



Pronghorns are the fastest land animal in North America, but this buck seemed content to rest in open grassland after a morning spent grazing. Nebraska is home to more than 6,000 pronghorns, most of which live in the western half of the state. Photo by Pasquale Mingarelli.



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INSIDE

Saving our Pollinators - Why We Should Care
Pallid Sturgeon Propagation • Sunny Hollow
Sherman Reservoir • Ethanol • Wood Duck WMA



NEBRASKAland

Volume 88, Number 6, July 2010

FEATURES

14 Losing our Pollinators - Why We Should Care

Around the world, almost half of all documented insect extinctions have been pollinators. There are many reasons why, as well as several ways we can help.

TEXT AND PHOTOS BY CHRIS HELZER

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A quick afternoon trip to Sherman Reservoir revealed all the opportunities this beautiful area has – camping, boating and, of course, fishing. TEXT AND PHOTOS BY JEFF KURRUS

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Twenty years after being federally listed as endangered, most pallid sturgeon reproduction now occurs under a sophisticated propagation program that helps keep them from becoming extinct while waiting for their habitat to be restored. TEXT AND PHOTOS BY MICHAEL FORSBERG

30 Wood Duck Grasslands

Southeast of Norfolk and encompassing 1,688 acres, Wood Duck WMA is the answer why conservationists should work so hard to preserve land for future generations – because it's the right thing to do. TEXT AND PHOTOS BY JON FARRAR

36 Ethanol and Wildlife - a Bad Mix?

In the race toward increased energy independence and reduced greenhouse gas emissions, ethanol has been a major player, perhaps to the detriment of wildlife and the environment. TEXT AND PHOTOS BY ERIC FOWLER



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Cover: The honey bee is Nebraska's most recognized pollinator, but is only one of many pollinator species experiencing declines around the world. See story on page 14. Photo by Chris Helzer. **Opposite:** A crowd views the July 4th fireworks at Rosenblatt Stadium in Omaha from the 10th Street bridge over Interstate 80. Photo by Pasquale Mingarelli.

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Feeding the Turkeys

I am enclosing a photo that might be interesting to your readers, especially after the “hard winter” of 2010. I am a 89-year-old retired Catholic priest living on the south side of the Platte River near Cedar Bluffs at Marianna, a retirement village for Catholic priests. Three of us living here were feeding the starving wild turkeys this winter, and they responded generously with their presence anytime we put out the cracked corn (I put out about 300 pounds of it this winter). I doubt we will have another winter like this last one, or that in the future the turkeys may be that plentiful. I just thought this photo might have some historical value in your Game and Parks annals. Your magazine is very interesting and high class. I’m sending along a check for another year’s subscription. I may not be living much longer at age 89! Thank you! Rev. Msgr. Andrew Meister Cedar Bluffs, Nebraska



Hungry Fox

Thought I would send you a picture that my son, Thomas (age 13), took of a fox. Thomas was practicing calling turkeys by our cabin on the Platte River when this fox came to check out the possible meal. Thought you would enjoy it. Love the magazine, especially the wildlife and other outdoor pictures. Keep up the good work. Mark Norvell Geneva, Nebraska



It's a cute picture, Mr. Reicheneker, but I'm afraid this is the best we can do for you.

Squirrel Cover

If possible, I would like to have this picture put on the front of the NEBRASKAland Magazine. This was taken at my home in the front yard. Thank you, Erwin Reicheneker York, Nebraska

Thank You for Lasting Memories

Thank you so much for offering the \$5 permits for youth – I purchased a turkey permit for my 10-year-old grandson Skylar this year. I shot my first turkey last spring, have taken three more since, and I wanted my grandson to enjoy the sport as much as I do. His dad (my son) died when Skylar was five months old, and I have made sure he is exposed to the outdoors as much as his dad was. We went archery hunting on opening day this spring and saw one jake, but it was out of range. Then 10 days before Skylar’s eleventh birthday, Terry Brentzel, the local game warden, my daughter, Shae, and I took Skylar to a blind along the Platte River to try again. Thirty minutes into the



Skylar with his first turkey.

hunt, two nice jakes walked in front of the blind. Skylar put the bead on the bird and pulled the trigger. His first hunt with a shotgun, first shot and he had a bird. That is what the explanation of PRICELESS is all about. The Nebraska Game and Parks Commission has offered all four of my grandsons lasting memories. Last fall we attended the Outdoor Expo at Ponca State Park and they keep reminding me that we are going back this fall. No need to travel out of state – the Commission offers plenty to do right here in Nebraska. It’s nice to take the boys out of town and into the country where the real living is. Thanks again for making affordable experiences. I have won one lifetime hunt/fish permit for my grandson Gunnar, and have the other three to go. I will be buying permits for the other grandsons when they are old enough to hold a gun or bow also. Sherri Rathman Grand Island, Nebraska

NEBRASKAland Visitor Letters
We want to thank all 115 readers that sent e-mails and letters for last issue’s visitor, a **garden centipede** on page 30 (see page 13 for the winner, rules and this issue’s hint). Here are just a few of the many wonderful responses we received:

I do believe the NEBRASKAland “visitor” is among the rocks and growth on page 30 at the bottom of the page – looks sorta like a centipede. Always enjoy each issue and have for many years of subscription. The artwork, pictures and stories are just fantastic! Maxyne S. Brannon Fremont, Nebraska

You almost got me on this one, but I found it on page 30, bottom center of the page, I believe it is a centipede. Great job on the magazine, I get four outdoor magazines every month and this one is my favorite. I enjoy reading every article you all write. Keep up the great work and I hope your "visitor" contest goes on for years to come. Monte Deatrich Thornton, Colorado

It was easy for my husband to spot the centipede at the bottom center of page 30 in the June 2010 issue, since he doesn't miss a thing that you put in your wonderful magazine! We moved away from Nebraska 21 years ago; but we still call it "home" and miss it very much. My husband looks forward to NEBRASKAland Magazine each month. When it comes I always set it on his recliner chair so he can't miss it when he's ready to sit down and relax a spell. He's like a person who has been waiting for a "letter from home" as he pours through the pages of each issue, devouring it like a starved man! Keep up the good work ... we love NEBRASKAland Magazine! Joe and Jeannie Smith New Holland, Pennsylvania

I truly enjoy the wonderful photography in NEBRASKAland. I found the centipede on page 30 with the raptors. We learn so much from your great magazine. Rae J. Radke Elba, Nebraska

The garden centipede (Lithobius forficatus) is an anthropod belonging to the family Lithobiidae. Centipedes have venomous pinchers up front and are predators, but very few species are dangerous to people. They are always found in moist habitats (such as under logs or in the soil here in Nebraska) because they don't have the waxy cuticle that true insects have that would protect them from losing moisture through their skin.

Send your comments to:
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Please include your postal address and telephone number.
Letters may be condensed and edited for clarity. Photographs are welcome and will be returned.

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PHOTO BY JEFF KURRUS

Cheyenne State Recreation Area near Wood River

Kelsea Nore

Cheyenne State Recreation Area, located on the northwestern side of Interstate 80 Exit 300 near Wood River, covers 18 acres and is an ideal spot for a morning sunrise, an afternoon picnic near the small playground, or an evening fishing trip. For those looking for an overnight stay, there are also

eight primitive campsites on-site near Cheyenne's 15-acre pond. Both electric motor and non-powered boats are welcome at Cheyenne SRA, which, according to the 2010 Nebraska Game and Parks Commission Fish Forecast, boasts good numbers of bass over 15 inches long.

But don't just stop here for the fishing. Stop because it just a nice place along the interstate to take a little break from the road.

Alcohol Ban Lifted

At their May meeting in Gering, the Nebraska Game and Parks Commission voted to end the ban on alcohol consumption in state park and state wildlife management areas (WMAs).

The new regulations do not become official until January 1, 2011, and must first be approved by the governor and posted on the secretary of state's web site. The new regulations include the following restrictions:

- consumption of alcohol may be prohibited on any state park and wildlife areas, or portions thereof, with the use of appropriate signage;
- consumption is prohibited between the hours of 10 p.m. and 6 a.m.;
- consumption is prohibited on all roadways, designated swimming areas and parking areas;
- all containers of alcoholic beverages whose single liquid capacity is greater than one gallon are prohibited.

Hostess of the Month



From April 1965 to December 1972, NEBRASKAland ran a department called "Roundup and What to Do" that featured a young woman from Nebraska as "Hostess of the Month." Posed indoors (such as Vivian Lewis pictured here in the March 1972 issue) or outside, each photo was accompanied by a profile including school, major, awards, accomplishments, hobbies and parents' names and home town.

A Gander at Goslings

Kelsea Nore

Canada geese, which partner for life, begin mating around three years of age. Pairs will build their nests, year after year, in the same general area. They prefer isolated sites near water, so islands are a very popular nesting area. Approximately 4 to 7 eggs a year are laid in the nest, and the female will incubate them for close to a month. All of the goslings typically hatch out of the eggs on the same day, and one to days later the goslings will be led to water. Swimming is a natural instinct and the goslings are able to dive for food immediately.

Young goslings stay close to their mother, who protects them from natural predators such as raccoons, coyotes and owls, much as the gander did before they were hatched. If there are other clutches in the area, the goslings will be flocked together by the adults in groups called crèches, where they are watched over by the community.

At birth, the goslings are covered in soft, fuzzy down. Nine to ten weeks later, they have sprouted their flight feathers (around the same time the adults have molted and regrown their own flight feathers) and will soon be ready for the upcoming migration.



PHOTO BY JEFF KURRUS

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Farm Bill Wildlife Biologists

These biologists are available through a partnership with the Nebraska Game & Parks Commission and the Natural Resources Conservation Service and offer landowners one-stop-shopping for technical assistance on the available conservation programs and incentives in the state. Landowners may contact them for site visits and program enrollment options.

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Coordinating Wildlife Biologists

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For further information visit www.NebraskaPF.com

A Look Back - July 1927

Jeff Kurrus

Outdoor Nebraska, the predecessor of *NEBRASKALAND* that began in 1926, started its July 1927 edition with a question for readers: "Have you purchased your 1927 hunting and fishing license?" It then made a statement sure to make today's reader long for things past: "The annual hunting and fishing license which costs a dollar, is the means of support for the Bureau of Game and Fish. It is your dollar that trapped and distributed 30,000 pheasants recently."

How far a dollar would go was a bit different in those days, as was how people viewed fishing. While today's anglers have numerous options, Herbert Hoover, then head of the Department of Commerce, wrote about various problems facing game fishing in "It Is Too Long Between Bites."

In the article "Can You Tell Me," readers posed questions to "the Game Warden" in an effort to clear up game laws. One was especially interesting and representative of the time period: "Does a lady need a license to fish?" Answer: "Yes, the law requires all ladies to have licenses. No lady objects to equality of the sexes nowadays and should be glad of this opportunity to be treated the same as men anglers."

Read "Too Long Between Bites," at NebraskalandMagazine.com by clicking on "A Look Back."



PHOTO BY JEFF KURRUS

Counting Pumps

Jeff Kurrus

The Remington Model 870, a shotgun that will see its fair share of time in Nebraska hunting blinds this year, was originally introduced in 1950. By 1966, one million 870s had been sold. Today, it is the most successful single model gun in Remington's 189-year history and the best-selling pump action shotgun in firearms history, with more than seven million sold.

Cotton Kills

Jeff Kurrus

When hiking this month, changing from cotton socks to a moisture-wicking material, such as polyester or nylon, will save your feet much undo pain due to the cracking and blistering associated with foot-cutting cotton. On a hiking trip near Chadron a few years back, I had to wear cotton socks one day because all of my polyester socks were dirty. That night, after a six-mile hike with another to follow, I could barely walk. The next day I had to turn my polyesters inside-out and experienced much less pain.

On a similar note, the same reasons cotton kills in the summer – making feet moist and susceptible to injury – are why it isn't a good thing to wear on your feet in the winter. Only wear cotton socks around the house, where your only traveling is from the couch to the kitchen. In all other facets of life, make a change.



PHOTO BY JEFF KURRUS

New NGPC Web Site

Interactive map tools, new fonts and updated graphics and layouts will help users access information more quickly and easily on the Nebraska Game and Parks Commission's newly redesigned web site.

The improved web site, located at OutdoorNebraska.org, contains the following new features:

- a precise menu with constant navigation that gives users a clearer indication of pages that exist on the site;
- an enhanced navigation structure that is categorized based on user needs;
- an interactive map tool that aids in planning things such as hunting, fishing, canoeing, and parks trips;
- an improved outdoor calendar that highlights all Commission events;
- a more robust search feature to help the public find needed information;
- an online community page that will give customers access to the Commission's latest news and social media community;
- and a new Outdoor Report that allows users to post field reports.

In coming months, additional enhancements and content will be added to improve and simplify the site. The redesign is intended to ensure that the site remains effective and user-friendly.



PHOTO BY BOBBI AND STEVE OLSON

Lake McConaughy's Annual Kites and Castles Event

Kristen Friesen

If Tyson Baker tells you go fly a kite, he means well. Baker grew up along the south side of Lake McConaughy, where he learned to maneuver stunt kites at the age of six. Now that he's grown, he's the go-to guy for Lake McConaughy's annual Kites and Castles event.

Now in its 21st year, this sandcastle-building, kite-flying beach party held on Big Mac's beautiful and abundant beaches is nearly as old as Baker himself. And as always, it's free and open to kids of all ages. While pre-registration is suggested, no one who shows up at Martin Bay July 31 will be turned away.

Registration for the sculpting contest will begin at 11 a.m., with the contest running from 12 p.m. to 4 p.m., followed by judging, prizes, a silent auction and a live band that will perform at Down by the Bay restaurant.

For more information about Kites and Castles, call (308) 289-2770 or visit www.kitesandcastles.8k.com.

