



# UI Extension Forestry Information Series II

Insects & Diseases No. 10

## Invasive Species

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*Spotted knapweed*

*What are invasive species?* A species is invasive when it is found beyond its natural range. In Idaho, an invasive species can be one that came from Europe or it can be one that came from Pennsylvania (as long as it is outside of its natural range).

*Why are invasive species important?*

Invasive species are a clear and present danger to our forest biodiversity. As a threat, invasive species rank second only to habitat loss as a threat to native biological diversity. Invasive species can devastate native tree species, alter ecosystems, and cause huge economic losses. For example, exotic insects may be more likely to outbreak than native forest insects and although exotic insects comprise approximately 2% of the total insect fauna of North America, they comprise approximately 40% of the forest insect pests of economic concern.

*How do invasive species arrive?* Many forest insects arrive in wooden shipping containers. Of the approximately 14 million shipping containers from foreign sources that arrive in the United States annually, APHIS inspects approximately 2% of them and finds approximately 400 dangerous exotic insects on/in wood packing material annually. Other routes of entry include nursery/planting stock (i.e. citrus longhorned beetle) or

transport on automobiles (i.e. gypsy moth).

*How do an invasive species become established?*

Most forest insects are controlled within their native ranges by: 1) the plant on which they feed, or 2) natural enemies that feed upon them. Successful invaders share several characteristics that release them from these normal controlling agents and help them to become established in the newly invaded area. These include:

- finding hosts in the newly invaded area similar to hosts in its native range;
- having these hosts not recognize the invasive species as a threat and not successfully defending themselves against the new species;
- encountering little competition from native species and being able to 'take over' the newly found host;
- arriving without its 'normal' component of natural enemies and having the potential natural enemies in the newly invaded area not recognizing it as a potential prey item; and/or
- reproducing rapidly, even at low population densities (invasive species normally arrive in low numbers and then the population builds).

*Invasive species can alter ecosystems – An example from the eastern United States.*

American chestnut was one of the most important trees growing in the forests of the eastern United States. American chestnut originally occurred from Maine to Florida and from the east coast west to Ohio. American chestnuts dominated the region and were a keystone species on approximately nine million acres of eastern forests. The trees were among the largest in eastern North America, with mature chestnut trees averaging up to 5 feet in diameter and up to 100 feet tall. The trees grew straight and often self-pruned to 50 feet or more, making them a valuable timber species. In addition, along with humans, native wildlife from birds to bears depended upon the nut crop from these trees. Then, chestnut blight was introduced into New York City in 1904. The disease spread quickly through eastern forests, leaving only dead and dying chestnut trees in its wake. Within 50 years, American chestnut was virtually eliminated from its once dominant place in eastern forests, leaving a gap in these forest ecosystems that was filled by other tree species, including many oaks.



Gypsy moth arrived in Massachusetts in the late 1860's. When it escaped, it found itself in an area with plentiful food and no natural enemies capable of regulating its population growth. Gypsy moth caterpillars feed on over 100 species

of plants, but their favorite host trees include oaks, poplars, and willows – some of the same species that replaced American chestnut. The moth has since spread southward as far as North Carolina and westward as far as Wisconsin. In areas where gypsy moth is well established, the insect is behaving much like a native insect, going through periodic outbreaks that are brought under control by natural enemies that include small mammals such as white footed mice, parasitic wasps, and naturally occurring diseases.

Much of the effort to manage gypsy moth populations in the eastern United States is now aimed at slowing its range expansion into new areas. This tactic has been termed 'slow-the-spread' and has decreased the range expansion of the insect from 13 miles per year to about 4 miles per year. Outside of the generally infested area and beyond the 'slow-the-spread' boundaries, new infestations are actively controlled, usually with some type of insecticide application. Several gypsy moth introductions in Idaho have been similarly controlled. In some of the areas where gypsy moth has become established, the heavily defoliated oaks have become less abundant and another shift in forest tree composition is occurring. This shift in species composition may favor an increased presence of maples and poplars in some areas.

Now, another invasive insect has arrived and may enter the forests in the eastern United States, the Asian longhorned beetle.



Asian longhorned beetle has probably been in the United States for about 10 years. Currently, populations of the insect are located in both New York and Illinois. In its native range, Asian longhorned beetle is a serious pest of poplars. Attempts to grow plantations of North American maples in China have been abandoned because the trees are killed by these beetles. If this beetle escapes beyond its localized populations into the eastern hardwood forests, it, like its predecessors, has the potential to alter North American forest ecosystems.

*But what about invasive insect species in Idaho?*

We currently have two invasive forest insects of concern in Idaho – larch casebearer and balsam woolly adelgid.

Larch casebearer is a tiny, silver-brown moth that was discovered feeding on western larch in northern Idaho in the late 1950's and has since spread through much of the interior west. As caterpillars mature, they cut off a portion of a larch needle, hollow it out, line it with silk and then live, feed, and complete development within this 'case'.



The caterpillars feed on new foliage in the early spring and heavily infested trees become reddish in color. Repeated defoliations can weaken the trees and reduce tree growth. Two parasitic insect species have been introduced into the western states and effectively control populations of this moth.

areas such as frost pockets with subalpine firs, trees may be eliminated by this insect. Balsam woolly adelgid feeds on the stem, branches, and twigs of the attacked trees. Trees that have heavy infestations on the trunk can die within a few years. Gouting of the buds that progressively weakens the trees occurs on the trees that have branch/twig infestations. Balsam woolly adelgid can have up to four generations per year. At present, there is no effective natural control agent for this insect in Idaho.

*So, what's to come?*

We do not know that any particular insect species will become established within our region or what economic and ecological consequences will be if a new invasive species does become established. However, we can be confident that we will continue to see new invasive species arrive and that some of these will have the potential to significantly alter our forests.



Balsam woolly adelgid is another tiny insect that was introduced into the western United States in the 1950's. This European insect looks like a small patch of wool on the tree and is a pest of true firs in both eastern and western forests. In Idaho, subalpine fir appears to be most heavily impacted by this insect. The entire population of balsam woolly adelgid is female and infestations can be started by a single individual. In some low-lying

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