



Quick Guide to Wisconsin Purple Loosestrife Biocontrol—March 2020

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Galerucella calmariensis
Black-margined loosestrife beetle
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Thank you for joining the statewide team of aquatic invasive species (AIS) professionals and volunteers conducting purple loosestrife biocontrol. Volunteers work on their own or with local coordinators. If you're looking for someone to work with, contact the statewide Purple Loosestrife Biocontrol Coordinator at DNRAISinfo@wisconsin.gov or 608-266-0061. You can also reach out to the regional AIS Coordinators found for your county on this interactive [map](#).



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In this quick guide, it is assumed that you already know where you will work on sites and who you will be working with to control the wetland invasive species purple loosestrife in your area. It also assumes, you have already done the early season work of checking old supplies, repairing as needed or replacing them.

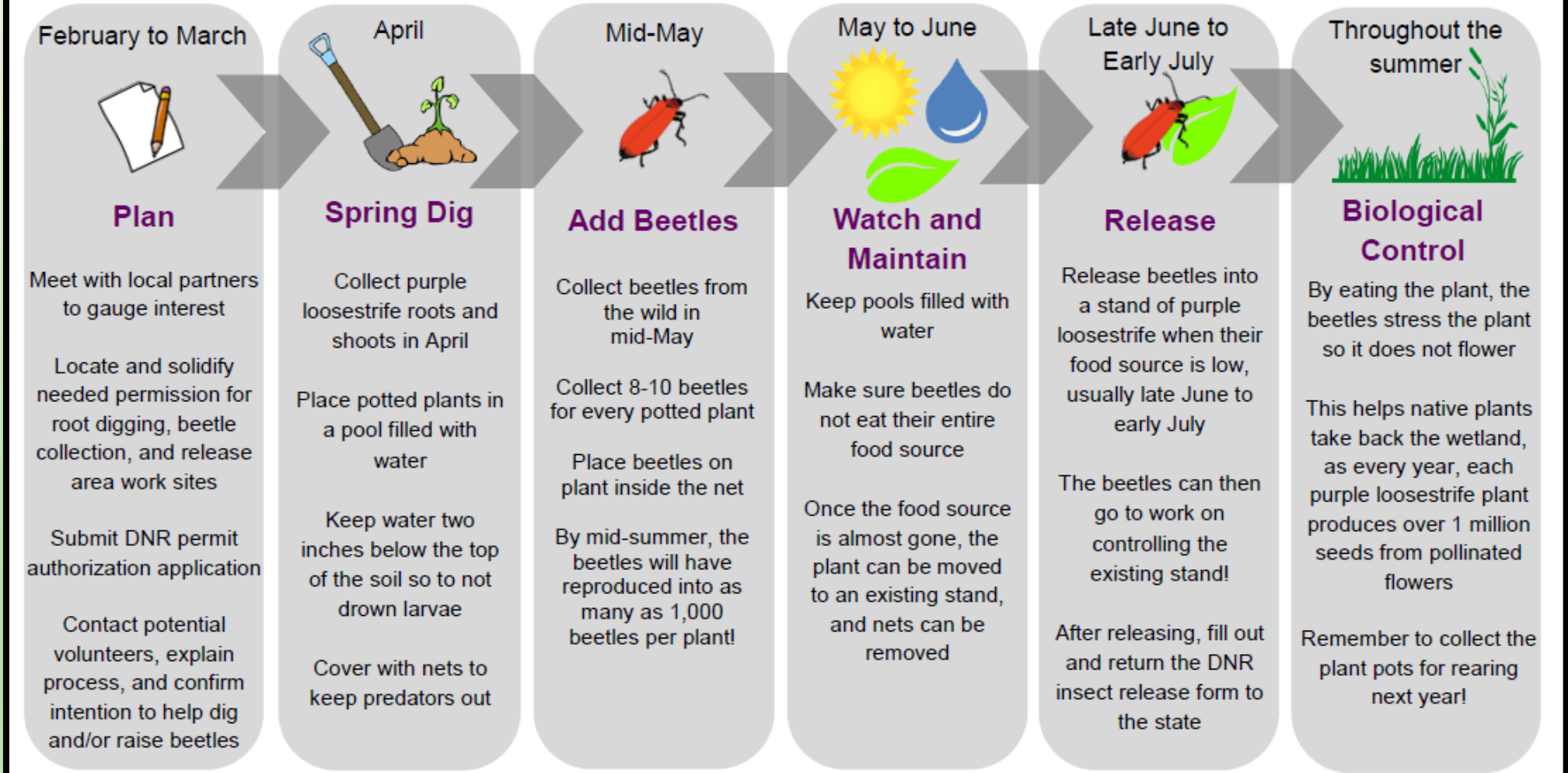
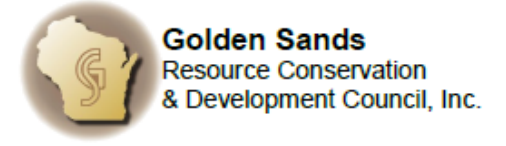
For the full guidance, see the WDNR Purple Loosestrife Biocontrol [website](#). You can access ID information, the application for a permit to participate and other needed forms on the webpage. The full guidance can give you tips on program history, searching for sites that are good candidates for biocontrol, how to report purple loosestrife sites to WDNR, the *Galerucella* beetle life cycle, and lots of helpful information about framing, winter monitoring, fall purple loosestrife digging and more.

