

# Thinking Like a Watershed

## Black Earth Creek Watershed Association

Spring 2018

1987 - 31 YEARS AND STILL COUNTING - 2018

### The Good, the Bad and the Ugly Spread of New Zealand Mud Snails in Black Earth Creek

*Bobbi Peckarsky, BECWA Board Member*

The New Zealand mudsnail (NZMS), which is native to New Zealand, was first discovered in North America in the late 1980s. Within the first two decades of its introduction, this invasive snail has spread from the initial invasion site in Idaho to a dozen other US states (including Wisconsin). In invasion sites, mudsnails typically exhibit high-density populations, leading to the displacement of native species. Rainbow and Brown Trout will eat these snails, but they lose weight when fed New Zealand mudsnails in the lab. In fact, these snails have been reported to pass through the guts of trout unharmed!



NZMS image with a penny

Images of mature New Zealand mudsnail  
(*Potamopyrgus antipodarum*).

During routine invertebrate sampling by Wisconsin DNR Biologists these invasive snails were discovered in 2011 in Black Earth Creek (BEC) at the crossing of South Valley Road. At that site NZMS densities went from very low numbers to hundreds/thousands per sample after one year. Six years after their initial discovery, they have been found in many other sites of BEC (as well as sites in the Sugar River drainage). Sites with infestations are not adjacent, suggesting that they are not colonizing adjacent sites on their own, but that people move them from one location to another. Biologists studying the spread of NZMS in Western US streams have reached the same

conclusion. Furthermore, they spread faster than possible by downstream drift in the water column or upstream dispersal along the stream bottom.

NZMS are highly successful invaders and very difficult to control because they can tolerate drying and survive over 50 days on wet soles of waders. They are very tiny and may, therefore go unnoticed with cursory inspection of footwear. They also reproduce asexually (clone), which enables them to increase numbers very fast. There has been considerable effort to control the spread of the New Zealand mudsnail in streams of the Western US, but most efforts have been unsuccessful because these snails have no natural enemies in the US. In New Zealand they are kept in check by trematode parasites that do not occur in North America. Therefore, the best method of halting or slowing the spread of this nasty invasive species is to educate the public and users of Black Earth Creek about proper disinfection and control protocols.

One of the missions of the Black Earth Creek Watershed Association (BECWA) is to strengthen watershed-wide efforts to tie communities and interests into shared activities to improve watershed and its environs. Currently, we are undertaking an effort to improve outreach and education related to slowing/mitigating the spread of the NZMS via information disseminated on the BECWA website, via signage, flyers, BECWA newsletters, student involvement in monitoring the locations of the snails, and efforts to more effectively connect to users and businesses of the Black Earth Creek watershed. To help support these efforts, BECWA has just received a Dane

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**Black Earth Creek  
Watershed  
Association**

**BECWA.ORG**

*For the wise management of the land and water resources in the Black Earth Creek Watershed.*

**BECWA Goals**

- To protect, conserve, support and advocate for the wise, long term management of the physical, biological, environmental, cultural and historical resources that constitute the heritage and future of the watershed.
- To foster and encourage citizen and locally-based stewardship among the many members of the Watershed community.
- To provide a forum for civilized discussion of issues and problems in the Watershed.

**Board of Directors**

Greg Hyer, *President*  
Bobbi Peckarsky, *Vice-President*  
Barbara Borns, *Secretary*  
David Lucey, *Treasurer*  
Richard Anderson - Steve Born - Dan Buckland  
Kathy Haig - Christopher Long - Debra Weitzel

Deb Nemeth - *Newsletter Design*  
Barbara Borns - *Newsletter Editor*  
Deb Weitzel - *Proofreader*

***Events in the Watershed***

**TROUT DAY**

Saturday, May 5 at 1 PM

**“Bugs by the Creek”**

with Mark Miller

**Fly Fishing Demonstration**

with Dennis Franke &  
Dan Buckland

South side of Black Earth Creek  
across bridge from CP Pharmacy

**Become a BECWA member or renew your membership**

Send your check with name, address and email to:  
David Lucey, 7952 County Highway K, Cross Plains, WI 53528

