United States Department of Agriculture

Forest Service

Southwestern Region

MB-R3-16-4

Record of Decision for the Invasive Plant Control Project

Carson and Santa Fe National Forests in Colfax, Los Alamos, Mora, Rio Arriba, San Miguel, Santa Fe, Sandoval, and Taos Counties, New Mexico

Printed on recycled paper – September 2005

Record of Decision

Background

In northern New Mexico's Carson National Forest and Santa Fe National Forest (referred to as the "Forests"), more than 7,300 acres of invasive nonnative plant populations (i.e. weeds) are known to impact National Forest System lands. Although this amount represents less than 0.5 percent of the 3 million acres encompassed by these two forests, weed treatments are most effective when the areas affected are small and before weeds are well established. Thus, it is important to control weed infestations at an early stage, before costly large-scale treatments such as aerial spraying become necessary.

The primary purpose of and need for this project is to protect the abundance and biological diversity of desired native plant communities on the Forests. This diversity will in turn help sustain and enhance wildlife and fish habitats, soil productivity, and watershed conditions. This is especially important in the riparian areas and moist valley bottoms where important habitat exists for many plant and animal species. Without effective control, invasive plants will increasingly impact natural resources on the Forests. Where invasive nonnative plants dominate, native plant communities are damaged and wildlife habitat quality is reduced. Where they replace grasses, they will increase erosion. Where they replace native riparian vegetation, they reduce streambank stability. They will reduce the quality of recreational opportunities by walling off riparian areas with thickets, by turning picnic and other areas into sticker patches, and by presenting allergens and skin irritants not otherwise present. Finally, where they crowd out desirable vegetation, they will reduce access/abundance of culturally important plants. In typically fire resistant riparian areas, they will increase the potential for wildfire. These conditions have been documented in the final environmental impact statement (FEIS pages 13-16).

Weeds primarily occur in the following locations (based on percent of inventoried weed infestations totaling approximately 7,350 acres[1]):

- Riparian areas and valley bottoms: 55 percent
- Scattered patches and along low-level roads and trails: 19 percent
- Major road corridors and recreation sites: 14 percent
- In or along access into wilderness: 12 percent

In terms of current weed species distribution, the most dominant weed species are the nonnative thistles, followed by the valley bottom species of saltcedar, Siberian elm, and Russian olive (FEIS pages 14-15). The final environmental impact statement (FEIS) documents the analysis of three action alternatives to meet this need.

Decision

Based upon our review of all alternatives, we have decided to implement **Alternative B - Integrated Strategy (see ROD Appendix 1)**. This alternative uses a variety of methods to control invasive plants, including manual (e.g. hand pulling), mechanical (e.g. mowing), prescribed fire, biological (e.g. releasing insects that target the invasive plant), controlled grazing (e.g. goats), and herbicides (FEIS pages 37-41). This alternative was the agency's proposed

[1] Based on inventory data through 2003. As more inventories are completed, the amount is expected to increase.

action and we identified it as the preferred alternative during the public comment period of the draft environmental impact statement (DEIS). It was developed to fully meet the purpose and need for action while minimizing the risk of adverse impacts through mitigation measures and monitoring requirements.

The selected alternative includes an adaptive strategy (FEIS pages 42-47). Using this adaptive strategy, weed treatments will be monitored, evaluated and modified as necessary to improve effectiveness of future treatments and/or reduce the potential for adverse effects to people and natural resources. This strategy also allows for applying the same weed control treatments to new weed infestation sites as long as the actions and effects (including decisionmaking criteria and limitations on treatments) are within the scope of the FEIS and this Record of Decision (ROD). Appendix 1 of the ROD includes the selected alternative in its entirety.

Reasons for the Decision

During scoping for the project, the control method that raised the most concern was the proposed use of herbicides. The analysis responded to this concern by including a range of alternatives to the proposed action that would exclude herbicides altogether (Alternative C) and an alternative that would use only herbicides (Alternative D). Thus, the DEIS showed the tradeoffs among these three different approaches. Comments on the DEIS continued to reflect this concern, with much of the comment focusing on the use of herbicides and their potential effects to public health and safety, as well as other impacts to the human environment.

In making this decision, we reviewed the FEIS and other supporting information, including the Forest Service risk assessments available for the herbicides proposed for use. We also reviewed herbicide information provided to us by several commenters on the DEIS.

In reviewing the FEIS, we noted the greatest difference in consequences are between no action and the action alternatives. As mentioned above, no action would lead to many unwanted changes to the Forests. Weed treatment under Alternatives B, C, and D provide long-term, beneficial improvements to native ground vegetation such as grasses, forbs and shrubs. Riparian vegetation—particularly rushes, sedges, willows and cottonwoods—would benefit from this project as well. Protecting and improving native plant communities would have positive effects on soil and water conditions, as well as wildlife and aquatic habitats (as a consequence of enhancing riparian vegetation).

In all action alternatives, negative effects to native vegetation, soil, water and aquatic organisms would be minor and of short duration (FEIS pages 58-60). The increases in sediment (slightly more with Alternative C) and herbicide delivery to streams (more potential in Alternative D) would have no measurable long-term consequences. There would be a low risk of adverse impacts to fisheries, including Rio Grande cutthroat trout (a Forest Service sensitive fish species) or other aquatic organisms based on application of mitigation measures (which include using the appropriate herbicides for site conditions), risk assessments, and Environmental Protection Agency (EPA) guidelines (which include product labels). Other than the effectiveness of treatments, there are few other key differences among the action alternatives.

Although Alternative C would cause slightly more ground disturbance and associated impacts to soils—especially on soils with a severe erosion hazard rating—all action alternatives would remain within soil erosion tolerance levels needed to protect long-term soil productivity. Soils with low revegetation potential would receive herbicide treatments in Alternatives B and D. In Alternative C, excluding herbicide use means that re-establishing native vegetation would take

longer (FEIS pages 60, 76-77). Mitigation requirements for all alternatives would ensure that vegetative ground cover is adequately re-established. With the required mitigation measures, all soil and water quality standards would be met.

Differences among the action alternatives' effects on air quality, heritage resources, livestock grazing, recreation, wilderness and visual resources are expected to be negligible, such that they were not given weight in the decisionmaking process. There would be minor increases in noise and traffic associated with the action alternatives, although generally within background levels.

By controlling the spread of weeds and protecting native plant communities, habitats and watershed conditions on the Forests, Alternatives B and D would maintain or enhance social or economic conditions, particularly for local rural communities in northern New Mexico who typically rely on the Forests' natural resources for their livelihood, traditional culture and quality of life.

In reviewing the breadth of information available to us in the FEIS, as well as the risk assessments and supporting information, we have determined the risk of harm to people, animals or nontarget plants is small when considered in the context of their use. Although it is certainly true herbicides pose a potential danger because of toxic effects at high doses, the likelihood of exposure occurring at these high levels is very small, as explained in more detail below. Nontarget plants are most at risk of being affected when using nonselective herbicides (e.g. glyphosate, imazapic, imazapyr, and others as described in the FEIS, Appendix 3). The advantage of the nonselective herbicides is that they tend to have the lowest risk of harm to people and wildlife. Thus, for a given situation, more risk would be accepted for nontarget plants in order to avoid a higher risk to people. We conclude herbicide use poses a very low risk of harm to people or animals, when used properly at the application rates proposed.

The analysis found in the risk assessments includes a number of plausible exposure scenarios that assume spills, human consumption of sprayed vegetation soon after application, and other occurrences that we do not believe are likely. In a few accidental exposure scenarios, the level of concern is exceeded for some of the herbicides proposed for use. Although the possibility of a single spill occurring is slight, the chance of repeated spills in the same place is even less likely. In other words, if these exposure levels were to occur regularly, they would raise the risk of harmful effect. However, these exposures occur during scenarios where herbicides were improperly used, or spilled, or where someone travels through a sprayed area only hours after application. Although included in the analysis to disclose these possibilities, we believe the more likely outcomes rely on proper application and safety measures included in the FEIS mitigation measures, which reduces these possibilities to a very small level.

During the public comment period, some comments noted that because the adaptive strategy places priority on treating areas of high human use, the risk to people from herbicides is greater. We have evaluated the risk and do not come to that conclusion. Herbicides, when used with the required application methods and following directions for use, can be used without causing harm. In the FEIS, special attention has been given to the differences among the herbicides so that we can more clearly disclose which herbicides would be most likely to be used in locations that people frequent, and which herbicides are more likely to be used in other areas where the extra protection is not necessary (FEIS Appendix 3).