Application

Anyone moving purple loosestrife and raising it, must complete an application for the program permit. If you haven't already sent in your application to participate in the program, please do so, especially if you need the netting that's placed over the potted purple loosestrife. If you're just helping with a dig or a release, the coordinator will have the permit and you do not need one. You can get a copy of the application [here](#), from your local coordinator or from the program webpage.

Overview

Purple Loosestrife Biological Control Helping Native Plants Battle Invasive Species



Graphic provided by Golden Sands Resource Conservation & Development Council, Inc., member of the Wisconsin Aquatic Invasive Species Partnership

Tools Needed



Pat Hayes

- **Decontamination tools** for footwear and tools, used when leaving wetlands
 - Hand held brushes
 - Jug(s) of water
- **Digging**
 - Waders or high-topped boots for walking in wetlands (used for all wetland visits)
 - Shovels and/or pitchforks—pitchforks are excellent for getting intact roots
 - Hand shears for clipping when you collect roots
 - Extra-large garbage bags or large tubs for hauling roots
 - Optional-native seed to drop into the holes left by your dug root stock
- **Potting and growing**
 - A sunny area near a water source for refilling pools
 - 2 to 5 gallon plastic pots at least 12” across - often free from local garden centers or landscape companies
 - Wading pools – each should hold 4-6 pots without crowding the growing plants. Drill holes about 4-5” from the bottom for draining-the pool water should be 2” below the soil line of potted plants.
 - Potting soil with a fertilizer – about 2 cubic feet per 6 pots
 - Fertilizer if not in the soil or to add when plants not growing well
 - A sturdy frame: clothes line, fence posts or other method to keep the tops of the nets raised to at least 5-6 feet
 - Netting (1 net/pot)-provided by the statewide coordinator, but the long side is sewn by volunteer(s). *
 - Double-sided Velcro, duct tape or bungee cords to secure net around the bottom of the pot
 - Cord, such as twine or fabric clothesline rope to tie top of net closed and secure to support
- **Collecting beetles** (primarily by coordinators and individuals with access)
 - Aspirators and vials - available from statewide coordinator, if needed*
 - 2-liter bottles
 - Electrical tape
 - Cotton balls
 - Zippered bags
- **Release**
 - Large garbage bags – for hauling out any flowers you cut, netting and pots
 - Flagging for pots left at release sites

