

# Musselshell Watershed Coalition

## 2022 Winter Edition



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[musselshellwc.wixsite.com](http://musselshellwc.wixsite.com)

### WHAT HAS THE MWC BEEN UP TO?

The Musselshell River Watershed is a place of extremes and since it's been awhile since we've sent a newsletter, it seemed appropriate to recap what has taken place on the Musselshell River since the inception of the Musselshell Watershed Coalition in 2009 and some of the things that we're doing in response.

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### NEXT MEETING:

Tuesday, December 13, at Noon in Roundup. MSU Extension Office

Agenda Highlight: *Montana Fish, Wildlife, and Parks to present on the Musselshell River Fishery*

A full agenda can be found on the website and our Facebook page. The meeting will end at 2:30. Please bring your own lunch. We hope to see many of you there.



# Musselshell Flooding: How it looks then and now

Flowing 342 miles, through the heart of Montana from Martinsdale to the Missouri River, the Musselshell River irrigates nearly 85,000 acres on 250 farms and ranches. Communities throughout the watershed cannot claim strength in numbers but have demonstrated that strength comes from shared challenges and shared concerns.

The people of the Musselshell are no strangers to natural disasters. In recent years, these have included floods in 2011, 2013 and 2014 and sustained 5-year flood waters for over a month in 2018 and 2019 as well as big fires in 2012, 2017, 2020, and 2021, and record setting drought in 2021 that extended into 2022.

During the 2011 flood, the river crested four feet over flood stage which left over 300 people stranded when roads were washed out or under water. For two weeks, stranded people had to rely on their neighbors to bring them necessities like medicine, food, and drinking water, much of which was transferred by boat. The Musselshell River itself shortened by almost 10%. In the years since, the river has continued to move in an effort to reclaim its length. This constant changing has brought constant challenges to landowners and communities trying to live on its banks.

The Musselshell Watershed Coalition (MWC), was one entity of many that helped to organize emergency repair projects, formed a technical advisory team to evaluate the damage, and learned of ways to lessen the economic, social, and ecological impacts of future flooding events. The MWC continues to work with partners to implement streambank stabilization projects and towards updating irrigation infrastructure, all of which lessens our community's susceptibility to flood damage.



The extremes of the Musselshell never cease to amaze. Above photos show the August 2014 flood on the lower end of the Musselshell and Flatwillow Creek wiping out a bridge and the photo on the right shows Flatwillow Creek in mid-October 2022. Dry. [Both photos by Chris Boyer, Kestrel Aerial.]



## A 10-year History of THE MUSSHEL RIVER

ALWAYS A PLACE OF EXTREMES, THE LAST 10 YEARS ON THE MUSSHEL HAVE BEEN EXCEPTIONAL.

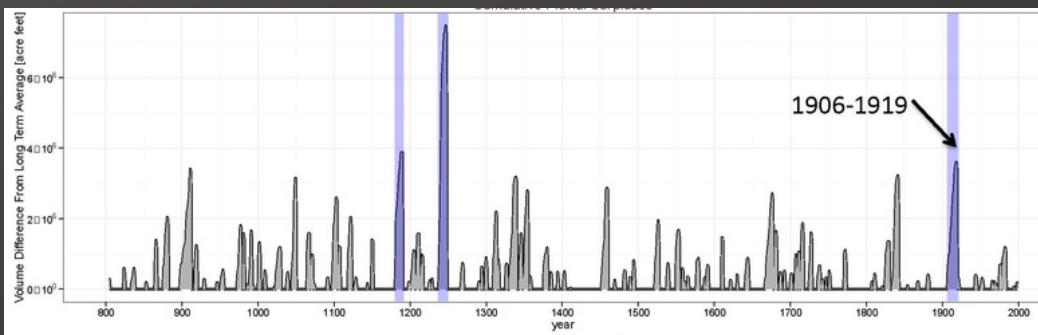


### Musselshell River at Mosby: High-Flow Periods

In the fall of 2021, the City of Roundup hosted a 10-year Anniversary Event for the 2011 floods. Much has been learned in the last ten years, the most of which is the importance to work together, communicate, and seek resources. Mayor Sandra Jones shared these 7 Steps for Building a Resilient Community:

- Assess the need
- Assess available resources
- Open lines of communication with one another
- Identify what each partner contributes to the whole
- Celebrate the differences among partners
- Present a unified force
- Evaluate the results (and then start over again)

One thing is sure, flood, fire, and drought will all come again and neighbors and partners will be prepared to respond. And, whether fire or flood, local landowner Mary Brown said it best: "Ranches can be rebuilt but knowing who will be there for you when things get tough, that is irreplaceable."



gage	pluvial_category	rank	cumulative_deficit_[acre_feet]	start_year	end_year	pluvial_length
Musselshell River at Mosby/MT	10-14yr	1	7160649.324	1237	1248	12
Musselshell River at Mosby/MT	10-14yr	2	3881403.038	1180	1190	11
Musselshell River at Mosby/MT	10-14yr	3	3525805.835	1906	1919	14
Musselshell River at Mosby/MT	15-19yr	1	3304288.594	897	912	16
Musselshell River at Mosby/MT	5-9yr	1	3141111.16	1044	1050	7
Musselshell River at Mosby/MT	10-14yr	4	3098771.904	1833	1842	10
Musselshell River at Mosby/MT	10-14yr	5	3056979.167	1330	1340	11
Musselshell River at Mosby/MT	5-9yr	2	2735399.631	1348	1355	8
Musselshell River at Mosby/MT	5-9yr	3	2489843.312	1097	1104	8
Musselshell River at Mosby/MT	5-9yr	4	2069284.614	1309	1314	6
Musselshell River at Mosby/MT	5-9yr	5	1811123.909	875	882	8
Musselshell River at Mosby/MT	2-4yr	1	1454251.867	1609	1611	3
Musselshell River at Mosby/MT	2-4yr	2	1416662.725	980	982	3
Musselshell River at Mosby/MT	2-4yr	3	1360259.821	1149	1151	3
Musselshell River at Mosby/MT	2-4yr	4	1249611.832	864	867	4
Musselshell River at Mosby/MT	2-4yr	5	1178189.93	1105	1108	4



Dust bowl



gage	drought_category	rank	cumulative_deficit_[acre_feet]	start_year	end_year	drought_length
Musselshell River at Mosby/MT	35-39yr	1	-7032975.091	1412	1450	39
Musselshell River at Mosby/MT	30-34yr	2	-6557219.242	1151	1180	30
Musselshell River at Mosby/MT	15-19yr	3	-3902113.926	1248	1266	19
Musselshell River at Mosby/MT	15-19yr	4	-2968516.656	1272	1289	18
Musselshell River at Mosby/MT	15-19yr	5	-2789477.522	1075	1090	16
Musselshell River at Mosby/MT	10-14yr	6	-2569424.495	1653	1666	14
Musselshell River at Mosby/MT	15-19yr	7	-2487930.349	1050	1064	15
Musselshell River at Mosby/MT	20-24yr	8	-2367465.954	1922	1942	21
Musselshell River at Mosby/MT	10-14yr	9	-2345449.933	1497	1507	11
Musselshell River at Mosby/MT	15-19yr	10	-2322771.475	957	972	16
Musselshell River at Mosby/MT	10-14yr	11	-2273812.872	1792	1805	14
Musselshell River at Mosby/MT	10-14yr	12	-1895487.495	1359	1370	12
Musselshell River at Mosby/MT	10-14yr	13	-1872474.517	1130	1143	14
Musselshell River at Mosby/MT	5-9yr	14	-1836763.124	1717	1724	8
Musselshell River at Mosby/MT	5-9yr	15	-1628379.743	1592	1600	9
Musselshell River at Mosby/MT	5-9yr	16	-1572684.862	1513	1521	9
Musselshell River at Mosby/MT	5-9yr	17	-1407923.979	1754	1762	9
Musselshell River at Mosby/MT	5-9yr	18	-1371967.438	1580	1586	7