A number of public comments disagreed with the proposed amendment to the Santa Fe National Forest Plan. Although the amendment modifies several standards, the one that received the focus was allowing use of herbicides in municipal watersheds. We understand the concern, based on the assumption that any amount of herbicide poses a potential threat and, therefore, use of any

herbicide in a source of municipal water could, therefore, compromise that water supply. As with use of herbicides elsewhere, the hazard exists, but the risk of people being exposed to levels that express a harmful effect is very low. We also recognize that there will be times when the threat to the watershed by invasive plants will outweigh the possible threat to the water posed by the use of herbicides. Recognizing municipalities have a stake in the outcome of either decision (to use herbicides or not), this decision includes a provision to involve the respective cities before any implementation involving herbicides occurs. Herbicides will be used in collaboration with the appropriate municipal governments.

The implementation of Alternative C would eliminate the risks associated with herbicides, simply by eliminating their use. On the other hand, this alternative would increase other risks, such as those associated with smoke because of the greater amount of burning included in this alternative. Other treatments, such as hand pulling or mowing have small risks associated with them as well. We do not believe that the risks of other methods are substantially different from those of herbicide use. Increasing their use simply shifts the risk without eliminating it.

As a tradeoff, not using herbicides in Alternative C means that the invasive plant control efforts would not be as effective across the two forests. With a given amount of funding and human resources available to fight the problem, fewer invasive populations could be controlled. If we had found clear and convincing evidence that herbicides were likely to cause harm, we would be more inclined to reduce the level of effectiveness in order to protect public health and safety. On review of both the Forest Service risk assessments and information provided by DEIS commenters, we have not found this evidence.

Given a large enough workforce (paid or volunteer), some nonherbicidal methods can be effective in small areas for some invasive plant species. Two towns in the project area (Taos and Santa Fe) have had some success after restricting the use of herbicides, but they have also seen weed populations grow as well. One city (Boulder, Colorado) has established a program of invasive plant control that uses herbicides to increase control effectiveness of its program. The Forests have similar locations to the urban landscape, such as campgrounds, day-use areas and other places readily accessible and where getting the large number of personnel to control invasive plants presents a realistic possibility. However, the Forests also have more remote locations, where the resources are simply not available to send regular patrols for repeated nonherbicidal treatment methods. Moreover, experience with volunteers has shown us that this approach works better in some circumstances (close to towns, small areas, on invasive plant species that lend themselves to hand pulling). We consider the use of volunteers as a key part of Alternative B in those circumstances where it can be effective.

Similar to suggestions to increase volunteer efforts, comments on the DEIS mentioned a number of alternative methods, such as covering weeds with rubber mats, and using vinegar and other methods found effective with organic gardening methods. Replacing weed populations with more vigorous plants has also been suggested. Selection of Alternative B does not preclude use of these methods as long as they fall within the effects and mitigation measures described in the FEIS. Alternative B provides for herbicide use where they are the most effective method, which may often be in combination with other treatment methods.

By contrast, the approach of using only herbicides (Alternative D) would tradeoff a level of effectiveness because it would give up those many instances where integrated management actions could be used. Commenters expressed a concern that Alternative B should not be selected simply because it is the least costly. The FEIS does not support that conclusion, showing that Alternative D is the least costly to implement (FEIS pages 173-179). We chose Alternative B

because it is the most effective, not because it costs the least to implement. As noted in the FEIS, the use of “herbicides only” as proposed in Alternative D would result in more repeated treatments where the herbicides had not achieved the desired level of control. Although the cost of treatments in this alternative is the lowest of the three action alternatives, we do not believe that cost alone should be the determining factor in selection. Over time, the less effective treatments would require closer monitoring and possibly more return visits than Alternative B, the integrated approach.

Several comments on the DEIS asserted Alternative B overemphasized use of herbicides by proposing 70 percent levels in the integrated approach. This level is an estimate based on current knowledge and with the assumption that herbicides are likely to be used in combination with other methods (herbicides after hand pulling, for example). As each treatment for each invasive plant population is further evaluated, an approach that includes both herbicides and some other method is likely to be the most effective.

We acknowledge a certain level of uncertainty exists with respect to the effects of herbicides. We have relied on the U.S. Environmental Protection Agency’s methodology to determine this risk and account for this uncertainty. This methodology determines a lower level of exposure with no adverse effect if this dose were given every day over a 70-year lifespan (known as a Reference Dose or RfD). The Reference Dose accounts for uncertainty by taking the lowest level of no observable adverse effect (NOAEL) and reducing it by factors of 10 based on uncertainty. For instance, most tests on the toxicity are conducted on laboratory animals, and so a safety factor of 10 would apply based on species to species extrapolation. Some comments on the DEIS were critical of the conclusions drawn, noting studies are conducted in laboratory settings, not in the field as used. Further safety factors apply when only laboratory studies are used without corroborating evidence from field studies. In many instances three safety factors are used, which means a factor of 1,000 separates the No Observable Adverse Effect Level from the Reference Dose (e.g. if the No Observable Adverse Effect Level is 5, then the Reference Dose would be 0.005).

Comments also asserted the actual formulations of the herbicides are not tested in the same depth as the constituent parts, including the “inert” components of the herbicides. The discussions of risk found in the risk assessments are complex, which makes them susceptible to narrow interpretation and apparent contradiction. They need to be considered in their entirety in order to evaluate how the uncertainty plays into the conclusions. In most cases, information may not be complete, but what is available provides a basis to conclude what the effects are likely to be, if any effects can be found. As with most science, not all questions can be answered and unknown effects may be postulated that cannot be proved. Many of the comments use examples of the EPA being wrong about past effects determinations (e.g. DDT). Although possible, such a turnabout is not highly plausible because the level of testing is so much more comprehensive now than in the period of the 1960s and 1970s. Products are tested now at a level much more complete than 30 years ago. The risk assessments weigh this information and the uncertainty as part of the conclusion that use would result in a low risk of harm.

Comments on the DEIS noted a number of epidemiological studies showing a connection between herbicide use and some forms of cancer. We acknowledge these studies and their claims, but we find the totality of information in the risk assessments more persuasive for each particular herbicides because they provide a broader context, which includes an evaluation of many of the studies and other literature cited by the DEIS comments. For instance, the impurity hexachlorobenzene is found in two of the herbicides proposed for use. As noted in the risk assessments and public comment, this substance has been linked to cancer. However, similar tests

on the two herbicides (picloram and clopyralid) indicate no such link. Nonetheless, the risk assessments evaluated the risks associated with the use of these herbicides and found them to be less than one in a million because of the small amount of hexachlorobenzene (below background levels). Although commenters argue that any risk is too much, this no-risk approach does not represent a standard that can be attained, even if these herbicides are not used in this project. The presence of hexachlorobenzene in the background environment results in some risk of exposure.

The FEIS and risk assessments also consider the cumulative effects of using herbicides in conjunction with known other herbicide uses, but also must acknowledge a boundary of what can be known considering the variety of other chemicals in use throughout the communities and on private land that may be adjacent to the National Forest System lands being treated. We do not find a substantially greater risk arises because of the potential for other herbicide applications on nearby lands. The greatest risk may be in the non-regulated use by private landowners, which cannot be quantified with any certainty. However, logic and experience tells us coordinated control with landowners in conjunction with advice from local extension services promises to be the best way to assure invasive plants are controlled with the least amount of herbicide used in the most effective and proper way possible.

We recognize the concerns expressed by many commenters regarding the threat of herbicides to people who suffer from the medical condition known as multiple chemical sensitivity (MCS). The potential for harm to come to this segment of the population as a result of herbicide use was given careful consideration in our decision. Many comments suggested we avoid herbicides in order to take the most conservative possible approach, especially when considering the low level of herbicides (noted as far below the Reference Dose) that may have an effect to people with this condition. As discussed previously, Alternative C would eliminate any risk posed by herbicide use—no matter how small the risk—but would shift to risks associated with other methods, which are also small.

We have reviewed the information provided by DEIS commenters, as well as the risk assessments, which review the effects of Forest Service herbicide use to sensitive populations (which in some risk assessments specifically include the MCS condition). When considering the low levels of potential effect described by these comments, we cannot single out herbicide use as a cause separate from many other factors in the environment, including such common substances as those found in automobile exhaust, commonly used household products, and other sources of chemicals. We recognize the difficulty of proving a link between MCS and the use of herbicides as proposed by the two forests, and although we do not find clear evidence of this link, we do not want to ignore the concern either. We believe we can best respond by including notification provisions in the mitigation measures (FEIS page 48-49) that will allow people suffering from this condition to avoid areas where herbicides are applied by the Forests. We do not believe a complete ban on the use of herbicides would provide the extra level of protection sought out by these commenters.

