



PACIFIC NW REGION
DOUGLAS-FIR TUSSOCK MOTH

RECORD OF DECISION

*USDA Forest Service
Pacific NW Region
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INTRODUCTION

This Record of Decision (ROD) documents my decision and rationale for the selection of the alternative to be implemented to address an anticipated outbreak of Douglas-fir tussock moth on portions of six National Forests in Oregon and Washington: the Colville, the Umatilla, the Wallowa-Whitman, the Malheur, the Ochoco, and the Fremont. The *Douglas-fir Tussock Moth Final Environmental Impact Statement* (“FEIS”) was released April 21, 2000.

The Douglas-fir tussock moth (“DFTM”) is a tree defoliator – in the larval (caterpillar) stage, it lives by eating needles of live trees. It attacks Douglas-fir (*Pseudotsuga menziesii*) and “true” firs: grand fir (*Abies grandis*), subalpine fir (*Abies lasiocarpa*), and white fir (*Abies concolor*). Tussock moth populations are cyclic, with an epidemic every 7-13 years. Each outbreak lasts 2-4 years and ends with a sudden crash. The outbreaks usually occur in mature and over-mature multi-story stands with a high density of host trees; trees on ridge tops and south facing slopes are the most vulnerable.

Tussock moths are always present in the environment. Since the female moth is incapable of flight, tussock moth outbreaks generally arise in place, with little or no spread into uninfested or previously treated areas. The insect can go from sub-outbreak to destructive, outbreak populations in one year. Once populations explode, substantial damage can occur before land managers are able to implement short-term management options. Because of an outbreak in the early 1970s, the United States Department of Agriculture initiated a program to research the moth. The objective was to better anticipate future outbreaks and to develop management options. One result of this program was a survey technique, the “Douglas-fir Tussock Moth Early Warning System”, which monitors population trends. Tussock moth traps are placed in forests throughout eastern Washington and Oregon. The number of captured male moths helps gauge the overall moth population. During non-outbreak years, it is common to have very few or no moths in most traps. Ground sampling is initiated when average capture exceeds 40 moths/trap.

A concern that arose early in the process was how to manage a potential outbreak of uncertain intensity over a vast geographic area. The exact location(s) of the anticipated outbreak will not be known until after this Decision is made. For treatment to be effective, it must occur from mid-June to mid-July (when larvae are actively feeding), before heavy defoliation becomes apparent.

According to data from the “early warning” system, DFTM populations have been increasing. Within the next few years, outbreaks could occur throughout the Colville, Okanogan, Wenatchee, Umatilla, Wallowa-Whitman, Malheur, Ochoco, Winema, and Fremont National Forests. The anticipated outbreak is expected to occur primarily in the years 2000-2002 and could last through 2004. In many

places, DFTM would act as a natural disturbance agent by reducing overstocking and creating stand openings. However, defoliation in some areas would cause unacceptable harm to fish and wildlife habitat (including species federally listed as threatened or endangered) or to areas where people live and work (recreational facilities, offices, work areas, etc.). The alternatives analyzed in the Final Environmental Impact Statement represent short-term management strategies to maintain existing vegetative conditions in specific areas and to protect specific resources until long-term management actions restore more balanced forest conditions over the landscape. It is not the intent of the US Forest Service to stop or prevent the overall tussock moth outbreak, or to prevent defoliation over the entire area where the outbreak may occur.

PURPOSE AND NEED/PROPOSED ACTION

A need exists to protect specific Areas of Concern where the tussock moth defoliation would change or jeopardize vegetative conditions for resources such as threatened and endangered species habitat, areas for health and safety reasons, and areas where the Forest Service has made substantial investment (FEIS, p. I-4).

The Proposed Action would protect specific Areas of Concern, identified in the project objectives, from defoliation. Two biological insecticides would be used: *Bacillus thuringiensis* var. *kurstaki* (B.t.k.) and TM-BioControl (FEIS p. I-5). They would be applied primarily from the air, although some ground application could also occur. B.t.k. is a bacterium that occurs naturally in the soil. It is specific to (i.e. only kills) some Lepidoptera (moths and butterflies). TM-BioControl is an insecticide made of the natural virus of the tussock moth. This virus is the primary cause of the collapse of Douglas-fir tussock moth outbreaks under natural conditions. This virus is specific only to Douglas-fir tussock moth and two other species of western tussock moths.

The goal of the Proposed Action is to maintain existing vegetative conditions in specific locations and to protect specific resources that are at risk from Douglas-fir tussock moth defoliation.

ENVIRONMENTAL IMPACT STATEMENT

I determined that the Proposed Action and potential effects could best be analyzed and disclosed to the public through an Environmental Impact Statement (“EIS”). A Notice of Intent to prepare an EIS was published in the *Federal Register* on June 18, 1999. Public Scoping and comments were received until August 20, 1999. Issues were identified and alternatives were developed based on public comments. The Draft Environmental Impact Statement (“DEIS”) was issued in January; the Notice of Availability for comment on the DEIS was published on January 11, 2000. Public comments on the DEIS were accepted until Feb 29, 2000.

The final EIS was published in April 2000. A Notice of Availability for the *FEIS* was published in the *Federal Register* on April 21, 2000. Pursuant to 40 *CFR* 1506.10(b)(2), this Decision is being issued more than 30 days after release of the *FEIS*.

After publication of the *FEIS*, two preferred alternatives were identified in a letter sent to *FEIS* recipients on May 5, 2000. On May 15, a letter from a law firm representing “various citizen organizations which have commented on the Douglas-fir tussock moth project” was received. This letter claimed the *FEIS* was faulty. The letter also requested a new notice in the Federal Register. I have considered this claim and believe that no significant harm has occurred to the public by issuing the preferred alternatives two-weeks after the release of the *FEIS*. One of the two preferred alternatives is the same alternative preferred in the DEIS. As discussed in the cover letter releasing the *FEIS* (dated April 18, 2000), and based on recent spring entomological sampling, this project is proceeding in the first year as an emergency. These factors outweigh the claim of a technical, procedural violation.

