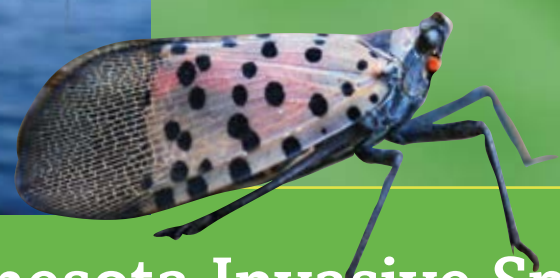




INVASIVE SPECIES

2017 Calendar



Minnesota Invasive Species Advisory Council

INVASIVE SPECIES THREATS

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 zebra mussels, starry stonewort, and nonnative bush honeysuckles. There are also new invasive species that could arrive and cause problems, including spotted lanternfly and hydrilla.

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 |
| University of Minnesota Sea Grant Program | 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.



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 cochairs are from the Minnesota Department of Agriculture and University of Minnesota Sea Grant. 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, St. Croix River Association, 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.

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: 888-545-6684 (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.
- EDDMapS Midwest website or Great Lakes Early Detection Network app at: www.eddmaps.org/midwest
- Or, as specified for individual species in this calendar.

Cover photos: Spotted lanternfly nymphs by Sven-Erik Spichiger, Pennsylvania Department of Agriculture, Bureau of Plant Industry. Hydrilla in hand by Robert Vidéki, Doronicum, Kft. Bugwood.org. Bush honeysuckle berries by Monika Chandler, Minnesota Department of Agriculture. Spiny waterflea photo by Jeff Gunderson.

Back cover photos: April—jumping worm by Josef Gorres, Plant and Soil Science Department, University of Vermont. October—bush honeysuckle berries by Monika Chandler, Minnesota Department of Agriculture. November—spiny waterflea by Jeff Gunderson.

Other photo credits are listed within the calendar.

INVASIVE PLANT EARLY DETECTION




Photo: Conservation Corps Minnesota

EVIDENCE OF SUCCESS:

- Initial treatments of noxious weeds in nine counties.
- New detections of *Prohibited Noxious Weeds on the Eradicate List* in Chisago, Cook, Fillmore, Houston, Olmsted, St. Louis, Wabasha, and Winona counties.
- Treatment of over 1,360 acres in 2014 and 2015.

Conservation Corps Minnesota youth crews pulling Grecian foxglove at Afton State Park

JANUARY

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

What is it?

Beginning in 2013, the Minnesota Department of Agriculture, Conservation Corps Minnesota, and University of Minnesota Extension received funding through the Environment and Natural Resources Trust Fund, as recommended by the Legislative-Citizens Commission on Minnesota's Resources, for the *Elimination of Target Invasive Plant Species* (ETIPS) project. The funding supports outreach and education, survey and monitoring, and control of target noxious weeds on the eradicate list.

Through the grant, project partners work across property boundaries to treat noxious weed infestations on public and private lands. Landowner agreements are set up that identify the species that will be treated, approximate area of infestation, and treatment timing. The grant covers the cost of the initial treatment as well as subsequent follow-up work.

Target plants include: Black swallow-wort, brown and meadow knapweeds, cutleaf and common teasels, Dalmatian toadflax, Grecian foxglove, Japanese hops, and Oriental bittersweet.

Additionally, project collaborators work to eradicate target species on roadsides, public lands, and private lands which are often adjacent to infestations being treated through ETIPS.

How can people help?

Report targeted invasive species to MDA at arrest.the.pest@state.mn.us or 888-545-6684.

Further information:

- Minnesota's Noxious and Invasive Weed Program: <http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol.aspx>
- *Elimination of Target Invasive Plant Species* project: <http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/targetplants.aspx>



Photos: Minnesota Department of Natural Resources

ZEBRA MUSSEL CONTROL IN CHRISTMAS LAKE

FEBRUARY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2 Groundhog Day	3	4
5	6	7	8	9	10	11
12	13	14 Valentine's Day	15	16	17	18
19	20 Presidents' Day	21	22	23	24	25
26	27	28				

Early detection and response

Zebra mussels were first discovered in Christmas Lake (Hennepin County) in August 2014 through an early detection monitoring program. Initial surveys suggested the infestation was small and localized near a public boat ramp, prompting a response from local and state partners.

