

Everyday Challenges in the Life of an Eagle

by Dan L. Reinking

Birds face many challenges in their day-to-day lives. Some of these such as inclement weather and disease are ubiquitous in the natural environment, while others are related directly or indirectly to human activities. Our Bald Eagle nest monitoring, online nest cameras, and satellite tracking programs are providing a more detailed understanding of how some of these challenges affect eagles in Oklahoma and elsewhere.

Our Bald Eagle Survey Team (BEST) volunteers keep an eye on all of the eagle nests we know about in Oklahoma during each nesting season. Repeated visits to observe from a distance provide information about when egg laying and incubation take place, as well as how many young eventually fledge from each nest. In April of 2012, volunteers noticed that a nest near Jackson Bay of Fort Gibson Lake fell to the ground when the branch supporting it broke during a storm (see the summer 2012 issue of The Sutton Newsletter for a detailed article). Three eaglets were somehow uninjured but now on the ground along with the nest. With assistance from a game warden and local landowners, Sutton staff and BEST volunteers quickly constructed a wooden platform in the tree, rebuilt a nest on the platform using materials from the original nest, and placed the chicks in it. With some supplemental food provided by volunteers, the three chicks eventually fledged, along with a fourth chick from yet another storm-damaged nest which had been fostered into the rebuilt Jackson Bay nest.

Before fledging, two of the chicks were equipped with satellite transmitters as part of our eagle tracking program. Based on measurements and relative sizes to determine gender, the two eagles were assigned the names Jackson Bay male and Jackson Bay female for identification on each of our online maps depicting their movements. For the rest of this article, our focus will be on the Jackson Bay female, because her fallen nest would not be the only significant problem she would face during her first two years.

Tracking data show that she headed north in June, as is typical for most of the Oklahoma eagles we have tracked since we started our program in 2010. She spent her first summer in the vicinity of Mankato, Minnesota, and by September she began moving south. Her first winter was spent moving between southwestern Missouri, northwestern Arkansas, and northeastern Oklahoma. By May of 2013 she was once again on the move northward, passing through Kansas and Iowa and tracing the North Dakota/Minnesota border before reaching Lake Winnipeg in Manitoba, Canada in June. By early October she started her seasonal





The before and after situations faced by the eagle labeled Jackson Bay female in her days as a nestling.

fall migration by moving south into Minnesota, and was about to experience another significant threat to her survival.

On October 17, 2013 we received a call from The Raptor Center at the University of Minnesota. They had received an injured eagle wearing both a numbered federal leg band and a satellite tracker. Because the partial government shutdown had ended just that morning, they were able to track the band number through the national Bird Banding Laboratory and found that it had been banded in Oklahoma. The co-founder and Director Emeritus of The Raptor Center, Dr. Patrick Redig, knows Sutton Center Executive Director Steve Sherrod, and suspected that the bird might be one that we banded. The phone call confirmed their suspicion; it was the Jackson Bay 2012 female. The eagle had been found injured in a roadside ditch along Highway 68 near Cambria, MN. While we do not know exactly what happened to her, the injuries she sustained and the location where she was found suggest that a vehicle struck her, perhaps as she was scavenging a road-killed animal. An examination by Dr. Redig revealed a broken leg and pelvis. The latter injury is especially problematic and difficult to overcome. Surgery was performed to stabilize both injuries, and the long months of monitoring the healing process and undertaking rehabilitation were begun.

After skilled care and months of healing and extensive rehabilitation to build her flight muscles at The Raptor

A federal leg band with a unique number is attached to an eagle that will soon be leaving its nest. The band will allow future identification if the bird is ever recaptured or found dead.





The Jackson Bay female receives a new satellite tracker at the University of Minnesota's Raptor Center after its rehabilitation and before its release.

Center, she was released near Minneapolis on June 27 of this year, sporting a new leg band as well as a new satellite transmitter. Early indications of success were very promising, as she immediately began her typical June movements northward and by late July was once again at Lake Winnipeg where she had spent the previous summer. At the time of this writing in mid-October, she was just beginning to move south once again, as we would expect for this time of year. You can follow her travels on the maps at suttoncenter.org, along with the movements of (currently) eight additional eagles. Eagle locations run one week behind real time because of the way we retrieve the satellite data, but are updated several times per week.

Years of monitoring eagle nests in Oklahoma have shown that our infamously frequent and severe thunderstorms can kill chicks and even destroy entire nests in many

if not most years. Were the Jackson Bay female eagle and her nest-mates unlucky to have had their nest destroyed by a storm, or was she lucky to have dedicated volunteers and the Sutton Center monitoring them to help secure their survival? Does her serious accident in Minnesota make her unlucky, or just the opposite because it happened near a leading hospital and rehabilitation center for birds of prey?

