*Wildlife Sightings* Newsletter of the Iowa Chapter of The Wildlife Society

**Volume (2013), Issue 2** **October 2013**

**Research Corner**

# CONTAMINATED AMPHIBIANS—ARE RESTORED AGRICULTURAL WETLANDS GOOD FOR AMPHIBIANS?

Amphibian populations are declining throughout the USA and globally from a variety of factors including habitat loss, emergent diseases and chemical contaminants in the environment. Habitat loss is especially profound in Iowa, where an estimated 90% of wetlands have been lost since tile drainage was introduced in the mid-1800s. As remaining habitat is converted for agricultural use and urban development, more and more chemicals are making their way into the environment. These chemicals include excess nutrients from fertilizers or animal waste, agricultural chemicals and even petrochemicals from spilled gasoline. An estimated 1-2% of agricultural chemicals applied to a field eventually make their way into waterways.

As habitat loss reduces the size of populations that can be sustained on the landscape, chemical contaminants and emergent diseases pose an even greater threat to remaining amphibians. Smaller, fragmented populations are more likely to face extinction. Furthermore, chemical contaminants and emergent diseases can have a synergistic effect on amphibians. Exposure to atrazine or acidic waters can suppress immune systems and leave them more vulnerable to diseases like Chytridiomycosis (Chytrid for short), which has already caused significant population declines or extinctions globally in > 200 species of frogs.

There are programs in place to help conserve amphibian habitat. The Conservation Reserve Enhancement Program (CREP) is a voluntary land retirement program that strategically restores wetlands to intercept tile drainage runoff from agricultural fields. These wetlands improve water quality, provide habitat and help connect existing habitats. However, wetlands must be designed and maintained to support healthy amphibian populations. If not, they could function as ecological traps luring in healthy frogs that would subsequently die of disease, starvation, or predation.

This study examines amphibian populations in 10 wetlands throughout central Iowa. Five of the wetlands are recently restored CREP wetlands, and 5 are 'reference' wetlands that were restored from agricultural use prior to 2000. The CREP wetlands under study were restored in 2009 or earlier and are fed primarily through subsurface tile flow, while the reference wetlands receive mostly surface flow. We compared a number of factors in each wetland including the presence of fungal zoospores and contaminants in soil, water



*Gray treefrog at Ada Hayden Park, Ames, Iowa.*
Photo by Wolf Osterreich.

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# VENTURA MARSH AQUATIC ECOSYSTEM RESTORATION PROJECT

**Management Corner**

Ventura Marsh is a 990 acre Wildlife Management Area (WMA) located in north central Iowa. The outflow of Ventura Marsh enters Clear Lake, a 3,600 acre natural lake. The Ventura Marsh WMA contains roughly 450 acres of marsh and 540 acres of uplands that offer many benefits to the people of the State of Iowa.

Historically, Ventura Marsh was a thriving ecosystem. The marsh contained a healthy mix of open water and aquatic vegetation, maintained a resident fish population that included yellow perch and northern pike, and offered superb habitat for waterfowl and aquatic wildlife.

Unfortunately, the marsh began undergoing a significant change once common carp became established in the system. Over the past couple decades, the common carp density continued to increase until they became the dominant fish species. Recently, the marsh fishery has consisted almost entirely of carp.

The shift in fish population coincided with a shift in aquatic plant diversity and density. By the mid 1990's, the eastern portion of the marsh had transitioned into an open water system with the only vegetation being a ring of cattails along the shoreline. The water quality of the marsh suffered greatly from the carp stirring up nutrient rich sediment into the water column and from the lack of vegetation to use up the abundant nutrients. The results were poor water clarity, degraded habitat for fish and wildlife, and diminished recreational opportunities. Ventura Marsh was researched as part of the Clear Lake Diagnostic and Feasibility Study completed by Iowa State University in 2001. The study determined that instead of filtering out contaminants, Ventura Marsh was acting as a nutrient and sediment exporter to the lake. It was estimated that up to 42% of the suspended solids and 33% of the phosphorus loading Clear Lake received was coming from the outflow of Ventura Marsh into Clear Lake.

*Ventura Marsh, May 2012, with exposed mud flat.*

With that information in hand, a partnership between local, state, and federal agencies began to restore Ventura Marsh. The U.S. Army Corps of Engineers took the lead on the project, which was known as the Ventura Marsh Aquatic Ecosystem Restoration Project. The principal goal of the project was to install a pump system so marsh water levels could be managed independently of the lake's water level.

