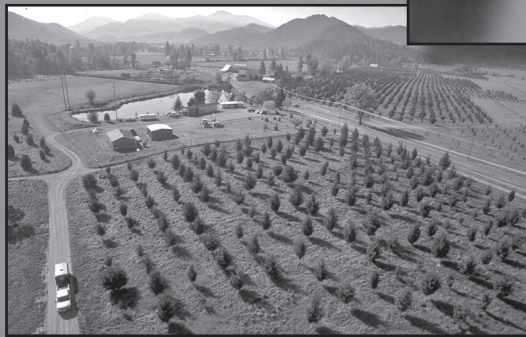


Record of Decision Integrated Pest Management

Provolt Seed Orchard
Grants Pass (Jackson & Josephine Counties), OR

Charles A. Sprague Seed Orchard
Merlin (Josephine County), OR



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

Photographs on cover:

Provolt: Douglas fir production Orchard Unit 2 - Butte Falls 3 Unit. Riparian area along Applegate River in background.

Provolt: Young developing Douglas-fir cones in April

Provolt: Orchard Unit 3 in foreground; office and administrative buildings; State Hwy. 238; OUs 4, 6, 8, 10, 12, 14

Sprague: Sugar pine production Orchard Unit 53 - developing conelets covered with cloth bags for insect protection and seed collection

Sprague: Lake CASSO



IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT OFFICE
3040 Biddle Road
Medford, Oregon 97504
email address: or110mb@or.blm.gov



Dear Reader:

Enclosed for your information is the Record of Decision (ROD) for the integrated pest management (IPM) program at the Bureau of Land Management's (BLM's) Provolt Seed Orchard, located near Grants Pass, Oregon, in Josephine and Jackson Counties, and the Charles A. Sprague Seed Orchard, located near Merlin, Oregon in Josephine County. The ROD summarizes the provisions of the selected decision to manage the insect, weed, animal, and disease problems at the seed orchards under an IPM program with environmental protection emphasis. The decision is based on the final environmental impact statement (EIS), entitled "Integrated Pest Management Provolt Seed Orchard, Grants Pass (Jackson & Josephine Counties), OR, Charles A. Sprague Seed Orchard, Merlin (Josephine County), OR." The decision best reflects agency analysis and public involvement throughout the process, including initial scoping to identify issues of concern, and public comments on the Draft and Final EIS.

The Final EIS was released to the public on July 22, 2005 with the publication in the Federal Register of a Notice of Availability, which commenced a 30-day public availability period on the Final EIS. The public comment period concluded on August 22, 2005, with two comments received. BLM has now published a Notice of Availability of the Record of Decision in the Mail Tribune, announcing the selection of the alternative to be implemented. The Notice was also published in the Grants Pass Daily Courier.

I find the planning and analysis process and seed orchard pest management directions have been developed and would be implemented in a manner consistent with procedures and intent of the Federal Land Policy and Management Act of 1976, the National Environmental Policy Act of 1969, the Endangered Species Act of 1973, and other applicable statutes, Executive Orders, regulations, manuals, and handbooks. Having considered a full range of alternatives, associated impacts, and public input, I approve adoption and implementation of the proposed IPM Program with Environmental Protection Emphasis (Alternative B in the Final EIS), as described in this ROD.

This forest management decision may be protested under 43 CFR 5003 – Administrative Remedies. In accordance with 43 CFR 5003.2, the decision for this action is subject to protest following publication of the Notice of Availability of the ROD in "a newspaper of general circulation in the area where the affected lands are located." Protests of the decision must be filed with this office within 15 days after that publication date. If no protest is received by the close of business (4:30 p.m. Pacific Standard Time) on the 15th day, the decision will become final. If a timely protest is received, the decision would be reconsidered in light of the protest and other pertinent information available in accordance with 43 CFR 5003.3.

Thank you for your cooperation. I look forward to any further comment you may have that would assist us in managing the Provolt and Sprague Seed Orchards.

Sincerely,

Timothy B. Reuwsaat
District Manager, Medford District

Record of Decision:
Integrated Pest Management Program,
BLM Provolt Seed Orchard
Grants Pass, Josephine and Jackson Counties, Oregon
and
BLM Sprague Seed Orchard
Merlin, Josephine County, Oregon

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Designation: Record of Decision (ROD) for Final Environmental Impact
Statement (EIS)

Privacy Advisory

Any protests on this Record of Decision must be submitted within 15 days of publication. In accordance with the *Privacy Act*, individuals (but not organizations and businesses) may request their name be withheld from public review by stating this request at the beginning of their letter.

Summary

In this Record of Decision (ROD), the Bureau of Land Management (BLM) adopts and approves the immediate implementation of Alternative B—Integrated Pest Management (IPM) with Environmental Protection Emphasis at the Provolt and Sprague Seed Orchards, based on the June 2005 Final Environmental Impact Statement (EIS) for Integrated Pest Management. Alternative B was the proposed action and BLM's preferred alternative in the Draft and Final EISs. Alternative B would give the seed orchards access to a full range of pest management methods, including biological controls, chemical pesticides, prescribed fire, cultural control methods, and other methods.

It is the policy of the Department of the Interior, and all of its agencies including BLM, to use chemical pesticides only after considering alternative methods; and to develop, support, and adopt IPM strategies wherever practicable. The Draft and Final EISs assessed four alternatives: (A) Maximum Production IPM, (B) IPM with Environmental Protection Emphasis, (C) Non-Pesticide Pest Management, and (D) No Action: Continue Current Management Approach.

Although Alternative B allows for chemical use, it is considered to be the environmentally preferable alternative. It allows for effective pest control, thereby providing positive conditions for seed production to support enhanced reforestation and restoration efforts that benefit the region, while balancing environmental protection in the vicinity of the seed orchards. Alternative B was developed to respond to risks identified in orchard-specific human health and non-target species risk assessments of Alternative A—Maximum Production IPM (among other factors), and incorporates limitations that would minimize the risks for human health, terrestrial wildlife, and aquatic species.

Overall, the EIS predicted no adverse impacts to air quality, groundwater, non-target vegetation, geology and soils, land use, noise, cultural resources, or socioeconomics and environmental justice from any of the alternatives. Potential impacts associated with Alternative B are effects to (1) public health, water quality, or aquatic species if there was an accidental spill to surface water; (2) worker health from injury during use of cultural methods or prescribed fire, or from an accidental pesticide spill onto the skin; (3) water quality if runoff or drift of pesticides or fertilizers occurred, although modeling predicted levels below those that would affect human health or non-target species; (4) non-target insects due to localized lethal effects of insecticides; or (5) special status aquatic species from fertilizer if maximum runoff conditions occurred at Sprague.

Orchard-specific Biological Assessments were prepared to document the Endangered Species Act and Magnuson-Stevens Fisheries Conservation and Management Act consultation process for Alternative B, the selected alternative. The National Marine Fisheries Service (NMFS) issued biological opinions concluding that the selected alternative is not likely to jeopardize the continued existence of coho salmon. The opinions also concluded that the selected alternative may adversely affect essential fish habitat for chinook and coho salmon. The opinion specified reasonable and prudent measures, with associated terms and conditions, to further protect these species and designated critical habitat and essential fish habitat for salmon. These terms and conditions were incorporated into the selected alternative analyzed in the Final EIS and the decision.

Alternative B (the selected alternative) contains numerous limitations and protection measures to protect health and the environment. No requirement for additional mitigation measures has been identified for Alternative B, including the terms and conditions specified by NMFS during consultation in accordance with the *Endangered*

Species Act. A monitoring plan incorporated into the protection measures will provide an ongoing assessment of the effectiveness of these measures in protecting water quality and protecting worker health.

The Provolt and Sprague Seed Orchards IPM EIS process included two scoping periods, an open house at each seed orchard, publication of the Draft EIS with public meetings and an extended public comment period, and publication of the Final EIS. BLM received 52 scoping comments, oral input from one individual at the public meetings and four comment letters on the Draft EIS, and two comments on the Final EIS. The public involvement process continues with a 15-day period for protests on this ROD after its publication. If no protests are received during this period, BLM will proceed with implementation.

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Introduction

The June 2005 Integrated Pest Management (IPM) Final Environmental Impact Statement (EIS) for Provolt and Charles A. Sprague (Sprague) Seed Orchards presented an array of IPM proposals to manage, over the long term, competing and unwanted vegetation, diseases, insects, and animal pests at Provolt and Sprague. This Record of Decision (ROD) presents the Bureau of Land Management's (BLM's) selection of Alternative B—IPM with Environmental Protection Emphasis for implementation. This ROD was developed in accordance with Council on Environmental Quality (CEQ) regulations at 40 CFR 1505.2, and all BLM and Department of the Interior guidance for implementing the *National Environmental Policy Act* (NEPA). The decision in this ROD is based on information contained in the Final EIS for IPM at Provolt and Sprague.

The Provolt Seed Orchard is located approximately 15 miles southeast of the city of Grants Pass and 25 miles west of Medford, Oregon, near the small community of Provolt. The 300-acre site contains Douglas-fir and sugar pine production orchard units, Douglas-fir and sugar pine preservation orchard units, a two-acre native plant production area, and administrative and storage buildings.

The Sprague Seed Orchard is located approximately ten miles northwest of the city of Grants Pass and 40 miles northwest of Medford, Oregon, near the small community of Merlin. The 200-acre site contains sugar pine and ponderosa pine production orchard units, sugar pine preservation orchard units, nine small grass gardens, a cone storage and drying facility, a containerized greenhouse facility, and administrative and storage buildings.

The seed orchards' purpose is to produce improved seed for conifer seedling production, preserve valuable individual conifer trees, and produce native species plants and seed (including grass, forb, brush, and other).¹ This high-quality seed is supplied to BLM and other cooperators for reforestation and restoration projects. The orchards have experienced periodic problems from insects, disease, weeds, and animals.

The Medford District Resource Management Plan (RMP) included the seed orchards within the District Defined Reserve system. These reserves were established for protection of specific resources, flora and fauna, and other values. These seed orchard values included preservation of genetic materials, production of improved seed, and various orchard developments and facilities.

The provisions of the Medford District RMP found in the resource program sections for Energy and Minerals; Land Tenure Adjustments; Rights-of-Way, Access, and Withdrawals; and the information in Appendices D—Best Management Practices-Roads and Landings, and F—Forest Genetics Program, apply to the Provolt and Sprague Seed Orchards. Except for these specific sections, the objectives and management actions/direction described in the Medford District RMP are not applicable to Provolt and Sprague.

BLM Decision—Alternative B

In this ROD, BLM adopts and approves for immediate implementation Alternative B—IPM with Environmental Protection Emphasis at Provolt and Sprague, based on the analyses and conclusions in the June 2005 Final EIS. This IPM program would

¹U.S. Bureau of Land Management. 1995. Medford Resource Management Plan (RMP) and Record of Decision (ROD). Medford District Office. Medford, OR.

manage adverse impacts from pests to allow the seed orchards to produce improved seed for conifer seedling production, preserve valuable individual conifer trees, and produce native species plants (including grass, forb and brush, and other) and seed. Appendix A to this ROD (Figure 2.2-1 from the Final EIS) illustrates the IPM decision process. Specifically, the IPM program would ensure attainment of the following pest management objectives at Provolt and Sprague, as well as efficient and cost-effective orchard operation over the long term:

- Minimize insect damage to orchard trees, cone crops, and native plants.
- Remove noxious weeds and control vegetation that favors animal pests and disease conditions, and reduce fire hazard conditions.
- Reduce growth of vegetation to allow tree establishment and growth, and to minimize damage to orchard equipment and infrastructure.
- Treat fungal diseases to maintain the health and vigor of the orchard trees used for seed production, and the native plant species for seed production. Also, to control plant pathogens in the native seedling grow-out beds.
- Minimize animal damage to orchard trees, native plant beds, and orchard equipment and infrastructure.

This program would allow the seed orchards to use the pest management methods described below, with chemical use restricted by a set of limitations that provide added protection to human health and the environment. These limitations, which are included only in the Alternative B (the selected alternative), are listed in Appendix B to this ROD (from Section 2.3.3 of the Final EIS). All of the alternatives analyzed in the Final EIS, including the alternative selected in this ROD, also include a set of protection measures described in Appendix C to this ROD (from Section 2.3.1 of the Final EIS). Limitations and protection measures are described in detail in the “Mitigation and Monitoring” section of this ROD.

BLM’s pest management will be conducted in accordance with all applicable state and local government regulations, including two laws specific to the Department of the Interior and BLM: the *Sikes Act* (16 U.S.C. 670 et seq.), as amended, and the *Federal Land Policy and Management Act* (FLPMA) of 1976 (43 U.S.C. 1700 et seq.). The *Sikes Act* authorizes the Department of the Interior, in cooperation with state agencies responsible for the administration of fish and game laws, to plan, develop, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish and game on public lands within its jurisdiction. FLPMA requires BLM to manage public lands and their resources for multiple use, and to develop resource management plans for lands under BLM’s jurisdiction.

Implementation of Decision

The EIS analyzed the actions under Alternative B (the selected alternative) in detail sufficient to allow implementation of most or all of the actions without additional NEPA analysis. Prior to implementation of each action (or group of actions), BLM will complete a “Documentation of Land Use Plan Conformance and NEPA Adequacy” (DNA) to document conformance of the proposed action with this seed orchard IPM ROD. The Medford District Manager will determine if the proposed treatment(s) conform(s) with the Decision in this ROD for the Integrated Pest Management Program for the Provolt and Sprague Seed Orchards and that all potential impacts of the proposed treatment(s) have been adequately analyzed in the Final EIS for the Integrated Pest Management Program at the Provolt and Sprague Seed Orchards. The district will then complete a

Decision Record to document the decision to proceed with the proposed treatment(s). Most specific IPM actions will be considered and decided as an annual IPM plan for the orchards (see Appendix A). If site-specific conditions differ substantially, or circumstances change, from those described in the IPM Final EIS for the Provolt and Sprague Seed Orchards, or if a DNA is inappropriate for other reasons, the BLM may need to conduct additional NEPA analysis.

Future decisions on specific IPM actions conducted consistent with this ROD will have protest opportunities additional to the protest opportunities for this ROD (see “Protest Opportunities” below). The decision to implement specific IPM actions—in accordance with an annual plan or for specific additional treatment projects for which the need was identified subsequent to development of the annual plan—will be subject to protest under 43 CFR 5003 when the notice of the decision is first published in the Mail Tribune and Grants Pass Daily Courier. These future protest opportunities for IPM actions will be limited to issues not addressed by this ROD or supporting Final EIS.

An essential element of the selected IPM program is research into better and more effective control methods. BLM will regularly review and assess for effectiveness the pest management methods available, including new and developing technologies, so that the seed orchards will use the most effective methods of control while minimizing the potential for any adverse environmental or health impacts. The potential use of new technologies or products would require a review to ensure compliance with NEPA. Such a review would follow the process outlined in the BLM Handbook (H-1790-1), Chapter 1, and consist of the basic steps outlined in Appendix D to this ROD (Figure 2.4-1 from the Final EIS).

Alternatives, Including the Selected Alternative

In the IPM EIS, BLM identified and evaluated four alternatives to address the need for a pest management program at Provolt and Sprague, as follows:

- Alternative A: Maximum Production IPM
- Alternative B: IPM with Environmental Protection Emphasis (Selected Alternative)
- Alternative C: Non-Pesticide Pest Management
- Alternative D: No Action—Continue Current Management Approach

Pest management methods that are common to all alternatives are biological methods, cultural methods, prescribed burning, and other non-pesticide control methods (described in more detail in the next subsection). Other activities common to all alternatives include orchard management activities unrelated to pest management, and protection measures (see Appendix C) that would be used under any alternative. The EIS also considered, but did not analyze in detail, one alternative suggested during the scoping process to plant more crop trees to offset losses resulting from no pest control (Final EIS, Section 2.3.6).

Alternative A—Maximum Production IPM

Under this alternative, the primary goal is the maximum production of seeds and plants with a very low level of acceptable losses. The Provolt and Sprague seed orchards would have all identified biological, chemical, prescribed fire, cultural, and other pest control methods available for use. An effective IPM strategy for all orchard pests would be implemented under this alternative; however, the primary management

objective would be to maximize seed production for annual BLM and cooperator seed needs by aggressively controlling cone and seed insects and other limiting factors. The most effective insect control measures would be implemented, to maximize seed yield and reduce damage to the seed crops with low acceptable seed losses, emphasizing production above other less-effective control methods and considerations, with a low threshold for initiating treatment.

Selected Alternative: Alternative B—IPM with Environmental Protection Emphasis

Under this alternative, the seed orchards would have access to the full list of pest management methods identified above; however, chemical use would be restricted by a set of limitations. These limitations address risks predicted by the quantitative risk assessments, respond to scoping concerns, consider the results of previous monitoring, and include recommendations made by the interdisciplinary EIS preparation team. The limitations provide added protection to human health and the environment, and distinguish the details of potential treatments under Alternative B from those under Alternative A. The complete list of limitations is provided in Appendix B (from Section 2.3.3 of the Final EIS).

Alternative C—Non-Pesticide Pest Management

Alternative C would allow the seed orchards to use only the non-pesticide biological, prescribed fire, cultural, and other methods listed above. No biological or chemical pesticides would be permitted.

Alternative D—No Action: Continue Current Management Approach

Alternative D would allow continuation of the current management system, which is the use of all non-pesticide control practices at the seed orchards, as well as the use of pesticides on a specific case-by-case basis. All biological, prescribed fire, cultural, and other non-pesticide methods would be used as needed. When a specific need is identified for a pesticide, the action would be reviewed to determine whether it is encompassed by an existing EA or EIS. This could include applications for controlling cone insects or other orchard insect outbreaks, disease infestations, and any vegetation control necessary that is not covered by other BLM vegetation control NEPA documents.

Pest Management Methods

Under Alternative B, the following pest management methods would be available to the Provolt and Sprague seed orchards:

Biological Control

- Insects: bird and bat boxes to attract insect-eating birds and bats, naturally occurring bacteria such as *Bacillus thuringiensis* (a biological insecticide).
- Disease: natural and planted herbaceous vegetation left intact to provide some natural shade to seedlings, thereby reducing stress and potential diseases.

- Animal pests: perch poles for birds of prey; barn owl nest box (Provolt); predators including bobcat, coyote, long-tailed weasel, and fox encouraged to populate the seed orchard lands to aid in control of animal pests.

Chemical Pesticides

- Vegetation: herbicides, including dicamba, glyphosate, hexazinone, picloram, and triclopyr.
- Insects: insecticides, including acephate, chlorpyrifos, diazinon, dimethoate, esfenvalerate, horticultural oil, imidacloprid, permethrin, propargite, and Safer® soap.
- Disease: a fungicide, chlorothalonil.

The methods that may be used to apply these pesticides at Provolt and Sprague are high-pressure hydraulic sprayer, hydraulic sprayer with hand-held wand, tractor-pulled spray rig with boom, backpack sprayer, hand-held wick, capsule implantation, and broadcast spreader. These application methods are described in an attachment to the Final EIS Appendix C.

Appendix E of this ROD (Table 2.2-1 from the Final EIS) lists the biological and chemical pesticides and fertilizers that may be used at Provolt and Sprague, including formulations, target pests, application methods, areas that could be treated, application rates, application frequency, and months when use could occur. Note that not all chemicals would be used in a given year, and some might never be used. However, their analysis in the Final EIS and subsequent selection in this ROD give the seed orchard the option of using them in the future should a specific need arise. It is also important to note that each chemical application must first be approved by the BLM District Manager. All pesticides will be applied in compliance with all Federal and Oregon state laws, BLM regulations and policies, the pesticide label, and manufacturer recommendations.

The application details presented in Appendix E correspond to the quantitative risk assessments conducted for the IPM EIS. Alternative B, which was developed in response to the impacts predicted by the risk assessments of the maximum production alternative (Alternative A), incorporates limitations that address these risks.