We have adopted notification procedures to alert the public about where herbicides would be used, and under the adaptive strategy, these procedures are subject to modification for increasing their effectiveness. As noted in some public comments, this strategy will result in treated places being unavailable for some people to use for a period of time after treatment. We acknowledge this potential result, but at the same time do not see this as unique to the use of herbicides. Such temporary use restrictions are common for other activities, such as thinning, prescribed burning, or road paving. As in those cases, we must weigh such short-term restrictions against the results of inaction, which will restrict use in a more subtle way as the resources people value and use become compromised.

The selected alternative includes necessary herbicide application licenses as required by Federal and State statutes. Some comments on the DEIS doubted the ability of the Forests to implement the herbicide restrictions properly. As noted in the FEIS response to comments (Appendix 9), civil and criminal penalties apply to anyone who does not follow herbicide label directions. Training and certification programs are used to assure anyone applying and supervising the application of herbicides has the knowledge to assure proper use.

In summary, Alternative B includes mitigation measures and notification procedures as outlined in the FEIS to assure the risk of adverse effects caused by herbicides is negligible. Given the low risk to people, animals, or sensitive nontarget plants, this alternative provides the most effective way to deal with invasive plants on the two forests. When compared to the other alternatives, this alternative provides what we consider to be an effective set of methods for achieving the project purpose and need. All practical means to avoid or minimize environmental harm from the decision have been adopted while still moving toward our desired condition.

Other Alternatives Considered

In addition to the selected alternative, we considered two other action alternatives, which are discussed below. A more detailed summary comparison of these alternatives can be found in the FEIS on pages 58-60, with full description found in Chapter 3 of the FEIS.

Alternative A - No Action. This is the baseline for comparing the other alternatives and is the alternative where proposed weed control actions would not generally occur on the Forests. Weed control would be limited to those actions approved through other analyses on the respective forest and those conducted by other jurisdictions and landowners in and around the Forests.

Alternative C - No Herbicides. This alternative eliminates herbicide use and was developed in response to public concerns raised about potential effects of herbicides on human health, fish/wildlife, and nontarget native vegetation.

Alternative D - Herbicides Only. This alternative exclusively relies on herbicides and was developed in response to the cost effectiveness issue associated with proposed nonherbicide treatments.

All action alternatives employed the adaptive strategy to provide for timely response to newly discovered weed infestations, as well as changes to treatment methods as technology advances or as monitoring results indicate a need for change. For reasons stated in the “Reason for the Decision” in this Record of Decision, Alternative B was identified as the environmentally preferred alternative.

Other alternatives considered but not analyzed in detail include the following:

- **Aerial Herbicide Application**: Application of herbicides from airplane or helicopter can be an effective means of controlling or eradicating very large infestations of weeds, particularly in areas that have steep slopes, rocky soils, and are too difficult to access to effectively treat from the ground. Aerial application provides a means to effectively treat infestations in isolated areas, allowing rapid and efficient reduction of a threat of further establishment or expansion. However, given the public concern regarding this method and the expectation that ground-based applications can meet the purpose of the project, aerial application was not studied in detail.

- **Weed Prevention:** This alternative would take action on human activities that promote the spread of weeds, such as by closing roads, restricting or modifying livestock grazing permits, and altering existing timber, mining, and recreational off-road vehicle activities. It was not considered in detail because it would not meet the purpose, which is to eliminate, control, or contain existing infestations. Prevention programs are also already being implemented independently of this project.

- **Organic Treatment Methods:** This alternative would use methods common in organic gardens and nurseries. These methods include covering weeds with newspaper and dirt, rubber mats, and other means without disturbing the ground. There is limited experience and little study to show that using these methods would be effective to meet the purpose and need on a landscape scale across portions of the 3 million acres comprising the two forests. In addition, these methods are not practical to use on Federal lands where weeds are scattered and isolated. Finally, the use of newspaper and dirt may create more suitable sites for weed infestations and items such as rubber mats would likely be stolen. If any of these methods can be shown to be effective, and if they meet the criteria of the adaptive strategy described in this FEIS and this ROD, then they could be used by the Forests.

Public Involvement

In 1996-1997, the Forests met with other Federal, State and county land management agencies to discuss the threat of invasive weeds. From 1998-2000, the weed control proposal was developed and various methods were used to inform and involve the public about the proposed project. These included a newspaper supplement, public meetings held in Taos and Española, and a scoping letter sent to approximately 450 individuals, agencies, tribal governments and organizations to inform them about the proposal. At that time, the Forests were developing independent environmental assessments of similar proposals. As a result of the March 2000 scoping efforts, a decision was made to combine the environmental analysis efforts of the two forests and write a single EIS. In December 2000, the Forests sent another scoping letter and published a Federal Register notice of intent to prepare an EIS. At the request of local citizens, a public field trip was conducted to discuss and visit weed impact sites on the Tres Piedras Ranger District of the Carson National Forest.

Issues were identified from comments received during scoping. The primary issues revolved around concerns about how herbicides might affect human health, wildlife, fish, and desired native plant communities. On the other hand, there was an important concern that where nonherbicide methods were used, there would be less effectiveness and the increased potential for weeds to spread at a faster rate than they can be controlled. As they become more dominant on the landscape, they have greater resource impacts and become more costly and difficult to treat in the long run.

Using the comments from the public, other agencies, and interested tribal governments, the interdisciplinary team identified several issues regarding the effects of the proposed action (see FEIS pages 32-34). To address these concerns, the Forest Service created the alternatives described above.

During the public comment period on the DEIS, herbicides remained a prominent point of concern. In response, language in the FEIS has been clarified, and the discussions about herbicides have been expanded to draw in more of the information available in the Forest Service risk assessments. Much of this information was left out of the DEIS in an effort to avoid delving into the technical aspects of herbicide risk. However, given the high level of concern and the

amount of technical information received from concerned publics regarding herbicides, we believe the additional technical information is warranted, even if it results in a more technical document. We also more clearly incorporate the information found in the risk assessments.

Finally, a response to comments has been included as an appendix to the FEIS that describes how these comments were used to complete the FEIS and help us make this decision.

Findings Required by Other Laws and Regulations

Numerous laws, regulations and Agency directives require that this decision be consistent with their provisions. The following discussion is not an all-inclusive listing, but is intended to provide information on the areas raised as issues or comments by the public or other agencies.

Endangered Species Act

This decision is consistent with the Endangered Species Act of 1973. Informal consultation with the U.S. Fish and Wildlife Service (USFWS) was undertaken. The USFWS concurred with the biological finding that the project “may affect, is not likely to adversely affect” the Mexican spotted owl, southwestern willow flycatcher, bald eagle, and Holy Ghost ipomopsis. Mitigation measures included in the FEIS provide protection for these species (FEIS pages 54-55).

Sensitive Species

Federal law and direction applicable to Forest Service sensitive species are included in the National Forest Management Act and Forest Service Manual (2670). The regional forester has developed the sensitive species list for plants and animals for which population viability is a concern (FEIS pages 83-118). In reviewing the analyses and projected effects on all sensitive species listed as occurring or possibly occurring on the two national forests, it has been demonstrated in the biological evaluations that there will be no trend toward Federal listing for any sensitive species.

National Historic Preservation Act

The Forest Service has evaluated this project in relation to the National Historic Preservation Act. A programmatic agreement has been developed between the Forest Service and New Mexico State Historic Preservation Officer (SHPO). While the adverse effects described for archeological resources could potentially occur, there is a low risk of adverse impacts occurring. These effects will primarily be mitigated by avoidance of significant sites. Site-specific heritage resource survey and evaluation will be completed prior to implementing weed treatments (other than for exempt actions such as biological methods and hand application of herbicides). Sites will be identified for avoidance or other specific mitigation measures. The programmatic agreement requires forest archeologists to ensure that effects to historic sites are mitigated to avoid adverse effects while meeting weed control objectives. For example, if burning is used, fuel loading would be reduced on sites with fire-sensitive materials (FEIS page 150).

The National Forest Management Act of 1976 (PL 94-588)

Below are specific findings required by the National Forest Management Act and accompanying regulations require that several other specific findings be documented.

- **Consistency with the Forest Plans:** This decision, including the nonsignificant amendment to the Santa Fe National Forest Plan, is consistent with the goals and objectives of the land and resource management plans for both national forests, and complies with the management direction, and standards and guidelines for all management areas described within those plans.

- **Resource Protection:** The following twelve statements address resource protection requirements of NFMA regulations at 36 CFR 219.27:

    1. Alternative B conserves soil and water resources and does not allow significant or permanent impairment of the productivity of the land. (FEIS pages 119-140)

    2. Within the scope of the project and consistent with other resource values involved, activities will minimize the risk from serious or long-lasting hazards from flood, wind, wildfire, erosion, or other natural physical forces unless these are specifically excepted, as in congressionally designated wilderness.

