



At 63 feet, Smith Falls is the highest waterfall in Nebraska. Located 18 miles east of Valentine, the falls are part of Smith Falls State Park and are adjacent to the Niobrara National Scenic River. The state park was established by the Nebraska Game and Parks Commission in 1992.
Photo by Eric Fowler.

Published by the
NEBRASKA
— GAME  PARKS —

NebraskalandMagazine.com
OutdoorNebraska.org
See You Out There.

Published by the Nebraska Game and Parks Commission since 1926

NEBRASKAland

August-September 2010

Nebraska City's AppleJack Festival

NebraskalandMagazine.com

\$4.95



INSIDE

The North American Badger
Catfishing the Niobrara • Hunting Spiders • Meanderings
Ethanol - Part II • Hearing Loss • Goldenrod Cure-all



NEBRASKAland

Volume 88, Number 7, August-September 2010

FEATURES

14 AppleJack Festival

With something to offer visitors of all ages, the AppleJack Festival held in Nebraska City the third weekend of every September is just good ol' small town fun.

By PASQUALE MINGARELLI

20 The North American Badger

Known for its fierce disposition, the North American badger is a key component of the grassland food chain.

Text and photos by MICHAEL FORSBERG

24 Cats on the Niobrara

An extensive study of catfish populations in the Niobrara River had some surprising results. Text and photos by JON FARRAR

30 Meanderings

An introspective look at where meanders come from, where they go and where they can take us. By LISA KNOPP

32 How Spiders Hunt

More than you want to know about these creepy but impressive predators. Text and photos by CHRIS HELZER

38 Ethanol - are Next-generation Biofuels the Answer?

While corn-based ethanol helps the state in many ways, it has some negative consequences for wildlife. The next generation of biofuels may bring about a win-win situation.

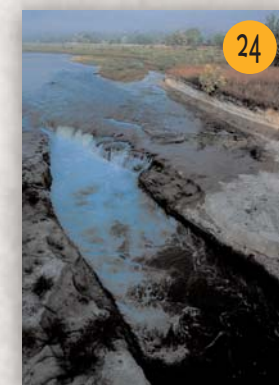
Text and photos by ERIC FOWLER

DEPARTMENTS

Comment	4
Mixed Bag	6
In the Field	44
Parks & Places	45
Outdoor Business	46
Nature Notes	47
Classifieds	48
Portraits from the Past	50

Cover: Held the third weekend of September, this year's Nebraska City Applejack Festival will, as always, be full of apples, people and fun. See story on page 14. Photo by Jeff Kurrus. **Opposite:** With its pink eye indicating its true albinism, an albino squirrel pokes its head out of a hole in a tree. Photo by Gerry Steinauer.

NEBRASKAland (VOL. 88 / NO. 7, ISSN 0028-1964) is published monthly, except for the combined Jan./Feb. and Aug./Sept. issues, by the Nebraska Game and Parks Commission, 2200 N. 33rd St., Lincoln, NE. Periodicals postage paid at Lincoln, Nebraska, and additional mailing offices. POSTMASTER: Send address changes to NEBRASKAland, P.O. Box 30370, Lincoln, NE 68503-0370.





Goose Daycare

Attached is a picture that I think this is rare: A pair of Canada geese with at least 25 goslings. Must be a daycare program. I took the picture at Community Park in Schuyler.

I enjoy your magazine. Father Meister, who was pictured in the July issue, was our pastor, so we enjoyed seeing him feeding turkeys. He hunted waterfowl with us when he was in Schuyler.

Francis Svoboda
Schuyler, Nebraska



A Steady Diet of Worms

I thought you might be interested in the enclosed photo. This is an estimated five pound channel catfish caught in late June on Lewis and Clark Lake by Stan and Joann Eisenbeiss

All of these worms were in the stomach of the fish.

Wes Eisenbeiss
Center, Nebraska

To the Rescue

My buddy, Ken Korte and I were driving on a gravel road east of Chadron this spring trying to locate the remains of the Spotted Tail Indian Agency when Ken, who lives in Chadron, happened to see a yearling deer that had become entangled in a barbed wire fence along the road. We didn't know how long the deer had been there, or even if she was still alive.

She was okay, but was getting pretty weak in her struggle for freedom. With the help of a wrench he had in his pickup, Ken was able to twist the wire and free her foot.

She lay there for a few minutes, got up on her feet and easily jumped over the fence, and then dashed over the nearby hill. That was our good deed for the day!

Dan McGlynn
Omaha, Nebraska



Caught Red-handed

My hired man, Matt Whitson, took this picture with his cell phone. It's not the best, however it is something most people don't get a chance to ever see. We were checking pastures and came across him.

Obviously this rattlesnake was taking cottontail rabbits out of season (poaching) and was attempting to hide the evidence before he got caught. The crime was committed in the panhandle of Gosper County.

Tom Andrews
Holbrook, Nebraska

NEBRASKAland Visitor Letters

This was a tough one. We received many responses (143 total) and a large number had not seen the snout beetle/weevil on page 52 (the outside back cover) of the July 2010 issue.

We want to thank all the readers that sent e-mails and letters (see page 13 for the winner, rules and this issue's hint). Here are just a few of the many wonderful responses we received:

My son, Alex, and I had just given up on finding the July visitor after combing through the magazine when my wife picked it up to have a look. As she held it up, looking at the front cover, Alex spotted the weevil on the N in Nebraska on the back cover (page 52?).

Thanks for giving us this fun little challenge each month. NEBRASKAland is a first-class publication with articles and photography that hold up to any other.

Scott Carson
Omaha, Nebraska

I just looked at the back of the outside cover page with the picture of the pronghorn and the "snout beetle"

just jumped out at me. The beetle is on the letter "N" of Nebraska. Saw it before I opened the magazine.

Lawrence Burman
Rockville, Nebraska

I have been unable to find the visitor in almost every issue to date, but this one jumped out at me from the back page. A small weevil is attempting to take over Nebraska.

Rev. Jonathan Sorensen
Grand Island, Nebraska

I found the insect on the very back page of the magazine for the month of July 2010, its a holly hock weevil, *Apion longirostre* the order *Caleopetra*, family *Curculionidae*.

I had to look for a long time for this one, it was diffucult with all the other photos of insect, Go Huskers!!!
Welcome to the Big Ten

I look forward to the next issue
Ben Horst
Ogden, Iowa

The snout beetle is a true weevil of the family Curculionidae, having the front of the head elongated to form a snout. Weevils can cause destruction to crops feeding on grains and nuts. In some cases, the adult appears in summer and chews a hole through the acorn husk and deposits an egg into the nut. The larva consumes the "meat" inside and matures in the autumn, when it chews an exit-hole through the husk and drops to the soil to pupate.

Special thanks to Jim Kalisch, Department of Entomology, University of Nebraska-Lincoln

*Send your comments to:
Doug Carroll, Editor
NEBRASKAland Magazine
P.O. Box 30370
Lincoln, NE 68503
or e-mail Doug.Carroll@Nebraska.gov
Please include your postal address and telephone number.
Letters may be condensed and edited for clarity. Photographs are welcome and will be returned.*

Under federal and/or state law, discrimination is prohibited on the basis of race, color, religion, age, gender, marital status, national origin, disability or political affiliation. If you think you have been discriminated against in any program, activity or facility by the Nebraska Game and Parks Commission or want more information, contact the Commission in Lincoln, NE, at (402) 471-0641 or the Equal Opportunity Commission, Lincoln, NE, (402) 471-2024, TTY/TDD (402) 471-4693.

NEBRASKAland Magazine

Published by the Nebraska Game and Parks Commission since 1926

COMMISSION

Director Rex Amack
Assistant Directors Roger Kuhn, Kirk Nelson, Sam Sidner

Commissioners
Chairman - Jerrod Burke, Curtis
Vice Chairman - Mick Jensen, Blair
2nd Vice Chairman - Ron Stave, Waterloo
Dr. Mark Pinkerton, Wilber
Dr. Kent Forney, Lincoln
Lynn Berggren, Broken Bow
Rex Fisher, Omaha
Mark Spurgin, Paxton
Norris Marshall, Kearney

CONSERVATION OFFICERS

City	Phone (308)
Gering	763-2940
Gering	631-0663
Gordon	360-0682
Ogallala	289-0755
Ogallala	289-3399
Oshkosh	778-7101
Valentine	(402)389-0444
Harrison	430-0572

SOUTHWEST

City	Phone (308)
N. Platte	535-8025
Brkn. Bow	870-0322
Cambridge	655-0028
Cozad	529-8146
Elwood	746-2418
Imperial	882-0015
McCook	340-2440
N. Platte	530-0016
Rep. City	920-0367

SOUTH-CENTRAL

City	Phone (308)
Kearney	865-5327
Clay Center	(402)762-5022
Doniphan	(402)469-5795
Fullerton	550-0489
Hebron	(402)768-8665
Kearney	440-3847
Milford	(402)947-1363

NORTHEAST

City	Phone (402)
Norfolk	370-3374
Bassett	760-0712
Columbus	910-3366
Fremont	719-1108
Kennard	889-8508
Norfolk	992-7590
O'Neill	340-0787
Neligh	929-0051
West Point	380-6410

SOUTHEAST

City	Phone (402)
Gretna	332-2965
Ashland	521-0159
Auburn	274-8063
Colon	443-6392
Lincoln	890-6465
Lincoln	890-6463
Lincoln	890-7140
Louisville	949-0593
Nebr. City	209-1506
Papillion	616-5961
Waterloo	658-7057

ADMINISTRATION

City	Phone (402)
Lincoln	471-5531
Lincoln	471-5532
Lincoln	471-5591
Ogallala	(308)284-8056

COMMISSION OFFICES

Headquarters
2200 N. 33rd Street Lincoln, NE 68503
Phone (402) 471-0641

District Office I
East Hwy. 2, Box 725 Alliance, NE 69301
Phone (308) 763-2940

District Office II
524 Panzer St., Box 508 Bassett, NE 68714
Phone (402) 684-2921

District Office III
2201 N. 13th St. Norfolk, NE 68701
Phone (402) 370-3374

District Office IV
301 E. State Farm Rd. North Platte, NE 69101
Phone (308) 535-8025

District Office VI
1617 First Ave. Kearney, NE 68847
Phone (308) 865-5310

Omaha Office
1212 Bob Gibson Blvd. Omaha, NE 68108
Phone (402) 595-2144

Ak-Sar-Ben Aquarium
21502 W. Highway 31 Gretna, NE 68028
Phone (402) 332-3901

Nebraska Wildlife Crimestoppers 1-800-742-7627

NEBRASKA
GAME PARKS

www.OutdoorNebraska.org

4 NEBRASKALAND • AUGUST-SEPTEMBER 2010

AUGUST-SEPTEMBER 2010 • NEBRASKALAND 5



PHOTO BY PASQUALE MINGARELLI

Raccoons

Pasquale Mingarelli

Shadowy characters can be seen crossing the streets at night in urban Omaha just south of downtown. The way they walk gives one the idea that they're up to no good. Word is these guys are more common throughout Nebraska than ever before and the last thing you would

want to do is confront one – despite their small size, these masked bandits are especially fierce.

The shadowy characters in question are raccoons. Although native to Nebraska, our modern urban, suburban and country landscapes have provided several ideal habitats for the raccoon population to boom. According to Sam Wilson, Nongame Mammal/Furbearer Program Manager with Nebraska Game and Parks Commission, just 9,774 raccoons were harvested in the 1958/59 season

compared with 170,817 during the 2008/09 season. Wilson said with today's lack of prairie fires, there are far more quality trees in the Nebraskan countryside, providing plenty of den areas. As for the urban raccoons, they den just about anywhere they feel secure – dens can be found in sewers, fireplaces, attics and crawl spaces under buildings.

Wilson also said that in addition to the quality trees, we have provided more quality foods for the raccoons: If you eat it, they will too, plus a whole lot more. In the urban and suburban areas there are many trash cans to scavenge, dumpsters to dive in and gardens to raid. In the country, coons feast on Nebraska's corn.

The biggest causes for raccoon mortality are hunting/trapping, motor vehicles and disease. Although rabies is common in raccoons living east of the Mississippi, it's not much of a problem here. Wilson said canine distemper is a big raccoon killer in Nebraska – when dead raccoons are tested here, it's the disease found most often. Canine distemper has symptoms similar to rabies and can be confused for it. Unlike rabies, it is not considered zoonotic but unvaccinated dogs can get it. So whether you live in the country or the city keep your pooch vaccinated to keep him safe from these nighttime prowlers.

Fetching Open Road

Kristen Friesen

With the dog days of summer breathing heavy down your collar, now is a perfect time to hit Nebraska's glorious open road. Fuel up, saddle up, shine up, rev up and pump up ... just don't forget your parachute. It doesn't matter how you roll, but below are a few suggestions, all perfectly good excuses to visit another piece of this big backyard. And just in case the wind through your hair makes you feel like a puppy again, we've included a nearby campsite at the tail end of each listing. For more information, visit nebraska.stateparks.reserveamerica.com.)

- Show and Shine Car Show: Arapahoe City Park; August 7, (308) 962-7777 – Johnson Lake SRA.
- Sandhills Open Road Challenge: Arnold; August 13-14, (308) 848-2522 – Victoria Springs SRA.
- Nebraska Balloon and Wine Festival: Omaha; August 13-14, (402) 346-8003 – Mahoney State Park.
- Kool-Aid Classic Bicycle Tour: Hastings' Highland Park; August 14, (402) 463-1138 – Mormon Island SRA.
- 27th Annual Vintage & Classic Wheels Car Show: Grand Island; August 15, (308) 384-7106 – Mormon Island SRA.
- 28th Annual Deer Creek Sodbusters Antique Machinery Show: Sterling;

- August 8, (402) 866-2122 – Pawnee SRA.
- Corporate Cycling Challenge: Omaha; August 15, (402) 346-8003 – Mahoney State Park.
- Thunder by the River Truck and Tractor Pull: Wisner; August 20-21, (402) 529-3338 – Willow Creek SRA.
- Heartland MX Series Racing: Sargent; August 22, (308) 215-0564 – Calamus SRA.
- Antique Airplane Association Fly-in: Minden; August 27-29, (308) 832-1181 – Ft. Kearny SRA.
- Defenders of Freedom Air Show: Bellevue; August 28-29, (402) 294-3663 – Louisville SRA.
- Nebraska State Antique Tractor and Horse Plowing Bee: Petersburg; August 28-29, (402) 386-5334 – Willow Creek SRA.
- Labor Day Trail Ride: Crawford; September 6, (308) 665-1580 – Ft. Robinson State Park.
- Old Trusty Antique Engine and Collectors Show: Clay Center; September 11-12, (402) 726-2487 – Mormon Island SRA.
- Old Time Threshing Bee and John Deere Roundup: Pierce; Sept. 17-19, (402) 329-4245 – Willow Creek SRA.

Kool-Aid Days

Kelsea Nore

Hastings, Nebraska will be celebrating its most famous beverage August 14-16th. The 13th Kool-Aid Days festival is annually celebrated on the second weekend of August and includes the world's largest Kool-Aid stand, a live concert and boat races among 30 other events. Last year's attendance was 32,000 (or about 1,921 gallons according to their web site).



PHOTO BY JEFF KURRUS

NEBRASKA Pheasants Forever & Quail Forever GUN-A-WEEK RAFFLE

TICKETS
\$50
EACH



TICKET PROCEEDS WILL GO TO YOUTH EDUCATION PROGRAMS AND HABITAT EQUIPMENT RIGHT HERE IN NEBRASKA. IN YEARS PAST, THIS RAFFLE HAS PROVIDED HUNTING VESTS TO OVER 8,000 BOYS AND GIRLS WHO WERE INTRODUCED TO THE NEBRASKA OUTDOORS THROUGH YOUR CONTINUED SUPPORT.