Prescribed Fire

- Vegetation: control of unwanted vegetation along fence lines, road sides, and irrigation ditches; pile burning of cut/cleared vegetation.
- Insects: pile burning of insect damaged branches and trees, burning cones from sanitation collections and insect-damaged cones.
- Disease: pile burning of infected branches and trees, burning grass straw in bed rows in the native plant gardens.

Cultural Control Methods

- Vegetation: hand-pulling; pruning; thinning; hand tools to cut and grub; tractors with various blade attachments for mowing; gasoline-powered string trimmers; brush cutter machine mounted on tractor; chainsaw for cutting up thinned, rogued, dead/dying orchard trees; power pruner; wood chipper; chipping with large tub grinders and marketing the chips for energy development; and mulch mats.

- Insects: pruning, thinning, shaping, use of grafting wax or spray seal on tree wounds, sanitation of damaged branches and trees, sanitation of insect-damaged cones and cones not harvested for seed production, hand-picking large and noticeable insect pupae.
- Disease: pruning, power saws to cut infected or dead trees; removal of diseased plants from the native plant gardens using a tractor and roto tiller, mesh shade screens to protect seedlings from heat damage, hand-painting older trees with exposed and thin bark to reflect the sun's rays and insulate from extreme heat.
- Animal pests: walking (herding) stray deer toward and out the gates; pruning tree limbs up at the base of the trees; removing unwanted vegetation, and mowing cover crop vegetation that would provide cover for small mammals; live trapping; lowering the lake's water level for several days to cause beavers to move out (Sprague); pellet gun to reduce western gray squirrel population (Sprague); screening buildings, under buildings, and inside culverts to act as a barrier against ground squirrel, skunk, and other animals; wire protection of lower tree stems to prevent beaver damage (Provolt).

Other Methods

- Pheromone bait traps to attract and capture damaging insects.
- Fertilization to promote overall tree health, cone production, and disease resistance.

Environmentally Preferable Alternative

Environmental preferability is judged using the criteria suggested in NEPA, and guided by CEQ. CEQ² has stated that

The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.

NEPA's Title I, Section 101(b) establishes the following broad policy goals for all Federal plans, programs, and policies (42 USC § 4331):

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable or unintended consequences;
- preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports a diversity and variety of individual choice;
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

²Council on Environmental Quality, "Forty Most Asked Questions Concerning CEQ's *National Environmental Policy Act* Regulations" (40 CFR 1500-1508), *Federal Register* Vol. 46, No. 55, 18026-18038, March 23, 1981: Question 6a.

In terms of direct impacts to the local biological and physical environment from pest control activities, Alternative C—Non-Pesticide Pest Management would have the least potential for effects, since it does not include the use of pesticides (Final EIS, Section 2.6). However, if the seed orchards were unable to contain disease or insect outbreaks using non-chemical methods, neighboring land uses could be affected if the seed orchards became an ongoing source of re-infestation to adjacent areas; the likelihood and magnitude of this potential adverse impact from Alternative C are not known. All other alternatives allow use of pesticides, including Alternative B (pesticide use with limitations) and the No Action Alternative (pesticide use with NEPA review on a case-by-case basis). Pesticide applications involve the release to the environment of chemicals that can cause impacts to health or ecological resources, under certain conditions of exposure. Therefore, under this criterion alone, Alternative C would seem to be the environmentally preferable alternative, since it results in the least chemical release to the environment. However, with respect to better protecting, preserving, and enhancing historic, cultural, and natural resources, Alternative B (the selected alternative) was determined to be the environmentally preferable alternative, based on the following rationale.

- (1) Alternative B makes a wider variety of pest management methods available to the seed orchards than does Alternative C, thereby allowing the orchards to implement more effective pest control measures, if needed, to maximize seed yield and reduce damage to the seed crops as compared to the measures available under Alternative C.
- (2) More effective pest management and better seed yield would likely lead to a greater number (and higher quality) of seed for conifer seedling and native species plant production; and ultimately lead to enhanced reforestation and restoration efforts in the region. Risks from insects to seed orchard tree survival and seed production capability would increase in future years when the orchard trees mature and produce more cones (Section 1.1.2).
- (3) Alternative A—Maximum Production IPM, would produce higher seed yields than Alternative B, and hence lead to potentially enhanced reforestation and restoration efforts. However, it also includes the highest potential for chemical pesticide use and does not include the added limitations of Alternative B that address the identified areas of risk from pesticide use. Therefore, Alternative A would result in potentially greater environmental impacts than Alternative B (the selected alternative) (Final EIS, Section 2.6).
- (4) When compared to Alternatives A and C, Alternative B appears to have the best balance of preserving our natural resources while resulting in minimal environmental impact. Alternative B was developed directly in response to the risks identified under Alternative A (among other factors) and incorporates special design features that would reduce the risks in each case to negligible levels for human health, terrestrial wildlife, and aquatic species (Final EIS, Section 2.3.3).

Management Considerations

Rationale for Decision

All of the alternatives analyzed in the EIS (including the No Action Alternative) meet the purpose and need of managing pests at the orchards, but do not accomplish the purpose equally. Each alternative includes elements of an IPM program to manage the pests, diseases, and unwanted vegetation that could limit the seed orchards' ability to achieve their purpose of producing improved seed for conifer seedling production,

preserving valuable individual conifer trees, and producing native species plants and seed (including grass, forb, brush, and other). The primary differences among the alternatives are related to the level of potential pesticide use that would be allowed, which would directly affect the expected seed production. Alternatives C and D would not manage pests as effectively or efficiently as Alternatives A and B. Alternative B has lesser environmental impacts than Alternative A.

Alternative B provides the best balance of preserving our natural resources while resulting in minimal environmental impact, when compared to the other alternatives. It allows more effective cone and seed insect control measures than the no-pesticide pest management alternative, resulting in greater seed yield. In addition, with the incorporation of additional limitations—specifically developed in response to the risk assessment findings to further protect the environment—the potential for adverse effects is anticipated to be negligible (similar to the non-pesticide pest management alternative), and certainly less than Alternative A, the alternative with the maximum seed yield.

BLM determined that Alternative B—IPM with Environmental Protection Emphasis best meets the seed orchards' need for pest management, while providing the best balance between environmental protection and seed production.

Environmental Consequences

The EIS and risk assessments identified human health, biological resources, and surface water (as it relates to aquatic species) as the resources with the greatest potential for impact. The potential impacts to these and other resources were evaluated and described in Chapter 4 of the Final EIS. The analysis included quantitative human health and ecological (non-target species) risk assessments (summarized in the Final EIS Appendix C). Threatened coho salmon are known to be present at the Provolt Seed Orchard in Williams Creek, and in the Sprague Seed Orchard vicinity in Jump-off Joe Creek; therefore, the EIS included an evaluation of sublethal effects from pesticides or fertilizers to this species.

The application details modeled in the quantitative risk assessments corresponded to Alternative A—Maximum Production IPM, which included the highest potential for chemical pesticide use. The selected alternative is Alternative B, an alternative developed in response to the impacts predicted by the risk assessments that incorporates limitations to address the predicted impacts. Each quantitative limitation was calculated by varying the application scenario parameters in the model spreadsheet until the risk was lowered to the acceptable level of negligible risk (see Section 4.6.1 in the Final EIS for human health risk methodology and Section 4.7.1 for non-target species risk methodology). The parameters that were varied are those that can be controlled at the seed orchards, such as application rate, frequency, length of time to re-entry, total area or number of trees treated, and distance from the area assumed to have received drift in the risk assessment scenario.

The EIS analyzed the potential for impacts to air quality, geology and soils, water, land use, human health, biological resources, noise, cultural resources, and socioeconomics and environmental justice from any of the alternatives. Table 2.6-1 in the Final EIS summarizes the environmental impacts for each resource by alternative. Human health, biological resources, and surface water (as it relates to aquatic species) are the resources with the greatest potential for impact. Impacts to these resources, along with cumulative effects, are summarized below:

Human Health and Safety

- There are no significant risks to members of the public from the proposed use of any of the control methods under any of the alternatives. However, under Alternatives A, B, and D, an accidental spill of pesticide to a stream could make surface water unsafe for drinking or fishing.
- Under Alternatives A and D, there is a possibility of health effects for workers from some chemical pesticides. No risks of worker health effects were predicted for pesticide applications under Alternative B. Under Alternatives A, B, and D, an accidental spill onto the skin could cause health risks. Under all of the alternatives, there is a possibility of injury from cultural or prescribed fire methods.

Water Quality

- No significant impacts to groundwater quality were predicted under any alternative.
- Runoff or drift from pesticide or fertilizer applications could enter streams and rivers under Alternatives A, B, and D; and fertilizers could enter surface water in runoff under Alternative C. The effects of the estimated stream concentrations on human health and aquatic species are described under those headings. Under Alternative B, limitations would be in place to control the potential for runoff and drift of pesticides.
- An accidental spill of pesticide concentrate or mix could contaminate groundwater or surface water under Alternatives A, B, and D. A spill of fertilizer could contaminate groundwater or surface water under all alternatives.

Biological Resources

- No adverse impacts to non-target vegetation are expected under any of the alternatives.
- There are possible risks to terrestrial wildlife species from three of the proposed insecticides under Alternatives A and D. Lethality would be expected for non-target insects in an area treated with insecticide under Alternatives A, B, and D. No significant impacts to terrestrial wildlife were predicted under Alternatives B and C.
- There are no significant risks to aquatic species from use of the chemical, biological, prescribed fire, or cultural control methods under any of the alternatives. Under maximum runoff conditions, fertilizer could cause impacts to special status species in the main tributary to Jump-off Joe Creek at Sprague; no aquatic species risks from fertilizers were predicted at Provolt. Under Alternatives A, B, and D, there could be adverse impacts to aquatic species from an accidental spill of pesticide to a stream.
- The National Marine Fisheries Service (NMFS) issued biological opinions concluding that the selected alternative is not likely to jeopardize the continued existence of threatened coho salmon, and is not likely to destroy or adversely modify designated critical habitat. The opinions also concluded that the selected alternative may adversely affect essential fish habitat for chinook and coho salmon. The opinions specified reasonable and prudent measures, with associated terms and conditions (see Appendix F), to further protect the species and designated critical habitat and essential fish habitat for salmon; these terms and conditions have been incorporated into the selected alternative.

Cumulative Impacts

- There are no other major projects proposed in the orchard's vicinities that are long-term in nature or would result in significant changes in the physical characteristics of the project area.
- Another cumulative effects concern relates to the potential toxic effects of exposure to multiple chemicals. The human health risk assessments addressed cumulative risk to workers and the public from the subset of proposed chemicals that are more likely than others to be used in a given year. No risk was identified for members of the public, but risk was identified for some workers under Alternative A when very conservative assumptions were applied to avoid underestimating the potential impact. No risk was identified for any of the remaining alternatives, including Alternative B (the selected alternative).

Protected Species Consultation

Orchard-specific Biological Assessments were prepared to evaluate the potential effects of Alternative B (the selected alternative) on the Southern Oregon/Northern California coasts evolutionarily significant units of coho salmon (*Oncorhynchus kisutch*), which is listed as threatened under the *Endangered Species Act* (ESA), and on their designated critical habitat. The Biological Assessments document the Section 7 consultation process with NMFS for this species, as well as consultation under the *Magnuson-Stevens Fisheries Conservation and Management Act* regarding essential fish habitat for chinook and coho salmon. Biological Opinions were issued by NMFS in response to the Biological Assessments on February 9, 2005; their transmittal letters, a clarification letter (see below), and terms and conditions are provided as Appendix F to this ROD. The Biological Opinions concluded that the selected alternative is not likely to jeopardize the continued existence of coho salmon, and is not likely to destroy or adversely modify designated critical habitat. The opinions also concluded that the selected alternative may adversely affect essential fish habitat for chinook and coho salmon. The opinions specified reasonable and prudent measures, with associated terms and conditions, to further protect the species and designated critical habitat and essential fish habitat for salmon; these terms and conditions have been incorporated into the selected alternative.

Subsequent to NMFS' issuance of the Biological Opinion for Sprague as published in the Final EIS, NMFS clarified one detail of their terms and conditions; this clarification letter is included in Appendix F to this ROD. An error has also been identified in both Biological Opinions that affects monitoring of the effectiveness of the Conservation Practices and Terms and Conditions. The error involves the "low trigger" value for esfenvalerate, which should correctly be stated as 0.0045 on pages 66 (Table 12) and 74 (Table 15) of the Provolt Biological Opinion, and on pages 66 (Table 11) and 74 (Table 13) of the Sprague Biological Opinion (Final EIS Appendix F pages F-70, F-79, F-175, and F-183, respectively). The low trigger values were computed by dividing the LC50 values by 20 (see Final EIS page F-64 or F-174).

Use of Provolt is likely to be very sporadic for the only two listed species—the bald eagle and the Northern spotted owl—that may be present in the vicinity of the seed orchard. The Final EIS reported that these species have not been observed at Sprague but were known to be present within a few miles. Since that text was finalized, one bald eagle was observed at Sprague in 2004 and one was observed in 2005, both times adjacent to the lake. However, these species were evaluated in quantitative risk assessments, and limitations were incorporated into Alternative B, the selected alternative, to address areas of potential risk. Therefore, the selected alternative would not have any effects on these species, and formal consultation with the U.S. Fish and Wildlife Service is not required.

Relationship to Ongoing NEPA Reviews and Legal Actions

This seed orchard IPM decision tiers to the 1987 Northwest Area Noxious Weed Control Program as supplemented. The scope of the IPM decision for the seed orchards extends beyond the noxious weeds, but meets the requirements for site-specific environmental analysis and documentation for proposed weed treatments specified by the 1987 Northwest Area Noxious Weed Control Program FEIS as supplemented.

In 1984, the Forest Service and BLM were enjoined from the use of herbicides in Oregon by the U.S. District Court for the District of Oregon (Civil No. 82-6273-B). The BLM returned to court in 1987 and received a partial dissolve of the injunction that allowed the use of herbicides containing dicamba, glyphosate, picloram, and 2,4-D to control and eradicate noxious weeds on BLM lands in Oregon (Civil No. 83-6272-BU). Use of herbicides at the orchards is limited to treatment of noxious weeds using dicamba, glyphosate, picloram by the injunction. Use of 2,4-D is not included in the decision in this IPM ROD for the seed orchards. The portions of this decision to treat unwanted vegetation other than noxious weeds with dicamba, glyphosate, or picloram cannot be implemented until the injunction is lifted in its entirety, either generally or specifically for the seed orchards. The portions of this decision to treat unwanted vegetation with hexazinone and triclopyr cannot be implemented until the injunction is lifted and *Endangered Species Act* consultation has been conducted. The decisions regarding treatments for orchard pests using non-herbicide chemicals, biological control methods, prescribed fire, cultural control methods, and other non-herbicide IPM methods, are unaffected by the injunction. The BLM has undertaken a Programmatic EIS for Vegetation Treatments on Public Lands Administered by the BLM in the Western United States, Including Alaska.³ This proposed EIS is anticipated to be submitted to the court for full dissolve of the injunction.

BLM's Salem and Eugene Districts in western Oregon developed IPM EISs for their two seed orchards concurrently with the EIS for Provolt and Sprague. However, those EISs and their associated RODs would have no effect on implementation of Alternative B at Provolt and Sprague.

There are two recent lawsuits relevant to pesticide use. However, differences between the circumstances in these lawsuits and the selected alternative make it unlikely that these lawsuits would affect implementation of the selected alternative.

- The U.S. District Court in Seattle ruled on a case between the Washington Toxics Coalition and EPA on July 3, 2002 (Washington Toxics Coalition et al. v. Environmental Protection Agency and Christine Todd Whitman, Administrator). The purpose of this lawsuit was to compel EPA to consult with NMFS over its registrations of pesticides known to affect fish. The court found that EPA was in violation of the Endangered Species Act because EPA had not consulted with NMFS, and determined that EPA needed to consult with them on 54 of the pesticides identified in the case, eight of which are proposed for use at Provolt and Sprague (acephate, chlorothalonil, chlorpyrifos, diazinon, dicamba, dimethoate, propargite, and triclopyr). Although the Court issued an interim injunction specifying "no spray" buffers for ground and aerial applications of the subject pesticides, specific agency actions such as the selected alternative described for this ROD are excluded from the injunction by issuance of a no-jeopardy biological opinion from NMFS, as is the case for this selected alternative.

³Bureau of Land Management. 2001. Notice of Intent To Prepare an Environmental Impact Statement for the Conservation and Restoration of Vegetation, Watershed, and Wildlife Habitat Treatments on Public Lands Administered by the Bureau of Land Management in the Western United States Including Alaska. October 12, 2001. *Federal Register* 66(198):52148-52149.

- In another lawsuit, the League of Wilderness and seven other environmental groups appealed a district court finding to the U.S. Court of Appeals for the Ninth Circuit, challenging the U.S. Forest Service's annual aerial insecticide spraying program covering over 628,000 acres of national forest lands in Washington and Oregon (*League of Wilderness Defenders et al. v. Harv Forsgren and U.S. Forest Service*, 309 F.3d 1181 9th Cir.). The spraying was aimed at controlling a predicted outbreak of the Douglas-fir tussock moth, and included planned direct overspray of natural bodies of water during the course of treating forested areas. The plaintiffs asserted that the EIS was inadequate, and that the Forest Service failed to obtain a National Pollutant Discharge Elimination System (NPDES) permit, which is required by the Clean Water Act for point source pollutant discharges to water. Although the district court had granted summary judgment in favor of the Forest Service, the Ninth Circuit reversed the decision on appeal in an opinion issued on November 4, 2002. EPA issued an interpretive statement of the Ninth Circuit court's opinion on September 3, 2003.⁴ EPA stated that they believe the court misinterpreted EPA's regulations regarding NPDES permits, and that they will only follow the ruling within the Ninth Circuit court's area of jurisdiction (which includes Oregon). EPA is now proposing to codify the substance of the interpretive statement in regulation and finalize the rule. Within this region, EPA stated that they will require NPDES permits only for applications of pesticides directly over and into waters of the U.S. that do not comply with relevant FIFRA requirements. No such applications are part of the selected alternative.

MITIGATION AND MONITORING

Limitations, Protection Measures, and Mitigation Measures

All limitations, protection measures, and mitigation measures identified under Alternative B would be implemented to avoid or minimize adverse impacts. While limitations, protection measures, and mitigation measures have similar goals, they have distinct definitions within the EIS and this ROD:

- *Limitations* are the list of exceptions presented in Appendix B of this ROD that distinguish the details of potential pesticide and fertilizer applications under Alternative B (the selected alternative) from those under Alternative A—Maximum Production IPM. These limitations specifically address the worker health and ecological risks predicted by the quantitative risk assessments conducted for the IPM program as defined under Alternative A, which had the highest potential for pesticide use, and include the terms and conditions specified during consultation with NMFS.
- *Protection measures* are best management practices (BMPs) intended to ensure the proper and safe application of pesticides at Provolt and Sprague, including BMPs for water quality protection under the *Clean Water Act*, that would be implemented during any use of pesticides by Provolt or Sprague. They are provided as Appendix C to this ROD. Protection measures address protection of workers, the public, the environment, and ecological resources. Protection measures include the implementation of the monitoring plan that is attached as Appendix G to this ROD (Appendix B in the Final EIS).
- *Mitigation measures* are defined by the CEQ in 40 CFR 1508.20. They are not specifically included in an alternative, but are additional measures in response to the potential environmental impact that an alternative may have. Mitigation measures are discussed in

⁴U.S. Environmental Protection Agency. 2003. Memorandum: Interpretive statement and guidance addressing effect on Ninth Circuit decision in *League of Wilderness Defenders v. Forsgren* on application of pesticides and fire retardants. September 3, 2003. Robert E. Fabricant, General Counsel. Washington, DC.

