



# INVASIVE PEST news & notes

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Extension  
UtahStateUniversity.



Cooperative Agricultural Pest Survey Program & Utah Pests Fall 2023

## What Makes a Species Invasive?

Invasive species come in all shapes, sizes, and colors. Some people might think any pest causing harm is invasive. Others might think that it is a species not native to the area. In reality, for an organism to truly be considered invasive it must meet both of these conditions.

### But what actually makes them invasive?

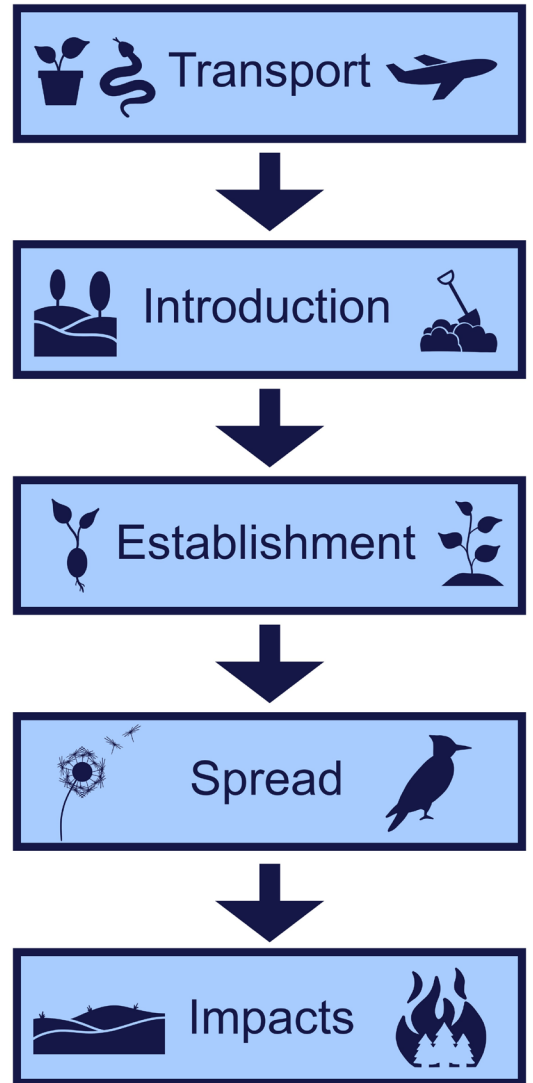
**Invasive species are:**

- 1. Not native to the ecosystem and capable of self-sustaining populations that may spread; and,**
- 2. Cause, or are likely to cause, economic and/or environmental harm**

Invasive species are always species that are not originally from the area. They may be referred to as non-native, exotic, non-indigenous, or many other terms. These species were at one point introduced to the area either purposefully or accidentally.

This however, does not mean that all non-native species are considered invasive. Some hitchhikers may be transported to a new area, but are unable to survive and thrive there. The Tens Rule (Williamson 1996) suggests that the chances of a non-native species surviving in a new area are about one in ten. For many species, there are numerous barriers to their establishment such as food resources, climate differences, available habitat, etc. It is likely that most accidentally introduced species don't receive attention because they die out quickly and never have a significant effect on the ecosystem.

Several non-native species are considered beneficial and are purposefully assisted in their continual success. For example, most of the



A simplified model of the process of invasion (adapted from Blackburn et al. 2011). This process is divided into a series of steps with environmental and biological barriers. Utah State University Extension

food crops grown in the U.S., including popular varieties of tomatoes, wheat, and rice, are not native to the region. Without human assistance, these plants may not be able to survive and reproduce and if they did they would likely still not be referred to as invasive.

The Cooperative Agricultural Pest Survey (CAPS) program supports the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service’s (USDA APHIS) mission to safeguard the nation’s agricultural and environmental resources from harmful plant pests and diseases. The Utah CAPS Committee is comprised of experts from multiple state and federal agencies as listed below. Members meet once a year to discuss and plan ongoing and future priorities and strategies.

