 Name _____

AIS Mini-Poster Project

Student Worksheet (1 of 5)

PROJECT CHALLENGE: Design your own "MOST UNWANTED AIS" poster for an aquatic invasive species that is a threat to Montana lakes, rivers, ponds, and streams.

FIRST: Select ONE of the following to research. Check the box for the topic you selected.

- ☐ Asiatic clam (*Corbicula fluminea*)
- ☐ Chinese mysterysnail (*Cipangopaludina chinensis*)
- ☐ New Zealand Mudsnail (*Potamopyrgus antipodarum*)
- ☐ Quagga Mussel (*Dreissena rostiformis bugensis*)
- ☐ Red-rim melania (*Melanoides tuberculatus*)
- ☐ Zebra mussel (*Dreissena polymorpha*)
- ☐ Virile crayfish (*Orconectes virilis*)
- ☐ Bloody red shrimp (*Hemimysis anomala*)
- ☐ Red swamp crayfish (*Procambarus clarkii*)
- ☐ Rusty crayfish (*Orconectes rusticus*)
- ☐ Spiny waterflea (*Bythotrephes longimanus*)
- ☐ Bighead carp (*Hypophthalmichthys nobilis*)
- ☐ Asian swamp eel (*Monopterus albus*)
- ☐ American Bullfrog (*Lithobates catesbeianus*)
- ☐ Northern pike (*Esox lucius*)
- ☐ Northern snakehead (*Channa argus*)
- ☐ Snapping turtle (*Chelydra serpentina*)
- ☐ Brazilian waterweed (*Egeria densa)*
- ☐ Curly-leaf pondweed (*Potamogeton crispus*)
- ☐ Didymo (*Didymosphenia germinata*)
- ☐ Eurasian watermilfoil (*Myriophyllum spicatum*)
- ☐ Flowering rush (*Butomus umbellatus*)
- ☐ Hydrilla (*Hydrilla verticillata*)
- ☐ Parrot Feather Water-milfoil (*Myriophyllum aquaticum*)
- ☐ Yellowflag iris (*Iris pseudacorus*)
- ☐ Starry stonewort (*Nitellopsis obtusa*)

SECOND: Research your AIS topic, complete the AIS Poster Research Guide worksheet, and create a mini-poster on an 8.5" x 11" paper or Google Slide. Please include the following:

- ☐ **Common name** of the organism (and scientific name if it has one).
- ☐ **Mug shot** – A photo, which must be properly cited (see example below), or draw a sketch.
- ☐ **What to Look For** – Physical appearance and any other distinguishing characteristics.
- ☐ **Modus operandi** – Police jargon for "mode of operation." What physical, chemical, and/or behavioral traits make it an invasive species.
- ☐ **Last Known Location** - Last know locations? Where could it be found in Montana?
- ☐ **Hide out** – What is its preferred habitat?
- ☐ **Armed and dangerous?** – How so? How does it harm the environment and/or economy?
- ☐ **Tips for capture –** Suggest weapons that can be used against it, as well as, ways to detect and prevent it.
- ☐ **Contact** – An agency or appropriate authority to contact if organism is found.
- ☐ **Miscellaneous** – At least two other unique facts that could help lead to its capture.

Photograph of American bullfrog. (Alan D. Wils, 2006)

THIRD: Create a ***Poster Reference List***

- ☐ At least <u>two sources</u> (ex. a website, book, or encyclopedia, etc.).
- ☐ Source material <u>MUST have an author's name or be from a reliable organization</u> (.gov, .org, or .edu), otherwise do NOT use it.
- ☐ A.P.A. formatted. See provided formatting guide.
- ☐ Alphabetized.
- ☐ You must submit it separately from your poster.

Most Unwanted AIS Poster

LAST: Review your poster to make sure the following criteria are met:

- ☐ Typed OR neatly hand written.
- ☐ Limit the number of words. Not too wordy, nor too sparse!
- ☐ 'Wow' factor that engages the viewer and helps them to learn about your AIS topic!
- ☐ 'Mug shot' is sketched, or copied and pasted from the web source (but make sure you cite the source directly beneath the image and include the source in your Reference List).