Section 4.12 of the Final EIS. No requirement for mitigation measures has been identified for Alternative B—IPM with Environmental Protection Emphasis. The design of this alternative, including the limitations specified in Section 2.3.3 of the EIS, is expected to address all identified potential risks.

In reviewing the Draft EIS, NMFS offered two recommendations for mitigation that were not accepted by BLM. The comments and BLM’s responses are provided below:

NMFS Recommendation	BLM Response
<p>As suggested in the draft EIS, the irrigation ditches within the Provolt Orchard offer an additional vector for compound introduction to surface waters. These irrigation ditches have grass species on each bank that offer reduced preventative function for the introduction of compounds from spills, drift and overland surface water flows relative to more diverse vegetative communities. In the event of compounds reaching the irrigation ditches, return flows to salmon bearing waters could adversely effect aquatic life. While mixing and dilution will occur, the relatively stable hydraulic characteristics of the ditches may prevent significant dilution. The BLM should plant vegetation (i.e. shrubs) that offer an increased measure of protection from contamination, or tight-line the irrigation ditches which would virtually eliminate runoff potential. In addition, shrubs or tight-lining would prevent return flows from heating up and transpiration loss that adversely effect listed species. An added benefit from tight-lining would be the anticipated elimination of setbacks buffers, in turn increasing pest management effectiveness.</p>	<p>BLM has thoroughly evaluated NMFS’ recommendations for planting additional vegetation or tight-lining the irrigation ditches at Provolt. However, neither of these actions are anticipated at this time, due to (1) modeling predictions that drift is unlikely to reach the ditches from treated areas, even without a two-tree-row additional buffer as is included in the limitations incorporated into the preferred alternative; (2) a need to maintain airflow patterns in the seed orchards to prevent/reduce frost damage, therefore precluding vegetation of any significant height other than the seed trees; and (3) requirements by the irrigation ditch company regarding the flow rates, maintenance standards, and structural integrity of the ditch banks (vegetation roots affect bank structure) for these irrigation ditches that provide essential water for downstream agricultural operations.</p>
<p>Enhanced buffers adjacent to Williams Creek and the Applegate River near orchard units 15, 16, and 17 (depicted in figure 2.1-1of the draft EIS) would also reduce potential contamination through more diverse and wider vegetative communities. Given the orchards sensitivity to native conifers adjacent to production conifers, a mix of native shrubs and willows should be planted.</p>	<p>Please see response to previous comment.</p>

All accepted limitations and protection measures will be applied throughout implementation. All practical means to avoid or reduce environmental harm would be adopted, monitored, and evaluated, as appropriate; the limitations and protection measures constitute all practical means to avoid or minimize environmental harm from the alternative selected. BLM will conduct monitoring as identified in the monitoring plan, a copy of which is attached to this ROD as Appendix G. Monitoring and evaluations will be utilized to ensure that limitations and protection measures are effective in avoiding or reducing adverse environmental impacts.

Monitoring Plan

The monitoring plan associated with this ROD incorporates an adaptive approach that allows the results of ongoing monitoring to determine whether the protective measures should continue or be modified to provide more protection to workers, the public, the environment, and ecological resources, as needed and appropriate. The plan has three components. The first component consists of monitoring water quality. Second, the pest monitoring component would evaluate the presence of pests and severity of pest-inflicted damage, and help determine the best way to manage pests as part of the IPM program. Finally, the human health component would monitor BLM employees to ensure that

all of the worker protection measures and limitations to protect worker health are implemented.

The water quality monitoring plan covers four types of monitoring: (1) implementation monitoring, to document the design features that are actually implemented; (2) effectiveness monitoring, to document how well these measures perform in avoiding introduction of chemicals to the aquatic and groundwater system; (3) validation monitoring, to validate, through use of the effectiveness data, the results of the water quality modeling conducted for the risk assessments; and (4) compliance monitoring, to document domestic water quality and chemical fate in the case of an accidental spill. The overall objective of the water quality monitoring program is to document the impacts of IPM actions on water quality and to use this information to continue or modify the protective measures.

Public Involvement

Scoping

A Notice of Intent to prepare the Provolt and Sprague IPM EIS (as part of one EIS for four BLM western Oregon seed orchards) was published on March 26, 1999 in the *Federal Register*, and in the local news media and in postings around the local community. Open houses were conducted on August 11 and 12, 1999 at Provolt and Sprague, respectively, as part of public scoping. A revised Notice of Intent, indicating a decision to prepare three district-specific EISs, was published on March 29, 2001 in the *Federal Register*, and in local media. A letter was sent to all known interested parties on July 1, 2002 announcing a second 21-day public scoping period, which concluded on July 26, 2002.

The Confederated Tribes of Grande Ronde and the Confederated Tribes of the Rogue-Table Rock were notified by mail of the scoping period; no input was received.

Draft EIS Review and Public Meeting

On June 27, 2003, a Notice of Availability of the Draft EIS was published in the Federal Register by EPA. Notices were placed in local newspapers and other media announcing the document's availability, the length of the comment period, and the date, time, and locations of public meetings. Postcards offering to send a hard copy or compact disk (CD) of the Draft EIS upon request were sent to 25 agencies and the 465 members of the public on the Draft EIS mailing list; a total of 63 EISs were distributed, including copies to 27 agencies and public review copies to the Medford Public Library and the Grants Pass Public Library. Electronic copies of the Draft EIS were placed on the Medford District website for viewing or downloading. Copies of the Draft EIS were made available in hard copy and on CD at the BLM Medford District Office and the Provolt and Sprague Seed Orchards.

During the extended public comment period, which ended on August 25, 2003, one individual provided oral comments during the public meetings and four written comment letters were received. Copies of the letters and oral input, each individual comment extracted from the letters and oral statements, and BLM's response to each comment, are provided in the Final EIS Appendix E.

The Confederated Tribes of Grande Ronde and the Confederated Tribes of the Rogue-Table Rock were notified by mail of the comment period; no comments were received.

Final EIS Review

On July 15, 2005, a Notice of Availability of the Provolt and Sprague IPM Final EIS was published by BLM in the Federal Register; a separate Notice of Availability was published in the Federal Register by EPA on July 22, 2005, which initiated a 30-day availability period. A notice was also published in the Mail Tribune on August 1, 2005 and in the Grants Pass Daily Courier on July 30, 2005 to announce the document’s availability.

BLM sent postcards announcing the availability of the Final EIS to a mailing list of 410 individuals, organizations, and agencies, in response to which 67 recipients requested (and were sent) hard copies or CDs of the Final EIS. BLM received two comments:

- Region 10 of the U.S. Environmental Protection Agency stated that they “have reviewed the FEIS and response to comments and feel that our concerns and questions have been adequately answered and addressed. We continue to support the direction and intent of BLM’s Preferred Alternative because it emphasizes environmental protection in the management of pests and seed orchards.”
- A member of the public in New Jersey requested a copy of the Final EIS, requested a 60-day extension of the availability period, stating that he opposed the action until he had reviewed all the project details.

The Confederated Tribes of Grande Ronde and the Confederated Tribes of the Rogue-Table Rock were notified by mail of the availability period; no comments were received.

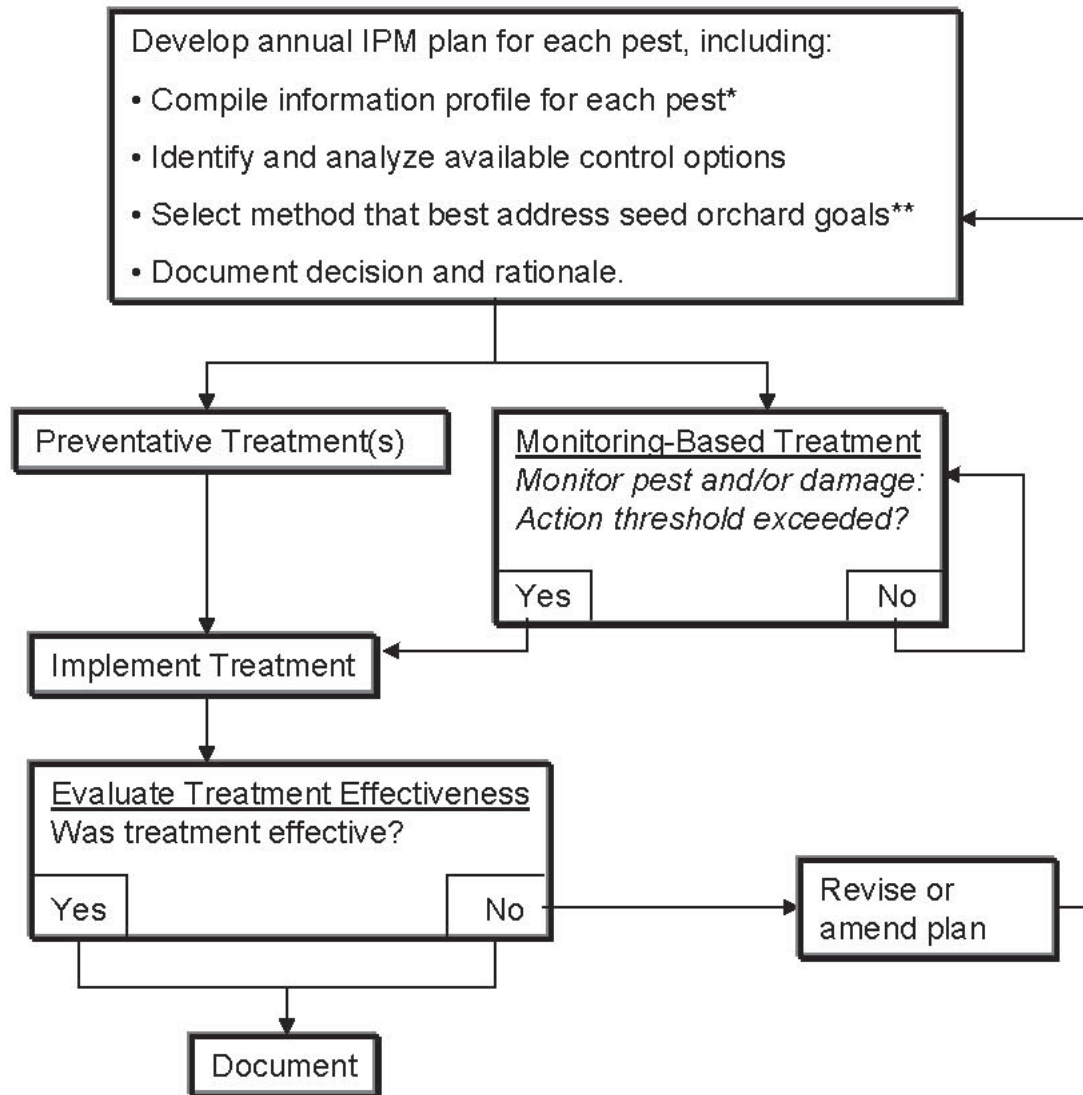
Protest Opportunities

This forest management decision may be protested under 43 CFR 5003 – Administrative Remedies. In accordance with 43 CFR 5003.3, the decision for this action is subject to protest as follows:

43 CFR 5003.3 Clause	Corresponding Seed Orchard IPM Program Details
(a) Protests of a forest management decision, including advertised timber sales, may be made within 15 days of the publication of a notice of decision or notice of sale in a newspaper of general circulation.	The notice of decision was published in the <i>Mail Tribune</i> . Protests must be received within 15 days of publication.
(b) Protests shall be filed with the authorized officer and shall contain a written statement of reasons for protesting the decision.	Protests must be filed with*: Mr. Gordon Lyford, Natural Resources Specialist Provolt and Sprague Seed Orchards 3040 Biddle Road Medford, OR 97504 *Note that BLM will accept only written and signed hard copies of protests that are delivered to the address above. BLM is not authorized to accept protests submitted by e-mail or fax.
(c) Protests received more than 15 days after the publication of the notice of decision or the notice of sale are not timely filed and shall not be considered.	Protests received after the 15-day period will not be considered.
(d) Upon timely filing of a protest, the authorized officer shall reconsider the decision to be implemented in light of the statement of reasons for the protest and other pertinent information available to him/her.	If applicable, the District Manager will reconsider the decision in light of the statement of reasons in the protest and other pertinent information available.
(e) The authorized officer shall, at the conclusion of his/her review, serve his/her decision in writing on the protesting party.	If applicable, the District Manager will respond to the protesting party in writing with the conclusions of the review.
(f) Upon denial of a protest filed under paragraph (a) of this section the authorized officer may proceed with implementation of the decision.	If a protest is denied, the District Manager will proceed to implement the selected alternative at Provolt and Sprague: IPM with Environmental Protection Emphasis.

APPENDIX A: Seed Orchard IPM Decision Process

Figure 2.2-1. Seed Orchard IPM Process



*Profiles will vary in depth and included information based on threat from any particular pest; may consist of a group of files, reports, and on-line data sources.

**Goals may vary between locations and ownerships, and over time. Possible goals might include high seed production, protection of human health, protection of the environment, and cost-efficiency.

APPENDIX B: Limitations in Alternative B

Limitations to protect worker health:

- An individual worker would not mix, load, and apply more than 3.75 lb a.i. of diazinon using a high-pressure hydraulic sprayer in any one day.
- An individual worker would not mix, load, and apply more than 9 lb a.i. of diazinon using a hydraulic sprayer with a hand-held wand in any one day.
- A closed mixing system would be used to prepare dimethoate for application by hydraulic sprayer with hand-held wand.
- Dimethoate would not be applied using a backpack sprayer.
- No more than 0.3 lb a.i. of permethrin would be applied by any individual worker using a backpack sprayer in one day.
- No more than 0.7 lb a.i. of propargite would be applied by any individual worker using a backpack sprayer in one day.
- No more than 0.61 lb a.i. of dicamba would be applied by any individual worker using a backpack sprayer in one day.
- No more than 6.7 lb a.i. hexazinone would be applied by any individual worker using a backpack sprayer in one day.
- Irrigation system maintenance personnel would not work in an orchard unit treated with chlorpyrifos at the maximum label application of 2 lb a.i. per acre (estimated 0.04 lb a.i. per tree) until at least 12 days post-application.
- Irrigation system maintenance personnel would not work in an orchard unit treated with diazinon at the maximum label application of 0.075 lb a.i. per tree until at least 26 days post-application.

Limitations in response to scoping concerns:

- Chemical herbicides would not be used to control blackberries along the common boundary between the Provolt Seed Orchard and the Provolt Grange.
- At Provolt, insecticides for cone and seed insect control would not be applied using a high-pressure hydraulic sprayer to the two rows of trees nearest and directly adjacent to any public or private road or private property, to provide a buffer from drift. This would apply to the north and east sides of unit 6; the east sides of units 8, 10, and 12; the south sides of units 1, 2, 3, 14 and 17; the west sides of units 7, 9, 11, 16, and 17; the north sides of units 1 and 4; and the south and west sides of unit 15.
- At Sprague, insecticides for cone and seed insect control would not be applied using a high-pressure hydraulic sprayer to the two rows of trees nearest and directly adjacent to any public or private road, private property, or railroad right-of-way, to provide a buffer from drift. This would apply to the west side of unit 42, the north sides of units 44 and 45, the west and south sides of unit 52, the west and north sides of unit 53, the north and east sides of unit 54, and the southeast side of ponderosa pine unit 44.

Limitations to protect ecological resources:

- Chlorpyrifos would not be applied within 40 feet of a bird box (unless the bird box is empty and covered with a plastic bag during spraying) or the edge of a managed orchard unit when a high-pressure hydraulic sprayer is used, or within 25 feet of a bird box (unless the bird box is empty and covered with a plastic bag during spraying) or unit edge when applied with a hydraulic sprayer with hand-held wand (these are the distances associated with no drift from the respective application methods).² It would not be applied to more than 166 trees at a rate of 0.02 lb a.i. per tree (nor any combination of number of trees and application rate that is more than 3.32 lb a.i. total applied) in any 12-acre area within a 14-day period.³
- Diazinon would not be applied within 40 feet of a bird box (unless the bird box is empty and covered with a plastic bag during spraying) or the edge of a managed orchard unit when a high-pressure hydraulic sprayer is used, or within 25 feet of a bird box (unless the bird box is empty and covered with a plastic bag during spraying) or unit edge when applied with a hydraulic sprayer with hand-held wand (these are the distances associated with no drift from the respective application methods).⁴ It would not be applied to more than one tree per acre within an 11-day period.⁵
- Dimethoate would not be applied within 25 feet of a bird box (unless the bird box is empty and covered with a plastic bag during spraying) or the edge of a managed orchard unit (the distance associated with no drift from the proposed application methods).⁶ It would not be applied to more than three trees at a rate of 0.13 lb a.i. per tree (nor any combination of trees and application rate that is more than 0.39 lb a.i. total applied) in any one-acre area within a seven-day period.⁷
- At Provolt, to decrease the potential for drift or runoff to surface water, esfenvalerate would not be applied to trees in the two rows of orchard trees nearest and directly adjacent to Williams Creek in units adjacent to the creek: units 1, 5, 7, 9, and 17; and the two rows of trees nearest the two irrigation ditches in units 5, 7, 12, 14, 15, and 16. These trees would then act as an additional shield against drift toward the surface water, as well as increase the buffer against overland runoff containing pesticide residues by as much as 200% in some areas.
- At Provolt, insecticides would not be applied using a high-pressure hydraulic sprayer to the two rows of trees nearest and directly adjacent to any open water, to provide a buffer from drift or runoff. (At Sprague, the waterways are intermittent and the existing natural vegetation buffer areas are high, thick, and wide, so no additional restriction is specified for that seed orchard.)
- Application buffers. Application methods will be restricted by zones as shown in Tables 2.3-1a and 2.3-1b. Zone widths refer distances from any intermittent or perennial stream or waterbody with flowing water, measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. These buffer widths shall not be decreased over the five-year term of the NOAA-Fisheries biological opinion, which expires on February 9, 2010.
- The terms and conditions specified by NOAA Fisheries during the ESA consultation process are incorporated as additional limitations into Alternative B, the proposed action, and are presented in full in the next subsection.

² To protect reptile and bird species.

³ To protect the black-capped chickadee.

⁴ To protect reptile and bird species.

⁵ To protect the black-capped chickadee and western bluebird.

⁶ To protect reptile and bird species.

⁷ To protect all terrestrial species.

Table 2.3-1a Minimum Pesticide No-Spray Buffers at Provolt Seed Orchard¹

Chemical	Application Method	Minimum Stream Buffer (ft)
B.t. Chlorothalonil Chlorpyrifos Diazinon Esfenvalerate Horticultural oil Permethrin Potassium salts of fatty acids Propargite	High-pressure hydraulic sprayer	90
Dicamba Glyphosate Hexazinone Picloram Triclopyr	Tractor-pulled spray rig with boom	40
B.t. Chlorothalonil Chlorpyrifos Diazinon Dicamba Dimethoate Esfenvalerate Glyphosate Hexazinone Permethrin Picloram Potassium salts of fatty acids Propargite Triclopyr	Hydraulic sprayer with handheld wand	40
Dicamba Dimethoate Esfenvalerate Glyphosate Hexazinone Permethrin Picloram Potassium salts of fatty acids Propargite Triclopyr	Backpack sprayer	40
Dicamba Glyphosate (for invasive weeds only)	Hand-held wick, Backpack sprayer	20
Glyphosate (Rodeo®) ñ for invasive weeds only	Hand-held wick	<20
Acephate Imidacloprid	Capsule implantation	40
Fertilizers	Broadcast spreader	50

¹ These buffer zones may be adjusted if drift monitoring results are obtained that demonstrate that either a reduced buffer would not introduce chemicals into the waterways or that a wider buffer is required. However, buffer widths will not be decreased during the term of the present NOAA-Fisheries opinion, which expires on February 9, 2010. After February 9, 2010, changes to buffer widths would be subject to further consultation with NOAA-Fisheries.

