GYPSY MOTH ERADICATION: FISHER SITE, LINCOLN COUNTY FISHERIES REPORT AND BIOLOGICAL EVALUATION FEBRUARY 20, 2003

INTRODUCTION

This report provides an evaluation of effects to fish species and their habitats from the Fisher Site Gypsy Moth Eradication Project. The objective of this report is to provide information on risks and potential effects to fish and fish habitats that would be caused by any of the selected alternatives, provide information on cumulative effects, make determinations of effects for listed fish species, and review compliance with the Northwest Forest Plan's aquatic conservation strategy.

SUMMARY OF PROPOSED ACTIONS

Proposed Action - This alternative proposes to eradicate the gypsy moth population in the Fisher area of Lincoln County. The proposed action conforms to the recommendations found in the USDA's Final EIS for Gypsy Moth Management in the United States (1995). The Final EIS recommends eradicating isolated infestations found in the western United States. The proposed action includes three aerial (helicopter) applications of the *Bacillus thuringiensus* var. *kurstaki* (B.t.k.) bacterium to a 706 acre treatment area within the 3,820 acre analysis area. Application would occur in late April to mid May, beginning in 2003, and would be followed by intensive trapping in the summer of 2003. Additional treatments may be needed in 2004 if the gypsy moths are found in the original treatment area or if they have spread beyond this area. Treatment could be expanded to include the entire 3,820 acre analysis area without conducting another environmental analysis. Any treatment outside of the analysis area, or the use of a different treatment option, e.g. diflubenzuron, would require a new analysis.

No Action - This alternative is included in the analysis as a means of comparing the effects of the action alternatives. It is also presented as an indicator of what may happen to the landscape if no activity were to occur.

SPECIES AND HABITATS OF INTEREST

The National Environmental Policy Act (NEPA) requires that proposed projects be analyzed for effects to the human environment, including effects to fish species and their habitats, and that these effects be disclosed to the public. Species and habitats for which an analysis is required include management indicator species (MIS) designated in the Siuslaw National Forest Land and Resource Management Plan (LRMP 1990), threatened or endangered species listed under the endangered species act (ESA), species listed as sensitive by the Regional Forester, and any essential fish habitat (EFH) designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

The LRMP selected coho salmon *Oncorhynchus kisutch* as an indicator of aquatic wildlife health. Fish species listed under the ESA are also limited to the coho salmon,

which was listed as a threatened species in 1996. Fish species listed as sensitive by the Regional Forester for the Siuslaw National Forest include the Umpqua dace *Rhinichthys evermanni*, Oregon coast chinook salmon *O. tshawytscha*, Pacific coast chum salmon *O. keta*, Oregon coast steelhead trout *O. mykiss irideus*, and the Oregon coast coastal cutthroat trout *O. clarki clarki*. The Regional Forester's sensitive species list was updated on November 28, 2000.

On September 27, 2000 the Pacific Fishery Management Council designated essential fish habitat for three species of Pacific salmon; coho, chinook, and Puget Sound pink salmon. The Alsea River system is included in this designation. The designation includes only streams with current or historical salmon use and applies only to the water column and substrate. Riparian and upslope areas, along with non-fish bearing tributary streams, are not included as EFH. The Pacific Fishery Management Council has also designated EFH for 81 species of Pacific groundfish. Several of these species, including starry flounder *Platichthys stellatus*, probably use the Alsea River estuary during part of their life history. Groundfish would not be found within the proposed spray area.

It should be noted that there is some overlap among the various lists of species. Most notably coho salmon, the Forest's management indicator species for fish, is also listed as threatened by the NOAA Fisheries and has its habitat listed as essential by the Pacific Fishery Management Council. In addition, chinook salmon, listed as sensitive by the Regional Forester, has its habitat listed as essential by the Pacific Fishery Management Council. Table 1 contains a summary of species and habitats of interest.

Table 1. Species and habitats of interest.