ISSUES

Issues were identified by the public and an interdisciplinary team of Forest Service resource specialists. Significant Issues had the greatest influence during the development of alternatives. I used both the Significant and Other Issues in the decision-making process. These issues are stated below as they were expressed during the analysis and public comment process.

1. Human Health Effects: There are many areas of human use not included in the Proposed Action, such as dispersed recreation areas, less used campsites, fishing spots, and general forest areas where human health could be affected by direct contact with tussock moth larvae. Human health could also be affected by contact with insecticides.
2. Protection of Timber Values: Areas not included in the Proposed Action that contain commercially viable timber need to be protected to prevent mortality and loss of timber value.
3. Non-Target Lepidoptera: B.t.k. would kill larvae of non-target Lepidoptera.
4. Maintaining Healthy Forests: a) Allow the natural cycle of tussock moth to thin out Douglas-fir and true fir trees, thus restoring a “healthy ecosystem”; b) protect forests from tussock moth because dead or dying trees are a sign of an “unhealthy forest”.
5. Fuel Build-up and Fire Risk: In unprotected areas, defoliation could cause additional fuels to increase the risk of ignition and catastrophic fire.
6. Effects of Spraying on Fish and Wildlife: Wildlife or fish could ingest insecticide.
7. Water Quality: a) Defoliation of unprotected riparian areas could affect stream temperature, peak flows, sediment input, etc.; b) The insecticide could pollute streams and lakes.
8. Economic Effects from Decreased Tourism: Protection of recreation areas could help local communities by maintaining tourist and recreation income.
9. Tussock moth larvae could increase the food supply for wildlife species: Killing tussock moth larvae could reduce the opportunity for certain wildlife to take advantage of a food surplus.
10. Operations: Spraying could cause environmental problems or limit access to the forest during operations. Examples include fuel spills, helicopter crashes, noise, and road closures during operations.
11. Secondary Mortality: Weakened trees that survive the tussock moth infestation could die from secondary attacks by bark beetles or other forest pathogens.

ALTERNATIVES CONSIDERED IN DETAIL

Four alternatives were considered in the final analysis. All alternatives considered effects on the 4.2 million acres of host type.

No Action Alternative – This alternative would allow the Douglas-fir tussock moth outbreak to occur naturally throughout its range.

Proposed Action – In this alternative, specific Areas of Concern, as identified by project objectives, would be protected from defoliation. The analysis focused on 628,000 acres proposed for protection from defoliation. The Areas of Concern vary in size and location throughout the Forests.

Expanded Protection Alternative – This alternative was developed in response to public scoping and was included in the draft and final EIS. Primary public concerns that influenced the development of this alternative were the need to maintain a healthy forest, protection of timber values, and protection of dispersed recreation sites. The analysis focused on 2,505,220 acres proposed for protection from defoliation. This included all area in the Proposed Action plus all acres with 60% or more host type.

TM-BioControl Only Alternative – This alternative was developed in response to the public comments from the draft EIS and included in the final EIS. The analysis focused on the same 628,000 acres proposed for protection in the Proposed Action, but considered using only TM-BioControl.

For additional details on these alternatives, please refer to the *FEIS*.

COORDINATION WITH TRIBES AND OTHER AGENCIES

Tribes in eastern Washington and Oregon near the project area were contacted by letter, and each received copies of the draft and final EIS. Additional contacts and meetings were made by local Forests.

Both the US Fish & Wildlife Service and the National Marine Fisheries Service were consulted during the analysis of potential effects on threatened and endangered species. The Advisory Council on Historic Preservation, Natural Resource Conservation Service, US Dept. of Commerce, US Army Corps of Engineers, Environmental Protection Agency, US Dept. of Energy, Federal Aviation Administration, Federal Energy Regulatory Commission, Federal Highway Administration, Federal Railroad Administration, General Service Administration, US Dept. of Housing and Urban Development, US Surface Transportation Board, Northwest Power Planning Council, and multiple agencies of the US Dept. of Agriculture and US Dept. of the Interior all received copies of the *FEIS*. In addition, the Washington Dept. of Natural Resources, Washington Parks and Recreation Commission, Washington Dept. of Health, Washington Dept. of Wildlife and Fish, Washington Dept. of Ecology, Oregon Dept. of Forestry, Oregon Dept. of Fish and Wildlife, Oregon Dept. of Parks and Recreation, Oregon Dept. of Water Resources, Oregon Division of State Lands, Oregon Dept. of Geology and Mineral Industries, Oregon Dept. of Environmental Quality, Oregon Dept. of Land Conservation and Development, Oregon Rural Development Section, Oregon State Economist, and Idaho Department of Lands were contacted. The Washington Department of Natural Resources and Oregon Department of Forestry will serve as our communication link with private landowners.

DECISION

The *FEIS* covers nine National Forests: the Colville, Okanogan, Wenatchee, Umatilla, Wallowa-Whitman, Malheur, Ochoco, Winema, and Fremont. **This decision applies only to the Colville, Umatilla (excluding Township 8 S, Range 27 E), Wallowa-Whitman, Malheur, Ochoco, and Fremont National Forests.** A second Record of Decision for the Okanogan, Wenatchee, Umatilla (only Township 8 S, Range 27 E), and Winema National Forests will be issued after completion of additional formal and informal consultation with the US Fish & Wildlife Service.