Poster Grading Rubric

Use the following rubric as a guide as you complete your poster.

	Exceeds	Meets	Does Not Meet
Content	☐ Common and scientific name included ☐ Mugshot clearly depicts the organism ☐ Physical appearance and distinguishing traits are clearly identified in detail ☐ Explains in detail why the species is invasive ☐ Hide out clearly identified ☐ Impacts to the environment and economy described in detail ☐ Accurate tips for detection and/or prevention provided ☐ Contact listed ☐ Three or more unique facts included	☐ Common name included ☐ Mugshot is included but the organism is difficult to see ☐ Physical appearance described ☐ Briefly explains why the species is invasive ☐ Hide out identified ☐ Provides potential impacts ☐ Minimal tips for detection and/or prevention provided ☐ Contact listed ☐ Two unique facts included	☐ Organism name not included ☐ Mugshot was either inaccurate or not included ☐ Physical appearance vague or inaccurate ☐ Invasive traits unclear ☐ Hide out not identified ☐ Impacts unclear ☐ Detection and/or prevention tips not included ☐ Contact not listed ☐ Unique facts not included
Format	☐ Typed or artistically hand-written ☐ Poster design elicits a 'WOW' ☐ Text is not too wordy or sparse	☐ Neatly hand-written ☐ Basic poster design ☐ Text is too wordy	☐ Writing messy or unclear ☐ Text is too sparse
Reference List	☐ Three or more reliable sources provided in correct A.P.A format ☐ Mugshot properly cited and included in reference list	☐ Two sources provided in A.P.A. format ☐ Mugshot cited and included in reference list	☐ Less than two sources provided or not in A.P.A format ☐ Mugshot not cited

Comments:

 Name _____

AIS Poster Research Guide

Student Worksheet (3 of 5)

Online resources that you may use to find information about your AIS topic:

Montana Field Guide: http://fieldguide.mt.gov/
Montana Fish, Wildlife and Parks Aquatic Invasive Species website: http://fwp.mt.gov/fishAndWildlife/species/ais/
Yellowstone Coordinating Committee Aquatic Invasive Species Pocket Guide:
https://docs.wixstatic.com/ugd/a0f00b_398521b0c8fc42acbc1226ea9c7a3110.pdf

Complete the following as you research your AIS topic:

Common name: _____ **Scientific name:** _____

Mug shot (Find a photo or create a sketch) Source/website: _____

Physical Description: _____

_____

_____

Other distinguishing (unique) characteristics: _____

_____

Modus operandi (what makes it invasive): _____

_____

_____

Who/what it associates with: _____

Armed and dangerous?

How it harms the environment: _____

_____

How it harms the economy: _____

_____

Where it is found in Montana: _____

Hide out (preferred habitat): _____

_____

Tips for capture: Weapons that can be used against it, as well as, ways to detect and prevent it: _____

_____

Contact if found: _____

Miscellaneous (At least two other unique facts that could help lead to its capture):

1. _____

_____

2. _____

_____

References (record the websites that you get information from):

_____

_____

_____

Student Worksheet (4 of 5)

Use this space to plan your poster design and layout:

A.P.A Referencing Guide

What follows is how to cite the most commonly used sources in APA format and how to make an in-text citation for each example.

Website:

Author last name, first initial OR organization's name. (Year of publication). *Title of document*. Retrieved from: URL

Example of a person as author: *How to in-text cite: (Campellone, 2007)*

Campellone, J. (2007). *Huntington's disease*. Retrieved from: http://www.nlm.nih.gov/medlineplus/en.htm

Example of organization as author: *How to in-text cite: (UCMP, 2005)*

University of California Museum of Paleontology, Understanding evolution (2005). *"Superweed" discovered in Britain?* Retrieved from http://evolution.Berkeley.edu/evolibrary

Article in a magazine or journal:

Author last name, first initial. (Year, month, day). Title of article. *Name of periodical,* issue number, pages. Retrieved from [database name].

