

USDA - FOREST SERVICE

Guide to Noxious Weed Prevention Practices

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USDA-Forest Service

GUIDE TO NOXIOUS WEED PREVENTION PRACTICES

Introduction

Preventing the introduction and spread of noxious weeds is one objective of Integrated Weed Management Programs on National Forest System lands throughout the United States. This Guide to Noxious Weed Prevention Practices (Guide) provides a comprehensive directory of weed prevention practices for use in Forest Service planning and wildland resource management activities and operations. This Guide will help National Forest and Grassland managers and cooperators identify weed prevention practices that mitigate identified risks of weed introduction and spread for a project or program.

This Guide uses the term "*weed*" to include all plants defined as "*noxious weeds*" by Forest Service policy:

"...plants designated as noxious weeds by the Secretary of Agriculture or by the responsible State official. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof." (FSM 2080.5)

For National Forests and Grasslands that use a State-defined noxious weed list, the listed weed species are the priority for implementing weed prevention practices in cooperation with neighbors and partners. National forests and grasslands that do not have a State-defined noxious weed list need to determine local weed prevention priorities using weed lists created by other State or local organizations. At line officer's discretion, the practices described in this Guide may also be applied to non-native invasive plants that are not defined as "noxious".

Supporting Direction

This Guide to Noxious Weed Prevention Practices supports implementation of the February 3, 1999 Executive Order on Invasive Species. Federal agencies are expected to follow the direction in the Executive Order.

Development of weed prevention practices is supported by Forest Service noxious weed policy and strategy. Forest Service policy identifies prevention of the introduction and establishment of noxious weed infestations as an agency objective. This policy directs the Forest Service to: (1) determine the factors that favor establishment and spread of noxious weeds, (2) analyze weed risks in resource management projects, and (3) design management practices to reduce these risks. The Forest Service Noxious Weed Strategy identifies development of practices for prevention and mitigation during ground-disturbing activities as a long-term emphasis item. The February 1999 Executive Order on Invasive Species requires Federal agencies to use relevant programs and

authorities to prevent the introduction of invasive species and not authorize or carry out actions that are likely to cause the introduction or spread of invasive species unless the agency has determined, and made public, documentation that shows that the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures to minimize risk of harm will need to be taken in conjunction with the actions.

Using This Guide

All resource management projects need to analyze weed risks in the planning stage. Risk includes identifying the likelihood of weeds spreading to the project area and determining the consequence of weed establishment in the project area. Resource programs undertaking maintenance operations need to analyze weed risks when preparing operating plans. A finding of risk is the basis for identifying the appropriate weed prevention practices from the Guide, which are likely to be effective in a particular project situation.

The Guide to Noxious Weed Prevention Practices provides a toolbox of ideas for use in mitigating identified weed risks in resource management operations. The Guide adds no new requirements or regulations.

In 2001 two weed prevention practices are required by Forest Service policy:

- 1. For forested vegetation management operations, use equipment cleaning contract provisions WO-C/CT 6.36 (see Appendix 1)**
- 2. Post and enforce weed-free feed orders, where they exist. (FSM 2081.03).**

All other weed prevention practices in this Guide are optional for use based upon an analysis of weed risks. This list of practices, if applied, is considered to be good overall direction, however, not all of these practices can be implemented in every project.

When considering the use of a weed prevention practice for a specific project or resource program, evaluate the efficacy of the weed prevention practice to meet the goal, its feasibility to implement in the specific situation, and its cost-effectiveness. A determination of cost-effectiveness may consider the probability and cost of weed control if a weed prevention practice is not used and the relative contribution of the project or activity to the overall weed risk at the site.

The Guide identifies weed prevention practices that can be applied to specific site-disturbing projects and that may also be applicable for maintenance activities. These weed prevention practices are listed in the first section: "*General Weed Prevention Practices for Site-disturbing Projects and Maintenance Activities*." The remaining sections list weed prevention practices that are more uniquely applicable to particular resource management programs, listed by type of resource activity. The intent of this Guide is for managers to first identify and apply the General Weed Prevention practices and then supplement those practices with the appropriate resource activity specific guidance.

General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs

Goal 1: Incorporate weed prevention and control into project layout, design, alternative evaluation, and project decisions.

- **Practice 1:** Environmental analysis for projects and maintenance programs will need to assess weed risks, analyze potential treatment of high-risk sites for weed establishment and spread, and identify prevention practices. Determine prevention and maintenance needs, to include the use of herbicides, if needed, at the onset of project planning.

Goal 2. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- **Practice 2.** Before ground-disturbing activities begin, inventory and prioritize weed infestations for treatment in project operating areas and along access routes. Identify what weeds are on site, or within reasonably expected potential invasion vicinity, and do a risk assessment accordingly. Control weeds as necessary.
- **Practice 3.** After completing "Practice 2" above, to reduce risk of spreading weed infestations, begin project operations in uninfested areas before operating in weed-infested areas.
- **Practice 4.** Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules are least likely.
- **Practice 5.** Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Clean equipment before entering National Forest System lands; a Forest Officer, in coordination with the Unit Invasive Species Coordinator, needs to approve use of on-Forest cleaning sites in advance. This practice does not apply to service vehicles traveling frequently in and out of the project area that will remain on the roadway. Seeds and plant parts need to be collected when practical and incinerated. Remove mud, dirt, and plant parts from project equipment before moving it into a project area.
- **Practice 6.** Clean all equipment, before leaving the project site, if operating in areas infested with weeds. Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Seeds and plant parts need to be collected when practical and incinerated.
- **Practice 7.** Workers need to inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. Proper disposal means bagging the seeds and plant parts and incinerating them.
- **Practice 8.** Coordinate project activities with any nearby herbicide application to maximize cost effectiveness of weed treatments.