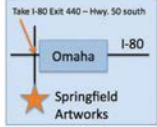
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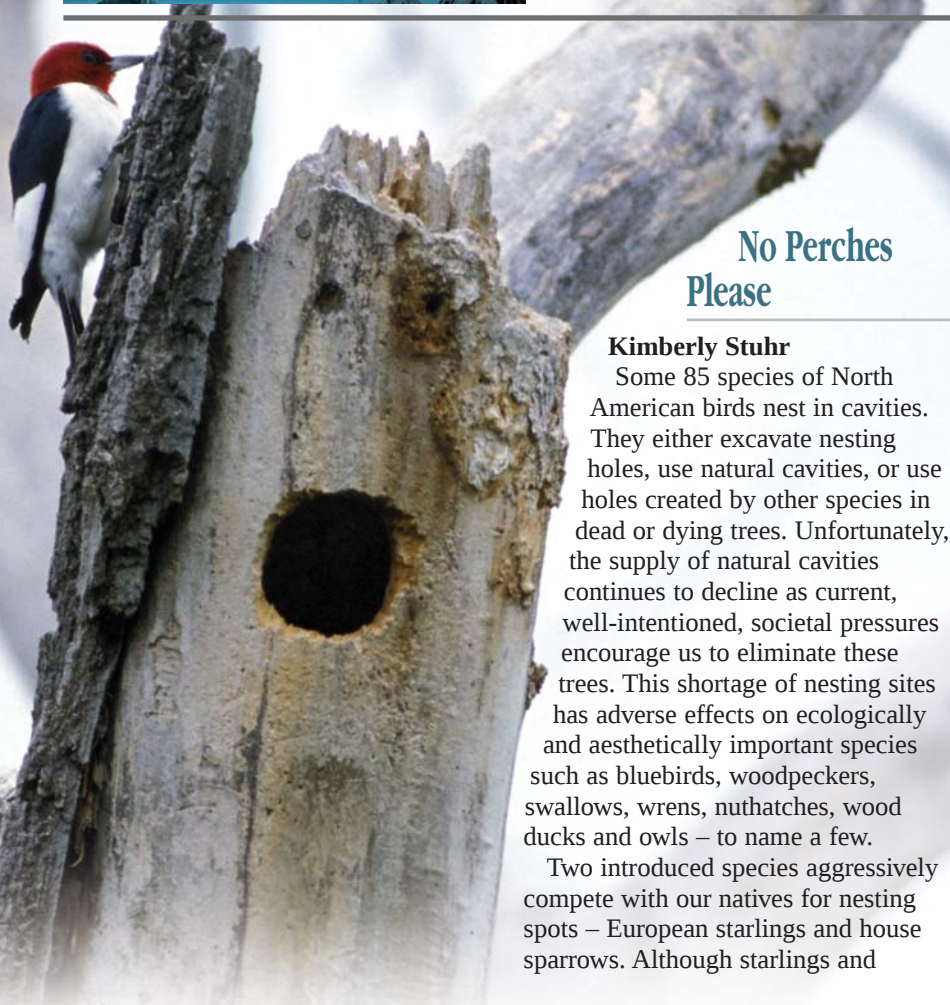


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No Perches Please

Kimberly Stuhr

Some 85 species of North American birds nest in cavities. They either excavate nesting holes, use natural cavities, or use holes created by other species in dead or dying trees. Unfortunately, the supply of natural cavities continues to decline as current, well-intentioned, societal pressures encourage us to eliminate these trees. This shortage of nesting sites has adverse effects on ecologically and aesthetically important species such as bluebirds, woodpeckers, swallows, wrens, nuthatches, wood ducks and owls – to name a few.

Two introduced species aggressively compete with our natives for nesting spots – European starlings and house sparrows. Although starlings and

sparrows can be interesting to watch in metropolitan areas where few other bird species thrive, they are a serious problem in areas where native birds exist. Males are especially aggressive; they will kill the inhabitants and eggs of an existing nest and then throw the material out or build a new nest on top of the existing one.

Having nest boxes is an obvious way to counteract the shortage of nest sites. Many commercial birdhouses have perches, but yours shouldn't. In addition to providing easy access for predators such as cats and squirrels, perches invite starlings and house sparrows to use and defend the box. Native cavity nesters have strong feet and easily cling to wooden surfaces so perches are not necessary. If you purchase a box that has a perch, simply cut it off.

Other things you can do to protect native cavity nesters include:

- Clean out nest boxes each year so birds can't build new nests on top of old ones. Also use boxes with a thick entry hole and deep nesting cavity that will hinder raccoons, crows, starlings, house sparrows and other animals from raiding or using the box.
- Take the boxes down each year or block the entrance holes after the breeding season and do not put them back up until you see or hear natives the following spring. Starlings and house sparrows don't migrate for the winter so they are looking for nesting sites long before migrants return in the spring.
- Carefully monitor the box throughout the breeding season. If you observe a starling or house sparrow building a nest in a nest box, repeatedly remove the nesting material, or plug the entry hole for several days to prevent them from re-entering.



European Starling



House Wren

WOODPECKER BY DON CUNNINGHAM, STARLING BY ROCKY HOFMANN, WREN BY KEN BOUC

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Guardian of the Wild

Dynamic hand-crafted sculpture showcases the art of wildlife master Ted Blaylock

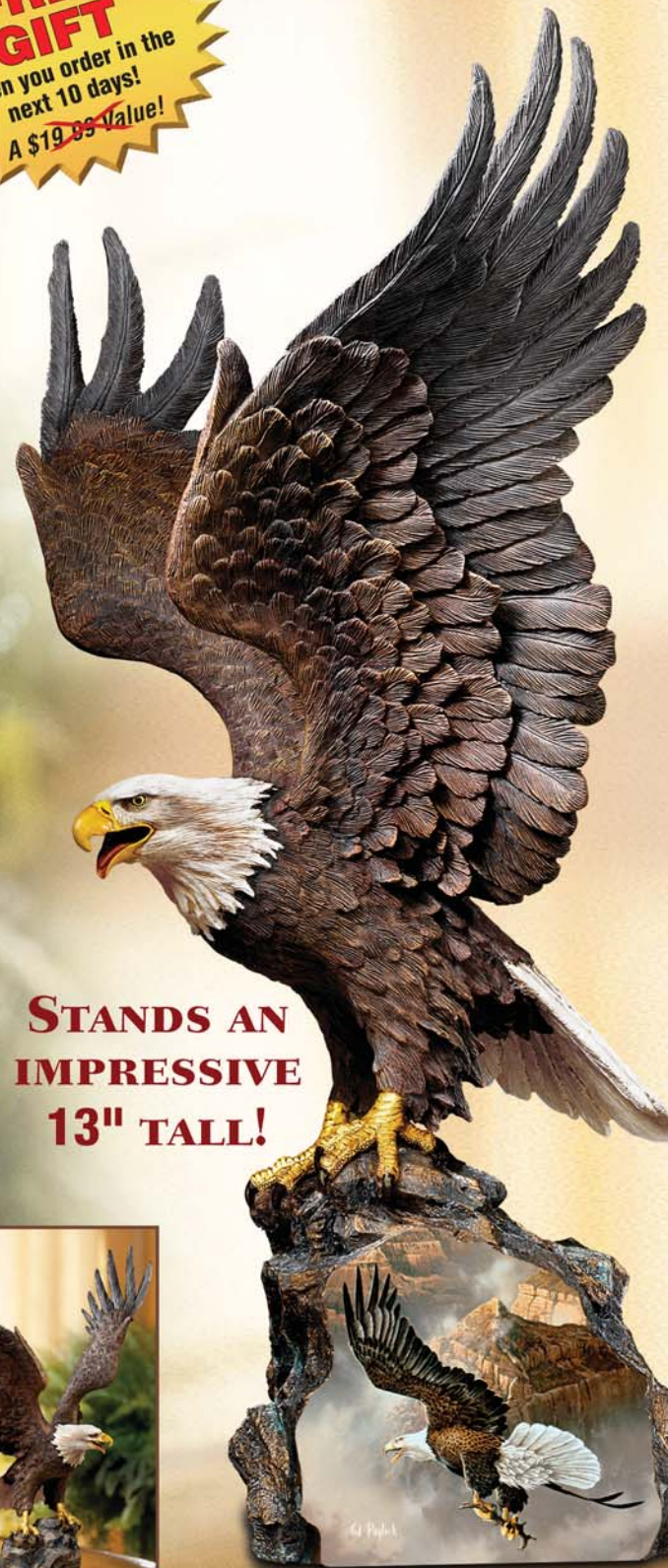
Far above the misty river valley, the American Eagle stands apart, powerful talons anchored to the rocky heights. Suddenly he rises on mighty wings to soar above the red rock canyon, guardian of all the wild rushing beauty that passes beneath his wings.

The vigilant majesty of the King of the Sky is beautifully expressed in the new "Canyon Guardian" sculpture. Standing a magnificent 13 inches tall, this hand-crafted and hand-painted three-dimensional treasure captures the eagle with mighty wings raised at the moment of takeoff. The mountain-top adventure continues in artist Ted Blaylock's thrilling panoramic portrait of the eagle soaring above the canyon.

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Officer's Notebook

Spotlighting

What is illegal about spotlighting? Legally defined: It is to hunt with the use of a spotlight or artificial light from or attached to a motor vehicle or water vessel while having in possession or control any firearm or bow and arrow. This does include vehicle headlights. And it doesn't matter whether you are on a public road or private property. By law, anyone and everyone in that vehicle are in violation of State Statute 37-514 and will receive a citation.

It is legal in Nebraska, however, to spotlight from a vehicle, if off of the public roadway, while having NO firearm or bow and arrow in one's possession or control, to view wildlife. This can be an excellent and enjoyable scouting method. Be nice though and first call your area conservation officer or county sheriff.

Can one legally hunt at night? Absolutely, hunters can use a varmint caller, electronic or otherwise, while on foot and legally use a spotlight. Outdoorsmen, with a valid fur harvester permit and habitat stamp, can enjoy both day and night hunting for most fur-bearers: fox, badger, bobcat, skunk, opossum, raccoon and mink. The beaver and muskrat can only be trapped, not hunted. All other game animals cannot be hunted after or before legal shooting hours.

However, one exception to the rule of law is that a farmer or rancher can legally spotlight and hunt non-game coyotes from their vehicle, while protecting and being physically on their own ground.

If you have any other questions regarding spotlighting, look on page 5 of *NEBRASKAland Magazine* to find the conservation officer in your area and give them a call.

— Dan Evasco, Conservation Officer, Papillion



Surf Nebraska!

Kristen Friesen

Nebraska's playground consists of lush green acres, somersaulting hills, the noisy laughter of rivers and lazy, sun-kissed lakes. Frankly, the options are dizzying. And that explains why a growing number of Nebraska's vacationers are taking up surfing.

What's that? You've never surfed Nebraska? Didn't even know it could be done? Well according to Scott Bonertz, public information manager for Nebraska Game and Parks, it's the best way to begin any Nebraska adventure.

"We always tell people, 'Go outside and play ... and whatever you do, don't look behind the curtain,'" he said. That's where the magic happens – where he and his department tweet, update their Facebook page and load information onto user-friendly web sites. Sure, Bonertz would rather be fishing on Lewis and Clark Lake, but someone's got to make sure Nebraska's favorite web sites are ready whenever you are.

• For starters, www.visitnebraska.gov lists things to do, places to stay, attractions, events and scenic byways –

all searchable by date or location. Maps are easily downloaded.

• The Nebraska Games and Parks Commission's homepage is www.OutdoorNebraska.org. There's a game guide, a regularly updated outdoor report, information on the Open Fields and Waters Program, permit fees, newsy wildlife stories and park information.

• For boat registration renewals, go to <https://secure.ngpc.state.ne.us/boaters.asp>.

• For links to Nebraska's plentiful campgrounds, visit www.nebraska.stateparks.reserveamerica.com. Video previews of Nebraska parks can be seen at <http://www.youtube.com/NGPCnews>.

• For some friendly interaction, follow the Nebraska Game and Parks Commission at <http://twitter.com/NEGameandParks> and <http://www.facebook.com/NEGameandParks>.

• Don't forget these four blogs: "Afield and Afloat," by *NEBRASKAland Magazine*; "Barbs and Backlashes," by Daryl Bauer, Fisheries Outreach Program Manager; "In the Wild with Greg Wagner;" and "Lock, Stock and

Bedlam," by Jeff Rawlinson and Aaron Hershberger of the Commission's Outdoor Education team.

• And if you're lucky enough to catch a lunker, brag to Scott Bonertz and the entire Nebraska surfing community in a post at <http://www.outdoornebraska.ne.gov/outdoorreports/>.



Nolan Yaren could show off his largemouth to the entire Nebraska online community.

PHOTO BY JEFF KURRUS

News From Abroad

A Dam, Big Dam

In a remote area of northern Alberta, Canada, beavers have constructed a dam so large it is visible from space, measuring 2,800 feet long on the southern edge of Wood Buffalo National park, twice the size of Hoover Dam.

Originally discovered in 2007, Canadian researchers report that beavers likely started the dam in the mid-1970s with several generations working on the steadily growing structure. In addition, there are smaller dams beginning at either side of the main dam that, in 10 years, biologists estimate that the three structures could merge into a dam just short of a kilometer in length.

Because the dam builds up water around their lodges, it has allowed safe passage to and from their homes from the coyotes, wolves and bears that would normally feed upon them, allowing more beavers to spend time working on their massive undertaking.

PHOTO BY ROCKY HOFFMANN

The Versatile Shad Rap

Jeff Kurrus

For many anglers, July can be a tough month for catching fish. Because predators in most Nebraska reservoirs are eating young-of-the-year shad, why not try to match this forage. Here are three techniques, using the Shad Rap, for making those tough days a bit easier.

• Shallow trolling – To catch Nebraska's open water species (walleye, white bass, and wiper), this lure will run a particular depth. However, an angler can make the lure run a little bit deeper by using a line with a smaller diameter, such as a smaller test or even a braided version.

• Deep trolling – "This is where some serious experimenting can come in to play," said Commission Outreach Program Manager Daryl Bauer. Attach a clip-on weight, some anglers will do so 10 or even 20 feet above their lure, and start fishing. This technique catches those same open-water species that can be found shallow trolling. Because shad roam so much in a lake, constantly changing depths may be critical to finding fish.

• Cranking – Fish rip-rap points and their drop-offs for largemouth bass by casting shallow and working the lure near these areas. You can also cast parallel to lake jetties using this same technique.



PHOTO BY JEFF KURRUS

So, You Think It's Hot Now?

Jon Farrar

The summer of 1936 was the hottest and driest on record in Nebraska. On July 25, a record high of 117 degrees was set in Lincoln and 113 degrees in Omaha. Total rain fall for the month in Omaha was one-half inch and it came in a dust storm with wind velocities of 109 miles per hour.

See You Out There ... But Where?



Do you know where this Nebraska photograph was taken? See answer at the bottom of page 13.

PHOTO BY BOB GRIER

NEBRASKAland Visitor Winner and Hint

Last issue's winner of the *NEBRASKAland* Visitor drawing was David Gloe of Omaha, Nebraska who found the **garden centipede** on page 30.

Readers are encouraged to contact *NEBRASKAland* within 10 days after this issue's publication with the correct page number and name of this issue's "Visitor" – a bug found in Nebraska that just happened to find its way onto one of the pages of our publication.

We will then gather the correct entries and draw one to win a NEBRASKAland Visitor mug.

To enter each month, write: **NEBRASKAland Visitor**
2200 North 33rd Street,
Lincoln, NE 68503.

Or e-mail:

Tim.Reigert@Nebraska.gov
with "Visitor" in the subject line of the message.

HINT: This issue's visitor is not on page 1 (cover), 5, 13, 14, 15, 16, 18, 19, 20, or 21.

Gilbert-Baker Wildlife Management Area - north of Harrison

Losing Our Pollinators

Why We Should Care

Text and photos by Chris Helzer

By now you've probably heard at least something about population declines among pollinators around the world. Media coverage of dramatic decreases in honey bee numbers throughout the U.S. has captured the attention of the public, and this decrease has direct effects on our lives, from our food supply right down to our backyard flower and vegetable gardens. However, to focus solely on the plight of the honey bee ignores a much larger and more serious problem.