It is my decision to select the Proposed Action for the Forests identified above with the stipulation that TM-BioControl is used until the supply is depleted. Enough TM-BioControl will be reserved to meet mitigation obligations identified in the *FEIS*. If the acres of Areas of Concern described in the Proposed Action that become infested to sub-outbreak/outbreak levels exceed the available supply of TM-BioControl, B.t.k. will be used as described in the *FEIS*. "Areas of Concern" refer to mapped

areas that meet the definitions of the project objectives. Maps of these areas were distributed with the *FEIS* and are on file in the Pacific Northwest Regional Office. Please also refer to *FEIS*, pp. I-4, I-5. *FEIS*, Table II-1 contains a list of Areas of Concern with acreages for each Forest in the project area and total acreages.

The Forest Service recently contracted for tests to confirm the viability of existing stocks of TM-BioControl. The data was received on May 10, 2000. The tests indicate that existing stocks can treat approximately 250,000 acres, somewhat less than originally believed.

Each fall, cocoon/egg mass surveys will be conducted in Areas of Concern to determine if populations are high enough to warrant treatment. Survey results will be used to identify proposed treatment areas. The following spring, these proposed treatment areas will be resurveyed for cocoon/egg masses or the presence of larvae (*FEIS*, p. Appendix G-1). This will verify if treatment is still necessary. Treatment will not occur unless population levels are at sub-outbreak/outbreak levels. Refer to *FEIS*, Appendix D for a description of sampling and thresholds for sub-outbreak and outbreak levels. After review of proposed spray areas, Forest Supervisors may recommend to the Regional Forester that an area be dropped from spraying.

Most spray will be applied by helicopter. Ground application could occur in small, accessible areas such as campgrounds. The insecticide will be sprayed as a single application by a helicopter flying 50 – 75' above treetops, with an average swath width of 90'. This will result in only a momentary presence of the aircraft at any location. In all cases, spraying will occur between mid-June and mid-July.

For logistical and safety reasons, application of pesticides by helicopter in mountainous terrain may include small incidental areas not identified for protection but are too small to be missed by the pilot. Generally, such inclusions are irregularly shaped and a few acres in size. Conversely, small, isolated areas approved for protection could be excluded from spray delineation for the same reasons. In some cases, there may be small parcels of state or private land (less than 20 acres) surrounded by federal lands ("inholdings") where protection from defoliation will contribute to project objectives. In such cases, the Forest Service will not treat these areas unless permission of the landowner has been obtained and federal and state requirements have been met.

Fall 1999 surveys indicated an outbreak was likely on 80,000 acres of Areas of Concern on the Umatilla and Wallowa-Whitman National Forests. Spring 2000 surveys will be completed by early June; early results indicate some of the 80,000 acres are not at sub-outbreak/outbreak levels. The final results will be used to determine specific treatment areas. Only TM-BioControl will be used in 2000. Estimated maximum treatment areas, by resource category, are displayed in Table 1 below – please note that some areas are included in more than one category.

Table 1 - Estimated Year 2000 Treatment Acres

CATEGORY	UMATILLA NF	WALLOWA-WHITMAN NF
Total	38,080	41,970
Anad. Fish Habitat	7,680	0
Bull Trout Hab.	7,680	1,940
Bald Eagle Hab.	0	0
OG	5,260	2,950
LOS	0	36,840
Res./Admin.	160	0
Rec.	1,200	7,450
Muni. Watershed	10,860	0
Scenic	15,890	0
Seed Orchards	0	120
Other	15	0

This decision includes protection of 5,890 acres in the North Fork Umatilla Wilderness. This area contains Columbia River bull trout, a species listed as federally threatened. Defoliation by tussock moth could result in a loss of shade and an increase in stream temperature, which would result in important spawning and rearing habitat area being degraded. Defoliation in the upland areas of this watershed would result in increased fuels and risk of fire, which in turn would result in an unacceptable risk of increased temperature and sedimentation into the river system.

MITIGATION MEASURES

As part of this decision, I am choosing to implement the mitigation measures identified below. I am confident that selected mitigation measures will adequately prevent adverse effects for the following reasons: the selected mitigation measures are practices we have used successfully in the past; they are state-recognized best management practices for protecting water quality; or they are based on current research.

Apply only TM-BioControl:

- ✓ Anadromous fish and bull trout habitat,
- ✓ Yellow-cedar grove on the Malheur NF,
- ✓ Research plots (1 mile radius) associated with neotropical bird studies on the Wallowa-Whitman and Ochoco National Forests,
- ✓ Known Mardon skipper colonies in proposed protection areas in Klamath County, Winema National Forest,
- ✓ 1 mile buffer along wilderness boundaries adjacent to Areas of Concern,
- ✓ North Fork Umatilla Wilderness,
- ✓ 1.75-mile radius around known or potential Townsend’s big-eared bat maternity sites. In the *FEIS*,

Mitigation Measures (p. II-7), this 1.75-mile radius was to be “avoided”. Because TM-BioControl has no effect on non-target Lepidopterans and will only suppress tussock moth populations to baseline levels, use of TM-BioControl near bat maternity sites will not cause a trend toward Federal listing or loss of viability,

- ✓ Mill Creek Municipal Watershed.

Avoid treatment:

- Pacific Northwest Research Natural Areas (“RNA”), except in the Mill Creek Municipal Watershed (serving Walla-Walla). The watershed is in a candidate RNA in the Forest Plan. The Forest Plan stipulates that when a RNA is in a municipal watershed, the direction and Standards and Guidelines for the municipal watershed take precedence,
- ½ 1 mile buffer around active bald eagle nests as defined in specific Forest Plans and the Northern Bald Eagle Pacific Recovery Plan,
- 1 mile buffer around active Peregrine falcon nests.