- Practice 9. Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established. Sites could include road and trail rights-of-way, and other areas of disturbed soils.

Goal 3. Prevent the introduction and spread of weeds caused by moving infested sand, gravel, borrow, and fill material in Forest Service, contractor and cooperator operations. For practices 10 through 12 below, work with the responsible transportation agencies to voluntarily adopt these practices where county and state governments have responsibility for maintenance of roads that cross National Forest System lands.

- Practice 10. Inspect material sources on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication, and strip and stockpile contaminated material before any use of pit material.
- Practice 11. Inspect and document the area where material from treated weed-infested sources is used, annually for at least three years after project completion, to ensure that any weeds transported to the site are promptly detected and controlled.
- Practice 12. Maintain stockpiled, uninfested material in a weed-free condition.

Goal 4. In those vegetation types with relatively closed canopies, retain shade to the extent possible to suppress weeds and prevent their establishment and growth.

- Practice 13. Retain native vegetation in and around project activity to the maximum extent possible consistent with project objectives.

Goal 5. Avoid creating soil conditions that promote weed germination and establishment.

- Practice 14. Minimize soil disturbance to the extent practical, consistent with project objectives.

Goal 6. Where project disturbance creates bare ground, consistent with project objectives, re-establish vegetation to prevent conditions to establish weeds.

- Practice 15. Revegetate disturbed soil (except travelways on surfaced projects) in a manner that optimizes plant establishment for that specific site. Define for each project what constitutes disturbed soil and objectives for plant cover revegetation.
- Practice 16. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching as necessary. Use native material where appropriate and feasible. Use certified weed-free or weed-seed-free hay or straw where certified materials are required and/or are reasonably available. Always use certified materials in areas closed by administrative order; refer to Appendix 3 for a sample closure order. Where practical, stockpile weed-seed-free topsoil and replace it on disturbed areas (e.g. road embankments or landings)
- Practice 17. Use local seeding guidelines to determine detailed procedures and appropriate

mixes. To avoid weed-contamination, a certified seed laboratory needs to test each lot against the all-State noxious weed list to Association of Seed Technologists and Analysts (AOSTA) standards, and provide documentation of the seed inspection test. There are plant species not on State and Federal noxious weed lists that the Forest Service would consider non-native invasive weeds. Check State and Federal lists to see if any local weeds need to be added prior to testing. Seed lots labeled as certified weed free at time of sale may still contain some weed seed contamination. Non-certified seed should first be tested before use.

- **Practice 18.** Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least three (5) growing seasons following completion of the project. For on-going projects, continue to monitor until reasonable certainty is obtained that no weeds have occurred. Provide for follow-up treatments based on inspection results.

Goal 7. Improve effectiveness of prevention practices through weed awareness and education.

- **Practice 19.** Provide information, training and appropriate weed identification materials to people potentially involved in weed introduction, establishment, and spread on National Forest System lands, including agency managers, employees, forest workers, permit holders, and recreational visitors. Educate them to an appropriate level in weed identification, biology, impacts, and effective prevention measures.
- **Practice 20.** Provide proficient weed management expertise at each administrative unit. Expertise means that necessary skills are available and corporate knowledge is maintained.
- **Practice 21.** Develop incentive programs encouraging weed awareness detection, reporting, and for locating new invaders.

Goal 8. Set the example; maintain weed-free administrative sites.

- **Practice 22.** Treat weeds at administrative sites and use weed prevention practices to maintain sites in a weed-free condition.

Aquatic Weed Prevention Practices

Goal 1. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules.

- **Aquatic 1.** Provide outreach to state fish and game departments, counties, and other agencies concerning the unique prevention measures and control practices associated with aquatic weeds.
- **Aquatic 2.** Inspect boats (including air boats), trailers, and other boating equipment and remove any visible plants, animals, or mud before leaving any waters or boat launching facilities. Drain water from motor, live well, bilge, and transom wells while on land before

leaving the vicinity. Wash and dry boats, tackle, downriggers, anchors, nets, floors of boats, props, axles, trailers, and other boating equipment to kill weeds not visible at the boat launch.

- Aquatic 3. Before transporting to new waters, rinse boat and boating equipment with hot (40°C or 104°F) clean water, spray boat or trailer with high-pressure water, or dry boat and equipment for at least 5 days.
- Aquatic 4. Inspect seaplanes and remove weeds from floats, wires, cables, water rudders, and pump floats; wash with hot water or spray with high-pressure water, or dry for at least 5 days.
- Aquatic 5. Before take-off – avoid taxiing through heavy surface growths of weeds before takeoff; raise and lower water rudders several times to clear off plants. If weeds were picked up during landing, clean off the water rudders before take-off and leave the water rudders up during take-off. After take-off – if water rudders were down during take-off, raise and lower water rudders several times to free weed plant fragments while over original body of water or over land. If weeds remain visible on floats or water rudders, the pilot may return to flight origin and remove plants if an extra landing and takeoff is not a safety concern.
- Aquatic 6. Maintain a 100 feet buffer of aquatic weed-free clearance around boat launches and docks.
- Aquatic 7. Promptly post sites if aquatic invasives are found. Confine infestation; where prevention is infeasible or ineffective, close facility until infestation is contained.
- Aquatic 8. Wash and dry tackle, downriggers, float tubes, waders, and other equipment to remove or kill harmful species not visible at the boat launch.
- Aquatic 9. Avoid moving weed plants from one body of water to another.
- Aquatic 10. Avoid running personal watercraft through aquatic plants near boat access locations. Instead, push or winch watercraft onto the trailer without running the engine. After the watercraft is out of the water, start the engine for 5-10 seconds to blow out any excess water and vegetation. After engine has stopped, pull weeds out of the steering nozzle. Inspect trailer and any other sporting equipment for weed fragments and remove them before leaving the access area. Wash or dry watercraft before transporting to another body of water.
- Aquatic 11. Waterfowl hunters may use elliptical, bulb-shaped, or strap anchors on decoys, because these types of anchors avoid collecting submersed and floating aquatic plants. Inspect waders and hip boots, removing any aquatic plants, and where possible, rinse mud from them before leaving the water. Remove aquatic plants, animals, and mud attached to decoy lines and anchors.
- Aquatic 12. Construct new boat launches and ramps at deep-water sites. Restrict motorized boats in lakes near areas that are infested with weeds. Move sediment to upland

