

**IOWA CHAPTER OF THE AMERICAN FISHERIES SOCIETY NEWSLETTER**  
**December 10, 2010**

# LATERALLINES



## **2011 AFS/TWS JOINT MEETING**

**JANUARY 20-21, 2011**



## **IOWA GREAT LAKES MUSKELLUNGE EMIGRATION**

**Page 9-10**

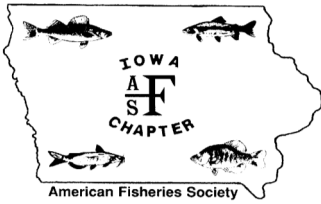


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# Newsletter of the Iowa Chapter of the American Fisheries Society Volume 28, Number 3

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Membership .....Bryan Hayes  
Resolutions.....Don Herrig  
REAP.....Ben Dodd  
Continuing Education.....Clay Pierce  
Student Affairs .....Clay Pierce  
Nominations.....Donna Muhm  
REAP.....Ben Dodd  
Best Paper .....Chad Dolan  
Newsletter Editor.....Kim Hawkins



## RENEW YOUR IOWA AFS MEMBERSHIP NOW!

Your Iowa AFS membership expires  
January 1st. If you will not be  
attending the AFS/TWS meeting in  
January, please send \$10 to:

Andy Otting  
1436 255th St  
Boone, IA 50036

OR

Renew at: [www.fisheries.org](http://www.fisheries.org) - Iowa  
Chapter.



## PRESIDENT'S CORNER—Andy Fowler

As I sat down to write this president's corner, I found myself looking over the past president's corners of our older newsletters. This reminded me to mention some work that Mike Colvin, Carol Dixon, and I have recently been completing. The North Central Division is urging all chapters to use their websites as archives for their past history, not only as a good storage area for the information but to promote good continuity between different leaders of the chapter through the years. To that end, we have scanned or located all available newsletters we could find and have posted them on the chapter's website at: <http://www.fisheries.org/units/iowa/index.htm>. It is interesting to see all the changes that occur down through the years and through different individuals. We currently have most of the newsletters from 1987 to current, however, there are a few holes in the archive or some versions that are a little rough. I would ask all of you to take the time to look at these and contact me if you have a better version of

a particular edition available or if you have one of the missing newsletters. We hope to also archive all past meeting agendas, meeting minutes, and Excom meeting minutes as well on the website. Thus, if you have any versions of these, please send them my way. Mike is also in the process of revamping the website to a new and more efficient design. He is doing a great job as chapter webmaster, and I am sure the change will be a great one.

The annual meeting held jointly with the Wildlife Society this January is almost here. I am very excited to have the meeting at Honey Creek State Park Resort. I imagine it will be the first time for many of us to stay at the resort and hopefully the excitement of seeing the resort will increase our meeting attendance. We already have many great presentations lined up and it looks to be a great meeting.

I hope to see you all there!



# 2011 AFS/TWS JOINT MEETING

**January 20-21, 2011**

**Natural resource professionals in Iowa will meet to share new research, management experiences, and valuable insight on fish and wildlife issues.**



## **SCHEDULE:**

### **JANUARY 20**

10 AM—Registration

11:30 —Lunch

1-4 PM Joint AFS/TWS

4 PM Chapter Business Meetings

5 PM—Social

6 PM—Banquet

### **JANUARY 21**

8 AM -NOON Concurrent Fisheries/Wildlife Presentations

## **RESERVATIONS:**

**Please RSVP by: Friday JANUARY 3<sup>RD</sup>**

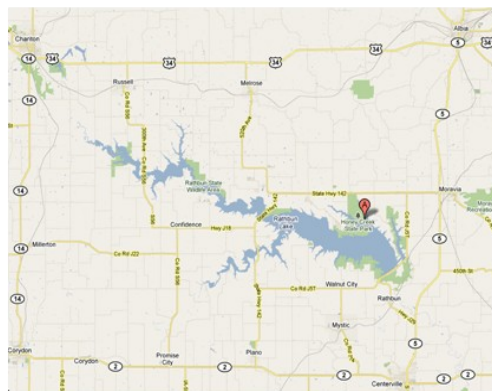
Lunch, Social, and Banquet included  
PROFESSIONALS: \$60 + \$10 AFS/TWS Dues  
STUDENTS/AMERICORPS: \$35

## **Please RSVP to:**

AFS: andy.fowler@dnr.iowa.gov

TWS: jeffrey.glaw@dnr.iowa.gov

Payment accepted at door



## **Location:**

**Honey Creek Resort State Park**

12633 Resort Drive, Moravia, IA 52571

## **Reservations:**

Room Block Reserved until January 3, 2011

\$59 for single/double occupancy

Ask for TWS/AFS Meeting group rate

Call : 641-724-9100





# CALL FOR PAPERS

## 2011 IOWA AFS/TWS JOINT MEETING

January 20-21, 2011

Honey Creek Resort State Park



Natural resource professionals in Iowa will meet to share new research, management experiences, and valuable insight on fish and wildlife issues.

Whether it's managing troubled areas, growing bigger fish, or presenting new research, we are interested! Come share your results, connect with other experts, meet students, and even find extra hands for your projects!  
Feel free to send your ideas in early.