Her hardships are not at all unique. Songbirds, eagles and other raptors, and many additional species of birds suffer mortality from collisions with a variety of human-related objects. Dr. Scott Loss of Oklahoma State University and several colleagues at the Smithsonian Migratory Bird Center have conducted a thorough and sophisticated review of existing information on unintentional human-related bird mortality, and generated mortality estimates for birds in the U.S. If the Jackson Bay female eagle was indeed hit by a vehicle, she has plenty of

company. The estimated mortality to birds from vehicle collisions based on the analyses of Loss and his colleagues is between 89 and 340 million birds annually in the U.S. (Loss et al. 2014, Journal of Wildlife Management 78:763-771). Add to this an estimated mortality of 12-64 million birds annually from electrocutions or collisions with utility lines (Loss et al. 2014, PLOS ONE 9(7):e101565). Then add an estimated 365-988 million birds killed annually from collisions with buildings (Loss et al. 2014, Condor: Ornithological Applications 116:8-23), and another 6.6 million killed by collisions with communications towers (Loss et al. in prep). Add another 140,000 to 328,000 killed by wind turbines each year (Loss et al. 2013, Biological Conservation 168:201-209). Our speedy vehicles, lighted towers and buildings, glass windows, and other infrastructure take a large collective toll on birds and other wildlife.

What is unique about the Jackson Bay female eagle is that her life has been observed and followed so closely. Her nest was being monitored long before it fell down, and her movements have been tracked by satellite since she left the nest. These intensive efforts have provided a glimpse into what life is like during the first two years of a Bald Eagle's life. If there is a silver lining to her tragedies, it is in the awareness she brings regarding the challenges faced by wildlife. The fact that she seems to be doing so well after her rehabilitation and release is encouraging, and her brand new tracking device with its 3-5 year lifespan means we have the potential to follow her through at least her first breeding season expected in 2017, provided she manages to navigate the dangers eagles face every day.

Tracking maps for the Jackson Bay female show that she spent her first summer in Minnesota after leaving the nest (map 1) and her second summer north of Winnipeg, Canada (map 2). Her injury occurred while moving south through Minnesota in October of 2013 (map 3). Map 4 shows her route back to Lake Winnipeg soon after being released near Minneapolis (location point 0) after surgery and rehabilitation in June 2014.

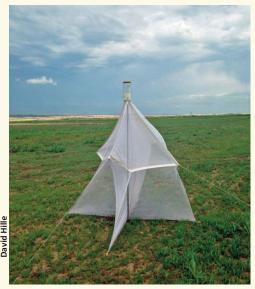








Grouse News....



David Hille used this Malaise trap to collect flying insects in the field.

Flying the coop –

Is disease driving Lesser Prairie-Chickens towards the edge of extinction?

by Diane Landoll and David Hille

Why are Lesser Prairie-Chicken populations declining? While we know major reasons for the decline of prairie-chickens are habitat loss and the conversion of prairies, population declines are not always as simple as they seem. Habitat loss and deaths as a result of fence collisions are major sources of decline. The demography of the species (lifespan, clutch size, etc.) and their avoidance of tall, human-built structures, such as power lines and windmills, also play a role.

What if more subtle factors are at play? Disease can play an important role in population dynamics. As with human populations, disease can magnify the effect of lessening habitat quality and influence population sizes through impacting birds at particular life stages or when they are under physical stress such as during nesting. One way disease can be transferred among individuals is by disease vectors, such as biting flies. We decided to investigate the possibility that flies spread disease among Lesser Prairie-Chickens by targeting lek sites where the birds reliably congregate during the breeding season.

The first step in this project is to assess the fly community and to determine if the types of flies that might serve as disease vectors are targeting leks. To do this, we collected flies on six leks in the summer of 2014. We also collected flies at off-lek sites, located in adjacent shortgrass prairie a few hundred meters from the lek. Given this paired sampling, we can compare the types of flies found on leks to those found off leks. This will allow our lab to determine if flies that are potential disease vectors target leks.

We are currently identifying the numerous flies we collected. Once the flies are identified, we will determine on what and how each fly feeds to identify which genera are potential disease vectors. The occurrence of potential vectors will be compared among on- and off-lek sites. If there is a greater prevalence of potential disease vectors on leks, it will be necessary to continue the investigation to determine if the flies are actually carrying diseases that could be transferred to Lesser Prairie-Chickens, and if these diseases are prevalent enough to affect how these birds respond to the ever increasing habitat pressures they are facing.



