

**APPENDIX E - Invasive Plant Management EIS**

**OKANOGAN & WENATCHEE NATIONAL FORESTS  
WEED MANAGEMENT & PREVENTION STRATEGY  
&  
BEST MANAGEMENT PRACTICES**



**VERSION 1.0**  
**June 2002**

Appendix E provides information on the management measures used by the Okanogan Wenatchee National Forest applied to land uses and activities to reduce the rate of spread of invasive plants and prevent their spread from one area to another. The invasive plant management program includes inventory and monitoring, outreach and coordination, prevention, and treatments to suppress, contain, control, and eradicate invasive plants. This appendix is provided to reinforce the understanding that the program is integrated, holistic, and includes prevention as the first line of defense for invasive plants. These measures are consistent with Forest Plan management direction.

## **INTRODUCTION**

This document is designed to provide a strategy and best management practices for Noxious Weed prevention and management. It is subject to revision as needed. Prevention is the first management activity necessary in the process of using integrated weed management for controlling noxious weed occurrence and spread.

Included here is some discussion of what weeds are, what prevention is and the law and policy relating to weed management. Additionally, important issues that relate to prevention are clarified. However, the real heart of this document is found in Appendix A. Here, management requirements and Best Management Practices (BMP's) for weed prevention for a variety of activities are detailed. This table outlines the steps that everyone - decision makers, project planners, managers, resource specialists, equipment operators, and field crews need to take in order to prevent noxious weeds on the Okanogan & Wenatchee National Forests. On the Okanogan & Wenatchee National Forests, effective weed management will be accomplished through the implementation of appropriate Best Management Practices (BMPs).

## **GENERAL**

Ecologically, weeds are usually non-native, aggressive plants that colonize both disturbed and undisturbed areas and have the potential to competitively exclude desirable native species. Further, weeds are often deemed as plants that can cause economic or environmental harm or harm to human health. Other related and more specific definitions are given below.

### **Definitions:**

**Noxious Weed.** Those plant species 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)

Overgrazed grasslands, waterways, roadsides, and other disturbed or open habitats are particularly susceptible to weed invasions (Baker, 1986) and weeds have altered the natural successional character of many eastside forest and range ecosystems (FEMAT, 1994). However, recent research confirms what many have suspected: even undisturbed habitats are susceptible to weed establishment.

Current lists of county and state noxious weeds are available from the Supervisor's office. Contact the forest noxious weed coordinator for these lists and for information about other species that may be a threat to native plant communities.

**Undesirable Plants.** Plant species that are classified as undesirable, noxious, harmful, exotic, injurious, or poisonous pursuant to State, or Federal laws. (FSM 2080.5)

**“Alien species”** means, with respect to a particular ecosystem, any species, including its seeds, eggs, spores or other biological material capable of propagating that species, that is not native to that ecosystem. (Executive Order 13112, US Government, 1999)

**“Invasive species”** means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. (Executive Order 13112, US Government, 1999)

**New Invaders** are those noxious weeds that are of particular concern because of their limited distribution and high damage potential on the Forest or State/County administrative unit.

### **What is prevention?**

“Prevention means to detect and ameliorate the conditions that cause or favor the presence of competing and unwanted vegetation in the forest” [USDA Forest Service 1989, *Mediated Agreement*]. Prevention is the preferred strategy in managing vegetation in the Pacific Northwest Region. It is important to understand that prevention is in contrast to treatment. The mediated agreement addresses prevention in two ways: (1) in planning for projects involving vegetation management activities that could result in weeds moving in to a previously weed free area and (2) in planning for projects to treat existing weed problems. Guidance for implementing this directive describes the need for Site-specific Analysis and the Agreement provides a series of questions to be asked and elements to follow in fulfilling this analysis (See Appendix B, Form B-2).

Some weeds can become established in areas with little or no disturbance. Often however, disturbance enhances the ability of weeds to invade and dominate a site. As a result, one effective way to reduce the establishment of weeds is to limit ground disturbance. When ground disturbance is unavoidable, successful prevention involves activities and practices to keep weeds from ever becoming established. Many prevention activities can retard or preclude the introduction and establishment of noxious weeds in non-infested areas.

One key component of successful prevention is developing a strategy to keep weeds out once an area has been either disturbed or treated for weed removal. Revegetation is the principal tool used to fill the open 'niche' created by these activities. In the U.S., there is growing interest in the use of native plants for landscaping and revegetation efforts with mounting concern over problems with exotics that have become invasive. A 1977 executive order from President Carter directed federal agencies to “restrict the introduction of exotic species into...natural ecosystems.” On April 26, 1994, President Clinton issued an executive memo asking agencies to use regional native plants for landscaping on federal grounds, federal projects, and federal funded projects. This document also addresses the appropriate use of native vegetation in noxious weed management under the rehabilitation section.

### **Legal and Policy Direction**

In 1974 Congress passed the Federal Noxious Weed Act. It provides authority for a regulatory system designed to prevent the introduction into the United States of noxious weeds from foreign countries. This was the first piece of legislation that dealt solely with the issue of noxious weeds and focused only on species introduction. Later, the National Forest Management Act of 1976 and The Public Rangelands Improvement Act of 1978 began to establish a national policy for protecting native plant communities which includes direction for preserving and enhancing the diversity of plant and animal communities, "including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest...".

Additionally, more specific direction for the development of weed prevention and management practices is provided in National Policy FSM 2080 Noxious Weed Management, Executive Order on Invasive Species (Feb. 3, 1999) and Stemming the Invasive Tide, Forest Service Strategy for Noxious and Nonnative Invasive Plant Management. Finally, there is a recent national prevention document entitled USDA Forest Service “Guide to Noxious Weed Prevention Practices, Version 1.0” (July, 2001).

National Policy outlines that preventing the introduction and establishment of noxious weed infestations is a high priority for the agency. It also directs the Forest Service to determine the factors that favor the establishment and spread of noxious weeds and design management practices to reduce the risk of spread.

**In 2001 two weed prevention practices were required by national Forest Service policy:**

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

**In Region 6 of the Forest Service, the Mediated Agreement (MA) requires:**

- **A prevention analysis (See pp. 14-16 of MA)**

The weed prevention practices in this document may either be required or recommended. All projects must include an analysis of weed risks (FSM 2080.44). 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.

Forest Service National Strategy identifies, among other elements, the development of prevention and mitigation BMP's for all ground-disturbing activities as one of the agencies long-term emphasis items.

The Executive Order on Invasive Species, signed by the President on February 3, 1999 states that all federal agencies will 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 be taken in conjunction with the actions.

Policy relating more directly to the Okanogan & Wenatchee National Forests emerged in the Region 6 FEIS for Managing Competing and Unwanted Vegetation (1988) and associated Mediated Agreement. Following these documents came the Forest Service Noxious Weed Strategy of 1996, Forest Service Strategy for Noxious and Nonnative Invasive Plant Management of 1998 and "Guide to Noxious Weed Prevention Practices, Version 1.0" (July, 2001). Finally, the Okanogan & Wenatchee National Forests Land and Resource Management Plans (1989-OKA; 1990-WEN), and the Noxious Weed Action Plan for the Wenatchee National Forest (1990) provide clear direction regarding noxious weed management and protection of native plant communities.

In addition to these federal laws and policies, the State of Washington Chapter 17.10 of the Revised Code of Washington (RCW) outlines State law for control of noxious weeds and the counties, mainly through Noxious Weed Boards, enforce noxious weed laws and do much of the actual control work along roads, trails and in parking areas.

## **PREVENTION & MANAGEMENT ISSUES FOR ALL ACTIVITIES**

The remainder of this document details the prevention activities that will be used on the Okanogan & Wenatchee National Forests. The following narrative discusses broad-based issues that must be considered regardless of the type of work being done. Appendix A then presents management direction, mostly in the form of Best Management Practices (BMP's) for 1) all activities; 2) Environmental Analysis (NEPA) and 3) for specific types of resource practices.

### **Weed and Risk Assessment**

The first step in effectively managing noxious weeds is to inventory the existing level of infestation. On the Okanogan and Wenatchee NFs, current surveys are needed to accurately define our overall weed problem and assist with setting management priorities. Because weed infestations are dynamic repeated inventories are necessary. At a minimum, weed inventories must be conducted in all large scale planning areas that propose ground-disturbing activities during NEPA analysis, with a goal of updating inventories throughout all areas of the Forest by FY 2005. There is potential to enlist volunteers to help inventory weed infestations within planning areas. We will encourage the participation of volunteers by providing the necessary training and materials as funding allows. To accomplish inventory outside of project planning areas Districts will train all field going personnel about noxious weeds and their identification. This would increase the likelihood of early detection of new weed populations by field personnel while completing daily tasks. In some cases field personnel will perform weed surveys in the course of their regular jobs. For example, trail crews could inventory the trails and trailheads that they encounter as part of their routine jobs.