* No cost to cooperators: beetles, netting, aspirator, vials

The Dig



J Scherer

- As soon as the ground is thawed enough, gather the tools, boots or waders and head out to your digging site, usually a wetland or lake edge. Take large garbage bags or tubs to hold your roots.
- Make sure you have brushes and some water to clean off your tools and footwear when you leave the dig site, so you don't accidentally move seeds in the mud to new locations. Remember that we're always acting to 'Stop Aquatic Hitchhikers!'
- Plan to dig 12-15 plants for every 10 you intend to pot. Small plants can be combined. The goal is to have 6-8 stems per pot. Extra plants can be used for feeding the larvae/beetles if they start to destroy their plants before you can get them back to the wetland. Later, any plants that are not needed can be bagged, labeled 'Invasive plant- DNR approved for landfilling' and put in the trash.
- The best plants for digging are hearty plants still standing after last year, that have **6-8 stems** covered in dry seed capsules. Break off the stems, leaving about 8-10" to act as a handle. Ideally, shoots shouldn't be up, yet, but you may find the buds if you look closely at the base of any old stems.
- Pitchforks are preferable over shovels if the ground is wet and loose because they'll do the least damage to roots. Shove the pitchfork around and under the plant to loosen the ground further. Then you should be able to rock the fork under that plant to pop it out.
- Shovels will work if the ground is too solid for a pitchfork. Dig as far out from the main stem as possible to protect the roots. If the root mass is too large for the pots that you'll use, you can use the shovel to split the plant in two or more. Often, a large clump is actually 2 or more plants and can be pulled apart.
- Pull the stems and roots of any other plants off your root mass. Dead loosestrife roots are black and brittle. Cut these off. Brush off the top of the root ball to remove any dead organic material and loose dirt. You do not need to remove soil from the roots. It will contain the nutrients the plant prefers. Leave all the removed material in the wetland.
- If you brought native wetland seed, drop it into the remaining hole.
- Thoroughly clean footwear and tools with a brush and water. When available, handheld steamers help kill seeds and organisms. Refer to the DNR disinfection website for further information: <https://dnr.wi.gov/topic/Invasives/disinfection.html>

Potting



- In a pool, spray wash just the top of the root ball with a garden hose to remove any eggs of plant or insect predators; bag the waste for the landfill
- In second pool, mix water and potting soil so it is thoroughly wet
- Add some soil to the bottom of the pot and place your roots on top, trimming the roots as necessary to fit; you want them to “just fit”
- Fill each pot with enough soil to allow the root crown to sit 2” below the top of the pot; if combining small roots, they should total 6-8 stems
- Pack the soil into any air pockets, but not too firmly; the larvae will need to penetrate the soil surface later
- If the soil does not have fertilizer, sprinkle slow release fertilizer (amount as shown for pot size) onto the soil and mix in about 1”
- Cage the plants with netting
 - Use double-sided Velcro, duct tape or very snug bungee cords around the pot and bottom of the net; pots often have a bit of a lip that will help keep the net from slipping off; if using duct tape, keep it out of the water and be prepared to replace it if it gets loose
 - Close the top of the net with heavy twine or clothesline rope 5-6” from the top; wire may also work; you will open this end later to add beetles, but it needs to be tight enough to keep out predators like spiders
- The pools should be in an area with full sun and under the structure used to support the netting, but out of strong windy areas
- Place your pots in the pools; one pot (2 if the pool is large) can go in the middle and the rest around the pool side, but don’t crowd them; airflow and sunlight need to reach the plants
- Tie the top of each net to the support, whether it’s a clothes line or rope strung across another structure; the goal is to have the net tall enough (5-6’ minimum) to give your plants maximum growing room and the beetles easy access around the plants
- Add water to the pools so that it comes to just under the drilled holes; remember the water level should stay 2” below the soil height for healthier pupating beetles
- Expect the plants to take at least 4-6 weeks to grow and rear beetles before the release

Plant Care

- Regularly check your pools to make sure there is water
- To avoid mosquito larvae living in the pools, occasionally fill the pools to just above the drain holes to flush out any larvae
- Crowns take a week or two to begin growth and then grow quickly
- When stems are 12-15" tall, spread the small leaves at the ends of each stem and remove the growing point (meristem) with a scissors or tweezers; Breaking off the plant tip with your fingers is more likely to cause a tear which will take energy from the plant to heal. This step will give you bushy plants with lots of foliage for the beetles and also keep the plants from getting too tall for their cages.
- If plants are not growing well after two weeks, add a bit of fertilizer



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Galerucella californiensis
Black margined loosestrife beetle
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Plants are ready for beetles when they are 1.5' tall. If you are collecting your own beetles, the next two pages provide directions. If have requested beetles and your plants are close to this height, immediately let the person who is going to get beetles for you know. It may be the Statewide Coordinator or a local coordinator. If you're not sure, contact the Statewide Coordinator.

Collecting your own beetles?