*Ticket Sales
Begin
July 8th*

AVERAGE
GUN RETAIL
IS OVER
\$900

*Each Ticket you purchase
Enters You into 104 separate
gun drawings lowering
your cost to 48¢ per Drawing*



TO ORDER TICKETS VISIT YOUR LOCAL CHAPTER OR GO TO: WWW.NEBRASKAPF.COM

A Look Back - Autumn 1934

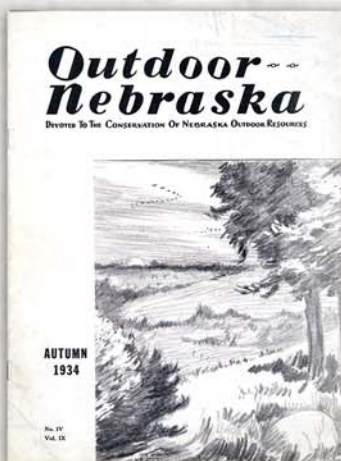
Jeff Kurrus

Fifteen years before publishing *A Sand County Almanac*, Aldo Leopold's work was appearing in *Outdoor Nebraska*, the predecessor to *NEBRASKALAND Magazine*. In his article entitled "The Game Cycle – A Challenge to Science," Leopold, then-Game Manager at the University of Wisconsin, wrote "Between 1933 and 1935 perhaps half a billion grouse, rabbits, and fur-bearers will die or disappear in northern North America from causes still largely mysterious."

This issue also featured "Commission Field Activities," which was a news and notes section regarding the Nebraska outdoors; information on the shortened pheasant season, a game bird hit hard in the state that year due to drought; and a short article about the rabbit bounty in Deuel County: "The number of rabbits has increased so that the bounty plan has been selected to rid the county of the pests," the article read.

However, there was one Nebraska animal that readers were being encouraged not to kill: "In Defense of the Eagle" made a plea to hunters to not shoot our national bird that "stands for Americanism first, last, and all the time." Six years later, the Bald Eagle Protection Act was amended.

To read Leopold's article, go to NebraskalandMagazine.com and click on "A Look Back."



Why Can't I Catch Fish in the Summer?

Daryl Bauer

By this point in the year, there are probably 963,412 excuses made by anglers that swear fish are harder to catch during July and August. One of the most popular excuses is that the fish become lethargic during the heat – it is hot and uncomfortable and they just do not feel like feeding. Baloney.

Fish are not humans; they do not "feel" or respond to their environment the same way we do. They are poikilotherms, which means their body temperature is the same as their environment and, for the most part, that means the metabolism rate of the fish increases as the water temperature increases. As these rates increase, fish feed as much or more during the summer than they

do in any other season of the year. This fact takes us back to the original complaint – why are they so hard to catch this time of year?

Fishing gets tough during the middle of the summer because of the abundance of natural prey that is available. With warm water temperatures, the entire aquatic food chain is operating at maximum capacity and zooplankton, aquatic insects, small fish and a host of other fish food organisms are at their peak abundance during the middle of the summer.

However, there are a few strategies that can be used to increase your chances of catching fish during the summer:

- With an abundance of natural prey, feeding periods may be short, but they can be very intense. Identify prime feeding times and areas. Dawn and dusk, for most species, are usually best.
- With an abundance of prey fish, fish may not recognize other things as potential prey. So "match the hatch," using baits that match the abundant prey in size, shape, behavior and color.
- Having said that, you can also try to make your bait stand out from the crowd. Do this by using baits with a slightly different color, varying your reel speed, or creating erratic movements of your lure as you fish it.

It's a Long Way Down

Jeff Kurrus

During this year's deer seasons, many hunters will climb really high into a deer stand with nothing to keep them from falling and suffering a serious injury. These accidents can be prevented, however, by using one of the many safety harnesses available today. A high quality and surprisingly comfortable fall-restraint system often costs less than \$100 – a small price to be much safer in the stand.



PHOTO BY JEFF KURRUS

Nebraska's Golden Oldies

Kristen Friesen

Some folks just don't know when to quit, least of all Nebraskans – good, hearty stock who'd sooner roll around on a bee hive than retire.

Such was the sentiment around the table at the old Hyannis Hotel back in 1974. As the story goes, Stan and Doris McKillip and a few friends came up with the notion that Hyannis – smack dab in the heart of the Sandhills – would be as good a place as any for the first-ever Old Timers Rodeo ... anywhere.

Not the sort to let grass grow, Hyannis' planners pulled off the first such event the following year. By 1979, the idea had jumped the fence and gone national.

If Hyannis' event was the "Granddaddy of 'em All" (and it was), then the National Senior Pro Rodeo Association – active today in 20 states and several Canadian provinces – is its grandbaby. And with roots in Nebraska, we believe it has a long ride ahead of it.

If you've got some kick and would welcome a chance to qualify for more than the senior discount at your diner of choice, consider these two upcoming Nebraska events:

Nebraska Senior Games in Kearney; August 12-15, (308) 237-4644.

Old Timers Rodeo at the Garfield County Fairgrounds in Burwell; September 4, (308) 346-5638.

News Not From Abroad

Kelsea Nore

A *Los Angeles Times Travel* article – "Hidden Gems: America's 20 Least Visited National Monuments" – lists Nebraska's Agate Fossil Beds as the fifth loneliest monument in the United States. In 2009, 12,694 visitors made their way to the secluded attraction, which is about 25 miles away from the nearest town. In the article author Erin Kinney writes of "trails that lead to the sites where fossils have been found – one leads through the Niobrara River wetlands, the other provides a view of the petrified spiral-shaped burrows of dryland beavers."

Not to be outdone, Alaska takes first (and second) prize for the two least-

visited national monuments – Cape Krusenstern boasted 1,810 visitors last year, while Aniakchak National Monument and Preserve had a grand total of 14 visitors, not including the bears.

If you decide to help Agate Fossil Beds boost its number or are simply looking for a quiet, though fascinating location in Nebraska to visit, check out www.nps.gov/agfo for information and directions.

If You Were Wondering

Elizabeth Mack

This time of year, you may notice some odd, discolored growths protruding from the beaks of white pelicans. This isn't disease related or a deformity – according to Paul Johnsgard, these are just odd growth variations of the horny knob atop the bill that sheds after the breeding season, "much like overgrown fingernails," said Johnsgard.

To read more on white pelicans, see "Sublime Beauty: The American White Pelican" in the April 2010 issue of *NEBRASKALAND*.



PHOTO BY JEFF KURRUS

Visit Springfield Artworks

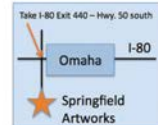
Bold contemporary glass art and wearable fiber art.




- Shop for one-of-a-kind gifts and artwork
- Take a class & make your own fiber art creations
- See artists working in fiber and glass

Phone: 402.301.9162

A working studio and gallery.



Take I-80 Exit 440 – Hwy. 50 south
Omaha I-80
Springfield Artworks

www.springfieldartworks.com
183 Main Street • P.O. Box 158 • Springfield, NE 68059

Take I-80 Exit 440 south – left on Main Street
Just minutes from Omaha metro area

Produced in part by a grant from the Nebraska Division of Travel and Tourism.
877-NEBRASKA • www.VisitNebraska.gov

NEBRASKA
possibilities...endless™



from renowned attractions



to specialty shopping



to world-class recreation

Take your pick.

Look for seasonal festivals, promotions, & lodging packages at www.NebraskaCity.com!

Nebraska City
SYRACUSE
and the communities of OTOE COUNTY

800-514-9113
Photos courtesy Arbor Day Foundation.

Jump-shooting Dove

Jeff Kurrus

In most locales, including across Nebraska, many people limit dove hunting to opening day. It's a sit-on-the-cooler affair at the edge of a cut sunflower field or near the shore of a pond. However, many more birds can be taken after the opening weekend by jump-shooting. Here's how:

The field – Locate a cut wheat, corn, sunflower, or even bean field by asking permission. It's much easier after the opening weekend to gain permission because most dove hunters have moved on by this point.

The crop rows – When working fields, walk across the rows versus down them. Dove see extremely well, and will spot you much easier if you are moving with the rows.

The sun – Always try to walk with the sun on either your left or right side. Behind you, it casts a long shadow in the direction of birds. In front of you the glimmer from your gun's metal may give you away.

The gun – Only load two in the gun.

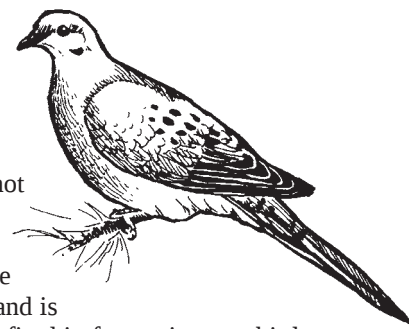
Your third shot is a waste on these hunts, and is usually fired in frustration at a bird at long range.

The first bird – Don't shoot the first bird you see. Dove are known for flying in groups, and rarely will a bird be feeding by itself. If you let the first one flush, there will probably be more on the ground in that same area that will flush and offer you a better shot.

The recovery – Shoot one dove and pick it up. Finding one downed dove in a field is often difficult, much less trying to find more than one.

The clothes – Dove see well, so wearing camouflage will help in your attempts to get close to birds.

Dove season starts September 1 and ends October 30. For more information about dove hunting, go to www.OutdoorNebraska.org.



Join us in Grand Island for the 2010
Nebraska STATE FAIR!
August 27 - September 6

Request a Free Visitor Packet and start planning your trip to Grand Island and the 2010 State Fair! 1-800-658-3178 www.VisitGrandIsland.com

Nebraska State Fair Est. 1868

Grand Island Hall County

A look every sportsman will love...

The Northwoods Legends Leather Jacket

Full-color imagery from wildlife artist Greg Alexander presented on a classic leather jacket

Rugged mid-weight leather jacket in sizes M to XXL

Waist-length with two zippered pockets



Surround yourself with the majesty of nature

When you enter the world of the whitetail deer, you are immediately enveloped in the serenity of their hidden realm. Now you can feel as if you're surrounded by nature every time you slip into the *Northwoods Legends Leather Jacket*, a work of wearable art that demonstrates your love of the outdoors—every time you step outdoors! Slip into the warmth and style of this rugged leather jacket decorated with striking artwork by famed wildlife artist Greg Alexander recreated on the back shoulder panel. The handsome brown leather jacket is styled in a waist-length full cut, with knit cuffs and waistband.

Exceptional value; satisfaction guaranteed

Available in four sizes, the *Northwoods Legends Leather Jacket* is offered by The Bradford Exchange at the affordable price of \$199*, payable in four convenient installments of \$49.75 each, and backed by our 30-day money-back guarantee. To acquire yours, send no money now; just return the Reservation Application today.

www.bradfordexchange.com/deerjacket

Each *Northwoods Legends* jacket is crafted of genuine leather, with the exception of the back shoulder panel, a man-made leather that allows for a higher quality and more durable reproduction of Greg Alexander's artwork.



Greg Alexander's portrait of a ten-point buck is featured on the back of this richly-styled jacket

©2009 BGE 01-06840-001-BIR

RESERVATION APPLICATION

THE BRADFORD EXCHANGE
— APPAREL & ACCESSORIES —

9345 Milwaukee Avenue • Niles, IL 60714-1393

YES. Please reserve the *Northwoods Legends Leather Jacket* for me as described in this announcement. I've circled my size preference below.
Limit: one per order. Please Respond Promptly

M(38-40) L(42-44) XL(46-48) XXL(50-52)

Mrs. Mr. Ms. Name (Please Print Clearly)

Address

City

State

Zip

01-06840-001-E52721

*Plus \$14.99 shipping and service. Please allow 4 to 8 weeks after the first payment for shipment. All sales are subject to product availability and order acceptance.

Officer's Notebook

A Plethora of Permits

"In case I lose one" – that's the excuse I usually hear when someone inadvertently mentions that they have printed extra copies of their deer permits or I find them in the field with multiple copies of the same permit.

With the advent of internet deer permits in Nebraska, it has become simple to print more than one copy of a deer permit on the personal computer. However, Nebraska game laws prohibit the duplication or copying of permits. So, whenever that computer printer spits out the second copy of a permit, a violation of game law has just happened – a misdemeanor violation with a possible penalty of up to five hundred dollars.

Whenever I speak to a hunter education class I take some sample deer permits along to teach the students the correct way of purchasing, carrying, and canceling a deer permit:

Purchase and print ONE original permit (no "extra" copies).

The person whose name appears on the permit should carry it while hunting (not dad, brother or anyone else).

Once the deer is killed, found, and IMMEDIATELY after it is determined to be dead, the permit must be punched or notched in the "tag" section as appropriate for sex of the deer, month and day of the month.

The permit may then be kept with the hunter while in possession of the deer and must be left with the deer if it not in the hunter's possession.

The kids in the classes seem to be able to grasp this information and properly notch their sample permits in a matter of a few minutes.

The reason for the notching the permit is to cancel it so that it cannot be used again. Multiple copies of deer permits are not allowed so that hunters cannot return to the field with an un-cancelled permit after taking a deer home on the first copy. The unfortunate hunter who loses a permit can purchase a legal copy at a Nebraska Game and Parks Commission office or on the website where the original permit was purchased.

One hunter who I contacted in the field had not left permits with his two dead deer (two violations) during the muzzleloader season. He had walked back to his vehicle, gone to town to get some help with dragging and loading the deer, and then returned to a nearby field. He admitted to shooting the two deer which I had found. When I asked to see his deer permits, he turned to his truck and removed a file folder which contained twenty deer permits – a few more than I usually see for one hunter. Closer examination revealed that there were actually four different deer permits in his name with five copies of each (several violations). None of them were punched or notched (two more violations).

When I asked which permits he intended to use on the two deer, he thought that a muzzleloader permit would be good for one deer and either a Season Choice 20 or 21 might work for the second one (possible violation). He didn't know what unit he was in. When I asked why he had so many copies of each permit, he gave the standard response, "In case I lose one," All in one file folder? My response, "Here's your ticket."

– Levi Krause, Conservation Officer, Louisville



Outdoor Message Plates

Mike "Jake" Kroeger does a lot of air-boating on the Platte River near his Schuyler home, continuing a tradition started by his dad, who was among the first to fly down the river when he got an airboat in 1952. A director and president of the Nebraska Airboaters Association, Kroeger spends time fishing the Platte and "just enjoying all its splendor." If you have a unique outdoor message plate you would like to share, e-mail a photo of it to Eric.Fowler@Nebraska.gov, along with your name, home town, and brief description of the interests expressed on it.



The State Tree

Kelsea Nore

The Eastern cottonwood (*populus deltoids*) was chosen as Nebraska's State Tree in 1972. The cottonwood was elected to represent the state due to the tree's hardiness and quick growth on the open prairie. Early settlers planted cottonwoods to serve as markers toward destinations and, in some instances, the young and upper branches of the tree were foraged to feed horses and oxen.

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 JEFF KURRUS

Jakes Day

Jeff Kurrus

Held by the Beatrice chapter of the National Wild Turkey Federation, there will be a JAKES (Juniors Acquiring Knowledge, Ethics and Sportsmanship)



PHOTO BY JEFF KURRUS

Turkey calling is one of the many activities at Jakes Day in Beatrice.

Day held at east of Beatrice on August 21 for youngsters up to the age of 17. Kids will be able to shoot .22-caliber rifles, muzzleloading shot-guns, modern shotguns and air rifles; throw tomahawks; and learn about treestand safety, game calling and a host of other outdoor activities.

This is the 11th year of the event, one that chapter president Jason Moore hopes is the largest ever. "Our first year we had 36 kids, with mostly parents volunteering. Last year, we had 196 kids. This year, people from all over the community are working together to make sure this event is one of the biggest JAKES Day events in the state. Our chapter is just trying to do its small part in exposing youth to the joys of hunting and the outdoors."

Families are encouraged to attend this event, held from 8:30 to 4:30, and adults should bring lawn chairs. Lunch will be provided, and in the occasion of rain, the event will be postponed until August 28.

For any more information on other JAKES Days throughout Nebraska, go to nwtf.org.