At the project level, once an accurate assessment of the problem is made, a risk assessment and noxious weed prevention analysis can be conducted (Appendix B). The weed prevention analysis (Appendix B) is a component of the Mediated Agreement and must be conducted for all projects. Examples have been included to assist with interpreting these questions. The results of these assessments should be included in the analysis file for proposed projects.

The Okanogan and Wenatchee National Forest Weed Risk Assessment (Appendix B, Form B-1) should be used to determine whether a proposed action poses a high, moderate, or low risk of introducing (or spreading existing) weeds. It should be used in the preparation of all categorical exclusions, environmental assessments, or environmental impact statements. The Weed Management Flow Chart (Figure 1) provides a visual example of the weed management decision process, the factors to consider and potential actions to be taken in projects.

To facilitate the analysis and management of noxious weed problems, a current database and accompanying GIS weed layer needs to be developed. (as funding allows). Once established, this database will be updated periodically.

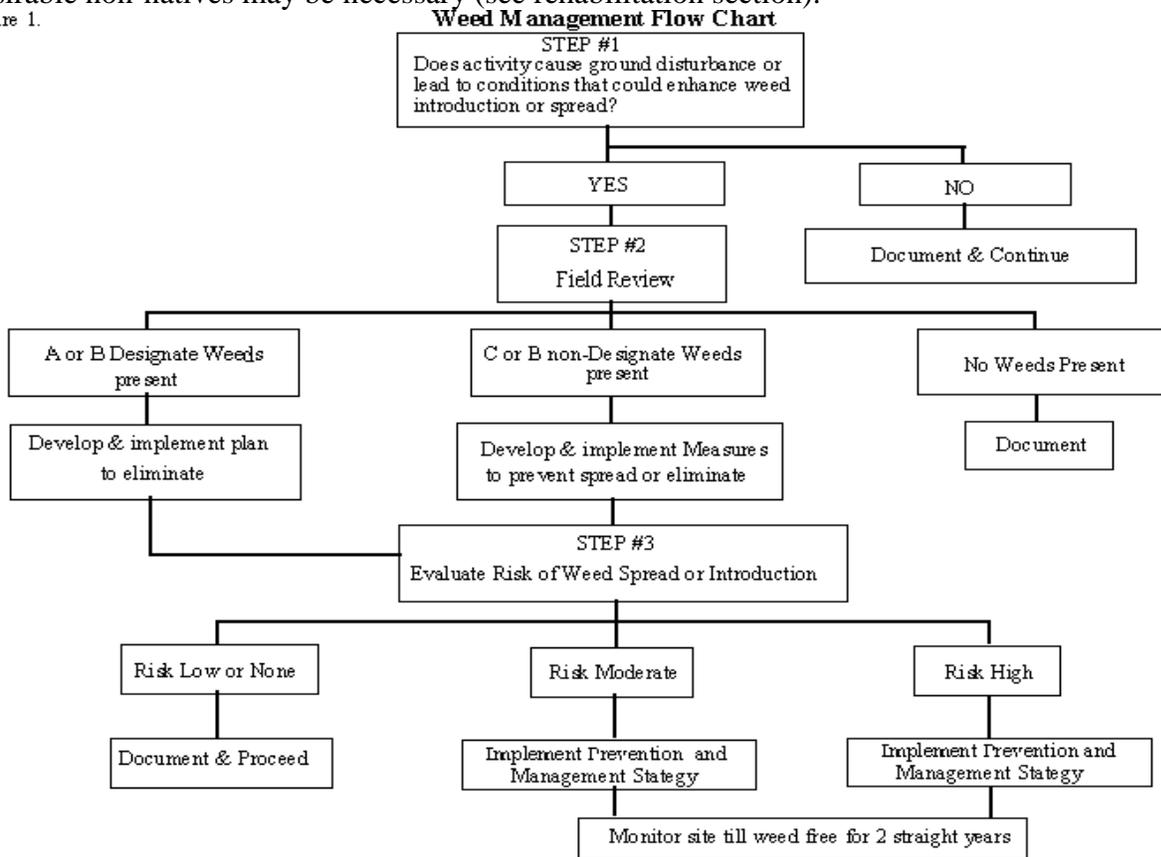
### **Education and Information**

Education and information are also vital parts of weed prevention. By informing Forest Service personnel, our partners, and the general public of the potential threats of weeds, we can begin to work together to solve the problem. There are a variety of ways to increase public awareness of weed issues such as videos, brochures, interpretive signs, advertisements, classroom material, etc. Trailheads and District offices provide good opportunities to disseminate information regarding noxious weeds. Weed information will be posted/available at campgrounds, trailheads, offices and other public contact sites. Educating young people will be essential in making weeds a broad social concern.

## Ground/Vegetation Disturbance

Where possible, minimize ground disturbance, particularly in areas with high levels of weed infestation. One difficulty with the rehabilitation of disturbed areas is that often the topsoil is removed leaving subsoil or substrate that is often devoid of the nutrients, organic matter, and mycorrhizal symbionts necessary for adequate seedling establishment. If this happens, the use of appropriate, desirable non-natives may be necessary (see rehabilitation section).

Figure 1.



## Minimize Weed Seed Production and Spread

In areas with existing weed infestation levels below the control or damage threshold, or when funding is insufficient for control, efforts should be directed toward limiting the ability of those plants to produce and disperse seed. This is particularly true when those areas are subject to potential vectors for dispersal (See Appendix form B-1 for examples of vectors). This may entail planning ahead to remove weeds prior to seed set in areas that will be exposed to disturbance. In the case of knapweed, mowing or hand-pulling the plants prior to seed set will not eliminate the infestation, however, it will greatly reduce the plants ability to set seed for that season and therefore reduce the risk of spread. Typically, noxious weed infestations over the control or damage threshold will require additional control work to reduce the populations below that threshold.

## Rehabilitation and Seeding Guidelines

Revegetation of disturbed sites is complex. Decisions about revegetation must always be objective-driven and site-specific. Common questions relate to seed mix, site preparation, fertilization, timing, application method, etc. Other questions to be answered include: Is the site to be continuously disturbed like a roadside or a landing? Are noxious weeds already present? Is erosion control a primary objective? Is topsoil present? What native species are common in the surrounding area?

According to the PNW USDA Forest Service (Region 6) policy on use of native and nonnative plants on national forests and grasslands, successful vegetation management is dependent on 1) clearly defined objectives, 2) availability of adapted plant materials to achieve the objectives, and 3) knowledge of the soil and other environmental conditions where the plant material is to be used. Given the obvious statement that native plant vegetation has an intrinsic value as a component of forest and rangeland ecosystems, there are still situations where nonnative plant species are the best answer. Region 6 policy specifically states that nonnative plant species may be used when: 1) needed to protect basic resource values (site productivity by reducing soil erosion), 2) as an interim, nonpersistent measure designed to aid in the re-establishment of native plants, or 3) local native plant species are not available. All plant materials used will either be certified (Blue Tag) or the seed test reports will be inspected to assure that any seed used is free of noxious weeds.

The use of nonnative species may be preferable in situations where locally collected natives are not yet available or where the site is to be continuously disturbed. Continuous disturbance may necessitate the use of a persistent nonnative that can effectively out-compete noxious weeds. The preferable nonnative in this case would be persistent and competitive but not invasive. In addition, soil loss or soil excavation can change sites so that native plant species cannot become established without interim ameliorating measures. Guidelines for the use of various non-native grasses are currently being developed for inclusion in the supplement to the Native Plants Notebook for the Okanogan and Wenatchee and should be available in near future. Currently, non-natives are used when the kind and quantity of native species needed are not available in the required timeframes. In fire rehabilitation efforts, for example, non-natives may be used when loss of site productivity, reduced water quality and risks to life and property are likely and native species are judged unable to ameliorate these risks in a timely fashion.

There is often a window of time between the completion of an activity (e.g. logging, road building) and restoration such as seeding. This delay can result in erosion and weed invasion. Additionally, there are often time lags between soil preparation (i.e. sub-soiling) and seeding with a resultant crust forming that inhibits seed germination. The reason for this lag time is due to a combination of events including lack of communication between work groups and economics. It is desirable to prepare soil surfaces and sow seed during the moist months of the spring or fall. However, authorities suggest that it is best to apply seed immediately following site preparation, even if you are outside of the moist seasons of the year--if additional seed bed preparation will not be done at a more suitable time. This may involve immediate revegetation of disturbed areas within a project even if the total project area is still active. Consequently some sites may require more than one seeding if re-opened during the project life. Another issue is depth of seed burial. If soils are loose volcanic ash, it may be better to wait for more firm soil conditions before seeding to avoid too deep burial of seed (personal communication with extension specialist Tom Brannon).