The USFWS has been petitioned to list some populations of the White-tailed Ptarmigan as Threatened under the Endangered Species Act.



Yellow-bellied marmots and big horn sheep also call these mountains their home. As a consequence of the remoteness of this area they show no fear of humans.



White-tailed Ptarmigan Survey Efforts

Story and Photography by Don H. Wolfe

As reported in a previous issue of The Sutton Newsletter, the USFWS has been petitioned to list some populations of the White-tailed Ptarmigan as Threatened under the Endangered Species Act. In 2012, the USFWS determined that the listing petition was valid, and initiated a status review for the Mt. Rainier White-tailed Ptarmigan and the Southern White-tailed Ptarmigan which occur in Colorado and northern New Mexico. At the extreme southern extent of White-tailed Ptarmigan range, in the alpine areas of northern New Mexico, the species may be particularly vulnerable due to lack of connectivity between suitable habitats, climate change, and changes in alpine vegetation. In the Pyrenees Mountains of France, Spain, and Andorra, a similar scenario has played out, with the closely related Rock Ptarmigan presently occurring on isolated peaks called "sky islands," with a resultant loss of genetic diversity in the remaining populations.

Since 2007, we have been systematically surveying all alpine peaks and ridges in north-central New Mexico. This allows us to evaluate occupancy by ptarmigan, as well as to conduct genetic analyses from molted feathers in order to determine if there has been a loss of diversity, and to gather data on summer temperatures. We believe the latter is a main determining factor whether a given alpine area is suitable for ptarmigan occupation. We have calculated that there are approximately 70 square kilometers of alpine (above 12,000 feet ASL) in New Mexico;

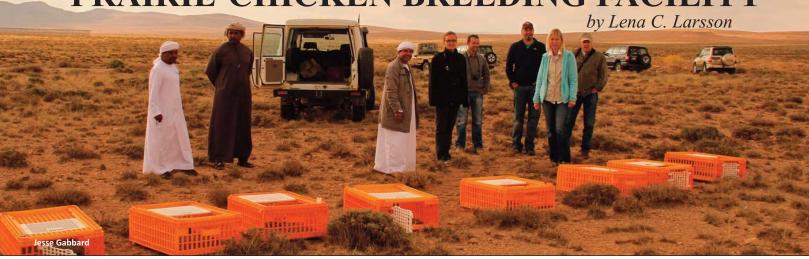


White-tailed Ptarmigan typically occupy the alpine habitat 500 feet above the timberline.

many of those are alpine sedge meadow or small or loose rock, and thus only about 20-25 square kilometers are suitable. There appear to be 3 separate ptarmigan populations in the state, one in the Pecos Wilderness Area, one in the Wheeler Peak Wilderness Area and adjacent peaks on U. S. Forest Service lands, and a third in the Culebra Range on the Vermejo Park Ranch. In June 2014, Ryan Christensen, Kenny Knowles, and I surveyed additional portions of the Vermejo Park Ranch and located birds and bird sign in new areas; we were also able to collect over 20 molted feathers which greatly increase our sample size for the area. In September, Kyle Thomas and I surveyed East Pecos Baldy Peak and Santa Fe Baldy Peak in the Pecos Wilderness Area. These peaks, although of suitable size and elevation,

are located several kilometers south and west of current known ptarmigan range. A few fecal piles were found, but we have not yet determined whether they were from White-tailed Ptarmigan or from Dusky Grouse (we did locate Dusky Grouse on the summit of Santa Fe Baldy Peak, at an elevation of 12,500 feet). While the vastness of Santa Fe Baldy Peak may warrant further surveying, we feel it unlikely that ptarmigan occur there on a regular basis. Having now visited nearly all alpine areas in New Mexico, future efforts will include estimating the population size, mapping alpine willow distribution, and continuing to determine factors limiting ptarmigan distribution and abundance. We are also collaborating with Sara Oyler-McCance (USGS) and others on a range-wide genetics survey of the entire Southern White-tailed Ptarmigan population.

TRAVELS FOR THE ATTWATER'S PRAIRIE-CHICKEN BREEDING FACILITY



Sutton employees and hosts releasing captive-bred Houbara bustards near Enjil, Morocco.