Turpin Time

Dick Turpin

Boat ramps and camping pads can really be frustrating on a busy Saturday or Sunday because some people have difficulty backing up a trailer or boat. Let me give those folks some advice: Don't concentrate at the top of the wheel or the edges, concentrate on the bottom of the steering wheel because my guarantee is whichever way you turn that steering wheel from the bottom is the way your boat is going to go. Keep your hand on the bottom of that wheel and that's how you're going to do a better job of backing that trailer in. ■



Don't forget your to get your HIP number by calling 1-877-634-8687 after 8-1-2010

NEBRASKAland Visitor Winner and Hint

Last issue's winner of the NEBRASKAland Visitor drawing was Dixie Wulf of Lincoln, Nebraska who found the **snout beetle (weevil)** on the back cover.

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 3, 5, 13, 21, 32, 33, 34, 35, 36, or 37.

Toadstool Geological Park - Sioux County

AppleJack Festival

By Pasquale Mingarelli



PHOTO BY BILL HAGER



PHOTO BY JEFF KURRUS

ABOVE: KIMMEL ORCHARD SELLS THOUSANDS OF APPLES LIKE THESE EACH YEAR AT NEBRASKA CITY'S APPLEJACK FESTIVAL.
OPPOSITE: BRICK STEPS FLANKED BY BEAUTIFUL GARDENS LEAD THE WAY TO ARBOR LODGE.

One cannot help but enjoy the country ride down U.S. Highway 75 from Omaha to Nebraska City on a beautiful fall day. The drying soybean and cornfields fill the rolling hills with the fall colors of Nebraska while yellow wildflowers highlight the roadside, all contrasted against a bright blue sky. A day like this a perfect time to attend the city's famed AppleJack Festival, held every third weekend in September.

From the moment one walks onto the property of either Arbor Day Farms or Kimmel Orchard, it's easy to see this is just good ol' small town fun. The entire atmosphere is filled with the feeling of family. There are people of all ages, plenty of activities and an abundance of things to eat. In the air is scent of grilled sausage and, of course, apple pie. The gift shop in the Apple House at Arbor Day Farms is one place to find those apple pies and almost everything else apple. Festival goers wishing to sample a bite can stop next door at the Pie Garden to grab some pie and lunch to enjoy out on the patio.



PHOTO BY JEFF KURRUS

ABOVE: AT THE APPLEJACK PARADE, FAMILY AND FRIENDS ARE ENTERTAINED BY A VARIETY OF ATTRACTIONS, INCLUDING BIG MEN IN LITTLE CARS. BELOW: SATURDAY'S APPLEJACK PARADE THROUGH THE HEART OF NEBRASKA CITY IS ONE OF THE FESTIVAL'S MAIN ATTRACTIONS.



PHOTO BY BILL HAGER

ABOVE: LINCOLN NATIVE MUSICIAN CHRIS SAYRE PERFORMS OUTSIDE THE TREE ADVENTURE BUILDING WITH MASCOT CARLY CARDINAL AT ARBOR DAY FARMS. BELOW RIGHT: RIDES AND GAMES ARE AVAILABLE FOR PEOPLE OF ALL AGES.

When the kids start looking for something more than just food, it's time to head over to Arbor Day Farm's Tree House Trail. This well-shaded and wooded trail allows the imaginative young mind to drift off to an adventure deep in a forest. It is only a short distance along the trail before the tree house emerges. At 50 feet tall, it's a towering sight for kids to come upon, and there are fun things for them to do inside, such as trekking to the top or visiting the displays inside to learn more about the natural world. At the base of the tree house outside is a place for face painting, and a walk further down the trail leads to an open area where kids can experience tree climbing and join with dad to see how fast they can saw through a cedar log.

Another festival activity to enjoy at the farm is the Discovery Ride – a trailer hooked up to a farm tractor that travels back into the orchard to a spot where you can pick your own apples. Apple picking can be done at Kimmel Orchard as well, and is part of the fun hayrack ride that takes you into the orchard. Kimmel also has a barrel train, pony rides, rope making and apple doughnuts to munch on. The extremely family friendly Kimmel also has something a little more adult friendly to offer – wine tasting. They have more than 12 different fruit wines to sample including grape, apple, peach and strawberry.



PHOTO BY JEFF KURRUS



PHOTO BY JEFF KURRUS

Outside of the apples and historical displays, there are plenty other events to fill a family weekend, including an antique car show with up to 250 classic cars; go-kart street races, which in the past has had more than 170 participants from five states; a parade with marching bands from across eastern and central Nebraska; and a Miss AppleJack Pageant.

Before leaving town, don't forgot to take a trip back in time at Arbor Lodge State Historical Park. Walks through J. Sterling Morton's home, the carriage house and among the living history displays allows visitors to



PHOTO BY JEFF KURRUS

catch a glimpse of Nebraska life during the mid-19th to early 20th centuries. Volunteers as well as park employees give demonstrations ranging from cider pressing to blacksmithing, and from hoop quilting to sausage making. Alongside those practicing as artisans from the past are artists of today displaying their work at an art and craft show. Visiting Arbor Lodge, especially during the AppleJack Festival, makes for a relaxing way to end a perfect September day or weekend celebrating small town family fun in Nebraska. ■



PHOTO BY PASQUALE MINGARELLI

ABOVE RIGHT: STEPHANIE BOYETT OF BELLEVUE BITES INTO THE FESTIVAL'S BIGGEST ATTRACTION. BELOW LEFT: JASON BARTLING HOLDS UP HIS SON GAVIN TO GRAB JUST THE RIGHT APPLE AT THE U-PICK PORTION OF KIMMEL ORCHARD. ABOVE OPPOSITE: BAYLEE GDOWSKI OF OMAHA CLIMBS A TREE ALONG THE TREE HOUSE TRAIL AT ARBOR DAY FARM. BELOW OPPOSITE: CALE CARLSON AND HIS SON ETHAN OF MARQUETTE CHECK OUT A 1923 FORD OWNED BY DEB PINNEO-MADDOX OF OMAHA AT THE RIVER CITY CLASSIC CAR SHOW.



PHOTO LEFT BY JEFF KURRUS, PHOTO RIGHT BY PASQUALE MINGARELLI



The North American Badger

Text and photos by Michael Forsberg

Known for its fierce disposition, the North American badger is a key component of the grassland food chain and an important controller of rodent populations throughout its range.

“Should one hear a badger call,
And then an ullot cry, Make thy
peace with God, good soul, For
thee shall shortly die.”

This old rhyme, somehow wedged in my mind from my youth, now kept running through my head as I sat on a hillside with adrenaline pumping through my veins. I thought I was going to have a heart attack.

I was on a hike with my eyes fixed to the sky, watching a pair of burrowing owls hovering as they hunted over a shortgrass pasture, when my foot suddenly sank in soft dirt, triggering the most fierce, hissing, snarling sound I had ever heard coming from a hole in the ground where my foot was half planted. I must have leaped five feet in the air before stumbling away over the prairie at top speed until I was half a football field away and in the relative comfort of an uninterested band of grazing cows.

As I looked back, all I could see was dirt shooting up like a small geyser from something digging furiously underground. When the digging

stopped, the black and white banded face of a badger emerged, smeared with dirt, sniffing the air and looking in my direction. Once he caught wind of me he crouched over the hole with his guard hairs up in a steely gaze. When he realized I was no threat, he went back to the chore of digging up his prize, an unlucky ground squirrel that became a noon day meal.

Badgers are members of the weasel family. Their brave nature and fierce disposition are legendary, and their popularity in folklore spans cultures across the globe. They have been made out to be objects of both good fortune and evil, but like all wild creatures, badgers of course are neither good or bad – they are just badgers, trying to live out their lives and stay out of the way of humans.

Of the six badger species in the world, the North American badger (*Taxidea taxus*) has the largest geographic range, extending from southern Canada to central Mexico and from parts of the West Coast to the Great Lakes region. It is a creature of open grasslands and can be found from the high mountain

meadows of the Rockies to the low desert grasslands of southern California and across the prairies of the Great Plains. In Nebraska, they are found statewide.

A full grown badger can measure 27-34 inches long from head to tip of tail, and can weigh 14 to 19 pounds. On average, males are roughly 25 percent larger than females. A badger's coat ranges from gray to yellow brown on top and is mostly buff-colored underneath. Its wedge-shaped head resembles a painted warrior's, with a wash of black

up the middle of its face, two triangular black markings on its cheeks, and a long white stripe from the tip of the nose to its tail. Its feet look like they have been dipped in chocolate.

Badgers live in burrows and dig for their prey, so they are highly efficient digging machines. Built burly and strong, their bodies are slightly flattened, with short, stocky legs. Their front claws are long and recurved to dig deep, while their back claws are short and shovel-like to throw dirt out of the way.

Badgers are primarily carnivores,

with strong jaws and sharp teeth. Their diet consists primarily of smaller rodents. In the Great Plains, they hunt a variety of species of ground squirrels and mice, as well as kangaroo rats, pocket gophers, prairie voles and prairie dogs. They also have been known to consume ground-nesting bird eggs and nestlings, reptiles and amphibians, and even a small amount of plant material. One study showed that two pocket gophers were an adequate meal per day for a badger. An adult prairie dog, roughly five times the

mass of two pocket gophers, is a true feast.

Strong but not swift, badgers rely on their digging skills to catch their prey and can generally dig faster than the prey that's trying to escape. If their intended prey has multiple holes as escape routes, such as the complex burrow systems of the Plains pocket gopher that is common in the Nebraska Sandhills, a badger will sometimes cover up all but one of the holes before it starts digging, forcing its prey to use only one entrance. On rare occasions badgers and coyotes have been observed



In early April, a female badger emerges from her natal den at twilight on a hillside at Audubon's Spring Creek Prairie in Lancaster County.



Badgers may dig several burrows throughout the year, and their burrows can often be distinguished from those made by other animals by their somewhat flat, elliptical shape.

hunting together. A coyote runs fast but is no match as a digger, so once prey is found, a badger will dig up the rodents and a coyote will catch anything that escapes. Apart from the company, I'm not quite sure how a badger benefits from communal hunting with a coyote, but a coyote certainly benefits by hunting with a badger.

Badgers are most active at night, but can also be seen out during the day. They are solitary except during the fall mating season and when a female has a litter of cubs. Litter size ranges from one to five cubs, which are born underground in early spring. The cubs will nurse five to six weeks, mixing in some solid foods, and will come above ground in four to five weeks. After 10-12 weeks, the association between mother and cubs begins to wane. By early fall, the cubs are nearly adult size.

A badger's home range has been measured from anywhere from 600 to 4,000 acres. Biologists consider it a somewhat fluid boundary, depending on quality of habitat, food base and time of year. Males generally have

larger home ranges than females. The boundaries are largest during breeding season, and there can be some overlap between male and female ranges. Transient juveniles weaned from their mother temporarily share ranges with adults until they establish their own territories. During winter, when an adult badger's metabolism slows and it decrease its activity above ground, its range shrinks considerably.

Active badger burrows can be eight inches to a foot in diameter and are elliptical in shape, echoing the flattened body shape of the badger itself. Dens are either dug from scratch or are abandoned burrows of other creatures, such as foxes and coyotes, that the badgers modify to suit their needs. The natal den where the female rears her young is not a simple hole in the ground – it has a main tunnel and a secondary tunnel with different chambers, some which are believed to function as places to allow badgers to get out of the way so they can pass each other underground, bury feces away from the living area, and other

uses not yet known to science. Once the burrows are abandoned, a badger's burrow does not sit idle, rather it becomes a home for a burrowing owl, rotates back to a fox or coyote den, or serves as a refuge /retreat for numerous prairie creatures escaping the elements and harsh climate above ground.

Although small in stature, badgers are high up the ladder in the grassland food chain. As mid-sized predators, they are important controllers of rodent populations. Historically, badger populations declined significantly in certain parts of their range as they were trapped primarily for their hair, which was used on paint brushes, the trim of coats and even rugs. They also declined in population with other grassland specialists such as swift fox, as vast prairie dog towns were poisoned out or effectively eliminated from many areas of the Great Plains and Desert Southwest through agricultural conversion.

Today badger populations are considered stable across much of their range, including Nebraska, but their level of protection varies – some states

protect badger populations year-round, others offer seasonal protection except during designated trapping seasons. In Nebraska badgers are listed in state statute as furbearers and can only be harvested during a specified season.

The badger's biggest challenge is the loss of habitat from continued agricultural conversion, as well as increasing road densities in certain locales due to development, which make them more susceptible to road kills. Badgers are also sometimes still killed as pests because they dig holes, or are inadvertently poisoned by rodent control efforts – the same creatures they prey upon.

Looking forward, the North American badger will keep its rightful place on the prairie as a keen predator protecting nature's balance for generations to come, but only if remaining grassland habitats can be kept intact far into the future. ■

Michael Forsberg is a nature photographer living on the road and eating rhubarb pie. He lives in Lincoln when not in the field with his camera.



Badger Folklore

Many years ago, people believed all sorts of things about badgers. These old sayings and stories (folklore) seem very strange today.

For instance, people used to say that badgers had legs that were shorter on one side than the other. This was supposed to be because badgers often walked on sloping ground on the sides of hills.

Some people thought that badgers could bring bad luck. This rhyme dates from about 200 years ago:

*Should one hear a badger call,
And then an ullot cry,
Make thy peace with God, good soul,
For thou shall shortly die.*

So, according to this bit of folklore, if you hear a badger call, then hear an "Ullot" (an owl) hoot, you are not long for this world.

Another 200-year-old story says that badgers – like black cats – can bring bad luck or good luck. If the badger walks across the path that you have just walked on, you are in for very good luck. However, if the badger walks across the path in front of you, and if it happens to scrape up a bit of earth as it goes, then it is time for you to choose your coffin.

The old rhyme goes like this:

*Should a badger cross the path
Which thou hast taken, then
Good luck is thine, so it be said,
Beyond the luck of men.
But if it cross in front of thee,
Beyond where thou shalt tread,
And if by chance doth turn the mould,
Thou art numbered with the dead.*

Finally, some people believed that badgers could help to protect you against witchcraft. All you needed was some badger hair and a bag made from the skin of a black cat. You also needed to be a bit of a star gazer:

"A tuft of hair gotten from the head of a full-grown Brock is powerful to ward off all manner of witchcraft; these must be worn in a little bag made of cat's skin – a black cat – and tied about the neck when the moon be not more than seven days old, and under that aspect when the planet Jupiter be mid-heaven at midnight."

I found the above stories in "The Badger," written by Ernest Neal in 1948.

*Source – Steve Jackson
www.badgers.org.uk/brocks-world*



Hunting at night, a badger emerges from a prairie dog hole after searching for prey. Badgers are important mid-sized predators in grassland ecosystems, feeding primarily on rodents.

Cats on the Niobrara

Text and photos by Jon Farrar



PHOTO BY KEN BOUC

Channel catfish, above, are the primary game fish found in the Niobrara River. A recent survey shows catfish are abundant upstream as far as the rocky chute, opposite, at the Norden Bridge north of Johnstown.

Ask most Nebraska anglers to name the state's best catfishing rivers and the Niobrara would be far down the list. The Niobrara is better known as a river where recreation means canoes, kayaks and tube floating, and for 30 years or more it has been at the center of controversy – if its flows are best used to grow corn or for recreation. Local anglers, though, have long known that the lower Niobrara was catfish waters.

Nebraska Game and Parks Commission fisheries biologists also knew about the river's catfish – they just didn't have much recent information about them. So from April through September of 2009, biologists sampled channel catfish populations in the Niobrara to determine where and how abundant they were on the river, as well as population demographics such as sizes, year classes and growth rates.

"It had been so many years since there was any sampling work done on the Niobrara," said Jeff Schuckman, Commission fisheries biologist for northeastern Nebraska. "We didn't know the density of the catfish and we didn't have current age and growth information. We just didn't know as much as we should about channel catfish in parts of the Niobrara River. We needed a comprehensive look."

The survey meshed with an ongoing study of Niobrara fish species by the U.S. Fish and Wildlife Service and research being done by the Commission to determine the recreational importance of the Niobrara as part of a possible instream

flow appropriation application in the future.