In addition, some rehabilitation techniques such as the winged sub-soiler that are effective in reducing soil compaction do a poor job of preparing a seedbed. Without a proper seed bed there is very low seeding success. This means that an alternative scarification technique must be employed in addition to the soil decompaction to prepare an adequate seed bed prior to seeding.

### **Mulch**

There are many benefits associated with the use of mulch in rehabilitation including that it creates a better seedbed by providing increased moisture, protection from some predators, and generally helps prohibit weed species from establishing. The Mt. Baker-Snoqualmie National Forest Native Plant

Notebook has an entire section on mulch with an opening statement that mulch provides the most effective immediate erosion control. Mulch holds the soil in place and shades the seed providing a moist environment for germination. However, mulching materials can be expensive and time-consuming to apply.

When seed and mulch are used together, the idea is that the mulch will hold the soil until the seed takes and to provide cover for the seed. Then the plants take over the job of holding the soil. Laura Potash, botanist for MBS, reports 2-3" layer of weed-free straw is best for all seeding. MBS uses straw as mulch even when they don't seed and it seems to make a big difference in terms of erosion control and revegetation success. It should be noted that there is currently no 'weed free' certification available in Washington State for straw, however; there are local sources that assure their straw is weed free. Contact the Forest Botanist for more information on where to obtain this straw.

Hydromulch can be used in some cases to apply mulch, seed, fertilizer (and other amendments) in one step. However, it is not a cure all for a poor seed bed. Additionally, there are variety of different mulch types and tackifiers that may affect success. The use of other amendments including such things as humates, pectin and other products that favor microbial activity and thus improve the soil environment may become critical in situations where the topsoil has been lost.

In some cases it may be appropriate to utilize wood chips as mulching material. An example of this could be the restoration of landings. It may be possible to have tops or small overstock material chipped on site for mulch. Note, however, that using wood chips may result in nitrogen deficiency on the treated area.

### **Fertilizer**

The appropriate use of fertilizers remains a challenging topic. If topsoil is present and not compacted fertilizer is probably not needed. However, in many cases soil conditions are poor and fertilizer is necessary. It is reportedly better to fertilize one year after seeding, but this is often not practical. If planting natives, no fertilizer is needed since these species are adapted to nutrient poor soils and the fertilizer may stimulate more weed competition. If planting legumes with nitrogen-fixing capability, perhaps little or no fertilizer is needed. General Guideline Washington Bulletin No. WA 180-7-36 for rangeland/pastureland stipulates no fertilizer be used for new seeding efforts. The perennial grasses often used in seeding lack the ability to utilize appreciable amounts of fertilizer, however, many weeds are annual and are efficient at utilizing added nutrients and thus fertilizer provides an advantage to the weed. Some work at the University of Idaho suggests that fertilization or a good residual grass stand after weed treatment may increase competition for weeds.

### **Partnerships Between and Among Agencies**

Noxious weeds do not respect the administrative boundaries that humans impose. The successful management of noxious weeds requires that all landowners/managers work together to resolve the problem. Consequently, we must work to develop new partnerships and foster existing ones. Forest Service policy directs cooperation with other agencies in the weed management effort. Landowners and agencies need to work closely together on weed management and make every effort to complement treatments along or across boundaries.

### **Monitoring**

Problems of both limited time and money have prohibited the level of record keeping and communications necessary to set up an effective monitoring program. We must prioritize the creation of an efficient record-keeping system to monitor and document weed prevention and control activities

so that we will know what seed mixes have been planted where, whether or not mulch was used, whether or not fertilizer was applied, etc. With this information, we can then set up the appropriate sampling strategy to monitor weed infestations, germination success, establishment success, and re-establishment of native vegetation. Monitoring appears to be an excellent opportunity for using volunteers.

### **Funding**

Effective noxious weed management is dependent on adequate funding. It has been recognized that funding of noxious weed management activities are “subject to the availability of appropriations” and fall “within Administration budgetary limits” (US Government, 1999). Further, where funds and other resources do not permit undertaking all desired measures, the Forest Service manual (FSM 2081.2) directs noxious weed prevention and control in the following order:

1. First Priority: Prevent the introduction of new invaders,
2. Second Priority: Conduct early treatment of new infestations, and
3. Third Priority: Contain and control established infestations.

Sources of weed management funding must include more than just that supplied through the vegetation management (NFVW) budget line item. Weed control activities related to projects should be funded according to the appropriate primary purpose. Realignment of other funds in order to meet the primary purpose of weed control for the full range of activities on the Forest has proven to be an important part of the weed management program on the Forest. It is imperative to continue to build partnerships to stretch the weed management funding pool to be effective in prevention, education and control.

## REFERENCES

- Baker, H.G. 1986. Patterns of plant invasion in North America. *In*: Mooney, H.A. and J.A. Drake, eds. Ecology of biological invasions o North America and Hawaii. Springer-Verlag, New Yourk. p. 44-57.
- FEMAT 1993. Forest ecosystem management , an ecological, economic, and social assessment. Report of the ecosystem management assessment team. Jack Ward Thomas, Team Leader. USDA Forest Service, WSDOC National Marine Fisheries Service, UDSI Bureau of Land Management, USDI Fish and Wildlife Service, USDI National Park Service, Environmental Protection Agency. Chapter V, Aquatic Ecosystem Assessment.
- Harrod, M. 1989. The control of *Linnaria dalmatICA* through clipping and hand-pulling. M.S. Thesis. Eastern Washington University. Cheney, WA.
- Harrod, R.J. 1994. Practices to reduce and control noxious weed invasion. PNW-GTR-330. USDA, Forest Service, Pacific Northwest Research Station, Portland, Or. Pp. 47-49.
- Harrod, R.J., W.L. Gaines, R.J. Taylor (and others). 1996. Noxious weeds in the Blue Mountains. *In*: T. Quigley and R. Jaindl (eds.) Search for a Solution. American Forests, Washington D.C. Pp. 107-118.
- Holzner, W. 1982. Concepts, categories and characteristics of weeds. *In*: Biology and ecology of weeds, eds. W. Holzner and M. Numata. Dr. W. Junk Publishers, Boston, MA.
- Haynes, J. 1994. Personal Communication at Regional Botany Meeting. CALTRANS employee.
- Jobling, S., D. Sheahan, J. A. Osborne, P. Matthiessen, and J. P. Sumpter. 1996. Inhibition of testicular growth in rainbow trout (*Oncorhynchus mykiss*) exposed to estrogenic alkylphenolic chemicals. *Environmental Toxicology and Chemistry*. 15 (2); 194-202.
- Lacey, J.R. C.B. Marlow and J.R. Lane. 1989. Influence of Spotted Knapweed (*Centaurea maculosa*) on surface runoff and sediment yield. *Weed Technology*, Volume 3, Issue 4. p. 627-631.
- Larson, L.L. and M.L. McInnis. 1989. Impacts of grass seedings on estalishment and density of diffuse knapweed and yellow starthistle. *Northwest Science* 63:4.
- Lee, D., J.R. Sedell, B.E. Rieman, R.F. Thurow, J.E. Williams and 16 others. 1997. Broadscale assessment of aquatic species and habitats. *In*: Quigley, T.M. and S.J. Arbelide Tech Eds. An assessment of ecosystem components in the interior Columbia Basin and portions of the Klamath and Great Basins. Vol. III pp. 1073-1496.
- MacDonald, K., S. Noble, J. Haskins. 1996. An assessment of aquatic resources within subbasins on the Wenatchee National Forest. USDA Forest Service, Wenatchee National Forest. Wenatchee Wa. Unpublished report. 22ppg.
- Mack, R.N. 1986. Alien plant invasions in the intermountain West: A case history. *In*: Ecology of Biological Invasions of North Amera and Hawaii. H.A. Mooney and J. A. Drake (eds.). Springer-Verlag, New York. *Ecological Studies* # 58. Pp. 191-213.
- McCune, B. and L. Geiser. 1997. *Macrolichens of the Pacific Northwest*. Oregon State University Press and USDA Forest Service. Corvallis, OR.
- McRae, B. and R. Harrod. 1992. Unpubl. Noxious weed survey project—Wenatchee National Forest. Wenatchee National Forest, Leavenworth Ranger District.
- National Forest Management Act, 1976.
- Pacific Northwest Weed Control Handbook. 2000. Oregon State University, Washington State University, University of Idaho.
- Public Rangelands Improvement Act, 1978.