- Utah Department of Agriculture and Food, lead
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service
- Utah State University Extension
- Utah Weed Supervisors Association
- U.S. Forest Service
- U.S. Homeland Security Customs and Border Protection
- Utah Division of Forestry, Fire & State Lands



[invasives.usu.edu](http://invasives.usu.edu)

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**Why aren’t non-native food crops considered invasive?**

Because humans value them. Who wouldn’t love a garden that plants and cares for itself, providing fresh produce with no effort? Because human perception is involved, sometimes the line between invasive or not can be quite blurry. Children often consider dandelions as beautiful flowers, while adults see their potential to harm the aesthetic or health of their lawns. The value of a species is often subjective to different people and so generally the line is drawn at whether that species is causing harm economically or environmentally.

Another example of an introduced species is the honey bee (*Apis mellifera*). This bee occurs naturally in Europe, the Middle East, and Africa. However, it has been spread extensively beyond its natural range due to its economic benefits related to pollination and honey production. The U.S. has nearly 3 million colonies of honey bees that populate \$15 billion worth of crops each year. Honey bees clearly aren’t causing economic harm and are therefore usually not considered invasive.



A honey bee (*Apis mellifera*) female worker. Kate Richardson, Utah State University



Two human-made hives for honey bees; each hive houses a queen and tens of thousands of workers. Andree Walker Bravo, Utah State University

**But are honey bees causing harm?**

When labeling a species as invasive, scientists consider the effects it has on human economics and the effects on the environment, including native species. The U.S. has more than 4,000 native wild bee species that are specialized in pollinating native plants due to co-evolution for thousands of years. They pollinate many plants that honey bees cannot, and while they are important ecosystem pollinators, they are in steep decline due to climate change, pesticide use, disease, and habitat loss. On top of those challenges, native bees also have to compete with introduced honey bees for oftentimes limited resources. A 2016 study by Cane & Tepedino found that a single honey bee colony can collect about 22 pounds of pollen pellets (pollen mixed with some nectar) throughout the summer. This is enough to feed the offspring of 110,000 solitary native bees. With decreasing habitat and landscapes where flowering plants are limited, this competition contributes to the decline of native bee species and the threat of species extinction. In addition to competition for food, dense colonies of honey bees can be reservoirs for diseases that could spill over into native bee populations that don’t have biological defenses against them.



Utah has many species of native bees that are excellent pollinators. Leafcutter bees are important pollinators of legumes and carry pollen packed onto hairs on the underside of the abdomen (left). Bumble bees are able to tolerate cooler temperatures and are important pollinators of native plants, especially at higher elevations. They carry pollen on their hind legs (middle). Sweat bees are great generalist pollinators that are important for many wildflowers and crops (right). Joseph Wilson, Utah State University

## Utah Pests Welcomes Alexander Knudson

Utah Pests is excited to welcome a new arthropod diagnostician to our team!



Alexander (Alex) Knudson is originally from southern Minnesota but spent the last 12 years in the Red River Valley of North Dakota.

He is an ecologist, systematic entomologist, and extension professional with broad entomological interests. For a decade, he has been identifying insects for different state and national agencies or conservation groups. He spent four years with North Dakota State University Extension, in their Plant Diagnostic Lab, where he helped people from around the country with their plant pest problems.

Alex loves Extension education, and outreach for people of all ages, but his favorite interactions are those light bulb moments when you give a client a new piece of information and it just clicks! As an entomologist, he enjoys teaching integrated pest management and alternative control to gardeners and homeowners so they can safely manage their pests with fewer pesticides.

The role of the arthropod diagnostician is to help identify insects and their relatives in Utah. You can contact him if you are concerned about an insect eating a garden plant, a spider in your home, mysterious turfgrass damage, etc. He is also to whom you can report potential invasive insects. He is excited and happy to help with all of your arthropod identification needs!

Contact Alex:

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## What Makes a Species Invasive?, Continued

### So are honey bees invasive?

This depends on who you ask. Some entomologists who fully understand the risks honey bees pose to native bee species might say yes, but the majority of the public would likely say no because honey bees are generally considered beneficial.