The study broke the middle and lower Niobrara into three segments, each of which included a barrier preventing catfish from moving upstream: The mouth of the Niobrara upstream to Spencer Dam, a hydroelectric plant near U.S. Highway 281, north of O'Neill; Spencer Dam upstream to the Norden Bridge north of Johnstown, where a natural chute created by the river carving down through rock for several feet prevents catfish movement upriver; and upstream from the Norden Bridge to Cornell Dam, a decommissioned hydroelectric plant just east of Valentine.

Four sampling sites were selected below Spencer Dam, four between Spencer Dam and the Norden Bridge chute, three between the chute and Cornell Dam, and three above Cornell Dam. Baited hoop nets were set at each site once a month from April into September. Channel catfish caught were counted, measured, weighed and a representative sample of spine removed to gather age and growth information.

Catfish of the Lower Niobrara

Anglers and biologists knew there were catfish in the Niobrara downstream from Spencer Dam – each spring catfish leave the Missouri River and move upriver on spawning runs, only to stack up when they encounter Spencer Dam, a favorite fishing spot for decades. Set-line



Nebraska Game and Parks Commission fisheries biologists Zac Brashears (left in both photos) and Andrew Glidden set baited hoop nets in the middle Niobrara River in the summer of 2009 to sample catfish populations. Each fish was weighed, measured and part of the spine was removed from some to gather age and growth information before being returned to the river. The survey showed more catfish above Spencer Dam than below, and they were in better condition. Northeastern Nebraska fisheries biologist Jeff Schuckman said he was “impressed with the sport fishing potential above Spencer Dam.”

and pole fishing has long been popular along that entire stretch of river. The fish study showed that catfish increased in abundance from the mouth of the Niobrara upstream and peaked just below Spencer Dam.

“It looks to me, without having done the habitat analysis,” said Schuckman, “that the habitat features for channel catfish are about the same above Spencer Dam as below. Catfish are coming out of the Missouri River. I don’t think there is any question about that, that there is a migratory run up the Niobrara. The Missouri River and Lewis and Clark Lake, though, provide better wintering opportunities than the Niobrara River.”

The study revealed, however, that catfish sampled below Spencer Dam were, on average, not in as good a condition as those above. Schuckman explained that in the past the Nebraska Public Power District (NPPD) had opened the gates at its Spencer hydro plant twice each summer to flush out upstream silt, and there were often fish kills associated with these releases. The apparent explanation was elevated levels of hydrogen sulfide that can be toxic to aquatic life,

even at low levels, if the water is warm. The hydrogen sulfide in this case probably was coming from the bacterial breakdown of organic matter released during the flushing. To remedy the problem, in recent years NPPD has moved its biannual flushes to April and October, when the Niobrara’s water was colder. But there still may be problems for channel catfish below the dam.

“There is a tremendous amount of sediment flushed out of the Niobrara,” Schuckman said. “It changes channels, covers invertebrates – there are some negative environmental effects of the flushing. I do not have thorough documentation to support this yet, but the channel catfish we sampled below Spencer Dam had more parasites, more bacterial infections, and some were skinny to the point of looking emaciated. Something is going on there that is not good for channel catfish, whether it is stress from the spawning run up through that stretch of river, the effects of low invertebrate populations or some other factor. The stretch of the Niobrara below Spencer is not functioning as you would expect a natural river to function. At this point we do not have enough information to say more than that.”

Surprise in the Middle Niobrara

Schuckman and other fisheries biologists were surprised at what they found on the river from Spencer Dam to Norden Bridge – that segment showed higher densities of channel catfish than below Spencer Dam with a good representation of age classes, indicating of a prospering population. To no one’s surprise, the highest densities of channel catfish were just below the rocky chute at the Norden Bridge, as it functions the same as Spencer Dam in stopping upstream migration, hence fish stack up there, particularly during the spring spawning run. And there were other surprises.

“Above Spencer the catfish looked wonderful,” said Schuckman. “They’re fat. They’re sassy. And, they had few parasites or bacterial infections. We have a healthy catfish population. Catfish abundance is higher above Spencer Dam than I anticipated it was going to be, catfishing opportunities exist up there, and some of the locals will say, ‘Yeah, well, we knew that.’ Well, we documented it, taking a comprehensive look at the catfish up and down that system.

“Historically, they used to catch catfish up to Cornell Dam at Valentine,” Schuckman said, “but the Norden chute didn’t use to be an obstacle to upstream movement. As the chute eroded, it’s become very steep and apparently, even during flooding situations, is a natural barrier for channel catfish. But the bottom line was, which surprised us, we have a healthy catfish population above Spencer Dam. And they seem to be finding adequate wintering habitat there.”

Catfish, however, are essentially absent upstream from the Norden Bridge chute and Cornell Dam.

Were There No Barriers

Schuckman knows catfishing opportunities on the Niobrara would be more extensive were it not for the presence of the Spencer and Cornell dams. And catfish could again be found further upstream if a way could be found for migratory catfish to bypass the Norden Bridge chute. Both Cornell

Dam and the chute fall within the boundaries of the Niobrara Scenic River created by Congress in 1991 to protect the natural and historical values of the river from Nebraska Highway 137 north of Newport upstream to Valentine. As Cornell Dam falls within the realm of “historical value” of the river and the Norden chute is a “natural value,” any changes to either will come ponderously slow if at all, although the environment effects of breaching Cornell Dam are currently being studied by the U.S. Fish and Wildlife Service, as it is located on the Fort Niobrara National Wildlife Refuge.

Were there no obstacles on the Niobrara River, how far upstream would catfish move? Schuckman said no one knows how far they would move before the water temperature became too cold for them, the aquatic habitat didn’t meet their needs, or an adequate food source was no longer available. What is known, he said, is that “catfish migrate for many, many miles unless they encounter a barrier.”

The Bottom Line

“I’m impressed with the sport fishing potential above Spencer Dam,” Schuckman said. “There are some good opportunities if people want to wet a line. They will be successful at it. They don’t have to think ‘Well, you can’t go above Spencer.’ It’s not just all about below Spencer Dam.

“And oxbows and backwaters along the Niobrara also warrant attention by anglers and further scientific scrutiny. Oxbows and marshy lakes along the Niobrara River are part of that system, part of the natural river system. There is a whole different fish community in them – green sunfish, crappie, bluegill, largemouth bass, probably some pickerel and maybe some pike. They are productive, have clear water and are vegetated. When people think of river fishing in Nebraska they think of channel catfish, but there is more than just catfish in the Niobrara system.”

The channel catfish study was not designed to determine the volume and timing of flows required to sustain the river’s catfish population, but does provide baseline data. How many cubic feet per second, and when it is needed for people floating the river and for wildlife will be determined by a computer model developed once all the known variables of the river system have been studied.

“Common sense tells you that to maintain the catfish population we currently have, we have to have at least the water we have now,” said Schuckman. “The more the Niobrara River is dewatered, the fewer catfish we will have, and what we do have may very well be lower quality catfish. There is a delicate balance, absolutely. Fish and water go together; and we’ve got to have the quality of habitat and the quantity of water necessary to maintain this population. We are going to look at this system periodically. Within five years we need to get back to the Niobrara River and trap catfish again, and compare what we find then to what we found in our sampling during the summer of 2009.” ■

Randy Bathke (left) and Danny Jackson, both from Sioux City, put a channel catfish on a stringer below Spencer Dam north of O’Neill while David Bathke of Laurel tries his luck in the background.



MEANDERINGS

By Lisa Knopp

The morning after a heavy spring rain, I started my car and drove but a few feet before a drag and a raking sound stopped me. I looked under my car to see a mass of sticks – a sloppy bird’s nest. I removed what I could. When I got an oil change and travel check the next day, the mechanic said that he had “cleaned out lots of sticks and leaves” from the grill and underneath my car. “Were you in a flood?” he asked. An interesting question, since I had gotten my car serviced so I could drive to my hometown on the Mississippi River and help sandbag during the Iowa Flood of 2008.

“Nope. I park it on the street in front of my house. No floods.” Then I remembered that in the heavy rains of the night before, a wide and fast stream of water – a flood of sorts – had rushed down the sloping street in front of my house.

A few weeks later my son told me that his landlord, who lives near me, said our street used to be a creek. So that the creekbed could be paved, the waters were diverted east into Antelope Park and now flow north, into Antelope Creek. Suddenly I could see it: Seven-block-long Jefferson Avenue sweeps down an incline, making three wide and graceful curves. The avenue ends in Antelope Park at Memorial Drive, which makes a broad turn before ending at “A” Street.” I named the creek bed and the water that once flowed there “Phantom Creek,” since I could feel its presence, even though it wasn’t physically there.

Jefferson Avenue is an anomaly in the older part of Lincoln, where the numbered and lettered streets run, for the most part, in straight lines. But Antelope Park near the center of the city and its creeks – Phantom, Antelope and the unnamed tributary of the latter – make a mess of the grid. Jefferson Avenue is also an anomaly in a city where most houses and yards are level with the street: I have the highest yard and house on my block because I am located atop the outer curve of a meander, which is why I climb five steps up a terrace – “the creek bank” –

and another seven steps to my porch, yet I only go down five steps in the house and one outside to be in my back yard. In a heavy rain, the water remembers where to go and flows down the sloping, meandering bed of Phantom Creek, carrying sticks, leaves and food wrappers.

On summer evenings I sit on my porch high above the street and read, write, converse with company, watch my neighbors and wait for the bats that cut sharp turns in the night air. And I think about meanders – where they come from and what they’re good for.

The shortest distance between the top and bottom of an incline is a straight line, yet water rarely flows in such a logical path. When water flows down a slope and encounters an obstacle in the streambed, say a fallen tree, big rock or an irregularity in the substrate, it flows around it. The water runs deep and fast at the outer or concave portion of the bend; it runs slow and shallow at the inner, or convex, portion of the bend. The faster, diverted current collides into the opposite bank, gradually wearing it away and depositing the eroded silt at the convex curve of the next bend, forming a point bar. This meandering pattern repeats again and again as the current crosses at the point of inflection, the straight area between two bends, and bounces off the opposite bank on its way downstream.

But a meander, a pair of loops pointing in opposite directions, also develops in the absence of obstacles. For instance, rainwater meanders down a clean windshield. Nor does the obstacle theory account for the predictable pattern one sees in meandering streams. Theoretically, a stream can wander all over the floodplain in a string of cursive “m’s,” lower case “e’s,” zigzags or a more random form. But it doesn’t. For the most part, it flows in irregular waves, what river expert Luna Leopold called a “sine-generated curve.”

What initiates the turning that results in a meander is a mystery. In “Theories of Stream Meander Causation,”

published in *Earth Sciences Reviews*, geographer Peter P. Sakalowsky says that meandering is “dependent not only on stream flow but also on the rate of stream discharge, sediment load, size and type of sediment, channel roughness, depth, width, velocity of flow and quality of water itself.” Sakalowsky says that the characteristics of helicoidal flow seem to be the best explanation for why meanders develop. Helicoidal flow refers to the corkscrew motion of water as it flows in a channel. It is caused by the tendency of the thalweg (the deepest part of the river) to flow in a straight line, transferring momentum from one bank to the opposite bank and back, creating a sinuous channel in the process. Because this shape minimizes such variables as the angle of deflection of the current, the water-surface slope, and the total work of turning done by the river, it is the shape by which the stream does the least amount of work with a minimum expenditure of energy. Thus the meander is, in Leopold’s words, “the most probable geometry for a river.”

Most meanders have a characteristic scale, proportional to the width of the river. In a June 1966 article in *Scientific American*, Leopold writes that after sampling fifty typical meanders, he found that the average length of a meander is 10 to 14 times the full-bank channel width, with 11 being average and that the distance a river is straight between bends doesn’t exceed 10 times its width at that point. Leopold also found that the ratio between the wavelength of the curve (the distance along the ground between two successive bends in the same direction) and its radius of curvature (the radius of the arc that the bend makes) averages 4.7-to-1; the ratio of the radius of curvature to the width of the stream was 2-to-1. Leopold referred to these proportions as “the nearly geometric regularity of river meanders.”

When I drive, bike or walk down Phantom Creek’s smooth and sweeping shifts of direction, it’s not the width-radius of curvature ratio I’m thinking

of, but that I don’t know what awaits me around the next bend – danger or delight, the marvelous or the mundane – until I get there.

A few blocks east of my house, near the bike and pedestrian paths in Antelope Park, is a creek that flows north for about eight blocks. I say “flows” even though it is dry most of the year. If my son’s landlord is correct, the waters that once flowed in Phantom Creek were diverted there so that my house and others could be built along its banks 80-some years ago. Perhaps the waters were diverted into a creek bed that was already there in the park, or perhaps someone made a channel in what seemed like a good place for a creek. Diversion Creek, as I call it, disappears through an iron gate into a graffiti-filled tunnel beneath Memorial Drive at what might have been Phantom Creek’s widest and lowest point.

While Diversion Creek is dry most of the year, heavy rains cause flash floods. Over the years, the flooding created steep banks and a clogged channel. In 2006 as part of a storm water project, the city of Lincoln corrected the problems with Diversion Creek not by straightening the channel, but by making it meander. J.J. Yost, construction manager for the Lincoln Parks and Recreation Department, told the *Lincoln Journal-Star* that a meandering channel will slow the water flow and reduce erosion; during big floods the channel will convey water without backing up. To further slow erosion, workers gave the creek gently sloping banks, piled big white rocks on some bends, and planted purple-flowered legumes, yellow composites, red clover and other vegetation that doesn’t have to be mowed. For the most part, the southern part of Diversion Creek runs straight and the northern part moves in one tight, human-made loop after another.

We humans have a deep preference for single-thread, meandering streams. In *The Analysis of Beauty* (1753), William Hogarth, a British painter, social critic and philosopher, explained the importance of the serpentine line to our perception of beauty: “The eye hath this sort of enjoyment in winding walks, and serpentine rivers, and all sorts of objects, whose forms . . . are

composed principally of what I call waving and serpentine lines . . . that leads the eye in a wanton kind of chase, and from the pleasure that gives the mind, entitles it to the name of ‘beautiful.’” Hogarth admired the elongated “S,” the line of grace and beauty that he saw in many places, including candle holders, country dancing, curly hair, women’s corsets (a woman’s form could also meander!) and even the worm gears on fireplace controls. Hogarth’s notions of beauty were put into practice by such landscape designers as Capability Brown, who fashioned serpentine forms on the estates of his wealthy clients so that they had the pleasure of expectation and revelation as they strolled along sinuous rills and paths.

The love of the serpentine form in the landscape isn’t limited to 18th century England. Perhaps people of all times have taken pleasure in anticipating what awaits them around the next bend of a winding creek, river, footpath or highway. But Diversion Creek, with its tight, close meanders, fails to evoke the wonder and mystery that I feel when rounding one of the wide and gentle contours of Phantom Creek.

To see the meandering process and pattern writ large, look at a map of Nebraska. At the city of North Platte, the North and South Platte rivers meet. East of that point, a single river begins its southeastern descent, swinging low like a hammock, swayed back or catenary curve as it flows through the Big Bend in south-central Nebraska. The Platte rises in a wide meander known as the North Bend, then it descends again and flows through a small crook of a meander, the South Bend, before rising to meet the Missouri. Dams, reservoirs, and irrigation have restricted the Platte, replacing many with fewer channels and reducing the water volume. But these unnatural acts haven’t straightened the river’s gentle, serpentine turns as it flows down from the Rockies, across the High Plains and toward the center of the continent.

As I sit on my front porch on a summer evening, my thoughts meander. My house and others should have been built where Diversion Creek now flows. Antelope Park should be here, on the banks of this meandering creek, with trails, benches and picnic tables

nearby, with people fishing in the creek or ruminating as they watch the crinkled, light-filled water flow past. Instead of pin oaks, cottonwoods and willows should grow on the creek’s brushy banks.

I imagine the pavement dissolving and water flowing again in Phantom Creek. During spring rains, the creek overflows its banks and I throw out a fishing line from my front porch. The waters draw down and I gather mussel shells. Kingfishers rattle and dive. Muskrats carry reeds in their mouths from this bank to that one. In the evenings, deer come to the creek to drink and raccoons patrol the banks.