- Rees, N. E., P.C. Quimby, Jr., G. L. Piper, E. M. Coombs, C. E. Turner, N. R. Spencer, and L. V. Knutson. 1996. *Biological Control of Weeds in the West*. Western Society of Weed Science. Bozeman, MT.
- Sakamoto, S. 1982. The Middle East as a cradle for crops and weeds. In: *Biology and ecology of weeds*, eds. W. Holzner and M. Numata. Dr. W. Junk Publishers, Boston, MA.
- Smith-Kuebel, C. and T. R. Lillybridge. 1993. *Sensitive plants and noxious weeds of the Wenatchee National Forest*. United States Department of Agriculture, Forest Service, Pacific Northwest Region.
- USDA, Forest Service. 1988 *Managing Competing and Unwanted Vegetation, Final Environmental Impact Statement*
- USDA, Forest Service. 1989 *Managing Competing and Unwanted Vegetation, Mediated Agreement to the Record of Decision for the EIS Managing Competing and Unwanted Vegetation*
- USDA, Forest Service. 1992 *Managing Competing and Unwanted Vegetation, Final Environmental Impact Statement, Amendment to 1988 Record of Decision*
- USDA, Forest Service, Pacific Northwest Region. 1992a. *A Guide to Conducting Vegetation Management Projects in the Pacific Northwest Region*.
- USDA Forest Service, 1995. *Forest Service Manual Section 2080*
- USDA, Forest Service, Wenatchee National Forest. 1998. *Forest-wide Noxious Weed Environmental Assessment*.
- USDA Forest Service, 1999. *Stemming the Invasive Tide. Forest Service Strategy for Noxious and Nonnative Invasive Plant Management*.
- USDA Forest Service, 2001. *Guide to Noxious Weed Prevention Practices*. USDA Forest Service, Washington Office.
- USDA, Forest Service, Wenatchee National Forest. (undated/unpublished) *Survey Guidelines for Endangered, Threatened, and Sensitive Plant Surveys on the Wenatchee National Forest*
- US Government. 1977. Executive order from President Carter directed federal agencies to ``restrict the introduction of exotic species into...natural ecosystems.
- US Government. 1994. Executive Memo—Use regional native plants for landscaping.
- US Government. 1999. Executive Order 13112 on Invasive Species, “all federal agencies will use relevant programs and authorities to prevent the introduction of invasive species...”.
- Washington State, Revised Code of Washington, Chapter 17.1

**APPENDIX A  
CONTENTS**

Instructions..... E-11

Part I--BEST MANAGEMENT PRACTICES FOR ALL ACTIVITIES..... E-12

Part II--PROJECT PLANNING AND NEPA ANALYSIS..... E-15

Part III--BEST MANAGEMENT PRACTICES BY RESOURCE AREA..... E-16

Engineering/Roads ..... E-16

Recreation, Wilderness, Roadless areas..... E-18

Cultural Resources..... E-19

Wildlife, Fisheries, and Botany..... E-19

Range..... E-19

Vegetation Management..... E-20

Minerals..... E-21

Soil and Water..... E-22

Lands and Special Uses..... E-22

Fire..... E-23

Administration/General ..... E-25

**INSTRUCTIONS**

This document outlines the steps that everyone - decision makers, project planners, managers, resource specialists, equipment operators, and ground crews need to take in order to prevent and better manage noxious weeds on the Okanogan & Wenatchee National Forests. On the Okanogan & Wenatchee National Forests, effective prevention and management will be accomplished through the implementation of Best Management Practices (BMPs). The process should be implemented in the following step-wise fashion:

1. For all projects, review Part I--BMPs for all activities.
2. For all projects, complete forms B-1 and B-2 (in Appendix B).
3. For all projects, use the applicable Management Practices listed in Part II of Appendix A (Project Planning and NEPA analysis).
4. Determine the project "type" and use the applicable BMP's for the relevant resource area.

The following practices have been developed to meet the intent of direction set forth in policy and executive order. Many of the specific practices such as the use of noxious weed-free hay and straw are already required by policy. The appropriate directive is stated at end of the practice description. Many practices have already been integrated into projects and programs and are currently being implemented.

The *objectives* of the Best Management Practices are to: 1) Reduce the risk of spreading noxious weeds; 2) Prevent the establishment of new invaders; 3) Integrate weed management practices into resource programs; and, 4) build awareness within the agency. These practices would apply to those noxious weeds identified by federal, state and county noxious weed lists.

The Best Management Practices are arranged by resource areas. The intent of this format is to provide easy reference of the practices for each resource areas without the necessity to review multiple sections. As a result of the formatting, many practices repeat throughout the document.

<i>Required Practices</i>	<b>Required means this practice must be integrated and implemented where appropriate to mitigate the effects of the proposed project or program, unless an equally effective measure can be developed at the forest or district level.</b>
<i>Recommended Practice</i>	<b>Recommended means this practice is not a requirement but represents an effective measure to reduce the risk of spreading weeds and may be integrated where appropriate.</b>

**NOTE: Implementation of recommended and required practices are subject of availability of funding.**

## PART I

### BMPs for ALL ACTIVITIES

<b>Objective</b>	<b>Management Practice</b>
<b>I-1. Maintain adequate weed data at each unit.</b>	<p><b>I-1.1) Maintain a noxious weed inventory (<i>Required</i>) and GIS layer (<i>Recommended</i>) of weed locations (FSM 2083, 2080.43 (4))</b></p> <p><b>I-1.2) Conduct extensive surveys (as funding allows) to determine the extent of weeds. (FSM 2083, 2080.44 93)) (<i>Recommended</i>)</b></p>
<b>I-2. Increase weed awareness of workers.</b>	<b>I-2.1) Train field going employees in weed identification and management. (<i>Required</i>)</b>
<b>I-3. Prevent weed establishment and spread for all activities on the Okanogan &amp; Wenatchee National Forests by encouraging and empowering our employees and publics.</b>	<p><b>I-3.1) Encourage incidental pulling of noxious weeds by all Okanogan &amp; Wenatchee National Forest employees, as appropriate, during their normal execution of duties. (FSM 2080.43 (5), 2080.44 (5)). (<i>Recommended</i>)</b></p> <p><b>I-3.2) Utilize volunteers in our weed programs and train them to assist with inventory and manual control. Those who volunteer should be sent annual updates to show how their efforts are helping. (<i>Recommended</i>)</b></p> <p><b>I-3.3) Develop strong partnerships and cooperation with private landowners, county government, State and Federal agencies, extension services, the research community and other interested parties for a consolidated, holistic approach to our weed problems. (FSM 2080.44 (9), 2082.2)(<i>Recommended</i>)</b></p>

	<p><b>I-3.4) Forest workers should inspect, remove, and properly dispose of weed seed and plant parts on their clothing, equipment including and vehicles. (Required)</b></p> <p><b>I-3.5) Identify a noxious weed coordinator for each unit (Required)</b></p>
<p><b>I-4. Prevent weed establishment and spread by applying appropriate weed management strategies and tactics forest-wide across resource boundaries.</b></p>	<p><b>I-4.1) Include Integrated Weed Management (IWM) in project planning and project plans will provide for necessary weed treatment within NEPA analysis for the proposed action. (FSM 2082.2 (2). (Required)This may require treatment prior to ground disturbance.</b></p> <p><b>I-4.2) Complete Weed Risk Assessments and Prevention Analysis for each project. (FSM 2080.44 (6), 2081.03) (Form B-1 &amp; B-2 attached)(Required)</b></p> <p><b>I-4.3) Re-vegetate all disturbed soil (except the travel way on surfaced roads) in a manner that optimizes plant establishment for that specific site, - unless ongoing disturbance at the site will prevent weed establishment. Use native material where appropriate. Use a seed mix that includes fast, early season species to provide quick, dense revegetation. To avoid weed contaminated seed, each lot must be tested by a certified seed laboratory against the all State noxious weed list and documentation of the seed inspection test provided. Refer to Appendix C for potential language/contract specifications. (Required)</b></p> <p><b>I-4.4 Develop and use local seeding guidelines (Forest/district veg. Specialists) for detailed procedures and appropriate mixes. Revegetation may include planting, seeding, fertilization and weed free mulching as necessary. Whenever practical fertilize desirable vegetation only after it has become established to help it maintain competitive advantage over the weeds.(Required)</b></p> <p><b>I-4.5) Use only weed-free plant materials and mulch for revegetation and site stabilization (FSM 2081.03, 36 CFR 261.50 (a), 261.58 (f)). (Required) All seed purchased or otherwise designated or accepted for the Okanogan &amp; Wenatchee NFs will be required to be tested for "all states noxious weeds" according to Association of Official Seed Analysts (AOSA) standards. Test results from all seed lots will be inspected to assure that no noxious weeds are present prior to application. Seed lots containing noxious weeds will not be used. (Note: All seed lots will include a seed analysis certificate and test information and may contain some "weed" seeds but should contain no "noxious weed" seed.) FSH 6309.12 sec 42 &amp; 42.1</b></p> <p><b>I-4.6) Utilize native species in revegetation projects wherever possible (FS Policy). Non-natives will be used in situations where locally collected natives are not available, where interim measures are needed or when the competitive quality of a nonnative is needed. Seeding and/or planting will occur at the appropriate times in the spring or fall where needed to reduce erosion, prevent weeds from re-invading, or to hasten recovery of non-weed species. Legume seed and other forbs will be utilized in seed mixes where feasible and appropriate. Trees and shrubs will be utilized in revegetation efforts where appropriate. (Required)</b></p> <p><b>I-4.7) Reduce the time lag between completion of an activity and rehabilitation of the area by: (1) developing better communication between all departments involved in creating and restoring disturbed areas, (2) requiring seeding within 10</b></p>