Lifetime Member - \$100 Business - \$50  
Watershed Patron - \$35 Household - \$25 Basic - \$15

***A Note from Greg Hyer***

Earth Day, 48 years old this year, celebrates our planet's environment and raises public awareness about pollution. Wisconsin's own, Gaylord Nelson, proposed the now international event after seeing damage done by a Santa Barbara oil spill. Earth Day hikes are organized to reinvigorate our souls and rededicate ourselves. Groups plant trees to remind us that single individuals can make a difference. BECWA's Black Earth Creek Clean Up Day, over decades, has hauled less and less trash out of the Creek and off the Creek bank. A visible indicator that citizen stewardship and education work improved the Black Earth Creek Corridor environment.

The oil spills, chemical, water and air pollution of 50 years ago were obvious and a public consensus developed on remediation efforts. Today's environmental threats are less obvious, and remediation efforts are hotly debated. Here at home, the threat to water quality and fish populations from New Zealand Mud Snails is a good example. Scientists are documenting the rapidly increasing numbers of snails in known locations and finding an alarming spread in the number of new locations in the Creek. Catastrophic, but not obvious to most of us, effects on insect, plant and fish populations are underway. There is disagreement among folks on whether anything can be done to reduce or eliminate the snail's damaging effects.

BECWA strongly believes WE can slow the spread of snails within the Creek and we can prevent the transfer of these snails from Black Earth Creek to other trout streams in Wisconsin. To paraphrase Smokey the Bear, only we can prevent the spread of these snails. Read about the great work of Dr. Bobbi Peckarsky and others on documenting the known problem areas in this issue; look for our flyers on what you can do and our signs along the creek highlighting problem areas.

***Happy Earth Day 2018!***



# Master Naturalist Volunteer Training

WISCONSIN  
Master Naturalist



**June 21st**

4:00 - 8:00 pm

Kromrey Middle School Room 510  
7009 Donna Drive, Middleton

**June 22, 23, 28-30**

9:00 am - 5:00 pm

Staging in  
Kromrey Middle School Room 510

Have you ever wanted to learn more about the environment and do it in a fun, hands-on, outdoor way? If your answer is YES, then consider registering for the Friends of Pheasant Branch Conservancy Master Naturalist Training being held in Middleton **June 21-23 and June 28-30**. The target audience is folks interested in environmental education and/or individuals seeking to help with restoration and management of the natural environment.

What's to learn? The course will look within the Pheasant Branch Conservancy, Black Earth Creek and beyond to explore geologic history, ecology, water and soil resources, and the connections between humans and the landscape. The 40 - hour training presents these concepts by traveling to sites doing walks and talks with professionals in the field.

Sneak peek: Learn geology while hiking in Devils Lake State Park and seeing evidence of the remains of the last glacier. What about controlling swimmer's itch by using knowledge of the lake's food chain and past nutrient history? Dick Lathrop will outline his successful program of draining nutrient rich bottom waters during the fall and spring turnovers. What about water? Compare lakes to streams and wetlands. Sample chemical and biological parameters at Black Earth Creek and discover one of the newest stream invasive species - the New Zealand Mud Snail. For the prairies, the oaks and so much more, experience restoration work at Pheasant Branch Conservancy and learn about restoration and management with Dave Lucey at Festge Park. Learn how citizen science is becoming a leading tool in tracking restoration needs, efforts and successes over time. Pursue your interests in a capstone project for education, environmental stewardship, or citizen science. Have fun while learning about nature and the importance of getting outside.

Course fee is \$250.

Scholarships up to \$200 are available as needed.

Register at:

<https://wimasternaturalist.org/volunteer-course/PheasantBranch2018>

For more information:

Contact Deb Weitzel at [debraw@chorus.net](mailto:debraw@chorus.net)

**UPDATE!!!** Look for this course offering in June of 2019. Due to the popularity of the Friends of Pheasant Branch WI Master Naturalist training, early signups filled the roster before publication of BECWA newsletter. Perhaps getting on the waiting list might afford a slot in 2018 if a cancellation occurs.



