



*Invasive Species
2016 Calendar*

Minnesota Invasive Species Advisory Council

Invasive Species Threats to Minnesota

Invasive species are nonnative plants, animals, and pathogens that cause environmental damage, economic loss, or harm to human health. These pests can displace native species, harm habitats, and degrade natural, managed, and agricultural landscapes.

Minnesota is presently battling a number of invasive pests featured in this calendar such as brittle naiad, Japanese barberry, and gypsy moth. There are also many new invasive species that could arrive and cause problems, including golden algae, yellow floating heart, and palmer amaranth.

In addition to harming our natural resources, invasive pests can pose serious economic threats to major Minnesota industries such as agriculture, tourism, and forestry. Some estimates peg the economic damage of invasive pests in the U.S. at more than \$130 billion a year.

Public awareness and action are the keys to preventing the spread of invasive species. Please use the information in this calendar to help inform Minnesotans about the invasive species problem and what they can do to take action in the challenge to reduce invasive species spread and harm.

Information Sources

The Minnesota Invasive Species Advisory Council (MISAC) website provides additional information about invasive species in Minnesota. This website is a gateway to invasive species information including many invasive species profiles, contact information for invasive species experts in Minnesota, and links to other related websites.

MISAC

www.mda.state.mn.us/misac

The following websites of MISAC members also have information about invasive species:

Minnesota Department of Agriculture

www.mda.state.mn.us/plants

Minnesota Department of Natural Resources

www.mndnr.gov/invasives

Minnesota Sea Grant

www.seagrants.umn.edu/ais

U.S. Department of Agriculture-APHIS

www.aphis.usda.gov

U.S. Department of Agriculture-Forest Service

www.fs.fed.us/invasivespecies

U.S. Department of Agriculture-National Invasive Species Information Center

www.invasivespeciesinfo.gov

U.S. Fish and Wildlife Service

www.fws.gov/invasives

Contact information for four agencies with invasive species responsibilities in Minnesota is included on the back of this calendar. These agencies, as well as other MISAC members, can provide informational products such as brochures, species identification cards, and videos about invasive species.



Minnesota Invasive Species Advisory Council

This calendar was produced and distributed by the Minnesota Invasive Species Advisory Council (MISAC). MISAC is a statewide entity that:

- Promotes communication and cooperation among organizations involved in invasive species issues.
- Coordinates outreach on invasive species.
- Supports statewide and multi-state conferences related to invasive species issues.
- Supports trainings and field visits related to invasive species.
- Recognizes outstanding and noteworthy work related to invasive species and encourages such work through the Carol Mortensen Award.
- Advocates for research and management for the species and pathways deemed greatest risk.

MISAC's co-chairs are from the Minnesota Department of Agriculture and USDA-Forest Service. The Council also includes these members: 1854 Treaty Authority, Leech Lake Band of Ojibwe, Minneapolis Park and Recreation Board, Minnesota Association of County Agricultural Inspectors, Minnesota Board of Water and Soil Resources, Minnesota Crop Improvement Association, Minnesota Department of Natural Resources, Minnesota Department of Transportation, Minnesota Forestry Association, Minnesota Nursery and Landscape Association, Minnesota Shade Tree Advisory Committee, National Park Service, Soil and Water Conservation Society-Minnesota Chapter, The Nature Conservancy, Three Rivers Park District, USDA-Animal and Plant Health Inspection Service, USDA-Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Forest Service, University of Minnesota, University of Minnesota Sea Grant Program, and Wildlife Forever.

Cover photo: Yellow floating heart, University of Florida, IFAS Center for Aquatic and Invasive Plants

Help Report Locations of Invasive Species

One of the keys for a rapid response to invasive species is the early identification of new occurrences. Please help report occurrences of invasive species in Minnesota at the following:

- MISAC website at: www.mda.state.mn.us/arrestthepest
- “Arrest the Pest” at: 651-201-MOTH (metro) or 888-545-MOTH (toll free). Please call to report suspicious pest species arriving on plants or articles from foreign countries or other states and for the latest updates on invasive species such as gypsy moth, soybean rust, sudden oak death, Asian longhorned beetle, emerald ash borer, bark beetles, and other destructive insect, plant, and disease pest species.
- DNR Invasive Species Program at: 651-259-5100 (metro) or 888-MINNDNR (toll free) to report invasive aquatic plants or wild animals such as Eurasian watermilfoil, zebra mussels, invasive carp, round goby, nonnative deer, and mute swans.
- Or, as specified for individual species in the invasive species calendar.