Example: *How to in-text cite: (Decaestecker, 2007)*

Decaestecker, E., et al. (2007, Dec 6). Host-parasite 'Red Queen' dynamics archived in pond sediment. *Nature*, 7171, 870-873. Retrieved from Science Reference Center.

Book:

Author last name, first initial. (Year of publication). *Title of work: Capital letter also for subtitle*. Location: Publisher.

Example: *How to in-text cite: (Percival, 1965)*

Percival, M. (1965). Floral biology. Oxford: Pergamon Press.

 Name _____

Poster Gallery

Student Worksheet (5 of 5)

Complete the following as you examine 5 of your classmates' posters.

#	Common Name	What adaptations make this species invasive?	How is it harmful?	Where is this species found in Montana?
1				
2				
3				
4				
5				

What do all of the aquatic invasive species that you looked at have in common?

In what ways can these species impact the local economy?

How can the spread of the species be prevented or controlled?

Most Unwanted AIS Poster

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AIS Poster Sign Up Sheet

AIS Poster Topic	Student Name(s)
Asiatic clam (*Corbicula fluminea*)	
Chinese mysterysnail (*Cipangopaludina chinensis*)	
New Zealand Mudsnail (*Potamopyrgus antipodarum*)	
Quagga Mussel (*Dreissena rostiformis bugensis*)	
Red-rim melania (*Melanoides tuberculatus*)	
Zebra mussel (*Dreissena polymorpha*)	
Virile crayfish (*Orconectes virilis*)	
Bloody red shrimp (*Hemimysis anomala*)	
Red swamp crayfish (*Procambarus clarkii*)	
Rusty crayfish (*Orconectes rusticus*)	
Spiny waterflea (*Bythotrephes longimanus*)	
Bighead carp (*Hypophthalmichthys nobilis*)	
Asian swamp eel (*Monopterus albus*)	
American Bullfrog (*Lithobates catesbeianus*)	
Northern pike (*Esox lucius*)	
Northern snakehead (*Channa argus*)	
Snapping turtle (*Chelydra serpentina*)	
Brazilian waterweed (*Egeria densa)*	
Curly-leaf pondweed (*Potamogeton crispus*)	
Didymo (*Didymosphenia germinata*)	
Eurasian watermilfoil (*Myriophyllum spicatum*)	
Flowering rush (*Butomus umbellatus*)	
Hydrilla (*Hydrilla verticillata*)	
Parrot Feather Water-milfoil (*Myriophyllum aquaticum*)	
Yellowflag iris (*Iris pseudacorus*)	
Starry stonewort (*Nitellopsis obtusa*)	
Other:	
Other:	

Most Unwanted AIS Poster

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Warm Up

Teacher Resource (2 of 3)

Examine the items below and be prepared to respond to the two questions below:

1. What is the problem?

2. Where is it occurring?

Eurasian watermilfoil:

Photo credit: www.clean-flo.com

Eurasian watermilfoil:

Photo credit: Alison Fox, U. of Florida, bugwood.org

Eurasian watermilfoil distribution map:

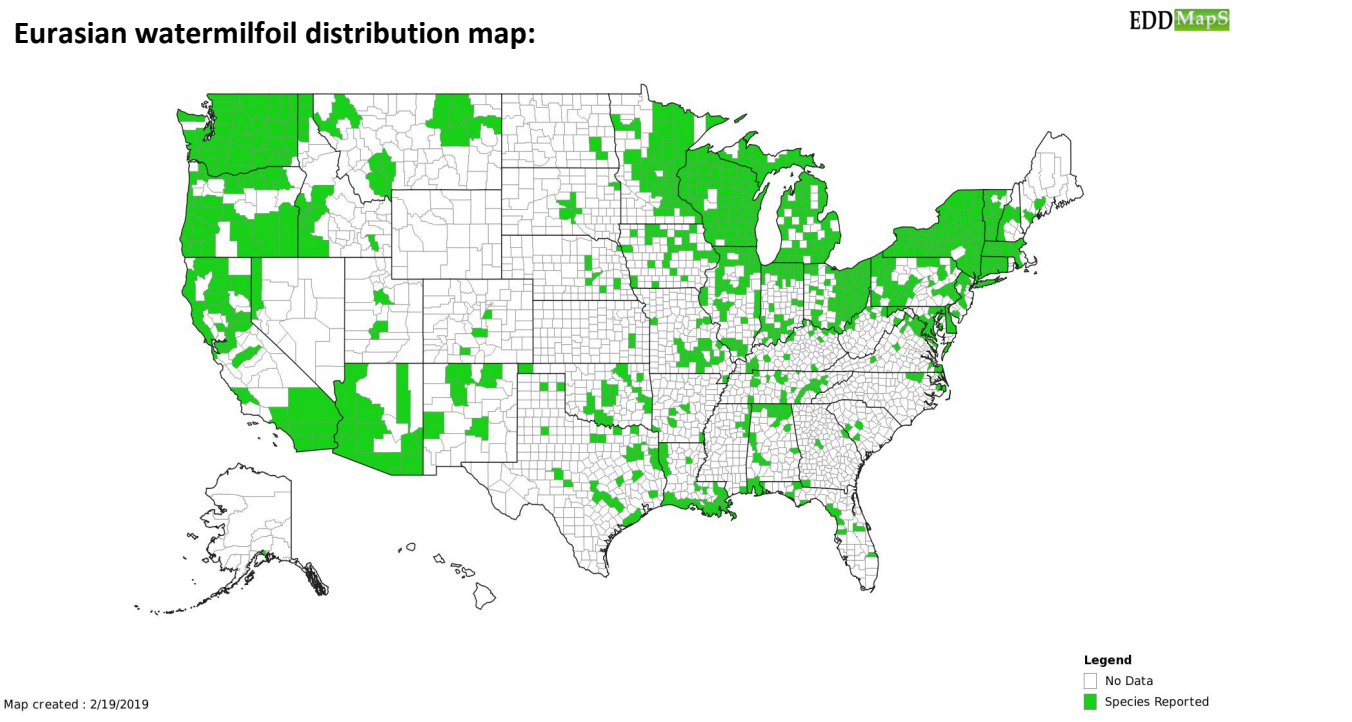

Photo credit: Invasive.org https://www.invasive.org/browse/subinfo.cfm?sub=3055

Most Unwanted AIS Poster

Teacher Resource (3 of 3)