Without the ability to pump water from the marsh, water levels in the marsh typically remained too high to induce winter fish kills or expose the marsh bottom to generate vegetation growth. Construction activities, including a pump station capable of removing 20,000 gallons per minute of water from Ventura Marsh, were completed in 2010. The new pumping system has given wildlife managers the ability to simulate severe drought cycles to get rid of unwanted rough fish species and expose mud flats to stimulate the growth of beneficial aquatic vegetation.

The pump station was utilized beginning in 2011 to initiate a two year drawdown of the Ventura Marsh WMA. Over the past two years, managers have documented a successful vegetation response to the drawdown. By the fall of 2013, the drawdown cycle will be complete and the marsh will be allowed to return to normal water levels. The new growth of

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**Management Corner**

*Ventura Marsh, July 2013, showing vegetative growth after drawdown of the marsh.*

vegetation offers a myriad of benefits to the Ventura Marsh system. First, it helps hold the bottom sediments of the marsh so they don't become suspended in the water column. Second, it provides the wildlife habitat critical to dozens of species dependent on the marsh system for survival. Last and not least, it filters out nutrients and traps contaminants before they reach Clear Lake, thereby improving the water quality of Clear Lake.

From a fisheries standpoint, the current management strategy for the marsh is to try and manage it free of all fish. Although the initial two year draw down will serve to eradicate the fish population, continued water level management will be needed to keep the carp population in check. Going forward, the pump can be used to lower the marsh following the fall hunting seasons to levels low enough to induce a winter fish kill , or to assist with a winter rotenone (fish toxicant) application.

The spring of 2013 provided a glimpse of what a well vegetated, fish free marsh will provide for water quality. Heavy rains occurred during the spring of 2013 in north central Iowa which partially filled the previously drawn-down marsh. Managers allowed water to remain in the marsh for a couple months during the spring before turning the pumps on to continue the draw down phase. Water monitoring was conducted during those months and the results were very encouraging. The data showed that phosphorus and suspended solids concentrations were reduced by more than 2/3 when compared to previous years' results. Water clarity in the marsh also drastically improved, maxing out at 1.8 m (6 ft), which was to the bottom of the marsh. Water clarity measurements in recent years previously averaged less than one foot.

Unfortunately, the improved water quality was somewhat compromised in 2013 by the reintroduction of several adult carp into the marsh. A new fish barrier was put in place at the gravity flow stop log structure of Ventura Marsh to prevent adult carp from entering the marsh from Clear Lake. The barrier, however, cannot prevent anglers from physically moving fish from one water body to another. It is believed that anglers are carrying carp from the lake and placing them in the marsh, as only a narrow road separates the two water bodies. In order to reduce this practice, A proposed regulation change would make spearing and archery fishing unlawful at this location in 2014. Current regulations also do not allow the intentional snagging of rough fish in this area.

Regardless of the actions of people, carp will eventually find their way back into the marsh system. Periodic management manipulations of the water level and the fishery will be necessary to meet the objective of a fish free, well vegetated, high quality marsh ecosystem. The installation of the pump station and other components of the Ventura Marsh Aquatic Ecosystem Restoration Project will now provide managers the ability to do just that.

*Scott Grummer is a Fisheries Biologist with the Iowa DNR. T. J. Herrick is a Wildlife Biologist with the Iowa DNR. David Knoll is an Environmental Specialist at Iowa DNR.*

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# MONITORING THE WILDLIFE VALUE, HYDROLOGY, AND WATER QUALITY OF DRAINED (FARMED) WETLANDS OF NORTH IOWA