### Musselshell River at Mosby: Low-Flow Periods





# Eastern Heath Snail

## Eastern Heath Snail

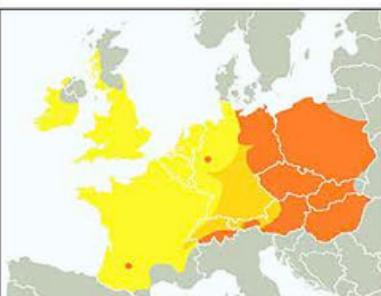
Terrestrial snail in the Hygromiidae family  
Scientific Name: *Xerolenta obvia* (Menke)

**Description:** a little smaller than a dime (0.63" (16 mm) - 0.75 (19 mm) in diameter); white with dark brown spiral brown bands



**Hosts:** feeds on a wide range of plant species (254 genera). Is a known pest of alfalfa, clover, lupine, sanfoin, serratella (a legume), wheat, and barley. Observed locally on a wide variety of plant materials, e.g., grasses, ornamentals, trees (including fruit), shrubs and weeds.

**Biology & Behavior:** found in vegetation, under rocks, boards, and refuse. Known for climbing on vegetation, fence posts and other upright objects to escape high ground temperatures and will aggregate in enormous numbers in a behavior called massing. Snails survive long periods of dry conditions by withdrawing into their shells and sealing the opening with a mucous membrane. Reproduces in the fall in Europe (typically October and early November) but has been observed to have a spring and fall reproductive cycle in North America. Overwinters in the soil.



**Distribution:** southeastern and eastern Europe (Bulgaria, Czech Republic, Poland, Slovakia) and isolated populations in western Germany and southern France (depicted in orange). Established population in southern Ontario (Bethany in 1969 and 1972) and detected in Detroit, Michigan in 2001. Introduction and spread of snail populations is largely by anthropogenic means (man). Snails readily attach themselves to a variety of materials.

Source: KERNEY et al.

**Damage/Impacts:** feeds on plant material, reducing yields and lowering crop quality

- Contaminant in grains; products may be downgraded (e.g., malting barley to feed barley) or may be unacceptable to grain handling authorities
- Contaminate of fruits and vegetables
- Transmits spores of *Alternaria* sp., *Fusarium* sp., and *Phytophthora* sp. (plant diseases)
- Vector of animal diseases: *Protostrongylus rufescens* (sheep lungworm), *Davainea proglottina* (cestode), and *Dicrocoelium dendriticum* (trematode).



Montana Department of Agriculture  
302 N. Roberts  
Helena, MT 59620-0201  
406-444-9430

### Contacts

United States Department of Agriculture  
Animal and Plant Health Inspection Service (APHIS)  
Plant Protection and Quarantine (PPQ)  
406-449-5210

# Best Management Practices for the Eastern Heath Snail

## Site Sanitation

Trash, litter, debris or other forms of waste provide snails with daytime hiding places or harborage. Infested areas/properties should be kept clean to help facilitate management and improve the effectiveness of control measures. Removal of trash, litter or other debris should be conducted to prevent the spread of an infestation by hitchhiking snails. To mitigate risks, ensure waste is free of snails, place waste in regular waste bags and seal prior to normal proper disposal.

## Artificial Movement Prevention and Inspection

Various articles can provide snails an opportunity to "hitchhike" and travel to other locations. Articles may include any product, commodity, vegetation or any means of conveyance, that present a pathway for the spread of snails or snail eggs. To address this concern, the following practices are recommended:

- Thoroughly inspect articles that will be leaving infested areas.
- Articles should not be staged in infested areas or where vegetation is present. Articles that need to be staged in vegetated or known infested areas should be inspected for snails prior to being moved.
- If snails are observed, they should be removed and eliminated by crushing.
- If possible, the article/s in transit should be properly inspected at the point of origin and at its destination to verify the condition as "snail free." If shipping to Oregon or California, an official inspection prior to shipment or transit is required.

## Site Management and Modification

**Vegetation Management:** Maintenance of vegetation in infested areas is an effective means of controlling the natural spread of snails by reducing food sources/habitat, in addition to enhancing the effectiveness of mollusk control measures. Some examples of vegetation management include mechanical cutting and herbicide applications.