or quarantine areas when cleaning around culverts, canals, or irrigation sites. Clean equipment before moving to new sites. Inspect and clean equipment before moving from one project area to another.

Cultural Resources

- Use the General weed prevention practices.

Fire Management

Pre-fire, Pre-incident Training

Goal 1. Improve effectiveness of prevention practices through weed awareness and education.

- Fire 1. Increase weed awareness and weed prevention in all fire training.
- Fire 2. Include weed risk factors and weed prevention practices in Resource Advisor duties on all Incident Management Teams and Burn Rehabilitation Teams.

Plans

Goal 2. Improve effectiveness of prevention practices through weed awareness and education.

- Fire 3. Assign a local weed specialist or include in Resource Advisor duties to the Incident Management Team when wildfire or control operations occur in or near a noxious weed area.
- Fire 4. Resource Advisors need to provide briefings that identify operational practices to reduce weed spread, (for example: avoiding known weed infestation areas when locating fire lines). Include this information in shift briefings.
- Fire 5. Provide weed identification aids to Field Observers.

Wildfires – General

All wildfire weed prevention goals apply except in instances where human life or property is at risk.

Goal 3. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Fire 6. Ensure that rental equipment is free of weed seed and propagules before the contracting officers representative accepts it.

- Fire 7. Maintain a network of airports, helibases, camps, and staging areas in a noxious weed-free condition.
- Fire 8. Coordinate with local weed specialists to locate and treat practice jump areas to make them weed-free.
- Fire 9. Inspect and treat weeds that establish at equipment cleaning sites after fire incidents.

Goal 4. Avoid creating soil conditions that promote weed germination and establishment.

- Fire 10. Use appropriate suppression tactics to reduce suppression-induced disturbances to soil and vegetation while minimizing seedbed creation due to disturbance from fire effects.
- Fire 11. Avoid moving water buckets from infested lakes to lakes that are not infested prior to inspection and cleaning. There is no hazard in using water infested with aquatic weeds on terrestrial sites.

Prescribed Fire

Goal 5. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules or manage fire as an aid in control of weeds.

- Fire 12. Ensure that rental equipment is free of weed seed and propagules before the contracting officers representative accepts it.
- Fire 13. Avoid ignition and burning in areas at high risk for weed establishment or spread due to fire effects. Treat weeds that establish or spread because of unplanned burning of weed infestations.
- Fire 14. When possible use staging areas and helibases that are maintained in a weed-free condition.
- Fire 15. Pre-inventory project area and evaluate weeds present with regard to the effects on the weed spread relative to the fire prescription.

Goal 6. Avoid creating soil conditions that promote weed germination and establishment.

- Fire 16. Use appropriate preparation and suppression tactics to reduce disturbances to soil and vegetation.

Fire Rehabilitation

Goal 7. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- Fire 17. Evaluate weed status and risks in Burned Area Emergency Rehabilitation plans.

When appropriate, apply for Burned Area Emergency Rehabilitation and restoration funding.

Goal 8. To prevent conditions favoring weed establishment, re-establish vegetation on bare ground caused by project disturbance as soon as possible using either natural recovery or artificial techniques as appropriate to the site objectives.

- **Fire 18.** To prevent weed spread, treat weeds in burned areas as part of the Burned Area Emergency Rehabilitation plan. For known infestations that will likely increase, the first preference is prevention, such as planting species to compete with unwanted plants.
- **Fire 19.** Inspect and document weed establishment at fire access roads, cleaning sites, all disturbed staging areas, and within burned areas; control infestations to prevent spread within burned areas. If you suspect the presence of noxious weeds, request BAER funds to inspect and document for emergence in the spring. Request BAER funds for control if noxious weeds are present and NEPA has already been approved.
- **Fire 20.** Seed and straw mulch to be used for burn rehabilitation (for wattles, straw bales, dams, etc.) all need to be inspected and certified that they are free of weed seed and propagules.
- **Fire 21.** Regulate human, pack animal, and livestock entry into burned areas at risk for weed invasion until desirable site vegetation has recovered sufficiently to resist weed invasion.

Forest Vegetation Management

Timber Harvest Operations & Stewardship Contracting

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- **Forest Veg 1.** Treat weeds on projects used by contractors, emphasizing treatment of weed infestations on existing landings, skid trails, and helibases before activities commence.
- **Forest Veg 2.** Train contract administrators to identify noxious weeds and select lower risk sites for landings and skid trails.
- **Forest Veg 3.** Encourage operators to maintain weed-free mill yards, equipment parking, and staging areas.
- **Forest Veg 4.** Use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix 1).

