

Become a Worm Ranger!

Document the Occurrence of Jumping Worms in Minnesota

UPDATED 8/14/20



Photo Credit: Beth Solie

Jumping worms are the latest invasive worm to arrive in Minnesota. They live in the top few inches of soils and alter soil structure and chemistry through feeding and burrowing behaviors. Found in garden beds, mulch and compost piles they represent a threat to the health of our managed and wild landscapes.

Worm Rangers are investigating their distribution and dispersal mechanisms throughout Minnesota. Jumping worms are spread through composting, horticulture, landscaping and fishing bait.

The overall goal of this project is to characterize the status of the jumping worm invasion in Minnesota. You will be trained to identify their species and describe their distribution and dispersal pathways.

Exploring your yard and gardens is key! Read this guide or join a workshop to learn more about them and how to collect data. If you suspect you have jumping worms take a photo. You can still participate this fall along with the 2021 growing season.

[SUBMIT DATA HERE](https://forms.gle/3ChnsKuPjB79v2g8)

<https://forms.gle/3ChnsKuPjB79v2g8>



Partnering organizations:



Funding agencies:



Meet the jumping worm

Jumping worms are not native to Minnesota, However, once established, they live in high densities and represent a threat to the health of our managed and wild landscapes. Researchers need your help to learn more about these newly emerging species in Minnesota.



Photo Credit: Beth Solie

Jumping worms...

IMPACT: Radically alter soil structure and chemistry

HABITAT: Garden beds, Mulch, Compost piles

SPREAD via: Composting, Horticulture, Landscaping, Bait

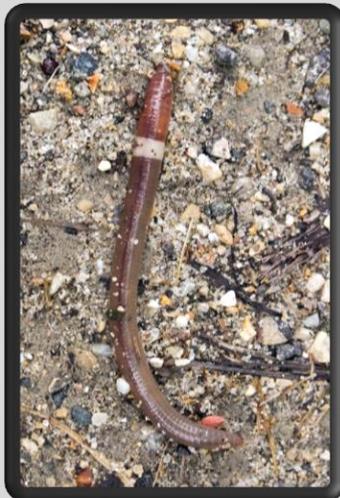


Photo Credit: UW Madison Arboretum

Adult Jumping worm

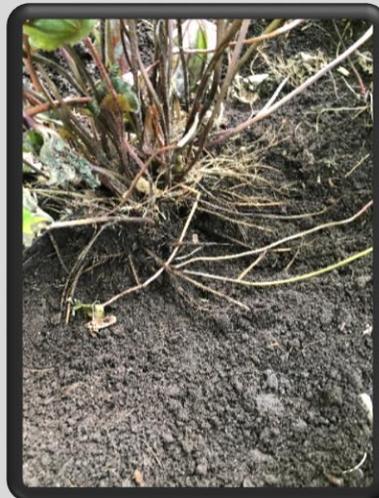


Photo Credit: Beth Solie

Jumping worm impacts on plant roots

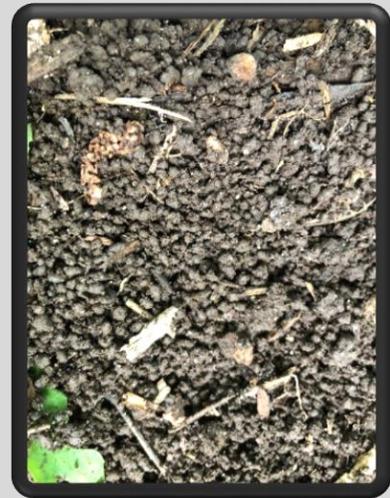


Photo Credit: Beth Solie

Jumping worm castings (poop) with coffee ground structure

Steps for Documenting Presence of Jumping Worms

Step 1: *Visually inspect:* Look at your yard, garden, woods for sign that earthworms are active

- Do you see earthworms?
- Does your soil look like coffee grounds?

Step 2: *Physically inspect:* Since jumping worms live on the surface and just below the soil you can use the flip and strip method

- flip logs & rocks, mulch, compost, soil, root around, under and through litter and see what you find.