## The Good, the Bad and the Ugly - con'd

County Environmental Grant from the Community Partners Program that contributes toward publication of this newsletter and to posting large WARNING signs in areas where NZMS has already invaded.

One critical component of BECWA's efforts to educate the public and slow the spread of NZMS is to promote ongoing monitoring of sites on Black Earth Creek. Biologists with the DNR did extensive surveys of many sites on BEC in early 2012; but limited budgets and realigned agency priorities have prevented them from continuing that effort. Therefore, with the blessing of the DNR NZMS response team, BECWA members have voluntarily undertaken a stream monitoring project with two objectives: 1) to identify the extent of the spread of the invasive snails in BEC, and 2) to test for effects of NZMS on the native stream communities.

In October 2017, under the direction of Bobbi Peckarsky, a group of graduate students in Professor Claudio Gratton's Basic and Applied Insect Ecology class from the University of Wisconsin Madison surveyed four sites on BEC in the Village of Cross Plains (See Map with Site numbers assigned by DNR biologists during 2012 surveys). In October 2017 two sites had known outbreaks of NZMS (#11: downstream of the Cross Plains Sewage Treatment Plant, and #22: behind the Kwik Trip upstream of Hwy P), and two sites did not (#41: downstream of the bridge on Hwy KP, and #34: across from the parking lot on Mill Creek Parkway in Zander Park).



Zander Nature Park  
Photo: Dennis Franke

### Site Map for Black Earth Creek



Flow



The photo shows a boot exhumed from Site #22 by DNR Biologist Mike Miller in May 2017, the first discovery of an outbreak at this site. The arrow pointing toward site #41 indicates the location of a new outbreak of NZMS discovered by the class in October 2017.

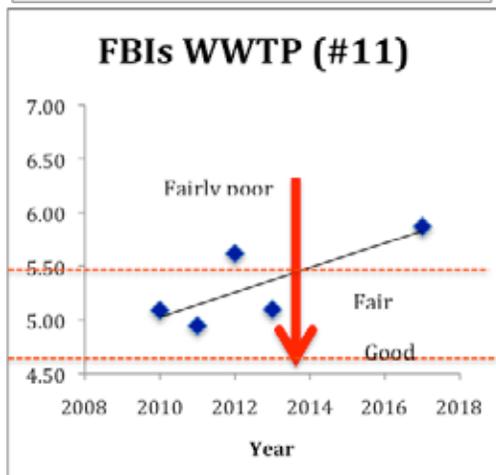
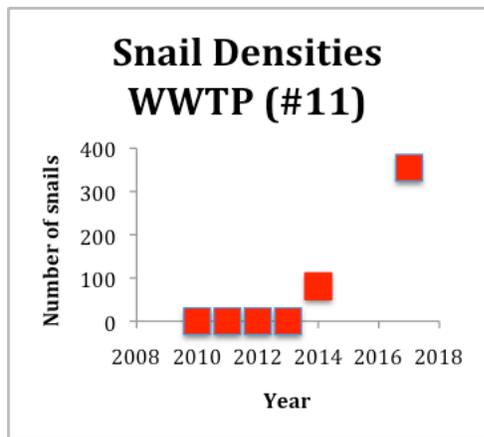
The class took samples of the invertebrates at all four sites and inspected them for snails, as well as calculating Family Biotic Index (FBI) that has been used by stream ecologists to evaluate stream habitat quality as indicated by the health of invertebrate communities. Here we present the preliminary results from these surveys based on counts of snails and the invertebrate FBIs measured in October 2017 and compared to historic data from the DNR SWIMS database. We are planning to collaborate with the UW Stevens Point Aquatic Entomology laboratory that has historically processed stream invertebrate samples taken by DNR biologists so that we can do more thorough identification of invertebrates to species and calculate the entire suite of biotic indices used by the DNR and recorded in the SWIMS database.