A skipper butterfly feeds on the nectar of a native thistle.

There are more than 3,500 species of bees in North America, and they are joined by thousands of species of other pollinators, including butterflies, moths, flies, wasps, ants, beetles, birds and bats. While declines on this continent have only recently started to be widely documented, every other continent, with the exception of Antarctica, has seen serious decreases in pollinator numbers over the past 25 years. Around the world, almost half of all documented insect extinctions have been pollinators.

Why Pollination Is Important

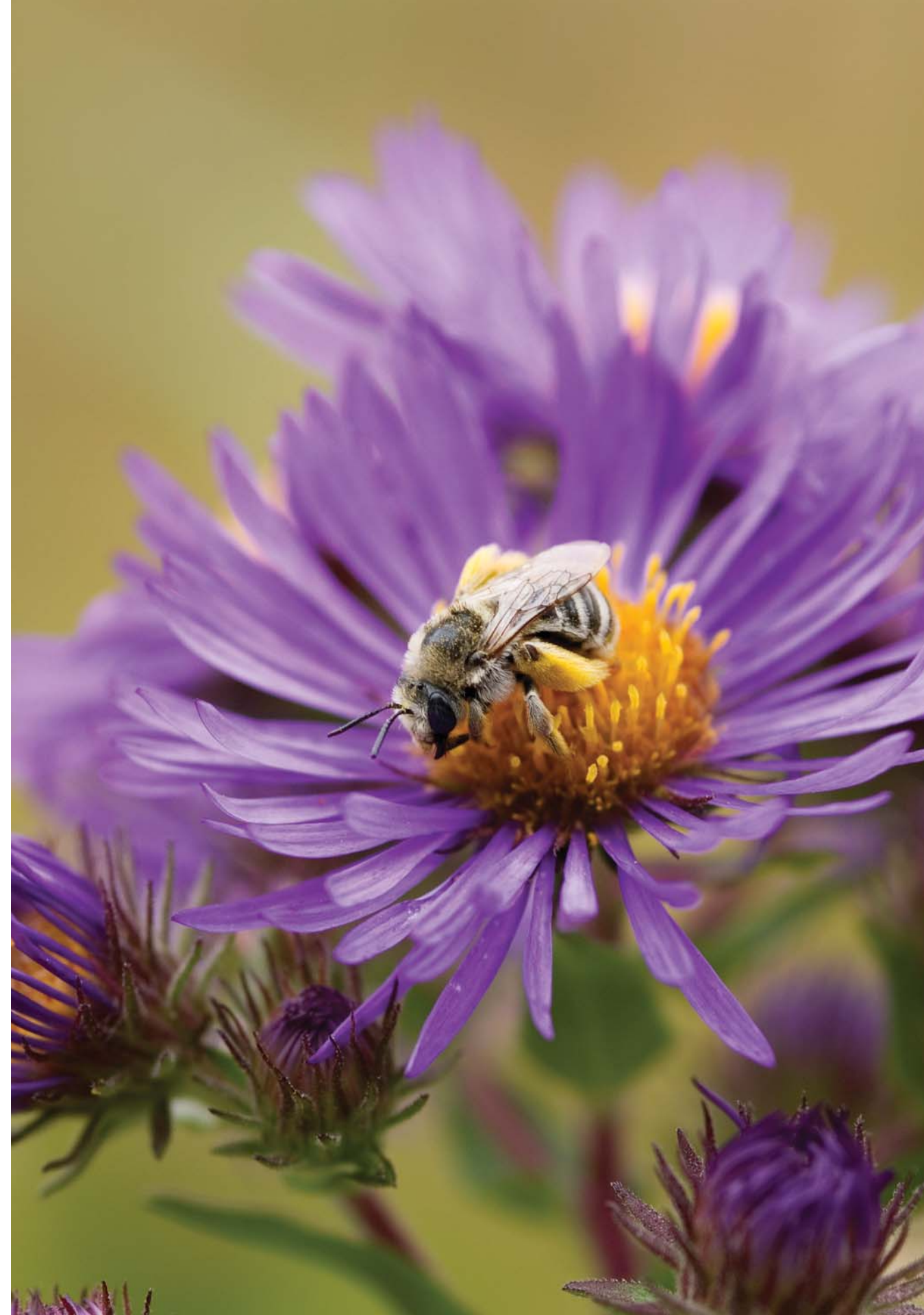
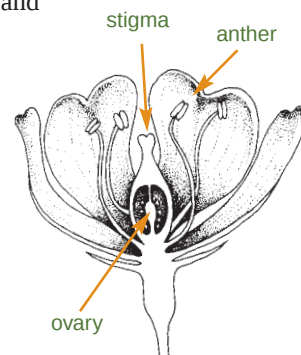
Pollination by animals is a critical component of world-wide agricultural production. Most of the fruit, vegetable, seed crops, and other agricultural products consumed by humans are dependent upon pollination. Although our two major row crops in Nebraska (corn and soybeans) do not rely on animal pollinators, other crops, such as alfalfa seed and sugar beets, do benefit from pollinators, as do most of our garden vegetables. And in grasslands across the state,

pollinators – primarily insects – play a huge role in maintaining both forage production and ecological function. Consistent seed production ensures the persistence of important forage plants in pastures and hay prairies.

That same seed production also feeds our state's wildlife and maintains grassland plant diversity, which is critical for both wildlife habitat and for maintaining pollinator populations. In fact, the most serious problem caused by the decline of pollinators could be that it will lower the total number of flowering plants available to the remaining pollinators. This potential downward spiral has been called an "extinction vortex" and could destabilize entire ecosystems if it is allowed to continue for too long. Plant species that are already rare and/or that occur in small populations are most vulnerable, but the loss of those species could lead to the loss of others.

The Basics of Pollination

To understand why pollination is important to plants, it's necessary to go back to the basics of plant reproduction. In all flowering plants there are two processes necessary for sexual reproduction: pollination and fertilization. Pollination is the process in which pollen is transferred from the **anthers of a stamen** (the male part of a flower) to the **stigma of a pistil** (the female part of a flower). Pollen is a carrier for the plant's sperm nuclei, but simply transferring pollen to the stigma only sets the stage. Fertilization takes place when a sperm nucleus from the pollen grain fuses with an egg nucleus in the ovary to produce an embryo. Some plants can self-pollinate, meaning that pollen



The honey bee is Nebraska's most recognized pollinator, but is only one of many pollinator species experiencing declines around the world.



Maintaining plant diversity is important for wildlife habitat and agricultural production. Insect pollination is key to sustaining that diversity.



A bee harvests nectar from the many florets of a false sunflower.

from the same plant (even the same flower) can fertilize that plant's ovary. However, the majority of species require cross-pollination, or the transfer of pollen from another plant, in order for fertilization to happen. Once a plant is fertilized, it begins to produce seeds.

For millions of years, plants managed to survive and reproduce just fine without animals by using wind to move pollen, seed and spores around the landscape. However, the major reason that flowering plants replaced ferns and conifers as the dominant plants across the world 100 million years ago is that those flowering plants were able to form associations with animal pollinators and

seed dispersers. Using animals to move pollen and seed allowed those flowering plants (including most of the plants we're familiar with today) to move farther and more dependably across the landscape than those that depended upon the wind. That increased mobility led to more genetic diversity because plants could more easily cross with plants from genetically-distinct populations rather than only with nearby plants that were genetically similar to themselves. This improved genetic diversity, in turn, allowed those plants to more quickly adapt when the environment around them changed, and to survive and reproduce in greater numbers.

However, while animal pollination has become the strategy of choice for the majority of modern plants, there are costs associated with it that wind-pollinated plants escape. For example, to attract animals, plants have to invest energy in producing large colorful flowers and/or an abundance of sweet nectar. Some plants take things even further by creating elaborate flower shapes that are only accessible to a few pollinator species. For example, flowers in which nectar is

stored at the bottom of long, tubular structures can only be harvested by pollinators such as hummingbirds that have tongues long enough to reach the nectar. Because there is abundant nectar, and less competition, those hummingbirds are likely to bypass other plant species and go directly from one flower to the next of the same species – helping to ensure that the plant's pollen is not wasted on a different species. However, investing in attractants and elaborate flower structures means that less energy is available for growth and seed production. Wind-pollinated species can reserve their energy for those other processes, but have to live with less control over their pollen dispersal.

Today, both wind and animal pollination remain popular strategies in the plant kingdom. Common plant species in Nebraska that are wind pollinated include all grasses and grass-like plants, coniferous trees and a number of broad-leaved plants, including sage and ragweed. These plants are all recognizable by their lack of showy flowers, and often maligned by people whose pollen allergies make them acutely

Importance of Diverse Native Plants

Besides providing consistent and accessible food sources for pollinators, the use of native plants, particularly in diverse mixtures, can provide a number of benefits to both backyard gardens and larger habitat projects. These include:

- 1. Low Water Use** – Because native plants are adapted to Nebraska's climate, they don't typically require as much water as many other horticultural varieties do.
- 2. No Risk of Becoming Invasive** – Although some native plants can be aggressive competitors, especially in small garden settings, the fact that they are already native to Nebraska ensures that they will not turn into invasive species and become a problem in the surrounding landscape. A number of Nebraska's worst invasive species were originally brought in from far away as horticultural or agronomic plants.
- 3. Resistance to Other Invasives** – Recent studies are showing that a diverse mixture of native plants can be one of the strongest defenses against invasive plants. Increasing the number of native species, particularly in large habitat plantings, can be a wise investment in the future battle against invasive species.
- 4. Better Wildlife Habitat** – Diverse plant species create diverse habitat structure, which is important for a range of wildlife species, including insects, reptiles and amphibians, grassland nesting birds and game species. Because each plant species has a unique architecture, adding more species increases the types of habitat structure available. In addition, plant species diversity adds to the abundance and variety of food available for wildlife.
- 5. Overall Resilience** – A diverse plant community is able to withstand a range of conditions and threats, including periods of very dry or very wet weather, and pest outbreaks. The more plant species in a community, the greater number of species that will be able to respond positively to make up for other species that are being hampered by weather conditions or pests.





Milkweeds are one of many groups of plants that are particularly dependent on insect pollination.

How You Can Help Pollinators



1. Add Native Plants to Your Property

- Provide blooming plants throughout the growing season so that there are always flowers available (multiple species at any one time is best). A variety of flower colors and shapes is also important.
- Using native plants ensures that they will be accessible to native pollinators. It also can provide important habitat for the larval stages of species such as butterflies, which often require a particular plant species (or group of species) for feeding.

2. Provide Nesting Habitat for Bees

- Nesting blocks can be created by simply drilling holes of multiple diameters into preservative-free blocks of wood. This can provide habitat for those cavity-nesting bees.

- Leaving dead and downed wood on your property can help provide nesting habitat for bees, along with other wildlife species.
- Maintaining small, undisturbed patches of bare ground, particularly on south-facing slopes where they will be warmed by the sun, can provide important habitat for ground-nesting bees.

3. Be Prudent in Your Use of Pesticides

- Avoid the use of pesticides when possible.
- When applying pesticides, use chemicals that are as selective as possible for the target pest. Avoid broad spectrum pesticides that kill all insects. Use the lowest possible application rate and apply when wind speeds are low to reduce drift.
- Select pesticide formulations that limit risk to pollinators. For example, granular formulations are often less noxious than dust. Microencapsulated formulations can be particularly harmful to bees because they mimic pollen.
- Bee mortality can sometimes be reduced by applying pesticides at night when bees are in nests.

More tips on helping pollinators can be found at the Pollinator Partnership web site (Pollinator.org).

aware of when the wind is assisting with pollen transport. Plant species that are animal pollinated (and that don't cause hay fever) are equally recognizable because of their colorful and often scented flowers. Those species include goldenrods, sunflowers, orchids, asters and most of the well-known wildflowers in Nebraska. Worldwide, there are about 180,000 plant species that are animal pollinated, and about 200,000 species of insects, birds, bats and other animals that assist them.

Nebraska's Pollinators

In Nebraska, the vast majority of animal pollination comes from insects. While bees are widely recognized as the most important, flies may be a close second because of their sheer abundance, diversity and the fact that many look and act much like bees. Some pollinating insects, such as butterflies and moths, carry relatively small amounts of pollen and/or are less likely to move from plant to plant within the same species. Others, like ants and wasps, are not fuzzy enough or otherwise suited to efficiently transport pollen from one flower to the next. Still others, including many beetles, sometimes end up eating parts of the flowers needed for reproduction as they harvest the nectar, obviously reducing



There are more species of flies than any other group of insects in North America, and many of them are important pollinators.

their value as pollinators. All of these insects contribute to pollination, and the loss of any of them would be important, but the overall abundance and efficiency of bees makes them the most critical of all pollinators.

There are two important groups of bees to consider: managed bees and wild bees. Managed bees are those that are at least partially domesticated by humans and are used to increase pollination services to crops that require them and, usually, to produce honey for human consumption. Although there are other kinds of managed bees, including some bumblebee and leaf cutter bee species, the overwhelming bee of choice for human management is the European honey bee (*Apis mellifera*). Honey bees have a long history of at least partial domestication, dating back to ancient Egypt. They were first introduced to North America from Europe in the 1600s. Today, more than 135,000 beekeepers manage 2.4 million colonies of honey bees in the United States, and honey bees are the dominant pollinator in most ecosystems, including those in Nebraska.

Most of North America's wild bee species are solitary, meaning that they tend to nest as individuals instead of in large groups organized around a queen. As opposed to social bees, which are active all season long, most solitary bees are only active as adults for a few weeks or months each year. This means that the species of bees pollinating early season flowers may be dramatically different than those flying in late summer.

The major exceptions to the social structure of wild bees are bumblebees, whose colonies are organized much like those of honey bees. The organization, size and long flight range of bumblebees all make them extremely efficient and important pollinators – second only to honey bees in that regard. Nebraska has 17 species of bumblebees, which can be distinguished from each other by variations in their stripes and other color patterns.



Honey bees are the most common insect pollinator species to have been partially domesticated. They provide both pollination services and honey as products.



A monarch butterfly collects nectar from a tall thistle flower. Unlike noxious weeds such as musk and Canada thistle, the native tall thistle is an important plant for pollinators and other wildlife.

The Decline of Bees

Both managed and wild bees, in addition to other kinds of pollinators, appear to be experiencing population declines across the world. Recent honey bee declines in North America seem to be largely tied to the parasitic varroa mite, which was first seen in the U.S. in 1987. In most cases, the presence of this mite in a hive is fatal to a honey bee colony. Other likely contributors to honey bee declines include diseases, pesticides and the encroachment of Africanized honey bees, an aggressive hybrid between African and European honey bees that attacks hives and is becoming more common in the southeastern United States. Although the number of honey bee colonies in the U.S. is difficult to track, it's estimated that there has been a 28 percent decrease in the number of managed colonies since the 1980s and scientists think the effect on feral bee colonies has been even more severe.