Step 3: *Found some:* Do the worms move like a snake or very “unworm like”?

- Check out the [following video](#)
 - <https://youtu.be/jrGnUFDXuyQ?t=2>

Step 4: *But are they jumping worms?* What are the characteristics that distinguish jumping worms from European earthworms?

- See **Appendix A – How to Identify Jumping Worms**

Step 5: *I have jumping worms!* How do I submit my data?

- Take a few pictures of the suspected jumping worms
 - See **Appendix B - How to Take Good Specimen Photos with your Cell Phone**
- Take a 5-10 sec video of worm moving
- You can enter your [data using this form](#)
 - <https://forms.gle/3ChnsKuPJpB79v2g8>



Photo Credit: Beth Solie



Photo Credit: Beth Solie



Additional Info

Want to learn more about Jumping worms?

Sign up for a 30 minute background and training



<https://forms.gle/KW6CcgdY85fQ671J8>

We are developing a project website

Keep up with the research and citizen science projects



<https://jwp.cfans.umn.edu/jumping-worms-project>

DO YOU HAVE DATA TO SUBMIT?



<https://forms.gle/3ChnsKuPjPb79v2g8>

Contacts:

Worm Rangers Citizen Science project

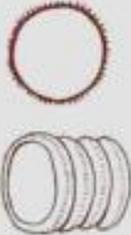
- Ryan Hueffmeier – Citizen Science project manager
 - rhueffme@d.umn.edu
- Caleb Weiers – Outreach coordinator
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Appendix A

How to Identify Jumping Worms

How to Identify Jumping Worms

Asian vs. European earthworms

	Asian	European
Clitellum (reproductive band)	<p>Annular wraps around body, less swollen</p>  <p>Side view of annular clitellum</p>  <p>Cross-section</p>	<p>Saddle shaped Wraps around 3/4 of the body, more swollen</p>  <p>Side view of <i>flared</i> saddle clitellum (in some species, saddle is <i>non-flared</i>)</p>  <p>Cross-section</p>
Setae (stiff hairs)	<p>Many bristle-like setae</p>  <p>Setae are arranged in dense rows around each segment</p>	<p>Eight setae Example: <i>widely paired</i></p>  <p>Distance within the pairs of setae (A) is only slightly closer than the distance between the pairs (B)</p> <p>All European species have 8 setae, but in some species, setae are <i>closely paired</i> or <i>separate</i></p>
Ability to jump	<p>Yes!</p> 	<p>No</p> 

Adapted from Earthworms of the Great Lakes (Hale 2007) with permission.

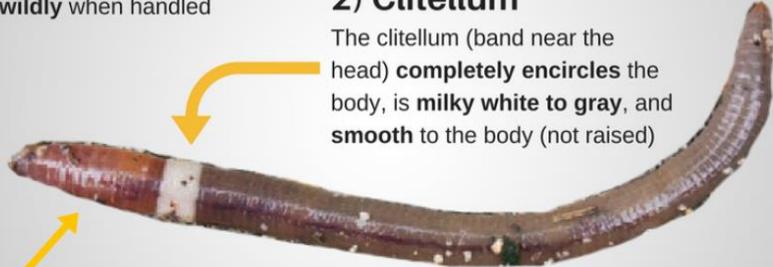
How to Identify Jumping Worms

1) Snake-like behavior
 Jumping worms will **thrash wildly** when handled

2) Clitellum
 The clitellum (band near the head) **completely encircles** the body, is **milky white to gray**, and **smooth** to the body (not raised)

3) Body color
 Body color varies from reddish brown to dark brown, but skin looks smooth and shiny, almost **metallic**

Not to be confused with: Common invasive European species have a raised or saddle-shaped, segmented clitellum



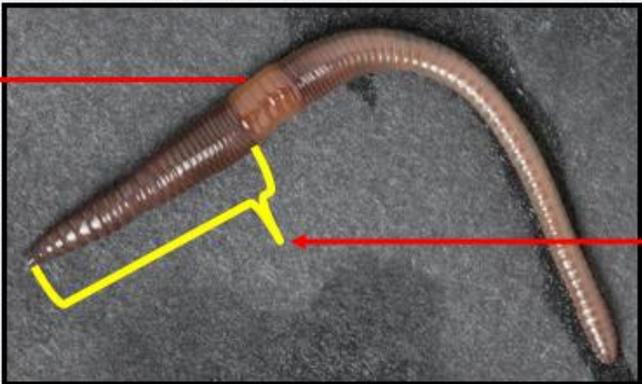

Created by Karen Ceballos for the NY Master Naturalist Program.