    3. The project is consistent with the relative resource values involved. It prevents and/or reduces serious long-lasting hazards and damage from pest organisms, using principles of integrated pest management. Under this approach all aspects of a pest-host system should be weighed to determine situation-specific prescriptions which may utilize a combination of techniques including, as appropriate, natural controls, harvesting, use of resistant species, maintenance of diversity, removal of damaged trees, and judicious use of pesticides. The basic principle in the choice of strategy is that, in the long term, it be ecologically acceptable and compatible with the forest ecosystem and the multiple-use objectives of the forest plans.

    4. Alternative B will protect streams, streambanks, shorelines, lakes, wetlands, and other bodies of water found on the two national forests.

    5. Alternative B provides for and maintains diversity of native plants and animal communities to meet overall multiple-use objectives.

    6. Alternative B restores, maintains and enhances adequate fish and wildlife habitat to maintain populations of management indicator species, and hence existing native vertebrate species. Habitat will be maintained and improved to the degree consistent with multiple-use objectives established in the two forest plans.

    7. The FEIS assesses potential physical, biological, aesthetic, cultural, engineering, and economic impacts of Alternative B and is consistent with multiple uses planned for the two national forests.

    8. Alternative B prevents the destruction or adverse modification of critical habitat for endangered or threatened species (See BA&E and U.S. Fish and Wildlife Service letters of concurrence in the project record).

    9. There are no rights-of-way corridors needed for the project.

    10. There is no road construction associated with the project.

    11. No temporary roads will be built in conjunction with the project.

    12. Alternative B is consistent with applicable Federal, State, and local air quality standards. All riparian areas, soil and water will be protected as described in the FEIS and this Record of Decision.

The purpose of this project is to protect, preserve, and enhance the diversity of plant and animal communities by reducing and limiting the spread of noxious or invasive weeds (See “Purpose and Need”). Alternative B is consistent with this objective.

The Federal Land Policy Management Act of 1976 (PL 94-579)

This act authorizes control of weeds on rangeland. This decision is consistent with that law.

The Clean Air Act

The basic framework for controlling air pollutants in the United States is the 1970 Clean Air Act as amended in 1990 and 1999 (42 USC 7401 et seq.) The primary concern with this project in regards to air quality is with ground application of herbicides. Since impacts will be distributed across the two national forests and over time, concentrations of air contaminants will not accumulate to the point of violating air quality standards for any area (FEIS pages 141-145).

The Migratory Bird Treaty Act

Alternative B—with mitigation measures described in the FEIS—provides for adequate conservation measures for migratory birds. Overall impacts on land birds and waterfowl are expected to be minimal (FEIS pages 93-95, 104-107).

Executive Order 13112, Invasive Species, 2-3-1999

Alternative B complies with this order directing Federal agencies whose actions may affect the status of invasive species to: (1) prevent the introduction of invasive species; and (2) detect and respond rapidly to, and control populations of such species in a cost effective and environmentally sound manner, as appropriations allow.

36 CFR Subpart A, Section 222.8

This regulation directs the Chief of the Forest Service to cooperate with county or other local weed control districts in analyzing noxious farm weed problems and developing control programs in areas which the national forests and grasslands are a part. Alternative B complies with this direction.

Federal Noxious Weed Act of 1974 (Section 9)

Alternative B complies with this authorization for the Secretary of Agriculture to cooperate with other Federal and State agencies or political subdivisions thereof, and individuals in carrying out measures to eradicate, suppress, control, or prevent the spread of noxious weeds.

The Plant Protection Act of 2000, PL 106-224, The 1990 Farm Bill, PL 101-624

These acts and laws direct the Forest Service to develop and coordinate management programs for controlling undesirable plants. Alternative B complies with this direction.

USDA Policy 9500-10

Under this directive the Agency is to integrate noxious weed management into all programs and activities and to develop, demonstrate, and apply the essential science, technology, and stewardship to effectively manage and prevent the spread of these plants. Alternative B complies with this direction.

In addition, Alternative B also complies with and compliments the following:

- National Prevention Strategy for Invasive Plant Management (USDA Forest Service 2001).
- Forest Service "Pulling Together Initiative" for noxious weed and nonnative invasive plant management that directed the Agency to set goals of education, implement integrated weed management as a high priority, include management of noxious weeds in all planning processes, and develop partnerships.
- Southwestern Region's "Strategy for the Protection and Restoration of Native Plant Communities" (USDA Forest Service, Regional Office 1999).

Administrative Review or Appeal Opportunities

This decision is subject to administrative review (appeal) pursuant to 36 CFR Part 215.

The appeal must be filed by regular mail, facsimile (fax), e-mail, hand delivery, or express delivery with the appeal deciding officer at: Harv Forsgren, Regional Forester, Southwestern Region, USDA Forest Service, 333 Broadway Blvd., SE, Albuquerque, NM 87102. The facsimile number for submitting an appeal is (505) 842-3173.

The office business hours for those submitting hand delivered appeals are: 8:00 a.m. to 4:30 p.m. Monday through Friday, excluding holidays. Electronic appeals must be submitted in a format such as an e-mail message, plain text (.txt), rich text format (.rtf), or Word (.doc) to *appeals-southwestern-regional-office@fs.fed.us*. In cases where no identifiable name is attached to an electronic message, a verification of identity will be required. A scanned signature is one way to provide verification.

Appeals must be filed within 45 days from the publication date of this notice in the *Albuquerque Journal* and the *Taos News*. In the event that the notice is published on different dates in the two newspapers, the appeal period will begin the day after the last notice is published. Attachments to the appeal must be received within the 45-day appeal period to be considered. The publication date in the newspapers of record is the exclusive means for calculating the time to file an appeal. Those wishing to appeal this decision should not rely upon dates or timeframe information provided by any other source.

Individuals or organizations who submitted substantive comments during the comment period specified at 215.6 may appeal this decision. The notice of appeal must meet the appeal content requirements at 36 CFR 215.14.

Implementation Date

If no appeals are filed within the 45-day time period, implementation of the decision may occur on, but not before, 5 business days from the close of the appeal filing period. When appeals are

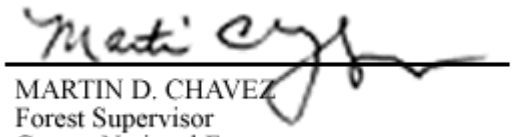
filed, implementation may occur on, but not before, the 15th business day following the date of the last appeal disposition, provided the decision is affirmed.

Contact Person(s)

For additional information concerning this decision or the Forest Service appeal process, contact:

- Sandy Hurlocker, Resource Coordinator, Española Ranger District, Santa Fe National Forest, P.O. Box 3307, Española NM, 87533, or
- Lucy Aragon, Environmental Coordinator, Carson National Forest, 208 Cruz Alta Road, Taos New Mexico 87571.

For the portion of this decision affecting the Carson National Forest,



MARTIN D. CHAVEZ
Forest Supervisor
Carson National Forest

9-12-05
Date

Santa Fe National Forest Plan Amendment

This decision includes a non-significant amendment to the Santa Fe National Forest Plan, as described in Appendix 1 of this ROD and the FEIS (page 49-50). As Forest Supervisor of the Santa Fe National Forest, in addition to the determinations described above, I have determined that the amendment does not change goals, objectives, or outputs of the Plan, nor does it constitute a significant change in the plan (36 CFR 219.10(f), revised July 2000[2]). The amendment provides for a better means of achieving the desired ecological conditions described in the forest plan, including native vegetation and wildlife habitat quality, along with sustainable soil, water and riparian conditions that would otherwise be threatened by ineffective treatments and the continued spread of invasive weeds (FEIS page 50). Effects of this change are documented in the FEIS. Public notice of this change occurred in May 2004, as well as in August 2004 when the DEIS was published for public comment.

GILBERT ZEPEDA
Forest Supervisor
Santa Fe National Forest

9/12/2005
Date

[2] The planning rule at 36 CFR 219 was last revised in January 2005. A provision of those rules (36 CFR 219.14) provides for plan amendments undertaken before January 2005 to be completed following the planning rules in place in July 2000. This determination is consistent with the July 2000 planning rule at 36 CFR 219.10.

Appendix 1 • Selected Alternative

Alternative B, the Selected Alternative

This alternative involves applying one or more methods to eradicate, control, or contain weeds where they occur on the Forests. A common element in all treatments is to destroy the plant, disrupt growth, or interfere with the reproduction cycle. Treatments are scheduled to begin in 2006, and will occur during the weed's growing season—spring, summer or fall—depending on the weed species and treatment method. Based on expected funding, each forest anticipates treating 300 to 800 acres annually, with an annual maximum of approximately 1,500 acres per forest, during the next 10 years. An adaptive strategy will be used to apply treatments to newly discovered weed populations or to modify treatment prescriptions based on results of monitoring. Treatment methods will need to be within the scope of the treatments and effects described in this document and the FEIS to be implemented under the adaptive strategy, and the same mitigation measure will apply to avoid or minimize adverse impacts. The adaptive strategy—including criteria and parameters that must be met in order to treat new weed sites or alter treatment prescriptions—is described later in this appendix.