I imagine following Phantom Creek northwest to Antelope Creek. I imagine following Antelope Creek west, past outcroppings of Dakota sandstone and north through a new and costly, Armorflex-lined channel to the point near the Nebraska State Fairgrounds where the Antelope enters the Salt Creek. I follow the Salt northeasterly to its confluence with the Platte at Ashland in Saunders County, what Alfred T. Andreas in his 1882 history of Nebraska called the “best watered county in the state.” I follow the Platte east, past wooded bluffs to its confluence with the Missouri River at the appropriately named Plattsmouth. I follow those waters south, as they draw the borders between Nebraska and Iowa, then Nebraska and Missouri, then Kansas and Missouri. The river angles across Missouri, and enters the Mississippi just north of St. Louis. For many millennia, the lower Mississippi meandered. But after decades of channel cutoffs, levees, revetments, and changes in the sediment regime, it’s a more or less straight shot that I follow to the Gulf of Mexico and beyond.

When I imagine the water back into Phantom Creek, its beautiful, graceful, and geometrically regular meanders can take me anywhere. ■

Lisa Knopp is an award-winning American essayist and author of introspective short stories, essays and creative nonfiction. She teaches creative nonfiction at UNO and has been contributing to NEBRASKALAND since 1992.



How Spiders Hunt

More than you probably want to know about these creepy but impressive predators

Text and photos by Chris Helzer

It's no accident that a spider scared Miss Muffet off her tuffet. With the possible exception of snakes, no creatures in Nebraska are more likely than spiders to send people into irrational, arm-flailing, high-jumping, screaming fits. You could make an argument for mice, but I would counter that it's usually the surprise of seeing them skitter across a room that gets people. Spiders don't need the element of surprise to be creepy – they just are. Simply by putting big pictures of spiders in this magazine, I've probably run off 20 percent of *NEBRASKAland*'s readers this month. Can you believe they're paying me for this?

The scary truth is that there are about 34,000 species of spiders in the world. But while at least 200-300 species can be found in Nebraska, only two of them are really a threat to people: the brown recluse and the black widow. The bites of both species can cause serious injury, but are rarely fatal if treated.

However, while the vast majority of spiders are harmless to people, they are very significant predators of insects and other small creatures. They're also impressive, even beautiful creatures, if you can get past the initial, visceral response many of us have when we see them (They're also less beautiful after they've been stepped on). The importance of spiders to Nebraska's ecosystems is difficult to gauge because we don't

really know much about their abundance, let alone how much they eat, but anyone who has seen their vast numbers of webs on dew-covered grass or tried to walk through woodlands without a stick to knock webs out of the way knows we have a lot of spiders. It's not hard to imagine the kind of impact spiders have on our environment.

How Spiders Hunt

Spiders are built for killing. First, most spiders have eight eyes (some spiders have six and a few species have fewer or none) to find and track their prey. All spider eyes are simple eyes, as opposed to the compound eyes that insects have. They usually have two main eyes, surrounded by secondary eyes. These secondary eyes help them catch the movement of prey within a broad field of vision, while the main eyes focus on the prey as it moves closer.

Besides their eyes, spiders have other sensory abilities. One is that their bodies are covered with hairs, and those hairs are attached to nerves, making them incredibly sensitive to vibrations. Some of these hairs are sensitive enough to pick up sound waves. In many cases, a spider can "hear" even small prey walking or flying nearby. In addition to these sensitive hairs, spiders also have what are called slit

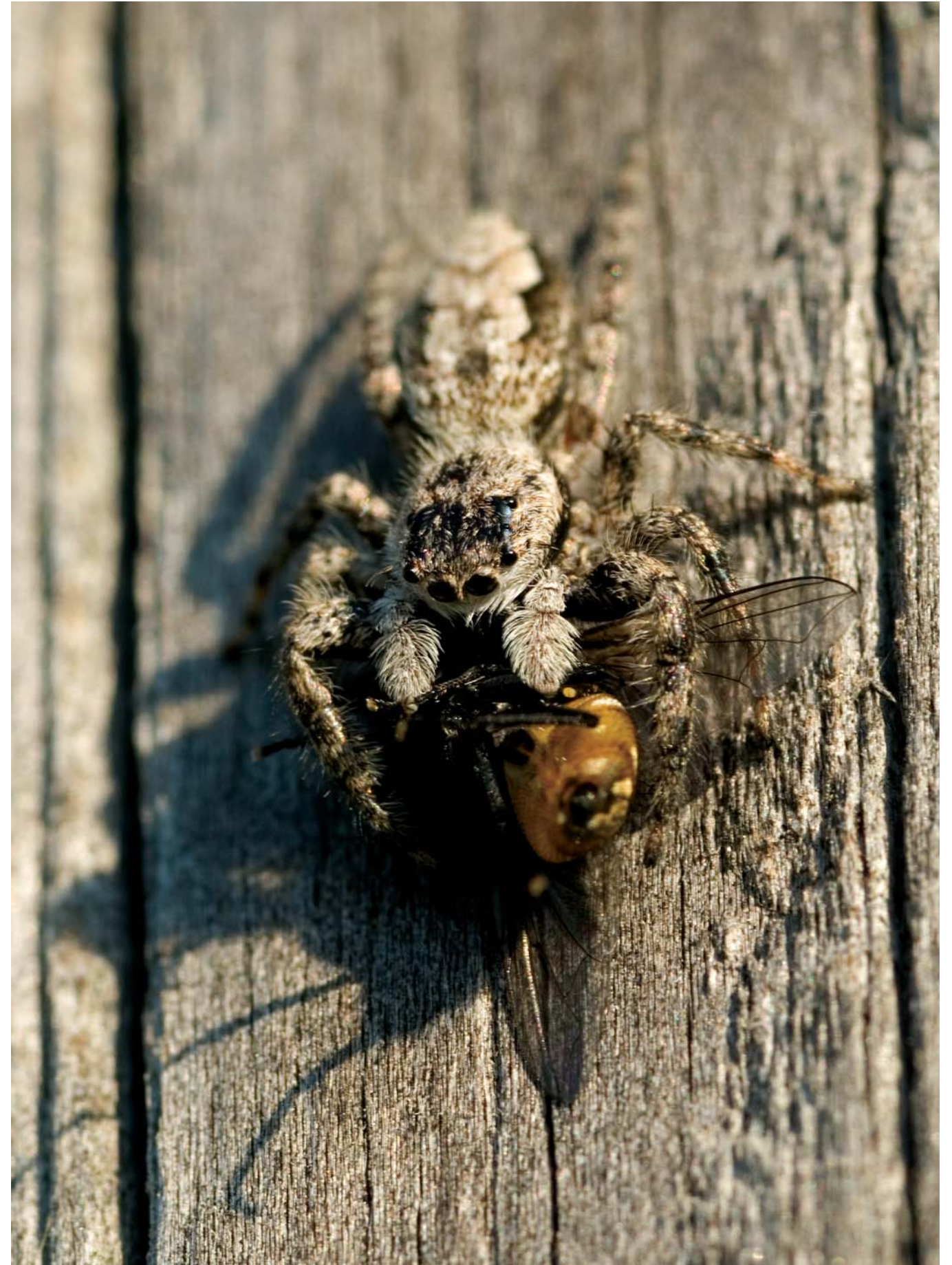
sense organs on their legs and elsewhere on their bodies that are probably used for "smelling." Finally, spiders have small appendages called palps (or pedipalps), that usually resemble small legs located beneath their eyes. These are actually sensory organs that function somewhat like the antennae of many insects. There are hollow hairs on the palps through which spiders can "taste" their prey or other things.

Spiders, of course, have eight legs, which they use to run, jump and climb, but also to catch and hold prey. In many species, only the front set or two of legs are typically used to grasp prey, but in some cases all eight are needed to hold onto particularly large and powerful creatures. In addition to the sensory hairs mentioned earlier, spiders also have fuzzy feet, which help them walk on vertical surfaces and upside down – even on very slippery surfaces.

All spiders have the ability to make silk threads, including wandering spiders. Webs that snare prey



Above: A long-jawed orb weaver dangles from grass in the early morning light near Wood River. Opposite: A jumping spider feeds on a fly it captured on a fence post along the Platte River west of Grand Island.



are one obvious use of that silk, but there are many others. Jumping spiders use silk as a safety line when jumping, some spiders use silk to pin their prey to the ground before biting it, spherical egg cases are woven from silk, and silk is commonly employed in the construction of various types of safe shelters for spiders to retreat into. Spider silk is surely one of the natural wonders of the world, with a tenacity only slightly less than nylon but with twice its elasticity. Its ability to stretch until broken surpasses that of bone, tendon or cellulose, and it is half as strong as the best steel humans can make.

Finally, the jaws (chelicerae) of spiders include hollow fangs, through which a potent venom is injected into their victim upon biting them. That venom contains enzymes that dissolves the inside of the prey, allowing spiders to then suck that liquid out through the bite holes. The fangs of jumping spiders are some of the easiest to see because they are often brightly colored.

While spiders employ a wide variety of hunting strategies, some with webs and some without, most spiders follow a fairly consistent set of steps when they capture and kill prey. Typically, the prey is first grabbed with the spider's front legs and held while the spider bites the prey and injects it with venom. Once the prey is immobilized by the venom, the spider typically lets go with its legs and uses its chelicerae to continue grasping the prey. It then proceeds to feed.

Some spiders, including jumping spiders, crab spiders and wolf spiders, do most of their hunting during the day, but the majority of spiders are more active at night. There are several reasons for this, including the fact that many of their prey species are also nocturnal. Another likely reason for spiders to be active at night is that birds and reptiles, common predators of spiders, do most of their hunting during the day. Finally, spiders can avoid desiccation in the dry sun by hiding in the shade during the day and coming out to hunt in the darkness.

What Spiders Eat

Spiders can be voracious eaters. Many species can eat up to 12 percent of their own body weight in a day – the equivalent of a 150-pound person eating an 18-pound steak. However, a large meal can last a spider several days and their slow metabolism allows spiders to go very long periods, even months, without food. Spiders consume only about one-fifth as much oxygen at rest as cold-blooded vertebrates, and about one-hundredth as much as warm-blooded animals. In other words, spiders can afford to be very patient. Since the vast majority of spiders are ambush hunters, that's a

good trait to have.

The two most common prey for spiders are flies and springtails (*Collembola*). The latter are very abundant, but tiny, insects that live and feed in leaf litter, and they are especially important sources of food for small spiders. For larger spiders, beetles, grasshoppers, and butterflies are also common prey, but nearly any insect is a possible target. However, there are some insects that have developed defenses against spiders, including stink bugs, ants, wasps, some beetles, moths and caterpillars. These species either have chemical defenses, or simply a bad taste, that make them less attractive prey.



Daniel Helzer shows off his new friend. Jumping spiders are fun to observe and play with, and pose no danger to people.

Hunting Strategies

Spiders can be generally categorized into one of two groups relative to their hunting strategies – wandering spiders or web spiders. Wandering spiders are those species that do not use webs for hunting and are therefore free to wander the world in search of food. Although many wandering spiders can move very quickly in pursuit of prey and have better eyesight than web spiders, the majority of wandering species are ambush predators. In Nebraska, the three most common groups of wandering spiders are jumping spiders, wolf spiders, and crab spiders.

Web spiders rely on silken structures to help them catch their prey. A great variety of web-weaving spiders and web designs can be found in Nebraska, but three of the most common and recognizable types are orb weavers, funnel-web spiders and sheet-web spiders. All three use their webs to snare prey, after which they run to the prey and subdue it with a venomous bite. Because they rely on their webs to catch their prey, web spiders tend to have small eyes and poor eyesight, relying on their ability to sense vibration much more than their vision.

Regardless of strategy, spiders are important predators in Nebraska. Their abundance and diversity make them valuable parts of the ecosystems they live in, but I think they're worthy of respect for other reasons as well. Anyone who has watched a jumping spider pounce on a fly or a garden spider dash out and wrap up a startled grasshopper can't help but be impressed. Spiders eat many of the same creatures we find to be pests, so even if you don't appreciate the aesthetic or athletic values that spiders have, they can still be helpful.

But only if you don't step on them. ■

Following are six examples of spiders and their hunting strategies.

Jumping Spiders

Perhaps the most charismatic of spiders is the jumping spider. Its very large eyes set it apart from other spider species, most of which have very small eyes and poor eyesight. Its short legs and compact fuzzy body make it look more like a tiny teddy bear than a spider. They are also relatively easy to catch and tolerate being handled relatively well, making them fun to play with (assuming you aren't in the middle of a screaming fit).

Jumping spiders hunt by ambush, but they see relatively well, so they generally stalk their prey until they are close enough to make a final pounce. Because they often hunt on vertical surfaces, pouncing can be particularly challenging. To compensate, jumping spiders attach a safety thread to whatever they're standing on before they jump. If they miss their target or muff the landing, the safety thread catches them and they can simply climb the thread back to where they started.

Though most are less than ½-inch long, jumping spiders justify their name by jumping up to six inches or more, especially when trying to flee danger. That distance is even more impressive considering that they don't have oversized legs, as do many other invertebrates known for jumping (grasshoppers, fleas, etc.). Furthermore, spiders don't use muscles to extend their legs when walking or jumping. Spiders contract their legs muscularly, but they extend their legs hydraulically – by increasing their blood pressure. (This is why the legs of dead spiders curl up – they've lost blood pressure and there is no resistance to the contraction muscles.) So when a jumping spider jumps, it lifts its front legs and extends its rear legs with a sudden and forceful boost of its blood pressure. It's likely that their prey also experiences a sudden boost of blood pressure when they realize the jumping spider is pouncing on them, but that's difficult to confirm.

Jumping spiders have very large eyes and good eyesight



A large female wolf spider with her egg sac



Wolf Spiders

In contrast to the cuddly jumping spiders, wolf spiders are everything arachnophobes dream of – large, fast spiders with long hairy legs and beady eyes. Contrary to what their name and speed might indicate, wolf spiders usually don't chase and bring down prey on the run. Instead they tend to sit in quiet ambush for prey to come to them. In addition, and fortunately for the world of small animals, wolf spiders hunt alone, not in packs.

Wolf spiders have two large eyes and six smaller eyes, but they rely on sensing vibrations from prey as much or more than they do on their eyesight. They are sensitive enough that they can sense wingbeats or footfalls of nearby prey and direct their attack based on those vibrations. Like jumping spiders, wolf spiders pounce on their prey, but they have to be much closer because most can only jump about one to one-and-a-half times their body length. Wolf spiders usually catch prey with their front pair or two of legs and hold on while they bite. With larger and stronger prey they will sometimes use a basketlike grasp employing all eight legs.

Smaller wolf spiders roam freely around the landscape and find shelter where they can, but larger ones dig burrows and line them with silk.

Burrows can be up to ½-inch in diameter or more, and are relatively easy to recognize if you're looking for them. Wolf spiders are probably best known for the level of brood care undertaken by females. After laying eggs, the female attaches the spherical egg case to her spinnerets and carries it until hatching time. Then she rips open the case to release the spiderlings, which ride around on her back before dispersing.

Crab Spiders

Crab spiders get their name from their long front legs and flattened bodies, which give them a crablike appearance. They can also move both sideways and backwards like crabs. In Nebraska, the species most often seen are those that sit on flowers, waiting to ambush any small insect that might land near them. Unlike most other wandering spiders, crab spiders have very small eyes. Those eyes function more like motion detectors than true eyes, but are good enough to see when prey is within reach.

Crab spiders sit motionless until prey comes within reach and then quickly grab the prey with their long front legs and bite it. Accordingly, most crab spiders are very well camouflaged, including both their color and the texture of their bodies. Some species can even change color – between white and yellow – to match the color of the flower they're hunting on. Although they can be difficult to see, if you look closely at flowers it won't take long to find crab spiders in just about any natural area you visit across the state.