Montana Aquatic Invasive Species Distribution – Plants 2018

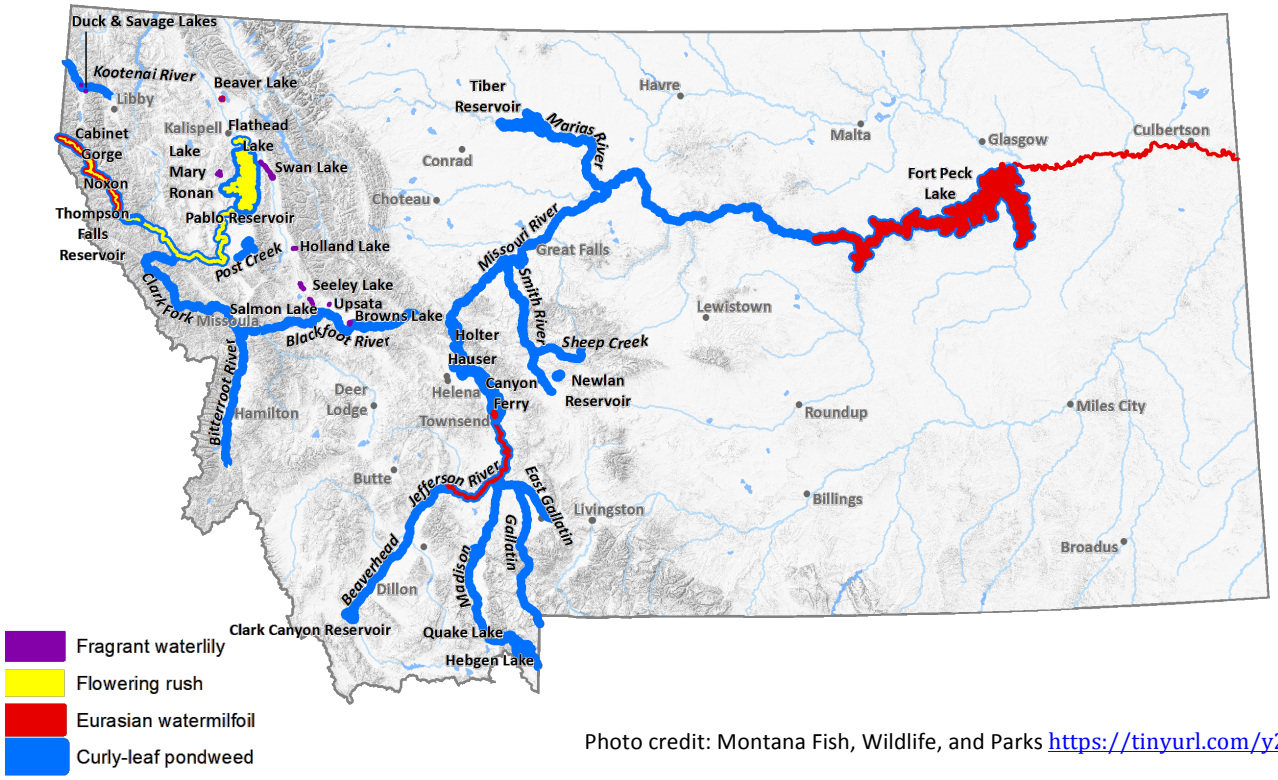

Photo credit: Montana Fish, Wildlife, and Parks https://tinyurl.com/y2fl4ak9

Life Cycle of Eurasian watermilfoil in the Great Lakes Region

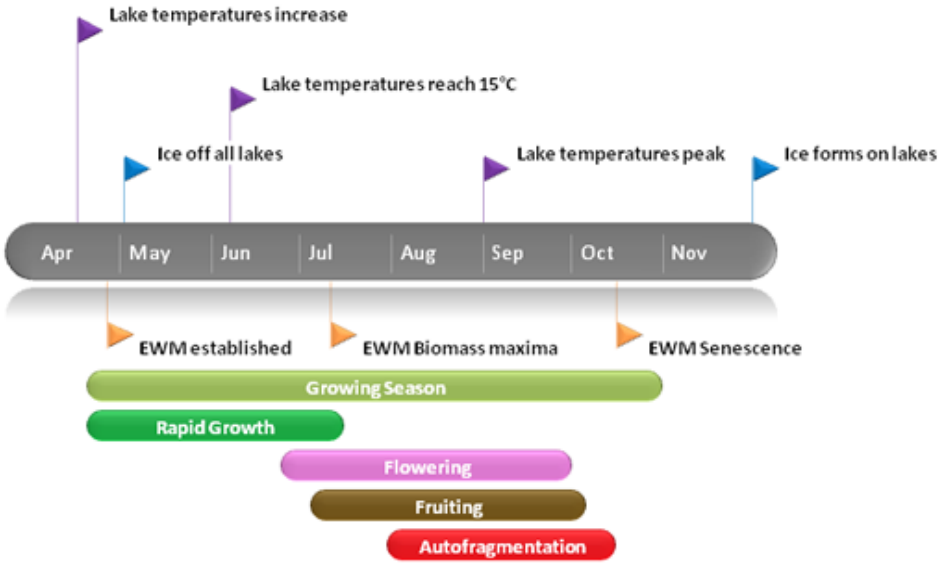

Photo credit: Michigan Tech Research Institute https://mtri.org/eurasian_watermilfoil_biology.html

Eurasian watermilfoil:

- grows quickly in dense patches.
- fragments easily.
- displaces native plants, reducing food for native waterfowl.
- produces large amounts of decomposing leaf-litter or detritus, which produces low oxygen conditions.
- makes it difficult for native trout to catch food.
- increases standing water and mosquitos.
- reduces land values.
- impacts tourism and recreation.