### DEADLINES:

TITLE: DECEMBER 21ST

ABSTRACT: JANUARY 10TH

PRESENTATION: JANUARY 18TH

SEND TO: [andy.fowler@dnr.iowa.gov](mailto:andy.fowler@dnr.iowa.gov)



# What Does it Take to Kill A Shad?

Mark Flammang

If you had asked me when I was in college what I would spend a good part of my time on, I would bet I would have said nothing about “invasive” or “injurious” fishes. However, the sad reality is the wrong fish, or mussels, or some other aquatic life form seems to be showing up in far too many places these days.

While “flying carp” provide a limited amount of comedic relief, it’s discouraging to watch their numbers grow. Bruce Ellison and I have seen first hand how the Des Moines and Chariton Rivers have been, at times, inundated with large populations of Asian Carps. We deal with zebra mussels not just on the Mississippi River these days, but in an increasing number of inland waters. However, the fact remains that these were likely unintentional introductions. We take little solace from that; however, it at least takes a little edge off of the alternative, intentional stockings. This latter means of infestation seems to be the case with an ever-increasing number of species such as yellow bass and gizzard shad in Iowa waters. The bottom line is, a select few are able to negatively impact or flat out destroy the angling quality of our waters and economic benefit of these areas to local economies.

Shad invariably lead to the demise of game fish when introduced to our



small systems throughout the state. Our bread and butter species such as bluegill and crappie tend to decline first, followed eventually by largemouth bass. It’s not just the angler that loses out, it’s local economies. We recently estimated lost economic benefit in the areas surrounding Lakes Hawthorn and Lake Wapello and the potential impact on the Lake Sugema area. The value of lost angling at Wapello and Hawthorn was estimated at \$2.3 million. In the case of Lake Sugema, if we allowed the fishery to collapse before renovation, the economic cost to the local area would have been approximately \$1.8 million. This was unacceptable.

Recent shad introductions to lakes such as Badger Creek, Hawthorn, Wapello (on multiple occasions),



and now Sugema have made it necessary for the Iowa DNR Fisheries Bureau to confront the issue head on. When injurious species are introduced, we are often faced with the dilemma of “pulling the plug” on systems at the peak of angling or forced to wait out the problem until angling quality declines to the point where few people utilize what was once a valuable resource. The question arises, is there a more aggressive “treatment” available to us. Both antimycin (no longer cleared for this use) and low-dose rotenone treatments have been employed to reduce or eliminate gizzard shad for years. In Iowa we have sometimes seen success, sometimes not with these methods. However, even in the face of success, our enthusiasm was often tempered by the loss of large numbers of game fish.

Recently, the Fisheries Bureau has been creating highly accurate maps of our public waters. These maps are valuable to biologists and anglers, alike. They provide accurate estimates of lake volume which removes much of the “guess work” from low-dosage selective treatments. The Mount Ayr and Rathbun Fisheries Management Crews have used these maps as developed by Mike Hawkins and Andy Otting, along with many highly motivated fisheries employees to treat gizzard shad populations at Lakes Sugema and Badger Creek





this fall. Our target concentration has been 5 micrograms active rotenone per liter, a concentration that has been widely utilized to manage shad populations in other states. A total of 95 gallons of Prentiss CFT Legumine Fish Toxicant was applied to Lake Sugema on November 16, 2010. Like previous “selective” treatments for shad, this dosage is approximately 3%-5% of the normal dosage used to renovate entire fish populations. Recent experience by Gary Sobotka suggested that the most effective method of application was in dilute form from a low volume ATV sprayer pump. This was the most common method of application used at Lake Sugema. The lake was lowered two feet prior to application to make hidden timber more visible and to provide a buffer in case of precipitation to reduce possible release downstream. The lake was divided into 15 sections, an individual volume was calculated for each section, and an appropriate amount of rotenone for this section was allocated. Using a GPS system, each applicator methodically applied chemical to an individual section in the prop wash of the outboard motor. Chemical was also pumped to depth in deeper areas of the lake to reduce the likelihood of “hotspots” that would negatively impact desirable game fish. Dead gizzard shad were found soon after the last of the chemical was applied.

Some game fish mortality was observed following the treatment. It’s important to remind ourselves and the public that these actions are not “free.” There is a cost; some game fish will be lost. However, the cost of inaction can be much greater, and the success of treatment must be judged on the speed to which the fishery returns to its high-quality state. With the tools and methods available to us today, our return to normal

may be weeks or months, rather than years. That in itself justifies our current evaluation of these methods.

Each application is a learning experience. We will continue to mine new knowledge from each treatment. The introduction of gizzard shad seems to continue in Iowa waters. Our goals are clear, however. First, we must continue to educate the public about the fact that these introductions do not benefit typical Iowa lakes. Second, the fact that it is illegal to introduce fishes into any public water body can never be overstated. And third, while we will likely continue to see introductions of injurious species to Iowa Lakes, our hope is to be able to reduce or eliminate them before they have catastrophic impacts to the quality of angling and the economics that drive our sport in those systems.

The jury is still out on our success at Lakes Sugema and Badger Creek. Both have been treated, and we are evaluating the rate of rotenone degradation in these systems. Table I demonstrates that at Lake Sugema, we were very near our desired level of 5.0 micrograms per liter in all tested areas. Follow-up samples demonstrate that the concentration continues to degrade. Similar results were observed at Badger Creek Lake also. The ultimate test of success will be determined during the open water season of 2011 as we search for shad in both systems. From our perspective, success will be limited to the complete eradication of gizzard shad from these lakes. Anything less will quickly lead to large-scale reinfestation. We are comfortable in the knowledge we have done all we can to reach that ultimate goal.