- Vegetation should be mowed to a maximum height of 5 inches.
- Green waste such as small trees, brush, and other vegetation should be chipped on site prior to removal to prevent artificial movement of snails.
- After clearing and removal of vegetation, mow or apply thorough, regular pesticide applications.
- Inspect all equipment before it leaves the infested site to prevent artificial spread.
- Optimally, equipment used for vegetation management should be cleaned and stored inside buildings. Any equipment stored outside can be protected by establishing a salt barrier.
- For questions about disposal procedures to help prevent artificial spread, contact the Montana Department of Agriculture or local USDA APHIS PPQ office.

## Site Modification

Site modification may be used in lieu of vegetative controls if the facility determines such practices would be more feasible and cost/effective. Site modification such as grading or resurfacing kills snails and eggs present in the shallow surface soils (0-4 inches below ground). Grading also disrupts existing vegetation and destroys snail habitat. Examples of site modification include raking, rough grading with a bulldozer or resurfacing with crushed stone or gravel, asphalt millings, pavement, or concrete to retard vegetation regrowth.

## Treatment

To reduce and manage snail numbers, apply molluscicides approved for use in your state to the infested areas. Use granular molluscicide baits having either metaldehyde or iron phosphate as the active ingredient. There are a variety of brand name molluscicides with these ingredients which have appropriate labeling for the sites to be treated.

## Summary

Property owners are encouraged to implement Exotic Snail Best Management Practices to prevent additional snail species from establishing active populations. The Exotic Snail Best Management Practices is not intended to be complete and all- inclusive, but provides a foundation for effective management. Property owners are encouraged to customize/tailor these Best Management Practices to their own property and unique set of conditions.



GPS-collared cows like this one near Malta can be managed through a web application, like Vence. The program, (a mashup of "virtual" and "fence"), allows ranchers to draw virtual fencelines on their cell phones - effectively improving grazing management and boosting drought resilience with less effort, less cost, and no black-and-blue thumbnails. - David Hanson.

## Montana Drought Management Plan: Fall 2022 Updates

### Regional groups to meet Dec. 15 to talk drought adaptation

Did you know that even though summer's over, most of the state is still in a multi-year drought?

#### Drought Plan Updates for Summer/Fall 2022:

- A huge thanks to those of you who carved out time over the summer for a one-on-one drought interview or to complete the online drought survey! Our team completed 60 interviews and collected survey responses from over 250 people representing a wide array of water interests across Montana.
- The Montana Drought Task Force met monthly over the summer to monitor drought and draft a modern drought response framework and response recommendations.
- We're wrapping up work with the Montana Climate Office and other partners on a drought monitoring analysis that identifies the best data-driven drought indicators and indices to use in different parts of Montana at different times of year.
- We've profiled six community members across Montana who are working on diverse drought adaptations in their fields – from beaver mimicry and biochar to regenerative farming and collared cattle.

The statewide drought vulnerability assessment – a data-and-stakeholder-driven look at how different communities experience drought – is almost complete.

#### What's Next?

Now, it's up to you to help identify local, regional, and state-level adaptation strategies. Please join us (virtually) on December 15 to hear results from your interviews/surveys and to look at drought vulnerability across the state.

Regional Groups meeting:  
Thursday, December 15 from 12:30 – 2:30 p.m. via Zoom.

[\*\*CLICK HERE TO REGISTER\*\*](#)

Keep an eye out for the opportunity to comment on the draft drought plan in spring 2023. In the meantime, please reach out with questions, comments, or just to say hello! See you on December 15.

Resiliently, **The DNRC Drought Team**

Regional Groups Refresher: There are seven regional stakeholder groups across Montana that formed for the purpose of updating the Montana Drought Management Plan through 2022. Group members – like you – represent various water-related categories including agriculture, public supply, recreation, energy, tourism, wildlife and fisheries, conservation, hydropower, industry, commerce, culture, and more. Your continued input will ensure the new state drought plan incorporates local needs, priorities, and solutions moving forward. Please feel free to pass this invitation along.