Table 2.3-1b Minimum Pesticide No-Spray Buffers at Sprague Seed Orchard¹

Chemical	Application Method	Minimum Stream Buffer (ft)
<i>B.t.</i> Chlorothalonil Chlorpyrifos Diazinon Esfenvalerate Horticultural Oil Permethrin Potassium salts of fatty acids Propargite	High-pressure hydraulic sprayer	90
Dicamba Glyphosate Triclopyr	Tractor-pulled spray rig with boom	90
Acephate <i>B.t.</i> Chlorpyrifos Diazinon Dicamba Dimethoate Esfenvalerate Glyphosate Hexazinone Horticultural oil Permethrin Picloram Potassium salts of fatty acids Propargite Triclopyr	Hydraulic sprayer with handheld wand	50
Dicamba Dimethoate Esfenvalerate Glyphosate Hexazinone Horticultural Oil Permethrin Picloram Potassium salts of fatty acids Propargite Triclopyr	Backpack sprayer	50
Glyphosate ñ for invasive weeds only	Hand-held wick, Backpack sprayer	<20
Acephate Imidacloprid	Capsule implantation	50
Fertilizers	Broadcast spreader	50

¹ These buffer zones may be adjusted if drift monitoring results are obtained that demonstrate that either a reduced buffer would not introduce chemicals into the waterways or that a wider buffer is required. However, buffer widths will not be decreased during the term of the present NOAA-Fisheries opinion, which expires on February 9, 2010. After February 9, 2010, changes to buffer widths would be subject to further consultation with NOAA-Fisheries.

APPENDIX C: Protection Measures

There are several features common to all alternatives. Pest management methods that are common to all alternatives are non-pesticide biological methods, cultural methods, prescribed burning, and other control methods. Additional activities common to all alternatives include orchard management activities unrelated to pest management (see Section 2.1.2) and protection measures that would be associated with a given pest control method under any alternative in which it is included. These protection measures are described in the following paragraphs.

Protection measures are intended to ensure the proper and safe application of pesticides at the Provolt and Sprague Seed Orchards. FIFRA requires pesticide manufacturers to register their chemicals with EPA, and list the allowable uses, application rates, and special restrictions on each pesticide's label. The pesticides considered for use at Provolt and Sprague are all registered under FIFRA. Application operations would comply with the label rates, uses, and handling instructions, in accordance with Federal law. In addition, the following procedures would be designed and implemented by the seed orchards, and routinely observed in pesticide applications. If output from the monitoring plan (see Appendix B) indicates that more protection is needed, these protection measures may be altered over the life of this IPM program to provide more (but not less) protection to workers, the public, the environment, and ecological resources:

Worker Protection Measures

- Pesticide treatments would frequently be completed under contract by licensed pesticide applicators. BLM would administer the contracts for compliance.
- A Job Hazard Analysis for pesticide applications would be developed, providing a detailed description of the jobs and associated risks involved with pesticide use and application, and identifying requirements for personal safety equipment, training, and certification to perform specific tasks.
- The seed orchards would develop a Pesticide Safety Plan, which would include safe handling and application procedures and a Spill Prevention Plan.
- Pesticide applications would be conducted in compliance with all aspects of EPA's Worker Protection Standard under FIFRA, including protection during applications, restricted entry intervals, personal protective equipment, notification of workers, decontamination supplies, emergency assistance, pesticide safety training and safety posters, and access to labeling and site-specific information.
- All workers involved in pesticide applications would be required to participate in a pesticide exposure monitoring program. Testing for cholinesterase inhibition would be conducted on BLM employees applying organophosphates. Also, workers with declared hypersensitivity or who display symptoms of hypersensitivity to pesticides would not be assigned to application projects.
- Material safety data sheets would be posted at storage facilities and made available to workers.
- Appropriate protective clothing would be worn by all workers, as required by each pesticide's label.
- All applicators would be trained and licensed; this training would be confirmed by the seed orchard manager.

- For all application methods except spot treatments using hand-held application equipment, treated areas would not be re-entered until sprays have dried or until the stated label re-entry period has been met, unless protective clothing is worn and early re-entry is permitted by the label.

Public, Environmental, and Ecological Protection Measures

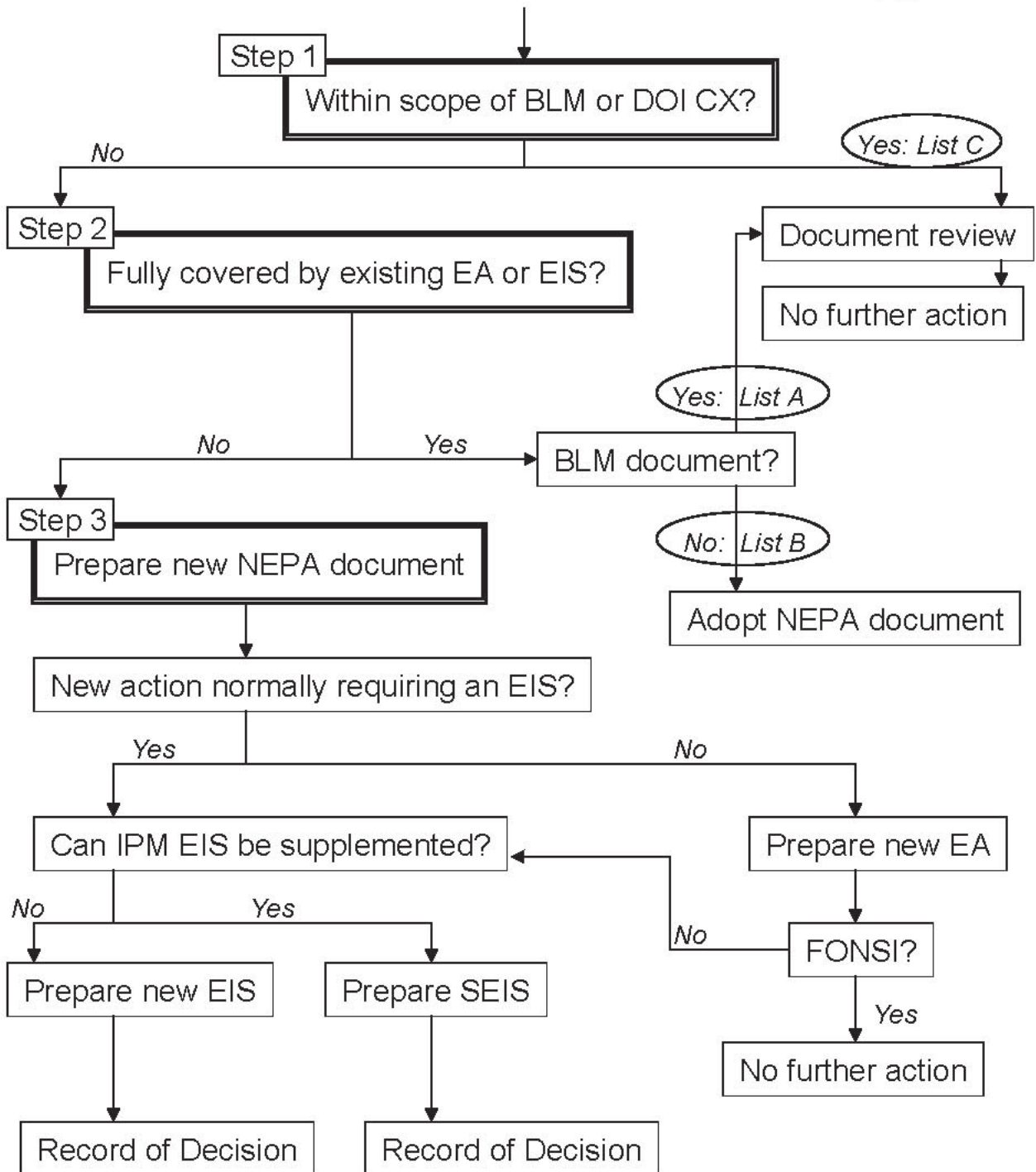
- Warning signs would be posted to discourage entry into treated areas.
- Pesticides would be applied within the parameters of prescribed environmental conditions stated on the label.
- No spraying would occur if snow or ice covers the target foliage.
- Factors such as relative humidity, wind speed, and air temperature would be considered to determine the timing of applications that would minimize the potential for off-target drift.
- Pesticides shall not be applied under the following weather and soil conditions unless the product label specifically recommends otherwise. (1) Within 72 hours of predicted precipitation that would result in runoff and measurable increases in streamflow. To predict this, use a combination of precipitation forecasting, antecedent soil moisture conditions and current streamflows. (2) In areas with standing water and saturated soils. (3) In unstable air situations that may affect spray pattern or lead to offsite movement of spray, such as high air temperatures, during temperature inversions.
- Equipment used for pesticide transport, mixing, and application would be properly maintained to avoid leaking pesticides into water or soil.
- Maintenance and calibration of spray equipment will occur at least annually to ensure proper application rates.
- Pesticides would be mixed and equipment cleaned in areas protected (e.g., paved and bermed, or on a portable bermed mixing pad) from the potential for runoff to surface waters or leaching to groundwater in the case of a spill.
- Chemical weed control within 20 feet of perennial and non-perennial streams with flowing water at the time of application would be limited to spot hand applications. In stream reaches where foliar applications of Rodeo® are used to treat knotweed growing in dry portions of the stream channel below the ordinary high water elevation, application is limited to the dry portions of the stream channel in the preferred in-water work period, in accordance with ODFW guidance.
- Fertilizer applications would be timed, to the extent predictable by weather forecasts, to not coincide or closely precede a storm event that could result in substantial runoff.
- Silt catchments barriers, such as bio-bags, will be installed across all ephemeral drainages located adjacent to or inside treatment units during periods when overland flow may occur following pesticide application. The function of these barriers will be to catch organics and sediment leaving the treatment area.
- Drift cards would be used to indicate when spray is heading toward a riparian zone, and spraying would cease if this danger seems likely.
- When spraying trees within two tree rows from the edge of treatment unit perimeters, spraying will be done by directing the nozzle towards the center of the treatment unit, minimizing the chance for drift outside the designated treatment areas.
- Temperatures would be monitored carefully.
- If possible, spraying would be conducted during the early morning or late evening, allowing foliage to dry before pollinators become active.

- Orchard fields would be mowed prior to insecticide applications, to remove floral components on ground cover that would attract pollinators, such as bees (if pollinators are active).
- Two special status¹ plant species are known to occur at Sprague in riparian stream buffers, dry drainage ditches, and other low, seasonably wet spots:
- Bureau sensitive species: slender meadow-foam (*Limnanthes gracilis* ssp. *gracilis*); and
- Bureau sensitive species: coral-seeded allocarya (*Plagiobothrys figuratus* var. *corallicarpa*).
- Herbicide-free buffer zones would be implemented for the protection of each of these special status plant species. Alternatively, mechanical control of nearby weeds could be accomplished through mowing.
- The monitoring program, detailed in Appendix B to this EIS, would be implemented as described for chemical pesticide applications.
- No carrier other than water would be used to mix (dilute) the pesticide products for application. In some cases, surfactants or adjuvants may be added to application mixtures of pesticides to improve their effectiveness or minimize handling and application problems. The seed orchards will only use surfactants or adjuvants that do not contain any ingredients on EPA's List 1 or 2, where listing indicates a chemical is of toxicological concern, or is potentially toxic with a high priority for testing (EPA 2000a). If a surfactant or adjuvant that contains any List 1 or 2 ingredients is considered, the risk associated with that chemical would be evaluated before a use determination is made. No additional adjuvants will be added to Rodeo (glyphosate).
- No more than one application of picloram will be made on an area in any given year to reduce the potential for picloram accumulation in the soil.
- Permethrin and esfenvalerate will not be used in the same year.
- At Sprague, only one application method for permethrin or esfenvalerate will be used in a year.
- At Provolt, no chemical pesticides would be applied to road or ditch surfaces that directly contribute to stream channel flow, nor to fence lines within 50 feet on either side of stream channels.
- Fertilizer will not be applied within 50 feet of any stream, wetland or other waterbody.
- Fertilizer loading areas shall be at least 100 feet from perennial streams.
- Design prescribed burns to minimize disturbance of riparian ground cover and vegetation, and any other habitat characteristic that could be damaging to long-term ecosystem function. If riparian areas are inadvertently damaged during a prescribed burn, immediately prepare and implement a rehabilitation plan designed to restore riparian ground cover and vegetation. Ensure that all vehicles, including emergency equipment, are not operated, maintained, or stored next to any stream, water body or wetland. Ensure that all vehicles, including emergency equipment, are not fueled within 150 feet on any waterbody. Appropriate fire suppression equipment shall always be at the project site during a prescribed burn.

¹ Special status species are species which are proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act; those listed by a state in a category such as threatened or endangered implying potential endangerment or extinction; and those designated by each BLM State Director as sensitive.

APPENDIX D: NEPA Review of New Products and Technologies

Identification of New Product or Technology



BLM NEPA Documents (List A)

- This seed orchard-specific IPM EIS.
- EISs associated with the District RMP or Plan amendments.
- Programmatic documents such as the EIS for Vegetation Treatments, Watersheds and Wildlife Habitats on Public Lands Administered by the BLM in the Western United States, Including Alaska (currently in preparation).
- Any seed orchard-specific EAs that have been prepared for pest management or operations.
- NEPA documents prepared by other Federal agencies, with BLM as a cooperating agency.

Other Agency NEPA Documents (List B)

- NEPA documents for which BLM was not listed as a cooperating agency, but for which the scope is relevant to evaluation of the proposed pest management method. Possible source agencies could include the Forest Service, National Park Service, Animal and Plant Health Inspection Service, and the military services.

Categorical Exclusion (List C)

- A Department of Interior or BLM categorical exclusion (516 DM 2, Appendix 1; and 516 DM 11.5, respectively).

APPENDIX E: Pesticide and Fertilizer Application Summary

Table 2.2-1. Pesticide and Fertilizer Application Summary^a

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
Insecticides					
<i>Accephate: Acecap® 97 (97% a.i. in an implant capsule)</i>					
<i>Target pests: defoliating insects, Douglas-fir cone worm, Douglas-fir cone moth</i>					
Implants	Individual trees in any orchard unit	1 capsule/4 inches circumference 1 application to 100 trees	1 capsule/4 inches circumference 1 application to 300 trees	Mar - Apr (Provolt) Mar - Jul (Sprague)	Every 1 to 3 years (Provolt) Seldom: 1 to 2 times in a 1-year period (Sprague)
<i>B.t.: Deliver® (18% active toxin as a wettable granular bioinsecticide)</i>					
<i>Target pests: tussock or gypsy moth, and other invasions of larvae of lepidopterous insects</i>					
High-pressure hydraulic sprayer	Sensitive areas, buffer areas, administrative areas	0.27 lb a.i./acre, in water at 100 gal/acre	0.27 lb a.i./acre, in water at 100 gal/acre	Mar - Jul	Every year of a harvestable cone crop
-or- Hydraulic sprayer with hand-held wand		1 to 2 applications to 500 trees on 5 to 10 acres	2 to 3 applications to 1,000 trees on 10 to 20 acres		
<i>Chlorpyrifos: Dursban 50W (50% a.i. as a wettable powder in water-soluble packets)</i>					
<i>Target pests: sucking insects and mites, defoliating insects such as tussock moth and gypsy moth, and rare use for cone and seed insects such as cone moths and cone worms</i>					
High-pressure hydraulic sprayer	Individual trees in any orchard unit	1 lb a.i./acre, in water at 100 gal/acre (0.02 lb a.i./tree)	2 lb a.i./acre, in water at 100 gal/acre (0.04 lb a.i./tree)	May - Sep	Seldom: 1 to 2 times in a 10-year period
-or- Hydraulic sprayer with hand-held wand		1 application to 300 trees (Provolt) 1 application to 100 trees on 20 acres (Sprague)	1 application to 300 trees and an additional application to 150 trees (Provolt) 1 application to 300 trees on 20 acres and an additional application to 150 trees on 10 acres (Sprague)		

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<i>Diazinon: Diazinon 50W (50% a.i. as a wettable powder)</i> <i>Target pests: ants, spiders, moths, aphids, mites, or other serious insect outbreaks in the administrative and landscaping areas, or in isolated orchard locations when small but serious insect damage needs attention</i>					
High-pressure hydraulic sprayer -or- Hydraulic sprayer with hand-held wand	Individual trees in any orchard unit	0.015 lb a.i./tree, in water at 3 gal/tree 1 application to 100 trees on 20 acres	0.075 lb a.i./tree, in water at 5 gal/tree 1 application to 300 trees on 20 acres and an additional application to 150 trees on 10 acres	Apr - Sep	Seldom: 1 to 2 times in a 5-year period
<i>Dimethoate: Digon 400 (43.5% a.i. as a liquid concentrate)</i> <i>Target pests: Douglas-fir cone gall midge (Provolt); larvae of sawfly species and other foliar damaging insects (Sprague)</i>					
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Individual trees in any production orchard unit	0.13 lb a.i./tree, in water at 2 gal/tree 1 application to 500 trees	0.34 lb a.i./tree, in water at 4 gal/tree 2 applications to 500 trees	Apr - Sep	As a back-up or alternate to esfenvalerate (Provolt) 1 to 2 times in a 5-year period (Sprague)
<i>Esfenvalerate: Asana[®] XL (8.4% a.i. as an emulsifiable concentrate)</i> <i>Target pests: Douglas-fir cone worm, western conifer seed bug, Douglas-fir seed chalcid, Douglas-fir cone moth, Douglas-fir cone gall midge</i>					
High-pressure hydraulic sprayer -or- Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Individual trees in any production orchard	0.001 lb a.i./tree, in water at 2 gal/tree 2 applications to 1,700 trees (Provolt) 2 applications to 500 trees (Sprague)	Cumulative maximum = 1.6 lb a.i./acre per year 0.002 lb a.i./tree, in water at 4 gal/tree 2 applications to 1,700 trees (Provolt) 2 applications to 500 trees (Sprague)	Apr - Jul (Provolt) May - Jul (Sprague)	Annual (Provolt) Every 2 to 3 years (Sprague)

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<i>Horticultural Oil: Dormant Oil 435 (98.8% paraffinic hydrocarbon oil)</i>					
<i>Target pests: used in sensitive treatment areas near waterways, near property boundaries, along roadways, or any buffer area not being treated with chemicals, or as an additive with insecticides, or as a dormant treatment for mites and insect pupae</i>					
High-pressure hydraulic sprayer	Individual trees in any orchard, as an additive to other insecticides, fungicides, or miticides; or alone as a dormant spray	0.03 gal oil/tree, in water at 3 gal/tree 2 applications to 350 trees (Provolt) 2 applications to 200 trees (Sprague)	0.05 gal oil/tree, in water at 5 gal/tree 2 applications to 350 trees (Provolt) 2 applications to 200 trees (Sprague)	Mar - Sep (as an additive) Sep - Jul (as a dormant oil)	Every 1 to 2 years as an alternate or supplement to non-chemical treatments
Sprague only: Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Individual trees in any orchard, as an additive to other insecticides, fungicides, or miticides; or alone as a dormant spray	0.01 gal oil/tree, in water at 1 gal/tree 2 applications to 200 trees	0.03 gal oil/tree, in water at 3 gal/tree 2 applications to 200 trees	Mar - Sep (as an additive) Sep - Jul (as a dormant oil)	Every 1 to 2 years as an alternate or supplement to non-chemical treatments
<i>Imidacloprid: Imicide® (10% a.i. in an implant capsule)</i>					
<i>Target pests: Douglas-fir gall midge, coneworm</i>					
Implants	Individual trees in any Douglas-fir (Provolt), ponderosa pine (Sprague), and sugar pine production orchard unit	1 3-mL capsule/4 inches circumference at breast height 1 application to 1,000 trees on 75 acres (Provolt) 1 application to 1,000 trees on 50 acres (Sprague)	1 3-mL capsule/4 inches circumference at breast height 1 application to 1,700 trees on 110 acres (Provolt) 1 application to 2,000 trees on 73 acres (Sprague)	Jan - Mar	Annually, rotating among orchard units