### Lake Sugema Active Rotenone Concentrations

	11/19/2010	11/23/2010	12/2/2010
	active rotenone (µg/l)	active rotenone (µg/l)	active rotenone (µg/l)
<b>Sugema Upper</b>	<b>6.0</b>	<b>5.1</b>	
<b>Sugema Mid-lake</b>	<b>5.1</b>	<b>4.8</b>	<b>4.0</b>
<b>Sugema Lower</b>	<b>7.0</b>	<b>6.1</b>	





It was a cold winter day, when an old man walked out onto a frozen lake, cut a hole in the ice, dropped in his fishing line and began waiting for a fish to bite.

He was there for almost an hour without even a nibble when a young boy walked out onto the ice, cut a hole in the ice not too far from the old man and dropped in his fishing line. It only took about a minute and WHAM! a Largemouth Bass hit his hook and the boy pulled in the fish.

The old man couldn't believe it but figured it was just luck. But, the boy dropped in his line and again within just a few minutes pulled in another one.



This went on and on until finally the old man couldn't take it any more since he hadn't caught a thing all this time.



He went to the boy and said, "Son, I've been here for over an hour without even a nibble. You have been here only a few minutes and have caught about half a dozen fish! How do you do it?"

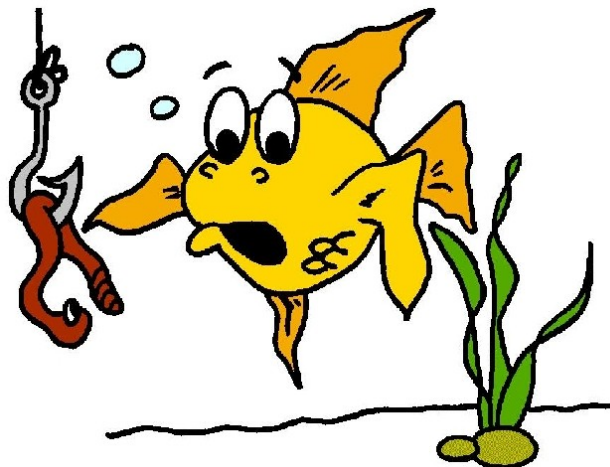
The boy responded, "Roo raf roo reep ra rums rrrarm."

"What was that?" the old man asked.

Again the boy responded, "Roo raf roo reep ra rums rrrarm."

"Look," said the old man, "I can't understand a word you are saying."

So, the boy spit into his hand and said, "You have to keep the worms warm!"





# Muskellunge Emigration from the Iowa Great Lakes

Jon Meerbeek

A South Dakota Game, Fish and Parks sturgeon netting crew recently reported catching a PIT tagged muskellunge below Gavins Point Dam in a Missouri River backwater during a routine fisheries investigation. The number sequence on the PIT tagged muskellunge corresponded to a fish that was originally stocked in Spirit Lake in May of 2003 and was last recaptured on April 21, 2007 in Spirit Lake. The fish traveled a total of 353 miles, departing the Iowa Great Lakes (IGL) through the Lower Gar outlet into Mill Creek, then into the Little Sioux River to the confluence of the Missouri River (224 miles), and finally upstream 129 miles to Gavins Point Dam (Figure 1).

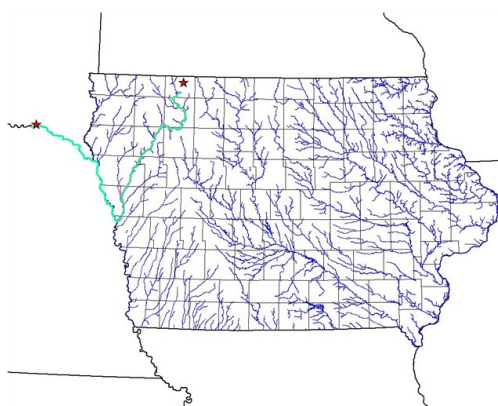


Figure 1. Movement of adult muskellunge Spirit Lake, Iowa, to Gavins Point Dam.

This was the first confirmed movement of a PIT tagged muskellunge out of the IGL to the Missouri River. Occasionally, the Spirit Lake Fisheries office receive reports of muskellunge caught by anglers near low head dams in Mill

Creek and the Little Sioux River, but none have come close to the extensive movement observed by this fish. Although surprising, this is not the first time that extensive movement of adult muskellunge has been documented in the IGL or other lakes and reservoirs across the Midwest. Considerable muskellunge emigration was documented in reservoirs in Missouri, Ohio, Minnesota, and Wisconsin. In some cases, adult muskellunge (> 40 inches) would plunge over a 40-ft high dam to enter the river and survive. In other cases, muskellunge were found dead below the dam after a large rain event. Telemetry studies that have evaluated muskellunge movement found that fish activity increased substantially as water temperatures exceeded 50°F. However, most emigration was correlated with both water temperature (> 50°F) and water

levels exceeding 12 inches above the level of the surface spillway. In the IGL, downstream movement of muskellunge was significant in 2005 when approximately 47% of the Spirit Lake population emigrated into the Okoboji lakes (based on recaptured PIT tagged muskellunge from 2005 to 2006; Figure 2).