MONITORING

Implementation and effectiveness monitoring will be done as outlined in the *FEIS*, Appendix I (the “Monitoring Plan”). Monitoring will ensure all operational aspects of the project are implemented as intended and that effects of treatment are consistent with the intent. The following items will be specifically monitored:

- tussock moth populations
- severity and location of defoliation
- effects on riparian vegetation (defoliation and tree mortality which affects stream shading and potential woody debris recruitment)
- effects on bald eagle nesting stands from defoliation (all nest sites in this decision are avoided – refer to mitigation measures)
- human health and safety impacts on forest visitors and workers (work with health providers in the area)
- recreational experience impact
- In areas where B.t.k. is used and where populations of sensitive plant species are known to occur, monitor the effect of seed production in sensitive plants.

If B.t.k. and TM-BioControl are used in the same year and in the same general area, monitoring will be done to determine the effectiveness of treating areas in a mosaic pattern to determine effects on non-target lepidopterans. The density of non-target moths and butterflies within mosaic treatment areas will be compared to non-treated areas of similar size.

RATIONALE

During the decision process for this project, I realized I would not be able to fully satisfy all public concerns, as some of them are mutually exclusive. I have selected an alternative that is ecologically sound, for both the short and long term. This decision includes a practical approach that reflects sensitivity to conflicting public concerns. In making this decision, I considered and balanced numerous factors, specifically whether project objectives will be met and potential effects on the forest environment, non-target species, and human environment. The following is a discussion of project objectives and the rationale for selecting the Proposed Action over the alternatives considered.

I have reviewed the DFTM *FEIS* and associated appendices. I believe there is adequate information in these documents to provide a reasoned choice of action. I am fully aware of the possible adverse environmental effects that cannot be avoided, and the irreversible/irrecoverable commitment of resources associated with the selected alternative. I have determined that these risks will be outweighed by the likely benefits (*FEIS*, pp. II-8 – II-12). Implementing the selected action will not cause unacceptable cumulative impact to any resource. There will be no significant impact to cultural resources, consumers, civil rights, minority groups, or women. There are no unusual energy requirements for implementing the decision. The *FEIS* adequately documents how compliance with these requirements is achieved.

PROJECT OBJECTIVES

Project objectives are described in the Purpose and Need (*FEIS*, p. I-4). The alternative I have selected meets these objectives. It is an interim, short-term action to protect specific areas from defoliation and therefore, to protect the resource values in those areas from unacceptable degradation or alteration. Outbreaks that may occur on the remaining 3.2 million acres of host type will not be treated. In these areas, the Douglas-fir tussock moth outbreak will be allowed to develop naturally.

FOREST ENVIRONMENT

FOREST HEALTH

Forest health is seen differently by people as described in the issue, “Forest Health”¹. In the natural ecosystem, dying trees are always visible. Events, like fire or insect infestation, are part of the natural environment.

Current forest conditions throughout much of the Pacific Northwest are the result of past fire suppression and other

past forest management practices. This has resulted in “unbalanced” conditions in some areas. The tussock moth is a natural component of this ecosystem - a disturbance agent that can result in creating forest openings. In an “unbalanced” forest, this disturbance may allow species (such as pine and larch) to become re-established where they historically existed. In other areas, tussock moth defoliation may only result in thinning overstocked stands.

However, there is also a need to maintain existing habitat conditions in some areas for some species of fish and wildlife; to prevent degradation of areas where people live, work or recreate; to protect areas where investments have been made in seed orchards; and to protect bark beetle prevention project areas which were designed to protect other resources. Of the 662,000 acres of high-risk host type in eastern Washington and Oregon (refer to *FEIS*, Appendix K, for a description of hazard risk ratings), one third would be protected from defoliation by this decision.

In the unprotected areas, approximately 425,000 high-risk acres would be subject to the natural effects of tussock moth. Forest openings might develop and species composition could change from firs to pine or larch. The Expanded Protection Alternative would protect most of the 425,000 high-risk acres from defoliation resulting in a continuation of the unbalanced condition of these forests. Dense host type found in these high risk areas could continue to decline in vigor and remain susceptible to insect infestation. In moderate to low risk areas, neither the selected alternative nor the other action alternatives would result in significant changes in stand structure or species composition.

FISH & WILDLIFE HABITAT

There is continuing concern about maintaining or restoring the abundance of old forest structure and related fish and wildlife habitat. The “Eastside Screens” were developed as interim standards to be followed until a long-term forest management strategy could be developed (now being drafted). The purpose and need of the Douglas-fir Tussock Moth EIS are consistent with the Eastside Screens and other direction intended to maintain critical habitat, especially for federally threatened or endangered species that could be negatively impacted by tussock moth defoliation.

This decision will protect existing old-growth and late /old successional habitats (“OG/LOS”) until restoration of historic levels begins to occur from implementation of longer term strategies. Generally, areas to be protected are located where there is a current shortage of OG/LOS habitat. I am concerned that management options be preserved until a broad-based analysis of these areas is completed. This decision will achieve that goal.

Anadromous fish require relatively cool water and stable stream temperatures. For federally listed steelhead and salmon, this decision protects important spawning and rearing habitat areas where defoliation could contribute to problems with stream temperature. Additional areas proposed for protection in the Expanded Protection

¹ Refer to *FEIS*, pp. III-3 – III-5, IV-5 – IV-7 for more information.

Alternative would offer no additional benefit to habitat; in some cases, lack of protection will have the most beneficial effect on habitat.

Bull trout populations in the project area are federally listed as threatened. They are more vulnerable to increases in stream temperature than anadromous fish and require very cool water. This decision protects important habitat that is occupied (or suspected to be occupied) by bull trout, especially isolated populations. As with anadromous fish, the Expanded Protection Alternative does not improve the effects on this species.