*Fairy shrimp from Iowa wetland.*

Beginning in 2011, the Iowa DNR and Iowa State University began a four year study on drained (farmed) wetlands in Iowa with funding help from US EPA . The purpose of the study is to gather and document information from farmed wetlands on three major aspects: their value to wildlife, key hydrological aspects, and the quality of water in these wetlands during periods of time when they hold water. There's actually little scientific information that exists in the literature on this topic, especially as it relates to Iowa's portion of the Prairie Pothole Region. What is known is that this area once contained approximately 3.5 – 4.0 million acres of wetlands and at least 90% of those acres are drained and used primarily for row crop production. Therefore, it's important to understand the implications – all implications – for policy related decisions that effect land-use decisions for this many acres. This study begins the process of collecting information on what these acres of drained wetlands offer, or don't offer, in terms of ecological services to support science based land-use decisions. The information gap on this topic has become very apparent as the intensity of landuse continues to increase. Commodity price increases, climate change, flooding, wildlife population decreases, and soil conservation practices are all issues Iowa is dealing with currently and the many acres of farmed wetlands are part of our landscape to consider. Many questions have been raised about the landscape level implications farmed wetlands may or may not provide in terms of implications ecologically and economically. Some of the questions we hope to address with this study include the following:

- Do farmed wetlands provide value to wildlife for food, breeding, or as resting areas? If so, what species – migratory water birds, amphibians and reptiles, upland wildlife?
- What are some of the interactions of farmed wetland soil types, water retention, and drain tile?
- What are implications of their hydrology with water quality?
- What are subsurface water filtration rates?
- Do these wetlands support temporary populations of aquatic invertebrates?

Questions like these posed above are important to address by documenting information gathered from a study such as this. At a larger scale, it's important to document whether these farmed wetlands offer any value for water quality and wildlife and if so, how much?

So far, field work has revealed some very good results that will come out in the next year or so despite challenges with either too much rain or too little rain. Some of those include interesting patterns of waterbird use, extreme variability in hydrology, and some interesting aquatic critters. So, we would argue there is life on Mars when conditions are right….at least in terrain similar to Mars… Stay tuned!


*Tadpole shrimp from Iowa wetland.*

*Vince Evelsizer is the Furbearer and Wetlands Biologist with the Iowa DNR stationed at Clear Lake.*
*Project partners include Dr. Karen Kinkead, Dr. Stephen Dinsmore, Kevin Murphy, Keith Schilling, Dave Hoffman and Dr. Mary Skopec.*

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**Research Corner**

## CONTAMINATED AMPHIBIANS—ARE RESTORED AGRICULTURAL WETLANDS GOOD FOR AMPHIBIANS? *(CON'D FROM PAGE 1)*

and frog samples as part of a larger project to assess the habitat quality of CREP and reference wetlands in central Iowa. We hypothesized that more contaminants would be found in CREP wetlands, which primarily receive subsurface tile drainage from agricultural fields.

We filtered water from 3 points within each of 6 wetlands (3 CREP and 3 reference) in 2012 and 2013 to check for *Batrachochytrium dendrobatidis* (Bd) zoospores, the fungus that causes Chytrid. Water contaminant samples were collected 3 times throughout the spring and summer of 2012 from 6 wetlands. Sediment was collected once from each wetland in August. Five adult chorus