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<i>Permethrin: Pounce® 3.2 EC (38.4% a.i. as an emulsifiable concentrate)</i> <i>Target pests: Douglas-fir cone worm, western conifer seed bug</i>					
High-pressure hydraulic sprayer	Individual trees in any production orchard unit	0.01 lb a.i./tree, in water at 5 gal/tree 2 applications to 1,700 trees (Provolt) 1 application to 500 trees (Sprague)	0.02 lb a.i./tree, in water at 10 gal/tree 2 applications to 1,700 trees (Provolt) 2 applications to 500 trees (Sprague)	May - Jul	As back-up or alternate to esfenvalerate
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Individual trees in any orchard unit	0.002 lb a.i./tree, in water at 1 gal/tree 2 applications to 250 trees (Provolt) 1 application to 250 trees (Sprague)	0.006 lb a.i./tree, in water at 3 gal/tree 2 applications to 250 trees (Provolt) 2 applications to 500 trees (Sprague)	May - Jul	As back-up or alternate to esfenvalerate

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<i>Potassium salts of fatty acids: Safer® Soap (49.52% a.i. as a liquid concentrate)</i> <i>Target pests: mites, aphids, mites, webworms, sawfly larvae and similar caterpillars and worms causing foliar damage, including the larvae of cone and seed insects</i>					
High-pressure hydraulic sprayer -or- Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Administrative areas or isolated orchard areas such as sensitive treatment areas near waterways, property boundaries, private or public roads, or treatment buffer areas	2.5 fl. oz. a.i./tree, in water at 1 gal/tree 1 to 2 applications to 500 trees	4.0 to 8.0 fl. oz. a.i./tree, in water at 1 to 2 gal/tree 2 to 3 applications to 1,000 trees	Mar - Sep	Every 1 to 2 years as an alternate or supplement to non-chemical treatments
<i>Propargite: Omite® CR (32% a.i. as a wettable powder in water soluble bags)</i> <i>Target pests: spider mites</i>					
High-pressure hydraulic sprayer -or- Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Individual trees in any orchard unit	1.4 lb a.i./acre, in water at 100 gal/acre 1 application to 250 trees (Provolt) 1 application to 600 trees on 4 acres (Sprague)	2.4 lb a.i./acre, in water at 100 gal/acre 2 applications to 550 trees (Provolt) 2 applications to 1,100 trees on 7 acres (Sprague)	Apr - Oct	1 to 2 times in a 10-year period

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
Fungicide					
<p><i>Chlorothalonil</i>: Bravo® 500 (40.4% a.i. as a liquid concentrate) <i>Target pests</i>: Douglas-fir Rhabdochline needle cast, Douglas-fir rust, Phomopsis canker, and possibly Swiss needle cast or other foliar diseases, conifer blights, and fungus diseases</p>					
High-pressure hydraulic sprayer -or- Hydraulic sprayer with hand-held wand (Provolt only)	Individual trees in any orchard unit, individual plants in special use areas	2.1 lb a.i./acre, in water at 100 gal/acre 2 applications to 250 trees (Provolt) 2 applications to 600 trees on 4 acres (Sprague)	4.2 lb a.i./acre, in water at 100 gal/acre 3 applications to 550 trees (Provolt) 3 applications to 1,100 trees on 7 acres (Sprague)	Feb – Jun	1 to 2 years in a 5-year period
Herbicides					
<p><i>Dicamba</i>: Barvel® (48.2% a.i. as a water-soluble liquid) <i>Target vegetation</i>: annual, biennial, and perennial broadleaf weeds, woody brush and vines, as noxious weeds or competing vegetation and unwanted fuels</p>					
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Spot or strip treatments of weeds along fences, along roads, within orchard units, within open fields, or around facilities	1 lb a.i./treated acre, in water at 10 to 100 gal/acre 1 application to 3 acres	2 lb a.i./treated acre, in water at 10 to 100 gal/acre 2 applications to 5 acres	Apr – Jun	Back-up or alternate to glyphosate or for persistent weeds.
Tractor-pulled spray rig with fixed nozzles or small boom	Strip treatments along roads or fences	1 lb a.i./acre, in water at 10 to 100 gal/acre 2 applications to 3 acres (Provolt) 2 applications to 1 acre (Sprague)	2 lb a.i./acre, in water at 10 to 100 gal/acre 2 applications to 5 acres (Provolt) 2 applications to 2 acres (Sprague)	Mar – Jul (Provolt) Apr – Jul (Sprague)	

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<i>Dicamba: Banvel® (48.2% a.i. as a water-soluble liquid) (continued)</i> <i>Target vegetation: annual, biennial, and perennial broadleaf weeds, woody brush and vines, as noxious weeds or competing vegetation and unwanted fuels</i>					
Hand-held wick	Spot treatments in orchard units, open fields, near sensitive areas, near facilities, along fencelines and roadsides	24.1% a.i. solution wiped on individual weed plants 2 applications to weeds on 2 acres	24.1% a.i. solution wiped on individual weed plants 2 applications to weeds on 3 acres	Mar – Jul (Provolt) Apr – Jul (Sprague)	Back-up or alternate to glyphosate or for persistent weeds.
<i>Glyphosate: Rodeo® (53.8% a.i. as isopropylamine salt; water-soluble liquid)</i> <i>Target vegetation: blackberry, yellow star thistle, puncture vine, Canada thistle, spiny clobur, Pacific poison oak, Scotch broom, bull thistle, and other noxious weeds, plus other competing vegetation or unwanted fuels vegetation</i>					
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Spot or strip treatments of weeds along fences, along roads, within orchard units, within open fields, or around facilities	4 lb a.i./acre, in water at 10 to 40 gal/acre 1 application to 3 acres	5 lb a.i./acre, in water at 10 to 40 gal/acre 2 applications to 5 acres	Apr – Aug	Initially 2-3 times per year. As plant populations diminish, spot applications 1 (Sprague) or 1-2 (Provolt) times per year to treat new invasions.
		1 lb a.i./acre, in water at 50 to 100 gal/acre 1 application to 3 acres (Provolt) 1 application to 1 acre (Sprague)	4 lb a.i./acre, in water at 50 to 100 gal/acre 1 application to 5 acres (Provolt) 1 application to 2 acres (Sprague)		
Tractor-pulled spray rig with fixed nozzles or small boom	Strip treatments along roads or fences			Apr – Aug	

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<p><i>Glyphosate: Rodeo® (53.8% a.i. as isopropylamine salt; water-soluble liquid) (continued)</i> <i>Target vegetation: blackberry, yellow star thistle, puncture vine, Canada thistle, spiny clothbur, Pacific poison oak, Scotch broom, bull thistle, and other noxious weeds, plus other competing vegetation or unwanted fuels vegetation</i></p>					
Hand-held wick	Spot treatments in orchard units, open fields, near sensitive areas, near facilities, along fencelines and roadsides	17.9 % a.i. solution wiped on individual weed plants 2 applications to weeds on 2 acres	17.9 % a.i. solution wiped on individual weed plants 2 applications to weeds on 3 acres	Apr - Aug	Initially 2-3 times per year. As plant populations diminish, spot applications 1 (Sprague) or 1-2 (Provolt) times per year to treat new invasions
<p><i>Hexazinone: Velpar® (90% a.i. as a soluble powder)</i> <i>Target vegetation: annual, biennial, and perennial broadleaf weeds, grasses, woody brush and vines, as noxious weeds or competing vegetation and unwanted fuels</i></p>					
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Spot or strip treatments of weeds along fences, along roads, within orchard units, within open fields, or around facilities	1 lb a.i./acre, in water at 25 to 100 gal/acre 1 application to 3 acres	7.2 lb a.i./acre, in water at 25 to 100 gal/acre 1 application to 5 acres	Apr - Jun	Used only as an alternate to other herbicides such as glyphosate, 1 to 2 times in a 10-year period

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Label Application Rate and Max Area	Application Date Range	Anticipated Frequency
<i>Picloram: Tordon® 22K (24.4% a.i. as a liquid concentrate)</i> <i>Target vegetation: annual, biennial, and perennial broadleaf weeds, woody brush and vines, as noxious weeds or competing vegetation and unwanted fuels</i>					
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Spot or strip treatments of weeds along fences, along roads, within orchard units, within open fields, or around facilities	0.25 lb a.i./acre, in water at 10 to 50 gal/acre 1 application to 3 acres	1 lb a.i./acre, in water at 10 to 50 gal/acre 2 applications (in two separate locations) to 5 acres per application	Apr - Jun	Primarily as an alternate to other chemicals for noxious weed control, especially spot treatments of persistent noxious weeds or other vegetation, 1 to 2 times in a 10-year period
<i>Triclopyr: Garlon® 4 (61.6% as a liquid concentrate)</i> <i>Target vegetation: annual, biennial, and perennial broadleaf weeds, woody brush and vines, as noxious weeds or competing vegetation and unwanted fuels</i>					
Hydraulic sprayer with hand-held wand -or- Backpack sprayer	Spot or strip treatments of weeds along fences, along roads, within orchard units, within open fields, or around facilities	1.5 lb a.i./acre, in water at 10 to 100 gal/acre 1 application to 3 acres	8 lb a.i./acre, in water at 10 to 100 gal/acre 2 applications to 5 acres	Apr - Jun	Primarily as an alternate to other chemicals for noxious weed control, especially spot treatments of persistent noxious weeds or other vegetation, 1 to 2 times in a 10-year period

Table 2.2-1. Pesticide and Fertilizer Application Summary^a (continued)

Application Method	Location	Typical Application Rate and Area	Max Application Rate and Max Area	Application Date Range	Anticipated Frequency
Fertilizers					
<i>Ammonium sulfate (21-0-0-24), ammonium phosphate (11-52-0), ammonium nitrate (34-0-0), or potassium nitrate (14-0-45)</i>					
Broadcast spreader pulled by tractor or ATV	All orchards	175 lb/acre ammonium sulfate -plus- 175 (Provolt) or 110 (Sprague) lb/acre ammonium phosphate -plus- 20 (Provolt) or 25 (Sprague) lb/acre ammonium nitrate -plus- 35 (Provolt) or 25 (Sprague) lb/acre potassium nitrate 1 application to 120 acres starting on Feb 1 (Provolt) or 91 acres starting on Feb 15 (Sprague)	175 lb/acre ammonium sulfate -plus- 175 (Provolt) or 110 (Sprague) lb/acre ammonium phosphate -plus- 20 (Provolt) or 25 (Sprague) lb/acre ammonium nitrate -plus- 35 (Provolt) or 25 (Sprague) lb/acre potassium nitrate 1 application to 120 acres starting on Feb 1 (Provolt) or 91 acres starting on Feb 15 (Sprague)	Feb - Mar	Annual

^a The formulations listed are those currently expected to be used. If other formulations of the same active ingredient are used, the application methods, locations, area, date range, frequency, and active ingredient application rates listed in this table would still apply.

Table 2.6-1. Summary of Potential Impacts by Alternative

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Air Quality	NS*	NS	NS	NS
Geological Resources	NS	NS	NS	NS
Water Resources	<p>Groundwater: No significant impacts. Although some of the proposed insecticides, herbicides, and fertilizers could leach, the predicted concentrations were far below levels of concern for human health and ecological protection.</p> <p>Streams and Rivers: Runoff or drift from pesticide or fertilizer applications could enter surface water. (The effects of the estimated stream concentrations on human health and aquatic species are described under those headings.)</p>	<p>Groundwater: No significant impacts. Although some of the proposed insecticides, herbicides, and fertilizers could leach, the predicted concentrations were far below levels of concern for human health and ecological protection.</p> <p>Streams and Rivers: No significant impacts from chemical, biological, prescribed fire, or cultural controls, since limitations to pesticide application would be implemented that control runoff and drift potential. Runoff containing fertilizers could enter surface water. (The effects of the estimated stream concentrations on human health and aquatic species are described under those headings.)</p>	<p>Groundwater: No significant impacts. Although the fertilizers could leach, the predicted concentrations were far below levels of concern for human health and ecological protection.</p> <p>Streams and Rivers: No significant impacts from biological, prescribed fire, or cultural controls. Runoff containing fertilizers could enter surface water.</p>	<p>Groundwater: No significant impacts if applications are as described under other alternatives. Pesticide and fertilizer chemicals could leach to groundwater, depending on project-specific details, limitations, and mitigations.</p> <p>Streams and Rivers: Runoff or drift from pesticide or fertilizer applications could enter surface water, depending on the project-specific details, limitations, and mitigations. (The effects of the estimated stream concentrations on human health and aquatic species are described under those headings.)</p>
Land Use	<p>Accidents: Spill of pesticide or fertilizer could contaminate surface water or groundwater.</p>	<p>Accidents: Spill of pesticide or fertilizer could contaminate surface water or groundwater.</p>	<p>Accidents: Spill of fertilizer could contaminate surface water or groundwater.</p>	<p>Accidents: Spill of pesticide or fertilizer could contaminate surface water or groundwater.</p>
	NS	NS	NS	NS

40 Table 2.6-1. Summary of Potential Impacts by Alternative (continued)

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Human Health and Safety	<p>Members of the Public: No significant impact from use of any proposed control method. An accidental pesticide spill into a stream would make it unsafe for drinking or fishing.</p> <p>Workers: Adverse health effects possible from some pesticide applications. Health risks predicted for accidental spill onto skin of pesticide concentrates or dilutions. Possible injuries from cultural or prescribed fire methods.</p>	<p>Members of the Public: No significant impact from use of any proposed control method. An accidental pesticide spill into a stream would make it unsafe for drinking or fishing.</p> <p>Workers: No significant impact predicted from pesticide applications. Health risks predicted for accidental spill onto skin of pesticide concentrates or dilutions. Possible injuries from cultural or prescribed fire methods.</p>	<p>Members of the Public: NS</p> <p>Workers: Possible injuries from cultural or prescribed fire methods.</p>	<p>Members of the Public: No significant impact from use of any proposed control method, if used as described under any action alternative. Unknown risks if pesticides other than those included in this EIS are used. An accidental pesticide spill into a stream would make it unsafe for drinking or fishing.</p> <p>Workers: Adverse health effects possible from some pesticide applications. Health risks predicted for accidental spill onto skin of pesticide concentrates or dilutions. Possible injuries from cultural or prescribed fire methods.</p>

Table 2.6-1. Summary of Potential Impacts by Alternative (continued)

Resource	Alternative A	Alternative B	Alternative C	Alternative D
Biological Resources	<p>Non-Target Vegetation: NS</p> <p>Terrestrial Wildlife: Possible risks to some birds, mammals, amphibians, and special status species under typical and maximum conditions (and reptiles under maximum conditions only) from three proposed insecticides. Non-target insects in an area treated with insecticide would be killed. No significant impacts from biological, cultural, prescribed fire, or other methods.</p>	<p>Non-Target Vegetation: NS</p> <p>Terrestrial Wildlife: Many non-target insects in an area treated with insecticide would be killed. No significant impacts from biological, cultural, prescribed fire, or other methods.</p>	<p>Non-Target Vegetation: NS</p> <p>Terrestrial Wildlife: NS</p>	<p>Non-Target Vegetation: NS</p> <p>Terrestrial Wildlife: Possible risks to non-target wildlife, depending on project-specific details, limitations, and mitigations. Many non-target insects in an area treated with insecticide would be killed. No significant impacts from biological, cultural, prescribed fire, or other methods.</p>
	<p>Aquatic Species: No significant risks from chemical, biological, prescribed fire, or cultural control methods. Risks to special status species from fertilizer in runoff at Sprague under maximum conditions only; no adverse impact predicted from fertilizers at Provolt. An accidental pesticide spill into a stream would have adverse effects on aquatic species.</p>	<p>Aquatic Species: No significant risks from chemical, biological, prescribed fire, or cultural control methods. Risks to special status species from fertilizer in runoff at Sprague under maximum conditions only; no adverse impact predicted from fertilizers at Provolt. An accidental pesticide spill into a stream would have adverse effects on aquatic species.</p>	<p>Aquatic Species: No significant risks from biological, prescribed fire, or cultural control methods. Risks to special status species from fertilizer in runoff at Sprague under maximum conditions only; no adverse impact predicted from fertilizers at Provolt.</p>	<p>Aquatic Species: No significant risks from use of chemical, biological, prescribed fire, or cultural control methods, if used as described under any action alternative. Risks to special status species from fertilizer in runoff at Sprague under maximum conditions only; no adverse impact predicted from fertilizers at Provolt. Accidental pesticide spill into a stream would impact aquatic species.</p>
Noise	NS	NS	NS	NS
Cultural Resources	NS	NS	NS	NS
Socioeconomics and Environmental Justice	NS	NS	NS	NS

*NS = no significant impacts predicted; see Chapter 4 for details.

APPENDIX F: NMFS Biological Opinion Transmittal Letters, Clarification Letter, and Terms and Conditions



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 Northwest Region
 7600 Sand Point Way N.E., Bldg. 1
 Seattle, WA 98115

Refer to NMFS No.:
 2004/00206

February 9, 2005

Mr. Timothy B. Reuwsaat
 District Manager
 Medford District Office
 Bureau of Land Management
 3040 Biddle Road
 Medford, Oregon 97504

Re: Amendment to the Endangered Species Act Interagency Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Proposed Integrated Pest Management Program at the Charles A. Sprague Seed Orchard in Josephine County, Oregon

Dear Mr. Reuwsaat:

On January 18, 2005, the National Marine Fisheries Service (NMFS) transmitted our biological opinion and Magnuson-Stevens Fishery Conservation and Management Act (MSA) essential fish habitat (EFH) consultation on the effects of the Bureau of Land Management's (BLM) actions to carry out the Proposed Integrated Pest Management Program at the Charles A. Sprague Seed Orchard in Josephine County, Oregon (Opinion) (refer to: NMFS No.: 2004/00206). That Opinion was one of four issued at approximately the same time as a result of concurrent consultations on different seed orchards in Oregon, all operated by the BLM. Since then, staff of NMFS and the BLM reviewed the results of those four consultations and found drafting errors were made such that some actions were attributed to the wrong orchard and, consequently, resulted in an improper effects analysis and incidental take statement. The enclosed document contains an amended Opinion intended to correct errors in the January 18, 2005 document, which is now withdrawn, and ensure that we have a common understanding of our consultation efforts.

In this new Opinion, NMFS concludes that the proposed action is not likely to jeopardize the continued existence of the Southern Oregon/Northern California coho salmon (*Oncorhynchus kisutch*), listed as threatened under the ESA. This Opinion also includes an amended incidental take statement with terms and conditions necessary to minimize the impact of the taking that is reasonably certain to be caused by this action. Take from actions by the action agency and contractors, if any, that meet these terms and conditions will be exempt from the ESA take prohibition.



This document also includes the results of our amended consultation on the action's likely effects on essential fish habitats (EFH) for Chinook (*O. tshawytscha*) and coho salmon pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes three conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations. If the response is inconsistent with the recommendations, the BLM must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations.

In response to increased oversight of overall EFH program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each EFH consultation and how many are adopted by the action agency. Therefore, in your statutory reply to the EFH portion of this consultation, we ask that you clearly identify the number of conservation recommendations accepted.

I apologize for any inconvenience these errors may have caused and appreciate the interest you and your staff has in assuring that our consultations are based on the most accurate and up-to-date information available. If you have further questions, please do not hesitate to contact Dan Gambetta, fisheries biologist, at 503.231.2243, or Ken Phippen, Southwest Oregon Habitat Branch Chief, at 541.957.3385.