Bald eagle nest sites will not be sprayed in this decision, because they could benefit from thinning of firs in pine stands or because any negative effect will be minimal. In these cases, potential disturbance of fledglings would be more detrimental than possible degradation of the habitat.

FUEL BUILD-UP AND FIRE RISK

Risk for fire occurrence, intensity, and severity depends on many factors (*FEIS*, pp. IV-11 - IV-12). Defoliation from tussock moth would increase risk in some areas. This decision protects 15% of the acres that could be defoliated. This is more protection than the No Action Alternative but much less than what the Expanded Protection Alternative would afford. I have weighed fire risks against the need to allow unprotected areas to transition to a more balanced ecosystem condition. In this decision, protection is focused on those areas that could be the most negatively affected by an increase in stand-replacing fire risk.

In summary, I selected the Proposed Action because it offers the overall greatest benefit to the forest environment and the overall least risk of negative impacts.

NON-TARGET SPECIES

This issue of direct and indirect effects of insecticides, particularly B.t.k., on non-target species was one of the most frequently cited concerns in public responses. Both B.t.k. and TM-BioControl are biological insecticides that are specific in their actions. B.t.k. is specific to Lepidoptera; in addition to tussock moths, it will kill some of the other moth and butterfly caterpillars that are feeding at the time of treatment. TM-BioControl is specific to tussock moths; it will only kill Douglas-fir and two other species of western tussock moths.

Both B.t.k. and TM-BioControl will be used in this decision, but the decision is to use TM-BioControl to the fullest extent possible is the most ecologically sensitive choice. Since TM-BioControl is more selective (targeting only tussock moths), its use will reduce any potential affect on non-target moths and butterflies.

About 40 percent of the supplies of TM-BioControl will be reserved for fish habitat, big-eared bat maternity sites, spotted owl activity centers, songbird study areas, and other areas described in the mitigation measures. Use of TM-

BioControl is expected to have a similar effect on non-target Lepidoptera as the No Action Alternative. The Expanded Protection Alternative would have required greater use of B.t.k. The effect on non-target Lepidoptera would occur over a larger geographic area.

In treatment areas, wildlife will not be able to take advantage of high tussock moth populations for opportunistic feeding. However, tussock moths in adjacent, unprotected areas will still be available for opportunistic feeding. The Expanded Protection Alternative would create significantly fewer chances for opportunistic feeding in adjacent areas during an outbreak.

B.t.k. will cause a temporary reduction in the populations of some non-target Lepidoptera in the treatment areas. I have weighed that with the need to protect resource values identified in the project objectives. Effects of B.t.k. will be minimized to the greatest extent possible through a mosaic of untreated areas and areas treated with only TM-BioControl. Other mitigating and operational measures, such as avoiding meadows and forest edges where the highest number of non-target Lepidoptera are likely to occur, will also minimize impacts of B.t.k. to these species.

The Mardon skipper was analyzed as a non-target Lepidoptera species of concern because it is a candidate for federal listing (*FEIS*, pp. III-26, IV-42, IV-43). The Mardon skipper does not occur within the analysis areas in Washington (where it is a state-listed species). In Oregon, the Mardon skipper has been found in Klamath County. This area is outside the project area included in this decision.

This decision will protect habitat for threatened and endangered species including anadromous fish (salmon and steelhead) and bull trout. No direct effect to these species, from either B.t.k. or TM-BioControl or their inert ingredients, was determined. There were no indirect effects on food sources for these species. The analysis determined there could be disturbance effects to bald eagles. In most cases, defoliation would either slightly negatively affect or slightly positively affect bald eagle nesting habitat (*FEIS*, p. IV-19). As a result, a no-treatment buffer has been placed around all bald eagle nests (*FEIS*, p. II-7). The Expanded Protection Alternative would neither add additional benefits nor cause additional impacts on these species, since all habitats that would benefit from treatment are included in the selected alternative. The No Action Alternative would result in adverse impacts to anadromous fish and bull trout through loss of habitat.

The analysis shows little or no direct adverse effects on other threatened and endangered species with implementation of the selected action. Lynx, gray wolf, caribou, and grizzly bear occur or potentially could occur in the analysis area. Grizzly bears feed on army cutworm moths in high mountain areas in the spring. Adult moths migrating through treated areas would not be affected by treatment. Impacts, positive or negative, from either the Expanded Protection Alternative or the No Action Alternative would be inconsequential for these species.

The effects of each alternative on 40 sensitive species were analyzed in the *FEIS*. For most, there was a determination of *No Effect* or *May Affect, But Will Not Lead Towards Federal Listing* (*FEIS*, pp. IV-32 – IV-35). The habitat for many of these species occurs outside proposed treatment areas or they are not dependent on Lepidoptera as a food source. Peregrine falcons could be affected by disturbance of the application aircraft, but mitigation measures (*FEIS*, p. II-7) that will buffer their nest sites results in *No Effect* on these birds.

There would be a beneficial impact to the Townsend's big-eared bat under the No Action Alternative. This is due to the potential for a short-term increase in food supplies (tussock moths). Treatment with B.t.k. could impact these bats because of impacts on the non-target Lepidoptera that are their primary food source. Treatment with TM-BioControl will have minimal impact because it would affect only tussock moths. The Expanded Protection Alternative could have the greatest impact, because a much larger area would be treated with B.t.k. The effects of this decision on these bats will be minimized because mitigation measures will leave a 1.75 mile buffer treated of TM-BioControl around known or potential nurse colonies (*FEIS*, p. II-7). Either B.t.k. or TM-BioControl may be applied where surveys have determined bats are not present.

Survey and Manage Species include mollusks and Larch Mountain Salamander. None of the alternatives would affect these species. Although the Expanded Protection Alternative would require more use of B.t.k., salamanders are generalist feeders. They are not dependant on Lepidoptera larvae for food; potential effects on individuals would be minimal.