Water levels in 2005 jumped sharply from 3.5 inches over crest to over 14.5 inches over crest in only a 2 week period. This dramatic increase in water levels corresponded perfectly to the optimal spawning temperature for muskellunge (Figure 3). This was the only year we documented extensive movement of adult muskellunge from Spirit Lake to the Okoboji lakes from 1999-2010. During a typical year, an average of 4.8% of the adult muskellunge population emigrated from Spirit Lake to the Okoboji lakes

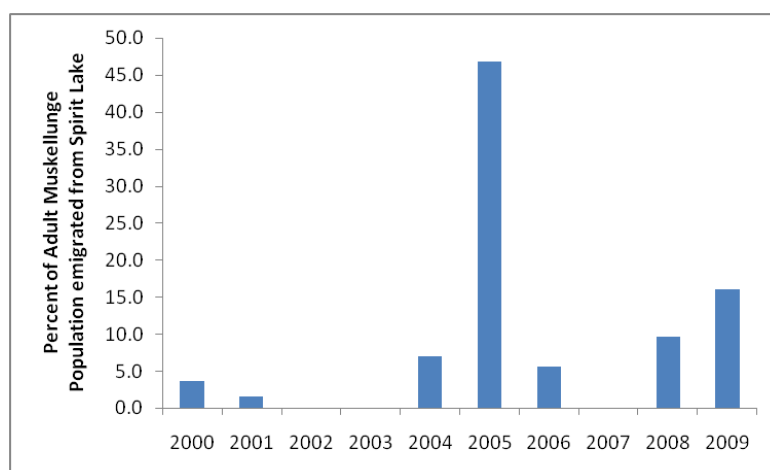


Figure 2. Documented emigration of muskellunge from Spirit Lake into the Okoboji lakes, 2000-2009.



(Figure 2). It is not uncommon for adult muskellunge to move from lake to lake. A recent study on a Wisconsin chain of ten lakes found that 55% of muskellunge moved from one lake to another within a year period. The problem with movement out of Spirit Lake and into the Okoboji lakes is that the spillway connecting the two systems becomes a barrier to fish movement 97% of the days within a year, thus fish are essentially “lost” from the Spirit Lake fishery. In addition, we have never recaptured an adult muskellunge in Spirit Lake that was initially caught and tagged in the Okoboji lakes. Recently, Spirit Lake fisheries management and research crews have been stocking additional yearling muskellunge in Spirit Lake to replenish the population. Also, fish captured during the broodstock collection in April that originated in Spirit Lake are being transported back to Spirit Lake to provide additional opportunities for Spirit Lake anglers.

Emigration of adult muskellunge out of the chain of lakes through the Lower Gar outlet is not thought to be substantial; however, it remains a concern for fisheries managers especially since the frequency of extraordinary rainfall events seem to have increased in recent times. The propensity for adult muskellunge movement during the spawning season is high and more rain and warmer

temperatures may increase fish escapement from the IGL. Spirit Lake fisheries research and management crews are in the process of developing methods to evaluate the extent of adult muskellunge emigration out of the IGL. Beginning in 2011, all yearling muskellunge stocked into the IGL will be implanted with a PIT tag. In the past, only adult muskellunge captured during the spring broodstock collection would be tagged. Having all stocked individuals tagged would allow researchers to easily evaluate muskellunge movement by placing PIT tag readers near the Spirit Lake spillway and the Lower Gar outlet. Spirit Lake research is also planning on conducting an electrofishing survey in Mill Creek and the Little Sioux River to evaluate the muskellunge population in those fisheries. In addition to increased tagging and sampling efforts, there may be opportunities to conduct a joint study with a motivated university to evaluate muskellunge movement. If muskellunge emigration was found to be substantial, modifications to the Lower Gar outlet or a barrier system may be a necessary part of a muskellunge management plan. Muskellunge emigration in other managed waters in Iowa has been identified as a concern in managing those systems. Findings from studies conducted in the IGL would help guide future management of muskellunge in Iowa.