### Results from the sites with previously known outbreaks of NZMS:

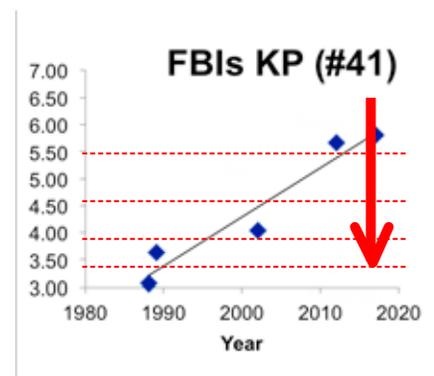
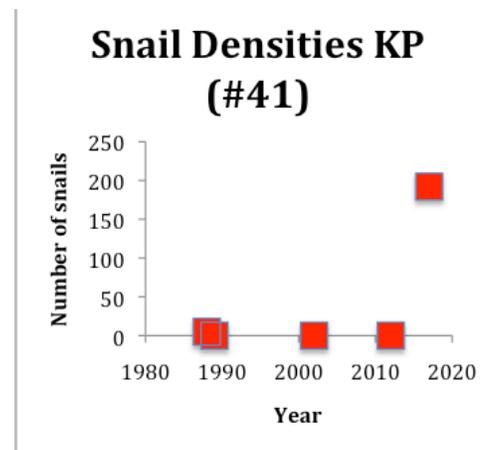
At the Cross Plains Waste Water Treatment Plant (WWTP) site (#11), DNR Biologist Mike Sorge reported snail outbreaks in 2014 (red arrow on Graph). Samples taken by the class in October 2017 show that densities of snails had increased four fold in 3 years (See Graph).

The Family Biotic Index (FBI) combines the diversity of invertebrates with their known tolerance for degraded conditions. The way this index is calculated, low values are good and high values are bad (0 – 3.75 = Excellent, 3.76 – 4.25 = Very Good, 4.26 – 5.00 = Good, 5.01 – 5.75 = Fair, 5.76 – 6.50 = Fairly Poor, 6.51 – 7.25 = Poor, 7.26 – 10 = Very Poor). Therefore increasing FBI's indicated that the health of the invertebrate community declined from good/fair to fairly poor in the years after the snail invasion (See graphs).

at site # 41, downstream of Hwy KP at the west end of the village of Cross Plains (See Graph). As with the other invaded sites, the FBI indicates that the health of the invertebrate communities has deteriorated at this site from "Excellent" 30 years ago to "Fairly Poor" in more recent samples (See Graph). However, this decline in the FBI occurred before the invasion of the snails (2012). Therefore, the fairly poor stream condition at this site (and also at the other sites) cannot be attributed to or be caused by snail outbreaks that occurred later; but relatively poor stream conditions may contribute to making streams more vulnerable to invasion, as also observed in streams in the Western US. It is also noteworthy that some sites on BEC that have relatively poor invertebrate communities have not been invaded by snails. Therefore, the causes of these invasions remain to be disentangled.



Similarly, snail densities went from zero when last sampled in 2014 at the site behind the Kwik Trip (#22) to ~250 per sample in October 2017. And the FBI indicated that the health of the invertebrate communities at this site declined from "Good – Excellent" to "Fair" after invasion of the snails.



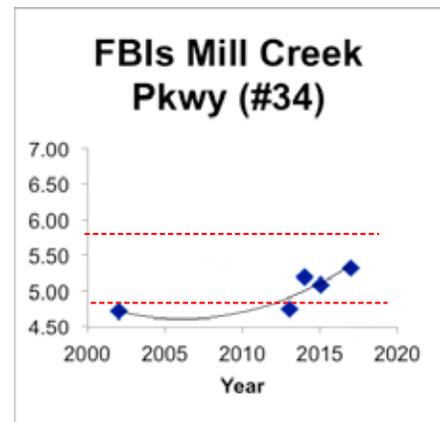
**Results from sites where NZMS outbreaks had not been reported prior to October 2017**

In October 2017 the students of the Applied and Basic Insect Ecology class discovered an outbreak of NZMS