In cases where an organism has been transported accidentally and harms both economics and the environment, the answer is usually much simpler. Thousands of invasive species have been accidentally transported to the U.S. and the economic costs due to management and losses exceed \$138 billion per year. These include many insect species that threaten agricultural production like the brown marmorated stink bug, European cherry fruit fly, and spotted wing drosophila or that might damage or kill landscape ornamental trees like the emerald ash borer, Asian longhorned beetle, and spotted lanternfly, to name a few. Some invasives pose public health issues like red and black imported fire ants and European paper wasp while others wreak environmental havoc. As in the case of the honey bee, negative impacts include the loss of valuable resources and decline of native insect populations.

### What can you do?

Human-assisted transport is the most common way that invasive species move and spread. Many people may not even know they are aiding in the spread. By simply enjoying the outdoors, many Utahans can be unwitting participants, going from adventure to adventure. Successful invasive species often have very effective ways of hitchhiking including camouflaged eggs and hiding within in or on plants.

### Here are some simple steps you can take to be sure you are not spreading invasive species:



#### Stay on designated roads and trails.

M. Reed, National Park Service

#### Clean your gear before entering and when leaving recreation sites.

Utah Division of Wildlife Resources



#### Remove plants, animals, mud, and any other natural material from boots, pets, and vehicles.

National Park Service

#### Use certified or local firewood and hay.

Dontmovefirewood.org



- Kate Richardson, Invasive Species Specialist

# Plum Curculio

Plum curculio (*Conotrachelus nenuphar*) is a small brown weevil (beetle with a snout) native to eastern North America where it is a major pest of pome and stone fruits. It thrives in environments where orchards are located next to hardwood forests. In its native habitat, it feeds on wild fruits, but it has also readily adapted to cultivated orchards and ornamental fruit trees. Native hosts include plants in the Rosaceae family such as wild and cultivated plum, crabapple, cherry, and other fruit trees.

Plum curculio was detected in Box Elder County, Utah, in the early 1980s, and this population remains the only known infestation in western North America where it is occasionally found in residential and wild fruit trees. It is a quarantine pest in U.S. and Canada and fruit grown in infested counties is restricted from being exported. As a threat to Utah's fruit industry, this insect requires ongoing monitoring and management to keep Utah's fruit export markets open.

Plum curculio adults are 1/4-inch long with a brown body overlaid with light gray and brown markings along a rough back. Adults overwinter in protected areas where they burrow under leaf litter in wooded areas and compost piles near host orchards. Adults indirectly damage fruits through oviposition (egg-laying). The scars have a characteristic crescent shape with slits about 1/4-inch-long on the fruit surface. In most cases, fruits will have both feeding and oviposition scars on the surface of the fruit. Early-season feeding causes fruit to be deformed at harvest and feeding wounds may allow for the invasion of fungal pathogens such as brown rot, increasing the severity of crop loss.

Eggs hatch into legless, gray-white grubs (larvae) that have curved bodies and small brown heads. Larvae cause damage by tunneling within the fruit flesh, making it unfit for consumption. Most infested fruits abscise and drop to the ground prematurely. Fruits that remain on the tree are deformed and may rot during ripening. Complete development from egg to adulthood requires 5 to 8 weeks depending on environmental conditions. In Utah, plum curculio only completes one generation per year.

The Utah Department of Agriculture and Food conducts an annual statewide monitoring program to track the spread of plum curculio. Backyard and commercial producers can also monitor for this pest beginning in spring during bloom when overwintering adults start migrating into fruit trees. Representative locations throughout orchards should be selected to detect adults or injury before economic crop loss occurs.

Good sanitation practices will help reduce local plum curculio populations. Removing wild and ornamental fruit trees growing near orchards will reduce harboring populations and appropriate habitats. It is also important to remove fallen fruit during the summer in an infested orchard. Chemical control of plum curculio may be necessary depending on the severity of damage in previous years. Chemical strategies differ for commercial fruit production and home fruit production.

-Kate Richardson, Invasive Species Specialist



**Top:** Plum curculio egg and oviposition (egg-laying) scar (left) and adult (right). Peter Jentsch, Cornell University's Hudson Valley Lab.