From September 2014 through July of 2015, enclosed portions of Christmas Lake were treated with three different molluscicides (Zequanox®, EarthTec QZ® and muriate of potash) to control the invasive mussel.

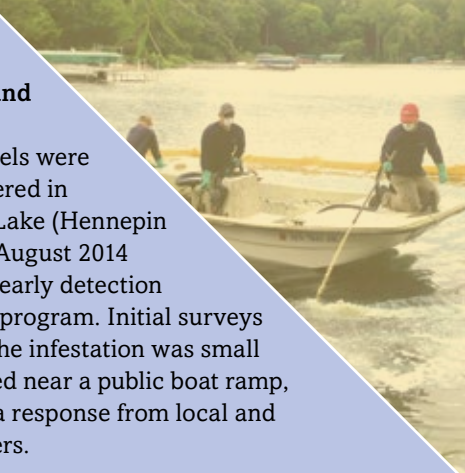
First time treatments and monitoring

This was the first time these products had been used in Minnesota lakes for zebra mussel control. Pesticide treatments were monitored for effectiveness via in-lake and laboratory experiments. Zebra mussel mortality within each treatment zone was 100%. Unfortunately, in the fall of 2015, 16 additional zebra mussels were found outside the treated areas.

Lessons learned

Efforts to control zebra mussels in Christmas Lake highlight challenges in partial-lake control efforts. While preventing the lakewide establishment of zebra mussels was not successful, treatments within contained areas were.

Lessons learned include information on new products for pesticide control of zebra mussels, creation of pesticide treatment monitoring protocols, importance of treatment design and the need for effective cooperation among partnering agencies in conducting a response.





SPOTTED LANTERNFLY

Lycorma delicatula



KEYS TO ID:

- A brightly-colored insect with black-spotted forewings; red, black and white hindwings; and yellow along the sides of the abdomen.
- Nymphs are black with white spots, but as they grow, red patches develop in addition to the white spots.

Cut-out photo: Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org.
All other photos: Sven-Erik Spichiger, Pennsylvania Department of Agriculture, Bureau of Plant Industry.



MARCH

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
Daylight Saving Time Begins					St. Patrick's Day	
19	20	21	22	23	24	25
	Spring Begins					
26	27	28	29	30	31	

Species:

Spotted lanternfly is a planthopper in the family Fulgoridae.

Origin: It is native to northern China.

Impacts: Spotted lanternfly is known to feed on more than 70 species, including cultivated grapes, fruit trees and hardwoods. Adults and nymphs feed on phloem tissue of young plant stems. Extensive feeding causes wounds on the trunk and wilting and death of branches. While feeding, they produce honeydew which can lead to the growth of large amounts of sooty mold.

Status: It was first detected in Pennsylvania in 2014. It has not been found in Minnesota.

Where to look: Spotted lanternflies congregate in large numbers on host plants. The best time to spot them is at dusk as they move up and down the trunk of their host. Egg masses are found on the trunks of host plants and on other smooth surfaces, including outdoor items.

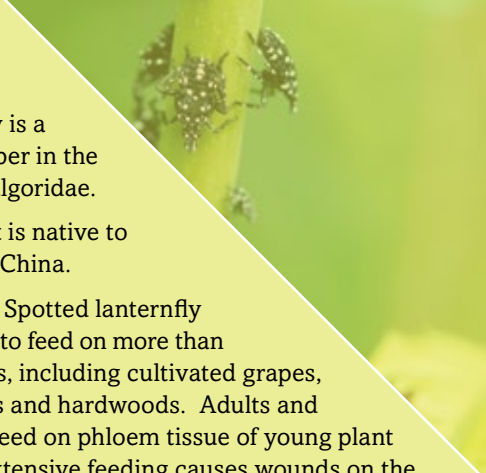
Regulatory classification: Currently, it is not regulated by the USDA. The Pennsylvania Department of Agriculture quarantined several areas in several counties to restrict the movement of articles that could harbor the insect (such as yard waste, firewood, and outdoor items like lawnmowers and deck chairs).

Means of spread: Spotted lanternflies can jump or fly short distances, but they spread long-distances by people moving infested plant material or items containing egg masses.

How can people help?