There is less certainty about the causes of native bee declines. It is likely that native bees and other pollinating insects are less abundant today because of habitat loss, fragmentation and a decrease in quality. Other threats include the widespread use of pesticides and both native and introduced disease organisms, but there are few studies that have shown those links definitively. One exception to the uncertainty is that bumblebee declines appear to be strongly linked to recently introduced protozoan parasites that came into the U.S. when commercial bumblebees were imported from Europe for greenhouse pollination.

Many biologists also believe that competition from honey bees has suppressed the number of native bees in most areas of the country, and are waiting to see whether those native bees can rebound in places where honey bee numbers are down. There are several reasons to suspect that honey bees have hurt native bee populations: Honey bee colonies typically number between 10,000 and 30,000 individual worker bees. Those numbers would be enough, on their own, to provide strong competition to native bees, but the long distances they can travel from their nests and their ability to communicate the location of nectar sources to other members of their hive makes them extremely efficient at monopolizing food sources. That efficiency explains why honey bees are both valuable pollinators to humans and ecosystems and a potential threat to native bees. The biggest worry of some biologists is that many ecosystems have had honey bees as their major pollinator for so long that if they suddenly disappear, there will be insufficient numbers of native bees to step in and maintain the same level of pollination.

Saving our Pollinators

To stave off the serious consequences of continued losses of pollinators, the most important thing that can be done is to improve habitat. In particular there is a need to increase the diversity of native flowers used in grassland plantings along roadsides and in habitat restoration projects, as well as in backyard gardens across the country. Using native plants is

Why Pollinator Conservation is Important

Of the roughly 240,000 species of flowering plants in the world, three quarters of them rely on pollination by animals, especially insects. About 35 percent of the world's food supply relies on pollination by bees. Most fruits and many vegetables rely directly on pollination, as well as much of the forage for livestock, including plants such as alfalfa and clover. A study in 2000 estimated the value of honey

bees to food crops in the U.S. at \$14.6 billion. If pollination services continue to decrease, many plant species will face a higher risk of extinction. The most immediately vulnerable are rare plants or plants growing in small scattered populations. Eventually, even common plants would suffer from lower seed production and less genetic diversity, making them less able to adapt to changing conditions or pest outbreaks. If plant species start disappearing, so will the animal species that rely on them. The resulting loss of biological diversity will make ecosystems less resilient. Biological diversity creates redundancy in function so that the loss of one species can be compensated for by other similar species. Eventually, however, as diversity decreases there are no more species to fill those kinds of gaps.

important, for instance, because the more complex flower shapes of many hybrid flowers can actually reduce or eliminate pollination by many insects because the flower structure prevents insects from being able to reach the nectar. Using native plants removes that potential barrier and also has a number of other benefits, including water savings.

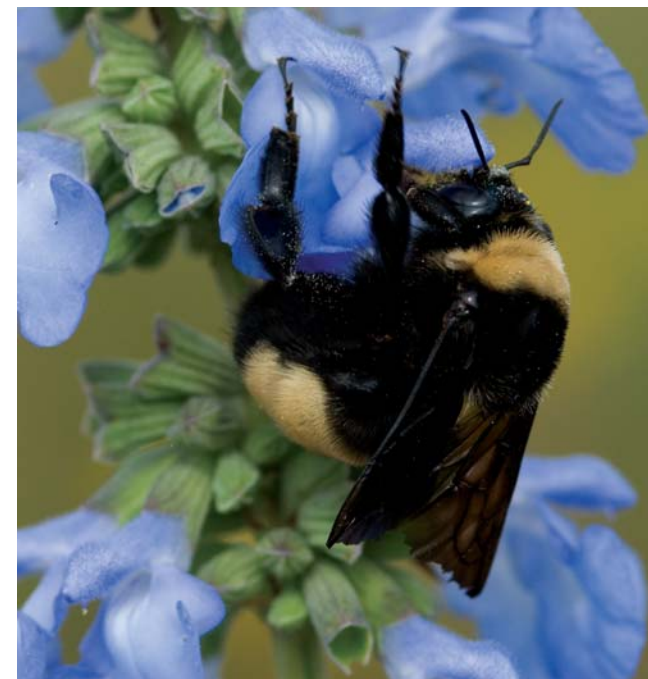
Fortunately, the use of native plants is already on the rise. Awareness of the benefits of native plants is increasing among gardeners, and habitat projects that use diverse native seed mixes are becoming more common, mostly because they also create higher quality wildlife habitat. In addition, the Natural Resources Conservation Service recently announced a new emphasis on pollinator-friendly practices

within the Farm Bill conservation programs they administer, which means that habitat project applications designed to benefit pollinators will receive higher rankings and/or higher payment rates. Among other things, projects that help ensure consistent availability of flowering plants through the season will be favored (See sidebar on page 16 for additional strategies to help pollinators).

To help prevent further losses of honey bees, beekeepers are trying to become more consistent in their treatment of mites within managed hives, although some varroa mites have apparently developed a resistance to miticides. Blocking the continued spread of Africanized honey bees, particularly in southern states, will also be important. Ongoing research may shed more light on other reasons behind recent population declines, as well as additional potential solutions.

The bad news is that pollinators appear to be declining around the world and the causes of those declines are not always clear, although there are some likely culprits, including habitat loss, pesticide use and diseases. There is good news too, though, starting with the fact that a number of pollinators, including many bee species, seem to be able to survive in severely fragmented habitats, including some urban areas. While large scale strategies such as increasing the use of habitat restoration projects that emphasize plant diversity are important, it's also likely that individual landowners, even in town, can help play important roles in pollinator conservation. Consider using more native plants in your landscaping, be conscious of whether or not you have multiple species of flowers blooming at all times throughout the year, and be selective in your use of pesticides. Most importantly, appreciate bees and other pollinators when you see them. They'll pay you back for your consideration. ■

Chris Helzer lives in Aurora and is the Eastern Nebraska Program Director for The Nature Conservancy.



Increasing the abundance of native flowers is a vital strategy in the conservation of insect pollinators.

Sherman Reservoir

Afternoon Options near Loup City

Text and photos by Jeff Kurrus

My introduction to Sherman Reservoir came during a stop, stretch and yawn moment on the way back from a Sandhills fishing trip. On a sunny weekday afternoon, I watched boat after boat leave the boat ramp, disappearing into small slivers of the lake for walleye, crappie and the like.

I even saw a boat or two already done with their fishing trip, returning to the dock after a

successful outing. Blake Covey and two of his friends transferred a net full of keepers from the livewell to a cleaning station. Meanwhile, Matthew Edwards and Daniela Dixson fished from a bench on the lake's east side, probably discussing a bit more than just proper depth and tackle.

Across the lake, Erick Norvell and his family played at their campsite at Sherman Reservoir State Recreation Area (SRA), enjoying a quiet afternoon of hide-and-seek before a fireside dinner near dusk.

While a brief stop for me, it was quite evident that those at Sherman had multiple reasons to stay around the rest of the evening: Camping, fishing, boating – everything a family needed to satisfy their summertime cravings.

And as I started my drive back east, another boat left the ramp for an early evening of walleye fishing, pushing slowly west as we moved in opposite directions, with him winning that day's contest of how best to spend a Nebraska summer evening. ■

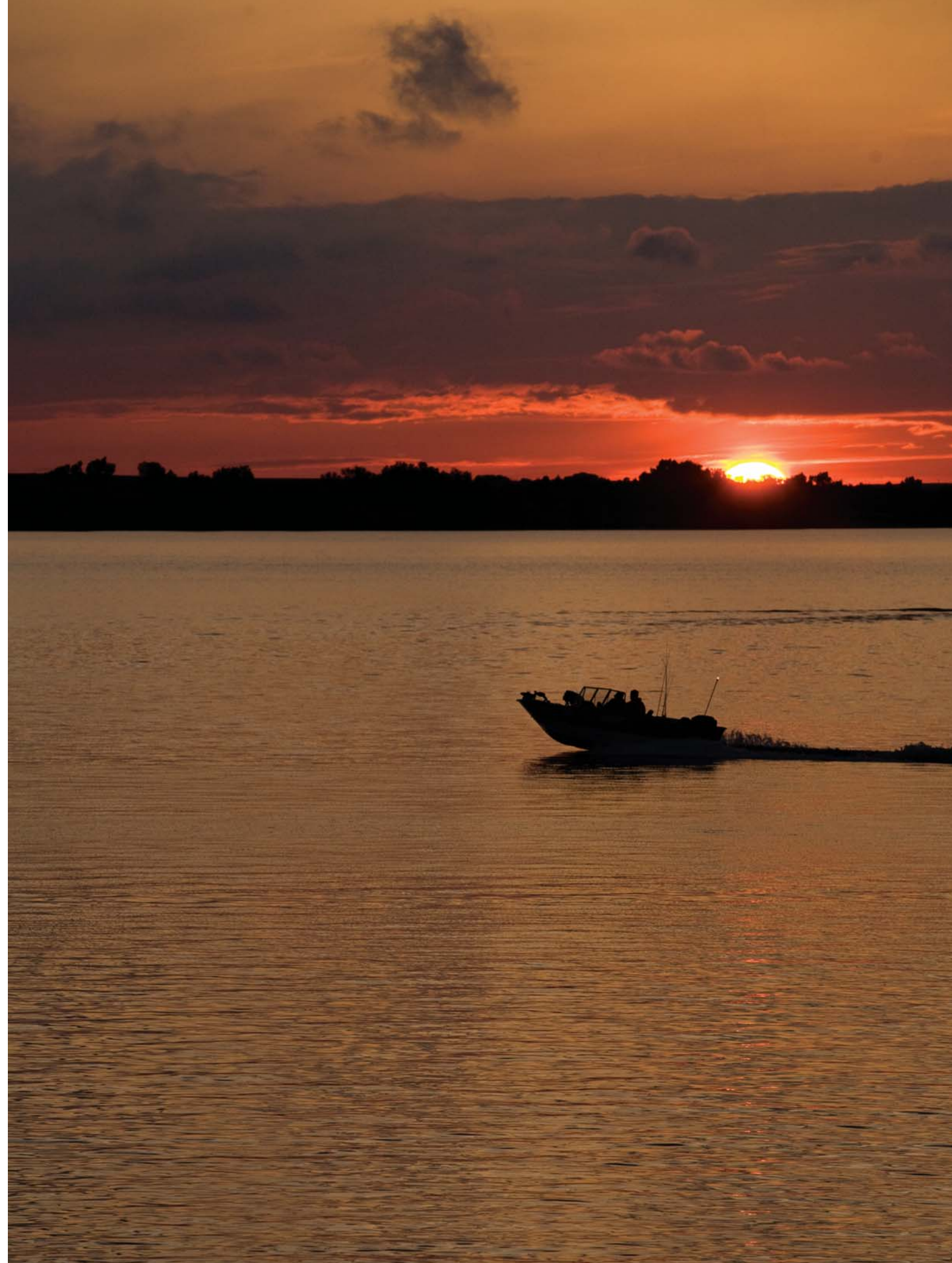


Located five miles northeast of Loup City, Sherman Reservoir SRA offers camping, boating and, of course, fishing. Available species include walleye, crappie, white bass, northern pike and both channel and flathead catfish.



Above: Before finishing the day's work at a cleaning station, Blake Covey shows a net full of fish from Sherman Reservoir.

Opposite: With safety light on, anglers leave a Sherman Reservoir boat ramp to begin an evening of walleye fishing.



Propagating Pallids

Text and photos by Michael Forsberg

Twenty years after being federally listed as endangered, most pallid sturgeon reproduction now occurs under a sophisticated propagation program that helps keep them from becoming extinct while waiting for their habitat to be restored.

I doubt I'll ever forget the December 2006 day when I first walked into the endangered species building at Gavins Point National Fish Hatchery (NFH) near Yankton, South Dakota. The building was dimly lit, damp and cold. I stepped up to the 30-foot-wide, chest-high tank with now-retired Hatchery Manager Herb Bollig and looked over the rim. I counted six, five-foot-long pallid sturgeon in the water below – pale giants swimming

slowly counter-clockwise around the tank, endangered survivors I had read about but never believed I would actually see.

The next morning I entered the tank wearing a dry suit and with camera and snorkel in hand, hoping to capture underwater photographs of these 50- to 60-year-old fish eye to eye. At first they kept their distance, but as time wore on, the curious fish began coming closer, even brushing against me as they gently moved past. In those moments, I didn't know what I expected to see as I peered into the small, copper-colored eyes of a species that hadn't changed since the age of dinosaurs, but what I saw in the half-light of the tank was something I can only describe as an ancient knowing or deep intelligence, much like how I have heard other people describe their experiences looking into the eyes of an old elephant or a whale.

These six fish, collected by biologists two months prior from an unchannelized stretch of the Upper Missouri in eastern Montana and western North Dakota, had been transported 500 miles to overwinter at this U.S. Fish and Wildlife Service hatchery along the Nebraska-South Dakota border. If all went well, these fish would be spawned in June, producing progeny for stocking and future broodstock before being transported back to the wild. And it was the responsibility of a small team of hatchery biologists, led by Bollig, to make it happen.

2010 marks the 20th year since the pallid sturgeon was put on the federally endangered species list. A big river fish, endemic to the Missouri and Lower Mississippi rivers of North America,

Left: Photographed in December 2006, these female pallid sturgeons were two of six breeding age adults captured from the Upper Missouri near the confluence with the Yellowstone River in eastern Montana and then transported to the U.S. Fish and Wildlife Service's Gavins Point National Fish Hatchery in Yankton, South Dakota. At five feet in length, 60-80 pounds and perhaps 60 years old, these mother fish were overwintering at the hatchery with all efforts focused on their hopeful spawn the following June, helping biologists propagate the next generation of pallid sturgeon in order to help recover this endangered species struggling for its survival in the Missouri and Mississippi river systems it calls home.



Above: Pallid sturgeon are primitive fish with no true scales or bones, but rather a cartilaginous skeleton with scutes and five rows of thick cartilage plates running from head to tail, forming a protective armor. Sturgeon are believed to have evolved as many as 70-100 million years ago during the Cretaceous period, when dinosaurs still walked the earth.

this warmwater species was specially designed to roam freely, sometimes hundreds of miles, throughout big, dynamic river systems with pulse flows that spilled turbid waters over large floodplains and had a complex of swift currents and slack waters, like the historic Missouri River used to be.

Although little was known about them at the time, in the 1980s fishery biologists began to realize that the pallid sturgeon was in trouble – the only ones being caught by fishermen or in biologists' nets were old, and there was little to no evidence of spawning activity, reproduction or recruitment into the existing population. It was evident that the string of major dams, reservoirs and channelization projects on the Missouri River in the 20th century had taken its toll on one of the largest freshwater fish species in North America, one whose lineage has survived virtually unchanged for millions of years. Most of its native habitat had either been significantly altered or destroyed, and the natural rhythm of river flows – its heartbeat – had been disrupted, as had the fish's natural cycle of movement to





Above: Herb Bollig, now retired hatchery manager for Gavins Point National Fish Hatchery, stands in front of a chalkboard that provides a timeline of pallid sturgeon broodstock he developed at the hatchery since propagation efforts began in 1992. Bollig began his career as a fisheries biologist in 1969 at a federal fish hatchery three miles from the farm where he grew up in northwest Kansas. He came to the Gavins Point hatchery in 1991 and was the project leader for the pallid sturgeon propagation program until his retirement in June 2007.

and from spawning grounds.