For species not discussed above, this decision will have different effects (i.e. for some there may be a positive benefit from the action, while for others there may be no effect, or a negative effect) (see *FEIS* IV 32-35 for more detailed discussion of these species). Due to habitat loss from defoliation, only the Expanded Protection Alternative would have a positive effect on barred owls and goshawks.

The No Action Alternative would have both a positive and negative impact on flammulated owls. They feed mostly on Lepidoptera. A temporary increase in food (from tussock moth population buildup) would result in a positive effect. Loss of habitat would have a negative effect. This decision to treat only specific Areas of Concern and to use B.t.k. and TM-BioControl will result in temporary reductions of Lepidoptera, but it will still allow these owls to take advantage of high DFTM populations in adjacent, untreated areas.

There are no threatened or endangered plants in the area covered by this decision.

Formal surveys for sensitive plants have not been done in many cases. However, habitats for many of these sensitive plants are not in proposed treatment areas or the plants are pollinated by bees (Hymenoptera) or flies (Diptera), insects unaffected by B.t.k. Most are biennials and although

uncommon, have wide distributions beyond the analysis areas. Of those species where Lepidoptera contribute to pollination, treatment with B.t.k. may affect pollination and subsequent seed production for 1-2 years. In these cases, use of B.t.k. may affect individual plants but these effects will not lead any species towards federal listing.

The U.S. Environmental Protection Agency (EPA) has concluded that toxicity and infectivity risks of B.t.k. to non-target avian, freshwater fish, amphibians, freshwater aquatic invertebrates, arthropod predators/parasites, honey bees, annelids and mammalian wildlife is minimal to nonexistent at the label use rates of registered B.t.k. (EPA, 1998). Due to the relatively short half-life of B.t.k., the exposure and subsequent risk to non-target wildlife is limited to the time immediately after application (EPA, 1998). B.t.k. toxins degrade rapidly when exposed to sunlight. As a result, above-ground organisms are not expected to be significantly affected.

Neither B.t.k. nor TM-BioControl will affect Lepidoptera populations in any unprotected areas. It is important to note that the analysis in the *FEIS* indicates there are few defined negative effects for B.t.k. The use of TM-BioControl and identification of mitigation measures reduces the uncertainties. B.t.k. is expected to have minimal long-term effects on other Lepidoptera species.

In summary, I selected the Proposed Action because it balances the needs of all wildlife. There is a risk that individuals of some non-target species may be negatively affected by this decision. However, these effects are expected to be short term and will not cause a trend toward federal listing or loss of viability for any species.

HUMAN ENVIRONMENT

HUMAN HEALTH

During the analysis, concerns about human health from insecticides and/or exposure to Douglas-fir tussock moth caterpillars were expressed. Generally, exposure to Douglas-fir tussock moth, B.t.k., and TM-BioControl cause similar effects on humans: skin, eye, or respiratory tract irritations. These effects are not life threatening or debilitating, and are reversible. Under routine conditions of exposure, only the Douglas-fir tussock moth itself is likely to cause a substantial number of adverse health effects on humans. Both B.t.k. and TM-BioControl may cause irritations in some people (*FEIS*, pp IV-49 – IV-51).

This alternative meets the objective of protecting people from the effects of high populations of tussock moth larvae in these high-use areas. As described in *FEIS*, Appendix G, "Timely notification will be given to anyone who may be near [a] project area during operations." Spray operations areas will be signed and posted with warning and explanations of what is occurring. It is possible some people will be exposed to spray, especially in and around high-use areas such as campgrounds and administrative sites. In unprotected outbreak areas, visitors and forest

workers will be exposed to insect larvae. Based on previous data, approximately 25%-40% of the public and 41% to 75% of workers will experience reactions if they are exposed to outbreak levels of larvae.

In the Expanded Protection Alternative, dispersed recreation sites would also be protected from DFTM larvae. This would increase protection from the larvae to forest visitors and workers throughout the general forest area. Since more, but not all of the potentially infested areas would be treated, there would still be some human exposure to larvae. There would be greater possibility of exposure from the spray under this alternative. The No Action Alternative would not meet the objective of protecting visitors from the effects of Douglas-fir tussock moth larvae.

HIGH-USE RECREATION SITES

All high use recreation sites in host type will be protected from tussock moth impacts in areas where the infestation reaches sub-outbreak/outbreak levels. The features that attract people to these sites will be preserved and loss of income opportunity to those nearby communities will be minimized. The spray action will generate local income. There would be no additional recreation benefit from the Expanded Protection Alternative. The No Action Alternative would result in short-term impacts on high-use recreation areas because many visitors would leave or find other recreation opportunities during the outbreak. Tree mortality or damage in recreation sites could diminish the recreation/aesthetics experience. There would also be expenses to remove and replace lost trees.

PROTECTION OF TIMBER VALUES

In stands available for harvest, this decision may prevent up to about 202 mmbf of loss from mortality, but could still result in about a 592 mmbf loss (worst case) from mortality. Based on the experience from the 1972 / 1973 outbreak, a more likely loss will be less than 200 mmbf. While the Expanded Protection Alternative could prevent nearly all loss from mortality, this decision balances the potential loss of timber values with effects on other resource values.

WATER QUALITY

DFTM outbreaks may occur in municipal watersheds. Secondary mortality from bark beetles and potential for increased catastrophic fire, resulting in subsequent impacts from sedimentation, are the primary water quality concerns. This decision to treat some watersheds will reduce this potential risk to water quality. Neither TM-BioControl nor B.t.k. are human pathogens. The small amounts of these agents that could reach water sources will be quickly diluted or removed by water treatment systems. Treatment of additional acres per the Expanded Protection Alternative would not substantially add to protection of water quality in these watersheds. Under the No Action Alternative, high densities of larvae and increased amounts of fecal matter

and fecal streptococci would enter streams but no adverse effects on human health would be expected. Under the No Action Alternative, the most significant impact to water quality would result from additional secondary tree mortality and increased risk for a catastrophic fire that could significantly impact water quality.