Species name	MIS	T&E	Sensitive	EFH
Oregon coast coho salmon	X	X		X
Umpqua dace			X	
Oregon coast chinook salmon			X	X
Pacific coast chum salmon			X	
Oregon coast steelhead			X	
Oregon coast coastal cutthroat trout			X	
Pacific coast groundfish				X

MANAGEMENT DIRECTION

The National Forest Management Act (NFMA) requires the Forest Service to maintain viable populations of fish and wildlife species. The riparian and fish habitat goals of the LRMP are to provide and maintain a diverse, well-distributed pattern of fish habitats. This goal applies to all areas containing anadromous and resident fish habitat, perennial and intermittent stream courses, wetlands, and floodplains. The goals of the LRMP were amended in April 1994 by the Record of Decision for Amendments to Forest Service and and Bureau of Land management Planning Documents Within the Range of the Northern Spotted Owl (Northwest Forest Plan). The Northwest Forest Plan refined the goals of the

LRMP by establishing an aquatic conservation strategy (ACS) that was developed to restore and maintain the ecological health of watersheds, and aquatic ecosystems contained within them, on public lands.

RELEVANT ISSUES, OBJECTIVES, AND KEY QUESTIONS

This section is used to assist in refining the level of analysis needed for the proposed alternatives and to define the area of analysis for each species of concern. The analysis area contains several fish-bearing streams including Crab, Cougar, Buck, Cherry, Wilson, and McDonald Creeks along with Five Rivers. Potential for direct effects to fish from the insecticide will, therefore, need to be analyzed. Indirect effects that will need to be analyzed include potential for changes in large wood inputs to streams and channel morphology, stream shade and water temperature, and food supply. Parameters that are not typically a concern for spray projects and therefore do not require any further analysis include the creation or elimination of fish passage barriers, access to fish populations by humans, and changes in sediment inputs to streams.

The area of analysis for direct effects to all fish species will be limited to the 3,820-acre analysis area of the proposed action. However, when describing the potential for certain indirect effects, such as changes in stream shade/water temperature associated with the no action alternative, a much wider area of analysis will be inferred. This is due to the likelihood of the gypsy moth infestation to spread from the Fisher Site throughout much of Western Oregon if no treatment occurs.

SPECIES PRESENCE

Fish species present in Five Rivers and its tributaries include western brook lamprey *Lampetra richardsoni*, Pacific lamprey *L. tridentata*, coho salmon, fall chinook salmon, cutthroat trout, steelhead trout, speckled dace *Rhinichthys osculus* and sculpins *Cottus ssp.* Chum salmon are present in Canal Creek, a direct tributary to the Alsea River estuary approximately 16 miles downstream from the analysis area. Groundfish, especially starry flounder, also inhabit Alsea Bay.

EFFECTS TO FISH

Proposed Action

Direct Effects – *Bacillus thuringiensis* var. *kurstaki* is practically nontoxic to fish species (Ag. Canada 1982). Rainbow trout, and bluegills *Lepomis macrochirus* exposed for 96 hours to B.t.k. at concentrations of 560 and 1000 mg/l (ppm) showed no adverse effects. In addition, B.t.k. does not bioaccumulate is fish. Field observations of populations of brook trout *Salvelinus fontinalis*, white suckers *Catostomus commersoni*, and smallmouth bass *Micropterus dolomieui* did not reveal adverse affects after aerial application (Abbott Laboratories 1982). Field studies by Buckner et al. (1974) concluded that B.t.k. contaminated water has no observable effects on resident fish behavior or reproduction. There is no evidence that B.t.k. treated insects consumed by fish have had any noticable

adverse affects. At field application rates, a water-based formulation of B.t.k. is not expected to have any direct affects on fish residing in the analysis area. This includes coho salmon, steelhead trout, cutthroat trout, Pacific lamprey, and various species of sculpins.

Indirect Effects – The primary source of food for salmonid fishes in streams is aquatic insects. Insecticides have the potential to indirectly affect fish by affecting their sources of food. The insecticide B.t.k. primarily affects species in the order Lepidoptera (moths and butterflies). Only about 50 of the over 10,000 species of insects in the order Lepidoptera found in North America are aquatic. Most of these are aquatic moths that inhabit lentic (standing water) environments not found in the project area. In lotic waters (streams) lepidopteran numbers are low and do not contribute meaningfully to the diet of salmon and trout. A decrease in their numbers, therefore, would not affect the supply of food or the growth rates of fish in the project area.

Bacillus thuringiensis var. *kurstaki* has been found to affect some black flies (order Diptera) (Eidt 1985) and stoneflies (order Plecoptera) (Kreutzweiser et al. 1992). True flies and stoneflies are common insects found in streams of the Pacific Northwest and do inhabit streams in the project area. The potential exists for an effect to this food source of salmon and trout. However, studies of aquatic insects conducted at field application rates for B.t.k. showed no change in biomass or species composition (Eidt 1985, Kreutzweiser et al. 1992, Otvos and Vanderveen 1993). The spay project would, therefore, not affect the aquatic food supply for fish present in the project area.