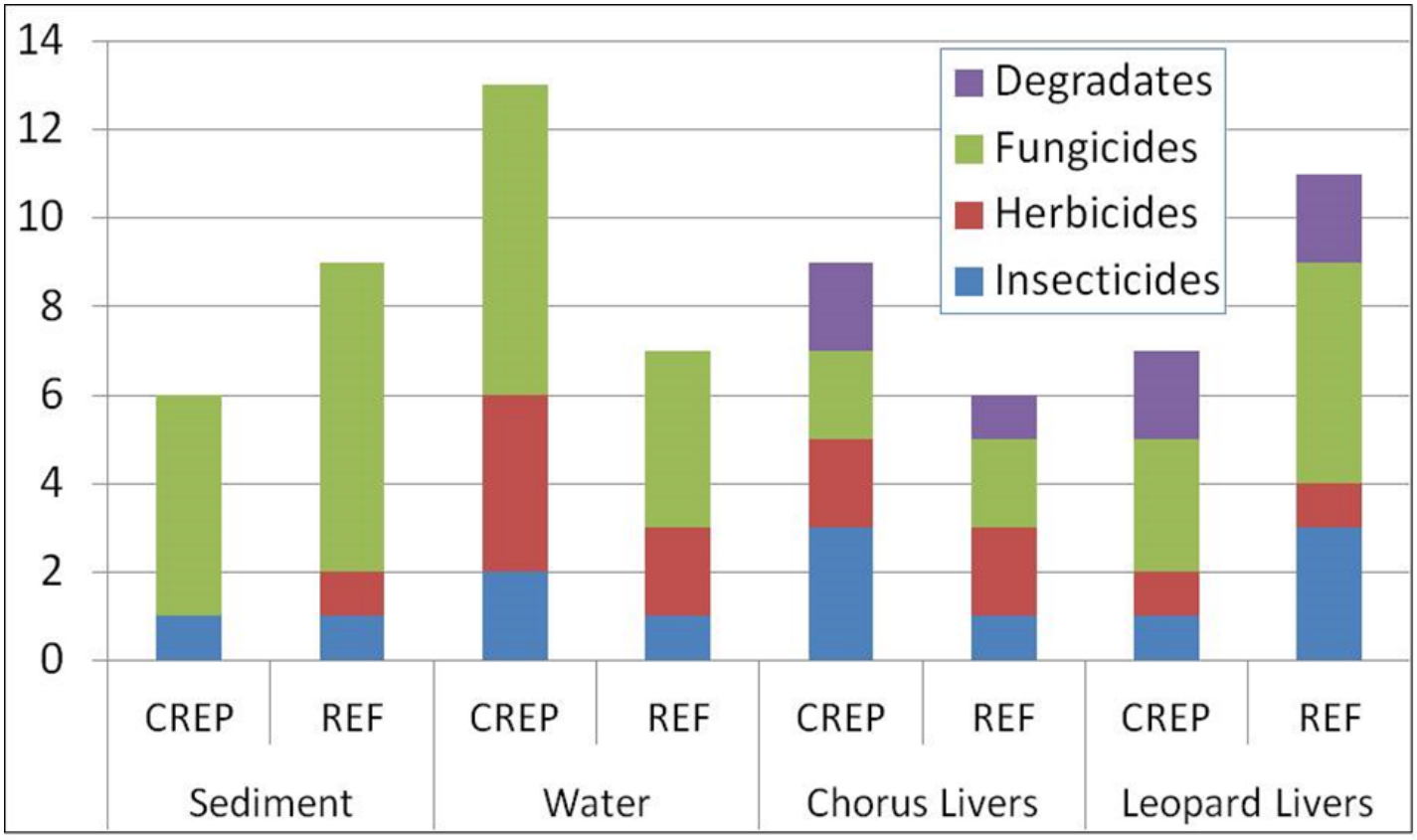


**Figure 1. Contaminant profiles of sediment, water, chorus frog liver, and leopard frog liver samples from Conservation Reserve Enhancement (CREP) and previously restored, 'reference' wetlands (REF). Fungicides were the primary contaminant in sediment and water samples. A degradation product of DDT, which was widely banned in the mid-1970s, was found in liver samples of both species.**

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## CONTAMINATED AMPHIBIANS—ARE RESTORED AGRICULTURAL WETLANDS GOOD FOR AMPHIBIANS? *(CON'D FROM PAGE 5)*

frogs (*Pseudacris maculata*) were collected in May from 2 wetlands (a CREP and reference site), while 5 leopard frogs (*Lithobates pipiens*) were collected from each of 3 sites in June (1 CREP and 2 reference sites). Samples were tested for > 100 chemical contaminants including 27 insecticides, 23 herbicides, 36 fungicides and 14 degradation products. Contaminant results were pooled (all detections from each sample and each wetland were added together) for each wetland type -CRP and reference.

Overall, there were 15 contaminants detected in water samples, 11 in sediment samples, and 12 in each of the frog tissue samples. Contrary to our expectations, CREP wetlands did not always have more contaminants than reference wetlands, even though they receive more tile drainage from agricultural fields. More chemicals were found in water and Chorus frog liver samples from CREP sites than reference sites, but the opposite trend was true for sediment and leopard frog liver samples.

Atrazine, a common herbicide, was found in every water sample from every wetland tested. Interestingly enough, the highest concentration was found in a reference wetland, and the concentration found, 19 ppb, is not far from levels that have been shown to cause immune suppression in amphibians. This is alarming because fungal zoospores were found in water samples from every wetland tested, and immune suppression from contaminants could lead to a higher prevalence of disease in some wetlands. A degradation product of DDT, which was largely banned in the mid-1970s, was found in liver samples from both frog species.

Fungicides were the most common contaminant in both water and sediment samples and made up > 50% of detections (Figure 1). Liver samples had a much more even spread among herbicides, fungicides, insecticides and degradation products. Frogs were collected from 6 wetlands in 2013 and the entire frog will be analyzed. In the future it would be interesting to know what effect these fungicides have on the prevalence of the fungal disease zoospores within the wetland.