This proposal applies a variety of methods including manual, mechanical, biological, cultural, prescribed fire, grazing, and herbicidal, based on the most feasible and appropriate methods for meeting treatment objectives, primarily based on the particular weed species and population size, along with considerations about specific locations and public concerns. Selection of the most feasible and appropriate treatment also depends on the specific objective (eradication, control or containment), risk of weed expansion, weed species biology, time of year, and environmental setting.

FEIS Figure 3 provides general locations for treatments of known weed populations, although the size of each weed population is significantly smaller than it appears on the map, due to the map size and scale. FEIS Appendix 7 lists each mapped weed population and the treatment method(s) proposed.

The following paragraphs describe proposed treatment methods and their map symbols.

Herbicides

Chemicals used to control plants are known as herbicides. Herbicides kill the existing plant but often allow remaining seeds to germinate. Herbicides are known through experience with similar Forest Service efforts to be the most effective treatment method for eradicating or controlling the weed species that currently exist on the two forests, especially when used in conjunction with an integrated treatment effort that improves the effectiveness of nonchemical treatments, either concurrently or as followup treatments. Herbicides are being proposed for weed sites where nonherbicide methods do not seem feasible or appropriate, due to ineffectiveness of other treatments, species characteristics, population size, treatment priority and objective, or access or terrain limitations of other methods.

The primary herbicides proposed for use on the Forests have metsulfuron methyl, clopyralid, dicamba, triclopyr, imazapyr, imazapic, or glyphosate as their active ingredients. A limited amount of picloram will be used. See Table 60 in the FEIS, Appendix 3 for general discussion of these chemicals and their properties. Booms or wands may be articulated or fixed. All these methods have turnoff capabilities in or near the operator's hand. Herbicides (such as hexazinone) may also be applied in granular or pellet form.

Where the objective for a given population is eradication and the target weed species has developed a large seedbed, herbicide applications usually require a followup treatment, either as a second herbicide application or using another method. Because the herbicides proposed for use do not persist in the soil at effective levels for more than a few months (at the maximum), in many invasive plant populations with seedbeds established, the followup treatments are needed to eliminate new sprouts that were in seed during the initial treatment.

Biological Methods

Biological control methods include release of insects or plant pathogens that are proven natural control agents of specific weed species. The insect or plant pathogen will attack, weaken, and kill a targeted weed species and reduce its competitive or reproductive capacity. Biological controls will be used for reducing population densities and rates of spread (when the objective is containment), as they are not effective for eradicating or substantially controlling weeds. This treatment is most effective on dense infestations of a weed species covering large areas.

Host-specific insects are proposed for use on some of the larger populations of riparian weeds like saltcedar, along with spotted knapweed (insects such as seed gall fly, root or seed head moth, flower or root boring weevil), and leafy spurge (e.g. flea beetles). In general, biological agents require an infestation large enough (more than 20 acres) to allow for the establishment of the controls to occur. Weed infestations on adjacent lands could be added to the populations on National Forest System lands in order to make this treatment effective.

Manual Methods

Manual control methods involve hand pulling or digging with hand tools like shovels or hoes, or hand-operated power tools. It may also involve clipping or cutting off the tops of plants. If enough root mass is removed, the plant may be destroyed. Cutting plants reduces reproduction of plants by seeds. Cutting also depletes the carbohydrate reserves in roots, thereby weakening a plant’s competitive advantage on a site. This method will be most often applied to small populations (less than an acre) of herbaceous weeds that spread primarily by seeds rather than through root sprouts.

Controlled Grazing

Grazing with goats or sheep has been shown to suppress weeds in some prolonged applications. Goats have a digestive system that can handle most vegetation including weeds. Goats have been used on a limited basis in efforts to control weeds, using hay, water, or minerals to attract them to the weed patch. Other grazing methods include herding and fencing to confine the goats/sheep within a specific area. For example, sheep can be induced to eat leafy spurge, which is toxic to cattle but not to sheep or goats. Sheep are known to suppress leafy spurge populations, but usually do not eradicate this weed.

This method may be used to reduce the vigor of some weeds where numerous, repeat treatments can be applied at the appropriate times. The availability of herds managed for this type of control may be limiting. This method is primarily proposed as a minor, incidental treatment method, and will be evaluated for effectiveness. Where appropriate, grazing will be integrated with other treatment methods to achieve more effective weed control.

This weed control method will be conducted in accordance with Forest Service grazing regulations and regional policy. A site-specific project operation plan will be developed for the treatment area that will consider factors such as target weed species, type of livestock to be used, forage preference, planned grazing intensity, herding characteristics, topography, water availability, season of use, and a monitoring program. Forest Service regulations, policies, and the appropriate mitigation measures will be followed.

Mechanical

Mechanical control methods include actions such as mowing or root tilling. Mowing cuts plants off above ground while root tilling digs into the soil to unearth the roots. These methods employ large mechanized equipment such as tractors with specially designed attachments. These methods have not been demonstrated to be effective in eradicating or substantially reducing weed infestations, and typically require frequent repeat treatments. They do reduce plant and root vigor. Feasibility is also quite limited on the Forests due to the steep slopes and other common terrain features such as trees, boulders or logs. Thus, this method is only proposed for minor, incidental use, mainly along highways in conjunction with ongoing road maintenance actions. Most mechanical treatment is proposed in combination with another method.

Prescribed Burning

Burning is similar to plowing or cutting the tops of weeds. It removes the seed heads and for some plants can reduce the seedbank in the soil. Broadcast burning weeds on the soil surface may be employed if there are sufficient fuels to carry a fire, or propone torches may be used on weeds where a surface fire will not carry through the weed population. Generally burning is not highly effective when used alone to eradicate or control most weed populations. Thus, it will typically be used in combination with other methods.

Cultural Methods

Cultural methods are actions such as planting or seeding with desirable native plants immediately following a weed control treatment or other methods that allow desirable plants to out-compete the weed species. These methods are not proposed to be used alone to eradicate or control weed populations, but will be used where needed on treated sites as a followup method to favor native species and minimize subsequent weed infestation. This method will also be used where necessary to minimize soil erosion or stream sedimentation where needed following removal of weed species and exposure of bare soil.

Table 1 summarizes treatment methods and acres for Alternative B. Acres shown are for the weed populations treated. The table shows some underestimation of treatment acres for weed sites where more than one method will be used to treat the same site. However, for some sites treated with multiple methods, the different methods will be applied on different portions of the site. On the other hand, the table shows some overestimation of treatment acres where the weeds are scattered among nontarget native plants or bare ground that will not be treated. Overall for the Forests, the table provides a rough estimation of weed treatment acres by method.

Table 1. Alternative B Treatment Summary

Treatment	Population Acres	Percent Total
Biological-grazing	35	0.46%
Biological	135	1.83%
Biological in Jemez RD*	1,770	22.81%
Prescribed fire	82	1.13%
Grazing-herbicides	37	0.54%
Herbicide	3,508	48.27%
Manual	43	1.60%
Manual-grazing	90	1.21%
Manual-herbicide	1,485	19.33%
Mechanical	24	0.31%
Mechanical-biological-grazing	14	0.19%
Mechanical-herbicide	122	1.78%
Total	7,345	

* Area along the Jemez River, Santa Fe National Forest will add biological agents to already approved methods.

Adaptive Strategy

The selected alternative will employ an adaptive strategy that has been determined to be necessary for the success of weed control projects and consistent with Forest Service policy (USDA-FS 2001b). As part of this adaptive strategy, weed treatments must be monitored, evaluated and modified as necessary to improve effectiveness of future treatments while reducing the potential for adverse effects to people and natural resources. This strategy allows for adopting findings from research studies on different practices or impacts, or changes in land or resource conditions. This strategy is key to finding and treating infestations that are not currently identified.

The adaptive strategy provides for flexibility to use the appropriate treatment method, based on the results of monitoring and evaluation. For Alternative B, the adaptive strategy will allow for any of the integrated weed control methods to be used on a given site. The adaptive strategy will cover weeds found in additional locations as well as new species found on the Forests. The Forests propose an adaptive strategy with the following actions:

- Annually inventory portions of the Forests that are likely to have new infestations (e.g. areas burned by wildfires) and map any new weed infestations. Budgets will govern the extent of these inventories.
- Identify the weed treatment objective, priority and methods to use for newly mapped infestations based on the specific criteria described later in this section.
- Monitor the effectiveness and effects of weed treatment activities and associated mitigation measures.
- Evaluate and disclose monitoring results, and use those results to determine appropriate modifications in treatment prescriptions, mitigation measures, or implementation practices.
- New information (as described in Table 9) would supplement the EIS.