Jumping worm – native to Asia
Amynthas spp.



Annular clitellum
vs
Raised clitellum
“Saddle shape”

Nightcrawler – native to Europe
Lumbricus terrestris



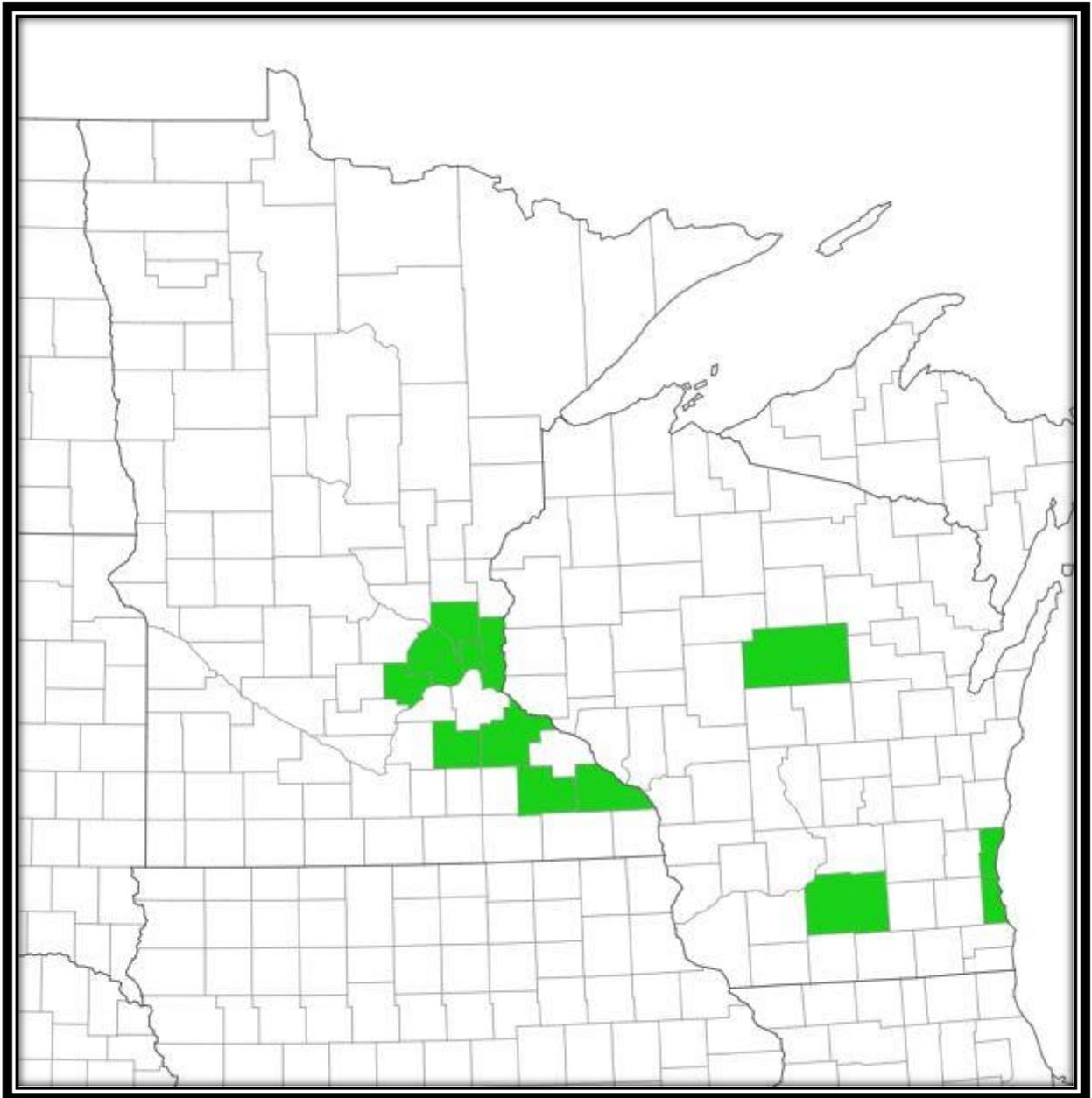
Clitellum close to head
start at segment 14 or 15
vs
Further from head,
start at segments 23-32,
depending on species