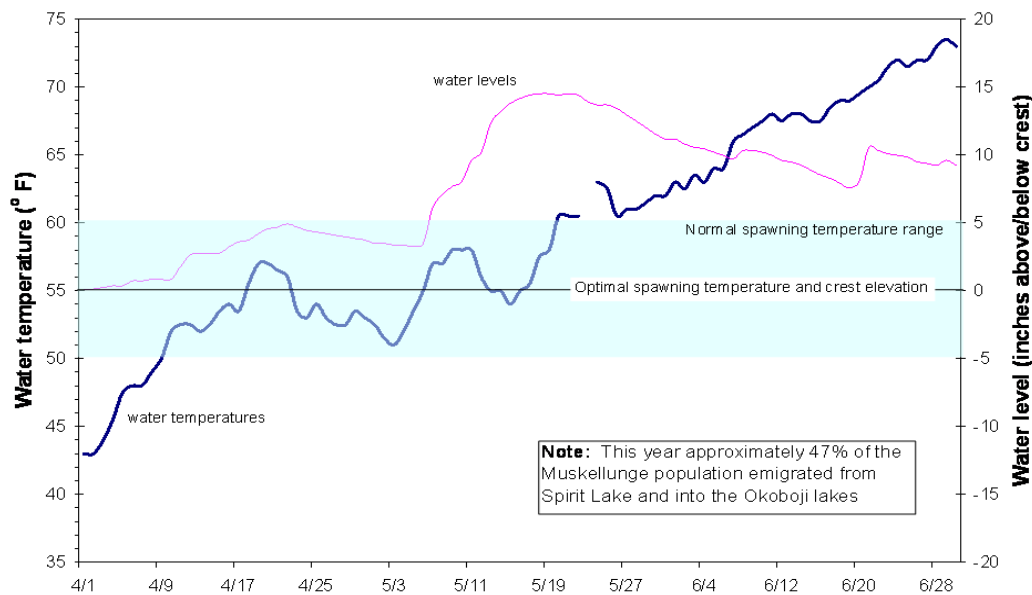


Figure 3. Water levels (inches above and below crest elevation) and water temperatures in Spirit Lake, April 1, 2005 – June 30, 2005. The normal spawning temperature (50-60°F) for muskellunge is shaded blue and the optimal spawning temperature is noted (55°F).



# ISU SUBUNIT UPDATE

## Current officers:

President – Chris Smith - [cdsmith@iastate.edu](mailto:cdsmith@iastate.edu)

President Elect – Evan Newman - [newmane@iastate.edu](mailto:newmane@iastate.edu)

Our web address is: <http://www.stuorg.iastate.edu/isu-afs/>



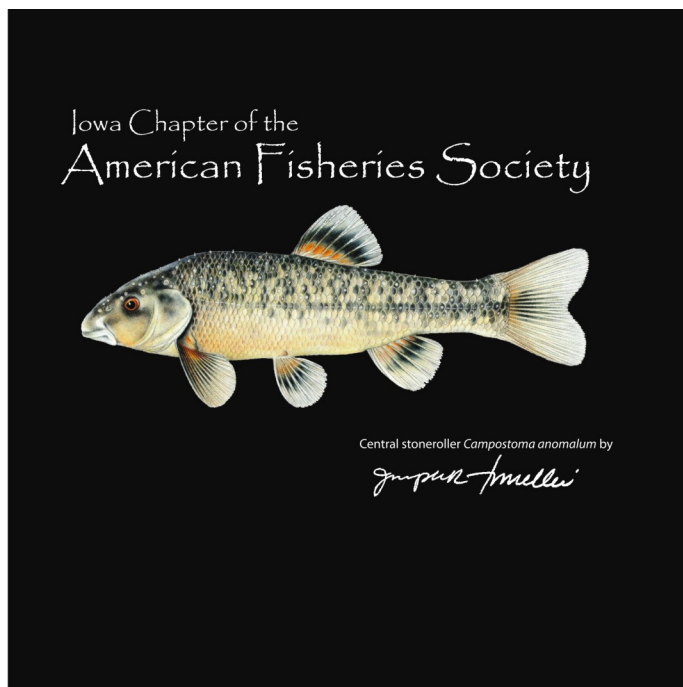
## Past Activities

The Subunit has been very active again this fall with members volunteering for fall walleye and sauger sampling on the Mississippi; monitoring the fish assemblage in Skunk River watershed around Ames; hosting a social event for members; and continuing to plan and attend monthly meetings. The Subunit also hosted Iowa DNR biologist Ben Wallace, who spoke about the role of watershed management in modern fisheries management. Additionally, Kim Bogenschutz, Aquatic Invasive Species coordinator, presented information regarding fisheries summer employment opportunities with the Iowa DNR. Kim also provided information on aquatic nuisance species found in the State.

## Current and Future Activities

Our Fishes of Iowa posters are still being edited. However, the Photoshop work involved in this poster has been more difficult than previously anticipated. The Subunit is still hoping to have them printed by the Iowa Chapter meeting. They will be available free of charge to state chapter members. Subunit members are also continuing to have active involvement in AFS by attending the Midwest Fish and Wildlife Conference, Iowa Chapter meeting and the annual Student Colloquium, hosted at South Dakota State University this January. Additionally, the Subunit is preparing for a busy spring semester with activities including: a Subunit ice fishing outing, our annual springtime fishing derby at Ada Hayden Lake, Ames, Iowa and our involvement with VEISHEA. However, we are still looking for volunteer opportunities, so if anyone is in need of volunteers for fisheries related projects please email me at [cdsmith90@gmail.com](mailto:cdsmith90@gmail.com).

Lastly, we will be selling T-shirts again this year featuring Joe Tomellari's artwork. This year our featured fish species is the central stoneroller *Campostoma anomalum*. Our T-shirts will be similar in layout to past year's shirts; however this year the color of the T-shirt will be black. The cost will again be \$15 per T-shirt. In addition, past years T-shirts featuring the orange spotted sunfish and the Iowa darter and hats will be available for purchase at the Iowa Chapter meeting.





# WHERE ARE THEY NOW

Megan Thul



Hello all!

I have been meaning to tell you about my graduate assistantship and experience at South Dakota State. Even though I am hours from home, I often think about my time working for Iowa and the unforgettable people I met along the way. Let me share with you some details of my project and thank everyone who helped shape me into a fisheries professional.

My first two summers in Bellevue challenged my thoughts to consider all variables that influence a fishery. It is here where I learned that a fisheries job is not only about fish but much more. While working in Boone, my independence and confidence improved from conducting statewide vegetation surveys (without my boss) and talking with anglers. This may not seem to be challenging but for someone as shy and inexperienced as I was, it made a big difference. I fine-tuned my research skills in Chariton, where each day brought something new to consider and questions to think about. This was a great stepping stone to pursuing a research project and masters degree.