Goal 2. To prevent weed germination and establishment, retain native vegetation in and around project activity and keep soil disturbance to a minimum consistent with project objectives.

- **Forest Veg 5.** Minimize soil disturbance to no more than needed to meet project objectives. Logging practices to reduce soil disturbance include, but are not limited to:
 - Over-snow logging
 - Skyline or helicopter logging
 - Reuse landings, skid trails and helibases when they are weed free
- **Forest Veg 6.** Minimize period from end of logging to site preparation, revegetation, and contract closure.

Post Vegetation Management Operations

Goal 3. To prevent weed germination and establishment, retain native vegetation in and around project activity and keep soil disturbance to a minimum consistent with project objectives.

- **Forest Veg 7.** Minimize soil disturbance to no more than needed to meet vegetation management objectives. Prevention practices to reduce soil disturbance include, but are not limited to:
 - Treating fuels in place instead of piling
 - Minimizing heat transfer to soil in burning
 - Minimizing fireline construction

Goal 4. To prevent favorable conditions for weed establishment, re-establish vegetation on bare ground caused by project disturbance.

- **Forest Veg 8.** For long-term restoration and weed suppression where forested vegetation management has created openings, recognize the need for prompt reforestation.

Grazing Management

Goal 1. Consider noxious weed prevention and control practices in the management of grazing allotments.

- **Grazing 1.** Include weed prevention practices, inspection and reporting direction, and provisions for inspection of livestock concentration areas in allotment management plans and annual operating instructions for active grazing allotments.
- **Grazing 2.** For each grazing allotment containing existing weed infestations, include prevention practices focused on preventing weed spread and cooperative management of weeds in the annual operating instructions. Prevention practices may include, but are not limited to:

- Altering season of use
- Exclusion
- Activities to minimize potential ground disturbance
- Preventing weed seed transportation
- Maintaining healthy vegetation
- Weed control methods
- Revegetation
- Inspection
- Reporting
- Education

Goal 2. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds. Minimize transport of weed seed into and within allotments.

- Grazing 3. If livestock are potentially a contributing factor to seed spread, schedule use by livestock in units with existing weed infestations which are known to be susceptible to spread by livestock, to be prior to seed-set or after seed has fallen.
- Grazing 4. If livestock were transported from a weed-infested area, annually inspect and treat allotment entry units for new weed infestations.
- Grazing 5. Close pastures to livestock grazing when the pastures are infested to the degree that livestock grazing will continue to either exacerbate the condition on site or contribute to weed seed spread. Designate those pastures as unsuitable range until weed infestations are controlled.

Goal 3. Maintain healthy, desirable vegetation that is resistant to weed establishment.

- Grazing 6. Through the allotment management plan or annual operating instructions, manage the timing, intensity (utilization), duration, and frequency of livestock activities associated with harvest of forage and browse resources to maintain the vigor of desirable plant species and retain live plant cover and litter.
- Grazing 7. Manage livestock grazing on restoration areas to ensure that vegetation is well established. This may involve exclusion for a period of time consistent with site objectives and conditions. Consider practices to minimize wildlife grazing on the areas if needed.

Goal 4. Minimize disturbed ground conditions favorable for weed establishment in the management of livestock grazing.

- Grazing 8. Include weed prevention practices that reduce ground disturbance in allotment management plans and annual operating instructions. Consider for example: changes in the timing, intensity, duration, or frequency of livestock use; location and changes in salt grounds; restoration or protection of watering sites; and restoration of yarding/loafing areas, corrals, and other areas of concentrated livestock use.
- Grazing 9. Inspect known areas of concentrated livestock use for weed invasion.

Inventory and manage new infestations.

Goal 5. Improve effectiveness of weed prevention practices through awareness programs and education. Promote weed awareness and prevention efforts among range permittees.

- Grazing 10. Use education programs or annual operating instructions to increase weed awareness and prevent weed spread associated with permittees' livestock management practices.
- Grazing 11. To aid in their participation in allotment weed control programs, encourage permittees to become certified pesticide use applicators.

Lands and Special Uses

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Lands 1. Consider weed status of lands when making land adjustment decisions.
- Lands 2. Conduct weed inventories of all lands considered for acquisition.
- Lands 3. As a condition of land adjustment decisions, the Forest Service may require the nonfederal proponent to treat weeds, to federal standards, on the land proposed for federal acquisition.
- Lands 4. Include a weed prevention and control provision in all new special-use authorizations such as, permits, easements or leases involving ground-disturbing activities when authorized activities present a high risk for weed infestation or the location of the activity is vulnerable to weed introduction or spread. Include a weed prevention and control provision in existing authorizations that authorize ground-disturbing activities when the authorization is amended for other reasons; consider the need to amend an authorization directly, when ground-disturbing activities are involved. These provisions can be accomplished through the development and incorporation of a supplemental clause (reference sample clause R1-D4 in Appendix 2) or as a requirement in an associated operation and maintenance plan.

Minerals

Goal 1. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- **Minerals 1.** Include weed prevention measures, including project inspection and documentation, in operation and reclamation plans.

Goal 2. To prevent conditions favoring weed establishment, minimize bare soil conditions and re-establish vegetation on bare ground caused by project disturbance.

- **Minerals 2.** Retain bonds until reclamation requirements are completed, including weed treatments, based on inspection and documentation.

