



Pine Butterfly

Forest Health Fact Sheet

March 2017



Rob Flowers, ODF

Pine butterfly males are white with black wing markings (left) and can be seen in large numbers in tree canopies during outbreaks.

Pine butterfly (*Neophasia menapia*) is a native butterfly whose caterpillars feed on the needles of ponderosa pine, and sometimes lodgepole and western white pines, western larch and western hemlock. Outbreaks from this pest occur periodically at irregular intervals and may last 2 -5 years. Defoliation from these pests may not directly cause mortality but may reduce tree resiliency against other pests such as bark beetles. Preventative management for this insect includes maintenance of overall tree health and diversification of tree species within a stand. Treatment includes *Bacillus thuringiensis* (Bt) sprays to control caterpillars.

Hosts

- Major: ponderosa pine
- Minor: lodgepole and western white pines, western larch, western hemlock

Pine butterfly occurs in ponderosa pine stands in the western United States and British Columbia. Populations of this insect are usually quite low, but large outbreaks are believed to have occurred periodically in the past in Oregon, though none have been specifically documented until recently. Outbreaks are short-lived, but can cause severe defoliation over large areas leading to growth loss and tree mortality. Host trees that survive pine butterfly outbreaks in a weakened condition may be more susceptible to bark beetles.

Biology

Peak adult flight occurs from mid-August through September. Adults mate and females oviposit in rows on current year foliage. The eggs overwinter and larvae emerge when new shoot growth begins in the spring. Immature larvae feed together, often on a single needle. Later caterpillar instars feed individually. Larvae feed from June - July then pupate on needles, branches, bark

crevices, and surrounding vegetation. The next generation of adults emerges at the end of summer.

Pine butterflies have one generation per year. Eggs are green and are arranged at a 45° angle, almost overlapping each other in a single row. Immature larvae are pale green with black heads, while mature larvae are 1" long, have two lateral white stripes, and green heads. Some pupae are green with white stripes and others, apparently females, are brown with white stripes. Adult males are white with black wing markings and have a 2" wingspan. Adult females have a yellowish cast and heavier black markings. Some females also have orange-red spots along the margins of their hind wings.



Pine butterfly larvae feeding on needles.

Don Scott, USDA-FS

Management highlights

- Maintain tree vigor in between outbreaks to enable trees to withstand and rebound from defoliation
- Bt application (aerial for forests and ground for ornamentals) in early summer

Management

Natural

Natural enemies such as the ichneumonid wasp parasitoid (*Theronia atalantae*) have been largely credited with reductions of past outbreaks. Build-up of this parasite's populations often lags 1-2 years behind that of the pine butterfly. Large numbers of a fly parasitoid (*Agria affinis*) and hemipteran predator (*Podisus placidus*) have been commonly observed as well. Larval starvation and winter egg mortality also appear to play a role in regulating pine butterfly populations.

Silvicultural

Silvicultural actions to reduce pine butterfly damage are best applied during the years between outbreaks, and are not recommended during or immediately following an outbreak. Tree health and vigor, prior to defoliation, is a good indicator of how well it will recover from defoliation. Crown classes and diameters do not appear to be correlated with tree mortality following defoliation.

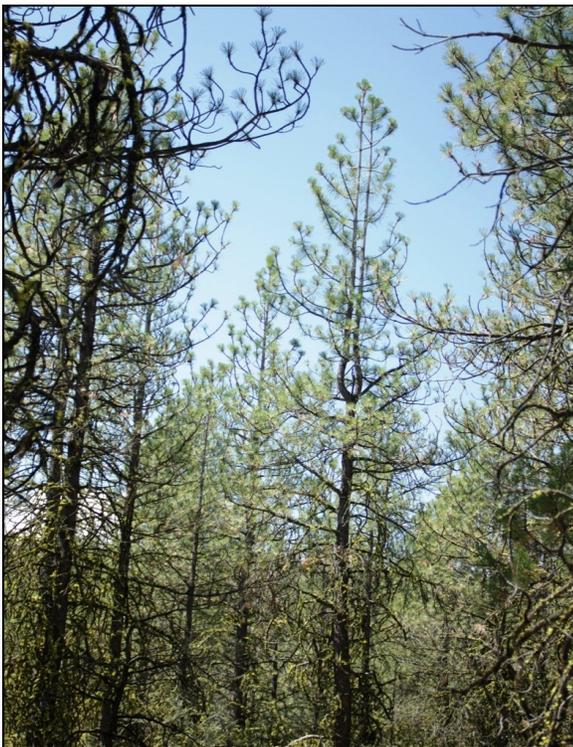
Insecticides

Bacillus thuringiensis (Bt) is an effective insecticide with few non-target impacts. Insecticides are most effective when applied in early summer before pine butterfly larvae mature. Large-scale insecticide applications are generally ineffective in controlling defoliators of this type, due in part to re-infestation from surrounding areas. Small-scale applications can preserve foliage in high-value areas. Annual applications of insecticides for several years may be necessary to protect trees until an outbreak subsides.

When using pesticides, always read and follow the label

Damage

Larvae generally feed only on the older needles creating a "lion's tail" appearance, but may consume new growth during outbreaks. Populations of pine butterfly usually exist at low levels, with outbreaks occurring rarely at irregular intervals. Ponderosa pine is the preferred host, but other hosts in mixed-conifer stands may be fed on as well - especially during outbreaks. Pine butterfly outbreaks have been documented previously in Washington, Idaho, Montana, and in undescribed locations in Oregon. Outbreaks have historically affected small areas up to tens of thousands of acres. Outbreaks are usually short-lived, lasting 2-5 years, before they decline to endemic levels from natural controls. Growth loss and tree mortality in affected areas is highly variable and is often dependent on outbreak severity and persistence, among other factors. Individual tree mortality appears to be associated with the percent crown defoliation that occurs, but this may be greatly influenced by site and stand conditions. Bark beetle infestations are common in trees weakened by defoliation, near the end of pine butterfly outbreaks.



Kirk Ausland, ODF

"Lion's tail" from defoliation of older needles

More information:

Oregon Dept. of Forestry, Forest Health
<http://tinyurl.com/odf-foresthealth>
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503-945-7200

Other references:

USFS Forest Health Protection
www.fs.usda.gov/goto/fhp/fidls

OSU Forestry Extension
<http://extensionweb.forestry.oregonstate.edu/>