- Inspect and clean outdoor items being transported that could harbor egg masses.
- Report suspect insects to MDA at arrest.the.pest@state.mn.us or 888-545-6684.

Further information: Visit www.agriculture.pa.gov/Protect/PlantIndustry/spotted_lanternfly



JUMPING WORMS

Amyntas



Photo: Josef Gorres, Plant and Soil Science Department,
University of Vermont

KEYS TO ID:

- Look for the unique soil texture of worm castings.
- Worms are very active, move like snakes, and secrete yellow mucus when agitated.
- Can drop its tail, which continues to flail wildly, when disturbed.
- Clitellum (ring on body) present on adults is close to the head, milky pink, encircles whole body evenly, and is barely raised above the skin.
- Setae (tiny hairs used to move) are evenly spaced around the entirety of each segment, not in pairs or concentrated on bottom or sides.

APRIL

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10 Passover Begins	11	12	13	14	15
16 Easter	17	18	19	20	21	22 Earth Day
23	24	25	26	27	28	29
30					Arbor Day	

Species:
Amyntas
species.

Origin: Jumping worms are native to East Asia (Korea and Japan).

Impacts: Jumping worms eat leaf litter and alter soil structure and chemistry dramatically, damaging forest understory habitat. The presence of jumping worms facilitates spread of invasive plant species by removing leaf cover for slower-developing native plants. Jumping worms leave a distinctive soil of worm castings (feces). These round pellets coat the ground and tend to erode very easily even in moderate rain.

Status: Jumping worms have been documented in Minnesota and other Great Lakes states as they move west and north from the southeastern U.S.

Where to look: They prefer flowerbeds, mulch, and compost piles, as well as logs and other shady, moist areas. Jumping worms live within the first couple inches of soil.

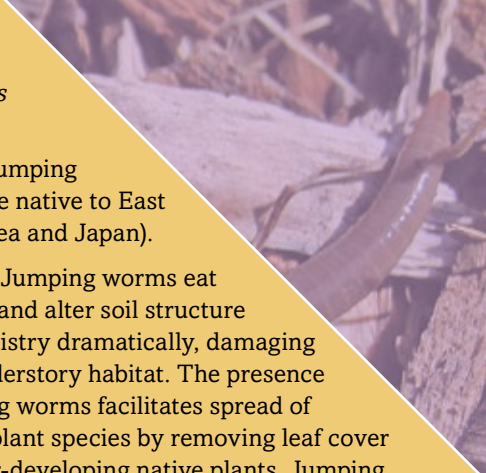
Regulatory classification: Jumping worms are not currently regulated in Minnesota.

Means of spread: Worms and worm cocoons can be spread as contaminants in composting worm shipments, fishing bait, and the movement of mulch, compost, plants, topsoil, and equipment.

How can people help?

- Report sightings to Great Lakes Worm Watch at www.nrri.umn.edu/worms/
- Do not use for bait. Jumping worms can live underwater for up to three weeks. Bait escapees can begin new populations around popular fishing lakes.
- Do not transport bulk topsoil or compost from infested areas, and wash equipment when moving between them.

Further information: Visit Great Lakes Worm Watch at www.nrri.umn.edu/worms/



STARRY STONEWORT

Nitellopsis obtusa



Photos: Paul Skawinski, University of Wisconsin, Steven's Point



KEYS TO ID:

- Main stem can be over 2 yards long with whorls of 4-8 leaflike branchlets.
- Branchlets can be several inches long.
- Small white starlike bulbils grow at nodes along stems in late autumn and in sediments on clear threads.
- Unlike native muskgrasses (*Chara* species), stems are smooth and usually bright green (unless covered with mineral deposits) and its musky or garlic odor is less pronounced.

MAY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
Mother's Day						Armed Forces Day
21	22	23	24	25	26	27
28	29	30	31			
	Memorial Day					

Species:

Large, rooted submerged alga which resembles native plantlike algae species and vascular plants. Starry stonewort produces small bulbs ("bulbils" or "stars") for which the plant is named.

Origin: It is native to Europe and Asia.

Impacts: Starry stonewort can form mats as thick as 7 feet. Mats can interfere with boating, swimming, and other activities on lakes. Dense starry stonewort also may alter environmental conditions and affect fish and wildlife.