Recreation, Wilderness, and Special Management Areas

Goal 1. To prevent new weed infestations and the spread of existing weeds, avoid or remove sources of weed seed and propagules.

- **Recreation 1.** Encourage public land users before recreating on public lands, to inspect and clean motorized and mechanized trail vehicles of weeds and their seeds.
- **Recreation 2.** On designated public lands, issue closure orders that specify the use of weed free or weed-seed-free feed, hay, straw, and mulch. Refer to 36 CFR 251.50 and Appendix 3. Cooperate with State, County, Tribal governments, and other agencies to develop and support publicly available weed-free materials.
- **Recreation 3.** Where they exist, post and enforce weed-free feed orders. (FSM 2081.03)
- **Recreation 4.** Encourage backcountry pack and saddle stock users to feed stock only weed-free feed for several days before travel on National Forest System lands.
- **Recreation 5.** Inspect, brush, and clean animals, especially hooves and legs before entering public land. Inspect and clean tack and equipment.
- **Recreation 6.** Tie or hold stock in ways that minimize soil disturbance and avoid loss of desirable native vegetation.
- **Recreation 7.** Annually inspect all campgrounds, trailheads, and recreation areas that are open to public vehicle use for weeds; treat new infestations.
- **Recreation 8.** Maintain trailheads, boat launches, outfitter and public camps, picnic areas, airstrips, roads leading to trailheads, and other areas of concentrated public use in a weed-

free condition. Consider high use recreation areas as high priority for weed eradication.

- Recreation 9. Consider seasonal or full time closure to campgrounds, picnic areas, and other recreation use areas until weeds are reduced to levels that minimize potentials for spread.
- Recreation 10. In areas susceptible to weed infestation, limit vehicles to designated, maintained travel routes. Inspect and document inspections on travelways for weeds and treat as necessary.

Goal 2. Improve effectiveness of prevention practices through weed awareness and education.

- Recreation 11. Post weed awareness messages and prevention practices at strategic locations such as trailheads, roads, boat launches, and forest portals.
- Recreation 12. In weed-infested areas, post weed awareness messages and prevention practices at roadsides.

Research Activities

Goal 1. Incorporate weed prevention into research project design, layout, installation, and decisions.

Research 1. Address weed establishment risk and spread in research project study plans and decisions.

Road Management

New and Reconstruction

Goal 1. Incorporate weed prevention into project layout, design, alternative evaluation, and decisions.

- Road 1. For timber sale purchaser road maintenance and decommissioning, use standard timber sale contract provisions such as WO-C/CT 6.36 to ensure appropriate equipment cleaning (reference Appendix 1).
- Road 2. For road new and reconstruction conducted as part of public works (construction) contracts and service contracts include contract language for equipment cleaning such as is in WO-C/CT 6.36 (Appendix 1).

Road Maintenance and Decommissioning

Goal 2. Minimize roadside sources of weed seed that could be transported to other areas.

- Road 3. Periodically inspect system roads and rights-of-way for invasion of noxious weeds. Train road maintenance staff to recognize weeds and report locations to the local weed specialist. Inventory weed infestations and schedule them for treatment.
- Road 4. Schedule and coordinate blading or pulling of noxious weed-infested roadsides or ditches in consultation with the local weed specialist. Do not blade or pull roadsides and ditches that are infested with noxious weeds unless doing so is required for public safety or protection of the roadway. If the ditch must be pulled, ensure the weeds remain on-site. Blade from least infested to most infested areas. When it is necessary to blade noxious weed-infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread. Minimize soil surface disturbance and contain bladed material on the infested site.
- Road 5. Avoid acquiring water for dust abatement where access to the water is through weed-infested sites.
- Road 6. For timber sale purchaser road maintenance and decommissioning, use contract provisions for equipment cleaning such as WO-C/CT 6.36 (Appendix 1).
- Road 7. For road maintenance and decommissioning conducted as part of public works (construction) contracts and service contracts include contract language for equipment cleaning such as is in WO-C/CT 6.36 (Appendix 1).
- Road 8. Treat weeds in road decommissioning and reclamation projects before roads are made impassable. Reinspect and follow-up based on initial inspection and documentation.

Watershed Management

Goal 1. Avoid or remove sources of weed seed and propagules to prevent new weed infestations and the spread of existing weeds.

- Watershed 1. Inspect and document for early detection of noxious weed establishment and spread in riparian areas and wetlands. Eradicate new infestations before they become established.
- Watershed 2. Address noxious weed risks in watershed restoration projects and water quality management plans.
- Watershed 3. Pay particular attention to practices listed under "General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs" and Aquatic Weed Prevention Practices".

Wildlife, Fisheries, and Botany

Goal 1. Avoid creating soil conditions that promote weed germination and establishment.

- Wildlife 1. Periodically inspect and document those areas where wildlife concentrate in the winter and spring resulting in overuse or soil scarification.
- Wildlife 2. Use weed-free materials at big game baiting stations.
- Wildlife 3. For wildlife openings and habitat improvement projects, follow the practices outlined in General Weed Prevention Practices--Goal 4; Forest Vegetation Management, Timber Harvest Operations & Stewardship Contracting.

APPENDIX 1

FOREST SERVICE TIMBER SALE

CONTRACT PROVISIONS

WO-C6.36

C6.36 – EQUIPMENT CLEANING. (5/01) Unless the entire Sale Area is already infested with specific noxious weed species of concern, Purchaser shall ensure that prior to moving on to the Sale Area all off-road equipment, which last operated in areas known by Forest Service to be infested with specific noxious weeds of concern, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall certify in writing that off-road equipment is free of noxious weeds prior to each start-up of timber sale operations and for subsequent moves of equipment to Sale Area. The certification shall indicate the measures taken to ensure that off-road equipment is free of noxious weeds will be identified. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. A current list of noxious weeds of concern to Forest Service is available at the Forest Supervisor's Office.

