United States Department of Agriculture

Animal and Plant Health Inspection Service

Interim Rule, Pine Shoot Beetle Quarantine

Environmental Assessment, September 1995

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I. Introduction

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), is proposing an interim rule for changes in 7 CFR Part 301, Part 301.50 (Domestic Quarantines, Pine Shoot Beetle). The changes amend the quarantine by adding new regulated articles (pine wreaths and pine garlands) to the list of regulated articles (section 301.50-29(a)) and expanding the quarantined area (section 301.50-3) to include additional counties found to be infested with pine shoot beetle. This environmental assessment (EA) analyzes the potential environmental effects of the proposed interim rule and its alternatives.

The proposed interim rule changes comprise a Federal action under the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 *et seq.*). Under the Council on Environmental Quality's NEPA implementing regulations (40 CFR § 1501.4(b)(1992), an EA must be prepared for such an action. An EA is "a concise public document" that must include "brief discussions for the need of the proposed action, of alternatives as required by section 102(2)(E), of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted." In this EA, APHIS considered three alternatives: (1) the proposed action, (2) no action (no change in the current quarantine program), and (3) termination of the quarantine program.

A. Pine Shoot Beetle Biology and Control

The pine shoot beetle (*Tomicus piniperda*) is native to Europe and Asia (Långström, 1980; Speight and Wainhouse, 1989), where it is a destructive pest of pine and related species. During July 1992, pine shoot beetle was detected on a Christmas tree farm near Strongsville, Ohio. The initial detection led to surveys in surrounding areas to delimit the infestation. As of July 1994, the pest has been found in pine tree plantings and nurseries in Ohio, Illinois, Indiana, Michigan, New York, and Pennsylvania. Pine shoot beetle was probably introduced into the United States with dunnage (rough-cut timber with attached bark used to stabilize cargo in the hulls of ships). It is now believed that this pest has been in the United States for at least 3–6 years. Pine shoot beetle may have been detected only recently because the last four winters in the infested area have been mild enough to allow populations to increase to detectable levels.

Adult beetles lay eggs in freshly cut logs. During heavy infestations they may also lay eggs in the trunks of trees that are already weakened by other factors. When eggs hatch, the young feed on the inner bark and surface of the wood (Speight and Wainhouse, 1989). This damage is often cosmetic and does not seriously degrade the quality of wood products. Most damage to

living trees results from feeding by adults. When juvenile development is complete, the adult flies to the tops of trees where it bores into the center of a healthy new shoot and proceeds to hollow it out by feeding on the pith. Each beetle may kill four or more of these shoots during the adult phase of its life. After overwintering under bark at the base of host trees, adults fly back to recently cut logs where they mate and lay eggs. Adults may subsequently continue feeding on shoots in preparation for further egg laying.

Heavy infestations of pine shoot beetle typically kill most of the lateral shoots near the tops of trees. In rare cases, whole trees may be killed either by direct damage or by pathogenic fungi introduced by the beetle. Managed and natural stands of pine are at risk from infestations of pine shoot beetle. So far, economic impacts and damage associated with pine shoot beetle in the United States have been minimal. The proposed interim rule adds pine wreaths and garlands to the list of articles regulated before movement from the infested area to areas outside the quarantine and establishes a quarantine around those additional areas recently demonstrated to be infested with pine shoot beetle. Infested areas require inspection and/or treatment of regulated articles (potential pine shoot beetle host material) before movement from the infested area to areas outside the quarantine.

Eradication and suppression have not been considered viable alternatives in preventing human-assisted spread of this pest because no reliable methods are available and the current infestation is so widespread (eight states). Natural dispersal of pine shoot beetle is quite slow because females lay their eggs within approximately 1 kilometer of the area where they feed and larvae have poor dispersal capabilities. This protracted dispersal could lend itself to an eradication and suppression protocol, except for two factors: (1) during the brief time newly metamorphosed adults require to move between larval and adult feeding habitats, all life stages of pine shoot beetle are sheltered from insecticides and other control agents by living within plant tissues; and (2) currently, there are no reliable means of directly attacking pine shoot beetle with biological control agents or attracting it with lures. In Scandinavia where pine shoot beetle occurs naturally, damage caused by pine shoot beetle is minimized through management of its host material. The primary potential for dispersal of pine shoot beetle is via transport of infested host material by humans.

B. Current Regulatory Status

The present quarantine area includes 10 counties in Illinois, 31 in Indiana, 37 in Michigan, 12 in New York, 18 in Ohio, and 10 in Pennsylvania. Movement of regulated articles interstate from any quarantined county is prohibited except in accordance with prescribed conditions. Regulated articles include pine Christmas trees; pine nursery stock; pine stumps and pine bark nuggets, including bark chips; and pine logs and lumber with bark attached.