MINNESOTA INVASIVE SPECIES REPORTING FORM

Observation Date: _____ Association: _____

Observer's Name: _____ City: _____ State: _____ Zip: _____

Address: _____

Phone: () _____ Email: _____

Species and Location Information

Common Name: _____ Scientific (if known): _____

Locality Name (lake or twosp): _____ County: _____

Site Address (if any): _____ City: _____

Property Ownership (i.e. Private, county, state, federal, etc.): _____



Photo: University of Minnesota, Extension



**Forest Pest
First Detector**

January

Photo: Minnesota Department of Agriculture

What is it?

The Forest Pest First Detector program relies on volunteers for the early detection and reporting of invasive species such as emerald ash borer, gypsy moth, Asian longhorned beetle, and Oriental bittersweet.

The program trains natural resource professionals and master volunteers such as Master Naturalists, Master Gardeners, and Tree Care Advisors on the signs, symptoms, and reporting methods for invasive species that affect or threaten Minnesota's trees and forests. These volunteers may be asked to investigate potential new finds of targeted invasive species.

Minnesota's Forest Pest First Detector program is a part of the National Plant Diagnostic Network and is a partnership between the University of Minnesota (UMN), UMN Extension, MDA, and DNR.

Evidence of success: Forest Pest First Detector volunteers were involved in:

- Minnesota's first emerald ash borer detection in 2009 (St. Paul).
- Minnesota's first gypsy moth caterpillar detection in Duluth.
- Additional new detections of emerald ash borer in Shoreview, Roseville, and elsewhere.
- New detections of Oriental bittersweet at multiple locations.

These finds led to management actions to slow the spread of these potentially harmful species. There are over 700 committed Forest Pest First Detector volunteers across Minnesota and 80% of the state's counties have at least one Forest Pest First Detector.

How can people help?

- Consider becoming a Forest Pest First Detector.
- Learn which terrestrial invasive species are targeted for early detection.
- Report targeted invasive species to MDA at arrest.the.pest@state.mn.us or 888-545-6684.

Further information: Visit z.umn.edu/forestpestfirstdetector.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
					New Year's Day	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
	Martin Luther King Jr. Day					
24	25	26	27	28	29	30
31						



Keys to ID: Leaves: heart-shaped, small (3-10 cm across), float on the water surface and frequently have purplish undersides. Flowers: 2-5 bright yellow flowers arise from erect flower stalks; and each petal has a distinctive fringe along the edges.

Yellow Floating Heart

Nymphoides peltata

February

Photos: University of Florida, IFAS Center for Aquatic and Invasive Plants

Species: Yellow floating heart is a perennial, aquatic, water lily-like plant. It is capable of rapid growth and spread, reproducing by plant fragments and seeds. It has been used for ornamental purposes.

Origin: It is native to temperate Asia and Europe.

Impacts: It grows in dense mats on the water surface, excluding native species and creating stagnant areas with low oxygen levels underneath the mats. The mats can negatively impact recreation such as fishing and swimming, as well as water quality and flow.

Status: It is not established in Minnesota, but documented in a few sites in Wisconsin.

Where to look: It is most commonly found in slow-moving rivers, lakes, and ponds, in 1-12 feet of water.

Regulatory classification (agency): Yellow floating heart is an *unlisted nonnative species* (DNR). It may not be introduced into state waters.

Means of spread: The plant has spread in North America through accidental and intentional releases. Flooding has aided in its dispersal into other waterways.

How can people help?

- Learn to identify yellow floating heart.
- Report new infestations immediately to the DNR or Minnesota Sea Grant.
- Inspect and remove all plant material from boats, trailers, and equipment.
- Look for ornamental alternatives to yellow floating heart.
- Do not plant or dispose of cut or dead plants in or near waters of the state.

