, science-based protocols designed to prevent the spread of invasive species in relation to all activities on Forest Service 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.

B. Specific Management Considerations

1. Livestock grazing

GOAL- PREVENTION 1

Minimize the introduction, establishment, and spread of invasive species due to livestock grazing.

Action- PREVENTION 3

In order to minimize the introduction, establishment, and spread of invasive species due to 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 ensure 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

The 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. Restrict 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 and Wildland-Urban Interface Treatments

GOAL – PREVENTION 3

The introduction, establishment, and spread of invasive species due to fire suppression and wildland-urban interface treatments shall be minimized.

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. Monitor each growing season for five years to eradicate introduced infestations.

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

Fire suppression operations shall:
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- PREVENTION 15

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 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.

Action- PREVENTION 17

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

4. Timber Sales

GOAL- PREVENTION 4

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

Action- PREVENTION 18

Maintain old-growth vegetation communities and native forest communities where fire has not been suppressed, as bulwarks of vegetation resistance to invasion. Minimize disturbance of old-growth and late-seral vegetation communities and communities with healthy fire regimes; 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 to prevent introduction, spread, and establishment of invasive species, including pathogens.

Action- PREVENTION 20

Require all gravel and other surfacing materials used for the project be free of invasive species.

Action-PREVENTION 21

Limit timber sale hauling to dry (where pathogens like POC and laminated root rot can be spread) or frozen conditions when possible.

Action-PREVENTION 22

Require steam cleaning of logging equipment and vehicles prior to entry on Forest Service lands regardless of the type of road surface being traveled.

5. Altered Hydrological Regimes

GOAL- PREVENTION 5

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

Action- PREVENTION 23

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 24

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

6. Oil, Gas, and Mineral Exploration and Development

GOAL- PREVENTION 6

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

Action- PREVENTION 25

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 26

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

Action- PREVENTION 27

In areas where seismic exploaration 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 28

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 29

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 30

Limit vehicular traffic to the running surface of roads and well locations as authorized in Applications 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 31

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

Action- PREVENTION 32

Require each operator to 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 33

Require grading and landscaping during and after construction activities to minimize slopes, and installation of water bars on disturbed slopes in areas with unstable soils where seeding alone may not adequately control erosion.

Action- PREVENTION 34

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

Action- PREVENTION 35

With each APD request, require the oil and gas operators to 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

7. Disturbance to biological soil crusts

GOAL- PREVENTION 7

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

Action- PREVENTION 36

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

Action- PREVENTION 37

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

Action- PREVENTION 38

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.

VI. NATIVE VEGETATION RESTORATION TREATMENTS

A. Direct Treatments of Invasive Species

Action- RESTORATION 1

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 2

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
c. the array of species that may be directly and indirectly adversely or beneficially affected
d. opportunities for minimized intrusion, extent, and risk
e. demonstrated record of restoring native vegetation

Action- RESTORATION 3

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 4

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

Action- RESTORATION 5

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 6

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

Action- RESTORATION 7

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 8

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

Action- RESTORATION 9

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 10

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 11

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 and which expose only the target plants.

Action- RESTORATION 12

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 13

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

Action- RESTORATION 14

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 15

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

Action- RESTORATION 16

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 and Fire Suppression

Action- RESTORATION 17

Use prescribed fire only in concert with a restoration assessment with clear objectives for native plant composition, and where it will not increase invasive species.

Action- RESTORATION 18

Document consideration of the following prior to prescribed burns:
1. long-term damage to biological soil crusts
2. soil erosion through wind and runoff events
3. risk of spread of invasive species

Action- RESTORATION 19

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 20

Prescribed burning teams shall:
1. use existing roads
2. limit ground disturbance

Action- RESTORATION 21

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

Action- RESTORATION 22

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

C. Forage Enhancement

Action- RESTORATION 23

Conduct forage enhancement projects using only native species. Forage enhancement projects using non-native plant species will be carried out 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. Any use of non-native species would occur only after extensive consultation with invasive plant experts inside US and abroad, with opportunity for public comment. Such forage enhancement projects must 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 Forest Service 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

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 Forest Service lands.

Action- REVEGETATION 6

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 7

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 5).

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 tiered 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 outcomes and conclusions can be independently verified.

Action-MONITOR 7

Each Ranger District must prepare an annual monitoring report of all vegetation restoration projects (passive and active). These reports shall be available on forest and regional websites.

Action-MONITOR 8

Each Ranger 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.

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 national forests and grasslands.

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 national forest lands
2. Forest Service 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 Forest Service projects or programs to alter activities that have facilitated the introduction, establishment and spread of invasive species

Action- CEPA 4

Establish annual awards to Forest Service 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 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 Forest Service lands, about prevention of invasive species introduction, establishment, and spread.

Endnotes

1. Vegetation (and thus invasive species) problems on Region 6 national forests 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 Forest Service that continue to contribute to invasive species are:
   - *Livestock grazing*, which compacts and bares soil, alters hydrological regimes to favor invasive species, preferentially eats particular native species and avoids eating unpalatable or armed invasive species, reduces reproduction and survival of native grasses, spreads and plants invasive species seeds, and diminishes or eliminates microbiotic crusts;
   - *Roads and motorized vehicles,* which compact and bare soil; damage riparian areas, steep slopes, and native vegetation; distribute and plant invasive species' seeds; and
   - *Logging,* which compacts and bares soils; damages native vegetation; transports invasive species' seeds; and often promotes the construction of roads.

   These activities lead to degraded soils and riparian areas, simplified native plant communities, widespread presence of invasive species propagules, and weakened native vegetation throughout much of the Forest Service-managed landscape.

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. 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.

6. Monitoring needs to be documented so that it can be independently reviewed by non-Forest Service scientists, the scientifically literate public, and others who are concerned about the ecological health of the nation's federal, public lands.