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Finally, there was no evidence of a NZMS outbreak at the site in Zander Park (#34) (only 10 NZMS were collected in October 2017). This site bears watching, however, because if snail densities do not increase, it could be an important reference site with conditions that do not support snail outbreaks. However, it is also noteworthy that the FBIs indicate that the health of the invertebrate community has declined from “Good” in 2013 to “Fair” in the years after the stream re-meander project occurred upstream of this site (See graph). We will continue to monitor this site not only for snail outbreaks, but also to observe whether the quality of the invertebrate community rebounds to levels measured before the re-meander project was completed.



## Summary and Recommendations

The patterns of distribution of outbreaks of New Zealand Mudsnails observed over space and time in Black Earth Creek are consistent with people spreading them from site to site, rather than natural movements of the snails along the stream bottom or in the water column. Therefore, it is of the utmost importance that users of Black Earth Creek understand the consequences of wading in stream sites that are infested with snails or have unknown snail status, and then moving to another site. The clone of snails that invaded Black Earth Creek is the same one that exists in Wyoming streams, which raises suspicion that they hitch hiked to Wisconsin on the boots of someone who had been fishing in Wyoming. Unless boots and any other gear that has been in contact with an infected site are thoroughly disinfected, careless human behavior carries a high risk of spreading the snails from site to site. Details for cleaning gear can be found on the Wisconsin DNR website: <http://dnr.wi.gov/topic/invasives/fact/newzmsnail2012.html>. Options include freezing, steam cleaning, or soaking in household cleaner 409 or a somewhat nasty chemical called Virkon. The best advice is for users of Black Earth Creek DO NOT WADE in sites with known infestations of NZMS or sites with unknown snail status. FISH FROM SHORE!

After 30 years of investigations, unfortunately, stream ecologists have found no effective means of eradicating these nasty snails. The genie is out of the bottle! However, one small glimmer of hope lies in the observation that some of the populations of NZMS that invaded streams in the Western USA are crashing on their own. If we can be responsible stewards of Black Earth Creek and try to contain the further spread of these snails, perhaps our local populations will also crash in due time and before they do irreparable harm to our local treasure.

This article has been revised since the printed version was released due to missing text and data.

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## Support Grows for Gateway to The Driftless Project

Gateway to The Driftless, a new local nonprofit organization promoting regional growth based on the area’s wealth of outdoor recreation and abundant natural resources, is gaining broad support from area residents, businesses, and governments.

The privately funded regional initiative is focused on the area of Northwest Dane County defined by the Lower Wisconsin River, US Highway 12, the West Beltline, the Military Ridge, and the Iowa County/Arena line. Framed within the beautiful natural landscape of Wisconsin’s Driftless region and the lower Wisconsin River valley,

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this geologically special area is ideally positioned to become a vibrant “gateway” connecting Dane County’s expanding urban center with the rural lifestyle and diverse natural resources found locally and throughout the Driftless region.

The Gateway group is currently developing an interactive regional marketing website and social media planned for launch this spring. The organization also will actively engage with both private and public community partners for regional initiatives that showcase the area’s natural resources and heritage, encourage the development of appropriate infrastructure, and promote responsible economic development of the region in support of the organization’s mission.

Recent local economic development studies have highlighted the Gateway area’s many natural resources and a range of other assets—high quality of life, top-rated schools, a business-friendly attitude—that create potential for future community growth and new economic opportunity. The consultant studies pointed to the important role of region-building in support of local economic development.

“Dane County is the fastest-growing county in Wisconsin. The Gateway to The Driftless organization is a community response to a critical question facing our unique corner of the world: What will this special place we call home look like 20 years from now?” said Christopher Long, administrator for the Gateway organization and a BECWA board member. “The Gateway’s vision is that our region will be known for its abundant outdoor recreation opportunities, rich natural heritage, special spirit of place, small-town quality of life, and business-friendly attitude to residents, visitors, and employers and employees.”