Making a Beetle Trap



Making a beetle trap

- 20 oz and/or 2 liter bottles
 - Scissors or X-acto knife
 - Electrical tape
 - Cotton balls
 - Gallon-sized zippered plastic bags for field use
 - Cooler for field use
1. Discard the cap. Wash and dry the bottle.
 2. Cut the bottle off just below the point where it starts to become straight instead of curved. If you flip the cut-off top over and it just falls into the bottle, you've cut too high and will need to start with a new bottle.
 3. The inverted top should fit snugly. Use the electrical tape to secure the inverted top to the bottle. Electrical tape works best because it is easy to remove when you're ready to dump the beetles into a zippered plastic bag. Carefully smooth the tape so there are no gaps for beetles to escape.
 4. The cotton balls will be used as a stopper to keep the beetles in the trap.

These traps are very useful if collecting large numbers of beetles. You can also use an aspirator and small vials or zippered bags to make collections of 10 beetles per vial/bag that can be dropped right into your caged plant. Some people will collect directly into the small bags without an aspirator. Because the beetles drop when disturbed, they may or may not miss the bag. It's ok to experiment with these methods.

How to collect beetles

What to look for:

- Feeding damage, small round holes among the veins
- The beetles tend to congregate at stem tips.

Trapping your beetles:

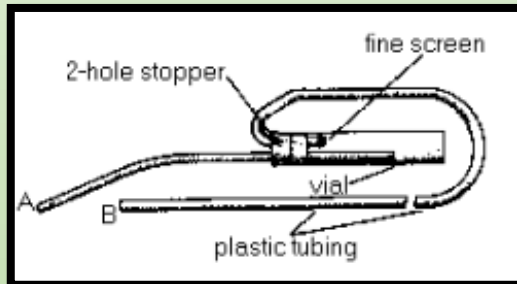
- *Galerucella* beetles escape predation by dropping off the leaves to the ground to hide when disturbed. This makes them easy to collect!
- Break off a short stem (2-3") with a few leaves and place in the bottle trap or bag for food and shelter.
- Hold the bottle below the beetles. Just tap or blow on the leaves or tip the stem over your bottle and give it a gentle shake. Close the trap or bag between collections.
- Keep an eye on the tape to make sure it doesn't loosen. Beetles will crawl up or fly to the top of the bottle. You can easily get them to drop to the bottom again with a gentle tap or two.
- When you're ready to put them in a zippered bag, remove the tape and set to side. Quickly cover the bottle with the bag and dump the beetles in. Leaving a small corner of the bag open, gently blow into the bag to fill it with air before closing.
- Remove any possible predators like weevils and spiders that have gotten into the bag.
- Keep the filled bags in a cooler and out of the sun.
- Collect some extra purple loosestrife leaves for food, in case they run out.

Counting and sorting beetles

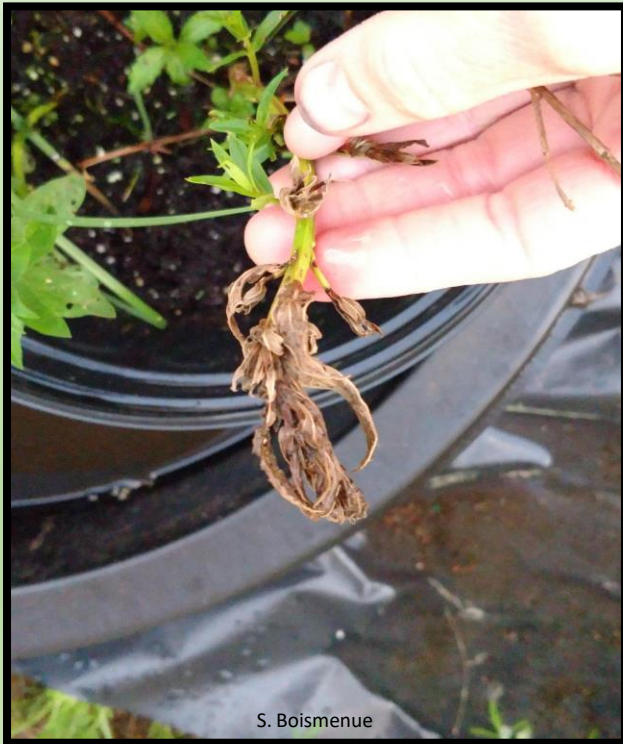
1. If you are using an aspirator to put the beetles into vials, you'll put 10 beetles per vial, so just count the vials when you're done. Aspirators provided by WDNR are similar to this image. You place the end of the metal tubing (A) close to the beetle. With the plastic/rubber tubing (B) in your mouth, give a quick suck and the beetle will be drawn into the vial. The fine screen protects you from pulling the beetle into your mouth.
2. Counting a bag of beetles: In a cool place (reduces movement), let some of the air out of the bag. Use a pencil, ruler or some other lightweight straight edge to hold over the bag to visually mark off areas. Count each area as you move the straight edge around over the bag.
3. You can also use the aspirator to move beetles from one very full bag into bags holding the amounts you are going to provide to others. Count as you add the beetles to the new bag.