Currently, I am one year into my research and loving it! In the remaining year and a half I hope to answer questions involving the low recruitment of walleye in Mina and Richmond Lakes. The problem is despite stocking various size walleye, few age-0 walleye are sampled during fall electrofishing runs. Based on previous research from Mark Flammang and others my project will address the food availability of walleye and with the use of stable isotope techniques, be able to determine where walleyes obtain their energy. I am also looking at diets of freshwater drum

ageing those sampled in Mina Lake.

I smile when I think how my seasonal experience has carried over to my research. Memories of Bellevue come to mind each time I fish nets, take a zooplankton tow, use a sweep net, and filter water. I think of the lessons learned from the Boone crew while starting the boat, selecting a study site, and talking with anglers. Walleye stomachs, ageing hard structures, depth profiles, and being involved in the community bring back memories of the Chariton crew. I could not have gone this far without your help! Please know your time and efforts are appreciated.

Special thanks to:

**Dan Kirby-** For making me get out of my comfort zone, showing me how to work hard and be a good person.

**Mel Bowler-** For teaching me the importance of long term monitoring and data sets, how to run nets, to strive to learn something new each day, be personable, and always remember to have fun. In South Dakota, I am known as the "lowegian" who loves flatheads, sound familiar?

**Dave Bierman-** My advisor, Steve Chipps, commented on how thorough I was while taking water samples and I told him I learned my skills from you....he and I say thanks!

**Josh Peterson-** I'm not sure if many students can identify aquatic plants in this state, but I can! Thanks!

**Jason Euchner-** For taking the time to teach me outboard mechanics and trusting me.

**Kim Bogenschutz-** For guiding me as a seasonal but not treating me as one and for always keeping an open door.

**Tony Giorgenti-** I realize how valuable it is to have good people around, thanks for your support!

**Randy Schultz-** For being a role model and always offering to help me out.

**Mark Richardson-** For life lessons, repairing nets, and tips to make life easier.

**Andy Fowler-** For being fun and easy to work with and showing me a thing or two about technology. I am using access for my data!





# IN THE NEWS

**Updated Tue Nov 9, 2010**  
**ABC News**

## Sex trap the next weapon against carp

The sex pheromones of the common carp are being used to lure the environmental pest into traps in Tasmania's central highlands.

In an Australian-first trial, adult carp in Lake Sorell are being implanted with hormones that stimulate the production of sex pheromones.

The hormone-fuelled carp are then used as a bait to lure wild carp into traps, preventing further mating.

Professor Peter Sorensen from the University of Minnesota developed the implant.

"When there's only a few dozen fish left in the lake, you're down to the residual population they're not limited by food, but they are limited by reproductive opportunity," he said.

"So sex trumps food."

Environmental journalist Dan Egan says Asian carp are a big problem in the United States and nobody knows what to do about it.

"Australia is known for being very progressive about invasive species problems and the fact that they've put this much effort and have come this close to eliminating all the carp in a lake this big is really interesting and I think it's something we (the US) can learn from."

"If they can do this without chemicals, then that's a first. That's important and that's going to have repercussions in the United States and beyond."

The eradication team hopes to have Lake Sorell carp-free within five years.



# NEW BEDROCK GEOLOGIC MAP OF IOWA NOW AVAILABLE

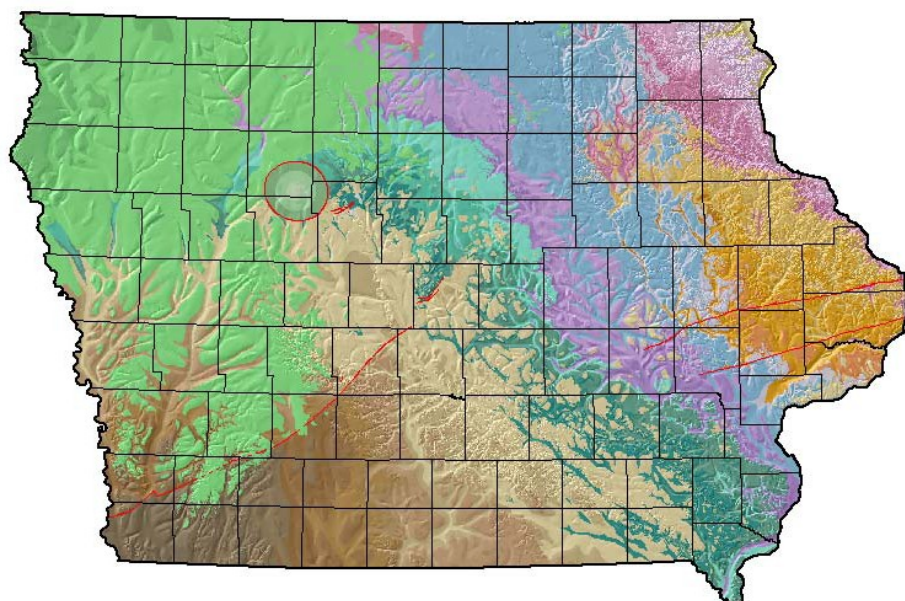
**MEDIA CONTACT:** Bob Libra, DNR, at (319) 335-1585 or [Robert.Libra@dnr.iowa.gov](mailto:Robert.Libra@dnr.iowa.gov)

IOWA CITY — If you're curious about what's in the earth below your town or farm, a recently completed map of the bedrock geology of Iowa can help you find out.