In registering with the State of Wisconsin as a nonprofit corporation, the Gateway to The Driftless filed this statement of purpose: The Corporation is organized and operated exclusively for charitable and educational purposes under 501(c)(3) of the Internal Revenue Code, or corresponding section of any future federal tax code. The specific purposes shall include promoting the “Gateway to The Driftless” region in order to strengthen the local economy through the preservation and enhancement of our natural resources, regional heritage, and quality of life.

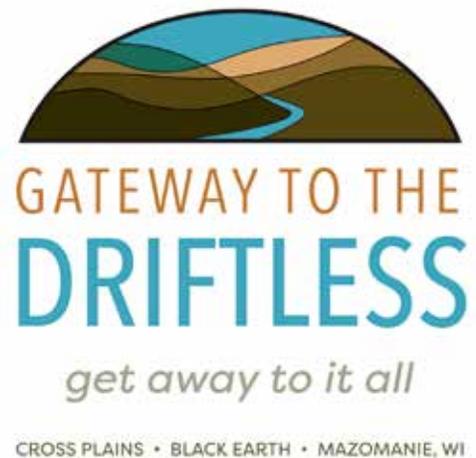
The Gateway project is to be funded by sponsors, donors, and grants. The villages of Mazomanie, Black Earth, and Cross Plains, the Wisconsin Heights School District, and the local Chambers of Commerce have endorsed the project. The organization is also seeking support from town governments and other private and public stakeholders in the project area.

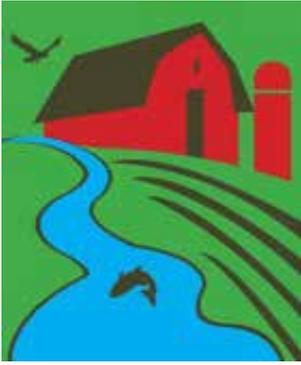
“Growth is inevitable. Simply put, the Gateway mission is the ‘Three Ps’ -- Promotion, Projects, Preservation. We believe that working with others to promote our area’s natural resources and support responsible growth around those irreplaceable assets is the best way to preserve that heritage and the liveability of our local communities,” Long said.

To learn more about the Gateway initiative, including how to become a supporter, please contact Christopher Long at [info@gatewaytothedriftless.com](mailto:info@gatewaytothedriftless.com) (608) 658-7901.

**SPECIAL THANKS!**

BECWA is grateful to the Dane County Environmental Council - Community Partners Program for awarding us \$1000 to help develop teaching materials - the goal of which is to slow the spread of New Zealand Mud Snails. Our spring newsletter (see page 4) and other teaching tools will focus on raising awareness through education on limiting the spread of this nasty invader.





## Black Earth Creek Watershed Association

c/o Greg Hyer  
4296 County P  
Cross Plains, Wi 53528

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### **US Geological Survey continues water quality monitoring efforts on BEC**

In partnership with the Village of Cross Plains, US Geological Survey is continuing their water quality monitoring efforts on Black Earth and Brewery Creeks for the foreseeable future. This is being done mostly with an eye towards remaining in compliance with phosphorus limits set by the DNR but also to characterize sediment loads and water quality and quantity of these creeks over the long term.

Additionally, Emily Stanley from the University of Wisconsin limnology department, in conjunction with the USGS has been working on a national stream metabolism project of which Black Earth Creek and Brewery Creek are part of. You can find out more about the StreamPULSE project at the following 2 links:

<https://stanley.limnology.wisc.edu/research-current-projects/#emsr>

<http://pulseofstreams.weebly.com/>

The computer model of the groundwater-surface water system for the BEC watershed is complete, and can be downloaded at: <https://pubs.er.usgs.gov/publication/sir20165091>

***Simulation of climate change effects on streamflow, groundwater, and stream temperature using GSFLOW and SNTMP in the Black Earth Creek Watershed, Wisconsin - Scientific Investigations Report 2016-5091***

By: Randall J. Hunt, Stephen M. Westenbroek, John F. Walker, William R. Selbig, R. Steven Regan, Andrew T. Leaf, and David A. Saad

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