Unfortunately, the pallid's struggle for survival is not unlike that of many other sturgeon species in the world today – all of these large, long-lived and slow to mature sexually fish have suffered greatly in recent years, their habitats and natural life cycles on big, wild rivers either greatly compromised or destroyed entirely by dams and diversions, pollution, overfishing for commercial markets, or a combination of the above.

Pallid sturgeon received protection under the Endangered Species Act on September 6th, 1990. Shortly thereafter, the Pallid Sturgeon Recovery Plan was developed, enlisting assistance from state and federal conservation agencies from Montana to Louisiana, including the Nebraska Game and Parks Commission.

The plan called for biologists to: gather as much information, as fast as possible, about how these secretive fish

lived their lives and what their specific survival requirements were; develop a captive propagation program using fish caught in the wild to help restore their population; and restore the habitat and natural river flow processes that pallid sturgeon relied on for reproduction.

Restoring habitat, because of history and politics, would take years, maybe decades. Pallid sturgeon, however, didn't have that much time. Thus propagation efforts began immediately, with one clear goal: make sure the species survives by reproducing in hatcheries and stocking them in the wild until pallids can naturally reproduce and create a self-sustaining population again.

Enter Herb Bollig, a veteran fisheries biologist who came to Gavins Point NFH in 1991, became project leader of the propagation program and authored the initial Pallid Sturgeon Propagation/ Genetics Plan.

Bollig said that when they started the recovery process, his group knew very little about pallid sturgeon, including the habitats where the fish lived. Enlisting the help of everyone from local fishermen on the Missouri to Russian scientists who had experience propagating sturgeon in their home country for both conservation and the caviar industry, the team started gathering as much knowledge as they could.

In early propagation work, they used the more common and closely related shovelnose sturgeon as a surrogate species, following the lead of crane biologists that had used sandhill cranes to perfect captive propagation techniques before trying them on the

critically endangered whooping cranes.

Bollig said through trial and error, hard work, previous experience, and common sense, the program progressed. Then in 1995, captive propagation took a big step forward when spawning techniques, such as using hormone injections and catheterization, were developed and perfected.

Using these techniques at the hatchery in 1997, Bollig's group successfully hatched and raised several thousand young sturgeon at Gavins for the first time from two adult females and three males that had been captured in the wild. The adult fish, among several collected from the Upper Missouri River in eastern Montana and western

North Dakota near the confluence of Yellowstone River, were part of the relict population that had survived the dam building era and would become the genetic source for the majority of the fish today.

"I remember when those first fish were brought in," said Bollig. "Many of them were emaciated. They basically were slowly starving to death in the river, just trying to stay alive. There was little energy left for reproduction, even if they had spawning habitat available."

Pallids are predators, and a large part of their diet is small fish. Over the winter hatchery staff started feeding them minnows, chubs, and rainbow trout from the hatchery stock, and those 16- to

Above: Their captivity nearly complete, five-foot-long adult females, captured in the wild the previous fall, cruise in the holding tanks just prior to spawning activities. Filled with a mix of lake water and well water, the tanks' water temperature and quality is carefully monitored by hatchery biologists. After spawning, the huge mother fish will be transported in large holding tanks on flatbed trucks back to their capture site and carefully released back into the wild.

18-pound fish doubled their weight over time and were able to produce eggs and sperm the following June after attaining a much-improved physical and sexual condition. The eggs and sperm from that first year's two females and three males were then crossed in very





Left: Hatchery staff hold an adult male pallid sturgeon in a shallow tub as milt (sperm) is extracted with a large syringe during the aspiration process. Like the female pallids, the males have been injected with a synthetic hormone that helps activate the release of sperm in males and eggs in females prior to the actual fertilization process.

resulting progeny are stocked into the Missouri, typically anywhere from fingerling size up to two years of age. Bollig believes that 90 to 95 percent or more of the genetics of the Upper Missouri River population now exist in the broodstock held at the Gavins Point NFH.

Since efforts began, more than 90,000 hatchery-reared pallid sturgeon have been released into the Missouri in various locations up and down the Nebraska, Iowa and South Dakota borders. In-depth studies of these fish, including tracking studies and habitat restoration efforts, are ongoing. (See “Saving a Living Dinosaur” April 2009 *NEBRASKALAND*)

The first broodstocks raised from the Gavins Point NFH in the 1990s are now reaching sexual maturity, just in the nick of time as the wild population continues to age. “A whole lot of people, time, and effort were put into figuring out this propagation process,” said Bollig. “Geneticists in this field are tough people to please, but they say we did it right.”

One part of the equation has now been met. Now these ancient fish are just waiting for their habitat to be restored. ■



Above: Hatchery biologists search through the refrigerator looking for the individual male genetics they want to cross with a particular female. Each female's eggs may be separated into batches, with every batch fertilized with sperm from a different male.

Right: With bodies perfectly designed for a life of swift currents in big rivers, this one-year-old juvenile pallid sturgeon represent the successful science of propagation and the dedication of the scientists creating another generation of future broodstock at Gavins Point National Fish Hatchery; fish that will one day be spawned and the resulting, tagged progeny released back into selected sites of the Missouri River system along Nebraska's eastern border. The propagation of these endangered fish protects a treasured genetic line of a species that dates back virtually unchanged into our ancient past, and keeps a ray of hope alive for their future if the river's character can one day be restored.



genetically specific, predetermined ways. In 1998, their offspring – 1,885 juvenile pallid sturgeon that were a year old and six to eight inches long – became the first generation of progeny to be released into the river. In addition, a specific number of fish from each cross was kept for future broodstock.

Since 1998, wild captured females and males in good reproductive condition have been spawned every year at the Gavins Point NFH and similar facilities along the Missouri, including Blind Pony State Fish Hatchery in Missouri, which is also capturing and spawning pallid sturgeon from the lower Missouri and Mississippi river systems. The

Right: These post-it note sized, plastic pieces of paper tell which adult male was crossed with which adult female. Like a name tag, this waterproof note has been with the eggs since they were fertilized and will be transferred with them to the jar incubators until the young are hatched in 10-14 days.



Wood Duck Grasslands

Text and photos by Jon Farrar



There is something about grasslands – you are born or raised with an affinity for them or not. Some discover and come to love them late in life, but that is like learning to ride a bicycle in your 40s – it will never be natural. Almost everything “discovered” is too cerebral. Perhaps someone can come to love ancient forests, roiling seashores or towering mountains later in life, as their magnificence is too grand to let you slip away without being awed. Being one with grasslands, though, is like being one with the ocean; not where ocean meets land but where there is no land in sight. The expanses of North American grasslands once were that way – too great to comprehend. Most saw only a sameness, a monotony, a seeming endlessness with nowhere to hide, hence something to be feared. Others saw a subtle beauty and freedom in the vastness. Today, so few expanses of grasslands remain we must settle for remnants here and there, avert our eyes from horizons with utility poles and center pivot irrigation systems, mostly looking down at what is around our feet, but even that can be quite

satisfying, dwelling on details, ignoring the whole. It is how some of us struggle through life.

There is a patch of native prairie southeast of Norfolk on the south side of the Elkhorn River, on a sandy dune no doubt deposited during prolonged drought in the past when unrelenting winter winds pushed sand up from the dry riverbed. The dune is one of the easternmost outliers of the expansive Sandhills region that covers most of north-central Nebraska. Soil surveys tell they are close relatives; both have Valentine and Elsmere soil types named for towns in Cherry County. This little patch of prairie is a microcosm of the greater Sandhills, cloaked with sandy-soil-loving plants – soapweed, prairie spiderwort, blazing star, sand bluestem and sand milkweed. In July it is awash with the yellow of fourpoint evening primrose. And there are animals there only expected in sandy grasslands to the west today – jackrabbits, ornate box turtles, greater prairie chickens and upland sandpipers.

This patch of Sandhills prairie is also a mixing ground, with elements of



PREVIOUS PAGES: IN THE PREDAWN OF A JULY MORNING, FROM A GRASSY RIDGE IT IS POSSIBLE TO IMAGINE THE ELKHORN VALLEY OF OLD. OPPOSITE: A MALE GRASSHOPPER SPARROW SINGS NOT TO WOO FEMALES, BUT TO TELL OTHER MALES TO STAY CLEAR OF HIS TERRITORY. ABOVE: PRAIRIE PIONEER PLANTS FILL THE DEAD BRANCHES OF A CEDAR TREE CUT AND BURNED TO RESTORE THE SANDHILLS PRAIRIE.

eastern tallgrass prairie. At the foot of the sandy ridge is the Elkhorn’s floodplain with shallow wetlands, signatures the river wrote on the valley of where it once had been, now cut off and isolated, wetlands where waterfowl pause during migration. In the wetlands, species with more northern ranges – Blanding’s turtles, marsh marigolds and wild rice – prosper in a land of cornfields. There are little gatherings of

bur oaks – true prairie-edge trees with thick bark able to survive the periodic wildfires that once raged with unpredictable regularity across the mid-continent. And on the river’s edge are cottonwoods and willow groves. This place has a name – Wood Duck Wildlife Management Area (WMA).

The first parcel of land for Wood Duck was purchased in 1966, a little

over 200 acres of riverbottom land with riparian woodlands, patches of cropland and horseshoe-shaped Loes Lake, well known to local hunters and anglers. There have been nine additions to Wood Duck since, some as small as 12 acres. Today, the area encompasses 1,688 acres, and few places in eastern Nebraska can match the natural diversity found on Wood Duck. In cross-section it has the full transition from upland

grasslands to floodplain tallgrass prairie with wetlands, to the river itself. Funding for acquisition of the land came from many sources, including funds derived from the sale of state habitat stamps to hunters, money from excise taxes on sporting equipment, and grants from the Nebraska Environmental Trust. Support from such diverse private conservation groups as Ducks Unlimited, Pheasants

Forever and the Wild Turkey Federation pretty much says Wood Duck is home to a diverse assemblage of plants and wildlife.

During its early years, Wood Duck WMA was floodplain – a great area for fishing, hunting, bird watching, morel mushrooms or just a walk in the woods. The addition of 860 acres of uplands of native grassland in 2001 on the western side of the WMA added a landform component previously absent.

Sandhills soils are fragile soils. Ranchers in the Sandhills proper were quick to learn too many cattle on the land would break the sparse mantle of plants and set the sand in motion. Eastern Sandhills soils have finer quartz particles and more organic matter, better able to withstand overgrazing than soils of Cherry County, but they too have their limits before giving way to the wind. In eastern Nebraska, where heavier and more tolerant soils are most prevalent, cattle have traditionally been put on pastures in the spring and left until fall, year after year, so native warm-season grasses and forbs – the plants best adapted to the region’s climate – were diminished or vanished. But prairie is forgiving of almost anything except cutting by a plow. Seeds of native plants can lay dormant in the soil for decades, or a few plants here and there manage to reproduce every few years and rejuvenate the seed bank waiting underground. And that is, essentially, the story unfolding on the sandy grasslands of Wood Duck.

Bringing a prairie back to what it once was is not yet a precise science, but it is light years beyond where it was 50 years ago. Nebraska Game and Parks Commission land managers are working to do that on Wood Duck’s grasslands. They know it will require decades, but each year there will be gains, a step or two back toward what the prairie once was as native plant species suddenly reappear, or plants that had just been hanging on become more abundant and thrifty. At the core of their management is the idea that prairie plants today prosper in the same

environment in which they evolved. The scale of factors that shaped and maintained grasslands is broad: from the smallest, perhaps an anthill that brings organic soil to the surface; to the massive, such as prolonged drought. Those sorts of environmental forces, though, are beyond the control or use by land managers. However, two natural forces that grasslands evolved with – grazing by herbivores and periodic wildfires – can be simulated.

Because summer-long grazing was traditional in eastern Nebraska, exotic cool-season grasses, such as smooth brome and non-native bluegrass, had the advantage of initiating growth and fruiting early in the spring before cattle were put on the pasture or had been there long, and became the dominant vegetation. Native warm-season grasses, better adapted to the region and its climate in the long term, could not compete. Grassland management to restore native prairie reverses that scenario: Grasslands are burned early, typically in April after nonnative cool-season grasses have put on growth and are vulnerable to fire damage, but before native warm-season grasses have stirred from the earth. Once the burned area has greened, mostly with cool-season grasses that survived the fire, cattle are pastured for 30 to 40 days (depending on rainfall) to further set them back and favor the native species in what range managers call “short-term, high-intensity grazing.” Under this regimen, by the end of summer warm-season plants are luxurious and provide the fuel for a hot fire the next spring. In time, the natives will crowd out most of the exotic forage plants. Autumn prescribed fires will probably be used in the future on Wood Duck to benefit native forbs, as well as random burns that replicate the occurrence of wildfires started by lightning or Native Americans. Prescribed burns and mechanical removal are being used to eliminate invasive trees such as red cedars and Siberian elms.

Some might ask why part of Wood Duck is being managed to restore native grasslands, as a remnant of

Sandhills prairie is probably not the best prescription for producing pheasants or white-tailed deer. There are several answers to that question, one being that the area was purchased with funds not just from hunters but derived from nonhunters as well, such as the financial support of the Nebraska Environmental Trust. Part of the answer is because saving the few bits of native grassland left in eastern Nebraska is the right thing to do, just as setting aside Yellowstone National Park in 1872 was the right thing to do, in the belief that when a country loses its natural identity it is poorer for it.



ABOVE: BLACK-EYED SUSAN AND DAISY FLEABANE ARE EARLY SUCCESSION WILDFLOWERS PRECEDING LONGER-LIVED PRAIRIE PLANTS.

The best answer, though, comes when you walk the prairie. Walk the sandy grasslands of Wood Duck in the predawn of mid-July, when the hillsides are yellow with primrose. Go to the little knobs of sand where the floodplain begins to rise to the uplands, where ancient bur oaks gather, and listen for spring courtship calls of chorus frogs in the wetlands or a bob-o-link singing *bob-o'-link, bob-o'-link, spink, spank, spink* from the dried stalk of last year’s goldenrod. Walk the high ground and find purple coneflower, silky and purple prairie clover, and bush morning glory when they are in flower; or earlier in

the season when the trumpeting flowers of shell-leaf penstemon are new and succulent, when male grasshopper sparrows sing out their lusty little hearts, or upland sandpipers sail so high on set wings they are nearly out of sight and send to earth their penetrating whistle – *whip-whee-ee-you*. Return in September when autumn color is coming to the grasslands.