	<p>days of activity completion and (3) monitoring disturbed areas for compliance. <i>(Recommended)</i></p> <p><b>I-4.8) Incorporate mulch into our revegetation efforts by utilizing weed-free straw, curlex matting, and wood chips or hyrdomulch whenever possible. This will be followed by monitoring to assess the value of the application. (FSM 2081.03 (2), FSH 6309.12 sec. 42&amp;43)(Recommended) NOTE: Certified Weed-free straw is not available in this state. However, use cleanest source available.</b></p> <p><b>I-4.9 Monitor and evaluate success of revegetation efforts. (Required)</b></p> <p><b>I-4.10) Complete a site-specific evaluation of the need to use fertilizer. (Recommended) Exclude use of fertilizer in areas with high infestation of weeds since fertilizer may favor growth and spread of weeds over natives. Whenever possible, apply fertilizer as needed one year after germination and establishment of plants has occurred. All contracts must include specific language for revegetation prescriptions, including the need for or timing and application of fertilizer.</b></p> <p><b>I-4.11) Mow, remove seedheads or remove weeds to reduce weed seed production (whenever) possible in areas that will experience disturbance.(Recommended)</b></p> <p><b>I-4.12) Add contract provisions for weed prevention and cleaning equipment to the "all activities" section. (FSM 2080.44 (10), 2081.03)(Required). Incorporate contract provisions CT6.343 Option 2-See Appendix C).</b></p> <p><b>I-4.13) Manage existing weed infestations with an integrated approach in future project areas prior to commencement of ground disturbance. (Recommended)</b></p> <p><b>I-4.14) Do not draft water (e.g. for dust abatement) from weed infested water sources. (Required)</b></p>
<p><b>I-5. Prevent weed establishment and spread using BMPs that have applicability to multiple resource areas on the Okanogan &amp; Wenatchee National Forests ).</b></p>	<p><b>I-5.1) Remove all mud, dirt, and plant parts from all off-road equipment before moving into project area. Cleaning must occur off National Forest lands. (This does not apply to service vehicles that will stay on the roadway, traveling frequently in and out of the project area.) Reference Clause C/CT6.343 in Appendix C. (Required)</b></p> <p><b>I-5.2) Clean all equipment prior to leaving the project site, if operating in areas with new invaders. (as determined by the Forest Weed Specialist). Reference C/CT6.343 Option 2-See Appendix C. Refer also to sample equipment cleaning certification form (Appendix D) (Required)</b></p> <p><b>I-5.3) Inspect and approve all gravel, fill, sanding stockpiles, quarries and borrow sources before use and transport. The source will not be used if the weeds present at the pit are not found at the site of intended use. If weeds of concern are present, they must be treated before transport and use. (Required)</b></p> <p><b>I-5.4) New Pits: On NFS lands, do not establish new gravel and fill material sources in areas where new invaders are present. Where widespread weeds occur at new pit sites strip at least the top 8" and stockpile contaminated material. (Required)</b></p> <p><b>I-5.5) Maintain stockpiled gravel and fill material in a weed free condition. (Recommended)</b></p>

I-5.6) Field check weed status after disturbance if weed risk moderate to high.

## PART II

### PROJECT PLANNING & NEPA ANALYSIS

<b>Objective</b>	<b>Management Practices</b>
<b>II-1. Collect sufficient field data to understand the existing site conditions</b>	<b>II-1.1) Conduct an inventory or otherwise obtain information about noxious weeds in proposed large scale planning areas that propose ground disturbance. Include, access routes, and areas immediately adjacent to the project site. (FSM 2080.44 (3))(Required)</b>  <b>II-1.2) Check for weed-free areas in project planning that could potentially be used as sites for project activity. (Recommended)</b>
<b>II-2. Analyze weed spread risks and the strategy of prevention.</b>	<b>II-2.1) Complete Noxious Weed Risk Assessment (Form B-1), which addresses vulnerability of the area to spread of noxious weeds. (FSM 2080.44 (6), 2081.03)(Required)</b>  <b>II-2.2) Complete Noxious Weed Prevention Analysis (Form B-2), which addresses the 6 questions required by the Mediated Agreement. (FSM 2081.2)(Required)</b>
<b>II-3. In the NEPA analysis, incorporate weed risk and prevention issues. Projects with CE's should include this information in the project file.</b>	<b>II-3.1) Incorporate summary of findings from Noxious Weed Risk Assessment and Noxious Weed Prevention Analysis into the text of the NEPA analysis for the proposed project. (FSM 2081.03 (1), 2081.2) (Required)</b>
<b>II-4. Provide for weed management in each Decision.</b>	<b>II-4.1) Include decisions in project decision documents that provide for weed management. (Required)</b>

# PART III

## BEST MANAGEMENT PRACTICES BY RESOURCE AREA

### *Engineering/Roads*

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

#### *New Construction Only*

<b>1) Incorporate weed prevention into road layout, design, and alternative evaluation.</b>	<p>1.1) See BMPs in Parts I-4, I-5 and II. <i>(Required)</i></p> <p>1.2) Develop weed ID and mapping program for contractors <i>(Recommended)</i></p>
---	---

#### *New and Reconstruction*

<b>2) Remove seed source that could be picked up by passing vehicles and limit seed transport.</b>	<p>2.1) Evaluate and prioritize noxious weeds along existing Forest Service access roads leading to project area and treat as necessary. Before construction equipment moves into project area, new road construction must be revegetated as described in Weed Prevention BMPs #I-4.3-4.10, <i>(Required)</i></p> <p>2.2) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. FSM 2081.03, Reference C/CT6.343 Option 2 in Appendix C; <i>(Required)</i></p>
<b>3) Retain shade to suppress weeds.</b>	<p>3.1) Minimize the removal of trees and other roadside vegetation (where practicable) during construction, reconstruction, and maintenance, particularly on southerly aspects. <i>(Recommended)</i> (SAFETY MUST NOT BE COMPROMISED ALONG ROADS)</p> <p>3.2) Maintain or plant vegetation for shade &amp; stabilization. (Road Spec. 210.05, 626) (See I-5.6)<i>(Recommended)</i></p>
<b>4) Re-establish vegetation on bare ground due to construction and reconstruction activity to minimize weed spread.</b>	<p>4.1) Revegetate disturbed soil due to construction and reconstruction activity(See I-4.3-4.10) <i>(Required)</i></p> <p>4.2) Evaluate fertilization to maintain vigor of competitive vegetation in road maintenance programs (three year period suggested.) <i>(Recommended)</i></p> <p>4.3) Utilize existing topsoil wherever possible in situations where ground disturbing activities are unavoidable. <i>(Recommended)</i></p>
<b>5) Minimize the movement of weeds caused by moving infested gravel and fill material.</b>	<p>5.1) Inspect and approve all gravel and fill (See I-5.3) <i>(Required)</i></p>
<b>6) Minimize sources of weed seed in areas not yet revegetated.</b>	<p>6.1) Keep road construction sites closed to vehicles not involved with construction until construction and revegetation is complete. <i>(Recommended)</i></p>

*Maintenance (See BMPs for all Activities)*

<p><b>7) Minimize roadside sources of weed seed that could be transported to other areas.</b></p>	<p><b>7.1) Road maintenance personnel look for priority weed species and report back to District Weed Specialist. (See I-2&amp; I-3)(Required) Weed infestations should be inventoried and scheduled for treatment. (Recommended)</b></p> <p><b>7.2) Do not blade roads or pull ditches where new invaders are found. (Required)</b></p> <p><b>7.3) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. FSM 2081.03, Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p> <p><b>7.4) If straw is used for road stabilization and erosion control, it must be as weed-free or weed-seed-free as possible. (See I-4.5 &amp; I-4.8) (Required; Policy 2080.03)</b></p> <p><b>7.5) Avoid road brushing on heavily weeded roads once seed has set. (Required)</b></p> <p><b>7.6) Spread material extracted during routine ditch and culvert cleaning on site or pile in a designated area and monitor for weed establishment. (Recommended)</b></p>
<p><b>8) Ensure that weed prevention and related resource protection are considered in travel management.</b></p>	<p><b>8.1) Consider weed risk and spread factors in travel plan (road closure) decisions. (Recommended)</b></p>
<p><b>9) Ensure road blading and roadside herbicide application are coordinated chronologically to minimize herbicide use and increase effectiveness.</b></p>	<p><b>9.1) Coordinate road maintenance activities with herbicide applications to maximize efficacy. (Required)</b></p>