Further information: www.dnr.wi.gov/topic/Invasives/fact/YellowFloatingHeart.html

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		Groundhog Day				
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14	15	16	17	18	19	20
Valentine's Day	Presidents' Day					
21	22	23	24	25	26	27
28	29					



Photo: Don Breneman, University of Minnesota

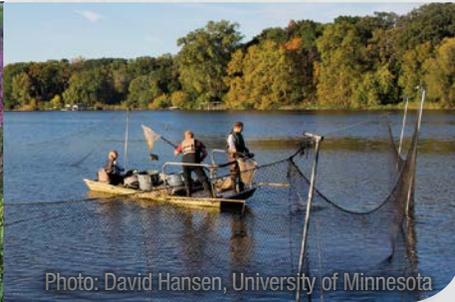


Photo: David Hansen, University of Minnesota

**Invasive Species
Research
Centers**

March

Photo: Mississippi River. Regents of the University of Minnesota.
Used with the permission of the Metropolitan Design Center.

What is it? The Minnesota Aquatic Invasive Species Research Center (MAISRC) and the Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC) were established at the University of Minnesota in 2012 and 2014, respectively, with funding from the Minnesota legislature. Both centers were created to research and develop ecologically and economically sound measures to prevent or minimize threats posed by invasive species.

The number of species that have or might invade Minnesota is large. Both centers work with stakeholders to develop risk and needs assessments to set research priorities, and will respond to changing conditions or research discoveries.

Who? The College of Food, Agricultural and Natural Resource Sciences oversees both centers. The centers draw relevant expertise from faculty throughout the University, but especially the departments of:

- Agronomy and Plant Genetics
- Applied Economics
- Bioproducts and Biosystems Engineering
- Ecology, Evolution, and Behavior
- Entomology
- Fisheries, Wildlife, and Conservation Biology
- Forest Resources
- Horticultural Science
- Plant Biology
- Plant Pathology
- Sea Grant Program
- Veterinary Population Medicine

Partners outside the University are vital to the success of both centers.

Key partners for MAISRC include:

- Minnesota Department of Natural Resources
- Watershed districts
- Lake associations

Key partners for MITPPC include:

- Minnesota Department of Agriculture
- Minnesota Department of Natural Resources
- Minnesota Department of Transportation
- Minnesota Board of Water and Soil Resources
- USDA Forest Service

Further information: www.maisrc.umn.edu and www.mitppc.umn.edu

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13	14	15	16	17	18	19
Daylight Saving Time Begins				St. Patrick's Day		
20	21	22	23	24	25	26
Spring Begins						
27 Easter	28	29	30	31		



Photo: Denny Behr, Minnesota Department of Natural Resources

Zebra mussels on aquatic plants.



**Boat Trailer
Pathway**

April

Photo: Deborah Rose, Minnesota Department of Natural Resources

Example species that can be transported by trailers: Eurasian watermilfoil, curly-leaf pondweed, zebra and quagga mussels, and spiny waterflea.

Impacts: These invasive species can outcompete and displace native species and harm swimming, boating, fishing, and other water recreation. Some of them can interfere with water supply and distribution infrastructure.

Where to look: Drain water from your trailer and inspect all its parts. Pay close attention to bunks, rollers, axles, and joints, especially under the boat. Also look near the winch post and wiring for attached plants or animals. In addition to inspecting, cleaning, and draining your boat and trailer, remember to do the same with fishing gear, bumpers, ropes, and anchors.

Relevant regulations (agency): Trailers must be free of aquatic invasive species and drained of water before transporting (DNR). Businesses that install, remove, decontaminate, or rent water-related equipment like trailers must be trained and permitted by the DNR to legally provide services.

Means of spread: Plant fragments get tangled and transported with trailers. Seeds and small/larval invasive species can be spread through residual water.

How can people help?

- Inspect trailers for invasive species; remove all plants and mud that could harbor invasive species and drain water before transporting.
- Check the DNR website to make sure the lake service provider company you hire is permitted.
- If you are a lake service provider business, be sure to get trained and permitted.