Sincerely,


fol

D. Robert Lohn
Regional Administrator

cc: Bob Ruediger, BLM
Jeannette Griese, BLM



**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to NMFS No.:
2004/00206

August 15, 2005

Mr. Timothy B. Reuwsaat
District Manager
Medford District Office
Bureau of Land Management
3040 Biddle Road
Medford, Oregon 97504

Re: Amendment to the Endangered Species Act Interagency Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Proposed Integrated Pest Management Program at the Charles A. Sprague Seed Orchard in Josephine County, Oregon

Dear Mr. Reuwsaat:

On February 9, 2005, the National Marine Fisheries Service (NMFS) transmitted our biological opinion and Magnuson-Stevens Fishery Conservation and Management Act (MSA) essential fish habitat (EFH) consultation on the effects of the Bureau of Land Management's (BLM) actions to carry out the Proposed Integrated Pest Management (IPM) Program at the Charles A. Sprague Seed Orchard in Josephine County, Oregon (Opinion) (refer to: NMFS No.: 2004/00206).

On July 22, 2005, Mr. Bob Ruediger of the Salem District BLM contacted NMFS and identified the need to further clarify monitoring requirements for implementing the five-year programmatic IPM program at the Sprague Seed Orchard, in order to avoid future uncertainty during IPM implementation.

Endangered Species Act (ESA)-listed Southern Oregon/Northern California (SONC) coho salmon (*Oncorhynchus kisutch*) are found downstream of the Sprague Orchard, but not on-site. Coho habitat is 1 mile downstream from the Orchard boundary in Jump-Off Joe Creek. All waterways within the Orchard are intermittent or ephemeral, with low flows even during winter storm periods and are not salmon-bearing. Concentrations of pesticides detected in sampling within the site, even if exceeding LC₅₀ values, may not represent "take" of ESA-listed fish because they do not represent true exposure scenarios due to downstream dilution and attenuation.

The NMFS considers that the likelihood of adverse effects would increase if the concentration of pesticides entering coho habitat, *i.e.*, the tributary stream at its confluence with Jump-Off Joe Creek, exceed the high or low trigger levels, presented in Tables 11 and 13 in the February 9, 2005 Opinion. However, pesticides can only be monitored in surface waters at the Orchard due to limited access of the downstream location. If detectable concentrations are found at the



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Orchard site, the concentration will be “diluted” to the estimated flow of the receiving tributary stream at its confluence with Jump-Off Joe Creek. This diluted concentration, which would be calculated with appropriate flow and precipitation data, will be used to determine if a low or high trigger has occurred.


The NMFS believes the effects of the amended monitoring requirements on ESA-listed salmonids are within the range of effects considered in the Opinion, and hereby amends Table 11, on page 67 within the effects analysis, titled “Monitoring Triggers” and Table 13, on page 75 within the incidental take statement, titled “Extent of incidental take anticipated to result from completion of the Sprague Seed Orchard IPM quantified as pesticide concentrations in the water column.” to include the following two specific points of clarification as footnotes to both tables (refer to Enclosures 1 & 2):

1. The “low trigger” levels are those estimated flowing water concentrations, at the receiving tributary’s confluence with ESA-listed SONC coho waters, 1 mile downstream on Jump-Off Joe Creek, which can be surpassed a single time, for a total of one compound, during each of the three annual precipitation and application “zones” as displayed within the Biological Opinion. Thus, a total of three annual exceedences of the “low triggers” are allowed, one during each period.
2. The “high trigger” levels are those estimated flowing water concentrations, at the receiving tributary’s confluence with SONC coho waters in Jump-Off Joe Creek, 1 mile downstream, at which acute lethal take of ESA-listed SONC coho may occur. Meeting or exceeding these concentrations would require reinitiation of consultation.

Consultation for the project must be reinitiated if: (1) The amount or extent of taking specified in the Opinion is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect ESA-listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on ESA-listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). To reinitiate consultation, please contact the Oregon State Habitat Office of NMFS and refer to NMFS No.: 2004/00206.

If you have further questions, please do not hesitate to contact Dan Gambetta, fisheries biologist, at 503.231.2243, or Ken Phippen, Southwest Oregon Habitat Branch Chief, at 541.957.3385.

Sincerely,



for
D. Robert Lohn
Regional Administrator

cc: Bob Ruediger, BLM
Jeannette Griese, BLM

Enclosures 1 & 2: Table 11 and Table 13

Enclosure 1.

Table 11. Monitoring Triggers

Compound	Chemical Family	LC50 (PPB)	'low trigger' ¹	'high trigger' ²	Detection Limit	LC50 Source
Chlorpyrifos	Organo-phosphate	3	0.15	1.5	0.04	EPA 1984
Dimethoate		6200	310	3100	0.8	EPA 1999
Diazinon		90	4.5	45	0.2	Johnson & Finley 1980
Permethrin	Pyrethroids	7	0.4	3.5	0.4	Holcombe <i>et al.</i> 1982
Esfenvalerate		0.09	0.0045	0.045	0.02	Curtis <i>et al.</i> , 1985
Propargite	Organo-sulfite	118	5.9	59	0.4	EPA 2000
Trichloropyridinol (Triclopyr and chlorpyrifos degradate) picloram	Pyridine derivatives	1500	75	750	NA	Wan 1988
Chlorothanil	Chlorinated-benzene nitrile	42	2.1	21	0.04	EPA 1999

¹ The "low trigger" levels are those estimated flowing water concentrations, at the receiving tributary's confluence with ESA-listed SONC coho waters, 1 mile downstream on Jump-Off Joe Creek, which can be surpassed a single time, for a total of one compound, during each of the three annual precipitation and application "zones" as displayed within the Biological Opinion. Thus, a total of three annual exceedences of the "low triggers" are allowed, one during each period.

² The "high trigger" levels are those estimated flowing water concentrations, at the receiving tributary's confluence with SONC coho waters in Jump-Off Joe Creek, 1 mile downstream, at which acute lethal take of ESA-listed SONC coho may occur. Meeting or exceeding these concentrations would require reinitiation of consultation.

Enclosure 2.

Table 13. Extent of incidental take anticipated to result from completion of the Sprague Seed Orchard IPM quantified as pesticide concentrations in the water column.

Compound	Chemical Family	Low Trigger ¹ (PPB)	High Trigger ² (PPB)
Chlorpyrifos	Organo-phosphate	0.15	1.5
Dimethoate		310	3100
Diazinon		4.5	45
Permethrin	Pyrethroids	0.4	3.5
Esfenvalerate		0.0045	0.045
Propargite	Organo-sulfite	5.9	59
Trichloropyridinol (Triclopyr and chlorpyrifos degradate) picloram	Pyridine derivatives	75	750
Chlorothanil	Chlorinated-benzene nitrile	2.1	21

¹ The "low trigger" levels are those estimated flowing water concentrations, at the receiving tributary's confluence with ESA-listed SONC coho waters, 1 mile downstream on Jump-Off Joe Creek, which can be surpassed a single time, for a total of one compound, during each of the three annual precipitation and application "zones" as displayed within the Biological Opinion. Thus, a total of three annual exceedences of the "low triggers" are allowed, one during each period.

² The "high trigger" levels are those estimated flowing water concentrations, at the receiving tributary's confluence with SONC coho waters in Jump-Off Joe Creek, 1 mile downstream, at which acute lethal take of ESA-listed SONC coho may occur. Meeting or exceeding these concentrations would require reinitiation of consultation.

Provolt - Terms and conditions:

Terms and conditions were specified by NOAA Fisheries during ESA consultation to implement reasonable and prudent measures. These are included in the limitations incorporated into Alternative B, the proposed action, and are provided, verbatim, below.

Reasonable and Prudent Measures

Reasonable and Prudent Measures are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The BLM has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the BLM fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions.

NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of listed species resulting from completion of the proposed action.

The BLM Shall:

1. Minimize incidental take by ensuring that orchard pests are managed using IPM techniques that use treatment thresholds and minimize the need for pesticide application.
2. Minimize incidental take from pesticide applications by choosing pesticide formulas, timing, place, and manner of pesticide use to minimize the likelihood of delivery to riparian and aquatic systems.
3. Minimize incidental take from fertilizer application by ensuring that fertilizer is applied in a time, place and manner that minimizes the likelihood of delivery to surface and groundwater.
4. Ensure completion of an annual comprehensive monitoring and operations reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary and, in relevant part, apply equally to proposed actions in all categories of activity.

1. To implement Reasonable and Prudent Measure #1 (integrated pest management) the BLM shall:
 - a. Treatment Thresholds. Ensure that no action to suppress insect pests will be taken unless pest monitoring show that one or more pests have reached a threshold at which losses in seed yield and quality exceed the economic and environmental cost of treatment. No pesticide will be applied on a routine basis, without regard for treatment thresholds based on pest populations.
 - b. Prescribed Burning. When prescribed burning will be used as a pest control, the following conditions will apply.
 - i. Design the prescribed burn to minimize disturbance of riparian ground cover and vegetation, and any other habitat characteristic that could be damaging to long-term ecosystem function.
 - ii. Ensure that all vehicles, including emergency equipment, are not operated, maintained and stored next to any stream, waterbody or wetland. Equipment

- shall not disturb native riparian vegetation.
 - iii. Ensure that all vehicles, including emergency equipment, are not fueled within 150 feet of any waterbody.
 - iv. If riparian areas are inadvertently damaged during a prescribed burn, immediately prepare and implement a rehabilitation plan designed to restore riparian ground cover and vegetation.
 - v. Appropriate fire suppression equipment shall always be at the project site during a prescribed burn.
- c. Each supervisor engaged in IPM activities must be informed of the following requirement:

NOTICE: If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NMFS Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

2. To implement Reasonable and Prudent Measure #2 (use of pesticides), the BLM shall ensure that:
- a. Spill Prevention Plan. Prepare and carry out a spill prevention plan to prevent contamination from spill of pesticides and other hazardous materials. The plan will contain the pertinent elements listed below, meet requirements of all applicable laws and regulations, and must be available for inspection on request by NMFS.
 - i. The name and address of the party(s) responsible for accomplishment of the spill prevention plan.
 - ii. A description of any regulated pesticide and other hazardous materials that will be used as part of the IPM Plan.
 - iii. Training and certification for those who will be involved with pesticide transportation, storage, use, disposal, record keeping, monitoring, and emergency response
 - iv. Practices to prevent spills associated with mixing sites (i.e. containment), critical areas where spills are likely to occur, and environmental restrictions.
 - v. Spill containment and notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials.
 - vi. Identify specific routes of the equipment, load limits for equipment, allowable speeds on the routes, mixing site limits in quantities, chemical types, or spill potential.
 - b. Choice of pesticide. Choose pesticides and additives as follows:
 - i. When pesticides are required, the BLM will choose the pesticide that is least toxic to fish while meeting IPM pest control objectives, and accounting for human health concerns.
 - ii. No carrier other than water will be used to mix (dilute) the pesticide products for application.
 - iii. No surfactant or adjuvant that contains ingredients included on EPA's List 1 or 2 for toxicological concern or that has a high priority for testing (EPA 2000a) may be used, unless otherwise approved in writing by NMFS.
 - iv. Only one application of picloram may be made on an area in any given year to reduce the potential for picloram accumulation in the soil.
 - v. No additional adjuvants may be added to Rodeo®, including but not limited to 'x-77.'

- c. Timing of pesticide application. Time pesticide applications as follows:
- i. Prioritize applications for mornings or evenings when pollinators are not active (as seasonally applicable) in accordance with the best overall weather period.
 - ii. Weather. Pesticides will **not** be applied under the following weather and soil conditions unless the product label specifically recommends otherwise.
 - (1) Within 72 hours of predicted precipitation that would result in runoff and measurable increases in streamflow. To predict this, use a combination of precipitation forecasting, antecedent soil moisture conditions and current streamflows. These methods shall be documented and included in the annual monitoring report.
 - (2) In areas with standing water, saturated soils, snow or ice.
 - (3) In unstable air situations that may affect spray pattern or lead to offsite movement of spray, such as high air temperatures, during temperature inversions.
 - (4) In wind that exceeds 6 miles per hour or blows toward flowing streams.
- d. Areas of pesticide application.
- i. Application buffers. Application methods will be restricted by zones as follows. Zone widths refer distances from any intermittent or perennial stream or waterbody with flowing water, measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. These buffer widths shall not be decreased over the five-year term of this Opinion.
 - (1) **<20 Feet**. Cultural methods and hand-held wicks using the Rodeo® formulation of glyphosate. Only small amounts of the product as required to treat the immediate application site may be brought into this zone. In stream reaches where foliar applications of Rodeo® are used to treat knotweed growing in dry portions of the stream channel below the ordinary high water elevation, application will be limited to the dry portions of the stream channel in the preferred in-water work period, in accordance ODFW guidance.
 - (2) **>20 Feet**. Cultural methods only, although hand-held wicks and backpack sprayers may be used to control plants designated as noxious weeds in Oregon, as defined in ORS 603-52-1200, that cannot be effectively controlled using cultural methods.
 - (4) **>40 Feet**. All of the above, and hydraulic sprayers with handheld wands, capsule implants, and tractor pulled spray rigs with booms
 - (5) **>90 Feet**. All of the above, and high pressure hydraulic sprayer.
 - ii. Do not apply pesticides to road or ditch surfaces that directly contribute to stream channel flow, nor to fence-lines within 50 feet on either side of stream channels.
 - iii. Install silt catchments barriers, such as bio-bags, across all ephemeral drainages beside or inside treatment units when overland flow may occur following pesticide application.
- e. Method of pesticide application.
- i. Mow or graze orchard fields before insecticide applications to remove floral components or ground cover that attract pollinators (as seasonally applicable and practicable).
 - ii. No pesticide may be applied on a routine basis, without regard for treatment thresholds based on pest populations.
3. To implement Reasonable and Prudent Measure #3 (use of fertilizers), the BLM shall ensure that:
- a. Fertilizer will not be applied within 50 feet of any stream, wetland or other waterbody.

- b. Fertilizer will be applied at agronomic rates.
 - c. Fertilizer loading (pertaining to application equipment) areas shall be at least 100 feet from perennial streams.
4. To implement Reasonable and Prudent Measure #4 (monitoring and reporting), the BLM shall ensure that:
- a. Annual monitoring report. All water quality monitoring information associated with application of the Provolt Seed Orchard IPM program shall be compiled, analyzed, documented, and reviewed on a 'water year' basis. This 'water year' shall include all monitoring performed during the October 1 to September 30 period. This information, along with any recommendation for adjustments to protection measures and adjustments to the monitoring plan, shall be contained in an Annual Provolt Seed Orchard Monitoring Report. This report shall be available to the public and regulatory agencies on November 15 of each year and be on file at the Provolt seed orchard. This report shall include the following information:
 - i. Project Identification.
 - (1) BLM contact person.
 - (2) Pesticide project manager.
 - (3) Starting and ending dates for work completed.
 - ii. IPM Documentation.
 - (1) Description of how treatments were based on weather and pest monitoring.
 - (2) A description of the biological and cultural pest controls used before pesticides were applied, or the reasons that biological and cultural controls were not used. Note that this provision is applicable to initial decisions to apply pesticides in response to pest population levels, not each individual application, and shall be documented within the annual monitoring report.
 - iii. Pesticide Use History.
 - (1) Type of chemical applied.
 - (2) Date of application.
 - (3) Buffers present.
 - (4) Method of pesticide application.
 - (5) Total area treated.
 - (6) Amount of pesticide applied.
 - (7) Precipitation for the three days preceding and following application.
 - (8) Wind direction and speed, relative humidity, air temperature at time of application.
 - (9) Location used for mixing and loading and notes regarding whether any leakage or spills occurred.
 - iv. Effectiveness Monitoring.
 - (1) Orchard units or treatment areas directly beside open water (within 100 feet) shall require drift cards be placed at a maximum of 100-foot intervals along the edge of Provolt's unit before the application (for high-pressure hydraulic sprayer applications).
 - (2) If open canopy occurs in the waterway buffer, drift cards shall be selectively placed along the waterway edge to characterize potential intrusion of drift toward waterways. Any applications shall cease if there is any indication that there is off-target delivery occurring.
 - v. Surface Water Monitoring to Detect Drift.
 - (1) For high-pressure hydraulic sprayer applications of chemicals, water samples shall be collected before and after spray application that include representative '15 minute' and 24-hour (composite)' post treatment water samples.
 - (2) Surface water samples are collected within the project area, also, where appropriate, collect water samples concurrently where flowing water enters the project area to facilitate a baseline/cumulative concentration analysis.

Surface drift monitoring shall occur for the following compounds that are applied using the specific methodologies.

Application Method	Compound	Surface Water Drift Monitoring	Sites for Surface Water Drift Sampling	Sites for SPMD Placement
High pressure hydraulic sprayer	Esfenvalerate Chlorpyrifos Permethrin Diazinon Dimethoate Propargite Chlorothalonil	A representative stream or streams will be sampled and tested for each application	Beside Williams Creek. Units 1, 5, 7, 9a, 17	Williams Creek above 9a and below 1 and 17 for 1, 5, 7, 9a
			Beside Irrigation ditches 1, 5, 7, 9b, 12, 14, 15, 16	Bridgeport Ditch NW corner of 7 and SE corner of 14 for 5, 7, 9b, 12, 14
				Laurel Hill Ditch NW corner of 15 and above 1
				for 1, 15, 16.
Hydraulic sprayer w/ handheld wand	Esfenvalerate	Surface water sampling and testing for each application within 300 feet of surface water	Same as above	
Backpack Sprayer - Hand-held wand	Esfenvalerate	Surface water sampling and testing for each application within 100 feet of surface water		

Note: For Orchard Unit numbers referenced above, see page76-78of the Provolt Biological Assessment.

vi. Cumulative Concentrations Runoff.

- (1) Stormflow with the highest potential for chemical presence shall be sampled and, during these flow events, samples shall be composited according to the rise and fall of the hydrograph.
- (2) SPMDs shall be deployed to sample initial winter storms and spring storm periods after pesticide application.
- (3) The SPMDs shall be tested for those pesticides that were applied that can be accurately sequestered.
- (4) SPMDs will be strategically deployed in timeframes that are representative of potential exposure scenarios, such as runoff from significant rain events and or drift during application. SPMDs shall be deployed for approximately 30 days, though smaller time increments are encouraged because they are more sensitive to pulses of pesticides.

Provolt monitoring locations for runoff and SPMD placement shall be at the following sites.

Sites related to surface runoff	Sites related to SPMD placement	Sites related to tile monitoring
Section 23; (site 9c) Ph-2, beside I-33 I-33 B-51 P-32	Section 23, above and below the SPMD B-51 I-33 Ph-2 beside I-33	B-12 B-14 (tile site 3) I-33 I-10 (tile site 2)
Section 23; (site 11a) I-12 I-11 I-33 Ph-2 I-10	Section 13 SPMD: Stream 5 and 2. B-30, B-11, B-50, B-15, B-12, B-14	Control (tile site 1)

Note: For Orchard Unit numbers referenced above, see page 85 and 86 of the Provolt Biological Assessment.

- vii. **Validation Monitoring.** For select sites, monitoring shall be used to validate the water quality modeling predictions presented in the EIS and BA.
 - (1) Concentrations shall be compared with modeled results utilizing field- and climate-specific data to validate RA estimates.
 - (2) If detectable concentrations are found, stream concentrations shall also be compared to model results using actual application information, field-specific data, and continuous climate record. These data shall provide a relationship between previous monitoring results and the management that is planned for the future. Once the yearly application period is complete, the climate record collected during that period shall be used to model a predicted concentration using the GLEAMS and MOC models. These concentrations shall be ‘diluted’ using the continuous flow data from the station. The resulting concentrations shall be compared with the actual measured concentrations for each storm event sampled.
- viii. **Spill Monitoring.** In the event of a chemical spill, the volume of spill, proximity to water, and chemical characteristics, such as toxicity and mobility, shall be immediately evaluated to determine if water sampling is desirable and necessary. If the spill occurs in an area that is reasonably certain to deliver to surface waters, either immediately, or on the next precipitation event, sampling shall occur, as appropriate.
 - (1) Water samples shall be collected in a sufficient number and at surface water and groundwater locations that shall allow characterization of impacts and effective remediation methods. Depending on ODEQ Monitoring Hazardous Substances Remediation Rules (OAR 340-122), monitoring could include surface water, groundwater, air, and soil.
- ix. **Groundwater Monitoring.** The domestic well at Provolt shall be monitored for groundwater contamination. These samples shall occur annually, and normally be collected in late summer and handled according to state-certified laboratory instructions.
 - (1) Groundwater monitoring wells associated with the greenhouse effluent field shall be monitored. Water quality sampling shall be conducted when risks are highest for irrigation water to potentially reach the local groundwater table. If ‘point in time’ samples are found to have detectable levels of the pesticide, SPMDs shall also be deployed in selected wells to allow a more quantitative determination of concentration over time.
 - (2) **Notification of Discharge.** If a surface water discharge occurs, the BLM shall notify NMFS within 10 business days of detection. Notification shall include the type, location, and concentration of the discharge.