Regulatory classification (agency): Starry stonewort is a *prohibited invasive species* (DNR). Minnesota law prohibits transport of water and aquatic "macrophytes" (plants and large algae), without a permit (DNR).

Where to look: Look for starry stonewort in lakes and slow-moving areas of rivers. It thrives in shallow and deep waters with soft substrates and tolerates a wide range of temperatures, light, pH, and conductivity.

Status: It was first found in the St. Lawrence River in 1978. It spread to inland lakes in Michigan, northern Indiana, Wisconsin, and the northeastern U.S. In Minnesota, it was found in Lake Koronis (Stearns County) in August 2015.

Means of spread: Small bulbs and plant fragments spread by water currents and by clinging to watercraft, docks, boat lifts, and anchors. Bulbils remain viable in lake sediments for years. Only male specimens have been documented in the U.S., so it does not spread by sexual reproduction.

How can people help?

- Clean all aquatic plants, animals, and mud from watercraft, trailer, motor, dock, lift, and anchor.
- Drain water from water-related equipment including drain plugs.
- Report sightings to the DNR or Minnesota Sea Grant.

Further information: Contact the DNR Invasive Species Program or Minnesota Sea Grant.



FLOWERING RUSH

Butomus umbellatus

Photos: Dick Hecock, Pelican River Watershed District



Lake after treatment.

KEYS TO ID:

- Leaves are erect and swordlike with a triangular shape.
- Leaves grow out of stout, fleshy root rhizomes.



JUNE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14 Flag Day	15	16	17
18 Father's Day	19	20	21 Summer Begins	22	23	24
25	26	27	28	29	30	

Species:

Flowering rush usually grows as an emergent aquatic perennial plant, resembling a large sedge. It also can grow as a submersed plant. Flowering rush occurs as two types, one that flowers regularly and produces viable seed and a second that flowers occasionally, but the flowers are sterile and so do not produce seed.

Origin: It is native to Africa, Asia, and Europe. It was imported to the United States intentionally by the horticulture industry.

Impacts: Dense stands of flowering rush may impede water recreational activities.

Status: Flowering rush has spread from a limited area around the Great Lakes and the St. Lawrence River, and appears in the northern U.S. and southern Canada. It is known to be present in over 30 bodies of water in Minnesota.

Where to look: It grows along lake shores, wetlands, slow moving streams, rivers, and ditches.

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

Means of spread: Disturbing plants can cause fleshy root rhizome buds to break off. Rhizome buds and other plant parts can easily be dispersed by water currents and human activities, forming new plant populations. The type that produces viable seed can spread by seed.

How can people help?

- Learn to identify flowering rush.
- Remove aquatic plants and mud from watercraft, motors, trailers, and equipment.
- Report sightings to the DNR.

Management information: Herbicide treatments can be effective. A permit is required prior to herbicide application. Mechanical cutting and hand pulling is not recommended because they can create rhizome fragments which can establish new populations. Effective biological control is not known at this time.

NARROWLEAF BITTERCRESS

Cardamine impatiens



Photo: Monika Chandler, Minnesota Department of Agriculture



Photos: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

KEYS TO ID:

- An important differentiation from other plants can be found at the point where leaves attach to stems; look for narrow pointed ears or auricles that grasp and may extend beyond stems.
- Small (0.1 inch), white 4-parted flowers. White petals may not be present.
- First year rosette leaves have rounded lobes, leaves on second year plants are more pointed.

JULY

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 Independence Day	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Species: An herbaceous annual or biennial plant. A plant may bloom in its first season (annual), but typically dies back to the ground to return the second year (biennial) with a 6- to 30-inch flowering stalk, thus completing its life cycle.

Origin: Narrowleaf bittercress was introduced to North America by unknown pathways from Eurasia. First reports in the U.S. were from New England in 1916. Minnesota first reported narrowleaf bittercress in 2008. Within a year, reports were made in several counties.

Impacts: Narrowleaf bittercress is a strong competitor that reduces species diversity and habitat quality by excluding desirable native vegetation.

Status: Several metropolitan counties in Minnesota have reported infestations.

Where to look: This shade tolerant plant is invading the herbaceous layer of moist woodlands and forests along rivers.

Regulatory classification (agency): Narrowleaf bittercress is a *Prohibited Noxious Weed on the Control List* (MDA). Landowners are required to prevent the spread, maturation, and dispersal of any propagating parts (seeds). The sale and transportation of narrowleaf bittercress (except for disposal at an approved site) is prohibited.