Orb Web Weavers

Among web-weaving spiders, the orb web-weavers are probably the most familiar. Although there can be tremendous variability between species, the standard orb web has three main elements: frame threads, radial threads and the catching spiral. The frame

threads are the rim, or outside edge, of the web and give the web its shape. Radial threads are like the spokes of a wheel and run from the frame threads to the hub in the center. The catching spiral consists of silk that spirals from the center of the web to the frame, and is the only part of the web that is sticky. The silk that makes up the catching spiral is studded with glue droplets that hold hapless insects fast when they blunder into the web. Most web designs also include a free zone outside the edge of the hub, which is a gap between the hub of the web and the beginning of the catching spiral. The spider can squeeze through this gap in order to switch from one side of the web to the other.

In most cases, the spider either sits in the center of the web or in a retreat on or near the edge of the web while it waits for prey to come along. Insects that hit the web get stuck, at least momentarily, and the spider runs to them and either bites the victim immediately or wraps it in silk to immobilize it before biting it. Since orb web spiders have poor vision, they locate the prey by sensing the vibrations of the web.

The most recognizable of the orb web spiders in Nebraska are probably the large yellow and black garden spiders. These spiders sit in the hub of their webs and are easy to see, especially in late summer and early fall. Garden spiders seem to have a system that helps them decide whether to bite their victims immediately or wrap them before biting. Small prey are usually just given a quick bite and carried back to the hub to be eaten. If the prey is large and difficult to carry, the spider will sometimes tie a thread to them and drag them.

Potentially dangerous insects such as wasps are often wrapped up in silk before being bitten. Moths are often wrapped as well because the numerous scales on their wings flake off so easily that they aren't often trapped for long by sticky web silk. Other large insects are often bitten immediately, but grasshoppers are usually an exception and are wrapped first – presumably to prevent their strong legs from damaging the web.



A crab spider waits in ambush on a purple poppy mallow flower



An orb web spider hangs in the center of its web on a dewy morning

Funnel-web Spiders

Funnel-web spiders are commonly seen in the corners of buildings or in the short grass of lawns, where they make sheetlike webs that narrow to a funnel on one end. However, the webs are also abundant outside of town, particularly in grass and low bushes. The spider sits in the silken funnel tube, which is open on both ends so the spider can quickly access the web or escape through the other end, when necessary. Funnel web spiders use their front legs to feel for the vibrations from an insect hitting the web and then run out to bite the prey and carry it back to the tube to be eaten. Many webs have vertical threads that help hold the web up, but that also are hit by flying insects which then fall to the sheet and are caught by the spider.

One of the intriguing things about funnel web spiders is that they can run quickly across their webs without getting stuck the way other insects do. Unlike orb web spiders that can simply avoid stepping on the sticky spiral catching thread, the funnel-web spider's secret is that it runs on tip toe. As it crosses its web, only the very narrow tips of its legs contact the web. In contrast, prey insects walk or run in a much more flat-footed manner, and get stuck in the dense network of silken fibers.

Sheet Web Spiders

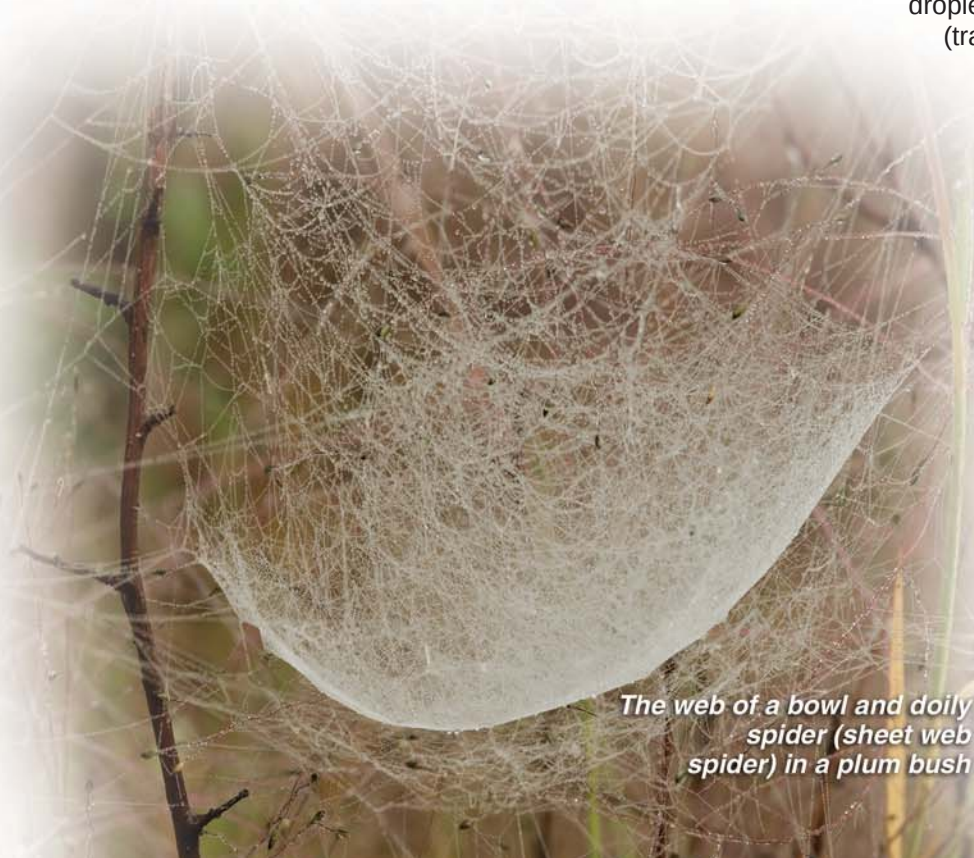
There are a number of different kinds of sheet webs built by a wide variety of spiders, including the dome- or bowl-like webs often found in bushes. These webs are delicate, horizontal and convex webs



A funnel web spider waits in its funnel, ready to attack any insect that happens by its web

suspended by threads above and below. As with funnel webs, those vertical threads are often hit by insects, which fall to the sheet. Sometimes insects get caught in the vertical threads themselves and the spider will shake the web until the insect falls to the sheet. The spider hangs underneath the bowl or dome while waiting for prey to arrive, and when an insect hits the sheet of the web the spider bites it through the web and then drags the victim through the web to eat it.

Another type of sheet web is called a tangle web or cobweb, constructed of loose and irregular threads. Glue droplets are used on some of those threads (trapping threads). When an insect hits a trapping thread and sticks to it, the bottom of the thread breaks off and leaves the insect dangling in the air. Usually, its struggles carry it to other nearby trapping threads and the insect becomes more tangled. The spider comes down from its hiding place above, throws more sticky threads over the victim and then bites it.



The web of a bowl and doily spider (sheet web spider) in a plum bush

Chris Helzer lives in Aurora and is the Eastern Nebraska Program Director for The Nature Conservancy. Special thanks to Bill Beachly, Hastings College, for help with this article.





Ethanol

are Next-generation Biofuels the Answer?

Text and photos by Eric Fowler

While corn ethanol has helped reduce oil demand and greenhouse gas emissions and has been good for farmers and communities with processing plants, the added demand for corn has resulted in land use changes that haven't been good for wildlife, as detailed in last month's issue. The next generation of biofuels, however, including producing ethanol from switchgrass, could provide benefits on each of those fronts, which is what we'll look at in this story.

To date, corn ethanol is leading the race to increase biofuel production and use with the hopes of reducing the United States' dependence on foreign oil and slowing global warming. But that lead is due primarily to the

industry's decades-long headstart.

The cell walls of all plants contain sugars that can be extracted and converted to fuel, and researchers are currently doing just that with switchgrass, crop residue, wood, sugar cane, algae – even

scrap lumber. Additionally, many of these materials can even be burned to generate electricity to power the processing plants. These segments of the bioenergy industry, while not yet operating on a commercial scale, are catching up to corn ethanol quickly thanks to more than \$1 billion in government funding in recent years for research, development and to start pilot plants around the country.

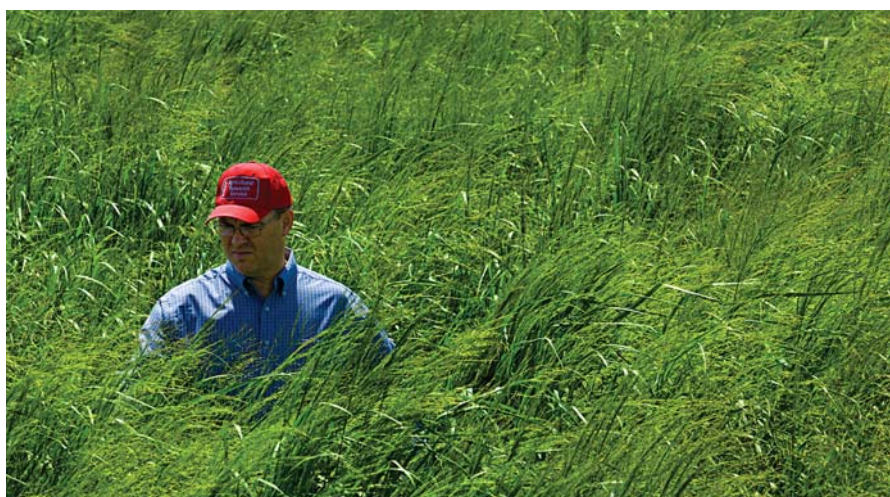
Some of that research is happening at the University of Nebraska-Lincoln (UN-L). If their findings hold true, not only is switchgrass a viable source of fuel, it can also provide environmental benefits, including water savings and wildlife habitat, that corn cannot.

Tallgrass Energy and Wildlife

Switchgrass research at UN-L's Agricultural Research and Development Center near Mead has been conducted continuously since 1936, longer than anywhere in the world, and has had a bioenergy focus since 1990. When President George W. Bush mentioned the need to produce ethanol from sources other than corn, including switchgrass, in his 2006 State of the Union address, it sparked even more interest in switchgrass research at the university.

U.S. Department of Agriculture (USDA) and UN-L researchers have studied all aspects of the equation, including establishing the crop, how fertilizer affects yields and how harvest timing and storage affect energy yield and plant genetics. "We have a molecular biologist, a geneticist and an agronomist working on switchgrass for bioenergy," said Rob Mitchell, an agronomist with the USDA's Agricultural Research Service based at the university. "We're conducting research from the cellular level to the field scale."

Mitchell was part of a recent field study on 10 farms in North Dakota, South Dakota and Nebraska that provided a more accurate measure of the costs and benefits of raising switchgrass, which previously had been studied only in small test plots. The study found that yields on some farms averaged as much as 4.2 tons per acre on marginal ground that would have qualified for the



U.S. Department of Agriculture agronomist Rob Mitchell inspects a switchgrass field at the University of Nebraska-Lincoln's Agricultural Research and Development Center near Mead. (Opposite) Rich Gooding swaths switchgrass.





Glenn Knust of Lincoln approaches his birdy Brittany in a northeastern Nebraska CRP field. Diverse CRP plantings could be managed to provide feedstock for cellulosic ethanol plants, with some benefits to wildlife.

USDA Conservation Reserve Program. On-farm costs to raise switchgrass were \$60 per ton including land and labor costs – higher than previous Department of Energy estimates – but from a feedstock standpoint, it costs half as much for the material needed to produce a gallon of ethanol than \$6 per bushel corn. Even with today’s lower corn prices, switchgrass feedstock cost is significantly less than corn.

This lower cost is based on findings that switchgrass returns 540 percent more energy than is required to raise it. “Although corn-grain ethanol has a very good energy return, switchgrass-based ethanol has a significantly greater potential energy return,” Mitchell said, pointing to estimates of 150 to 180 percent energy return realized when converting corn to ethanol.

One ton of switchgrass will yield about 80 gallons of ethanol, which translates into 400 gallons of ethanol

per acre if switchgrass yield is five tons per acre. Processors are currently tapping 2.5 to 2.9 gallons of ethanol per bushel of corn, or 375 to 435 gallons of ethanol with yields of 150 bushels per acre. But where switchgrass has real potential is on marginal cropland: a dryland corn field yielding 100 bushels per acre can produce only 240 to 290 gallons of ethanol.

Mitchell said switchgrass can be grown wherever dryland corn is raised, providing reliable, year-to-year production east of Cozad. Although specific research is lacking, switchgrass may be viable for water-short areas farther west, including the Republican and North Platte river basins in Nebraska, which are faced with the need to reduce groundwater use. There, Mitchell said, establishing the crop would be the biggest hurdle, but limited irrigation after seeding could reduce this risk. “In those regions of Nebraska,

there may be opportunities to strategically apply irrigation water in the switchgrass establishment year, but in the majority of the years it would never see a drop of irrigation water.”

Switchgrass requires far fewer inputs than corn or other row crops. Weed control typically is only required during the planting year, and once established there is no annual seed cost and no fuel required for spring field work. The only input costs after establishment are the application of fertilizer and harvest costs.

Where switchgrass really shines is the potential it holds in wildlife habitat for some species. Naysayers will point out that high-intensity monocultures provide little wildlife benefit, but “high-intensity is pretty relative if you’re looking at switchgrass compared to corn or soybean fields,” said Mitchell, who has a background in wildlife biology. “Any opportunity we

winter,” Mitchell said. However, harvesting after a killing frost allows many of the nutrients to be recycled, which reduces the fertilizer need and overall cost of production. “Ethanol facilities will need feedstock 365 days a year, so it’s likely harvest will occur at both times, and may depend on which fits best into the farm operation,” Mitchell said.

Mitchell said a 50-million-gallon ethanol plant would require 625,000 tons of switchgrass to operate year-round, requiring about 10 percent of the landscape within a 25-mile radius of an ethanol facility be planted to the perennial grass. Harvesting an entire year’s supply at one time and storing it may be logistically impossible and could require that the harvest be

staggered, with some being harvested in August, some after a killing frost and maybe some after the spring snow melt.

Mitchell said USDA research so far has found that delaying harvest results in lower yields because dry matter is lost in the field. But stored switchgrass also loses dry matter. Further research will try to measure the best approach to maximize energy yields. “Harvesting at different times during the year can provide some diversity in habitat across the landscape, and would be a real benefit for wildlife,” Mitchell said.

Spring regrowth can serve as nesting cover. Mitchell has flushed nesting pheasants, prairie chickens and even ducks from their switchgrass plots. “It is being utilized a lot,” he said.



More than nine million acres of corn are grown in Nebraska, making it the state’s biggest crop. While fertile bottomlands like these near the Platte River will likely always be in row crop production, marginal land that had been in CRP but put back into production in recent years may be better suited for growing switchgrass, providing feedstock for ethanol plants as well as benefiting the environment and wildlife.



University of Nebraska-Lincoln doctoral student Nathan Palmer and postdoctoral research associate Aaron Saathoff load a vial of switchgrass stems into a cryogenic grinder at the USDA-ARS Biomass Research Laboratory at the university. Working under a U.S. Department of Energy grant, researchers at the lab are trying to identify genes and traits of switchgrass that can be used to develop varieties with better winter survival.

Growing Options

Diverse native prairie containing both grasses and forbs also has the potential to be harvested for biofuel production. Studies indicate that while energy yields from unmanaged native prairie grass may only be half as much as managed switchgrass, it would still be comparable to corn grown on marginal soils, while having a much greater wildlife value than either crop.

“Native grasslands are hugely productive and require virtually no inputs, so using native hay as a source for cellulosic ethanol, or perhaps even for biomass and combusting that material, could be a win-win for wildlife habitat and the need for biofuel production,” said Mace Hack, head of the Nature Conservancy in Nebraska. “You’ve got native plant species that have evolved over hundreds of thousands of years that are highly productive in the too wet, too dry or any of the different

conditions we get on the Great Plains. To not take advantage of those genes and that adaptation and productivity and try to recreate it with other crops could be a mistake. It’s a missed opportunity, really.”

One thing Hack doesn’t want to see is the use of exotic plants for biofuel production, not with so many other introduced species, including smooth brome grass and reed canarygrass, already invading native wildlife habitat. “I think we have a ton of experience with those experiments going awry and we end up with invasive species problems and all sorts of other costs that, in retrospect, don’t outweigh the benefits of having made that introduction.”

Whichever perennial grasses are used, they all have the potential to sequester carbon, with the potential of decreasing greenhouse gas emissions by 86 percent – more than the 51 percent savings offered by corn ethanol. Mitchell said previous studies estimated that it would take 10 years for this

benefit to appear in switchgrass, but their recent study found otherwise. “In just five years we saw a significant increase in soil organic carbon, with four farms in Nebraska storing an average of 2,590 pounds of carbon in the soil per acre each year,” he said.