**Middle:** Plum curculio larvae causing damage in a young peach. Texas A&M Extension

**Bottom:** Plum curculio feeding and egg-laying damage on cherries (left; Utah State University Extension), nectarines (upper right; Michigan Plum Growers), and saskatoon/western serviceberry (lower right; Michigan State University).

# Invasive News Highlights

## Mediterranean Oak Borer

A new pest has recently been causing concern for oak trees in Oregon and California. The Mediterranean oak borer (*Xyleborus monographus*) is originally from Europe and the Middle East, but turned up in North America in 2017. This pest transmits multiple fungal species to the trees that it attacks. Some fungal species (*Raffaelea montetyi*) cause diseases such as oak wilt, which can kill oak trees in as little as two to three years. This tiny wood-boring beetle does not subsist on the inner wood of the tree, but rather eats the fungus grown in the galleries it creates. The beetle farms the fungi as food for their young to eat once they hatch. The fungus will continue to grow within the tree, eventually robbing tree canopies of water necessary for growth and survival. Drought-affected trees are particularly susceptible and common symptoms of oak borer attack include flagging, entrance and exit holes, and wood-colored boring dust in mounds at the base of the tree. Currently researchers at the Oregon Department of Agriculture, Oregon Department of Forestry, and University of California, Davis are trapping for this pest and investigating methods of control.



Adult Mediterranean oak borer (top; Curtis Ewing, Cal Fire) and black, fungal-stained galleries in a valley oak tree in California (bottom; Bob Rabaglia, USFS)

## A New True Bug

The discovery of a newly introduced non-native true bug, *Centrocoris volxemi*, occurred in recent years. This insect is native to the Middle East and Asia and unfortunately, does not have a common name. *Centrocoris volxemi* was first verified via iNaturalist photographs in 2020 followed by physical specimens being to the Utah Plant Pest Diagnostic Lab from Box Elder County in 2021. Further evaluation of online records and field surveys seem to suggest this species is firmly established in parts of Utah and Idaho. Some evidence points to a strong association with Russian thistle (*Salsola tragus*). To date, there is no knowledge of how this true bug arrived in the U.S.



Mating *Centrocoris volxemi* adults found in Utah. Zach Schumm, Utah State University

## Quagga Mussel

In September 2023, the Idaho State Department of Agriculture (ISDA) confirmed the presence of quagga mussel in the Snake River. Quagga mussels are freshwater mollusks, originally from Eurasia, that pose a significant threat to western aquatic ecosystems. They outcompete native mussel populations and disrupt fisheries, hydro-power operations, and municipal water utilities. They are extremely difficult to eradicate due to their ability to quickly spread. This infestation has the potential to cost Idaho hundreds of millions of dollars in actual and indirect

costs. ISDA has taken action by closing off public access to the Snake River between Niagara Springs and Twin Falls. A ten day, copper-based treatment (Natrix) was put into action early October 2023 and is intended to eradicate quagga mussels at all life stages. These findings mark the first time a rapid response plan has been put into action for quagga mussels in Idaho.

## Asian Jumping Worms

Invasive jumping worms have been making many appearances in the news recently due to their ability to flip themselves more than a foot off the ground. These worms go by many names including Alabama jumpers, Jersey wrigglers, wood eel, crazy worms, and snake worms. Generally, these names refer to three similar-looking species: *Amyntas tokioensis*, *Amyntas agrestis*, and *Metaphire hilgendorfi* which all belong to the Megascolecidae earthworm family and originate from eastern Asia. Jumping worms are voracious feeders and alter the soil structure more than any other worm. They feed close to the surface and can quickly consume all of the leaf litter which can be detrimental to native plants and animals. Currently, these worms are known to be in about 30 states in the eastern U.S. and have the potential to continue to spread. Since jumping worms reside in soil, they are often spread in mulch, potting mixes, or even potted plants. Research is ongoing about the best control options.