Means of spread: It spreads by seed, like other members of the mustard family. Individual plants can produce thousands of seeds from slender seed pods known as *siliques*. Individual siliques burst open at maturity, spreading an average of 10-24 seeds a short distance. Seeds are easily spread by human activities.

How can people help?

Report narrowleaf bittercress plants to MDA at arrest.the.pest@state.mn.us or 888-545-6684.

Further information:

www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist/bittercress.aspx



Photo: Minnesota Department of Agriculture

◀ DIFFUSE KNAPWEED

Centaurea diffusa



Photo: Ron Vanderhoff

◀ RUSSIAN KNAPWEED ▶

Acroptilon repens



Photo: Ron Vanderhoff

Spotted knapweed



Photo: Minnesota Department of Agriculture

KEYS TO ID:

- Flower color can range from white to pink to purple for all of these species.
- Distinguish species by the flower bracts found below the petals.
- Diffuse knapweed bracts are fringed, but do not have brown tips.
- Russian knapweed bracts do not have fringe or brown tips.
- Spotted knapweed bracts are fringed and have brown tips.

Both of these early detection invasive knapweeds look similar to spotted knapweed, an abundant invasive species.

AUGUST

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Species:

Both are herbaceous plants.

Origin:

Diffuse knapweed is native to the eastern Mediterranean while Russian knapweed is native to central Asia.

Impacts: These knapweeds can overtake grasslands which reduces species diversity, forage, and wildlife habitat. Russian knapweed is toxic to horses.

Status: There is one documented infestation of diffuse knapweed in Duluth, and one of Russian knapweed in Lac qui Parle County.

Where to look: Look for these knapweeds in grasslands and disturbed areas.

Regulatory classification (agency): Both species are recommended to be *Prohibited Noxious Weeds on the Eradicate List* (MDA) pending approval of the commissioner of agriculture. Above and below ground plant parts must be destroyed and propagation, sale, and transportation (except for disposal at an approved site) is prohibited.

Means of spread: Diffuse knapweed spreads by seed. Dried plants with seed can break off and blow like tumbleweeds. Russian knapweed also produces seed, but primarily spreads by horizontally spreading roots. Root fragments can be moved with equipment or with infested soil. Seed can be moved by wind, water, animals, equipment, and with soil and hay.

How can people help? Report suspect diffuse and Russian knapweed plants to [arrest.the.pest@state.mn.us](mailto:pest@state.mn.us) or 888-545-6684.

Management information: Diffuse knapweed can be effectively managed with hand-pulling and herbicides. Biological control is not an option for diffuse knapweed management in Minnesota because plants must be eradicated. Tools for managing Russian knapweed include mowers, duck foot cultivators, and herbicides.



HYDRILLA

Hydrilla verticillata

Close-up photos: Robert Vidéki, Doronicum, Kft. Bugwood.org



Photo: David J. Moorhead, University of Georgia, Bugwood.org

KEYS TO ID:

- Pointed, bright green leaves grow in whorls of 3-10 (5 is most common).
- Toothed (serrated) leaf edges.
- Small tubers form at the end of the growing season and allow plants to overwinter in the south, or to quickly regrow in the north, in the spring.

SEPTEMBER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4 Labor Day	5	6	7	8	9
10	11 Patriot Day	12	13	14	15	16
17	18	19	20 Rosh Hashanah	21	22 Autumn Begins	23
24	25	26	27	28	29 Yom Kippur	30

Species:

Hydrilla is a highly invasive rooted, submersed aquatic plant. It has bright green whorled and serrated leaves.

Origin: Native to Asia, Africa, and Australia, it was first introduced to the U.S. in the 1950s, via the aquarium and water garden trade.

Impacts: It forms dense mats and traps heat, which raises water temperature and depletes dissolved oxygen for fish. It disrupts water flow, negatively impacts recreation, and may alter habitat for fish and wildlife.

Status: Hydrilla is not known to be in Minnesota. The closest known infestation is in Indiana. Isolated populations have been eradicated from ornamental ponds in Iowa and Wisconsin.

Where to look: Hydrilla is often a contaminant with water garden plant shipments—look for it (and other hitchhiking organisms) before putting any plants into water gardens.