Modified from Lee Frelich

Appendix B

Current Documented distribution of Jumping Worms by County

Current Documented distribution of Jumping Worms by County



Map created 8/8/20

Explore the distribution data here:

<https://www.eddmaps.org/distribution/uscounty.cfm?sub=58695&map=distribution>

Distribution map provided by EDDMaps

Appendix C

How to Take Good Specimen Photos with your Cell Phone

How to Take Good Specimen Photos with your Cell Phone

Choose an appropriate container for your specimen.

The better you can limit the earthworms movement the less time you will need to spend chasing it around with your camera.

You can easily make a good container by cutting a plastic cup. A white jar lid can also be really useful. Feel free to use your imagination. If they are really active a piece of plain glass on top of the container is ideal — it constrains the creature and you can still photograph through it. If you don't have a piece of glass handy, you can try stretching a piece of cling wrap over the container to achieve a similar effect, although plain glass is optically better.

Use a plain, clean background of neutral color.

We like white, so we use a white piece of PVC plastic, but black or grey are also fine. Avoid using colored backgrounds, as the color from the background can spill onto the creature and create an inaccurate appearance that is not ideal for science documentation. Reflective backgrounds are not great either.

Lighting: take your specimen where there is a lot of available light.

Outside or near a window is good. You may also want to use additional light. That might mean using a white card, silver card or just a plain old flashlight. You can make a white card by using just about anything (white cardboard, office paper). For a silver card, you can buy them from an art supply store, or just wrap some aluminum foil on a piece of cardboard. A pocket makeup mirror would also work fine.

Avoid using digital zoom.

Digital zoom only crops the picture, which loses information. If the creature is really small in the frame, try using a close-up lens attachment. You can find affordable ones easily on the internet that work with any phone. A lot of point-and-shoot cameras are also good at macro photography. Many of them have a "macro" setting often indicated by a little illustration of a flower.

<https://www.amazon.com/Best-Sellers-Cell-Phone-Lens-Attachments/zgbs/wireless/15124502011>

Get the specimen in focus and set the exposure.

Most smart phones will allow you lock the focus with your finger on the screen so it's not shifting focus as you follow the creature. Once the focus is locked, you can then focus easily by moving your camera. Some phones will let you set the exposure the same way, but not all. There are smart phone applications available, however, that give you more manual control over your smart phone camera

Think about depth of field.

Macro pictures often suffer from shallow depth of field, so you may not be able to get the whole creature in focus. You may want to try several pictures where the focus is in different places (head, body, legs, etc.).

Be mindful of reflections.

If the creature is shiny, it will have reflections on it. You may need to move the camera or your light to put the reflection in an inconspicuous place. If the creature is in water, be careful of reflections on the surface. Avoid reflection if you can, or find a way to put it in an inconspicuous place.

Take descriptive pictures.

Scientists look at certain physical characteristics for species identification that vary from creature to creature, so don't be afraid to try several angles (top, bottom, from the side).

Before you move onto the next specimen

thoroughly check and make sure you have the picture. Is it in focus? Can you see detail everywhere on its body? Zooming into the picture with your fingers can be really helpful for checking. And most importantly, don't forget: Have fun with it and keep going.

This document is based on The Smithsonian National Museum of Natural History's document titled " Cell Phone Specimen Photography Tips" from February 2019. The original document can be found here:

<https://naturalhistory.si.edu/sites/default/files/media/file/cellphonephotographytipsbiocubefeb2019.pdf>