Come to the little remnant sandhills grassland not just throughout the year, but year after year. Watch it gather itself up and become more and more of what it once was. And if you live so

long, if prairie courses your veins, if you avert your eyes from the horizon in the stillness of the predawn, you might just conjure up what this land once was when, from the hillside where you stand, there was nothing between you and the shallow, sand-laden Elkhorn River but grass broken by twisting sloughs and a fringe of cottonwoods and willows along the shoreline. If you are fortunate, a prairie chicken or two might glide by overhead, flapping and gliding, flapping and gliding. Then you will know why such places are worth whatever it takes to preserve them. ■



Ethanol

and Wildlife – a Bad Mix?

Text and photos by Eric Fowler

In the race toward increased energy independence and reduced greenhouse gas emissions, ethanol has been a major player, perhaps to the detriment of wildlife and the environment.

Ethanol will end this country's dependence on foreign oil. *Ethanol is the reason behind increased food prices.* Clean-burning ethanol will help reduce greenhouse gasses and slow global warming. *The production of ethanol consumes more energy than it produces and contributes to global warming.*

Corn ethanol, it seems, has spun into one big "he said, she said" drama. When one side says something, the other usually disputes it. It is, without a doubt, a political hot potato.

Tim McCoy has been following the subject closely ever since he became the ag program manager with the Nebraska Game and Parks Commission five years ago. The field is evolving so rapidly and is so politically charged that the first question he asks himself when a new study or technology is announced – something that happens almost weekly – is whether it is fact or simply spin.

There is little doubt that ethanol has been a boost for Nebraska's economy, both in the 24 communities where

ethanol plants now operate and statewide for the value it adds to corn, the state's top cash crop. And it has slightly reduced the nation's dependence on foreign oil, one of its primary goals.

But there are doubts related to its environmental benefits. With greater demand for corn, more acres are now being farmed, including 5.5 million acres nationally that had been enrolled in the federal Conservation Reserve Program (CRP). While difficult to measure, studies suggest land conversion may actually increase global warming, and the loss of the wildlife habitat provided by CRP is a concern not only to wildlife enthusiasts and hunters, but also anglers due to the potential for increased runoff from farm fields.

On the other side of the coin, the

next generation of biofuels – liquid fuels derived from plant materials – that will come from grasses, corn stalks, wood and other sources rather than corn and other grain, could actually benefit wildlife. And if ethanol of any type can indeed slow global warming, which could in itself have catastrophic consequences for wildlife, not to mention mankind, it has merit.

It's a complicated story, only a few chapters of which will be touched on in the pages to follow.

More Ethanol, More Corn

Ethanol has been around about as long as the internal combustion engine, but didn't enter the nation's fuel supply in any quantity until gasohol hit the

pumps after the energy crisis of the 1970s. While growth in the corn ethanol industry in the 1980s and 1990s was slow, it was exponential in the past decade thanks to government mandates that called for 15 billion gallons of corn ethanol by 2015 – nine times the production capacity of 2000.

Producing more ethanol meant producing more corn. Ever improving crop yields have covered some of the need. So has shifting production from other crops to corn. But the rising corn demand for ethanol has also led to a rising demand for land and a shift in land use, especially during a recent spike in corn prices. "It kind of created a perfect storm of an intense focus on more land for crops," McCoy said. "You saw an immediate response from

landowners with more acres going into crops, especially corn."

Nationally, farmers are expected to plant 88.8 million acres of corn this year, up two million acres from last year and 10 million from 2006. In Nebraska, a slight increase to 9.2 million acres of corn is expected.

According to a University of Michigan report published this year by the National Wildlife Federation, an estimated 10.69 million additional acres of corn will be needed to meet the mandates for ethanol production.

"Part of the solution is going to come from clearing new land, and there just isn't that much land out there," said Mace Hack, head of The Nature Conservancy in Nebraska.

But the clearing has begun, most



A greater prairie chicken stands on a lek near Hartington where corn and a center pivot replaced CRP grass in 2008. The birds had danced on this hilltop since the late Stuart Heikis enrolled it in CRP in 1986, but did not return in 2009.



The Standard Ethanol plant in Madrid is one of 24 ethanol plants in Nebraska. The plant, which opened in 2007, is capable of producing an estimated 44 million gallons of ethanol annually from 16 million bushels of corn and employs 36 people.



(Above) While they are more often associated with woodlands, white-tailed deer are regular visitors and even residents in CRP fields. (Right) Row-crop production in Nebraska has been increasing throughout much of the past decade, primarily the acres devoted to corn.

visibly in the loss of acres enrolled in CRP, which was created in 1985 to reduce crop surpluses by retiring land, protect soil on highly erodible and marginal cropland, improve water quality and provide wildlife habitat via the perennial grasses that were planted.

CRP enrollment peaked at 36.8 million acres in 2007, a level that may not be seen again. With farm interests chomping at the bit to capitalize on high grain prices and mandates calling for more corn ethanol, Congress was pressed during the creation of the 2008 Federal Farm Bill to lower the CRP cap from 39 to 32 million acres to make room for more corn.

Nationally, 5.8 million acres of CRP, most of it in the Midwest, have already fallen off the books as contracts have expired. Nebraska's enrollment in CRP has dropped from a high of 1.3 million acres in 2007 to 1 million today. Northeastern Nebraska appears to have been the hardest hit to date, losing 47,000 of its 239,000 acres in 2008, and possibly another 28,000 by year's end.

Homeless Wildlife?

Clayton Stalling, regional wildlife biologist in the Commission's Norfolk office, grew up in northeastern Nebraska and has spent the past 42 years working to improve wildlife habitat in the region. He remembers when there were no soybeans or center pivots, and

every farm had small fields of corn, wheat, oats, rye, alfalfa or clover. He also remembers the pheasant heydays of the Soil Bank program, and even hunting birds in weedy cornfields. "My God, we had a lot of pheasants back then," said Stalling.

Then in 1971, Secretary of Agriculture Earl Butz revolutionized agriculture, telling farmers to plant crops "from fencerow to fencerow" and "get big or get out."

"And they did," Stalling said. "They responded and did exactly what they were asked to do. We lost everything. It was really bleak."

CRP returned habitat to the landscape and wildlife responded. But with many of those acres having gone back into production in recent years, "The landscape is starting to look about the way it looked 25 years ago," Stalling said.

When Stalling talks to school kids of the effects of lost habitat, he uses this analogy: What if you burned down half of the houses in a town, but left the churches, grocery stores, movie theaters, gas stations and other businesses? "How many people are going to live there six months from now? Well, about half, because the other half lost their homes," he said.

Wildlife will try to find suitable habitat nearby, but in most cases, that habitat is already occupied by other wildlife and can't support more. "So when you

remove a quarter section of CRP, you've just removed potentially up to 150 pheasants and who knows how many meadowlarks or bobolinks or grasshopper sparrows or whatever you're talking about, and it goes right down to the mice, the coyotes, the badgers ... the whole system out there – they're gone," said Stalling. "They die and they're not replaced because there's no place for them to be."

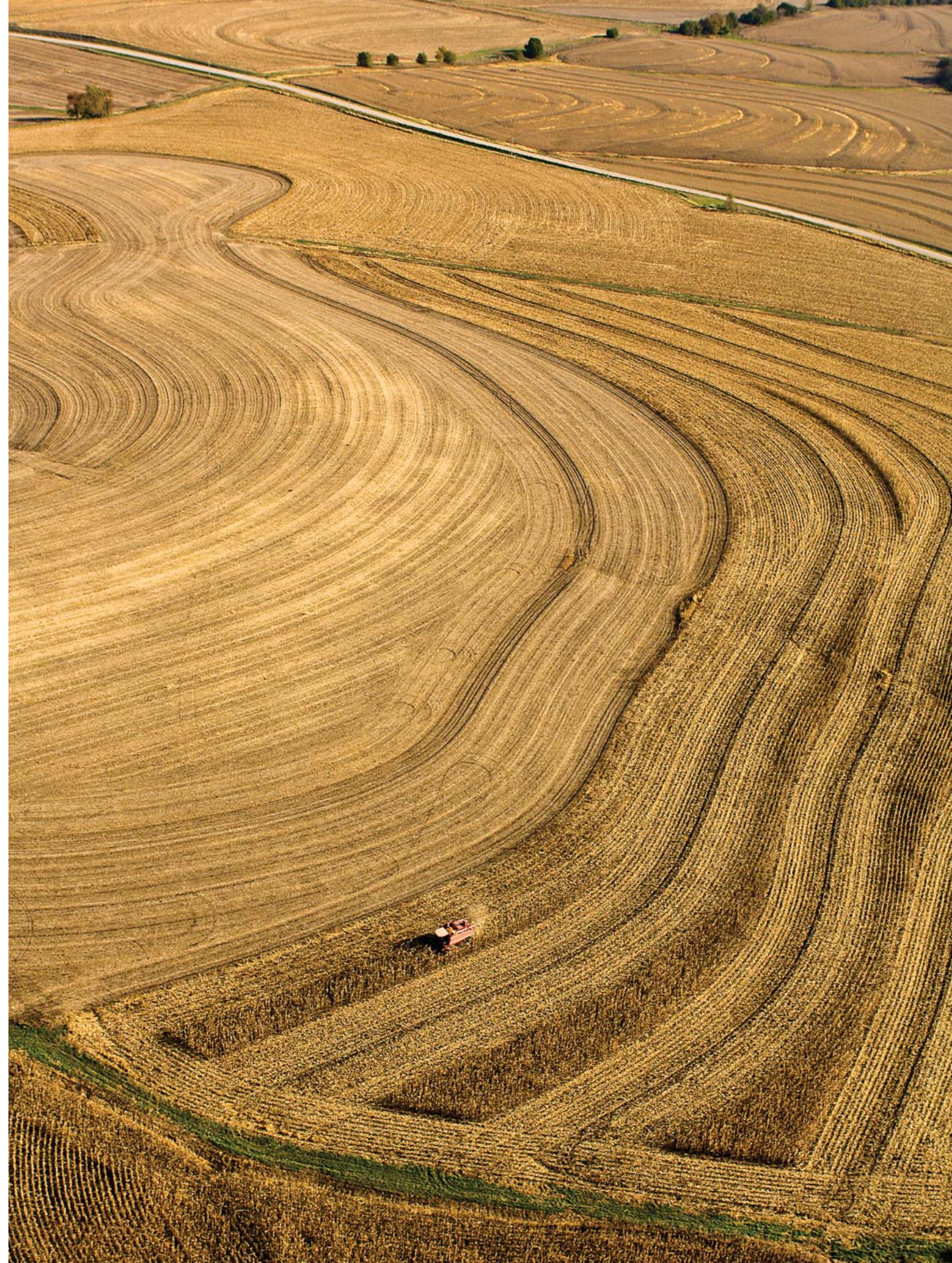
If existing CRP isn't reenrolled or replaced, things could get worse for wildlife. Nationally, between 4.4 and 6.5 million acres will expire each year through 2012. Nebraska could lose another 190,000 acres this year and 540,000 by 2012. Other states in the Pheasant Belt face similar declines, and upland hunters are worried.

Waterfowl hunters have cringed at the loss of 1.8 million acres of CRP in Montana and the Dakotas between 2007 and 2009, much of it in the Prairie Pothole Region where another 3.4 million acres could expire by 2012. "Studies have shown that with CRP in the Prairie Pothole region, an additional two to three million waterfowl are produced each year," said Mark Vrtiska, waterfowl program manager with the Commission. "It doesn't take a mathematical genius to see what happens to duck seasons in the future if we don't have CRP on the ground."

It's not just the total acres of wildlife habitat that are lost that concerns managers, but also the fragmentation of the habitat that remains. Most grassland-nesting birds do better in large blocks of habitat. In the smaller blocks, "predation increases and nesting success tends to tumble," Vrtiska said. "It's a double whammy."

The loss of CRP acres will affect many species. Prairie chicken populations rebounded from historic lows in eastern Nebraska thanks to CRP. Stalling said of the 12 known leks in Dixon County – only one or two of which were present before CRP – all but three are now gone. "I'm guessing those three will probably disappear also," he said. And populations of grassland songbirds, which continued to decline even with CRP, may plummet.

Less CRP also means fewer places to hunt. Enrollment in the CRP-Management Access Program, which pays landowners to improve the habitat



Carbon Debt

The effects of increased corn demand for ethanol will extend beyond the U.S. borders, according to a study published in *Science Magazine* in 2008. Meeting the goal for 15 billion gallons of ethanol would have consumed 43 percent of the acres planted for corn in 2004. It may also require plowing an additional 27 million acres of land worldwide, including 5.4 million in the U.S.

This land conversion could override one of the touted benefits of biofuels, says another 2008 study published in *Science*. Plants absorb more carbon dioxide from the atmosphere than is emitted when they are processed into ethanol and burned in a vehicle instead of gasoline, resulting in a net reduction of greenhouse gasses. Perennial plants, however, stockpile carbon in their roots below ground, a process known as carbon sequestration. When land is cleared to grow crops for biofuels, 17 to 420 times more greenhouse gas is released than the savings provided by burning biofuels produced on the land. This carbon debt varies according to the type of land cleared and the type of crop grown. Scientists estimated that it takes 93 years to repay the carbon debt when native grassland is plowed for crops. Convert rainforest in Brazil to produce soy or palm biodiesel, and the payoff balloons to 319 to 423 years.

The study based its findings on the assumption that biofuel use reduces greenhouse gas emissions by 20 percent when it replaces gasoline. However, a 2009 University of Nebraska – Lincoln study found that today's ethanol plants use much less energy to process corn into ethanol. Combined with credit for co-products like distillers grains and advances in crop production, the study found that corn ethanol emits 51 percent less greenhouse gasses than gasoline throughout its production life cycle.

on their CRP and open it to walk-in hunting, is down 20 percent from its peak of 186,000 acres in 2003-04. More than half of those acres were lost in northeastern Nebraska, which had just 9,500 acres enrolled last year, a 73 percent decline from its peak. A recent survey of hunters found that 32 percent of all pheasants harvested in Nebraska, as well as 25 percent of all quail and 13 percent of grouse, came from CRP-MAP lands. A high percentage of the remaining harvest comes from other CRP acres.

Other Grasslands Being Lost

Increased crop acreages in recent years have, for the most part, mirrored lost CRP acres. But CRP isn't the only source of land feeling pressure to meet the increased corn demand. No state or federal agency tracks land conversion, making numbers hard to come by, but across the country many native grasslands and pastures have been converted to cropland in recent years.

In Nebraska, where 19 million acres are farmed – 38 percent of all land – there have been reports of remnant tallgrass prairie in the east being

converted, center pivots once again pushing into the fringes of the Sandhills, and pastures being plowed that haven't been farmed since before the Soil Bank era.

"Some of that [brome pastures] did not have a lot of wildlife benefit up in this country," Stalling said, "but it was still better for the environment than a poorly managed row crop field."