Regulatory classification (agency): Hydrilla is a *prohibited invasive species* (DNR).

Means of spread: Hydrilla spreads by stem fragments, buds, runners, and sprouts from underground tubers. There are two types of hydrilla in the U.S. One type can produce viable seeds and the other cannot.

How can people help?

- Inspect plant orders and remove seeds, other plant fragments, snails and fish.
- Do not release plants from aquariums or allow escape from water gardens into Minnesota waters.
- Clean all aquatic plants, animals, and mud from watercraft, trailer, motor, dock, lift, and anchor.
- Report any sightings immediately to the DNR or Minnesota Sea Grant.

Further information:

- Identification: www.misin.msu.edu/training/
- Factsheet: dnr.wi.gov/topic/Invasives/fact/Hydrilla.html



Close-up photos: Monika Chandler,
Minnesota Department of Agriculture

NONNATIVE BUSH HONEYSUCKLES



Photos: David L. Hanson, Minnesota
Department of Transportation



KEYS TO ID:

- Leaves are simple and opposite.
- Flowers and fruits are in pairs.
- Nonnative honeysuckle twigs are hollow with brown pith while native honeysuckle twigs are solid with white pith.



OCTOBER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9 Columbus Day	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31 Halloween				

Tatarian honeysuckle, Morrow's honeysuckle, Bell's honeysuckle, Amur honeysuckle
Lonicera tatarica, *L. morrowii*, *L. x bella*, *L. maackii*

Species: Nonnative bush honeysuckles are deciduous shrubs.

Origin: They are native to Eurasia and were introduced to the U.S. as ornamental shrubs.

Impacts: They can form dense monocultures that impede growth of native species and decrease timber regeneration.

Status: Tatarian, Morrow's, and Bell's honeysuckle are present in much of Minnesota. Amur honeysuckle has been found planted in Minnesota in limited urban locations, but has not been reported in natural or wilderness areas.

Where to look: Look for invasive honeysuckles in woodlands, fields, pastures, and disturbed upland habitats.

Regulatory classification (agency): All four species are recommended to be *Restricted Noxious Weeds* (MDA) starting in 2017. The sale and purposeful movement of restricted noxious weeds is not allowed.

Means of spread: People have intentionally planted shrubs for landscaping. Birds eat the fruits and can transport seeds to new locations.

How can people help?

- Plant native or non-invasive species.
- Report occurrences of Amur honeysuckle using www.eddmaps.org.
- Remove nonnative bush honeysuckles from your property.

Further information: www.dnr.state.mn.us/invasives/terrestrialplants/woody/exotichoneysuckles.html

SPINY WATERFLEA

Bythotrephes longimanus

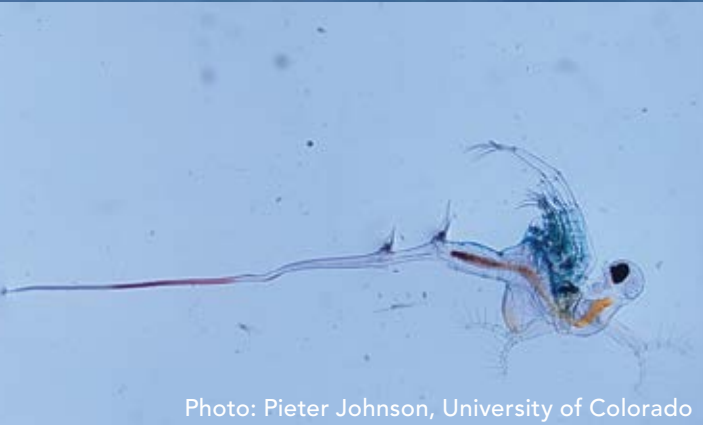


Photo: Pieter Johnson, University of Colorado

KEYS TO ID:

- Adults range from $\frac{1}{4}$ " to $\frac{5}{8}$ " long.
- Individuals have a single long "tail" with small barbs and a dark eye spot.
- Clumps of individuals look and feel like gelatin or cotton batting with tiny black spots.

Photo: Jeff Gunderson

NOVEMBER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5 Daylight Saving Time Ends	6	7 Election Day	8	9	10	11 Veterans Day
12	13	14	15	16	17	18
19	20	21	22	23 Thanksgiving	24	25
26	27	28	29	30		

Species:

Spiny waterfleas are small animals (zooplankton) that have long barbed tails.