Further information:

- Prevention measures: www.mndnr.gov/invasives
- Lake Service Provider information: www.mndnr.gov/lsp

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17	18	19	20	21	22	23	
24	25	26	27	28	29	30	
					Earth Day	Passover Begins	
					Arbor Day		



**Keys to ID for
Cerceris wasp:**

- ½-¾ inches long.
- Dark, smoky brown wings.
- One cream/yellow band on second segment of abdomen.
- Female has three large cream/yellow spots on face.



Keys to ID for *Cerceris* nests:

- Ground nests in compacted, sandy soil.
- Nest openings are round with a diameter of a pencil.
- Nest opening is surrounded by a mound of excavated soil, much like an ant hill.
- Hole often tucked beside or under grass or plants.
- Within 200 yards of wooded area or stand of trees.



Biosurveillance

May

Biosurveillance—*Cerceris* wasps to detect emerald ash borer

Species: Smoky winged beetle bandit, *Cerceris* wasp *Cerceris fumipennis*

What is it? The term biosurveillance describes the use of one species to monitor for the presence of another species, in this case, with the help of a harmless, ground-nesting wasp.

The smoky winged beetle bandit, *Cerceris fumipennis*, naturally preys on metallic wood boring beetles, including the invasive emerald ash borer. The female wasp stocks an underground nest with beetles as food for her offspring and will capture emerald ash borer when it is present. Wasp Watcher volunteers can observe wasp nests in their communities and collect some of their beetle prey for identification. If emerald ash borers are in the area, the *Cerceris* wasp may retrieve one for us!

Evidence of success: Many other states and Canadian provinces engage volunteers in Wasp Watcher programs. Volunteers monitoring *Cerceris* wasp nests were responsible for detecting emerald ash borer in Connecticut. Volunteers can help survey sites across Minnesota.

Related regulations (agency): Several counties in Minnesota are *quarantined* for emerald ash borer (MDA). See www.mda.state.mn.us/eab for affected counties. No unprocessed ash material or any hardwood firewood may be moved out of these counties.

How can people help?

- Become a Wasp Watcher and get involved in emerald ash borer detection.
- Scout out new *Cerceris* nesting sites at your community's ballfields.
- Monitor known *Cerceris* sites and collect beetles.
- Report findings to the Wasp Watchers website.

Further information: Visit z.umn.edu/waspwatchers or www.cerceris.info

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Mother's Day							
	15	16	17	18	19	20	21
							Armed Forces Day
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	29	30	31				
		Memorial Day					



Photos: Graves Lovell, Alabama Department of Conservation and Natural Resources, Bugwood.org

Keys to ID: Rooted plants form dense, underwater mats and produce shoots up to 3 feet long. Leaves are opposite with 7-15 small teeth along leaf margin.

Brittle Naiad

Najas minor

June

Photo: Nancy Loewenstein, Auburn University, Bugwood.org

Species: Brittle naiad is a rooted submersed annual aquatic plant. Its shoots grow to the water surface.

Origin: It is native to Europe and Asia.

Impacts: It forms dense underwater mats that outcompete native plants and can interfere with recreational activities such as boating, swimming, waterfowl hunting, and fishing.

Status: Brittle naiad has spread to Ontario, Canada, and the eastern and southeastern United States. It has only been reported in a few lakes in Minnesota.

Where to look: It grows in ponds, lakes, reservoirs, slow-moving streams, rivers, and canals. It can grow in waters less than 16 feet deep. It can live in turbid and high nutrient conditions.

Regulatory classification (agency): It is a *prohibited invasive species* in Minnesota (DNR).

Means of spread: Plants easily break into pieces which can establish in new locations. Plant fragments can spread by “hitchhiking” on watercraft, motors, trailers, and field gear. Seeds may spread in contaminated mud on field gear.

How can people help?

- Learn to identify brittle naiad.
- Clean off aquatic plants and mud from watercraft, motors, trailers, and field gear before leaving the water access.
- Do not release plants from aquariums and water gardens into the environment.
- Report sightings to the DNR or Minnesota Sea Grant.

Management information: Herbicide and mechanical removal can be effective. Herbicide treatment requires a permit. No biological control is known at this time.