The U.S. Department of Energy estimates that eventually about one third of biofuels will come from perennial crops, including grasses, one third from crop residue and one third from forest resources.

As is the case with grain ethanol, finding land on which to grow enough grass to meet those goals is “the million dollar question,” said Tim McCoy, ag program manager with the Nebraska Game and Parks Commission.

Some have their eyes on grasses growing in fields enrolled in CRP or on native prairie and pastures. McCoy said haying entire fields each year would be a detriment to wildlife, but periodic haying can improve the habitat value of grasslands by removing litter and

encouraging new growth, especially in forbs. Different bird species also prefer different heights of grass, so if a rotational schedule could be developed to meet demand and leave a mosaic of cover at different heights, wildlife could benefit. “It may not be a direct benefit, but it may be less of an impact than we get if we convert a cool-season pasture to a crop field,” McCoy said. “Maybe we’ll see conversion of those pastures into warm-season grasslands.”

Maximizing Output

The next generation of the ethanol industry is evolving so quickly that McCoy said it is impossible to predict what feedstocks will be used to meet future ethanol production goals. Algae, for example, wasn’t even considered a few years ago, but now is showing great promise in early research.

Developments also have been made in the use of crop stover – stalks, cobs and leaves, and other plant material – to produce ethanol. The Abengoa Bioenergy ethanol plant near York launched a pilot plant in 2003 that uses corn stover and distillers grains. An Iogen plant in Canada is producing ethanol from wheat straw.

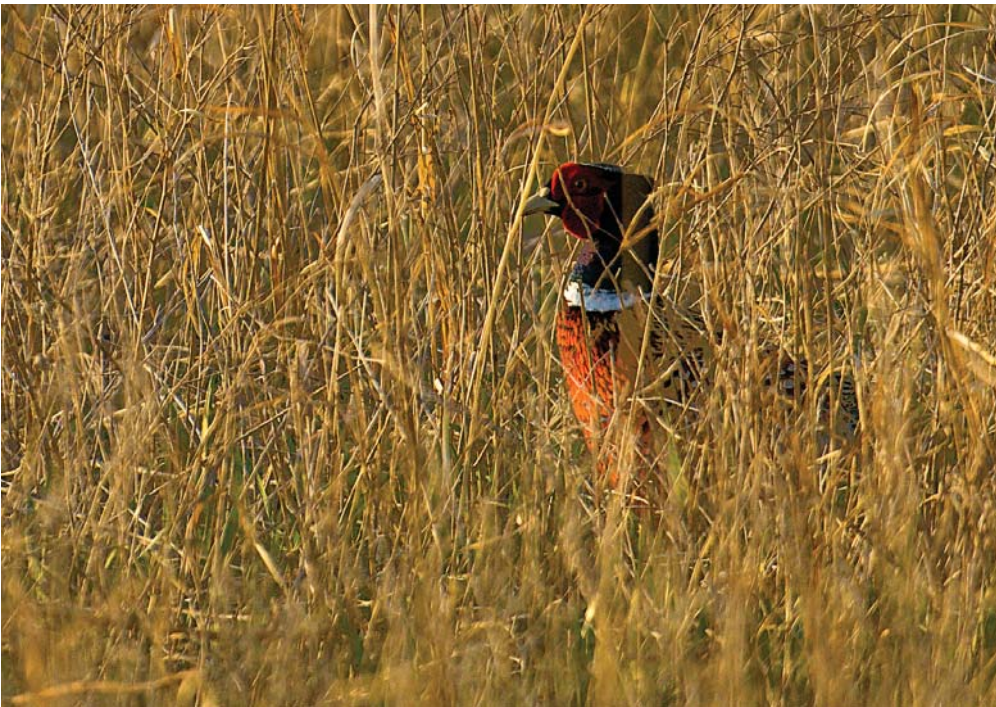
While using crop stover allows for more energy to be extracted from existing cropland rather than requiring additional land conversion, removing crop residue can also increase field runoff and reduces soil carbon. Studies on marginal dryland fields have found that annual removal of half of the corn stover cuts grain yields by five percent. Mitchell said this practice is essentially mining the soil of nutrients. A long-term study on irrigated fields has shown no effect. “It does vary by region and management and needs to be sorted out – can we remove stover and be sustainable,” he said.

Much of the current research is aimed at reaching commercial-scale production levels and reducing the cost of producing ethanol from things like grass, wood and corn stalks. Currently, the processes are much more expensive than producing ethanol from corn. If successful, it could help boost ethanol production on the east and west coasts, which currently use a fraction of the corn ethanol produced in the Midwest

due to transportation issues but could certainly take advantage of other feedstocks, especially wood.

Developments in cellulosic ethanol also include talk of small-scale mobile plants that could be moved to feedstock supplies that are not perpetual. That could include anything from a cedar-clearing project on Nebraska’s prairies to the Rocky Mountains, where pine beetles have killed countless trees, leaving the forests ripe for a catastrophic wildfire, but stockpiled with a seemingly endless fuel supply.

But as recent research has found, there is much more to the story that must be considered, including the effect the industry could have on land use, wildlife and the environment. These things have already been affected by increased corn production, and the thought of increasing the current goal of producing 15 billion gallons of ethanol from corn, as some have proposed, scares McCoy. “We’ll see even bigger impacts on land use in terms of the amount of corn being grown,” he said. “[Land conversion] has the potential to be a huge driver for



Pheasants are one of many grassland species that can benefit if switchgrass is grown for bioenergy production.

Questions Remain

Finding alternative fuel sources that can slow global warming and reduce our nation’s dependence on foreign oil is something we have to do, and corn ethanol is certainly one step in that direction. In Nebraska, ethanol has created a demand for an additional 600 million bushels of corn and added five to eight cents per bushel to the price farmers receive for the crop, according to the Nebraska Ethanol Board. The 24 plants operating in the state have created 1,000 jobs directly and another 2,000 indirectly, resulting in \$3 billion in additional economic activity.

what we end up with in terms of wildlife habitat.”

These are all things that must be considered by policy makers to ensure that biofuel production is sustainable, while meeting the goals of reducing dependence on foreign oil and greenhouse gas emissions. With the advancements that have been made in recent years, McCoy sees promise that the next generation of biofuels can help reach those goals.

“We need to be innovative,” he said. “and I think there are some good ideas that need to be looked into harder. If we can develop renewable fuels and provide wildlife habitat on the same land, now that’s sustainable.” ■

Hearing Loss Prevention

Take steps now to avoid problems later.

By Kelsea Nore

Noise-induced hearing loss is a very real problem for hunters, but one that is easily preventable. Some hunters may argue that earmuffs or earplugs prevent them from hearing small noises while hunting, but modern technology has caught up with this argument – there is now a wide variety of earmuffs and inner ear devices that amplify small noises, cut down on wind noise and, most importantly, muffle gun blasts. Basic earplugs cost as little as 99 cents, are for people who aren't exposed to loud noises very often, and should always be used by bystanders. If you're shooting a gun, newer model earmuffs are one way to go. They are lightweight, and the majority have reasonable price tags – between \$30 and \$50. Inner-ear devices, such as Walker's High-Definition Game Ear, amplify high-frequency sounds but function to muffle noise over 85 decibels (dB). These models are more expensive, in the \$200 range, but are a popular option for hunters. Whichever method you choose, remember that the ability for an outdoorsman to hear well is priceless.

The ear is composed of three parts: the external, middle, and inner ear. Hearing loss on account of noise trauma (sensorineural hearing loss) commonly causes damage to the inner ear, which contains the cochlea, the hearing organ and the vestibular apparatus – a sense organ that affects gravity and motion. The cochlea is lined with thousands of tiny hair cells called cilia. Cilia signal the auditory nerve to report to the brain that it heard something. Repeated

exposure to loud noises deteriorates these cells to a point of permanent damage. Hair cells cannot be re-grown, so hearing loss cannot be easily reversed and may even require expensive surgery. This damage can lead to difficulty hearing others in social settings, depression, vertigo or



Ear protection is a vital accessory for all hunters, and there are many varieties available online and from outdoor retailers.

dizziness, and even acute deafness.

Sudden hearing loss can occur when the ear is exposed to a sound of 170dB or higher. A .22-caliber rifle registers at 145 dB – louder than being in the front row of a rock concert. A standard 12-gauge shotgun emits a sound that is 155 dB, or the level of noise you would

hear if you stood 30 feet from a jet plane as it takes off. A .44-caliber revolver emits a

noise/blast that could very easily rupture your eardrum (the tiny bones in your middle ear crack or break).

When choosing hearing protection, look for the Noise Reduction Rating (NRR) on the package. A higher NRR number means more noise reduction or lower decibels. The majority of earmuffs and inner-ear devices available have an NRR between 27-33 dB. Shooting near water amplifies sound, so waterfowl hunters need to take special precaution. In addition, the loads used in waterfowl hunting are much more powerful than standard shells. If you are already hard of hearing, using earplugs and earmuffs is recommended. For those who wear hearing aids on a daily basis, it would be best to consult your audiologist before hunting in order to receive the best possible protection. ■

For more information on hearing loss visit www.hearingloss.org.

Kelsea Nore is a freelance writer living in Omaha. To see her NEBRASKAland blog, log on to afieldandafloat.wordpress.com.



PHOTO BY JEFF KURRUS

Nebraska's Family Reunion

A new start to an old tradition.

By Kristen Friesen

I grew up in Lincoln, a child of the seventies and the middle of three daughters. Summers were spent sailing at nearby lakes, riding the train at the Lincoln Children's Zoo and downing Goodrich ice cream cones. Come late-August, we'd frequent the Nebraska State Fair, walking off hot days in the cool of the evenings. It was the last hurrah before the start of school.

For our family (and many others, I'm told), the fair was tradition. Like potato salad at a picnic. Set in stone. Something we never missed and, more importantly than I realized at the time, JUST A SHORT DRIVE ACROSS TOWN.

If walking hand in hand through the stinky livestock building didn't bring our family together, then funnel cake certainly did. And my annual plea for a pet rabbit. And Mom's predictable proclamation that any child of hers was not about to board a ride that took less than 20 minutes to assemble – followed by Dad's quick save which, with a wad of cash and precision, produced three giant stuffed critters, one for each of us girls.

"Well now, you wouldn't want to risk losing that while you wait in line for a ride. Besides, if you don't fall out, you'll definitely lose your funnel cake," he'd say.

It was difficult to argue with such logic. But then my parents have always had the last words in our family ... until lately.

Not long ago, when they downsized into a pristine condo situated along one of Lincoln's hike and bike paths, it was decided that family gatherings would be moved to my Grand Island home. Not only is it much bigger (the house, not Grand Island), but it's difficult to ruin something that was built more than 100 years ago. At least that's what my mom says. And with 18 mouths at the table, she's willing to excuse my sorry potato salad.

During a recent family shindig, my

mom, sisters and I all slipped away from the family chaos at my house to enjoy our favorite Grand Island antique store. There, in a center booth, tucked almost out of sight, was an old rusty sign that read: "Nebraska State Fair, Lincoln." I couldn't stop myself: "Well, this is a timely bit of antiquity."

I knew I'd said too much when, like oppressive humidity through a screen door, a stifling silence enveloped us. My sisters shot me deserved glares, and we trudged along in misery unfit for any shopping trip. After a long while, Mom finally spoke up. "The state fair belongs in Lincoln where it's always been." That's all she said, and I knew better than to argue. But I could have.

For example, the fair actually got its start in Nebraska City, set up camp in Brownville for a couple of years and danced between Lincoln and Omaha for nearly 20 years until, in 1901, it settled down in the Capital City. And I didn't remind her that in 2008 the state fair was on the verge of homelessness, nor did I mention the \$8.5 million dollars Grand Island coughed up in hopes of even being considered seriously. I would've been crazy to bring up Grand Island's location and accessibility for farm and ranch families, though it crossed

my mind.

At the risk of biting my tongue in two, I resisted the urge to brag on our "Can Do Committee" which, through the efforts of 70-some volunteers, has turned a big idea into a tangible reality, with parking, landscaping and community-wide beautification. I neither drove her by the new hotels and eating establishments nor the five enormous red barns boasting 500,000 square feet reserved for Nebraska's four-legged guests ... and chickens.

Like a lot of folks in Grand Island – blessed with a little space and a great deal of hospitality – I've decided there's no use arguing. Nebraska is a family, and a family will have its reunion. Sure, the Nebraska State Fair's a big deal, but it's 141 years in the making. Ninety miles of interstate will hardly put a dent in it.

And I'm confident that, once Mom pulls up the drive, sees a few familiar faces and takes a bite of funnel cake, she'll feel right at home. ■

Kristen Friesen is a freelance writer living in Grand Island with her husband and three children. She is also an English major at UNK.



The Nebraska State Fair, no matter where it's located, will still have its midway.

PHOTO BY DOUG CARROLL



Aquatic Habitat Stamp – Phase Two

In its second phase, the aquatic habitat program will improve fishing access.

By Jon Farrar

With the exception of lakes in the Sandhills region and a handful of cut-off lakes on the Missouri River floodplain, Nebraska was not naturally blessed with standing water for fish and anglers. That started changing in the late-1940s as rivers and streams were impounded to create irrigation and flood-control reservoirs, with the added benefit of great fishing. By the 1980s, however, many reservoirs constructed in the 1950s and 1960s were showing their age and the quality of fishing was declining.

“We were well past midlife on a lot of these waters,” said Randy Winter, the recently retired fisheries biologist who administered the Commission’s Aquatic Habitat Program for most of its existence. “Some of the older lakes had lost half of their volume to sediment, had grown shallow enough that winter fish kills were common, and many were dominated by undesirable fish species, such as carp, that destroy aquatic vegetation important to most game fish.”

In 1994, public information meetings were held statewide; and late that same year 76 anglers representing all regions of the state met with Commission biologists at a conclave in Grand Island. Out of that process came a proposal for the nation’s first fund specifically earmarked for aquatic habitat rehabilitation. Additional public meetings were held to gather suggestions for aquatic habitat improvement projects after the bill was passed by the 1996 Nebraska Legislature. Forty-nine high-priority habitat improvement projects were selected for the program’s first eight years, with statewide distribution of projects considered as much possible. Forty-six of those projects have been completed.

Habitat projects were tailored to the need of the lake and biologists employed every tool and technique they had – renovation, meaning a short-lived toxicant is used to eliminate

all fish, fish barriers installed where feasible to prevent unwanted species from re-entering the lake, and then restocking with game fish; excavation or dredging to remove silt; construction of jetties and off-shore breakwaters to decrease shoreline erosion and create spawning shoals; creation of sediment trap structures in the watershed, grassed waterways and buffer strips to slow runoff of soil and pesticides; and installation of aeration systems.

Funds generated by stamp sales have been leveraged against more than 87 other funding sources such as the Sport Fish Restoration Fund, Nebraska Environmental Trust, and the Environmental Protection Agency, to more than double the money available for aquatic habitat work. To this point, nearly \$40 million have been spent to improve habitat for fish and anglers in the state.

The Aquatic Habitat Program is now in its second phase: In March 2008, the Commission’s governing board approved an additional 72 projects, with a projected budget of \$3.5 million each of the next 15 years. Projects were selected after a thorough review and ranking of needed habitat restoration by fisheries biologists across the state. While aquatic habitat improvement will remain the emphasis of the second round of the program, improvement of angler access to lakes and streams, particularly bank fishing, will be an important component. When the 2009 Nebraska Legislature approved expanding the aquatic habitat program by raising the Aquatic Habitat Stamp from \$7.50 to \$10, it obligated that up to 30 percent of the funds be used to improved access to public waters.