Four compounds were found in both water and liver samples and 4 shared among liver and sediment samples. Only 1 compound was found in both water and sediment samples. Overall, leopard and chorus frog livers were more similar to one another (10/12 compounds shared) than they were to either water or sediment samples.

Contaminants can have large indirect effects on amphibians by changing food-web structure. Herbicides eliminate algae that tadpoles eat, while insecticides reduce zooplankton and other invertebrates. Stress from contaminants can also reduce tadpole growth rates, which increases the amount of time that it takes them to metamorphose. Increased time in the wetland increases their exposure to predation and aquatic contaminants, and increases the risk that the wetland will dry before they can escape.

Overall, CREP and reference wetlands both expose amphibians to contaminants in sediments and the water column. Contaminant samples collected in 2013 are still being processed, but may paint a clearer picture of ways in which restored wetlands can be better habitat for amphibians.

*This project is funded by the USGS Amphibian Research and Monitoring Initiative and the Fort Collins Science Center (FORT) as a part of ongoing technical assistance given to the Farm Service Agency (FSA) to assess Iowa CREP wetlands.*

*Rebecca Reeves is a second year Master's graduate student in Wildlife Ecology at Iowa State University. She received her B.S. in Environmental Science from the University of Maryland in 2010.*

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## MEET YOUR NEW CHAPTER OFFICERS!

### President- Elect Tyler Harms

Tyler is a Research Associate II at Iowa State University and serves as the biologist for the Iowa Multiple Species Inventory and Monitoring (MSIM) Program. He is active in The Wildlife Society at both the state and national levels serving as Chair of the Education and Information Committee for the Iowa Chapter of TWS and as a member of the national Biometrics Working Group. As Chair of the Education and Information Committee, Tyler worked with committee members to revitalize the Iowa TWS website, resume publication of the biannual newsletter (Wildlife Sightings), and create an informative display banner to highlight Iowa TWS. In 2012, Tyler was recognized as an Associate Wildlife Biologist with The Wildlife Society. Tyler enjoys interacting with fellow wildlife professionals through Iowa TWS and would enjoy the opportunity to lead this organization in advancing the science and art of wildlife management and conservation in Iowa.

### Member at Large Dr. Stephen Dinsmore

Stephen J. Dinsmore is an Associate Professor (Wildlife Ecologist) in the Department of Natural Resource Ecology and Management at Iowa State University, where he has been employed since 2005. He received degrees from Iowa State University (B.S., Fisheries and Wildlife Biology; 1990), North Carolina State University (M.S., Zoology; 1994), and Colorado State University (Ph.D., Fishery and Wildlife Biology; 2001) and was previously employed as an Assistant Professor (Avian Ecologist) at Mississippi State University (2001-2005). His broad research interests are in the areas of avian ecology and population biology. Recently, he has focused on topics such as avian nest survival modeling, survival estimation, and sampling techniques, and he currently supervises four graduate students working in these areas. He also teaches two undergraduate courses (Ecological Methods and Ornithology), one graduate course (Avian Ecology), and teaches in the Study Abroad program (Natural History of Costa Rica) at Iowa State University. He has regularly attended both the Iowa Chapter and national meetings of The Wildlife Society and wants to become an Iowa Chapter board member to strengthen the ties between Iowa State University and other Iowa wildlife professionals.

### Secretary/Treasurer AnnMarie Krmpotich

AnnMarie Krmpotich is a Wildlife Biologist for the U.S. Fish and Wildlife Service (USFWS) and implements the Partners for Fish and Wildlife (Private Lands) program for the IA Wetland Management District and Union Slough National Wildlife Refuge. AnnMarie grew up in north-central Minnesota and earned a B.S. degree in Wildlife Biology at Colorado State University (CSU) and M.S. degree in Biology from the University of North Dakota (ND). She has a strong passion for natural resources which has been instilled since childhood. Personal experiences are reminders of the opportunities the land has to offer and the reasons why we as wildlife professionals need to protect what we know and love for future generations using the best management, education, and research available. Past experience includes working with Delta Waterfowl on duckling survival research projects, establishing a National Park Service Inventory and Monitoring Program, USFWS Reed Canary grass adaptive management study, Massasauga Rattlesnake distribution analysis, and many migratory bird studies. A strong research background and both public and private lands habitat management experience contribute to a good overall perspective of wildlife conservation. AnnMarie has demonstrated leadership abilities within The Wildlife Society including treasurer of TWS-CSU Chapter, ND Chapter "Outstanding Graduate Student Award" recipient, and has been recognized as an Associate Wildlife Biologist from The Wildlife Society since 2010. My experience, commitment and passion for the profession will help me in an officer role within the chapter if elected.