- x. Circumstances that would trigger reinitiation:
- (1) More than one discharge per zone, as defined in this Opinion, between the 'low trigger' and 'high trigger'; values (within any one year). Note that discharges below the low trigger value are not applicable to this total.
 - (2) A discharge within any one year above the 'high trigger' value.
 - (3) For compounds with a common mode of action (i.e. pyrethroids and organophosphates), if the sum total of the toxic units is >0.05 (equivalent to $1/20$ of the standardized LC50s) it will be counted as a 'low trigger' exceedence. If the sum total of the toxic units is >0.5 (equivalent to $1/2$ of the standardized LC50s) it will be counted as a 'high trigger' exceedence. This applies only when both detections occur in the same location, and at the same time (the compounds co-occur in the water column). The toxic units for each class, pyrethroids, and organophosphates, will be calculated as outlined within this Opinion. Only one 'low trigger' exceedence will be counted if there is a toxic unit 'low trigger' exceedence for a particular chemical family that contains a 'low trigger' exceedence of an individual compound within that same chemical family.
 - (4) To account for the synergistic action of pyrethroids and organophosphates, as described within this Opinion, an exceedence of a 'low trigger' of both a pyrethroid and an organophosphate (either individually or as a sum total of family toxic units) will be considered the equivalent of exceeding a high trigger. This applies only when both detections occur in the same location, and at the same time (the compounds co-occur in the water column), and includes SPMD data.
 - (5) Upon any SPMD detection, the data shall be used to provide a 24-hour average waterborne contaminant concentration for the chemicals that were applied and can be sequestered. To reflect the margin of error within the SPMD methodology, a two-fold safety factor (Huckins 2004) shall be applied to the back calculated 24-hour average concentration (multiply the value by two). The corrected 24-hour concentration shall then be treated as a discharge within the final monitoring plan and the same circumstances apply for reinitiation.
 - (6) An annual review of SPMD data collection, data use, and sampling methodology may occur. In the event of a detection, factors leading to the resultant discharge concentration shall be reviewed.
- c. Annual Operation Report. The Annual Operation Report will be submitted to NMFS by December 1st, and include the following information (NMFS will review the Annual Operation Report within 30 business days of its receipt, note that the annual operations plan for 2005 only needs to include data specified within number (5)):
- i. The results of the previous year monitoring program. If a discharge occurred during the previous year, possible causes of the discharge shall be explored, as well as future mitigation steps to prevent like discharges in the future.
 - ii. A data review of the pesticides that are proposed for use, or may be used, at Provolt in the following year. The review shall include:
 - (1) New scientific data regarding non-target fish species effects or environmental fate.
 - (2) Changes to EPA-approved labels (ESA-approved and other).
 - (3) A review of legal findings relevant to the use of pesticides.
 - (4) A plan for proposed pesticide applications for the following year, including, to the extent possible, units or acres to be treated, proposed pesticide, application rate and method, dates, and a proposed monitoring plan covering the locations and pesticides to be monitored.
 - (5) Any proposed changes to the IPM, including new limitations, protection measures, or mitigation measures as part of an adaptive management approach; the use of pesticides in addition to those proposed; or other relevant information.

(6) The annual report shall be sent to:

Director, Oregon State Habitat Office NMFS
Attn: 2004/00207
 525 NE Oregon Street
 Portland, OR 97232

d. Annual Coordination. Meet with NMFS by March 31 each year to discuss the annual monitoring report and any action necessary to make the program more effective.

Sprague - Terms and conditions:

Terms and conditions were specified by NOAA Fisheries during ESA consultation to implement reasonable and prudent measures. These are included in the limitations incorporated into Alternative B, the proposed action, and are provided, verbatim, below.

Reasonable and Prudent Measures

Reasonable and Prudent Measures are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The BLM has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the BLM fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions.

NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of listed species resulting from completion of the proposed action.

The BLM Shall:

1. Minimize incidental take by ensuring that orchard pests are managed using IPM techniques that use treatment thresholds and minimize the need for pesticide application.
2. Minimize incidental take from pesticide applications by choosing pesticide formulas, timing, place, and manner of pesticide use to minimize the likelihood of delivery to riparian and aquatic systems.
3. Minimize incidental take from fertilizer application by ensuring that fertilizer is applied in a time, place and manner that minimizes the likelihood of delivery to surface and groundwater.
4. Ensure completion of an annual comprehensive monitoring and operations reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary and, in relevant part, apply equally to proposed actions in all categories of activity.

1. To implement Reasonable and Prudent Measure #1 (integrated pest management) the BLM shall:

- a. Treatment Thresholds. Ensure that no action to suppress insect pests will be taken unless pest monitoring show that one or more pests have reached a threshold at which losses in seed yield and quality exceed the economic and environmental cost of treatment. No pesticide will be applied on a routine basis, without regard for treatment thresholds based on pest populations.
- b. Prescribed Burning. When prescribed burning will be used as a pest control, the following conditions will apply.
 - i. Design the prescribed burn to minimize disturbance of riparian ground cover and vegetation, and any other habitat characteristic that could be damaging to long-term ecosystem function.
 - ii. Ensure that all vehicles, including emergency equipment, are not operated, maintained and stored next to any stream, waterbody or wetland. Equipment shall not disturb native riparian vegetation.
 - iii. Ensure that all vehicles, including emergency equipment, are not fueled within 150 feet of any waterbody.
 - iv. If riparian areas are inadvertently damaged during a prescribed burn, immediately prepare and implement a rehabilitation plan designed to restore riparian ground cover and vegetation.
 - v. Appropriate fire suppression equipment shall always be at the project site during a prescribed burn.
- c. Each supervisor engaged in IPM activities must be informed of the following requirement:

NOTICE: If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NMFS Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

2. To implement Reasonable and Prudent Measure #2 (use of pesticides), the BLM shall ensure that:
 - a. Spill Prevention Plan and Methods. Prepare and carry out a spill prevention plan to prevent contamination from spill of pesticides and other hazardous materials. The plan will contain the pertinent elements listed below, meet requirements of all applicable laws and regulations, and must be available for inspection on request by NMFS.
 - i. The name and address of the party(s) responsible for accomplishment of the spill prevention plan.
 - ii. A description of any regulated pesticide and other hazardous materials that will be used as part of the IPM Plan.
 - iii. Training and certification for those who will be involved with pesticide transportation, storage, use, disposal, record keeping, monitoring, and emergency response.
 - iv. Practices to prevent spills associated with mixing sites (i.e., containment), critical areas where spills are likely to occur, and environmental restrictions.
 - v. Spill containment and notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available onsite, proposed methods for disposal of spilled materials.
 - b. Timing of Pesticide Application. Time pesticide applications as follows.
 - i. Prioritize applications for mornings or evenings when pollinators are not active (as seasonally applicable) in accordance with the best overall weather period.
 - ii. Weather. Pesticides will not be applied under the following weather and soil conditions unless the product label specifically recommends otherwise.

- (1) Within 72 hours of predicted precipitation that would result in runoff and measurable increases in streamflow. To predict this, use a combination of precipitation forecasting, antecedent soil moisture conditions and current streamflows. These methods shall be documented and included in the annual monitoring report.
 - (2) In areas with standing water and saturated soils.
 - (3) In unstable air situations that may affect spray pattern or lead to offsite movement of spray, such as high air temperatures, during temperature inversions.
 - (4) In wind that exceeds 6 miles per hour or blows toward flowing streams.
- c. Areas of Pesticide Application.
- i. Application Buffers. Application methods shall be restricted by zones as follows. Zone widths refer distances from any intermittent or perennial stream or waterbody with flowing water, measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. These buffer widths shall not be decreased over the five-year term of this Opinion.
 - (1) **<20 Feet.** Cultural methods, backpack, hand-held wick, injection using the Rodeo® formulation of glyphosate.
 - (2) **>50 Feet.** Capsule implantation, hand sprayer, and hydraulic sprayer with handheld wand.
 - (3) **>90 Feet.** All of the above, and tractor-pulled spray rig with boom and high-pressure hydraulic sprayer.
3. To implement Reasonable and Prudent Measure #3 (use of fertilizers), the BLM shall ensure that:
- a. Fertilizer will not be applied within 50 feet of any stream, wetland or other waterbody.
 - b. Fertilizer will be applied at agronomic rates.¹⁷
 - c. Fertilizer loading (pertaining to application equipment) areas shall be at least 100 feet from perennial streams.
4. To implement Reasonable and Prudent Measure #4 (monitoring and reporting), the BLM shall ensure that:
- a. Annual monitoring report. All water quality monitoring information associated with application of the Sprague Seed Orchard IPM program shall be compiled, analyzed, documented, and reviewed on a 'water year' basis. This 'water year' shall include all monitoring performed during the October 1 to September 30 period. This information, along with any recommendation for adjustments to protection measures and adjustments to the monitoring plan, shall be contained in an Annual Sprague Seed Orchard Monitoring Report. This report shall be available to the public and regulatory agencies on November 15 of each year and be on file at the Sprague seed orchard. This report shall include the following information:
 - i. Project Identification.
 - (1) BLM contact person.
 - (2) Pesticide project manager.
 - (3) Starting and ending dates for work completed.
 - ii. IPM Documentation.
 - (1) Description of how treatments were based on weather and pest monitoring.
 - (2) A description of the biological and cultural pest controls used before pesticides were applied, or the reasons that biological and cultural controls

¹⁷'Agronomic rate' means a quantity and timing of total nutrient application that does not exceed the requirements of the crop production and harvest or grazing system, as opposed to a nutrient application rate based on production goals that are difficult to define and variable. Calculation of the agronomic rate takes into account the total nitrogen or phosphorus resources for plant nutrition, and any retention of phosphorus in the soil and losses of nitrogen through denitrification and ammonia volatilization.

were not used. Note that this provision is applicable to initial decisions to apply pesticides in response to pest population levels, not each individual application, and shall be documented within the annual monitoring report.

iii. Pesticide Use History.

- (1) Type of chemical applied.
- (2) Date of application.
- (3) Buffers present.
- (4) Method of pesticide application.
- (5) Total area treated.
- (6) Amount of pesticide applied.
- (7) Precipitation for the three days preceding and following application.
- (8) Wind direction and speed, relative humidity, air temperature at time of application.
- (9) Location used for mixing and loading and notes regarding whether any leakage or spills occurred.

iv. Effectiveness Monitoring.

- (1) Orchard units or treatment areas directly beside open water (within 100 feet) shall require drift cards be placed at a maximum of 100-foot intervals along the edge of Sprague's unit before the application (for high-pressure hydraulic sprayer applications).
- (2) If open canopy occurs in the waterway buffer, drift cards shall be selectively placed along the waterway edge to characterize potential intrusion of drift toward waterways. Any applications shall cease if there is any indication that there is off-target delivery occurring.
- (3) Immediately after the application, the cards shall be collected and reviewed to determine if a drift signature is present, the extent of the drift, and the potential for aquatic contamination. A copy of all the cards shall be kept on file at Sprague, along with a record of their location and all the compliance monitoring documentation.

v. Surface Water Monitoring to Detect Drift.

- (1) For high-pressure hydraulic sprayer applications of chemicals, water samples shall be collected before and after spray application that include representative '15 minute' and '24-hour (composite)' post treatment water samples.
- (2) Surface water samples are collected within the project area, also, where appropriate, collect water samples concurrently where flowing water enters the project area to facilitate a baseline/cumulative concentration analysis.

vi. Surface Runoff.

- (1) Continuous flow recording stations shall be established in the intermittent stream on the west side of OU 53 if water is flowing in this drainage to collect water and water column sediment samples during runoff events with the intention of providing individual storm concentrations. If this site does not have enough water to be effective, the BLM shall investigate sites further down the drainage. SPMDs may be used to supplement flow-weighted concentration monitoring.
- (2) The data from recording stations shall be interpreted to be representative of water quality conditions as a result of the effectiveness of implemented protection measures and limitations in the higher-risk seed production areas.
- (3) All data shall be used in conjunction with continuous recorded climate data to evaluate the effectiveness of protection measures and limitations in minimizing introduction of pesticides and fertilizers to the aquatic system.
- (4) Samples shall be analyzed at a state-certified laboratory at the lowest certified detection levels.

79 Surface Drift monitoring shall occur for the following compounds that are applied using the specific methodologies.

Application Method	Compound	Surface Water Drift Monitoring	Sites for Surface Water Drift Sampling	Sites for SPMD Placement
High pressure hydraulic sprayer	Esfenvalerate Chlorpyrifos Permethrin Diazinon Dimethoate Propargite Chlorothalonil	A representative stream ¹⁸ or streams will be sampled and tested for each application	OU West, 53 West, 42 East, 43 All, 44PP all	OU 53 West
Hydraulic sprayer w/ handheld wand	Esfenvalerate	Surface water sampling and testing for each application within 250 feet of surface water		
Backpack Sprayer - Hand-held wand	Esfenvalerate	Surface water sampling and testing for each application within 100 feet of surface water		

Note: For Orchard Unit numbers referenced above, see page 76-78 of the Sprague Biological Assessment.

vii. Cumulative Concentrations Runoff.

- (1) Stormflow with the highest potential for chemical presence shall be sampled and, during these flow events, samples shall be composited according to the rise and fall of the hydrograph,
- (2) SPMDs will be deployed, to monitor the accumulation of chemicals in waters containing aquatic species. SPMDs shall be used in the intermittent stream on the west side of OU 53 if water is flowing in this drainage to collect water and water column sediment samples during runoff events with the intention of providing individual storm concentrations. If this site does not have enough water to be effective, the BLM shall investigate sites further down the drainage.
- (3) SPMDs shall be deployed before initial winter storms and spring storm periods after pesticide application.
- (4) Stream flow gauges (USGS and BLM) shall be maintained to provide flow data for deriving concentrations (chemical loading) over the period of time the SPMD is deployed.
- (5) Data from the SPMD concentrations shall be used to compare and validate the storm flow concentration monitored during the deployment period.
- (6) SPMDs shall be strategically deployed in timeframes that are representative of potential exposure scenarios, such as runoff from significant rain events and or drift during application. SPMDs shall be deployed for approximately 30 days, though smaller time increments are encouraged because they are more sensitive to pulses of pesticides.

vii. Validation Monitoring. For select sites, monitoring shall be used to validate the water quality modeling predictions presented in the EIS and BA.

- (1) Concentrations shall be compared with modeled results utilizing field- and climate-specific data to validate RA estimates.
- (2) If detectable concentrations are found, stream concentrations shall also be compared to model results using actual application information, field-

¹⁸A representative stream is any stream beside a spray unit, downwind of a spray unit, or otherwise likely to be affected if drift outside the treatment units occurs.

- specific data, and continuous climate record. These data shall provide a relationship between previous monitoring results and the management that is planned for the future. Once the yearly application period is complete, the climate record collected during that period shall be used to model a predicted concentration using the GLEAMS and MOC models. These concentrations shall be 'diluted' using the continuous flow data from the station. The resulting concentrations shall be compared with the actual measured concentrations for each storm event sampled.
- (4) A collection chamber shall be installed where there is overland flow in OU53. During the first overland flow event following select chemical applications, this sites shall be visited, and a water sample taken from the collection chamber, these data shall be used to assess the mobility of chemicals that have been used onsite within the past year.
 - (5) For select sites and once the yearly application period is complete, the climate record collected during that period shall be used to model a predicted concentration using the GLEAMS and MOC models. These concentrations shall be 'diluted' using the continuous flow data from the station. The resulting concentrations shall be compared with the actual measured concentrations for each storm event sampled.
- viii. Spill Monitoring. In the event of a chemical spill, the volume of spill, proximity to water, and chemical characteristics, such as toxicity and mobility, shall be immediately evaluated to determine if water sampling is desirable and necessary. If the spill occurs in an area that is reasonably certain to deliver to surface waters, either immediately, or on the next precipitation event, sampling shall occur, as appropriate. Water samples shall be collected in a sufficient number and at surface water and groundwater locations that shall allow characterization of impacts and effective remediation methods. Depending on ODEQ Monitoring Hazardous Substances Remediation Rules (OAR 340-122), monitoring could include surface water, groundwater, air, and soil.
- ix. Groundwater Monitoring. The two irrigation and three irrigation/domestic wells and one proposed test well at Sprague shall be used for monitoring of groundwater contamination. The pesticides chosen shall vary according to the rates, persistence, and mobility of the pesticides applied during the period since the last sampling. These samples shall occur annually, and normally be collected in late summer and handled according to state-certified laboratory instructions.
- (1) Groundwater monitoring wells associated with the greenhouse effluent field shall be monitored. Water quality sampling shall be conducted when risks are highest for irrigation water to potentially reach the local ground water table. If 'point in time' samples are found to have detectable levels of the pesticide, SPMDs shall also be deployed in selected wells to allow a more quantitative determination of concentration over time.
 - (2) Notification of Discharge. If a surface water discharge occurs, the BLM shall notify NMFS within 10 business days of detection. Notification shall include the type, location, and concentration of the discharge.
- x. Circumstances that would trigger reinitiation:
- (1) More than one discharge per zone, as defined in this Opinion, between the 'low trigger' and 'high trigger'; values (within any one year). Note that discharges below the low trigger value are not applicable to this total.
 - (2) A discharge within any one year above the 'high trigger' value.
 - (3) For compounds with a common mode of action (i.e. pyrethroids and organophosphates), if the sum total of the toxic units is >0.05 (equivalent to 1/20th of the standardized LC50s) it will be counted as a 'low trigger' exceedence. If the sum total of the toxic units is > 0.5 (equivalent to 1/2 of the standardized LC50s) it will be counted as a 'high trigger' exceedence. This applies only when both detections occur in the same location, and at the same time (the compounds co-occur in the water column). The toxic

units for each class, pyrethroids, and organophosphates, will be calculated as outlined within this Opinion. Only one 'low trigger' exceedence will be counted if there is a toxic unit 'low trigger' exceedence for a particular chemical family that contains a 'low trigger' exceedence of an individual compound within that same chemical family.