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			Flag Day				
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Father's Day	Summer Begins						
26	27	28	29	30			



MINNESOTA DEPARTMENT OF TRANSPORTATION

Minnesota Noxious Weeds

Includes look-alike species for comparison



Icons: bus, train, truck, airplane, car, bicycle, wheelchair, pedestrian

This is a blue informational sign for Minnesota Noxious Weeds. It features the state logo at the top, a large photo of a thistle, and a section with three smaller images of look-alike species. At the bottom, there are icons for various transportation modes: bus, train, truck, airplane, car, bicycle, wheelchair, and pedestrian.



Roadsides
Pathway

July

Terrestrial invasive plants exploit the unique environment that occurs along roadsides, areas with frequent disturbance, altered hydrology, and high salt content. This linear habitat cuts across landscapes, allowing invasive plants to spread through otherwise inaccessible areas into adjacent lands and displace existing native vegetation.

Roadsides are also ideal places to notice new invasive species and control them before they can cause more harm. The Minnesota Department of Transportation (MnDOT) has helped with early detection and control of several invasive plants, including meadow knapweed, Oriental bittersweet, and Dalmatian toadflax. MnDOT is working to further reduce the spread of invasive plants and has produced a field guide (see web address below) to raise awareness about noxious weeds.

Impacts: Invasive plant species on roadsides can reduce visibility, obstruct drainage, and increase erosion. Weeds spread onto adjacent lands where they can have large scale impacts in natural and agricultural landscapes.

Means of spread: Seeds and plant fragments are spread by mowing, haying, shouldering, ditch cleanouts, culvert repairs, grading, construction, utility work, and even with airflow created by traffic.

How can people help?

- Watch for invasive plants on roadsides, especially for new or unfamiliar species, and report sightings on the Early Detection & Distribution Mapping System (EDDMaps) at www.eddmaps.org.
- Ask permission before haying roadsides to avoid interfering with weed control efforts.
- Work to reduce weed spread during construction and maintenance activities.

Further information: Minnesota Noxious Weed Field Guide: www.dot.state.mn.us/roadsides/vegetation/pdf/noxiousweeds.pdf or purchase at mnbookstore.com

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	Independence Day						
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31							



Photo: University of Illinois



Photo: University of Illinois

Keys to ID:

- Palmer amaranth looks similar to native pigweeds such as common waterhemp, redroot, and smooth pigweeds.
- Seedhead spikes on Palmer amaranth are much taller (up to 3 feet) and more prickly than waterhemp or redroot and smooth pigweed spikes.
- Redroot and smooth pigweeds have fine hairs on their stems and leaves. Palmer amaranth and waterhemp do not have these hairs.
- Leaves are oval to diamond-shaped with a small, sharp spine at the leaf tip.
- The petiole (leaf stalk) is longer than the length of the leaf. For common waterhemp, the petiole is half the length of the leaf.

**Palmer
Amaranth**
Amaranthus palmeri

August

Species: Palmer amaranth is a flowering annual plant.

Origin: It is native to southwestern United States and northwestern Mexico.

Impacts: Palmer amaranth competes aggressively with crops by growing up to 2-3 inches per day, commonly reaching heights of 6-8 feet and inhibiting nearby crop growth. It can be herbicide resistant and cause crop losses.

Status: It is documented in 28 states including neighboring South Dakota, southern Iowa, and southern Wisconsin. It has not been documented in Minnesota.

Where to look: Look in crop fields and their borders, ditches, and around dairies.

Regulatory classification (agency): Palmer amaranth is a *prohibited noxious weed* on the eradicate list (MDA). All of the above and below ground parts of the plant must be destroyed. Additionally, no transportation, propagation, or sale of these plants is allowed, with limited exceptions.

Means of spread: Female plants are prolific seed producers. Seed can be spread in moving water, by wildlife, and by agricultural practices such as moving equipment, harvesting crops, and spreading manure—especially from cottonseed meal feedstocks in dairies.

How can people help? Report suspected Palmer amaranth to MDA at arrest.the.pest@state.mn.us or 888-545-6684.

Management information: Palmer amaranth is difficult to control because it can be resistant to multiple classes of herbicides with different modes of action. Visit www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/palmeramaranth.aspx.