The map, produced by the DNR's Geological and Water Survey, represents the compilation of available data from more than 125 years of study, and replaces the last statewide version that dates from 1969. The mapping also produced renditions of the bedrock surface elevation and the depth to bedrock from the land surface.

"This information is critical to accurately predicting subsurface conditions for a wide range of uses, from obtaining groundwater and mineral resources, gauging geologic hazards, guiding construction and protecting water quality" said Bob Libra, who serves as State Geologist of Iowa. "The map is also a great educational tool for schools, conservation groups and all those interested in the earth."

The geologic map is available for download in PDF format at <http://www.igsb.uiowa.edu/> and is available in print for \$5. Copies can be ordered online or by calling the DNR's Iowa Geological and Water Survey at (319) 335-1575.



## INTERESTING READS

### **CASE STUDIES IN FISHERIES CONSERVATION AND MANAGEMENT: APPLIED CRITICAL THINKING AND PROBLEM SOLVING**

Murphy, B.R., D.W. Willis, M.D. Klopfer, and B.D.S. Graeb

September 2010

Through more than 30 original case studies related to contemporary conservation and management issues in fisheries, this new book challenges students to develop critical-thinking and problem-solving skills that will serve them as future natural resource professionals. Intended to encourage students to go beyond the information level of many science texts, these case studies have no right answers. Many of the cases are presented in a dilemma format, where students are asked to assess information from a variety of sources, find additional information as needed, and propose and evaluate alternative solutions. Cases are approached from a variety of dimensions (biological, ecological, political, cultural, and socioeconomic) and stakeholder perspectives. Spiral binding allows the book to lie flat for easy reference during classroom discussions and activities.

To read the Introductory Chapter see: <http://www.fishwild.vt.edu/faculty/murphy/casestudiesbook/>

### **TIMING OF WALLEYE SPAWNING AS AN INDICATOR OF CLIMATE CHANGE**

Schneider, K.N, R.M. Newman, V. Card, S. Weisberg, and D.L. Pereira

Transactions of the American Fisheries Society 139:1198–1210, 2010

**Abstract.**—We obtained Minnesota Department of Natural Resources historical records describing the egg take from walleyes *Sander Vitreus* at 12 spawning locations to determine whether the timing of walleye runs could be used as an indicator of climate change. We used ice-out instead of temperature for our analyses because walleyes often spawn soon after ice-out, and ice-out has been previously related to climate change. We used linear regressions to determine (!) the relationship between the start of spawning (based on first egg-take) or peak of the spawning run (greatest egg-take) and ice-out date and (2) whether long-term trends existed in ice-out and date if spawning over time. Linear regressions of the date of first walleye egg-take versus ice-out date. All but two regressions had slopes less than 1.0. Similar results were found for peak of spawning runs. Regressions of egg-take and ice-out date versus year showed trends toward both earlier spawning and earlier ice-out. For regressions of first egg-take versus year (16 total with restricted data sets), significant negative slopes ( $P, 0.10$ ) were observed in 5 of 16 regressions; for peak egg-take, six regressions had significant negative slopes. For regressions of ice-out date versus year, 25 of 26 regressions were negative; there were nine significant negative slopes ( $P, 0.10$ ). Overall, ice-out and walleye spawning are occurring earlier in Minnesota, and the timing of walleye spawning may be a good biological indicator of climate change.



# OFF THE BEATEN PATH

## Color Bind: A New Study Finds Wind Turbine Color May Play a Role in Bat Fatality Rate

**Scientific America – October 2010**

Could purple wind turbines decrease the carnage wreaked in the night by looming towers

It is clear that wind turbines—the number of which is steadily increasing globally—kill bats. They also kill birds, but studies have consistently shown the Halloween icons to be more prone to death by turbine. The data also indicate that certain species of insectivorous bats, in particular migratory, tree-roosting species, are especially apt to fly into turbines. But exactly why this remains a mystery.

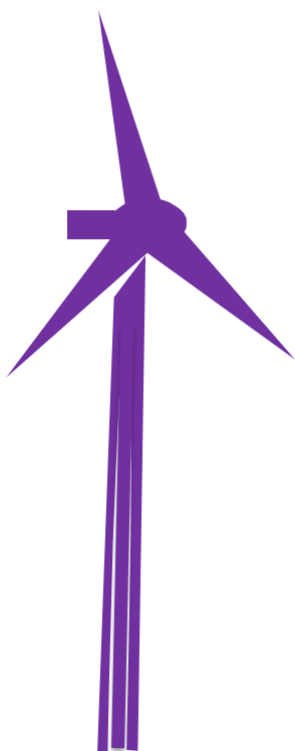
One theory is that the bats approach the turbines in pursuit of insect prey. Now, a new study suggests that simply changing the color of wind turbines to hues less attractive to insects could reduce the number of bugs that congregate around the turbines, which could in turn reduce bat deaths.



Chloe Long, the lead author of the paper, published in the October issue of the *European Journal of Wildlife Research*, is a PhD student of bioacoustics at Loughborough University in England. Long was studying bat echolocation in the context of wind turbines when she came across a finding in the primary literature that inspired her. "I noticed that a couple had pointed out that insects might be prevalent in areas that have land-based turbines," she says. "The first thing that came to my mind was the possibility that the color of the turbines somehow might be influencing insect activity around them."