Interstate movement of regulated articles is allowed subject to inspection and associated issuance of Limited Permits or Certificates. Interstate movement of pine seedlings less than 36 inches tall is allowed if these have been certified as pest-free by visual examination. Greenhouse-grown ornamental pines can also be moved interstate if the premises are certified pest-free and protected to prevent pest entry. Interstate movement of pine stumps, bark nuggets, and bark chips is allowed if the articles are fumigated with methyl bromide. Interstate movement of pine logs and lumber, depending on the origin and destination of the articles (quarantine versus nonquarantine areas) and the season of the year, may be allowed after fumigation with methyl bromide and/or in closed containers and/or without stopping in a quarantine area. Cut Christmas trees may be moved interstate, depending on the origin and destination of the articles, without stopping in a quarantine area or after inspection and certification as pest-free or after cold treatment or fumigation with methyl bromide. Cut and unsold Christmas trees after December 25 must be either fumigated, burned, or chipped before disposal by January 1.

II. Need for the Proposed Action

The interim rule is needed to introduce changes in the quarantine to impede the spread of the pine shoot beetle from newly infested areas and reduce its potential for environmental and economic damage. The interim rule accomplishes this by adding new regulated articles to the list of articles regulated for pine shoot beetle and adding new counties to the quarantine area.

The USDA has the authority to establish quarantine areas under the Plant Quarantine Act, as amended (7 U.S.C. 151 *et seq*.), which regulates the importation of nursery stock, plants, and plant products. The Act provides for establishment of quarantine districts to regulate movement of plants for various purposes, including interstate shipments. The Federal Plant Pest Act, as amended (7 U.S.C. 150aa *et seq*.), enables USDA to use emergency measures to inspect and seize regulated articles and regulate the movement of articles by requiring general or specific permits in accordance with certain conditions. The purpose and need of the proposed interim rule change is to prevent human-assisted dispersal of pine shoot beetle from infested (quarantine) areas to uninfested areas.

III. Alternatives

A. Proposed Interim Rule

The proposed interim rule adds pine wreaths and pine garlands (which have been determined to be capable of harboring pine shoot beetle) to the list of regulated articles and adds counties that have been newly determined to be infested with pine shoot

beetle to the quarantine area. (Refer to figure 1 for a list of counties added to the quarantine area.) The list represents 28 counties in 6 states (2 new counties in 2 new states) that would be added to the current 118 counties in 6 states presently quarantined for pine shoot beetle.

Federal coordination appears to be the most effective approach for prevention of human-assisted spread of pine shoot beetle. The proposed interim rule would ensure that the quarantine is consistent for all states. It represents a cooperative effort between APHIS and the governments of states with pine shoot beetle infestations. Quarantines are specified on a county-wide basis, with the states continuing to regulate the intrastate movement of host materials from infested counties. APHIS would continue to regulate movement of host materials across state boundaries.

Figure 1. Counties Added to the Pine Shoot Beetle Quarantine

State	Counties
Illinois	Champaign, Grundy, Vermilion, Winnebago
Maryland	Allegany
New York	Steuben
Ohio	Carroll, Columbiana, Crawford, Fulton, Holmes, Lucas, Ottawa, Sandusky, Seneca, Tuscarawas, Williams, Wood, Wyandot
Pennsylvania	Armstrong, Cameron, Clearfield, Elk, Forest, Jefferson, McKean, Westmoreland
West Virginia	Hancock

B. No Action

Under the no action alternative, there would be no change in the regulations currently being implemented by APHIS to limit spread of pine shoot beetle. Counties newly determined to be infested with pine shoot beetle would not be included in the Federal quarantine area and thus would not be restricted in the interstate movement of infested materials. No new articles would be added to the list of articles regulated for pine shoot beetle.

C. Elimination of Quarantine

Under this alternative, the Federal quarantine and its associated restrictions on interstate movement of potentially infested pine shoot beetle host material would be eliminated, subject to reinstatement when improved techniques for preventing spread of pine shoot beetle become available. At their discretion, individual states could examine the problem and implement quarantines and/or programs to serve their own needs.

IV. Environmental Impacts of Proposed Action and Alternatives

A. Proposed Interim Rule

Beneficial and adverse environmental impacts would result from the changes incurred through the proposed interim rule.

The changes sought in the quarantine would impede the spread of pine shoot beetle, resulting in beneficial environmental impact (minimization of ecological disruption in natural ecosystems and minimization of losses in commercially managed agricultural systems). Those beneficial impacts are difficult to quantify because they are related to host distribution and diversity. It is safe to say, however, that use of pine and related tree stands for commercial purposes, esthetic purposes, recreation, and wildlife cover would be enhanced if the spread of pine shoot beetle is impeded. In some cases, where those natural ecosystems provide habitat for endangered and threatened species, the survivability of those species also would be enhanced.