[MTDroughtInfo.org](http://MTDroughtInfo.org)

Stay Connected with Montana Department of Natural Resources & Conservation  
1539 Eleventh Avenue  
Helena MT 59601





CEMIST's four Regions



CEMIST Educational Table set up at tradeshows, conventions & events

# CEMIST Update

The Central and Eastern Montana Invasive Species Team (CEMIST) is a team of local and state partners whose purpose is to protect and preserve the economy and natural resources in Central and Eastern Montana from current and future invasive species. CEMIST's mission is to leverage the invasive species prevention work of our state and local partners through education, outreach, advocacy, and rural connections.

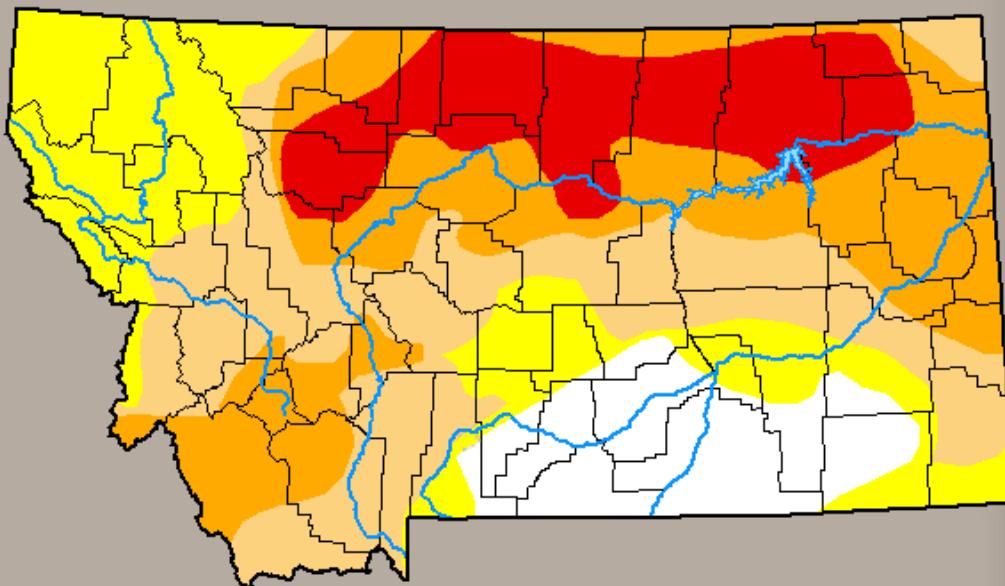
CEMIST is currently updating its strategic plan to help focus the team's efforts. CEMIST has hired a new program manager, Brent Smith, who will join the team full time on December 1st. The Petroleum County Conservation District is hosting this position in Winnett, MT.

If you have any questions regarding the CEMIST program or invasive species management, please contact the new CEMIST Manager:

**Brent Smith**  
**cemist.manager@gmail.com**  
**406.599.5120**  
**PO Box 118**  
**Winnett, MT 59087**



## U.S. Drought Monitor ~Montana~



**November 22, 2022**  
*(Released Wednesday, Nov. 23, 2022)*

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	12.04	87.96	66.74	40.51	15.47	0.00
<b>Last Week</b> 11-15-2022	10.43	89.57	66.76	41.89	15.47	0.00
<b>3 Months Ago</b> 08-23-2022	32.62	67.38	31.85	15.53	3.59	0.00
<b>Start of Calendar Year</b> 01-04-2022	7.36	92.64	89.33	86.35	53.93	13.87
<b>Start of Water Year</b> 09-27-2022	5.40	94.60	77.46	45.05	12.35	0.00
<b>One Year Ago</b> 11-23-2021	0.00	100.00	100.00	92.82	66.82	33.10

### Intensity:

None	D2 Severe Drought
Yellow	D0 Abnormally Dry
Orange	D3 Extreme Drought
Light Orange	D1 Moderate Drought
Dark Red	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

### Author:

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U.S. Department of Agriculture



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

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