Terrestrial insects, of which Lepidotera are only a part, do contribute to the food supply of trout and salmon. The application of B.t.k. will kill many of the moths and butterflies present at the proper larval stage at the time of application. Because Lepidopterans make up only a portion of the terrestrial insects available to feed trout and salmon, and because terrestrial insects contribute only a small portion to the diet of salmonids, there will be no change in the growth rates of fish in the project area.

Cumulative Effects – Much of the bottomlands in the Five Rivers area are under private ownership and consists of small farms and rural residences. Streams have been simplified during settlement and development of the area. These streams have less woody material, less shade, and reduced connectivity to floodplains than historically occurred. Streams under Forest Service management have also been simplified by stream cleanout and have a reduced capacity to produce future large wood due to past timber harvest. The spray project would maintain current shade levels for streams and allow for future increases in shade and large wood as recovery occurs under the Northwest Forest Plan. In addition, the gypsy moth infestation would not spread to other drainages up and down the coast.

No Action

Direct Effects – There would be no direct effects caused by the implementation of the no action alternative.

Indirect Effects – The primary indirect affect of taking no action on the gypsy moth infestation is a decrease in summer rearing habitat potential for salmonids caused by a decrease in the amount of stream shade and associated increased water temperatures. In one example during a massive gypsy moth outbreak in Rhode Island, light penetration increased from 5-18 percent to 73 percent and stream temperature increased 6.7 degrees Fahrenheit. Increases in water temperature would affect those species that reside in streams in the summer for part of their life cycle. This includes coho salmon and steelhead and cutthroat trout. Fall chinook and chum salmon would not be particularly affected by an increase in summer water temperatures.

Cumulative Effects – As the infestation spreads up and down the coast, more and more streams would be affected. Many of these streams already have elevated water temperatures due to past human activities. It is most likely that the spread of the gypsy moth outside of the analysis area would delay recovery of the listed coho salmon.

MITIGATION MEASURES

Mitigation measures have been included in the design of the action alternative. This includes the location of helispots and refueling sites away from streams.

DETERMINATIONS FOR T/E/S SPECIES AND ESSENTIAL FISH HABITAT
(Biological Evaluation)

This Biological Evaluation (BE) determines the effects of the alternatives contained in the Fisher Site Gypsy Moth Eradication Project analysis file on Proposed, Endangered, Threatened, and Sensitive (PETS) fish species, according to regulations contained in the FSM 2672.4. These species are those that are:

1. Listed or proposed to be listed under the Endangered Species Act as Endangered or Threatened by the USDI Fish and Wildlife Service or the USDC National Marine Fisheries Service. For the Siuslaw National Forest this list consists of the Oregon coast coho salmon.

2. Listed as sensitive by the USDA Forest Service Region 6 (FSM 2670.44). For the Siuslaw National Forest this list currently consists of the Umpqua dace, Oregon coast chinook salmon, Pacific coast chum salmon, Oregon coast steelhead trout, and Oregon coast coastal cutthroat trout.

The Magnuson-Stevens Fishery Conservation and Management Act requires action agencies to provide an effects determination on essential fish habitat (EFH). For the Fisher Site Gypsy Moth Eradication Project this is limited to habitat for chinook salmon, coho salmon, and several of the 81 species managed under the Pacific Coast Groundfish Fishery Management Plan.

Oregon coast coho salmon *Oncorhynchus kisutch.* This fish species is listed as "Threatened" by the National Marine Fisheries Service. Review of existing data indicates that habitat for this species is present within or downstream of the project area. Field surveys have documented the presence of this species in streams within the project area. Implementation of the action alternative would have no effect on this species. Implementation of the no action alternative may lead to adverse affects on this species.

Umpqua dace *Rhinichthys evermanni.* This fish species is listed as "Sensitive" by the Regional Forester. Review of existing data indicates that habitat for this species is not present in or downstream the project area. Implementation of either alternative, action or no action, would have no impact on this species.