Beetles need to be placed on plants again within 2-3 days! If they need to be shipped, use an overnight service.

Aspirator



Adding and Raising Your Beetles



S. Boismenu

Beetle damage

- Plants are ready for beetles when they reach 1.5' tall
- There are three options for getting beetles
 - Collect yourself, if you know where to find them.
 - Work with your local coordinator to find beetles, whether or not you personally help collect them
 - Contact the statewide coordinator for beetles or to help you find a nearby coordinator to provide them
- Whether you receive beetles by hand or by overnight shipment, you must get them into the cages as soon as possible; until they go into the cages, keep them cool and out of direct sunlight. If they are in a zippered bag and have eaten the leaves provided, you can open a corner, carefully and slip in a few leaves for them to eat until they are put on the plants. You can also blow in some air but be careful. They are escape artists!
- If you receive your beetles in small vials or small bags with about 10 beetles/vial or bag, open the top of each net and either shake the beetles on to the plants or just drop the open vial or bag into the net cage. Make sure the vial did not land upside down, trapping the beetles. Retie the net.
- If you have large bags of beetles, you will also be provided an aspirator and vials. You can use the aspirator to 'suck' beetles out of the zippered bag either directly into the cage, or to be sure they don't escape, into an attached vial.
- The advantage of having an aspirator is that you can often catch the escapees, since they will gravitate to the netting since their favorite food is inside. Local coordinators are provided aspirators to help those in their areas, and one can be sent directly to groups, but those will need to be returned to the statewide coordinator.

Releasing Your Beetles or Larvae



M. Alaimo

- You may need to do a release at the larval stage, the pupating stage or the young adult stage, dependent on how much damage there is to the plants. It's not uncommon to make a plant check and discover a plant looks dead or nearly dead overnight because of heavy larvae production or the pupating beetles hatching. Or you may find the top of your beetle cage crawling with hundreds of new beetles. In either case, you need to get the plants to the release site immediately to prevent starvation.
- Release areas should have abundant plants. Remember that one of your cages could provide up to 1000 new adults.
- Transport your pots with cages on! Avoid jarring and high temperatures. If carrying in a pickup or pulled boat, lay them down.
- Release where access and footing are safe.
- Where there are 50 or more plants, you want to cluster 2-4 pots worth of beetles in large patches. If the area covers several acres, you will probably want to find multiple locations to cluster pots. The adults will fly to new plants as needed.
- If you are releasing along shorelines, choose areas with several plants close and others nearby. Use your best judgement for the number of pots per location.
- Uncover your plant next to a free growing plant. Especially, if there are still larvae, entwine the branches of the two plants so they can crawl over to fresh leaves.
- You should plan to mark where you leave the pots and retrieve them later. This is especially important for pots that still have larvae or pupates.
- Complete the beetle release form for each site. Enter the data into SWIMS if you have been trained or return the form to your local or the statewide coordinator. Pictures of the plants at your site are appreciated—only 1-2 that clearly show purple loosestrife plants. If your site hasn't been verified by WDNR, the photos will complete that step.
- Plan to return after two or more weeks to collect pots.
- If you make a site revisit to see the results of the work done by you and the beetles, please use a Site Revisit form and send it with photos to your local coordinator or the statewide coordinator.

A woman in a wetsuit is kneeling in the water next to a boat labeled "MAD RIVER CANOE". She is handling a white mesh trap. Another woman is on the dock to the right, also handling a trap. The background shows a body of water and a forested shoreline under a bright sky.

Thank you!

If you have any questions, contact the
Statewide Purple Loosestrife Biocontrol Coordinator:
DNRAISinfo@Wisconsin.gov or 608-266-0061