Jumping earthworm (*Amyntas* sp.), Nancy Knauss, Pennsylvania State University

## Recent U.S. Border Interceptions

- May 2023- Pests were found on a shipment of plastic flowers at the John F. Kennedy International Airport International Mail Facility. The parcel originated from Kenya and contained 630 live insect larvae. The shipment was seized for violating USDA regulations. The species of larvae were not specified.
- May 2023- Two live giant African snails (*Lissachatina fulica*) were intercepted at the Louisville Port of Entry. The snails were inside a parcel arriving from Germany. The snails were intended for direct consumption, but are considered a prohibited organism in the United States due to their health risks to humans and the environment. According to the USDA, giant African snails can carry a parasitic nematode that can lead to meningitis in humans. They also feed on at least 500 types of plants and plaster and stucco, which threatens ecosystems and human structures.
- June 2023- At George Bush Intercontinental Airport, a discovery of an invasive fungus was found in a cargo shipment of pacaya from Guatemala. Pacaya are the edible flowers of date palms and are frequently imported to Houston. In this shipment, the stems were found to be

infected with a species *Colletotrichum* fungus. This pathogen infects a wide variety of hosts, causing plant diseases in important crops worldwide. According to a study by the National Institutes of Health, the *Colletotrichum* genus ranks eighth in the top ten fungal pathogens and can include a range of 29 to 700 species. If the fungi are allowed to establish themselves in the southern U.S., it will affect the production of high-value crops such as citrus fruits, strawberries, mangoes, and avocados.

- June 2023- Khapra beetle (*Trogoderma granarium*) remains were discovered in unaccompanied international baggage at the Detroit Metropolitan Airport. The remains were found in a bag of rice that originated from India. The Khapra beetle is native to South Asia and one of the world's most destructive pests of stored grain products and seeds. This pest has the ability to survive without food for long periods of time, requires little moisture, and is relatively resistant to many insecticides and fumigants. It is also only 0.8 mm in size and can hide in tiny cracks and crevices, adding to its potential for hitchhiking. Previous detections of this tiny beetle have required massive, long-term, and costly control/eradication efforts.

- July 2023- Customs Border Patrol discovered a true bug pest, *Rhabdotebra signata*. This finding is a first-in-port pest, meaning that it has never been detected at any port in the nation. This species, known as a "leafhopper" has never been recorded in the USDA's Pest ID Database. It was found while inspecting a shipment containing betel leaves at the Otay Mesa cargo facility. This pest is native to Central America and can be dangerous to agriculture due to its ability to eat large amounts of leaves and vector many plant diseases.
- Sept 2023- A moth, *Hapigia* sp. (Notodontidae), was intercepted at the Rio Grande City International Bridge import lot. The moth was found during the examination of a tractor trailer floor that was hauling a shipment of coconuts. This was a first-in-port interception according to USDA's Pest ID Database. The entry was canceled and the shipment was rejected and reexported back to Mexico. The moth family Notodontidae, known as prominents, contains more than 3,800 species, many of which are pest species. While they do not feed as adults, the larval form feeds on trees or shrubs often causing noticeable defoliation. This pest is known to occur in Central and South America.



Live insect larvae in a shipment of artificial flowers from Kenya. U.S. Customs and Border Protection



Khapra beetle larva and adult on rice grains. Australia Department of Agriculture, Water and the Environment



*Hapigia* sp. (Notodontidae) found in a coconut shipment from Mexico. U.S. Customs and Border Protection