- Implement modifications or other feasible and appropriate treatment methods based on monitoring results, as long as the new or modified action and its effects are considered by an interdisciplinary team and determined by the responsible official to be within the scope of actions and effects evaluated in this FEIS (and in accordance with Forest Service Handbook FSH 1909.15 §18).

Treatment Objectives, Priorities and Decision Criteria

Treatment objectives for a given weed species fall into one of the following three categories:

- Eradication (elimination)
- Control (reducing the population over time)
- Containment (preventing the population from spreading)

Eradicating or controlling every weed infestation at the same time is beyond the budget and personnel resources of the two forests. Eradication will be the objective applied to first priority species or situations, followed by control for second priority situations, and containment for third priority. Therefore, a system for setting priorities is proposed so that treatment concentrates on species that have the greatest impact on the resource base, and those that become more difficult to control if action is delayed. Most weeds become much more difficult to control once they have spread.

Thus, the highest priority is to eradicate new species occurrences on the Forests, and then to keep existing populations from spreading or increasing in size.

Weed species of limited extent are eradicated or controlled. Because the size threshold varies by weed species, this determination will need to be made based on site-specific conditions. Extremely widespread and common weeds are much more difficult to control, and so they are generally scheduled to “contain” as a Priority 3 species.

Treatment objectives and priorities are interconnected, and will be based on the following criteria, which is consistent with New Mexico’s weed control laws and procedures.

Priority 1—Eradicate New Populations of High-Threat Species.

This priority immediately eradicates new populations of species that pose a high threat to resources. Eliminating these populations while they are small creates the best opportunity to avoid impacts from these species. Eradication includes all viable seeds and vegetative propagules. High-threat species are those that can rapidly expand into native habitats and displace native vegetation throughout the Forests in a relatively short period of time. Eradicate all infestations of Class A weeds, which are those species exotic to New Mexico, but threatening to invade the State. Examples include black henbane, leafy spurge, and toadflax. They have limited distribution on the Forests (e.g. yellow toadflax), but if they become widespread, they pose a threat to agriculture crops, rangelands, plants listed as endangered, threatened or sensitive, and other resources in the State.

Priority 2—Control Existing Populations of High-Threat Species.

This priority gradually reduces existing populations of high-threat species. Control is accomplished by preventing seed production throughout the target area, decreasing the area

coverage of the weed over time, and preventing the weed from dominating the area's vegetation. This priority strives to achieve low levels of the weed populations if eradication is not feasible. For Class B weeds, this priority will decrease the population size and eventually eliminate this class of weeds, which are exotic (NMDA 1999) and of limited distribution in the Forests but are common in other parts of the State and so likely to appear. As a general rule, the objective will be to substantially reduce Class B weed infestations. For populations of 5 to 25 acres in size this means reducing the size by about 75 to 100 percent. For Class B weed infestations greater than 25 acres in size, this means reducing the size by 50 percent. Examples of Class B weeds include bull thistle and musk thistle.

Priority 3—Contain Existing Populations of High-Threat Species.

This priority holds existing populations of aggressive weeds in check, so that they do not increase from their current size. Containing populations is accomplished by preventing weeds from expanding beyond the perimeter of the infestation, perhaps providing only limited treatment within the infestation, and treating to eradicate or control the weed outside the perimeter of the infestation. This priority will contain the spread of Class B weeds that are of limited distribution on the Forests (e.g. poison hemlock). For Class C weeds, which are widespread throughout the State and Forests, contain them to their present population size, or for populations greater than 5 acres in size, strive to reduce by 50 percent. Examples include saltcedar, Russian olive, and Siberian elm.

Priority 4—Eradicate New Populations of Moderate-Threat Species.

This priory eradicates new populations of less aggressive weeds. This priority immediately treats these new populations to eradicate them early, although they are not as high a priority as Priority 1 weeds. These populations expand into native habitats more slowly and/or are less successful than Priority 1 weeds in displacing native plants.

Priority 5—Control Existing Populations of Moderate-Threat Species.

This priority gradually reduces existing populations of less aggressive weeds.

Priority 6—Contain Existing Populations of Moderate-Threat Species.

This priority holds in place existing populations of less aggressive weeds.

Additional Criteria for Prioritizing and Determining Objectives and Methods

In addition, weed infestations found in the following locations will likely be given an elevated priority ranking:

- Areas that are now relatively weed free and have little or no road access, such as areas designated as wilderness, roadless recreation or semiprimitive, nonmotorized, including the road corridors and trails that lead to those areas;
- Areas that are now relatively weed free that provide unique and desirable wildlife habitat, such as recovery habitat for threatened or endangered species, deer and elk winter range; and riparian habitat;

- Areas on the Forests with weed populations adjacent to other land ownerships where land managers have active weed control programs; and
- Areas of high human use, including but not limited to administrative sites, developed recreation sites such as campgrounds, scenic viewpoints, interpretive sites, and trailheads.

Schedules for implementing weed treatments will be based first on the priorities just described, and spread out over time based on levels of funding and staffing on the Forests.

Selection of treatment method is based to a large extent on the priority of the weed species and associated objective, along with site-specific factors such as proximity to water or roads (which increases chance of spread), and the size of the weed infestation (small sizes are easier to eradicate).

For example, a Priority 1 weed species (spotted knapweed) is found in a site that suggests eradication is the objective (it lays along a major highway). The size of the infestation is more than can be hand pulled (more than 2 acres). Therefore, an herbicide will be selected because that is the only method known to be highly effective and economically feasible for this weed population.

In addition to using treatment objectives, priority rankings, and infestation size, additional criteria that will be used in selecting the most appropriate treatment method under the adaptive strategy is shown in Table 2.

Table 2. Additional Treatment Criteria and Limitations

Weed Site Conditions	Treatment Method Limitations
Area of high human use such as a recreation site, administrative site or area where people often collect plants.	Method(s) must have been documented to be low risk of causing harm to people. Examples include nonherbicide methods with lowest risk (e.g. those that avoid burning) or herbicide formulations/application methods having the lowest risk of harmful effects to humans (for example, glyphosate, imazapyr, imazapic, metsulfuron methyl, clopyralid products will be available for use per risk assessments results found in Appendix 3). Also adhere to other mitigation measures that apply to protection of human health and safety (e.g. notification).
Area where there is a shallow water table (≤ 6 feet deep) and soil with a high permeability rate, where there may be a risk of an herbicide leaching through the soil to the ground water.	Nonherbicide method(s) appropriate for the site conditions (manual pulling or mowing), or an herbicide appropriately labeled for use in these locations (e.g. short-lived, nonleachable herbicides such as glyphosate, imazapic, imazapyr, metsulfuron methyl, clopyralid, chlorsulfuron) that has been registered by the EPA for use on permeable soils with shallow water tables. Herbicides that use picloram as their active ingredient (e.g. Tordon 22K) will not be used in these situations per risk assessment results). Also adhere to mitigation measures that apply to protection of soil and ground water resources.
In riparian areas or next to live water bodies containing aquatic species.	Method(s) determined and documented to have low risk to fish or other aquatic species. Examples include a nonherbicide method (e.g. mowing) that avoids erosion/sediment production or herbicides registered by the EPA for aquatic habitats (e.g. chlorsulfuron, glyphosate formulations such as Rodeo (which does not use the surfactant POEA), imazapic, imazapyr). Also adhere to mitigation measures that apply to protection of riparian, water and aquatic resources.

Weed Site Conditions	Treatment Method Limitations
Threatened, endangered or sensitive plant species are present.	Method(s) determined and documented to have low risk to native plant species, such as nonherbicide methods (hand pulling) with appropriate disturbance controls. Herbicide applications include spot treatment (by hand or backpack spray) that avoid vehicle boom spray application of herbicides such as imazapyr, imazapic clopyralid, chlorsulfuron, because they have high potential to affect nontarget plants up to several hundred feet away. Herbicides, if used from boom spray, could be used if similar risk ratings to 2,4-D, which has low risk of impact beyond 25 feet of drift. For Holy Ghost ipomopsis, see specific mitigation measures later in this section. Adhere to mitigation measures that apply to protection of threatened, endangered or sensitive plant species, including limitations on herbicide spraying from vehicles.
Occupied threatened, endangered or sensitive wildlife species habitat.	Method(s) used must have been determined to have low risk to wildlife species. These methods include nonherbicide methods at the proper timing (e.g. burning outside seasonal restrictions). Herbicide applications must be shown to be below the level of concern through specific risk assessment for the herbicide used when applied in these habitats (See Appendix 3). No direct application of herbicides to water will be permitted under the adaptive strategy even where formulations are registered for such use (e.g. AquaKleen formulation of 2,4-D). This restriction is imposed because of possible effects of direct application to Rio Grande cutthroat trout. Also adhere to other mitigation measures that apply to protection of threatened, endangered or sensitive wildlife species.
Wilderness and designated nonmotorized areas	Motorized vehicles and mechanized equipment are prohibited in all wilderness areas. In the Pecos Wilderness, sheep or goat grazing for weed control will be prohibited by an existing closure order. In other locations of Rocky Mountain bighorn sheep habitat, controlled grazing for weed control will also be prohibited. See mitigation measures.