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28	29	30	31			



**Seaplane
Pathway**

September

Photo: Pat Conzemius, Wildlife Forever

Species: Seaplanes may move zebra mussels, Eurasian watermilfoil, curly-leaf pondweed, and invasive snails from one water body to another.

Impacts: These animals and plants outcompete and displace native species, threatening Minnesota's waters. Some of these invaders interfere with water supply systems and can make waters less suitable for swimming, boating, or fishing.

Where to look: Look for and remove plants, animals, and mud from pontoons, chine, transom, cross members, wires or cables, wheel wells, and rudders.

Regulatory classification

(agency): Transport of aquatic plants, prohibited invasive species, and water is prohibited (DNR).

Means of spread: Plant fragments can snag on pontoons, chine, or wires and cables. Zebra mussels and invasive snails can attach to pontoons if moored on infested waters for more than a day.

How can pilots help?

- Inspect and clean off plants, animals, and mud.
- Pump water from floats prior to take-off.
- Raise and lower rudders several times to dislodge aquatic plant fragments over land.
- Spray with hot and/or high-pressure water, or dry everything for at least five days between flights.

Further information: Visit the Aquatic Nuisance Species Task Force website at www.anstaskforce.gov/documents.php and see "Voluntary Guidelines to Prevent the Introduction and Spread of Aquatic Invasive Species: Recreational Activities."

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	Labor Day						
11	12	13	14	15	16	17	
Patriot Day							
18	19	20	21	22	23	24	
				Autumn Begins			
25	26	27	28	29	30		



Photo: Minnesota Department of Agriculture

Keys to ID: Leaves: purple to green, small, and rounded.
Stems: numerous single spines. Fruit: small, bright red, and oblong.

**Japanese
Barberry**
Berberis thunbergii

October

Photo: Minnesota Department of Agriculture

Species: Japanese barberry is a woody ornamental shrub; there are many cultivars.

Origin: It is native to Japan and eastern Asia.

Impacts: Japanese barberry increases nitrogen and pH levels in the soil beneath the plant, making the site more favorable for its growth. It can form dense thickets which can crowd out native species. The thick understory of Japanese barberry can create conditions that are favorable to mice that harbor black deer ticks, possibly resulting in more cases of tick borne diseases.

Status: Wild plants have been found in eastern Minnesota.

Where to look: Look for Japanese barberry in wooded understory; adapted to many soil types and light levels.

Regulatory classification

(agency): The 25 seediest cultivars of Japanese barberry are listed as *specialty regulated plants* (MDA) until December 31, 2017 to give sellers time to phase them out of production. Beginning January 1, 2018, these 25 cultivars and the parent species will become *restricted noxious weeds* (MDA), meaning that they cannot be sold in the state. Regulations do not require the removal of existing ornamental plantings or other Japanese barberry plants.

Means of spread: Japanese barberry is a widely planted landscape plant. The seeds are spread by birds. Plants spread vegetatively when branches have contact with soil.

How can people help? Report Japanese barberry plants outside of cultivation to MDA at arrest.the.pest@state.mn.us or 888-545-6684.

Further information: Visit www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/japanesebarberry.aspx

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	Rosh Hashanah							
9	10	11	12	13	14	15		
	Columbus Day		Yom Kippur					
16	17	18	19	20	21	22		
	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Upper Midwest Invasive Species Conference October 17-19 La Crosse, WI </div>							
23	24	25	26	27	28	29		
30	31							
	Halloween							



Photo: Gary Southard, Texas Parks and Wildlife

A golden algae cell. Blooms cause waters to turn yellowish, yellowish-copper, or brownish tea color. Foaming may occur at the water surface when there is wave action; however, foaming can be caused by natural factors. Toxins released cause fish to asphyxiate (lack of oxygen). Sick fish cough excessively or are listless. Blooms may last for days, weeks, or may occur just a couple of times a year.

Healthy habitat that could be affected by golden algae blooms.

Golden Algae
Prymnesium parvum

November

Photo: Laura Van Riper,
Minnesota Department of Natural Resources

Species: Golden algae are single celled organisms.

Origin: Golden algae are found on every continent except Antarctica, mostly in coastal marine waters, but this species can also thrive in freshwater.