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# CHICHAQUA BOTTOMS PROVIDES HABITAT FOR THREATENED BLANDING'S TURTLES

**Species Spotlight**
**Blanding's Turtle**

When Chichaqua Bottoms Greenbelt staff spotted a turtle with a sunny yellow throat, they knew it was something special – a Blanding's turtle, one of Iowa's threatened species.

"I almost drove right past it, but something about its color, shell shape and movement struck me as being different from the myriad painted turtles we typically see here", said Doug Sheeley, Polk County Natural Resources Supervisor.

Sheeley and Lael Neal, Natural Resources Worker, encountered the turtle at Chichaqua Bottoms Greenbelt in September 2011. A few weeks later, another Blanding's turtle was found about three miles from the first one. The most recent previous report of a Blanding's turtle at Chichaqua was in 2007 when researchers from Drake University found a single individual during a box turtle study.

Chichaqua Bottoms Greenbelt is a large natural area jointly owned and managed by Polk County Conservation and the Iowa Department of Natural Resources. Its approximately 7,500 acres provide a wide variety of woodland, wetland and grassland habitats. Chichaqua was formed in 1960 from the unfarmable remnants of the historic course of the Skunk River. The Skunk was channelized and levees added in the early part of the 20th century to improve conditions for farmers in the "dreaded Skunk bottom" – as this area was known to the early settlers of the area.

To survive, Blanding's turtles need diverse, connected wetlands like those found at Chichaqua. They live in shallow marshes and, like other turtles, surface to bask on logs. Lucky wildlife watchers might glimpse their bright yellow neck and chin through binoculars, but Blanding's turtles, shyer and rarer than painted turtles, quickly plop into the water. Up close, tiny flakes of yellow speckle the turtle's dark shell and legs. Males wear a black "moustache". Adult turtles are typically 8-10 inches long and may weigh 3 pounds.

Blanding's turtles spend more time on land than many other turtles. Males and females journey from wetland to wetland, chomping crayfish, frogs and snails. Unlike most Iowa turtle species, Blanding's turtles can swallow food out of the water and eat earthworms, slugs, grass and berries.

In June, females search on land for sandy nesting areas. They may travel more than half a mile to bury their eggs. The eggs and hatchlings encounter many obstacles before reaching adulthood. Raccoons, foxes and skunks snack on the eggs and fish, snakes and birds eat young turtles.

Adults face few natural predators and can live more than 70 years. They defend themselves by shutting out danger. The turtles can pull in their head and close the front of their shell with their hinged plastron (A box turtle can close its shell completely). Blanding's turtles are found in west-central Nebraska, across the Great Lakes region and into western Pennsylvania and New York. Most states in the turtle's range list them as threatened or endangered.

*Doug Sheeley is a Natural Resources Supervisor for Polk County, stationed at Chichaqua Bottoms.*

*Blanding's turtle discovered at Chichaqua Bottoms in 2011.*

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***UPCOMING EVENTS***:

*Midwest Fish & Wildlife Conference, January 26-29, 2014. Sheraton Kansas City, Kansas City, Missouri. For registration and other information, http://www.midwestfw.org/.*

*Iowa Association of County Conservation Board Employees (IA CCB) Winterfest, January 21-23, 2014. Five Sullivan Brothers Convention Center, Waterloo, Iowa. For registration and more information, http://www.mycountyparks.com/Info/WINTERFEST.aspx.*

*Iowa Pheasants Forever and Quail Forever State Convention, January 31—February 2, 2014. Prairie Meadows Hotel and Casino, Altoona, Iowa.*

*Iowa TWS members learn about Black Locust management at Decorah Community Prairie during the2013 Fall Workshop in Decorah, Iowa*

Rebecca Christoffel,
Newsletter Editor
(christof@iastate.edu)



**We're also online!**
**Check out Iowa TWS at**

http://iowatws.org