Mitigation Measures and Monitoring Requirements

Table 3 lists mitigation measures and monitoring requirements for the selected alternative, including best management practices (BMPs) for minimizing the risk of water pollution in accordance with Clean Water Act regulations. The mitigations were developed specifically for this project in order to avoid or minimize the risk of adverse project-related impacts to people or natural resources on the Forests, including potential impacts to human health and safety, native plants, special status plants or wildlife, soil, water, riparian and aquatic resources, and heritage resources.

Table 3. Mitigation Measures and Monitoring Requirements for All Alternatives

Description of Mitigation Measure/Monitoring
HUMAN HEALTH/SAFETY and GENERAL MITIGATIONS
Herbicides formulations (specific products including mixtures) will not be used unless they have been registered for use by the EPA and all EPA label requirements (including limitations) are strictly followed. Only herbicides with a completed risk assessment per Forest Service standards will be used.
In areas of human habitation or high use such as a recreation site, administrative site or area where people often collect plants, the treatment method must have low risk of harmful effects to humans. Examples include nonherbicide methods (manual/mechanical/grazing) or herbicides rated as having the lowest risk of harmful effects to humans (See FEIS, Appendix 3).
Herbicide application will strictly adhere to EPA label instructions regarding temperature, humidity, wind speed and other weather variables, to avoid spray drift to nontarget plants or other resources while increasing treatment effectiveness.
Herbicide use will be restricted to EPA registered application rates (usually in terms of pound per acre of active ingredient applied) and conditions listed on the label. Followup application of a second herbicide to an area should be conducted only after reviewing best available information on compatibility with the previous application's formulation.
Herbicides may only be applied by a trained applicator under supervision of a licensed applicator, in accordance with Forest Service directives.
Herbicide use will comply with the direction contained in Chapter 2150 of FSM 2100 - Environmental Management (USDA FS 1998a), including the requirement that a Pesticide Use Proposal (form FS-2100-2) be completed for all proposed pesticide (i.e. herbicide) uses on National Forest System lands.
Herbicide applicators will have the chemical spill plan and emergency cleanup kit onsite during treatments. The spill plan identifies methods to avoid accidental spills as well as how to report and clean up spills. The kit will contain appropriate spill cleanup supplies. (See Appendix 6)
Workers handling herbicides will be required to wear protective clothing, including long-sleeved shirt and long pants to reduce worker doses. For herbicides containing hexazinone, respiratory protection will also be required per label direction. Clothes should be cleaned daily. Workers will also wear waterproofed boots, gloves, and other safety clothing and equipment listed on the herbicide label. Workers mixing or loading herbicides will be required to wear eye protection (goggles or eye shields) and Tyvek suits or herbicide resistant aprons.
A pesticide application record (PAR) will be completed on a daily basis for each project area detailing the herbicide application, treatment area, target species distribution and density, weather conditions, and recommendations for followup treatments or rehabilitation.
The Forests will provide public information about weed treatments using herbicides, including herbicide to be used, locations, application schedules, etc. This information will be posted on the respective forest's Internet Web sites and mailed by the respective forest to those who request it.
To further notify forest visitors and users, signs regarding herbicide use will be placed at access points to treatment areas prior to herbicide application. Signs will include the herbicide to be used, effective dates, and phone number for acquiring more information.
Traffic control and signing during weed treatment operations will be used as necessary to ensure safety of workers and the public. Recreation sites, roads, trails or other areas scheduled for treatment may be temporarily closed during weed treatment activities to ensure public safety.

Description of Mitigation Measure/Monitoring
Weed treatments will be coordinated with potentially affected adjacent landowners and range allotment permittees. Cooperative efforts on adjacent lands and range allotments will increase treatment effectiveness and the ability to meet weed control objectives.
NATIVE VEGETATION and TREATMENT EFFECTIVENES
Weed treatments will only be applied where weeds actually exist, not on areas with a potential for weed infestations.
Vehicles used for weed treatments will be properly cleaned prior to entering National Forest System lands and again before leaving the treated area to avoid further spread of weeds.
Where treatments result in exposing bare mineral soil, those sites will be evaluated to determine the need for revegetation (seeding, planting), mulching, or other erosion or sediment control measures. The evaluation will consider the potential for subsequent re-invasion by weed species, potential for erosion, water runoff, and/or stream sedimentation. Where seeding is used, certified "weed-free" seed will be required. Seed mixes will be based on site-specific conditions and objectives.
Herbicides will not be applied if snow or ice covers the target weed plants, to avoid runoff into soil and onto nontarget vegetation.
After treatment, livestock grazing will be deferred where needed to achieve weed treatment objectives, based on site-specific conditions. This will be accomplished by working with permittees and adjusting their annual operating instructions as necessary.
Biological agents will not be released until screened for host plant specificity and approved by the USDA Animal Plant Health Inspection Service and New Mexico Department of Agriculture.
All weeds that are mechanically or hand excavated after flower bud stage will be double bagged and properly disposed of at an approved facility (e.g. covered landfill).
Use of prescribed fire must adhere to restrictions contained in the Forest Plan and agency directives, such as those for using fire within wilderness (FS Manuals 2324.2 and 2324.04(b)), requirements for detailed burn prescriptions, and other requirements intended to avoid unexpected consequences.
Threatened/Endangered/Sensitive Plants and Animals
If herbicides are to be sprayed within potential habitat for any threatened, endangered or sensitive plant species, a survey of that habitat will be conducted if possible. If no survey is conducted, the potential habitat will be treated as if occupied by the threatened, endangered or sensitive plant, and the mitigation that follows (for occupied habitats) applies.
A 50-foot buffer applies to any prescribed fire or mowing within the habitat for the Holy Ghost ipomopsis.
Controlled grazing by goats will not be used within the 200 acres of occupied habitat for the Holy Ghost ipomopsis.
Within the known population of Holy Ghost ipomopsis, herbicides will not be applied.
For other plants (sensitive) there will be no spraying of herbicides from vehicles (boom spray) within 25 feet of any occupied threatened, endangered or sensitive plant species habitat if the herbicide formulation is low risk (e.g. 2,4-D). For herbicides that have a large area of potential impact if drift occurs (e.g. clopyralid), boom spray must be avoided or a larger (1,000-foot) buffer must be used. Within a sensitive plant population, herbicide formulations must be chosen that have low risk of migration through roots, and then must be applied by hand to individual weeds (e.g. wand from backpack sprayer, or on gloves, wicks, rags). (See Appendix 3).
Design ground-disturbing activities (tilling, pulling, digging, etc.) to avoid trampling or other direct impacts to individual Holy Ghost ipomopsis or other threatened, endangered or sensitive plant species. The risk of this occurring will be prevented or reduced by the required presence of a Forest Service biologist or

Description of Mitigation Measure/Monitoring
other qualified person who can identify the plant during any treatment activity in the occupied habitat.
Before implementing any weed control work in the occupied Holy Ghost ipomopsis habitat, the forest or district will coordinate with the New Mexico Environment Department and U.S. Fish and Wildlife Service to use the most current survey information.
WILDLIFE, including T & E and SENSITIVE SPECIES
In general, for treatment areas exceeding 1 acre in size within threatened and endangered species wildlife habitat, conduct surveys for the species prior to implementation, if feasible. If surveys are not feasible prior to implementation, that area will be treated as if occupied. Within "occupied" threatened and endangered species habitats, avoid loud, persistent noise disturbance or modifications of breeding habitat features. If a potentially adverse effect cannot be avoided, develop a supplemental biological assessment and consult with USFWS to determine the appropriate mitigation measures.
For "occupied" Mexican spotted owl and Southwestern willow flycatcher habitat, implement applicable breeding season restrictions as specified in forest plans and recovery plans for those species.
If bald eagle may be in an area proposed for treatment during the winter months (through March), a presence/absence survey must occur within a one-half-mile radius of the work site before activity starts and following any breaks. If an eagle is present within the one-half-mile radius, work must be suspended until the bird leaves of its own volition or if a Forest Service biologist in consultation with the USFWS, determines that the potential for harassment is minimal. If bald eagles nest on National Forest System land in proximity to areas planned for invasive plant treatment, the U.S. Fish and Wildlife Service will be contacted to determine if further consultation is needed.
For treatment units that are located within known Southwestern willow flycatcher habitat (Carson National Forest), the following measures apply: Survey to protocol before any treatment if the timing of the treatment coincides with dates the birds are likely to be in the area. If the flycatcher is found, no treatments can occur. If no flycatcher is found, treatment will proceed.
No prescribed burns will be done within Mexican spotted owl PACs.
For other "occupied" sensitive wildlife species habitat where individuals in the population may be negatively impacted, consult with the forest biologist and apply mitigation measures that minimize those negative impacts to individuals while continuing to maintain population viability and avoid a trend toward Federal listing.
Herbicide applications will be limited to those herbicides and application rates/methods documented to have a low risk to wildlife species.
In areas with bighorn sheep populations (high country/wilderness), controlled grazing with sheep or goats will be prohibited.
In Jemez Mountain salamander areas, no treatment will occur during the season when salamander are above ground. This is during late summer monsoon season. Rain for 5 consecutive days will be used as a measure to delay treatment until land surface conditions have dried. Areas to protect in this way will follow the cooperative management plan.
No herbicide treatment will occur within 50 feet of streams that are known to be occupied by Rio Grande cutthroat trout between June 1 and June 30 (spawning season).