Origin: Native to Europe and Asia, they were introduced into the Great Lakes by ballast water discharged from oceangoing ships. They were first discovered in Lake Ontario in 1982 and were detected in Lake Superior in 1987.

Impacts: Spiny waterfleas eat native zooplankton including *Daphnia*, which are an important food for native fishes. In some lakes, they caused the decline or elimination of some species of native zooplankton. They can be a nuisance, clogging eyelets of fishing rods, fishing line, and related gear.

Status: They have spread throughout the Great Lakes and are established in several inland lakes in northern Minnesota.

Where to look: They collect in gelatinous blobs on fishing lines and downrigger cables. They typically prefer cold, clear, deep lakes, but also can live in shallow, heavily stained waterbodies.

Regulatory classification (agency): Spiny waterfleas are a *regulated invasive species* in Minnesota (DNR). Introduction into another waterbody is prohibited.

Means of spread: They can stick to fishing lines, downriggers, anchor ropes, and fishing nets. Female waterfleas carry eggs that resist drying and freezing, and heat. They also may be transported in bilge water, bait buckets, and livewells.

How can people help?

- Clean all aquatic plants, animals and mud from boats, trailers and equipment.
- Drain water from bilges, livewells, and bait buckets before leaving the access.
- Report infestations to the DNR or Minnesota Sea Grant.

Further information: www.dnr.state.mn.us/invasives/aquaticanimals/spinywaterflea

AQUATIC INVASIVE SPECIES PREVENTION AID



Photo: Don Kitson



Photo: Kyle Daun, watercraft inspector, Aitkin County

This boat with visible adult zebra mussels attached to the hull was stopped by a watercraft inspector before launching at Big Sandy Lake in Aitkin County. It had been moved from the Mississippi River just one day before. If the watercraft inspector had not been present, live zebra mussels would likely have been introduced into an uninfested lake.

Lake County SWCD staff next to St. Urho's Day Float in emerald ash borer, rusty crayfish, gypsy moth caterpillar, zebra mussel, and spiny waterflea costumes—raising awareness on AIS prevention.

Local government AIS leads attended a DNR facilitated Regional AIS Prevention Workshop. Attendees shared successes and challenges, discussed possibilities for collaborative efforts, and continue to build on this network of support. Photo: Minnesota Department of Natural Resources

DECEMBER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12 Hanukkah Begins	13	14	15	16
17	18	19	20	21 Winter Begins	22	23
24 Christmas Eve	25	26	27	28	29	30
31 New Year's Eve	Christmas	Kwanzaa Begins				

What is it?

In 2014, the Minnesota legislature passed a county aid tax bill to secure a sustainable funding stream for local government units (LGUs) to establish, support and conduct aquatic invasive species (AIS) programs. It provides funds, \$4.5 million in 2014 and \$10 million each year thereafter, to help prevent the spread of AIS. Funds are allocated based on the number of watercraft trailer launches (50%) and watercraft trailer parking spaces (50%) within each county.

Each county that receives a distribution under this bill must use the proceeds solely to prevent the introduction or limit the spread of AIS at all water access sites within the county.

How are these funds used?

Each County Board designates program management to an LGU within the county. LGUs in turn work closely with government, nonprofit, and private organizations at the local, state, and federal levels to develop and implement their AIS programs.

Impacts:

The AIS Prevention Aid empowers counties to take on the problems of AIS using innovative solutions. Local initiatives include developing prevention plans, educating youth, engaging water resource users, inspecting and decontaminating watercraft, working with law enforcement, managing established AIS populations, monitoring, conducting early detection and rapid response activities, and promoting consistent messages such as "Clean, Drain, Dispose."

These locally led programs are bridging the gaps between all organizations and individuals involved; this in turn strengthens the effectiveness of AIS prevention efforts statewide.

Further information:

DNR Resources for Counties: <http://www.dnr.state.mn.us/invasives/ais/prevention.html>

JANUARY



FEBRUARY



APRIL



MAY



MARCH



FOR MORE 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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JUNE



JULY



SEPTEMBER



OCTOBER

AUGUST

DECEMBER



NOVEMBER

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