Minimal adverse impact may be anticipated from the disposal of some regulated items, such as cut Christmas trees, and the use of the chemical fumigant methyl bromide. Although methyl bromide is an acutely toxic vapor that can produce systemic and cumulative effects on humans that are excessively exposed, its use in this program presents minimal potential for environmental impact. The anticipated lack of environmental impact is a result of (1) the carefully controlled manner in which it is used, (2) its short half-life and quick dispersal, (3) the relatively small increase in use that would result from this interim rule, and (4) the minimal contribution of agricultural use of methyl bromide to the ozone depletion phenomenon. Further explanation follows.

Fumigations of wood products with methyl bromide are conducted in a temporary or permanent exposure chamber following guidelines in the APHIS "Plant Protection and Quarantine Treatment Manual." Adherence to these guidelines protects the applicators, workers, and the general public from exposure and any adverse effects of methyl bromide. There is a 30-foot (10-meter) area around the fumigation chamber where entry is restricted to individuals wearing self-contained breathing apparatus when a fumigation is being conducted. When the prescribed treatment period is over, the chamber is aerated with ventilation fans and the methyl bromide is vented into the atmosphere.

Methyl bromide gas is heavier than air, is highly volatile, and disperses rapidly when released. Exposure and risk of adverse effects to humans and nontarget organisms from fumigations is prevented by routine safety precautions and dispersion and mixing within the 30-foot restricted area. After venting, detectable amounts of methyl bromide may reach adjacent soil or surface water, or accumulate in low areas adjacent to fumigation facilities, but minimal impact is anticipated. The half-life of methyl bromide is less than 7 hours in water (Wegman *et al.*, 1981) and less than 8 days in soil (EPA, 1992).

The U.S. Environmental Protection Agency (EPA) has classified methyl bromide as an ozone-depleting chemical, similar to chlorofluorocarbons (CFC's) and other halogen gases, and is requiring that the production and use of the compound be phased out by the year 2001. Halogen gases have been implicated in ozone destruction in the stratosphere, and ozone depletion has been identified as a contributing factor in the anticipated rise in the incidence of skin and other cancers associated with increased exposure to ultraviolet light.

A number of factors suggest that methyl bromide associated with agricultural fumigation may be of limited importance in ozone depletion. Methyl bromide has a short atmospheric half-life compared to CFC's (1.6 years versus 80–100 years (Mix, 1992)). Also, a large percentage of atmospheric bromine may be generated naturally by marine wave action (Sturges and Harrison, 1986), whereas industrial and agricultural sources contribute from 10% to 35% (Prather *et al.*, 1984). Some industrial sources associated with the manufacture of polyester fibers release into the atmosphere nearly 1 million pounds of methyl bromide in a year (Bonvie, 1992). Thus, the contribution from agricultural methyl bromide would be small relative to natural and industrial sources of bromine. The total amount of methyl bromide required by APHIS (for all of its programs) in Fiscal Year 1992 contributed less than one-half of one percent of the atmospheric load of methyl bromide from all human uses.

APHIS analyzed its use of methyl bromide for certification of imported logs, lumber, and other unmanufactured wood products in an environmental impact statement (EIS) (USDA, 1994), incorporated by reference in this EA. For 1992, it calculated only a 0.000042 percent increase in ozone depletion from program use of methyl bromide, an insignificant change. For the pine shoot beetle quarantine, the costs associated with fumigation make other regulatory options more desirable; therefore, the number of fumigations that will be done is expected to be minimal. Because far fewer fumigations are required for the pine shoot beetle quarantine than for imports, there should be no significant contribution to ozone depletion.

Because the newly quarantined areas are not major exporters of regulated articles (pine logs, pine lumber with bark, pine stumps, pine bark nuggets, pine chips, and cut Christmas trees), relatively few treatments would be required. In addition, the number of unsold Christmas trees that are fumigated instead of burned or chipped is expected to be very low, owing to the ease and low cost of burning and chipping to dispose of discarded trees. Thus, the number of fumigations is expected to be very low.

B. No Action

Potential environmental impacts under the no action alternative would be virtually the same as those under the present program because the control methods which give rise

to those impacts would remain the same. The magnitude of those environmental impacts would be only slightly less.

C. Elimination of Quarantine

In the absence of any Federal action to regulate movement of pine shoot beetle host material from newly infested areas, natural pine ecosystems and pine timber industries could be at considerable risk. In addition to allowing the spread of pine shoot beetle to natural and agricultural ecosystems to go unchecked, this alternative could also lead to increased use of chemical insecticides as individual growers or local communities attempt to suppress or eradicate pine shoot beetle infestations.

Detailed consideration of such an alternative may be appropriate in the future, but is not warranted at the present time due to insufficient information. It has yet to be determined that the documentation of "new" infestations represents movement of pine shoot beetle from previously documented infestations, rather than representing previously established infestations that have been newly detected. The pathway for human-assisted spread of pine shoot beetle has yet to be fully documented, and although methyl bromide fumigation is quite effective in killing pine shoot beetle, its contributing role in preventing the spread of pine shoot beetle is unquantified.

V. Agencies, Organizations, and Individuals Consulted

This environmental assessment was prepared and reviewed by the Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Domestic and Emergency Operations:

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