Bat fatality studies frequently mention the importance of looking further into the role of insects may play in attracting bats to wind towers. But the question has not been investigated in detail, partly due to the difficulty of designing a controlled experiment. Wind power facility operators are generally resistant to modifications that experiments may impose on equipment and operating schedules, and national and local government regulations for turbine specifications present obstacles. In Long's case, for example, actually painting turbines different colors was out of the question.

Instead the group used rectangular, laminated color cards, each roughly 20 by 30 centimeters and representing one of 10 different colors from a commonly used outdoor paint color system called RAL. They included the two most common colors for outdoor turbines in Europe, "pure white" and "light gray," eight additional RAL colors, from "jet black" to "traffic yellow," and an 11th transparent control card. They laid the cards in a grid pattern at the base of a single 13-meter, three-blade, light gray turbine—the only one in a public parkland meadow that featured an "abundance of local bird and bat activity," according to the paper. Long says: "We chose this site because it is exactly the type of place where you might find insects if they were next to turbines." Testing multiple locations and turbines would have







been more advantageous, she acknowledges, but the group was limited to the facility to which they had access.

The researchers observed each card for a set period of time, counting the number of insects on or within 10 centimeters of the card. After counting the bugs they moved on to the next card, moving counterclockwise through the grid for 10-minute periods, between which the cards were gathered, cleaned, shuffled and redistributed in a new random grid pattern. The group collected data between the months of June and October—the time of year that corresponds to peak bat activity—for three years. They made 2,012 total insect observations, from 59 10-minute sessions.

Yellow was by far the most attractive color to the insects, perhaps not surprising, given the color's prevalence in flowers. The second and third most attractive shades were the two most common turbine colors, white and light grey. "We weren't expecting that at all," Long says. Additionally, when they analyzed individual color properties outside of the spectrum visible to humans, the researchers found that insects were more attracted to colors that reflect high amounts of infrared or ultraviolet radiation. The card that attracted the least bugs was painted purple.

The results, although preliminary, show it's worth taking a deeper look—not just at turbine color, but also at the general question of whether certain simple modifications to turbines could reduce bat attraction, says Edward Arnett, a conservation scientist at Bat Conservation International. But the problem with jumping to conclusions about insects and turbines, he says, is that the insect attraction hypothesis is still just that—a hypothesis. Bats are clearly drawn to insects, but "I have yet to see convincing evidence that insects are somehow attracted to the facilities or the turbines themselves."

Arnett, who in 2003 founded the Bats and Wind Energy Cooperative, a research group focused on developing solutions to minimize deaths, acknowledges that collecting definitive evidence would be challenging. Most difficult, he says, would be establishing a control site and then replicating results. Further complicating a potential study design is the fact that bat death rates seem to be dependent on wind speed. More occur under low-speed conditions (less than six meters per second), so an experiment comparing two sites would need to account for this. Finally, most of the relevant action happens at dusk or at night, meaning expensive imaging equipment is needed.

A 2008 study that Arnett co-authored was the first to capture video evidence, using thermal imaging, of bats flying around (and into) wind turbines. That same study also found a correlation between observed insect activity and bat activity.

Experiments with real turbines are imperative, Long says, and that prospect that might now be more realistic. The response from scientists—and even a couple advisers to turbine manufacturers—interested in supporting further research has been encouraging, she says. As for purple turbines? "We're not really suggesting that people should go out and paint turbines purple," she says. "Bear in mind, we did only test 11 colors, so there are likely to be other colors that need further testing."



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Application form

**Fisheries Project Grant**

Iowa Chapter – American Fisheries Society

Project Name: \_\_\_\_\_

Project Description: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Attach map or supplementary information

Project Location:

Water Body: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_ County: \_\_\_\_\_

Start Date: \_\_\_\_\_ End Date: \_\_\_\_\_

Project Personnel: \_\_\_\_\_

\_\_\_\_\_

Fisheries Benefits: \_\_\_\_\_

\_\_\_\_\_

Iowa Chapter Representative: \_\_\_\_\_

Amount needed: \$ \_\_\_\_\_ Total project cost: \$ \_\_\_\_\_

Money will be used for: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**Up to \$1,000.00 per project.**

Approved by Excom Committee Date: \_\_\_\_\_



The Iowa Chapter of the American Fisheries Society is offering to help finance worthwhile fisheries related projects. The completed application form needs to be transferred to the Iowa Chapter President by an Iowa Chapter Member.

Project Name – Give the project name.

Project Description – Give a brief review of the intended project. Include the work to be done, the methods and material that will be used in the project.

Attach a map and any supplementary information that you think will help the Excom Committee evaluate the project.

Project Location – Where will the work be done.

Start and End dates for the project. Month and calendar year will do.

Project Personnel – Include organizations and or individuals who will be directly involved in the work.

Fisheries Benefits – A very important part of the project should be direct benefits to Iowa's fishery. How does the project help and who is the beneficiary?

Iowa Chapter Representative – All projects need to have an Iowa Chapter member as a sponsor.

Amount needed – Tell us how much you need and the total project cost.

Money will be used for – Be as specific as you can. Will the money be used to hire people, buy, equipment, be seed money for a grant, etc.

There is a \$1,000.00 limit for each project.

The Excom Committee of the Iowa Chapter will review the application and approve or reject the request.