## REFERENCES AND ADDITIONAL READING

- Alston, D., Spears, L., & Burfitt, C. (2016). Invasive Fruit Pest Guide for Utah Chapter 5: Plum Curculio, Pg. 65-75. Utah State University Extension.
- Blackburn, T. M., Pyšek, P., Bacher, S., Carlton, J. T., Duncan, R. P., Jarošík, V., Wilson, J. R. U., & Richardson, D. M. (2011). A proposed unified framework for biological invasions. *Trends in Ecology & Evolution*, 26(7), 333–339. <https://doi.org/10.1016/j.tree.2011.03.023>
- Breth, D.I., Shaw, M., Fargione, M., Reisinger, R., Eve, J., Hoyin, S.S., Jentsch, P., & Tee, E. (2014). Apple IPM for Beginners, Chapter 10: Plum Curculio, Pg. 28-29. Cornell University Cooperative Extension.
- Farmer, S. (2022, April 22). Invasive Jumping worms can change their world. US Forest Service. <https://www.fs.usda.gov/features/invasive-jumping-worms-can-change-their-world>
- Gersbach, J. (2023). New pest raises concern for oak trees in Oregon. Oregon Department of Agriculture, Oregon Department of Forestry.
- Home—Don't Move Firewood. (n.d.). Don't Move Firewood. Retrieved October 16, 2023, from <https://www.dontmovefirewood.org/>
- Jefferson Exchange Team. (2023, October 4). Oregon braces for yet another tree-killing bug. <https://www.ijpr.org/show/the-jefferson-exchange/2023-10-04/thu-oct-5-oregon-braces-for-yet-another-tree-killing-bug>
- Jumping Worms. (2021, April 2). NH Bugs. <https://www.nhbugs.org/damaging-insects-diseases/jumping-worms>
- Knauss, N. (2023, March 22). Look Out for Jumping Earthworms! <https://extension.psu.edu/look-out-for-jumping-earthworms>
- Lampasona, Timothy, Rodriguez-Saona, Cesar, Leskey, Tracy, & Nielsen, Anne. (2020) A Review of the Biology, Ecology, and Management of Plum Curculio (Coleoptera: Curculionidae), *Journal of Integrated Pest Management*, 11, Issue 1, 2020, 22, <https://doi.org/10.1093/jipm/pmaa018>
- Lienk, S. E., (1980). Tree Fruit IPM, Insect Identification Sheet No. 3, Plum Curculio, *Conotrachelus nenuphar* (Herbst). New York State Agriculture Experiment Station.
- Lockwood, J., Hoopes, M., & Marchetti, M. (2013). *Invasion Ecology* (Second Edition). Wiley-Blackwell.
- Page, M. L., & Williams, N. M. (2023). Honey bee introductions displace native bees and decrease pollination of a native wildflower. *Ecology*, 104(2), e3939. <https://doi.org/10.1002/ecy.3939>
- Ripley, K., & William, W. (2023). Mediterranean Oak Borer *Xyleborus monographus* (Fabr.). Oregon Department of Forestry. U.S. Customs and Border Protection. September 29, 2023. CBP agriculture specialists intercept first in port pest at Rio Grande City Port of Entry.
- Snake River Quagga Mussel—Idaho State Department of Agriculture. (2023, September 19). <https://agri.idaho.gov/main/plants/snake-river-quagga-mussel-veligers/>
- U.S. Customs and Border Protection. August 22, 2023. CBP Discovers Khapra Beetle Remains at Detroit Metropolitan Airport.
- U.S. Customs and Border Protection. August 17, 2023. CBP agriculture specialists discover first-in-nation pest in San Diego.
- U.S. Customs and Border Protection. June 1, 2023. CBP Finds Fungi on Flower Stems.
- U.S. Customs and Border Protection. May 23, 2023. 2 Giant African Snails seized by CBP Agriculture Specialists in Louisville.
- U.S. Customs and Border Protection. May 18, 2023. CBP Agriculture Specialists at JFK Discover Live Larvae Among Plastic Flowers.
- USDA APHIS | Giant African Snail. (n.d.). Retrieved October 16, 2023, from <https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/the-threat/giant-african-snail/giant-african-snail>
- USDA APHIS | Khapra Beetle. (n.d.). Retrieved October 16, 2023, from <https://www.aphis.usda.gov/aphis/resources/pests-diseases/hungry-pests/the-threat/khapra-beetle/khapra-beetle>
- Williamson, M., & Fitter, A. (1996). The Varying Success of Invaders. *Ecology*, 77(6), 1661–1666. <https://doi.org/10.2307/2265769>
- Zesiger, C., Cohen, E., Jarvis, H., Spears, L., & Ramirez, R. (May 2021). Beginner's Guide to Common Native Bees. Utah Pests Fact Sheet. Utah State University. [https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=3213&context=extension\\_curall](https://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=3213&context=extension_curall)

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