Purchaser must clean off-road equipment prior to moving between cutting units on this timber sale that are known to be infested with noxious weeds and other units, if any, that are free of such weeds. Sale Area Map shows areas, known by Forest Service prior to timber sale advertisement, that are infested with specific noxious weed species of concern.

Purchaser shall employ whatever cleaning methods are necessary to ensure that off-road equipment is free of noxious weeds. Equipment shall be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required.

Purchaser shall notify Forest Service at least 5 days prior to moving each piece of off-road equipment on to the Sale Area, unless otherwise agreed. Notification will include identifying the location of the equipment's most recent operations. If the prior location of the off-road equipment cannot be identified, Forest Service may assume that it was infested with noxious weed seeds. Upon request of Forest Service, Purchaser must arrange for Forest Service to inspect each piece of off-road equipment prior to it being placed in service.

If Purchaser desires to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to a new unit that is free of noxious weeds, Purchaser and Forest Service shall agree on methods of cleaning, locations for the cleaning, and control of off-site impacts, if any.

New infestations of noxious weeds, of concern to Forest Service and identified by either Purchaser or Forest Service on the Sale Area, shall be promptly reported to the other party. Purchaser and Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. In the event of contract modification under this Subsection, Purchaser shall be reimbursed for any additional protection required, provided that any work or

extra protection required shall be subject to prior approval by Forest Service. Amount of reimbursement shall be determined by Forest Service and shall be in the form of a reduction in stumpage rates, unless agreed otherwise in writing. However, in no event may stumpage rates be reduced below Base Rates.

INSTRUCTIONS: Include in all new contracts.

The Forest Service must identify on the sale area map units that are infested with specific noxious weeds species of concern.

The prospectus for the sale must notify prospective purchasers that maps of these known locations are available from the local Forest Supervisor's Office or District Ranger Station. A list of noxious weeds of concern to the Forest Service (normally included in the Noxious Weed Program Guide) must be available for the purchaser's inspection. The current National Forest Noxious Weed Program Guide, noxious weed atlas, or other data sources, as needed, will be used to determine locations of known infestation.

Significant changes in the status of noxious weed infestations on the sale may require contract modifications to deal with changed conditions. An example might be where new noxious weed infestations are discovered after contract award, which require costly additional methods to prevent the spread of such infestations.

WO-CT6.36

CT6.36 – EQUIPMENT CLEANING. (5/01) Unless the entire Sale Area is already infested with specific noxious weed species of concern, Purchaser shall ensure that prior to moving on to the Sale Area all off-road equipment, which last operated in areas known by Forest Service to be infested with specific noxious weeds of concern, is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall certify in writing that off-road equipment is free of noxious weeds prior to each start-up of timber sale operations and for subsequent moves of equipment to Sale Area. The certification shall indicate the measures taken to ensure that off-road equipment is free of noxious weeds will be identified. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. A current list of noxious weeds of concern to Forest Service is available at the Forest Supervisor's Office.

Purchaser must clean off-road equipment prior to moving between cutting units on this timber sale that are known to be infested with noxious weeds and other units, if any, that are free of such weeds. Sale Area Map shows areas, known by Forest Service prior to timber sale advertisement, that are infested with specific noxious weed species of concern.

Purchaser shall employ whatever cleaning methods are necessary to ensure that off-road equipment is free of noxious weeds. Equipment shall be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required.

Purchaser shall notify Forest Service at least 5 days prior to moving each piece of off-road equipment on to the Sale Area, unless otherwise agreed. Notification will include identifying the location of the equipment's most recent operations. If the prior location of the off-road equipment cannot be identified, Forest Service may assume that it was infested with noxious weed seeds. Upon request of Forest Service, Purchaser must arrange for Forest Service to inspect each piece of off-road equipment prior to it being placed in service.

If Purchaser desires to clean off-road equipment on National Forest land, such as at the end of a project or prior to moving to a new unit that is free of noxious weeds, Purchaser and Forest Service shall agree on methods of cleaning, locations for the cleaning, and control of off-site impacts, if any.

New infestations of noxious weeds, of concern to Forest Service and identified by either Purchaser or Forest Service on the Sale Area, shall be promptly reported to the other party. Purchaser and Forest Service shall agree on treatment methods to reduce or stop the spread of noxious weeds when new infestations are found. In the event of contract modification under this Subsection, Purchaser shall be reimbursed for any additional protection required, provided that any work or extra protection required shall be subject to prior approval by Forest Service. Amount of reimbursement shall be determined by Forest Service and shall be in the form of a reduction in stumpage rates, unless agreed otherwise in writing. However, in no event may stumpage rates be reduced below Base Rates.

INSTRUCTIONS: Include in all new contracts.

The Forest Service must identify on the sale area map units that are infested with specific noxious weeds species of concern.

The prospectus for the sale must notify prospective purchasers that maps of these known locations are available from the local Forest Supervisor's Office or District Ranger Station. A list of noxious weeds of concern to the Forest Service (normally included in the Noxious Weed Program Guide) must be available for the purchaser's inspection. The current National Forest Noxious Weed Program Guide, noxious weed atlas, or other data sources, as needed, will be used to determine locations of known infestation.