*Obliteration*

<p><b>10) Reduce weed establishment in road obliteration / reclamation projects.</b></p>	<p><b>10.1) Treat weeds in road obliteration and reclamation projects before roads are made un-driveable. Monitor and retreat as necessary. Provide for ATV access for treatment. (Recommended)</b></p> <p><b>10.2) Revegetate according to #I-4.3-4.10 (Required)</b></p> <p><b>10.3) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. FSM 2081.03, Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p>
--	--

## *Recreation, Wilderness, Roadless Areas*

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

<p><b>11) Minimize transport and establishment of weeds on NFS lands.</b></p>	<p><b>11.1)</b> See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements for recreation and trail projects.</p> <p><b>11.2)</b> Post and enforce pelletized (weed free) feed order in wilderness <i>(Required; Policy 2081.03, Forest Order 141)</i></p> <p><b>11.3)</b> Develop weed ID and mapping program for permittees <i>(Recommended)</i></p> <p><b>11.4)</b> Encourage back-country pack and saddle stock users to feed only weed-free feed for several days prior to traveling off roads in the Forest. Before entering NFS land, animals should be brushed to remove any weed seed. <i>(Recommended)</i></p> <p><b>11.5)</b> Tie or hold stock in the back-country in such a way as to minimize soil disturbance and avoid loss of native/desirable vegetation. <i>(Required; Forest Order 141)</i></p> <p><b>11.6)</b> As funding allows, maintain trailheads, boat launches, outfitter and public camps, airstrips, roads leading to trailheads and other areas of concentrated public use in a weed-free condition. <i>(Required)</i></p> <p><b>11.7)</b> Only seed when necessary at back-country sites to minimize introduction of non-native species and weeds. Reseed according to #I-4 <i>(Required)</i></p> <p><b>11.8)</b> Encourage inspection and cleaning of motorized and/or mechanized (e.g. mountain bikes) vehicles prior to using NFS lands. <i>(Recommended)</i></p>
<p><b>12) Increase weed awareness and prevention efforts among forest users.</b></p>	<p><b>12.1)</b> Use education programs and signing to increase weed awareness and prevent weed spread by recreationists. <i>(Required)</i></p> <p><b>12.2)</b> Post weed awareness messages at strategic locations such as trailheads, roads, boat launches and forest portals (eg. Noxious Weed Insert Posters). <i>(Required)</i></p>
<p><b>13) Reduce weed establishment and spread from activities covered by Recreation Special Use Permits.</b></p>	<p><b>13.1)</b> Seek to establish a new Regionally approved contract clause relating to weed prevention and management for use in all new and reissued recreation special use permits, authorizations, or other grants involving ground-disturbing activities. (Refer to Northern Region clause R1-D4) <i>(Recommended)</i></p> <p><b>13.2)</b> Revegetate bare soil resulting from special use activity according to (See I-4.3-4.10). <i>(Required)</i></p>
<p><b>14) Prevent weed establishment from land and trail use, construction, reconstruction and maintenance.</b></p>	<p><b>14.1)</b> Trail crews should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. See I-3.4 <i>(Required)</i></p> <p><b>14.2)</b> Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. FSM 2081.03, Reference C/CT6.343 Option 2 in App. C; <i>(Required)</i></p> <p><b>14.3)</b> Inspect and approve all gravel and fill (See I-5.3)<i>(Required)</i></p> <p><b>14.4)</b> Revegetate according to #I-4.3-4.10 <i>(Required)</i></p>

## *Cultural Resources*

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

<p><b>15) Reduce weed establishment and spread at archeological excavations.</b></p>	<p><b>15.1) Revegetate bare soil resulting from cultural resource excavation activity according to #I-4.3-4.10 (Required)</b></p> <p><b>15.2) Passports In Time programs and other Cultural Resource workers should be given weed briefings and should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. (Required)</b></p>
--	---

***Wildlife, Fisheries and Botany***

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

<p><b>16) Incorporate weed prevention into watershed, wildlife, fisheries and botany project design.</b></p>	<p><b>16.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements.</b></p> <p><b>16.2) Revegetate bare soil resulting from project activity according to #I-4.3-4.10. (Required)</b></p> <p><b>16.3) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. FSM 2081.03, Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p>
--	---

***Range***

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

***Grazing Allotment Management***

<p><b>17) Ensure weed prevention and control are considered in management of all grazing allotments.</b></p>	<p><b>17.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements.</b></p> <p><b>17.2) Discuss weed prevention practices and control measures at annual meetings and include outcomes in Annual Operating Plans. Items to be addressed in plan may include: minimizing ground disturbance, weed seed transportation, maintaining healthy vegetation, control methods, revegetation, monitoring, reporting and education. (Required)</b></p> <p><b>17.3) Develop weed ID and mapping program for permittees (Recommended)</b></p>
--	---

<p><b>18) Minimize ground disturbance and bare soil.</b></p>	<p><b>18.1) Revegetate bare soil from grazing activities according to #I-4.3-4.10 See also 17.3) (Required)</b></p> <p><b>18.2) Check areas of concentrated livestock use for weed establishment (Required). Treat new infestations. (Recommended)</b></p> <p><b>18.3) Armor constantly disturbed areas like cattle changes at road/stream crossings. (Recommended)</b></p>
<p><b>19) Minimize transport of weed seed into and within allotments.</b></p>	<p><b>19.1) Avoid driving vehicles through off-road weed infestations. (Recommended)</b></p> <p><b>19.2) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. FSM 2081.03, Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p> <p><b>19.3) Use weed-free or weed-seed-free hay or straw (or best available) in permitted areas. (Required; FSM 2081.03) (See I-4.5)</b></p> <p><b>19.4) Exclude livestock from sites with new invaders or manage new invaders in these areas before entry by livestock. (Required)</b></p> <p><b>19.5) Feed weed-free feed to livestock for several days prior to moving them onto the allotment to reduce the introduction of new invaders and spread of existing weed species. Consider using transitional pastures when moving animals from weed infested areas to the NF and before leaving NFS lands. (Transitional pastures are designated fenced areas that can be logistically and economically maintained.) (Recommended)</b></p>
<p><b>20) Maintain healthy desirable vegetation that is resistant to noxious weed establishment.</b></p>	<p><b>20.1) Manage forage utilization to maintain the vigor of desirable plant species as described in the AMP. (Required)</b></p> <p><b>20.2) Minimize and/or exclude grazing on restoration areas until vegetation is well established. (Required)</b></p> <p><b>20.3) Allow grazing in burned areas only after judged ready for use. (Required)</b></p>

### *Vegetation Management*

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

#### *Pre Harvest*

<p><b>22) Ensure that weed prevention is considered in all timber projects.</b></p>	<p><b>22.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements. (Required)</b></p> <p><b>22.2) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p> <p><b>22.3) Treat weeds on roads used by timber sale purchasers. Refer to Appendix C for potential language/contract specifications (Recommended)</b></p> <p><b>22.4) Treat weeds on infested landings, skid trails and helibases before logging activities. (Recommended)</b></p>
---	--

	22.5) Where timber purchaser's log yards or other contractor's equipment yards are known or suspected to be infested with noxious weeds, seek eradication to the degree possible within the contract framework through cooperation with the purchaser/contractor and the County Weed Board. <i>(Recommended)</i>
--	--

*Harvest*

23) Minimize the creation of sites suitable for weed establishment.	<p>23.1) Minimize soil disturbance to no more than needed to meet project objectives and consider the following:</p> <ul style="list-style-type: none"> <li>--Limit soil disturbance to no more than needed for tree regeneration.</li> <li>--Give preference to winter skidding over snow in problem weed areas.</li> <li>--Favor broadcast burning over dozer pile burning; if pile burning use small piles and burn under conditions than minimize heat transfer to the soil.</li> </ul> <p>--Consider chipping or other means of slash disposal over burning.</p> <p>--Encourage yarding systems that reduce ground disturbance. <i>(Recommended)</i></p> <p>23.2) Revegetate bare soil as described in #I-4.3-4.10 <i>(Required)</i></p> <p>23.3) Maintain tree and shrub cover where appropriate to create shade and stabilize the sites. <i>See I-5.2 (Recommended)</i></p>
24) Maintain shade, treat weeds and monitor for weeds and efficacy of control after sale activity.	<p>24.1) Use trust, stewardship or other funds to treat soil disturbance or weeds as needed after timber harvest and regeneration activities. <i>(Recommended)</i></p> <p>24.2) Monitor and treat weed infestations at landings and on skid trails after harvest. <i>(Required)</i></p> <p>24.3) Ensure prompt regeneration to maximize shading. Plant trees and shrubs where appropriate to create shade and stabilize the sites. <i>(Recommended)</i></p> <p>24.4) Consider elevating weed management to the highest priority for non-essential KV funding. <i>(Recommended)</i></p>