ADJACENT LANDS

Since the female moth does not fly, there is little danger for reinvasion of DFTM from unprotected areas onto protected lands or spread from infested to uninfested lands regardless of the acres protected.

In summary, I selected the Proposed Action because it will reduce the negative effects of a tussock moth outbreak on people in areas of highest human concentration. The probability of contact with either TM-BioControl or B.t.k. is minimal and such contact, if it occurred, would pose the same or less effect than contact with tussock moth caterpillars.

CUMULATIVE EFFECTS

As described in the FEIS, pp. IV-60 – IV-63, large-scale forest insect suppression projects have been conducted at various times throughout eastern Washington and Oregon for over 50 years. These operations mostly targeted western spruce budworm and Douglas-fir tussock moth. The treatments were widely separated in space and time. Monitoring of treatment effects from B.t.k. indicates that lasting population suppression does not occur. Studies on non-target Lepidoptera show these insects return to pre-treatment levels in species richness and population numbers within 1-2 years. TM-BioControl does not result in any effects to non-target insects.

Because of the time interval between treatments, cumulative impacts from previous insect suppression projects and the current project will be minimal. Other factors that may contribute to cumulative effects on non-target Lepidoptera populations include removal of host plants, habitat loss (expansion of residential use into meadows, conversion to agricultural uses, invasive weeds displacement, etc.), and use of insecticides by private landowners outside the treatment area.

In summary, I selected the Proposed Action because no adverse, overall cumulative effects on federal lands are likely.

PUBLIC PARTICIPATION

The NEPA scoping process (40 CFR 1501.7) was used to invite public participation, to refine the scope of this project, and to identify preliminary issues to be addressed. The Forest Service sought information, comments, and assistance from federal, State, and local agencies, tribes, and other groups and individuals interested in or affected by the Proposed Action. The total scoping period lasted 75 days. The public was provided numerous opportunities to

participate in the Douglas-fir Tussock Moth Project. For additional discussion and details, see *FEIS*, pp. I-6, I-7, and Appendix C. Since the release of the *FEIS*, twelve individuals or organizations have submitted comments. Refer to the attached Appendix for a summary of these comment and the Forest Service response.

CONSULTATION WITH USFWS AND NMFS

A biological assessment was submitted to the USFWS and NMFS on April 19, 2000 with the following determinations (copies of the assessment are available upon request). In response to this biological assessment, the USFWS provided a Letter of Concurrence and NMFS provided a Biological Opinion, agreeing with Forest Service determinations for the following species:

NO EFFECT²

- Canada lynx (COL, WAW, UMA, MAL, FRE)
- Woodland caribou (COL)
- Warner sucker/critical habitat (FRE)
- Lost River sucker/critical habitat (FRE)
- Shortnose sucker/critical habitat (FRE)
- Bull trout (OCH)
- Northern bald eagle (COL, WAW, MAL, FRE)

MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT

- Grizzly bear
- Gray wolf
- Northern bald eagle (OCH)

MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT (BENEFICIAL EFFECT)

- Bull trout (WAW, UMA, MAL, FRE)
- Middle Columbia River steelhead trout/ Evolutionary Significant Unit (WAW, UMA, MAL, OCH)
- Snake river fall-run chinook salmon/Evolutionary Significant Unit (WAW, UMA)
- Snake River spring/summer-run chinook salmon/ Evolutionary Significant Unit (WAW, UMA)
- Snake River sockeye salmon/ Evolutionary Significant Unit (WAW)
- Snake River steelhead trout/ Evolutionary Significant Unit (WAW, UMA)

MAY IMPACT INDIVIDUALS OR HABITAT, BUT WILL NOT LIKELY CONTRIBUTE TO A TREND TOWARD FEDERAL LISTING OR CAUSE A LOSS OF VIABILITY TO THE POPULATION OR SPECIES

- Townsend big-eared bat (a Regionally sensitive species) – Implementation of this decision with the mitigation measures described on p. 4 of this

document will change the determination made in the *FEIS* (p. IV-35).

FINDINGS REQUIRED BY OTHER LAWS AND REGULATIONS

In reviewing the EIS and actions to implement the Proposed Action, I have concluded that this decision is consistent with the following laws and requirements.

CLEAN WATER ACT, 1982

On May 15, I received with a notice of intent to file a lawsuit alleging that the Forest Service has or is about to violate the Clean Water Act (CWA). The selected alternative will conform to the Clean Water Act, as amended in 1982.

The CWA establishes a non-degradation policy for all federally proposed projects. The selected action meets anti-degradation standards agreed to by the Oregon Department of Environmental Quality, Washington Department of Ecology, and the Forest Service, Region 6, in a Memorandum of Agreement (*Forest Service Manual 1561.5*). This will be accomplished through planning, application, and monitoring of Best Management Practices. For more information, please see *FEIS*, pp. IV-15, IV-56, IV-65, and Appendix H.

ENDANGERED SPECIES ACT OF 1973, AS AMENDED

A biological assessment has been prepared to document possible effects of proposed activities on endangered and threatened species in the analysis area. Appropriate coordination, conferencing, and consultation with USFWS and NMFS have been completed. For more information, please see *FEIS*, pp. IV-15 – IV-32, IV-44 – IV-45, IV-56 – IV-57, the project Analysis File, Biological Assessment, Letter of Concurrence, and Biological Opinion.