Significant changes in the status of noxious weed infestations on the sale may require contract modifications to deal with changed conditions. An example might be where new noxious weed infestations are discovered after contract award, which require costly additional methods to prevent the spread of such infestations.

APPENDIX 2

SAMPLE SPECIAL USE SUPPLEMENTAL CLAUSE USDA-FOREST SERVICE NORTHERN REGION

Include a weed prevention and control provision, such as the following supplemental clause example, in all new special-use authorizations such as, permits, easements, and leases, or when those authorizations are amended, when there are ground-disturbing activities.

The following is a weed prevention and control supplemental clause approved for use in Region 1. (Reminder: Supplemental clauses used in a special use authorization must be reviewed and approved by the Regional Forester, after review by the local Office of the General Counsel.)

**R1 SUPPLEMENT 2709.11-2000-1
EFFECTIVE 02/08/2000**

**2709.11, 50
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R1-D4 - Noxious Weed/Exotic Plant Prevention and Control. Use this clause in all authorizations involving ground disturbance which could result in the introduction or spread of noxious weeds and/or exotic plants. This clause may also be used where cooperative agreements for noxious weed control are in place with state and local governments.

The holder shall be responsible for the prevention and control of noxious weeds and/or exotic plants of concern on the area authorized by this authorization and shall provide prevention and control measures prescribed by the Forest Service. Noxious weeds and exotic plants of concern are defined as those species recognized by (*insert county weed authority and/or national forest*) in which the authorized use is located.

The holder shall also be responsible for prevention and control of noxious weed and exotic plant infestations which are not within the authorized area, but which are determined by the Forest Service to have originated within the authorized area.

When determined to be necessary by the authorized officer, the holder shall develop a site-specific plan for noxious weed and exotic plant prevention and control. Such plan shall be subject to Forest Service approval. Upon Forest Service approval, the noxious weed and exotic plant prevention and control plan shall become a part of this authorization, and its provisions shall be enforceable under the terms of this authorization.

With respect to the second paragraph of the above provision, the intent is to apply this

provision only for a well defined confined area such as a narrow linear right-of-way where it can be determined without a doubt that the noxious weeds resulted from the activities of the holder.

SPECIAL RESTRICTION

CERTIFIED NOXIOUS WEED-FREE HAY, STRAW, AND FEED REQUIREMENT

BLACK HILLS NATIONAL FOREST
WITHIN THE
STATES OF WYOMING AND SOUTH DAKOTA

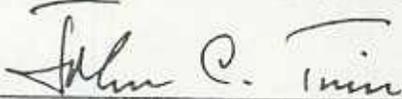
Pursuant to 36 CFR 261.50 (a) and/or (b), the following is prohibited on all National Forest System Lands and Forest Development Roads and Trails managed by the Black Hills National Forest within the States of Wyoming and South Dakota until further notice:

1. Possessing, storing, or transporting any hay, straw, and mulch which has not been certified as free of noxious weeds and seeds by a certified State or County Agriculture Officer or pelletized to minimize the potential for viable noxious weed seeds. 36 CFR 261.58 (t)

Pursuant to 36 CFR 261.50 (e), the following persons are exempt from this Restriction:

1. Persons with a permit specifically authorizing the otherwise prohibited act or omission.
2. Persons transporting hay, straw, mulch, or processed feed on State, County, and Forest System roads for use on non-National Forest System Lands, roads, and trails.

Done at Custer, South Dakota, this 26th day of January, 2000.



JOHN C. TWISS
Forest Supervisor
Black Hills National Forest
Rocky Mountain Region, (R-2)

Violation of this prohibition is punishable as a class B misdemeanor, by a fine of not more than \$5,000 for an individual and \$10,000 for an organization, or imprisonment for not more than six months or both.

Title 16 USC 551 and 18 USC 3571 (b) (6).

HERBICIDE/BIOLOGICAL CONTROL OPERATING PROCEDURES

FOR TREATMENT OF TARGET WEED SPECIES

This information was compiled from (a) research references, (b) weed specialists, and (c) general knowledge of plant phenology.

Leafy Spurge

Description: Aggressive perennial, Difficult to control.

Control by: Removal of Top Growth

This treatment, alone, is ineffective. Mowing or grazing before seed set followed by a fall chemical treatment has shown some results.

Soil Disturbance

Not effective.

Biological

Somewhat effective. Two flea beetles (*Aphthona nigriascutis* and *A. flava*) defoliate the plants while the larvae feed on the roots. New bio-agents are in the process of being cleared and their use in the future is quite promising.

Chemical

This is the most effective control at this time. Tordon 22K provides the best control. Multiple treatments may be necessary.

Russian Knapweed

Description: Aggressive perennial, Difficult to control, easily displaces desirable vegetation.

Control by: Removal of Top Growth

Not effective

Soil Disturbance

Continuous tillage is somewhat effective.

Biological

Allelopathic compound producing perennial grasses are currently being researched as a control method. Grass establishment ranges from 0 to 45% cover depending upon the species (Whitson, Tom. 1992). Control by stem and leaf-galling nematode is currently being used in the USSR and showing good results (James; Lynn F. 1991).

Chemical

Effective control. Tordon provides the best control. Banvel and Roundup also provide good control.

Spotted Knapweed

Description: Aggressive perennial, Difficult to control, easily displaces desirable vegetation.

Control by: Removal of Top Growth

Not effective

Soil Disturbance

Not effective

Biological

Somewhat effective. Two seed head flies (*Urophora affinis* and *U. Quadrifasciata*) are available. They reduce seed production. A root-boring moth (*Agapeta zoolagnia*) causes considerable damage to roots.