*Minerals*

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

25) Minimize weed establishment in mining and oil and gas operations and reclamation.	<p>25.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements. <i>(Required)</i></p> <p>25.2) Include weed prevention measures in operation and/or reclamation plans. <i>(Required)</i></p> <p>25.3) Retain bonds until reclamation requirements are completed. <i>(Required)</i></p> <p>25.4) Revegetate bare soil (except travel way on surfaced roads) as described in #I-4.3-4.10 <i>(Recommended)</i></p>
26) Remove seed source and limit seed transport into new or existing mining and oil and gas operations.	<p>26.1) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. Reference C/CT6.343 Option 2 in Appendix C; <i>(Required)</i></p> <p>26.2) Treat and monitor weeds on project access routes. <i>Refer to Appendix C for potential language/contract specifications (Recommended)</i></p>

<p><b>27) Minimize weed spread caused by moving infested gravel and fill material.</b></p>	<p><b>27.1) Inspect and approve all gravel and fill (See I-5.3) (Required)</b></p> <p><b>27.2) See 26.1 above.</b></p> <p><b>27.3) Check the area where pit material will be applied to ensure that the seeds of no new weeds are transported to the site. (Recommended)</b></p>
--	--

### *Soil and Water*

**Note: For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.**

<p><b>28) Integrate weed prevention and management in all soil and watershed and stream restoration projects.</b></p>	<p><b>28.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements. (Required)</b></p> <p><b>28.2) Treat weeds in road obliteration and reclamation projects before roads are made un-driveable. Check and retreat as necessary. (Recommended)</b></p> <p><b>28.3) Revegetate bare soil as described in #I-4.3-4.10 (Required)</b></p> <p><b>28.4) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p> <p><b>28.5) Use weed-free straw (or best available) for road stabilization and erosion control. See I-4.5 (Required; FSM 2081.03).</b></p>
---	--

### *Lands and Special Uses*

**Note: For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.**

<p><b>29) Incorporate weed prevention in all special use permits, road use permits and easements.</b></p>	<p><b>29.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements. (Required)</b></p> <p><b>29.2) Revegetate bare soil as described in #I-4.3-4.10 as a condition of the authorization, (Required)</b></p> <p><b>29.3) Work to include noxious weed prevention and control measures as indicated by local prescriptions in new or reissued road permits or easements granted pursuant to FLPMA (P.L. 94579 0/2/76), FRTA (P.L. 88657 0/3/64) or subsequent authorities. This includes FLPMA Private and Forest Road Permits and Easements; FRTA Private and Forest Road Easements; Cost Share Easements; and Road Use (commercial haul) Permits (7730). (Required) (While the approved terms and conditions of certain permits or easements may not provide for modification, the necessary weed prevention and control provisions may be included in written plans, specifications, stipulations and /or operation and maintenance plans attached to and made a part of the authorization.)</b></p> <p><b>29.4) Clean all off road equipment prior to entering the project site (See I-5.1-5.2). Clean off road equipment prior to leaving site only if new invaders are present. Reference C/CT6.343 Option 2 in Appendix C; (Required)</b></p>
---	--

<p><b>30) Minimize weed spread caused by moving infested gravel and fill material.</b></p>	<p><b>30.1) Inspect and approve all gravel and fill (See I-5.3)(Required)</b></p> <p><b>30.2) See 26.1 above.</b></p> <p><b>30.3) Check and continue to monitor the area where pit material is used to ensure that no weed seeds are transported to the use site. (Required)</b></p>
--	--

***Fire***

**Note: For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.**

***Pre-fire, Pre-incident training***

<p><b>31) Increase weed awareness among all fire personnel.</b></p>	<p><b>31.1) Emphasize weed awareness, education and weed prevention in fire training (especially resource advisors, fire management teams, and district orientation). (Required)</b></p> <p><b>31.2) Include weed risk factors and weed prevention considerations in the Resource Advisor duties on Incident Management Teams and Fire Rehabilitation Teams. (Required)</b></p>
---	---

***Wildfires General***

<p><b>32) Mitigate and reduce weed spread during fire activities</b></p>	<p><b>32.1) Include weed prevention and management practice in fire delegations of authority. (Required)</b></p> <p><b>32.2) At established helibases, camps and staging areas maintain a noxious weed-free condition. On non-Forest Service lands eliminate potential for spread. (Required)</b></p> <p><b>32.3) Minimize weed spread in fire camps by incorporating weed prevention and containment practices such as mowing, flagging or fencing weed patches, designating weed free travel routes. (Required)</b></p> <p><b>32.4) Check and treat weeds that establish at equipment cleaning sites after fire incidents. (Recommended)</b></p> <p><b>32.5) Fire going vehicles should be regularly inspected to assure that undercarriages, attachments and grill work are kept weed seed free. All vehicles sent off Forest for fire assistance should be cleaned of mud and plant debris before they return home. (Recommended)</b></p> <p><b>32.6) Emphasize M.I.S.T. tactics where possible to reduce soil and vegetation disturbance. (Recommended)</b></p>
--	--

***Smoke Jumpers***

<p><b>33) Minimize weed spread during smoke jumper operations.</b></p>	<p><b>33.1) Avoid or minimize travel through weed infested areas. (Recommended)</b></p> <p><b>33.2) Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. (Required)</b></p> <p><b>33.3) Coordinate with Weed Specialist(s) to locate, monitor and/or treat practice jump areas. (Required)</b></p>
--	---

*Air Operations*

<b>34) Mitigate and reduce weed spread in Air Operations.</b>	<b>34.1) Provide weed prevention briefings for helibase staff. (Required)</b>  <b>34.2) At established helibases, camps and staging areas maintain a noxious weed-free condition. On non-Forest Service lands eliminate potential for spread. (Required)</b>  <b>34.3) Minimize weed spread at helibases by incorporating weed prevention and containment practices. Examples practices include: mowing, flagging or fencing weed patches, designating weed free travel routes and washing ground-based equipment. (Recommended)</b>  <b>34.4) Inspect and remove weed seed and plant parts from all cargo nets (Required).</b>
---	---

*Logistics/Operations*

<b>35) Mitigate and reduce weed spread from Logistics/Operations activities.</b>	<b>35.2) Route traffic through camps to avoid weed infested areas. (Recommended)</b>  <b>35.3) Fire vehicles should be regularly inspected and cleaned as necessary to assure that undercarriages and grill works are kept weed seed free. (Recommended)</b>
--	--

*Plans*

<b>36) Address weed issues with Planning Section.</b>	<b>36.1) Resource Advisors should provide educational briefings to identify operational practices to reduce weed spread. (Required)</b>  <b>36.2) Provide Plans Section with weed control contact familiar with weeds in the fire area. (Recommended)</b>
---	---

*Prescribed Fire*

<b>37) Integrate weed education, prevention and management in all prescribed burning. Mitigate and reduce weed spread during prescribed fire activities.</b>	<b>37.1) See sections I-4.1-4.2 and II-2 for risk and prevention analysis and NEPA requirements. (Required)</b>  <b>37.2) Consider treating high risk areas (as defined in Risk Assessment (App. B) with weed infestations (e.g. roads, disturbed ground) before burning and check and retreat after burning if necessary. (Recommended)</b>  <b>37.3) When possible, utilize helibases that are maintained in a weed-free condition. (Required)</b>  <b>37.4) All crews should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. (Required)</b>  <b>37.5) Consider avoiding ignition and burning in high risk areas (as defined in Risk Assessment (App. B) that cannot be treated before or after prescribed fire. (Recommended)</b>  <b>37.6) Emphasize M.I.S.T. tactics to reduce soil and vegetation disturbance. (Recommended)</b>  <b>37.7) Work to get weed awareness and prevention education into NWCG Fire Effects and Prescribed Fire training. (Recommended)</b>
--	---

*Rehabilitation*

<p><b>38) Encourage desirable vegetation during rehabilitation activities.</b></p>	<p><b>38.1) Revegetate (see I-4) only erosion susceptible and high risk areas (as defined in Risk Assessment (App. B). (Required)</b></p> <p><b>38.2) Check and treat weeds at cleaning sites and all disturbed staging areas. (Recommended)</b></p> <p><b>38.3) Use weed free straw (or best available) for rehabilitation, road stabilization and erosion control. See I-4.5 (Required; FSM 2081.03).</b></p> <p><b>38.4) Treat State Class A, B and B-designate weeds within the burned area as part of rehabilitation plan to reduce weed spread into burned areas. (Recommended)</b></p> <p><b>38.5) Check for weed spread resulting from fire and fire suppression activities. (Recommended)</b></p> <p><b>38.6) Apply for restoration funding for treatment of weed infestations within the fire area. (Recommended)</b></p>
--	---