Impacts: Golden algae release toxins that kill fish and clams. Healthy fish caught from infested waters are safe to eat; however, people should not handle dead or dying fish. Toxins are not threats to humans or animals that drink contaminated water.

Status: First found in Texas in 1985, it is now reported in 15 states. It has not been found in Minnesota or other Midwest states.

Where to look: Look in lakes, rivers, and streams. Blooms occur when temperatures rise above 50°F, usually between 65-85°F.

Regulatory classification (agency): Golden algae are not regulated. However, transport of surface water is regulated (DNR). Felt-soled waders, another way golden algae might spread, are not regulated in Minnesota, but are prohibited in several states.

Means of spread: It likely spreads through connected waterways, contaminated water in ballasts, livewells, and bait buckets, and on gear including waders.

How can people help?

- Drain water from ballast tanks, bilge, livewell, and bait bucket *before leaving the access.*
- Use slip-resistant alternatives to felt-soled waders.
- If using felt-soled waders in waters with golden algae, don't use them in Minnesota waters.
- Rinse equipment with hot water or dry for at least 5 days.
- Report fish kills to a local DNR Fisheries office.

Further information: Contact DNR Invasive Species Program or visit www.dnr.state.mn.us/invasives/felt.html

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6	7	8	9	10	11	12
Daylight Saving Time Ends		Election Day			Veterans Day	
13	14	15	16	17	18	19
20	21	22	23	24	25	26
				Thanksgiving		
27	28	29	30			

Example species that can be transported through internet trade:

- Jumping earthworms (*Amyntas* genus) in orders of composting worms or as soil contaminants
- Thousand cankers disease in walnut wood
- Hydrilla (*Hydrilla verticillata*) contaminating an order of an ornamental aquatic plant



**Internet Trade
Pathway**

December

Photo: Minnesota Department of Agriculture

Where to look: Invasive species can be introduced through products you order online. Websites may offer living organisms for sale, including plants and animals that are invasive in Minnesota. Invasive organisms also could be unintentionally included in shipments of other items ordered online.

Impacts: If released into the environment, invasive species can cause detrimental effects: aquatic invasive species can outcompete native species and make water bodies less suitable for recreation such as boating, swimming, and fishing; earthworms destroy the forest's ground layer; and thousand cankers disease kills walnut trees.

Regulation: It is illegal to possess, transport, or release many invasive species in Minnesota. The DNR regulates aquatic invasive species and MDA regulates terrestrial invasive plants and plant pests.

How can people help?

- Don't purchase invasive species. Buy native species whenever possible.
- If you notice invasive plants or animals for sale online, ask the retailer to provide non-invasive alternatives and to advise buyers on the legal status of the species in our state.
- Inspect online purchases for invasive species that may be contaminating your order.
- Do not buy walnut wood unless you know where it came from. If the wood comes from a state where thousand cankers disease is present, contact MDA to find out how to move it safely.

Further information:

- Invasive earthworms: www.nrrf.umn.edu/worms
- Thousand cankers disease: thousandcankers.com
- Great Lakes Commission, aquatic invasive species via internet sales: glc.org/projects/invasive/internet-trade-ais

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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25 Christmas Hanukkah Begins	26 Kwanzaa Begins	27	28 Winter Begins	29	30	31 Christmas Eve New Year's Eve

For information about invasive species in Minnesota, contact:

Aquatic Plants and Animals

Minnesota Department of Natural Resources
Invasive Species Program 651-259-5100
U.S. Fish and Wildlife Service 612-713-5114
University of Minnesota Sea Grant Program 218-726-8712

Terrestrial Plants and Insects

Minnesota Department of Agriculture
Invasive Species Program 651-201-6328

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Forest Pest First Detector



Yellow Floating Heart

Nymphoides peltata



Invasive Species Research Centers



Boat Trailer Pathway



Biosurveillance



Brittle Naiad

Najas minor



Roadsides Pathway



Palmer Amaranth

Amaranthus palmeri



Seaplane Pathway



Japanese Barberry

Berberis thunbergii



Golden Algae

Prymnesium parvum



Internet Trade Pathway