Oregon coast chinook salmon *Oncorhynchus tshawytscha.* This fish species is listed as "Sensitive" by the Regional Forester. Review of existing data indicates that habitat for this species is present within of the project area. Field surveys have documented the presence of this species in streams within the project area. Implementation of either alternative, action or no action, would have no impact on this species.

Pacific coast chum salmon *Oncorhynchus keta.* This fish species is listed as "Sensitive" by the Regional Forester. Review of existing data indicates that habitat for this species may be present downstream of the project area. Field surveys have documented the presence of this species in Canal Creek, downstream of the project area. Implementation of either alternative, action or no action, would have no impact on this species.

Oregon coast steelhead trout *Oncorhynchus mykiss irideus.* This fish species is listed as "Sensitive" by the Regional Forester. Review of existing data indicates that habitat for this species is present within the project area. Field surveys have documented the presence of this species in streams within the project area. Implementation of the action alternative would have no impact on this species. Implementation of the no action alternative may lead to impacts to individuals or habitat, but is not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Oregon coast coastal cutthroat trout *Oncorhynchus clarki clarki.* This fish species is listed as "Sensitive" by the Regional Forester. Review of existing data indicates that habitat for this species is present within the project area. Field surveys have documented the presence of this species in streams within the project area. Implementation of the action alternative would have no impact on this species. Implementation of the no action alternative may lead to impacts to individuals or habitat, but is not likely to contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Chinook salmon essential fish habitat. Essential fish habitat for chinook salmon was designated by the National Marine Fisheries Service in September of 2000. Essential fish habitat for this species does exist within the planning area. Implementation of the action alternative would have no effect on chinook salmon EFH. Implementation of the no action alternative may affect chinook salmon EFH.

Coho salmon essential fish habitat. Essential fish habitat for coho salmon was designated by the National Marine Fisheries Service in September of 2000. Essential fish habitat for this species does exist within the planning area. Implementation of the action alternative would have no effect on coho salmon EFH. Implementation of the no action alternative may affect coho salmon EFH.

Pacific coast groundfish essential fish habitat. Essential fish habitat for Pacific coast groundfish was designated by the National Marine Fisheries Service. Essential fish habitat does exist downstream of the project area. Implementation of either alternative, action or no action, would have no effect on Pacific coast groundfish EFH.

AQUATIC CONSERVATION STRATEGY COMPLIANCE

Proposed Action

Objective 1--Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations, and communities are uniquely adapted.

Eradication of the gypsy moth infestation would maintain the complexity of watershed and landscape-scale features by eliminating the potential for unnatural tree defoliation and mortality.

Objective 2--Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life- history requirements of aquatic and riparian-dependent species.

By eliminating the potential of tree mortality due to defoliation, eradication activities would maintain the spatial and temporal connectivity in and between watersheds. Maintaining connectivity would allow aquatic and riparian-dependent species access to and between refugia to allow diverse life-history types to develop.

Objective 3 --Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

By eliminating the potential of tree mortality due to defoliation, eradication activities would maintain the physical integrity of the aquatic system.

Objective 4--Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Water quality (temperature) would be maintained by eradicating the gypsy moth infestation.

Objective 5--Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Eradication of the gypsy moth infestation is not expected to affect the sediment regime.

Objective 6--Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Eradication of the gypsy moth infestation is not expected to change existing in streamflow.

Objective 7--Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Eradication of the gypsy moth infestation would allow hardwoods and conifers in meadows and wetlands to develop at their natural rate and avoid potential mortality due to defoliation.

Objective 8--Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

Eradication of the gypsy moth infestation would maintain a more natural species composition and structural diversity of plant communities in riparian areas. Hardwoods and conifers would continue to provide shade and continue to develop large tree character necessary to produce inputs of large woody material to streams. Instream large wood is needed to develop and restore physically complex fish habitats.

Objective 9--Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

All activities are designed to maintain natural conditions and processes that develop habitat for native riparian-dependent species.

No Action

The no action alternative would allow the gypsy moth to defoliate hardwoods and Douglas-fir that provide shade to streams, including those that are water-quality limited due to temperature. Because this alternative would result in expected decreases in current stream shading over time, it is not expected to meet the objectives of the Northwest Forest Plan's aquatic conservation strategy. Defoliation would eventually be followed by an input of small to medium sized woody material as trees killed by the gypsy moth fall into streams. This small to medium sized woody material would not produce the structure necessary to develop needed physically complex fish habitats.

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