### *Administration/General*

**Note:** For each activity review the previous PARTS I & II related to overall BMPs and needs for NEPA analysis.

<p><b>39) Ensure Forest Service administrative sites are managed for noxious weeds.</b></p>	<p><b>39.1) Apply weed treatment and prevention on all Forest Service administrative sites including Ranger Stations, trailheads, campgrounds, pastures, interpretive and historic sites. (Required)</b></p>
<p><b>40) Ensure Forest Service employees are aware of and knowledgeable about noxious weeds.</b></p>	<p><b>40.1) Encourage weed awareness and education in employee development and training plans and orientation for both field and administrative work. (See I-2) (Required)</b></p> <p><b>40.2) Consider a reward program for weed awareness, reporting and locating new invaders. (Recommended)</b></p> <p><b>40.3) Line Officers will receive education in noxious weed management principles and practices. (Required)</b></p>
<p><b>41) Ensure that forest workers are reducing the chance of spreading noxious weeds.</b></p>	<p><b>41.1) Forest workers should inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment including FS vehicles. (Required)</b></p>
<p><b>42) Ensure continuity in weed management programs</b></p>	<p><b>42.1) Each unit will have access to Weed Specialist at the Ranger District or Supervisors Office. (Required)</b></p> <p><b>42.2) Ensure at least one permanent staff member per District, is trained and proficient in weed management. (Required)</b></p>

**APPENDIX B**

**Risk Assessment & Prevention Analysis**

Appendix B

Noxious Weed Risk Assessment.....	B-2
Form B-2. Noxious Weed Prevention Analysis.....	B-4

**Form B-1. Noxious Weed Risk Assessment. To be completed for all projects.**

**Risk Assessment Factors and Rating**

**FACTOR 1: *Likelihood of Undesirable Plant Species, Including Noxious Weeds Species, Spreading to Project Area:***

- NONE (0): Undesirable plants, including noxious weed species not located within or immediately adjacent to the project area. Project activity is not likely to result in the establishment of undesirable weed species on the project area. Site conditions are poor for weeds and there is little likelihood that vectors\* will result in weeds being brought to area.
- LOW (1): Undesirable plant species present in areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of undesirable plants into the project area. Site conditions are likely poor for weeds and there is low probability that vectors\* will result in weeds being brought to area.
- MODERATE (5): Undesirable plant species located immediately adjacent to or within the project area. Project activities or vectors\* are likely to result in some areas becoming infested with undesirable plant species even when preventative management actions are followed. Control measures are essential to prevent the spread of undesirable plants or noxious weeds within the project area. Site conditions are at least adequate for weed establishment and growth.
- HIGH (10): Heavy infestations of undesirable plants are located within or immediately adjacent to the project area. Project activities, even with preventative management actions, are likely to result in the establishment and spread of undesirable plants on disturbed sites throughout much of the project area. Control measures are essential to prevent the spread of undesirable plants or noxious weeds within the project area. Site conditions are excellent for weed establishment and growth.

**FACTOR 2: *Consequence of Undesirable Plant Establishment in Project Area***

- LOW (1): None. No cumulative effects expected. Site conditions across the project area are poor for weeds.
- MODERATE (5): Possible adverse effects on site and possible expansion of infestation within project area. Site conditions in the project area are favorable for weed establishment and growth. Cumulative effects on native plant community are likely, but limited.
- HIGH (10): Obvious adverse effects within the project area and probable expansion of undesirable plants, including noxious weed infestations to areas outside the project area. Site conditions are excellent for weeds. Adverse cumulative effects on native plant community are probable.

## RISK RATING PROCEDURE

**Step 1.** Identify level of likelihood and consequence of adverse effects and assign values according to the following:

None: 0  
 Low 1  
 Moderate 5  
 High 10

**Step 2.** Multiply level of likelihood times consequences.

**Step 3.** Use the value resulting in step 2 to determine Risk Rating and action as follows\*\*:

Value	Risk Rating	Action
0	NONE	Proceed as planned
1-10	LOW	Proceed as planned. Initiate control treatments on undesirable plant populations that get established in the area.
25	MODERATE	Develop preventative management measures for the proposed project to reduce the risk of introduction or spread of undesirable plants into the area. Monitor the area for at least 3 consecutive years and provide for control of new infestations.
50-100	HIGH	Modify project design <b>and</b> implement preventative management measures for the proposed project to reduce the risk of introduction or spread of undesirable plants into the area. Monitor the area for at least 5 consecutive years and provide for control of new infestations.

**\*Examples of Vectors\*(Check off or list expected vectors)**

1. Heavy equipment
2. Importing soil, fill or gravel
3. Site restoration (importing seeds, live plants, or mulch)
4. Off road vehicles, including snowmobiles
5. Pack animals, other livestock or wildlife
6. Recreationists (hikers, campers, mountain bikers, boaters)
7. Forest Service project vehicles when driving or parking off the road bed or on little used roads
8. Helicopter rotorwash
9. Road maintenance activities
10. Trail maintenance/rehabilitation
11. Other \_\_\_\_\_ (List those considered)

\*\* Also see the Weed Management Flow Chart (Fig. 1) to see how risk relates to management actions, weed class and monitoring activities.

**Form B-2. Noxious Weed Prevention Analysis. To be completed for all projects.**

**Project Name:** \_\_\_\_\_

These questions must be addressed as per the Mediated Agreement (See: MA page 14)

1. What is the nature and role of associated vegetation? (e.g. seral stage, unvegetated landslide, avalanche chute, naturally sparse, etc?)

2. Do conditions exist that favor the presence of competing and unwanted vegetation? (exposed ground, continuous disturbance, unshaded area, existing weeds, vectors?)

3. If conditions exist that favor the presence of competing and unwanted vegetation, have past management actions exacerbated the situation? (caused conditions listed in #2 above?)

4. Do natural controls exist on the site? (E.g. are trees already established and thriving that will eventually lead to a shaded condition which could provide control for some species? Have biocontrols previously been introduced and are they effective?)

5. Can management actions be taken that either encourage natural controls or help avoid the conditions that favor the presence of competing and unwanted vegetation? (Document how implementation of the Prevention Strategy will be applied to this particular project.)

6. Is it feasible to undertake the management actions (#5), and if not, why? If undertaken, are impacts on other Forest Service objectives and goals acceptable?

# APPENDIX C

## Contract and Permit Provisions

The only current approved contract provisions are for equipment cleaning in timber sales. However, there are a number of provisions from other regions and under development here that address such things as seeding and noxious weed control. Approved provisions will be added to later versions of this document.

### **APPROVED TIMBER SALE PROVISION:**

**CT6.343 (OPTION 2) - CLEANING OF EQUIPMENT.** (12/97) Unless otherwise agreed, to prevent the introduction of the seeds of noxious weeds onto National Forest land, Purchaser shall ensure all equipment moved onto National Forest land is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds. Purchaser shall employ whatever cleaning methods necessary to ensure compliance with the terms of this provision, and shall notify Forest Service prior to moving each piece of equipment onto National Forest land, unless otherwise agreed. Notification will include identifying the location of the equipment's most recent operations. Upon request of Forest Service, arrangements will be made for Forest Service to inspect each piece of equipment prior to it being moved onto National Forest Land.

Purchaser shall certify in writing, compliance with the terms of this provision prior to each start-up of sale operations. For the purposes of this provision, "equipment" includes all logging machinery except for log trucks, chip vans, pickup trucks, cars, or other vehicles used to daily transport personnel.

**[R6-2452-CT6.343 \(Option 2\) 12/97](#)**

***INSTRUCTIONS: This provision may be used when the EA and Decision Document addresses the issue of noxious weed control. Forest Service and other vehicles will be given the same scrutiny and properly cleaned prior to entry into areas that are subject to this provision.***

---

SAMPLE NOXIOUS WEED PREVENTION  
CLEANING of EQUIPMENT  
CERTIFICATION

WO-CT6.36 (7/00) or CT6.343 Opt. 2 (12/97)

Operational Year:

Sale Name:

Contract No:

Purchaser or Contractor:

Type of Operations: *Road Construction* \_\_\_\_\_ *Harvesting*  
*Other*

Location of Last Operations: *County* \_\_\_\_\_ *State*

*Popular Landmark Name* \_\_\_\_\_ *Ownership*

Proposed Move-In Date:

Proposed Measures to ensure compliance (how was equipment cleaned?):

List of Equipment to be moved in at a later date (*move on will require 5 days notification under WO-CT6.36*):

I certify that all requirements as outlined in CT6.343 Option #2 or WO-CT6.36 *Cleaning of Equipment*, have been met, and all equipment has been cleaned of soil and vegetative materials.

\_\_\_\_\_ Date: \_\_\_\_\_  
Purchaser or Contractor Representative

\_\_\_\_\_ Date: \_\_\_\_\_  
Forest Service Representative