Fish Like CRP Too

Preventing soil erosion to maintain water quality is one of the defined purposes of CRP. Many former crop fields enrolled in the program were on hillsides with steep slopes. When heavy rains fell, they were prone to wash, sending a deluge of soil-laden water downstream.

Putting these highly erodible lands back into production may affect water quality in streams, rivers, ponds, lakes and even groundwater on a local and national level. Soil washed from fields can fill ponds and large reservoirs, taking up space that could be used by fish. It also clouds the water, making it difficult, if not impossible, for aquatic vegetation to grow. Without that vegetation, which forms the base of the

aquatic food chain and as habitat and nursery areas for fish, the potential productivity of a water body is reduced.

Randy Winter spent 15 years treating the symptoms of these problems in reservoirs to improve fishing as the head of the Commission's Aquatic Habitat Program before retiring in May. He said calculating the effects of increased sediment loading in these reservoirs caused by converting grassland, be it CRP or pasture, to cropland, is as simple as comparing the sediment load rates of cropland and grassland in the watershed, which depending on farming practices, can be considerable. "You can extrapolate that out and figure out how fast a reservoir is aging and how many useful years of recreation life you're carving off of it because of the land use practice," said Winter.

Compounding the problem is the residue from fertilizer used in farming that comes with the soil, which can lead to algal blooms that consume oxygen and, in severe cases, can be fatal to fish. These problems not only can affect farm ponds and reservoirs in Nebraska, but they also trickle all the way down to the Gulf of Mexico, where fertilizer carried by the Mississippi River fuels massive algal blooms. This has resulted in a dead zone, void of fish and other marine life, that has covered an average of 6,000 square miles in the Gulf for the past five years and is affecting the region's multi-billion dollar fishing industry. Experts believe cultivating more land could make it impossible to meet the federal goal of reducing the size of the dead zone by 60 percent by 2015 and instead worsen the problem.

Another water issue in Nebraska can be indirectly tied to ethanol: reduced stream flows caused by groundwater irrigation, and the resulting decline in reservoir levels. A 2009 report by the U.S. Government Accounting Office states that three gallons of water is required to convert corn to one gallon of ethanol, but it takes 320 gallons of water to grow that same amount of corn in the region that includes North and South Dakota, Kansas and Nebraska.

Well-drilling moratoriums in much of the Platte and Republican river basins, where water use had been deemed to be greater than supply, may ensure that



A female bobolink perches near her nest in a CRP field. Grassland bird populations declined with the loss of native grassland and are expected to continue to decline as land comes out of CRP.

increased demand for corn doesn't worsen groundwater problems. But further increases in grain ethanol production may make it difficult to bring water use back in line with 1997 levels as required by an agreement signed by Nebraska, Colorado, Wyoming and the U.S. Fish and Wildlife Service to protect flows in the Platte River, as well as meeting the requirements of a compact with Kansas and Colorado governing Republican River flows.

When Will it End?

So far, the decline in CRP acres has been mandated. Fears that enrollment

could continue its precipitous decline, with some calling for the cap to be lowered further to 24 million acres to make room for even more corn, lessened in February, when the USDA announced plans to open a new CRP general sign-up this year, the first since 2006, and to keep enrollment at the current authorized level.

But those fears did not go away completely, and there is no guarantee that the new sign-up will stem the losses. A recent study estimated that 61 percent of Iowa's two million CRP acres would return to cropland if corn prices were fixed at \$4 per bushel. Prices were slightly below that threshold as of press time. They could fall, but should they



The runoff and erosion that is evident in crop fields does not occur in CRP. At points downstream from fields such as this, the water quality in the streams, ponds and reservoirs they feed is reduced.

climb to \$7 per bushel as they did in 2008 – \$5 higher than 2006, a spike caused by a number of factors, including high oil prices and increased demand for ethanol – all bets are off, McCoy said.

Part of the problem is that for years, CRP payments did not compete with what landowners could make farming the ground themselves or renting it to other farmers.

Until his death last year, Stuart Heikes lived on a hill overlooking a quarter-section of land he had enrolled in CRP in 1986. The Hartington-area farmer said he would’ve liked to keep the land in the program. He appreciated the wildlife that used it and spoke of the white-tailed doe that fawned there in recent springs, pheasants that family hunted and the prairie chickens that danced on a hilltop there each spring for the past 20 years. But when his contract expired in 2007, the decision of what to do with the land came down to dollars and cents. A center pivot was installed and the land planted to corn

the next spring.

“It’s a financial thing,” Heikes said in 2008. “It’s got to compete, but it’s so far out of line. The [cash] rental rates were double what I was getting [for CRP]. Our taxes keep going up, so it gets to the point that regardless of if you want to farm it or not, something has to happen.”

The 2008 Farm Bill did increase the rates for new contracts, making CRP more competitive, but the new rates did not apply to extensions offered to those with expiring contracts, of which there were many – 75 percent of all CRP nationwide was set to expire between 2007 and 2010.

With the new rental rates coming into play for the first time in this year’s CRP enrollment, “things will be more competitive,” McCoy said. “But in certain parts of Nebraska where you have high-value cropland that’s highly productive, there’s a good chance CRP rates aren’t ever going to be able to match cash rental rates for cropland.”

Ethanol or Wildlife?

Corn has been and always will be a vital part of Nebraska’s economy. But wildlife and the environment are also important, and often don’t get the consideration they might deserve. That’s understandable, however, as farmers are in business to make money and, in most cases, corn pays better than wildlife.

In the case of ethanol, however, many are now asking that lawmakers look at the big picture as biofuel development progresses, and take into consideration the effects further mandates could have on fish, wildlife, the environment and even global warming. If those costs are considerable, they say, we should look for better ways to reach the goal of energy independence.

Researchers appear to be on track to a better way, looking at making ethanol from switchgrass and other plants that can also provide wildlife habitat or other environmental benefits. Tune in next month for more on that front. ■

The Rise of Ethanol

Renewable energy is a hot topic these days, with benefits coming on three fronts: insuring energy sources are in place when the finite sources of fossil fuels dwindle; reducing dependence on foreign oil, which currently accounts for more than 60 percent of the United States’ use; and slowing global warming.

With “green” being society’s latest buzzword, the latter may be getting the most play. Burning fossil fuels in our cars, factories and power plants releases carbon dioxide into the earth’s atmosphere, creating a greenhouse effect that traps heat radiating from the planet, causing average temperatures to rise. The reality of global warming is still disputed by many and no one knows for certain what the consequences might be, but with scientists around the world sounding the alarm and pointing to evidence such as shrinking glaciers and polar ice caps and rising ocean temperatures, many governments, including our own, have taken notice and are looking for alternative sources of energy. At the forefront of that push in recent years in the United States has been increased use of biofuels, primarily corn ethanol, to replace gasoline refined from oil.

Ethanol blended with gasoline has been available since the 1970s. Mixtures of 10 percent ethanol and 90 percent gasoline are standard at the pump today, a rate that may soon increase to 15 percent. Some



- Ethanol plants in operation
- Ethanol plants under construction
- Ethanol plants that are idle

There are currently 24 ethanol plants operating in Nebraska with a capacity of 1.8 billion gallons per year according to the Nebraska Ethanol Board.

vehicles are now designed to also run on E85, which contains 85 percent ethanol.

Federal energy and environmental regulations, as well as state and federal subsidies, helped the ethanol industry grow slowly through the 1980s and 1990s. But it wasn’t until 2002, when a Renewable Fuel Standard (RFS) calling for increased ethanol use was first discussed in the U.S. Senate, that ethanol really took off. The RFS was made law in 2005 and expanded in the Energy Independence and Security Act in 2007, which called for biofuels to replace 20 percent of the nation’s transportation fuel by 2022. The first step was production of 15 billion gallons of grain-based ethanol by 2015. To follow was an additional 21 billion gallons of advanced biofuels, including one billion gallons of bio-diesel and 15 billion gallons of cellulosic ethanol, which extracts and refines sugars found in the cell walls of all plants, with the primary focus being on switchgrass, crop residue and wood.

Under the new mandates, grain ethanol expanded from 68 plants with an annual production capacity of 2.7 billion gallons in 2002, to 200 plants with a capacity of 13 billion gallons by the end of 2009. The 11 plants under construction will soon bring capacity to 14.5 billion gallons. Nebraska’s first ethanol plant opened in Hastings in 1985. The state now has 24 plants capable of producing more than 1.8 billion gallons of ethanol, second only to Iowa, with one more under construction.

There have been growing pains, with 11 plants idled nationally, including one in Nebraska, where another plant was scrapped after construction began. Falling oil prices and skyrocketing grain prices had turned the economics of the industry upside down. How much effect ethanol had on increased corn demand and the spike in prices, which topped \$7 per bushel in 2008, \$5 higher than 2006, is often debated.



CRP-MAP signs marked many tilled fields in 2008 that had been grassland the previous fall in northeastern Nebraska, where two-thirds of the land enrolled in the walk-in hunting program has been lost in recent years.



Great Park Pursuit

Explore Nebraska parks and have a chance at a \$1,000 prize.

By Doug Carroll

The Nebraska Game and Parks Commission and the Nebraska Park and Recreation Association share a common goal to promote the use of Nebraska's park and recreational opportunities as a simple, inexpensive and sensible way to stay active and healthy. To that end, these agencies partnered in 2008 to develop the Great Park Pursuit (GPP), sending participating teams out to explore various parks across Nebraska by following clues that will lead them to special posts hidden at each park. The program proved to be so successful, and was received with such enthusiasm, that it has continued to grow and kicked off its third season this spring.

The 2010 program will challenge teams to visit as many of this year's 15 participating parks as possible. Participants will make nature-based impressions from the posts they find, and entry into prize drawings are based on the number of impressions collected. Five winners of a \$1,000 grand prize package will be drawn after the contest ends early next September, and winning teams will be able to select their choice of a camping, kayaking or fishing package.

GPP registration is free – participating teams need only to pay for postage when mailing in the post impressions and entry into some of the park sites. Teams can be made up of only one person, but only one team per household is allowed. While there is no limit to the number of people that can be on a team, the registration form only has room for

the team captain's and 10 team member names.

This year's program will highlight the relationship between physical activity, access to quality open space, and healthy Nebraskans. To promote

selected sites. These posts will be located at further distances in the park, and participants will have the opportunity to select the normal post at each of these three sites, or choose the longer distance bonus posts. Additional prize drawings will be held for teams reaching the bonus posts.

Last year 1,975 people (513 teams) from Nebraska, Iowa, South Dakota and Missouri signed up for the GPP competition. As of June 1, 320 teams had already signed up for this year's contests, with three months of the competition still to go.

"We are killing our record from last year at this point," said Tim Montgomery, who coordinates the program for the Nebraska Game and Parks Commission.

Participating parks this year are: Branched Oak State Recreation Area (SRA), David City Park, Johnson Park in Fremont, Zorinsky Lake in Omaha, Willow Creek SRA, Niobrara State Park (SP), Cowboy Trail near Long Pine, Riverside Park in Scottsbluff, Legion Park in Sidney, Lake Ogallala SRA, Lake Helen Park in Gothenburg, Fort Kearny SRA, Bussell Park in Ord, Streeter Park in Aurora and Rock Creek Station SRA.

To register, visit negpp.org or request a packet and registration form by calling (402) 471-5424 or in writing to Nebraska Game and Parks Commission, ATTN: Tim Montgomery, 2200 N. 33rd Street, P.O. Box 30370, Lincoln, NE 68503. ■

the relationship, posts will be located between a half-mile and 1 mile out on accessible trail systems at park sites. This distance allows participants to achieve 30 minutes of daily physical activity.

A second change this year will be the inclusion of long-distance posts at three



Sunny Hollow Wildlife Management Area

Even though only 160 acres, it is worth exploring.

By Jon Farrar

The best things often come in small packages, like diamond rings and babies, and the same might be said of Sunny Hollow Wildlife Management Area (WMA), located in Nance County south of Genoa. It covers only 160 acres and is managed as a satellite of the complex of larger areas close by – George D. Syas, Don Dworak and Loup Public Power District WMAs – and others not far beyond those. But what you will find on Sunny Hollow is different than what is found on those larger WMAs.

Historically there was a 25-mile-long, elliptical band of low rolling Sandhills topography and soils south of the Loup River, spanning from southwest of Columbus in Platte County to southwest of Genoa in Nance County, probably not wider than five miles anywhere. Associated with it were plants and animals (such as soapweed and Ord's kangaroo rats) characteristic of the greater Sandhills region. In low-lying areas the groundwater rose above the land surface, creating small wetlands. Most of this "little Sandhills" vanished under center-pivot irrigation systems growing corn and potatoes in the 1970s and 1980s. A handful of tracts, though, were too wet too farm and farmers who still pastured cattle needed the grasslands, so a few survived. So it was with the quarter section now called Sunny Hollow.

Warren Schwanebeck, Nebraska Game and Parks Commission land manager for Sunny Hollow and other WMAs in the region, recalled the first half of the 1980s had above average precipitation: "It started raining in the spring of 1981 and it seemed like it never stopped until about 1985."

During those years, the remaining wetlands in the band of Sandhills south of the Loup River were full, producing broods of blue-winged teal and red-winged blackbirds. In the late-1980s, the tract of land that would become Sunny Hollow WMA was purchased by

the Commission using funds generated by the state Habitat Stamp Program.

The land that became Sunny Hollow WMA had been used to graze cattle, hayed some years, never plowed, and had been enrolled in the Water Bank Program (a federal farm program designed to preserve wetlands by enrolling private land in 10-year, renewable conservation agreements) since 1977.

During the drought of the late-1980s the wetlands on Sunny Hollow WMA vanished, but they reappeared with more abundant precipitation in the 1990s. Because of the relatively small size of the area, the wetlands provide only limited wetland habitat even during wet cycles, but they are a rightful component of the complex.

Exotic plants, particularly smooth brome and nonnative bluegrass, had invaded the uplands; but overall it was in good condition. Prescribed fires and grazing have been used to encourage native vegetation and set back invasive plants. A six-row shelterbelt planted in the southwest quarter of the area in 1990 is incrementally being reduced to restore the entire area to its natural state. There were gatherings of



Sunny Hollow Wildlife Management Area is located three miles south, one mile west, and one mile south of Genoa on Nebraska Highway 39. Visitors should be aware reaching the area's parking lot on the east side may not always be possible in a car – during wet periods the minimum maintenance road to the south may be impassable, and the road to the north can be sandy and rutted. Vehicles with enough clearance, though, should be able to reach Sunny Hollow WMA most times of the year

cottonwoods on the northern part of the property and they are being allowed to persist so long as they tolerate the prescribed fires used to maintain the grassland. Similarly, a quarter-acre farm pond on the area when acquired has not been filled or modified, as it holds water even during dry periods.

Throughout the year there is a succession of flowering forbs to be found on Sunny Hollow WMA, and in the spring the grasslands are nesting grounds for native songbirds. While greater prairie chickens occasionally use the area, the principal attraction of Sunny Hollow for hunters is pheasants and mourning doves. ■



In July, this remnant of Sandhills prairie is yellow with fourpoint evening primrose.