- (4) To account for the synergistic action of pyrethroids and organophosphates, as described within this Opinion, an exceedence of a 'low trigger' of both a pyrethroid and an organophosphate (either individually or as a sum total of family toxic units) will be considered the equivalent of exceeding a high trigger. This applies only when both detections occur in the same location, and at the same time (the compounds co-occur in the water column), and includes SPMD data.
 - (5) Upon any SPMD detection, the data shall be used to provide a 24-hour average waterborne contaminant concentration for the chemicals that were applied and can be sequestered. To reflect the margin of error within the SPMD methodology, a two-fold safety factor (Huckins 2004) shall be applied to the back calculated 24-hour average concentration (multiply the value by two). The corrected 24-hour concentration shall then be treated as a discharge within the final monitoring plan and the same circumstances apply for reinitiation.
 - (6) An annual review of SPMD data collection, data use, and sampling methodology may occur. In the event of a detection, factors leading to the resultant discharge concentration shall be reviewed.
- c. Annual Operation Report. The Annual Operation Report will be submitted to NMFS by December 1st, and include the following information (NMFS will review the Annual Operation Report within 30 business days of its receipt, note that the annual operations plan for 2005 only needs to include data specified within number (5)):
- i. The results of the previous year monitoring program. If a discharge occurred during the previous year, possible causes of the discharge shall be explored, as well as future mitigation steps to prevent like discharges in the future.
 - ii. A data review of the pesticides that are proposed for use, or may be used, at Sprague in the following year. The review shall include:
 - (1) New scientific data regarding non-target fish species effects or environmental fate.
 - (2) Changes to EPA-approved labels (ESA-approved and other).
 - (3) A review of legal findings relevant to the use of pesticides.
 - (4) A plan for proposed pesticide applications for the following year, including, to the extent possible, units or acres to be treated, proposed pesticide, application rate and method, dates, and a proposed monitoring plan covering the locations and pesticides to be monitored.
 - (5) Any proposed changes to the IPM, including new limitations, protection measures, or mitigation measures as part of an adaptive management approach; the use of pesticides in addition to those proposed; or other relevant information.
 - (6) The annual report shall be sent to:

Director, Oregon State Habitat Office NMFS
Attn: 2004/00206
 525 NE Oregon Street
 Portland, OR 97232

- d. Annual coordination. Meet with NMFS by March 31 each year, as necessary, to discuss the annual monitoring report and any action necessary to make the program more effective.

APPENDIX G: Monitoring Plan (Appendix B from Final EIS)

Appendix B: Monitoring Plan

Note: This monitoring plan would be modified as necessary to address the differences between the various pesticides and application methods, and to respond to the results of on-going monitoring.

B.1 Water Quality Monitoring

B.1.1 Goal

The goal of the Medford District Seed Orchards water quality monitoring plan is to ensure water quality is protected during and after IPM activities.

B.1.1 Background

Agencies and the public are concerned that pesticide or fertilizer application in the Provolt and Sprague Seed Orchards may enter streams and groundwater, contributing to concentrations which exceed those known to have impacts to human and aquatic life. Special status salmonid species occur in direct proximity to some actively managed orchard units at Provolt, and one mile or more from the Sprague Seed Orchard.

The Human Health and Non-Target Species Risk Assessments for Pest Management at the Provolt and Sprague Seed Orchards indicate the use of pesticides or fertilizers poses minimal threat to water quality with one possible exception: in the unlikely event that conditions favoring maximum runoff are present following maximum levels of fertilizer application at Sprague.

Protection measures (best management practices) planned for use in any future pesticide or fertilizer application project, and limitations in the EIS proposed action, are expected to minimize the potential water quality and other environmental impacts from drift and runoff. Monitoring the protection measures and limitations, documenting impacts, and adjusting practices based on this knowledge are part of the monitoring plan.

This plan provides general direction for water quality monitoring whenever a pesticide or fertilizer covered under the EIS is proposed for use. The plan covers four types of monitoring: implementation monitoring, effectiveness monitoring, validation monitoring, and compliance monitoring. The implementation monitoring is intended to document the protection measures and limitations that are actually implemented. The effectiveness component documents how well these measures performed in avoiding introduction of chemicals to the aquatic and groundwater system. The effectiveness data would also be used to further validate that water quality modeling conducted for the Human Health and Non-Target Species Risk Assessments was conservative for orchard units. Compliance monitoring would be used to document domestic water quality and chemical fate.

The Sprague and Provolt Seed Orchards are fortunate to be the beneficiary of previous similar monitoring activities conducted by the Horning and Tyrrell Seed Orchards. Water quality monitoring of an aerial esfenvalerate application at Horning during the spring of 2001 documented that introduction of drift is possible despite implementation of standard protection measures. Monitoring of a similar spray project in 2002 documented control of drift through implementation of additional stream-specific protection measures. (Note that no aerial applications are proposed at Provolt or Sprague.) During both periods of monitoring at Horning, surface runoff from the orchard units was found to be an insignificant pathway for esfenvalerate transport as almost all actual and potential rainfall infiltrates the soil surface. No concentrations of esfenvalerate were recorded in stream-flow samples during peak storm flow periods. This monitoring indicates that risk assessment estimates of chemical concentrations in surface runoff are very conservative and significantly over-estimate the potential for runoff and concentrations of exposure. The predicted model values have inherent uncertainty in terms of pesticide movement through subsurface pathways of preferential flow. During the April 2003 aerial esfenvalerate application at Tyrrell, drift was limited to less than 50 feet with one drift card being hit 30 feet away from the spray boundary. Runoff monitoring is still in progress.

Protection measures utilized in the Horning 2002 spray project, similar measures included in the Sprague and Provolt EIS proposed action, and orchard operational plans are expected to minimize the potential water quality impacts from drift, runoff, irrigation, and spill. Monitoring the protection measures, documenting impacts, and adjusting practices based on this knowledge are part of the EIS design features.

B.1.3 Overall Objective

The overall objective of the monitoring program at the Provolt and Sprague Seed Orchards is to document the impacts of IPM actions on water quality, and to use this information to continue or modify the protection measures needed to meet the requirements for a healthy aquatic ecosystem. A full assessment of protection measures used in the orchards requires monitoring both groundwater and surface water. Documentation would focus on the following monitoring questions, which were formulated based on public concerns and prior monitoring results at Tyrrell and Horning.

B.1.4 Specific Monitoring Questions

1. Does drift of pesticides occur?

Method: Monitor all high-pressure hydraulic sprayer applications to ensure compliance with protection measures and to document application rates, environmental conditions, and the actual occurrence of drift.

2. Does application of pesticides or fertilizers result in measurable concentrations in the streams associated with the treated fields?

Method: Conduct effectiveness monitoring to ensure that the implemented protection measures were effective in preventing drift, surface runoff, and subsurface runoff from entering surface water.

3. What are the measured pesticide concentrations in domestic, irrigation, and monitoring wells downgradient of treated orchard units?

Method: Conduct annual water sampling of wells to document any chemical concentrations in the groundwater.

4. If a spill occurs, what is the potential for surface water and groundwater contamination and what are the resulting concentrations in the associated stream and groundwater area?

Method: Depending on the type and amount of chemical, conduct surface water, groundwater, air, and soil monitoring to comply with the ODEQ Hazardous Substance Remedial Action Rules (OAR 340-122). At a minimum, sample downslope streams and the immediate groundwater table, if present. Conduct sampling of orchard domestic well if in proximity to spill.

5. What are the cumulative effects of the most toxic pesticides included in the IPM program?

Method: Conduct fall / winter monitoring of select waterways for analysis of select chemicals applied during the previous season.

The overall strategies to address these questions and apply these methods are provided in the following section.

B.1.5 Monitoring Strategies

B.1.5.1 Implementation Monitoring

All pesticide and fertilizer applications would be documented by the orchard manager or designated representative. Items to be documented include type of chemical applied, date of application, method of application, area treated, amount applied, precipitation for the three days preceding and following application, location used for mixing and loading, wind direction and speed, relative humidity, air temperature, and notes regarding whether any leakage or spills occurred. A list of all protection measures and limitations for each orchard unit receiving pesticide or fertilizer application would all be provided in the Annual Provolt and Sprague Seed Orchards Monitoring Report.

Implementing protection measures and analyzing monitoring data of all types depends heavily on quality climate information. Informed decisions involving chemical application rely on access to on-site weather data. Maintenance of the existing seed orchard weather stations (RAWS) would continue providing real-time climate data including air temperature, precipitation, wind speed, wind direction, and relative humidity. These data would provide documentation of compliance and information to predict runoff patterns for effectiveness and validation monitoring.

B.1.5.2 Effectiveness Monitoring

Drift

Drift Card Monitoring

All orchard units adjacent to flowing streams and planned for high-pressure hydraulic sprayer applications of chemicals would have spray cards placed so drift from the application can be captured and characterized. Orchard units or treatment areas directly adjacent to open water (within 100 feet) would require drift cards be placed at a maximum of 100-foot intervals along the edge of the orchard unit prior to the application. If open canopy occurs in the waterway buffer, drift cards would be selectively placed along the waterway edge to characterize potential intrusion of drift toward waterways. Immediately after the application, the cards would be collected and reviewed to determine if a drift signature is present, the extent of the drift, and the potential for aquatic contamination. A copy of all the cards would be kept on file at the seed orchard along with a record of their location and all the compliance monitoring documentation.

Surface Water Monitoring

Water samples would be taken in streams before and during the 24 hours after spray application, dependant on the type of chemical, the distance from water and the application method. The time of collection would be based on the time of concentration measurements in the flowing channels associated with the treatment areas. Selection of sampling stations for surface water sampling would be based on the proximity to application areas.

All data would be used in conjunction with the spray cards to determine the effectiveness of the full "suite" of protective measures implemented to avoid drift. Samples would be analyzed at a state-certified laboratory that has detection limits of 0.02 parts per billion (ppb) for most of the potential pesticides. Samples would be collected in accordance with laboratory instructions. When sites are sampled, additional interpretive data would be collected for pH, specific conductance, turbidity, and temperature.

Runoff

Surface Runoff

Pesticide and fertilizer fate modeling from the risk assessment indicates that field runoff events within the first six months after spray application have the highest probability for carrying detectible concentrations of chemicals. One study (Rashin and Graber 1993) determined that runoff events within the first 72 hours of application were the most important in terms of increases in detectible pesticide concentrations. Effectiveness monitoring of protective measures and limitations in the proposed action would target those periods of precipitation that could result in field surface runoff and increased streamflow. These periods are most likely to carry the greatest detectible concentrations of chemicals. If a runoff event occurs after spring applications, these events will be sampled.

Previous rates of surface runoff and predicted concentrations from aerial applications of esfenvalerate at the BLM - Horning Seed Orchard in the Salem District have been shown to be significantly lower than the literature and model predictions for the soils and climate at that orchard (BLM 2002). Under this Provolt and Sprague monitoring plan, similar investigation for ground-based applications of pesticides would be conducted at both orchards. Continuous flow recording stations would be established to collect water and sediment samples on a flow-weighted basis with the intention of providing individual storm concentrations for multiple runoff events. The data from recording stations would represent water quality conditions as a result of the effectiveness of implemented protection measures and limitations in the higher-risk seed production orchards.

All data would be used in conjunction with continuous recorded climate data to evaluate the effectiveness of protection measures and limitations in minimizing introduction of pesticides and fertilizers to the aquatic system. Samples would be analyzed at a state-certified laboratory that has detection limits of 0.02 ppb for most of the potential pesticides. Samples would be collected in accordance with laboratory instructions.

Subsurface Runoff

Subsurface flow could be a significant pathway for water to reach a stream system via the orchard units. Buffers exist between orchard units and adjacent open water, such as Williams Creek, the Applegate River, and irrigation ditches at Provolt; and Lake CASSO and a few intermittent streams at Sprague. Monitoring would provide an indication of the buffer area effectiveness and over time would provide information for future pesticide applications with the use of buffer areas.

Cumulative Effects Runoff

Even with non-detectible chemical concentrations, there is a potential for concentrations over a cumulative period to approach sublethal levels affecting beneficial uses. There is also concern over the transitory nature of concentrations in the stormflow period and questions on whether sampling would account for concentration which may be present. Stormflow with the highest potential for chemical presence would be sampled and, during these flow events, samples would often be composited according to the rise and fall of the hydrograph, which in turn can inadvertently diminish concentrations.

In an effort to address these issues and answer the cumulative effects question, semi-permeable membrane devices (SPMDs) may be deployed, if applicable, to monitor the accumulation of chemicals in waters containing aquatic species. The SPMD is an in-stream “accumulator” which allows calculation of an average chemical concentration during the period of deployment. For this reason, the SPMDs would only be deployed during the initial winter storms and spring storm periods after pesticide application.

Stream flow gauges (USGS and BLM) would be maintained to provide flow data for deriving concentrations (chemical loading) over the period of time the SPMD is deployed. Data from the SPMD concentrations would be used to compare and validate the storm flow concentration monitored during the deployment period.

B.1.5.3 Validation Monitoring

Validation monitoring is intended to verify the water quality modeling predictions presented in the EIS. Concentrations well below those that would cause sublethal effects to fish were predicted for Williams Creek, Applegate River, and irrigation ditches at Provolt, and Jump-off Joe Creek near Sprague; and for all fertilizer applications under expected (typical) ground saturation conditions at the time of application. Monitoring the stream systems would identify the effectiveness of protection measures, and to help validate the conservative estimates in the risk assessment.

Collection chambers may be installed in areas where there are concerns regarding overland flow. During the first overland flow event following select chemical applications, these sites would be visited, and a water sample taken from the collection chamber. Once the first surface runoff event is captured and results become available, the need to sample later runoff events would be determined based on concentrations detected. In the short term, these data would be used to assess the mobility of chemicals with high aquatic toxicity. Concentrations would be compared with modeled results utilizing field- and climate-specific data to validate risk assessment estimates.

Stream concentrations would also be compared to model results using actual application information, field-specific data, and continuous climate record. These data would provide a relationship between previous monitoring results and the management that is planned for the future. Once the yearly application period is complete, the climate record collected during that period would be used to model a predicted concentration using the GLEAMS and MOC models. These concentrations would be “diluted” using the continuous flow data from the station. The resulting concentrations would be compared with the actual measured concentrations for each storm event sampled.

B.1.5.4 Compliance Monitoring

Spill Monitoring

In the event of a chemical spill, the volume of spill, proximity to water, and chemical characteristics, such as toxicity and mobility, would be evaluated to determine if water sampling is desirable and necessary. If so, water samples may be collected in a

sufficient number and at surface water and groundwater locations that would allow characterization of impacts and effective remediation methods. Depending on ODEQ Monitoring Hazardous Substances Remediation Rules (OAR 340-122), monitoring could include surface water, groundwater, air, and soil. At a minimum, sampling would be conducted in the streams draining the spill area and the immediate groundwater table. The orchard domestic well would be sampled if in proximity to spill.

A spill prevention plan would be developed prior to any pesticide applications, and be part of the Orchards Pesticide Safety Plan. The Spill Prevention Plan would minimize or eliminate the risk of a pesticide spill for any pesticide operation. The orchards would develop a model or general pesticide spill plan which would address concerns and identify such factors as: (1) critical sites where spills would likely occur, such as narrow road or stream/waterway crossings, soft soil or roadway areas, and rough roads; (2) mechanical or operational requirements, such as tire tread to reduce blowouts, speed limits at critical roadway curves or other areas, and quantity carrying capacity of tanks/vehicles at safe levels to prevent roll-overs and sloshing; (3) environmental restrictions such as rainfall limits and standing water limits; and (4) approved mixing sites.

At the operational level, the plan would include specific routes of the equipment, load limits for equipment, allowable speeds on the routes, mixing site limits in quantities, chemical types, or spill potential.

Groundwater Monitoring

The domestic and irrigation wells would be monitored according to the parameters outlined by the Oregon Department of Health. There are four monitoring wells and three irrigation/domestic wells at Sprague. Two irrigation/domestic wells and one proposed test well (2004) at Provolt are available for monitoring tests. A water sample could be taken from the wells on a yearly basis during maximum well usage for pesticide tests. The pesticide chosen would vary according to the rates, persistence, and mobility of the pesticides applied during the period since the last sampling. These samples would normally be collected in late summer and handled according to state-certified laboratory instructions.

B.1.6 Annual Reporting

All water quality monitoring information associated with application of the Sprague and Provolt Seed Orchards IPM program would be compiled, analyzed, documented, and reviewed on a “water year” basis. This “water year” would include all monitoring performed during the October 1 to September 30 period. This information, along with any recommendation for adjustments to protection measures and adjustments to the monitoring plan, would be contained in an Annual Provolt and Sprague Seed Orchards Monitoring Report. This report would be available to the public and regulatory agencies on November 15 of each year and be on file at the Provolt and Sprague Seed Orchards. BLM will request that NOAA Fisheries’ review of this Plan be complete by January 15 of the following year. This schedule should provide for timely inclusion of monitoring results in the Annual Operating Report and inclusion of the full period of runoff during the fall/winter period and planning for the upcoming budget year.

B.1.7 Responsibility

Specific aspects of implementing this plan would be determined by the seed orchards orchardist with help and guidance from district hydrologists in coordination with the seed orchard program manager, tailoring the site-specific monitoring needs to the chemicals actually applied, the level of use, the risk of entering water, and the toxicity. At a minimum, water quality monitoring would be implemented to satisfy the terms and

conditions of the NOAA Biologic Opinion. The orchardist, with review by a hydrologist, would be responsible for completing the “water quality monitoring component” of the Annual Sprague/Provolt Seed Orchards Monitoring Report for inclusion in the Annual Operation Report with the seed orchard manager for presenting results to the regulatory agencies. The orchardists and district hydrologists would be responsible for formalizing future water sampling plans with the seed orchard program manager, selecting the sample locations and times, determining the methods for analyzing sample results, and submitting an annual budget.

The orchardist or hydrology specialists would be responsible for maintaining all sampling sites, collection of all water samples, quality assurance, quality control, shipment of samples to the laboratory, coordination with the analysis lab, and providing data for analysis.

B.2 Pest Monitoring

Monitoring of all pests (insects, diseases, vegetation, animals) and pest activities is an integral and continuing segment of the orchard IPM program on all lands in the orchards. A wide variety of monitoring tools is used to detect and report the incidence and severity of pest activity and damage to orchard resources and facilities.

Knowledge of the potential pests, past occurrence, and damage in the orchards or surrounding lands, recognition of damage symptoms, the analysis of the damage in relation to objectives, and other factors all help to determine the best route through an IPM program. Field observations and pest identification methods, plus specific pest and damage survey techniques, are used to detect the presence of pests and the severity of the damage. Annual assessments of cone and seed insect populations and damage are used to predict potential crop damage, the need for pest control, and the methods of pest management. Other insect, disease, vegetation (noxious weeds and competing vegetation), and animal pests are routinely surveyed throughout the orchard during normal orchard activities and projects, and during regular orchard tree inventories.

Pest and damage survey data are collected and summarized, then evaluated to determine the best methods of control if control measures are needed and the most effective methods of control. The primary focus of pest management in the orchards is the protection of cone and seed crops. Specific cone and seed insect monitoring plans for annual assessments would be developed or expanded to recognize present or new pests causing damage to cone crops or crop trees. Monitoring plans and techniques would be modified to incorporate new research. Orchard staff receive periodic training to build a knowledge base for recognition of orchard pests and damage symptoms. Forest health (insect and disease) specialists are contacted for identification and assessment support, and collaboration when necessary with the orchard manager for control decisions. In other IPM work, noxious weed specialists, botanists, wildlife biologists, fish biologists, and silviculturists may be contacted for expertise in identification of pests or control methods.

Douglas-fir cone gall midge monitoring has been done using pheromones to lure male gall midges to a sticky trap, and the collective data used to determine emergence and potential damage. Other field and lab monitoring methods such as cone dissection, seed x-rays, seed yields, and a variety of structured observations of insects and damage are used before and after control.

Monitoring pest control measures, particularly chemical applications, would include plans for monitoring the implementation of control projects, methods to determine the effectiveness of the protective measures used during the project implementation,

validation monitoring to verify the modeling predictions in the EIS, and any necessary compliance monitoring.

B.3 Human Health Monitoring

All BLM employees involved in orchard pesticide application programs at Provolt and Sprague would be required to participate in a monitoring program. Monitoring would ensure that all of the worker protection measures and limitations to protect worker health are implemented during application projects. Documentation would include a written record of names and application duties of involved individuals, chemical(s) used, dates of application, acreage and location of treatment areas, use of protective clothing and equipment, duration of exposure, and method of application.

Baseline medical evaluations would be conducted on BLM employees for the use of cholinesterase-inhibiting pesticides. The Government would not conduct medical or personal monitoring of Contractors involved with pesticide application.

References

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