HEALTH AND SAFETY CODES

The Oregon Occupational Safety and Health Code for Forest Activities (*OAR 437, Division 6*) and Washington State Department of Labor and Industries Code for logging operations/forest activities (*WA Code 54, Chapter 296*, [effective 12/99]) will be met when the selected alternative is implemented. Application strategies to provide for worker safety are highlighted in *FEIS*, Appendix G, “Guidelines for Implementation”.

NATIONAL ENVIRONMENTAL POLICY ACT, 1969

NEPA establishes the format and content requirements of environmental analysis and documentation. The entire process of preparing an environmental impact statement was undertaken to comply with this Act.

² The referenced Forest(s) are in parentheses.

NATIONAL FOREST MANAGEMENT ACT, 1976

All alternatives were developed to be in full compliance with NFMA.

OTHER POLICIES OR GUIDING DOCUMENTATION

The selected action is consistent with 36 CFR 219.19, which require the agency maintain viable populations of fish and wildlife species.

Forest Land and Resource Management Plans for each Forest provided the framework for the development of all alternatives. The selected action is consistent with the long-term management objectives and other management direction in these Forest Plans. For information on the relevant Forest Plan Standards and Guidelines for each Forest, please review FEIS, Appendix F. Information on Land Management Areas, by Forest, is found in FEIS, Appendix A.

I have reviewed the scientific assessment from the Interior Columbia Basin Ecosystem Management Project (ICBEMP) and have incorporated principles from it.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

For the DFTM Environmental Impact Statement, I have determined the Proposed Action, with emphasis on the use of TM-BioControl as supplies allow, is the environmentally preferable alternative (40 CFR 1505(2)(b)). It limits the amount of area to be treated, and fully provides for the protection of identified resources. Impact of the Douglas-fir tussock moth and its defoliation on those resources in those areas is minimized. By using TM-BioControl for fish habitat, big-eared bat maternity sites, spotted owl activity centers, songbird study areas, and other areas described in the mitigation measures, impacts to non-target Lepidoptera can be minimized with all identified areas protected, if necessary. At the same time, this alternative allows the flexibility of assuring that all areas can be treated if necessary.

The No Action Alternative would have a negative effect on the human environment, would affect some riparian areas where defoliation would degrade habitat for bull trout and anadromous fish, and could affect old-growth stands and habitat. As a result, the No Action would not meet neither the identified Purpose and Need nor project objectives.

The TM-BioControl Only Alternative would be a more environmentally preferable alternative if there was an adequate supply of TM-BioControl. However, there may not be enough TM-BioControl to treat all of the potentially infested areas in the Alternative. In that case, some of the identified resource areas would be unprotected, incurring impacts as described in the No Action Alternative. The TM-BioControl Only alternative is essentially a "first-come, first served" alternative, which removes the

flexibility of using TM-BioControl where it may be most needed.

The Expanded Protection Alternative would treat a much larger area and have more environmental consequences. In some cases, this would actually prevent some of the beneficial aspects of the tussock moth outbreak. More area would be treated with B.t.k., potentially resulting in a larger effect on non-target Lepidoptera and the organisms that may depend on them.

IMPLEMENTATION

On November 1, 1999, Forest Service Deputy Chief Jim Furnish determined the Douglas-fir Tussock Moth Project to be an emergency and exempted it from stay the first year (2000) pursuant to 36 CFR 215.10(d)(1). This means that this decision may be implemented immediately following public notice in *The Oregonian* and *Seattle Post-Intelligencer*. As cited earlier, specific treatment areas for the first year will be identified when field surveys are completed in early June.

Minor changes may be needed during implementation to better meet on-site resource management and protection objectives. In determining whether and what kind of further NEPA action is required, the Responsible Official will consider the criteria for whether to supplement the existing Environmental Impact Statement per 40 CFR 1502.9(c) and FSH 1909.15, sec. 18, and in particular, whether the proposed change is a substantial change to the intent of the Selected Alternative as planned and already approved, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes regarding particular areas or specific activities will be considered together in making this determination. The cumulative impacts of these changes will also be considered.

APPEAL RIGHTS

This decision is subject to administrative appeal. The exemption to stay of implementation, described above, only applies to spraying in the year 2000. Based on current entomological surveys, implementation of the project will begin during the middle of June, 2000 on the Umatilla and Wallowa-Whitman National Forests. Organizations or members of the public may appeal this decision according to 36 CFR 215. The 45-day appeal period begins the day following the date the legal notice of this decision is published in *The Oregonian*, Portland, Oregon, and the *Seattle Post-Intelligencer*, Seattle, Washington, the official newspapers of record. Written appeals must be received or postmarked by the Appeal Deciding Officer within 45 days of the date of this legal newspaper notice:

Chief Mike Dombeck
USDA Forest Service
ATTN: NFS Appeals
PO Box 96090
Washington, DC 20290-6090

Those who appeal a decision must provide the Reviewing Officer sufficient written evidence and rationale to show why this decision should be changed or reversed. The written notice of appeal must:

1. State that the document is a Notice of Appeal filed pursuant to *36 CFR 215*.
2. List the name, address, and if possible, telephone number of the appellant(s).
3. Identify the decision document by title and subject, date of the decision, and name and title of the Responsible Official.
4. Identify the specific change(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects.
5. State how this decision fails to consider comments previously provided, either before or during the comment period specified in *36 CFR 215.6* and, if applicable, how the appellant believes the decision violates law, regulation, or policy.

CONTACT PERSON

For additional information about the specific activities authorized by this decision, please contact:

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PO Box 3623
Portland, OR 97208-3623
503-808-2984

/s/ Nancy Graybeal
for HARV FORSGREN, Regional Forester

May 26, 2000
Date