Emphasis in selecting sites for access enhancement will largely be based on four criteria – proximity to population centers or high-use waters, such as Fremont Lakes State Recreation Area; if the benefits of habitat enhancement can be sustained long enough to justify the project; geographic distribution of the projects with an emphasis on regions where there are few public fishing waters, such as Wellfleet State Lake in Lincoln County; and ownership of the property, with emphasis on those managed by the Commission, making management more efficient. Angler access projects will also be planned for newly constructed, purchased or leased public waters. Angler access improvements will include construction of jetties extending out into the body of water, ensuring a safe walking surface to the water’s edge from public parking areas, floating or permanent fishing piers, and adding fish attractors such as submerged cedar trees near access points.

“Improving habitat for fish should not be viewed as an added cost to the angler, but as an investment in fish habitat and improved angling experiences in the future,” Winter said. “Convenient access to these quality fish communities is the key to recruiting and keeping anglers. The Aquatic Habitat Rehabilitation and Angler Access programs jointly address these needs.” ■



Construction of off-shore breakwaters and jetties, as shown above at Sherman Reservoir, are typically part of aquatic habitat improvements. In addition to providing improved fishing access, they create spawning shoals and feeding areas for game fish.

PHOTO BY ERIC FOWLER



Goldenrod Cure-all

The power of Nebraska’s state flower.

By Elizabeth Mack

Nebraska’s state flower, the goldenrod (*Solidago gigantea*), is not only a showy bloomer in late summer and early fall, but is also known to have medicinal properties as well. Goldenrod leaves were used in teas by Native American medicine men to cure a variety of ailments, including intestinal disorders, colic, urinary disorders and edema or dropsy. Some tribes also used the leaves topically to heal bruises and to relieve arthritis pain.

Europeans have long believed in goldenrod’s medicinal qualities: The German Commission E, a government regulatory agency that oversees herbs and supplements, has approved goldenrod for treatment of bladder and kidney stones and to aid in the treatment of urinary infections. Many Europeans also use the leaves in a gargle for colds, sore throats and laryngitis. Herbalists in the Appalachians continue to make Blue Mountain Tea from the leaves of goldenrod, which they believe to alleviate exhaustion and fatigue.

Although no quality studies of its effects have been done on humans, some research suggests that goldenrod does in fact increase urine flow. Whether a proven remedy or not, many people are convinced of its healing benefits – though no one needs convinced of its beauty. ■

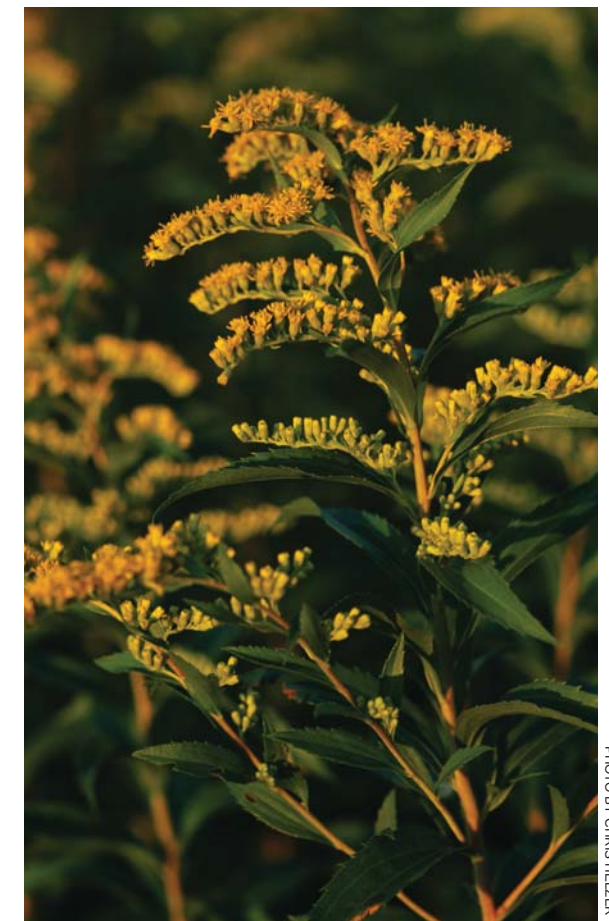


PHOTO BY CHRIS HEIZER

Explore the Science of Life



Photo credit to NASA and Brett Hampton

Environmental Studies

You’ve got the whole world in your hands through the School of Natural Resources. Explore conservation, environmental protection, natural resource management, sustainability, the green economy, climate change, biodiversity and social justice and obtain the knowledge to identify, analyze and resolve environmental challenges.



University of Nebraska–Lincoln College of Agricultural Sciences and Natural Resources
103 Agricultural Hall • Lincoln, NE 68583-0702 • 1-800-742-8800 ext. 2541
casnr.unl.edu • casnr@unl.edu

The University of Nebraska–Lincoln is an equal opportunity educator and employer with a comprehensive plan for diversity.



FREE Quit Spit Kit

Thinking about quitting?
We can make it
easier.

Text "IMReady" to 39649

for your FREE Quit Spit Kit.

For tools and information that can help
you quit tobacco, visit **QuitNow.ne.gov**

While supplies last. Standard texting rates apply.

**Kit includes a toothbrush,
toothpaste, floss and more!**

Tobacco Free Nebraska

Nebraska Department of Health & Human Services • Division of Public Health

ATTRACTIONS/EVENTS

WILDERNESS SURVIVAL CLASS - Start a fire with the bow-drill method, build a survival shelter, be introduced to primitive traps, cordage, flint knapping, edible and medicinal plants, water location and purification, and much more! Go to www.greatplainsracker.com.

BOOKS/PUBLICATIONS/VIDEOS

EXPLORE NEBRASKA art, history, culture and the great outdoors with a subscription to Nebraska Life Magazine. One year (six issues) for \$21 or two years (12 issues) just \$38. Phone (800) 777-6159, write us at 206 W Norfolk Ave, Norfolk NE 68702-0819 or visit www.NebraskaLife.com. Makes a great gift.

SATISFY YOUR CURIOSITY about Nebraska's rich past with *Nebraska History*. Learn about Nebraska's fascinating people, places and events that shaped our state. To subscribe or to give a gift of *Nebraska History*, call 1-800-833-6747 or (402) 471-3272. To learn more, visit www.nebraskahistory.org.

DOGS

PLUM CREEK KENNEL. German shorthairs, stud service, puppies and started dogs. Training for all pointing breeds. Specialize in training the handler as well as the dog. Wayne Clark, Percival, Iowa (near Omaha) (712) 529-4238, clarks1@iowatelecom.net.

DUCKDAWG RETRIEVERS - Raising exceptional hunting yellow and black Labradors. Puppies raised in our home. 30-month, written health guarantee. Stud service: GRHRCH UN DuckDawg's Eba Roll the Dice and GRHRCH UH McMac Magic Eyes A'Smilin MH. The first Grand Hunting Retriever Champions in Nebraska. www.duckdawg.com Ron Green, DVM and Libby Milroy, North Platte, NE (308) 534-3659

AT STUD: GRHRCH UH Platte's TNT Duckdawg Dozer MH. First yellow Labrador in the state of Kansas to earn his Grand, Upland and Master titles. Seventy pounds of muscle, exceptional marker and blind runner Dozer is available for breeding to approved females. Natural breeding requires a brucellosis test on females. Chilled semen available. Stud Fee \$600. Contact owner Tom Phillips at (785) 635-5776 or trainer/handler - Chris Jobman at (308) 249-0707, www.flatlanderkennels.com.

PREMIER GUNDOGS TRAINING KENNEL: State licensed kennel specializing in Hunting Dog and Hunt Test training for all waterfowl and upland flushing retrievers, spaniels and pointing Labradors. Dale and Kris Taylor (402) 787-2048 www.premieryundogs.com.

FLATLANDER KENNELS INC. Bayard, NE Full-time retriever training facility for the serious hunter or AKC and HRC hunt tester. Trainer of Nebraska's first and only GRHRCH's! Super Retriever Series competitor and a member of Avery's Team Waterdog. Training available for all levels of hunt tests and gundogs. Chris Jobman: (308) 249-0707, www.flatlanderkennels.com.

FISH/FISHING

FISH FOR SALE. Catfish, largemouth bass, smallmouth bass, perch, crappie, bluegill, walleye, rainbow trout, grass carp, minnows. Pleasant Valley Fish Farm, 27851 U.S. Highway 83, McCook, NE 69001. (308) 345-6599.

GUN DOG TRAINING All Sporting Breeds

All dogs worked on foot – no horses. Obedience included. Midwest's finest facilities.

Started and trained dogs for sale.

"Training for hunters by hunters."

Wilderness Kennels
Henry Sader-Lincoln, NE
(402) 423-4212

www.wildernesskennels.com

NEBRASKA LAKE MANAGEMENT. Biological lake surveys, fish stocking, rough fish control, lake aeration, algae control, aquatic weed control. Rob Hofpar, Aquatic Biologist, licensed, insured and qualified. (402) 784-6005 Valparaiso - (888) 850-2460 www.nelakes.net.

GET YOUR FISHING PERMIT online today! Don't wait until tomorrow to enjoy Nebraska's great outdoors by going fishing with the family. To purchase a permit from the comfort of your own home, go online to www.OutdoorNebraska.org and click on *Purchase a Permit* under *Licenses and Fees*.

FOOD/GIFTS/HOME

HOMEBREWING/BEER AND WINEMAKING. Fermenter's Supply, 8410 K Plaza, Suite #10, Omaha, NE 68127. Phone orders only, (888) 655-2739. Advice line (402) 593-9171. www.fermenterssupply.com.

GUIDES/OUTFITTERS

CANOE - KAYAK - TUBE RENTALS on the beautiful Niobrara River with Dryland Aquatics at Sparks, Nebraska. Your Niobrara River Specialist. (800) 337-3119. www.drylandaquatics.com, info@drylandaquatics.com.

NIORRARA SUPERTUBES in Valentine. We rent only high-quality Mad River Canoes. For all your Niobrara River canoe & tube rentals call (402) 376-2656 or go to www.niobrarasupertubes.com.

OUTDOOR EQUIPMENT

IS PERFORMANCE IMPORTANT? For the finest canoes and accessories look to Great Plains Canoe Co., 205 Main, Springfield, NE 68059. Phone (402) 253-2000.

PHOTOGRAPHY

NEBRASKA WILDLIFE PHOTOGRAPHIC PRINTS. Matted. Go to inplainssight.homestead.com. "The more you buy, the quicker my wife can retire!"

VACATIONS/RESORTS

THE OLDE MAIN STREET INN. A historic bed and breakfast listed in the National Register of Historic Places. Beautiful dining room with fireplace. Headquarters for General Nelson Miles, Wounded Knee Incident, 1890-91. 115 Main Street, Chadron NE 69337 (308) 432-3380. www.chadron.com/oldemain.

DIAMOND B TROUT RESORT, Orchard, Nebraska. Lodge, cabins, spring-fed lakes, playground equipment, paddleboats. Great for families, groups, hunters. Book your cabin now! Call for brochure (800) 974-3002. www.diamondbtroutresort.com.

BIG BLUE RANCH & LODGE - Enjoy fishing, hunting, hiking, birdwatching and ranch adventures on 2000+ acre cattle ranch in southeastern Nebraska. Beautiful log cabin, with fireplaces, kitchens & big covered porches, overlooks 20-acre lake. www.bigblueranch.com (402) 730-3643.

MILL IRON V LODGING has modern cabins for your vacation pleasure. We are located near Verdigre, NE in turkey country. Each cabin offers privacy, view and a birdwatcher's paradise. Stay with us for a COUNTRY



Double R Guest Ranch, LLC
Mullen, NE
Established 1908
Open Year Round

HUNT-FISH-RIDE-RELAX

Enjoy a retreat in Nebraska's Sandhills! Hunt deer, grouse, pheasant and coyote. Fish for yellow perch and northern pike in the spring-fed lakes. Ride our horses or go hiking. Relax in our furnished cabins with kitchenettes, AC, TV and gas grill.

For more information call 866-217-2042
info@RRguestranch.com • www.RRguestranch.com

19 miles North of Mullen on Hwy 97
Jim and Pat Bridges, Owners

EXPERIENCE. (402) 668-7488. www.milliron-v-lodging.com, jpeinrem@gpcom.net.

UNCLE BUCK'S LODGE: Treat yourself to a lodge vacation at the scenic Rhoades family ranch on the North Loup river near Brewster in central Nebraska. Cattle drives, brandings, hunting, birdwatching, stargazing, family reunions, spa weekends, tanking and river fun. 14,000 sq. ft lodge, full service restaurant/bar (800) 239-9190, www.unclebucksloodge.com.

PLANNING A VACATION? Why not make it at a Nebraska State Park? With more than 80 state park and recreation areas across Nebraska to choose from, you can enjoy a campground or cabin and enjoy activities such as

fishing, swimming, camping and hiking. Call (402) 471-1414 for reservations or go online at www.OutdoorNebraska.org and follow the Parks link.

Classified Rates: 85¢ per word, minimum \$15. Closing: First business day six weeks before issue date. Classified ads are accepted on a first-come, first-served, space-available basis. Classified Ads, NEBRASKAland Magazine, P.O. Box 30370, Lincoln, NE 68503-0370. Telephone (402) 471-5473. Fax: (402) 471-1984. E-mail: ngpc.classifieds@nebraska.gov. Ads are posted online at NebraskalandMagazine.com at no additional charge.

NEBRASKAland Now Offers Display Advertising...

Enhance your advertisement
with photos, graphics
and color!

Reach
thousands of
NEBRASKAland
readers with your
message through
our display
advertising program.

A limited number
of spots are available,
so call us today at
(515) 440-2810 or e-mail

dave@larsonent.com



**PRAIRIE PLAINS
RESOURCE INSTITUTE**
AURORA • NEBRASKA

EST. 1980

IT'S WORTH THE EFFORT.

Making anything by hand takes time, patience and a commitment to quality. For 30 years Prairie Plains Resource Institute has been restoring Nebraska prairies with over 150 species of Nebraska seed - collected, processed and planted by hand. That same care and attention goes into everything we do - planting prairies, offering outdoor education for all ages and maintaining our 7 Nebraska prairie preserves. Learn more by visiting our website and become a member today!

1307 L Street | Aurora, NE 68818 | 402-694-5535 www.prairieplains.org



▲ This picture was taken around 1974 following our first fall wild turkey hunt in Holt County. We followed all the protocol; scouted out some possible roosting trees, in the field before dawn and hunted all of the likely places. We hunted several spots that day and finally, in late afternoon, we encountered a flock of hens and toms in a wheat field north of O'Neill where we filled our limit. That was a day to remember. Since then our group has hunted wild turkey along the Niobrara River for several years. We never failed to get our toms.

Our hosts from O'Neill were, from left, Virgil Larsen and Howard Larson. The group from Kearney were, left center, myself (Bobb Hobbs), Doug State, John (Shot) Lowe and Merle Herring.

— Bobb Hobbs, Kearney, Nebraska



▲ This is a picture of myself, Dwain Luhr, taking "the weekly bath" five miles southwest of Pender around 1934.

Notice the warm weather, strong winds and lack of vegetation.

— Dwain Luhr, Hot Springs, South Dakota



▲ In Columbus around 1941, my uncle Roy Bernt (left), and my dad, Virgil Stone, with a stringer of sandpit bass. Roy owned Bernt's Sporting Goods store there.

Inset above is me with a 6 1/4-lb bass I caught from the same sandpit in 1961. It is still mounted in my den.

— Gary Stone, Waverly, Nebraska



▲ Pictured at left is my brother, Gene Schwenke, and my future brother-in-law, Alrae Olson, in 1954. Notice the BB guns and the fruit of a successful hunt — two mice. Taken at my parents' farm near Minden.

Gene became an M.D., and is now retired and living in Lincoln. Alrae is now a teacher in Eustis.

Both still like to hunt in Nebraska, but thankfully bigger game!

P.S. — I really enjoy reading NEBRASKALand.

— Jack Schwenke, Fort Morgan, Colorado

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.

SAND CREEK
Post & Beam

TRADITIONAL WOOD BARNs



**My Barn.
My Rules.**



*Call today to
request a catalog*

Located in Wayne, NE
888-489-1680
sandcreekpostandbeam.com



Rule #6 - My barn will have big beams like my grandpa's.