PHOTO BY JON FARRAR

Paddlefish by Hook or Bow

Archery and snagging seasons only chance to harvest ancient fish

By Eric Fowler

Only 1,875 Nebraskans get the chance to pursue paddlefish on the Missouri River with bow or snagging tackle each year. For some, it's a passing fancy tried only once or just occasionally. For those who appreciate the firm, white flesh of the fish that has been dubbed "poor-man's lobster," it's a ritual they won't miss, even if they don't draw a permit and are relegated to the duty of full-time boat driver or simply watching from the rocks.

"I've been doing this for many years," Norfolk's Paul Lind said while watching son Brian, the lucky permit recipient in the family, snag fish in the Gavins Point Tailwaters area. "It's fun to come out and watch it."

"We come up every year whether we both draw or not," Rich Walters of Kearney said while bowfishing on the unchannelized river near St. Helena with long-time fishing partner Paul Hagen of O'Neill.

Paddlefishing is only allowed between Gavins Point Dam and the mouth of the Big Sioux River near Sioux City, Iowa. During the snagging season, about half of all anglers fish only in the tailwaters area below the dam, with most fishing from the bank. During the archery season, most bowfishermen patrol the unchannelized river between the St. Helena area and Ponca State Park in boats. Paddlefish congregate in the tailwaters area to feed on plankton being flushed from Lewis and Clark Lake. Downstream, the best places to find paddlefish are the pools below large sandbars.

Snagging

Snagging paddlefish is not complicated. Anglers need only a heavy six- to 10-foot rod and spinning

or baitcasting reel; 30- to 50-pound test monofilament or braided line; a heavy-duty treble hook (2/O typically complies with the maximum gap allowed of one-half inch between barb and shank); a two to four-ounce weight, with the weight used dependent on current and whether fish are on the bottom or

reduce the drag caused by standard sinkers. Like most anglers, the Linds tie the shank of their hook to their line to increase hooking success.

Snagged paddlefish put up a good fight. Some anglers snag and release many fish, extending their fun and hoping to land a fish above the 35 to 45 inch protected slot limit. Others keep the first legal fish they land and head home for a fish fry.

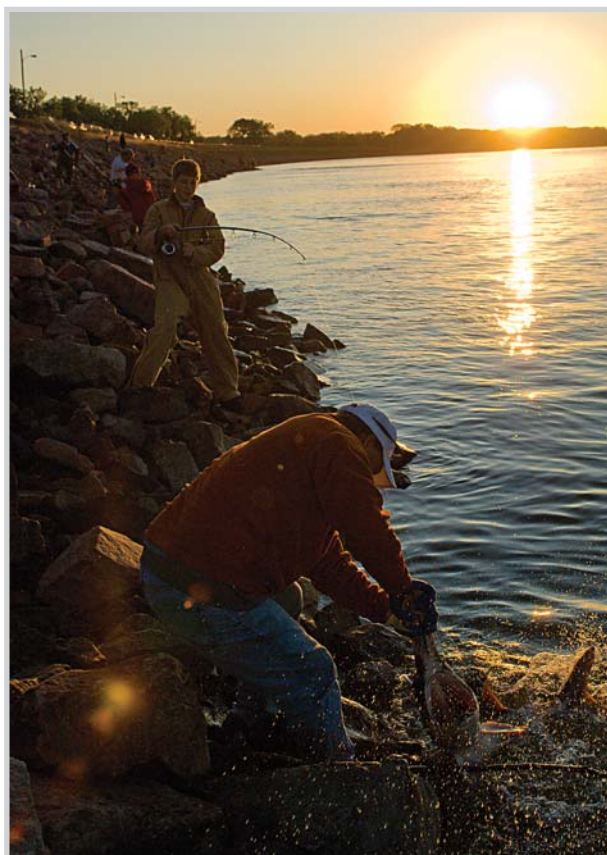
The snagging season isn't what it once was: a race to get your fish before the quota was reached that drew anglers to the tailwaters by the thousands. Anglers still line the banks and dozens of boats cruise the stilling basin, but finding room to fish is no longer a challenge, even on opening day.

Archery

Archers have also refined their techniques through the years. Many build elevated platforms on the fronts of their boats, giving them a better angle of view that allows them cover more water. "You don't see your target very long and you have to snap shoot them," said Walters, noting that bows with draw weights much lighter than those most hunters use while deer hunting are best suited for the sport.

Jeff Shuckman, the Nebraska Game and Parks Commission district fisheries supervisor in Norfolk and a long-time paddlefisherman, said spotting feeding fish near the surface is easier on sunny days with the sun at your back than on cloudy days or at first or last light.

While some bowfishermen troll the tailwaters area searching for fish, most anchor and simply wait for fish to surface within range. In the unchannelized river, however, most power slowly



Jeff Larson of Yankton, S.D., lands a paddlefish for his son, Aaron, while snagging in the Gavins Point Dam tailwaters.

suspended; and the endurance to cast the outfit repeatedly.

"There ain't a lot of skill involved in this," said Pat Ross of O'Neill. "You've just got to have more muscles than brains, I guess. It's real fun for about four hours. After that it starts turning to work."

While snagging paddlefish isn't rocket science, veterans have tricks they deploy. Darren Buettner of Meadow Grove uses long, thin pencil weights to



PHOTOS BY ERIC FOWLER

Rich Walters of Kearney takes a shot at a paddlefish on the Missouri River in 2008.

through holes, where the displacement caused by the boat seems to bring bottom dwelling fish to the surface. While effective, this technique does disturb fish and can chase them out of holes. Because of this, some anglers avoid opening day and fish weekdays or later in the season when they might have

long stretches of river to themselves.

Whether snagging or bowfishing in the unchannelized river, anglers need to use caution and have some experience reading a river so they can avoid sandbars and snags that can damage lower units or even boats. There are few access points and little boat traffic, making

Permit Fees

Resident: \$21
Nonresident: \$41

Snagging

Permits: 1,600
Application Period: July 1-31
Season Dates: Oct. 1-31

Archery

Permits: 275
Application Period: April 1-30
2010 Season Dates: July 10-Aug. 8

getting off the river difficult. Greenhorns may want to get their feet wet in the tailwaters before venturing downriver. Flat-bottom or semi-V hulls aren't as apt to get hung up in shallow water as deep-Vs, but the latter is capable of navigating the river.

Demand for snagging permits is typically double the number available, but a preference point system allows anglers to draw about every other year. Demand isn't as high for archery tags, and some anglers can pick up a second following the initial drawing. ■

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Photo by Brett Hampton

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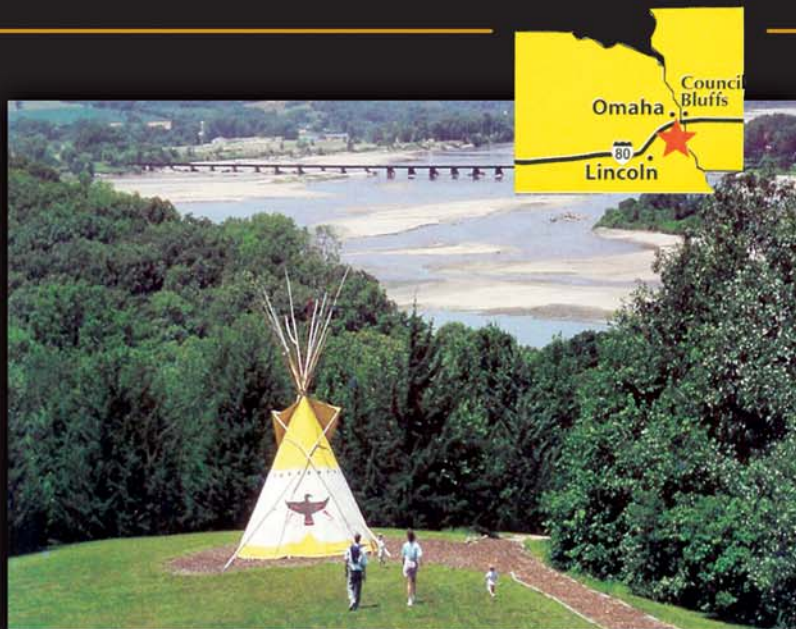


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▲ Take a kid rabbit hunting and he will remember it the rest of his life. I have! This picture was taken in November of 1966 by the late Jim Rush Sr. of Omaha. He was a pretty serious quail hunter, hunting mostly around Tecumseh and Pawnee City. He noticed an abundance of bunnies that fall while hunting quail and thought it would be fun to leave the English pointers at home and take his son, Jim Jr., and me (on left) on a rabbit hunt. He thought rabbits might be an easier target than quail for a couple of 12-year-old kids. It was a great day, as I had success on a cottontail or two with my bolt-action 20-gauge. On the way back to the vehicle I was walking close to Jim Sr. when the pheasant pictured got up between us. He waited as long as he could for me to shoot, but finally figured that I was too startled to shoot and shot it himself – he was right. Good thing we were rabbit, and not quail, hunting. I still enjoy hunting and other outdoor recreation, and Jim Jr. farms and hunts near Tecumseh.

– Jim Gross, Norfolk, Nebraska



▲ This picture was taken November 11, 1917. The birds were taken two miles southwest of Central City on the Platte River. Left to right are Cecil Tooley, Paul Nielsen and Thomas Lach (my uncle) with 36 ducks and geese.

– Robert Davis, Central City, Nebraska



▲ Hay Springs, Nebraska in 1929. From left to right: Ed, Bill and Bob Hollstein (my second cousins), and John Rush (my great-grandfather). The ducks were shot at Walgren Lake five miles southeast of Hay Springs. Thousands of ducks spent a great part of the winter on the lake and kept the water from freezing solid. Ed Hollstein is still alive at about the age of 96 and Bob Hollstein is also living.

– Becky Stiehl McCord, Colorado Springs, Colorado



▲ For us, trapping was a way of living in the winter. Bobcat, beaver, mink – all part of a five-day catch. Pictured left to right: Larry Henne (myself), Fred Henne (my dad) and Freddie Henne (my brother).

– Larry Henne, Ainsworth, Nebraska

Send contributions to: Portraits from the Past, NEBRASKALAND Magazine, P.O. Box 30370, Lincoln, NE 68503-0370. Or e-mail to tim.reigert@nebraska.gov. Photos should show people enjoying Nebraska outdoor activities, such as camping, boating, hunting or fishing, and must have been taken before 1980. We will give priority to unusual photos or activities. When possible, please include a story about the photograph and identify the people, places and approximate date it was taken. Photos will be returned.

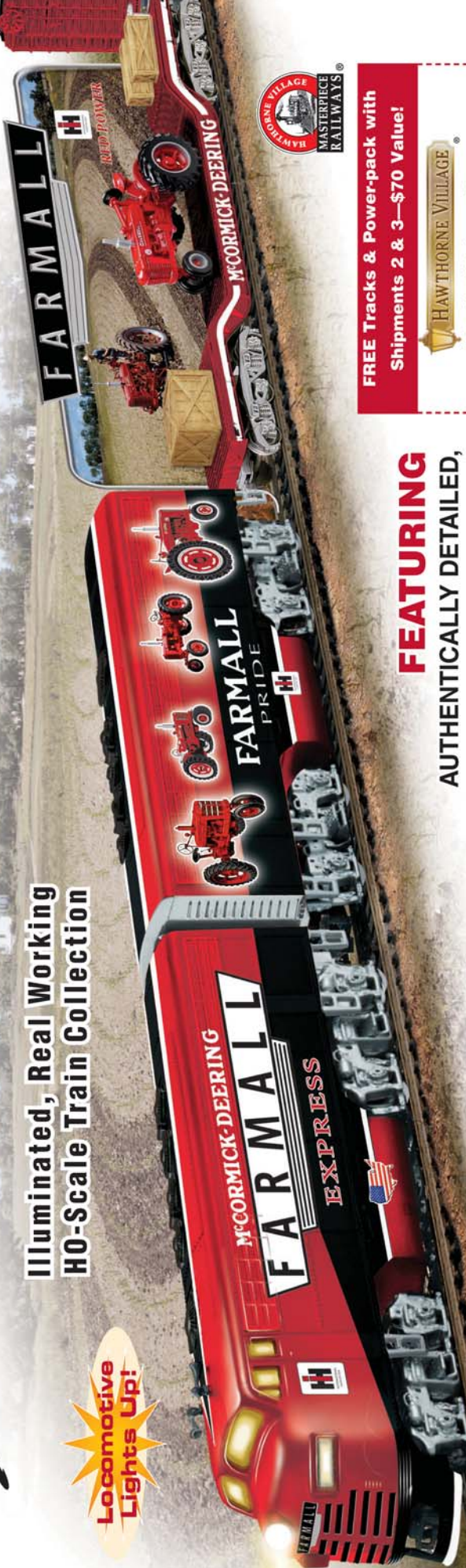
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Farming's one tough job. So for over 50 years, America's farmers relied on one tough tractor...Farmall...Red Power. As their advertising proclaimed, they were "Time Proved for Improved Farming." In tribute to these famous tractors that helped grow America, Hawthorne is proud to bring you the Farmall Delivers Express.

Authentically detailed.
And Built to Last ... like Farmall Tractors!

You'll be amazed at the wealth of authentic details lavished on each train car, including flat cars featuring fully-sculpted and removable Farmall tractors. And you'll delight in the images of these classic tractors that boldly decorate the train cars, recalling half a century of their service as America's small farm tractor. Masterfully crafted with a solid metal chassis and steel alloy wheels, your Farmall Delivers Express will bring you years of enjoyment as you watch its powerful diesel locomotive and cars plow around the tracks.

An exceptional value. An incredible train collection!
Begin your illuminated HO scale train collection with the Diesel Locomotive. You will be billed the first of three easy payments of \$23.33* when it is sent. Soon, you can look forward to adding coordinating Farmall Delivers Express cars—including fully-sculpted vintage Farmall tractors—and the **FREE tracks and power-pack!** They will be billed separately each at the same attractive price and sent about one every other month. You can cancel at any time and our 365-day guarantee assures your satisfaction.

**It's a must-have for classic tractor
& rail fans alike! Act now!**

Strong demand is definitely expected. Orders are limited to one train collection per customer. Send no money now. So don't wait and mail the coupon today.

Fine collectible. Not intended for children under 14.

www.bradfordexchange.com/farmall

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**FREE Tracks & Power-pack with
Shipments 2 & 3—\$70 Value!**



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Limited-time Offer—Please Respond Promptly

Yes! Please enter my order for one Farmall Delivers Express illuminated electric HO-scale train collection, beginning with the "Diesel Locomotive" as described in this announcement. I need SEND NO MONEY NOW.

Signature _____
Mrs. Mr. Ms. _____
Name (PLEASE PRINT CLEARLY) _____
Address _____
City _____ State _____ Zip _____
Apt. No. _____
Email _____

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365-day Unconditional Guarantee**

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*Plus \$9.99 shipping and service. All sales subject to acceptance and product availability. Please allow 4-6 weeks for delivery.