Chemical

Effective control. Good to Excellent control with Tordon or 2,4-D plus Banvel.

Diffuse Knapweed

Description: Highly competitive biennial. Difficult to control.

Control by: (Same as spotted with additional biological agent - a metallic wood-boring beetle (*Sphenotera jugoslavica*) feeds within the root crown.

Perennial Sow thistle

Description: Perennial in low wet areas. Difficult to control.

Control by: Removal of Top Growth

Very effective.

Soil Disturbance

Effective but not feasible if located next to water.

Biological

None available.

Chemical

Effective control. Good control results with applications of Tordon 22K if high water tables don't preclude its use.

Purple loosestrife

Description: Aggressive perennial in aquatic sites. Difficult to control.

Control by: Removal of Top Growth

Effective control. Mowing or cutting in spring before seeding is effective.

Soil Disturbance

Somewhat effective control dependant on location to water.

Biological

Several new bioagents are available that show promise.

Chemical

Very effective. Control with Rodeo in the fall has best results.

Canada Thistle

Description: Perennial. Difficult to control.

Control by: Removal of Top Growth

Not effective.

Soil Disturbance

Not effective.

Biological

Ongoing research indicates effective control with biological agents. A beetle (*Ceutorhynchus litura*) can stress plants.

A stem and shoot gall fly (*Urophora cardui*) and (*Larinus planus*) are other biological insect options. The leaf beetle (*Cassia rubiginosa*), released on Musk thistle, has shown promise for Canada thistle, as well.

Chemical

Effective control. Excellent control with Tordon, Banvel or Roundup. Requires multiple treatments.

Musk Thistle

Description: Biennial or sometimes a winter annual.

Control by: Removal of Top Growth

Somewhat effective. Mowing in late flowering stage can effectively reduce seed production. Cut seed heads must be gathered and burned to prevent weed from maturing.

Soil Disturbance

Effective control. Severing root below ground will destroy the plant

Biological

Very effective. There are 3 control agents available: 1. A seed head weevil (*Rhinocyllus conicus*) reduces seed production. Must be used with other control methods to provide effective control. 2. A rosette-feeding weevil (*Trichosiromalus horridus*) feeds on the basal plant tissue destroying the plants ability to grow upright. 3. A leaf-feeding beetle (*Cassia rubiginosa*) causes considerable damage by skeletonizing leaves.

Chemical

Effective control. Good control with Tordon or 2,4-D plus Banvel.

Scotch Thistle

Description: Biennial

Control by: Removal of Top Growth

Somewhat effective. Mowing can reduce seed production.

Soil Disturbance

Effective control by pulling or grubbing plant below surface of ground.

Biological

No effective control.

Chemical

Effective control with Tordon or 2,4-D plus Banvel.

Plumeless Thistle

Description: Can be either an annual or biennial.

Control by: Removal of Top Growth

Somewhat effective. Mowing can greatly reduce seed production.

Soil Disturbance

Effective control by pulling or grubbing plant below surface of ground.

Biological

Somewhat effective. The same seed head weevil that attacks Musk Thistle, (*Rhinocyllus conscus*), feeds on Plumeless Thistle seeds. Must be combined with other control methods to provide effective control. A rosette-feeding weevil (*Trichosirocalus hordius*) feeds on the basal plant tissue destroying the plants ability to grow upright. The use of this weevil is yet in the experimental stages and its effectiveness is not fully known. If transplanted, should be taken from a plumeless thistle host plant.

Chemical

Effective control with Tordon or 2,4-D plus Banvel.

Whitetop

Description: Very competitive perennial.

Control by: Removal of Top Growth

Somewhat effective. Repeated treatments may reduce seed production and limit spread.

Soil Disturbance

Same as above.

Biological

No effective control.

Chemical

Effective control. Escort, Oust and Telar all provide effective control.

Burdock

Description: Non-native biennial.

Control by: Removal of Top Growth

Very effective control through pulling, and mowing

Soil Disturbance

Partial control through repetitive tilling.

Biological Chemical

No control available.

Chemical

Effective control using 2,4-D, Tordon, or Banvel.

St. Johnswort

Description: Non-native perennial.

Control by: Removal of Top Growth

Somewhat effective.

Soil Disturbance

No information available.

Biological

Somewhat effective. The *Chrysolina quadrigemina* is a known insect providing partial control.

Chemical

Effective control with Tordon.

Horsenettle

Description: Native perennial. Poisonous to livestock. Difficult to control.

Control by: Removal of Top Growth

Very effective.

Soil Disturbance

Very effective control in summer and fall if done on a continuous basis.

Biological

No control available.

Chemical

Effective control using Tordon.

Dalmation Toadflax

Description: Introduced perennial, native of southeastern Europe. Difficult to control.

Control by: Removal of Top Growth

Somewhat effective with repeated treatments, may reduce seed production.

Soil Disturbance

Not effective, extensive root system may actually benefit from disturbance and result in an increase in the number of plants.

Biological

Several insects show some success. A defoliating moth and seed head-feeding weevil

Chemical

Effective control using Tordon where chemical application is possible.

Yellow Toadflax

Description: Introduced perennial, native of Urasia. Difficult to control.

Control by: Removal of Top Growth

Somewhat effective with repeated treatments, may reduce seed production.

Soil Disturbance

Not effective, extensive root system may actually benefit from disturbance and result in an increase in the number of plants.

Biological

Several insects show some success. A defoliating moth and seed head-feeding weevil

Chemical

Effective control using Tordon where chemical application is possible.