Description of Mitigation Measure/Monitoring
AIR, SOIL, WATER, RIPARIAN and AQUATIC RESOURCES
All prescribed burning must comply with the New Mexico smoke management requirements (permitting, monitoring, etc.) to maintain levels of these emissions within State and Federal air quality standards.
Heavy mechanized equipment such as tractors with tillers or mowers will not be used on slopes over 40 percent, to minimize erosion potential.
Heavy equipment will not be used to mechanically dig up weeds within riparian zones unless a Forest Service soil, water or fisheries specialist examines the site-specific conditions and determines that there will be no adverse impacts to water quality, stream morphology or aquatic resources.
Herbicide treatment areas that may be near water or have a high water table will be field checked to verify GIS data. If applying herbicides within 25 feet of a water body, or within a riparian area or other areas with a shallow water table, a short-lived, nonleachable herbicide that has been registered by the EPA for use on permeable soils, near water, or in areas having shallow water tables must be used (e.g. 2,4-D, glyphosate, triclopyr). Herbicides that use picloram as their active ingredient (e.g. Tordon 22K) will not be used in this situation.
Herbicide application within a riparian area or 50 feet of a water body is limited to hand application onto individual weed plants (using backpack spray wand, or glove, wick, or rag).
Mixing and loading of herbicides will not occur within 200 feet of live water, and will adhere to the other mitigation measures listed in the chemical spill plan (see Appendix 6).
In riparian areas or next to live water bodies containing fish, methods used must have been documented to have low risk to aquatic species.
In riparian areas, prescribed burning will be incidental (e.g. pile burning slash from mechanical treatment of woody invasive species). No broadcast burning will be permitted.

Description of Mitigation Measure/Monitoring
HERITAGE RESOURCES
Adhere to the programmatic agreement developed for this project,* including requirements for conducting preimplementation heritage resource inventories and evaluations, consulting with State Historic Preservation Office and tribes, applying appropriate mitigation measures to avoid adverse impacts, and monitoring treatment activities for effects to heritage resources. (Programmatic agreement is available in the project record.)
Herbicides applied from vehicles (e.g. trucks, off-road vehicles) will not occur within 25 feet of archeological remains consisting of perishable materials with analytic or information value, including wood, organic ceramic paints, datable materials, and residues on artifacts. Within 25 feet of such archeological remains, herbicides must be applied by hand to individual weeds (e.g. on gloves, wicks or rags) to avoid getting herbicides or carrier fluids onto those remains.
Adhere to the mitigations previously listed that minimize adverse impacts to nontarget native plants in order to reduce the risk to plants of ethnographic concern.
Notification of tribes and other traditional use groups will occur before herbicides are used to inform them of pending chemical treatment activities and schedules. This measure will reduce the risk to native plants used for traditional cultural purposes and the risk to the health of individuals who gather these plants.
Sheep or goat grazing will not be used on heritage resource sites easily damaged by trampling as identified through heritage resource inventories prior to implementation.
Avoid direct impacts to archeological sites by designing ground-disturbing activities to avoid archeological sites, and conduct archeological surveys for all ground-disturbing activities. Root tilling, mowing, hand pulling, digging or other weed treatments that disturb the soil, will be conducted in a manner that avoids heritage resource sites whenever possible. If avoidance is not possible, data recovery or another similar mitigation measure may be required.
During prescribed burning, avoid archeological remains consisting of perishable materials with analytic or information value, including wood, organic ceramic paints, datable materials, and residues on artifacts. Conduct fuel assessments, and reduce fuels onsite without affecting the perishable materials (unless data recovery occurs per programmatic agreement). This can be accomplished with prescriptions that ensure low temperature, low duration, low residence time and low intensity on sites to be burned.
MONITORING and ADAPTIVE MANAGEMENT
Weed inventories and mapping will be conducted annually, and treatment of newly found populations will be identified and prioritized based on criteria in the EIS.
Treated sites will be monitored and results evaluated (documented) to determine: - Effectiveness of the method(s) used in meeting the objective; - Whether impacts to resources or people were within the scope of EIS predictions; and - Implementation and effectiveness of mitigation measures, and whether mitigations should be modified or added to enhance effectiveness.
Changes in treatment prescriptions made as a result of monitoring and evaluation, and treatments prescribed for newly found weed populations must adhere to all mitigation and monitoring requirements in the EIS, and the actions and effects must be within the scope of those considered in the EIS. New information will be considered in accordance with FSH 1909.15, Sec. 18, to determine the need for

Description of Mitigation Measure/Monitoring
additional environmental analysis under NEPA. The evaluation and decision by the responsible official regarding consistency with the EIS will be documented in the project record.

*Programmatic agreement between the USDA Forest Service, Carson and Santa Fe National Forests, USDA Forest Service Regional Office, and New Mexico State Historic Preservation Office, and other consulting parties, to comply with applicable portions of the National Historic Preservation Act, including Section 106 and its implementing regulations.

Forest Plan Amendment

The selected alternative amends the Santa Fe National Forest Plan. The current standards of the Forest Plan prohibit herbicide use within municipal watersheds, in areas of human habitation, on soils with low regeneration potential or less than moderate cation exchange capacity (USDA FS 1987). The amendment will allow herbicides to be used where necessary in those situations (while maintaining limitations listed in the "Mitigation" section of this document). The current Santa Fe National Forest Plan also prohibits herbicide use if an environmental analysis shows that it is not "environmentally, economically or socially acceptable," which is an ambiguous and nonquantifiable standard, subject to variable interpretations. The amendment will slightly modify that standard while continuing to focus on using the environmental analysis of environmental, economic and social impacts to determine the appropriateness of herbicide application. The specific language changes proposed for the amendment are ***italicized*** in Table 4.

The need for the amendment is to help meet the purpose and need for this project. In order to achieve the desired ecological conditions described in the Santa Fe National Forest Plan, including maintaining native vegetation and wildlife habitat quality, along with sustainable soil, water and riparian conditions that will otherwise be threatened by ineffective treatments and the continued spread of weeds, it may be necessary to have the flexibility to apply herbicides to weed populations that cannot be effectively treated with other methods. This could in some instances include herbicide applications within municipal watersheds, on National Forest System lands adjacent to human residences, and on some soils with a low revegetation potential or less than moderate cation exchange capacity. The amendment is made within the context of the mitigation measures and label instructions that apply to herbicide use, as well as the mitigation measure that requires sufficient ground cover to ensure that soil erosion does not exceed the tolerance level for that soil type based on the terrestrial ecosystem survey for the Santa Fe National Forest (USDA FS 1993). This will ensure that long-term soil productivity will be maintained. In addition, the Forest Plan standard and guideline regarding cation exchange capacity is proposed for deletion because it is outdated. That particular soil measurement is not used by the Forest Service in the Southwestern Region.

Table 4. Santa Fe National Forest Plan Amendment

Existing Forest Plan Direction (p.76)	New Forest Plan Direction
Chemical treatments may be applied: - When determined through an environmental analysis to be environmentally, economically, and socially acceptable. - On areas outside municipal watersheds and areas of human habitation. - On soils with moderate or high revegetation potential.	Chemical treatments may be applied: - When determined through an environmental analysis to ***have no long-term adverse environmental, economic, or social impacts.*** ***- Within municipal watersheds only when the municipality concurs with the proposed treatment prescription and mitigation measures to be implemented***. -On ***any soils provided that effective ground cover is quickly restored and soil erosion on that site is not reduced to below the tolerance level identified in the terrestrial ecosystem survey for the affected soil unit***.