As we move forward on constructing the Attwater's Prairie-chicken breeding facility, Sutton Center staff has traveled relatively near and very far to consider practical designs. We are exceptionally grateful for the insights shared by our hosts. In chronological order we thank Beavers Game Farm in Pierceville, Kansas, Emirates Center for Wildlife Propagation in Morocco, and Timberline Fisheries in Marion, Illinois. Here is a brief summary of our learning travels.

Beavers Game Farm produces 300,000 ring-necked pheasants annually. Most of the pheasants are sold as day-old chicks, but breeders are raised to adulthood and kept in football field-sized enclosures. The purpose of keeping the pheasants in very large enclosures is for maximum production with free choice of mates. We, on the other hand, need to document all reproduction of individual prairie-chickens to keep an exact record of the genetic make-up of the captive population. The intent is to use large enclosures to let prairie-chicken poults grow up in as natural an environment as possible to prepare them for wild conditions. Modifications will be necessary, but Beavers Game Farm let us see what works well for them.

The Emirates Center for Wildlife Propagation (ECWP) is a world leader in raising the Houbara bustard in captivity. The Houbara bustard of the semi-deserts in North Africa and Asia experienced a sharp decline due to hunting and environmental damage. ECWP aims to restore and preserve the natural population of the North African Houbara bustard, and conducts research on all areas relating to the birds' biology. The staff in charge provided an outstanding tour of their facilities when the Sutton Center visited to catch the last of the most productive breeding season at the end of May 2014. Intricate details of their designs and methods in breeding native birds were shared, and this information will be very useful as we establish the prairie-chicken facility.

We must provide the prairie-chickens with the best possible food to ensure that breeders thrive and young birds get the healthiest nutrition to grow strong for a life in the wild. **Timberline Fisheries** started in 1973 by raising fish for stocking ponds, but has evolved into a first rate supplier of small animal food. They produce crickets and mealworms that are sold to pet stores and zoos. The general manager Todd Goodman and the production manager Steve Williams shared their know-how to efficiently produce consistent, good quality, nutritious prairie-chicken food. Did you know that mealworm flour is marketed as a very nutritious alternative for humans too?



Above: A prototype netted enclosure (in which prairie-chicken poults can be raised) is examined at Beavers Game Farm. Below: Steve Williams at Timberline Fisheries shows the Sutton staff his inventory of meal worms.







DLIFE EXPO 2014

by Kimberly A. Lobit and Ryan A. VanZant

After a year off, the Wildlife Expo in Guthrie was in full swing at the Lazy E Arena this September. People from all over attended; an estimated 45,000 wildlife enthusiasts came to this free event hosted by the Oklahoma Department of Wildlife Conservation. If you have never been to the Wildlife Expo, mark your calendar for next year. Expo goers can learn how to weave a basket and tie their own fly, as well as practice shooting and archery. No matter where your interests lie, there is something for you.

As in past Wildlife Expos, the Sutton Center swooped in with live birds. The Sutton Center booth had illustrations and newsletters showcasing some of our work. Our booth also had interactive games such as "Can you guess?" in which visitors identified birds from very close-up photos; the correct answer and facts about the bird were provided underneath a flap. Visitors could also compare their "wingspans" with the wingspans of different bird species, in order to determine with what type of bird they were comparable in size.

Our booth would not have been possible without the help of volunteers Cheryl Cavert and Jan Duffy, who also are part of Sutton Center's Bald Eagle Survey Team (BEST). Cheryl and Jan, along with Sutton employee, Karen Kilbourne, worked tirelessly answering questions, giving out information, and taking pictures.

The Sutton Center education team presented two programs a day in the center of the Lazy E Arena. It is a very large space in which they usually host rodeosplenty of room to play! There was a large pool next to the center stage where attendees could test their kayaking skills.

Our presentation was a much shorter version of the It's All About Birds! education program. We brought our sandhill crane, Doodle, to explain the importance of birds in different cultures. Zephyr, a Harris' hawk, flew over the crowd as we discussed how predators are beneficial to humans. The Abyssinian ground hornbill, Beaker, assisted in educating the audience about the disappearing prairies and grasslands across the globe. We ended the program on a positive note explaining the story of the reintroduction of the southern bald eagle while showing our education eagle, Fiona. While visitors were taking pictures and asking questions about the eagle, we also brought out our new team member, Georgia the great horned owl, and two mallard ducks, Charlie and Charlize. The kids loved throwing catfish pellets into the water for the ducks to gobble up.

The audience could get a close look at the education birds and ask questions. The Wildlife Expo is great exposure for schools to learn about *It's All About Birds!*, and we received responses from attending teachers who want to schedule future programs from us. It goes to show that coupling sound educational topics with birds really hits home with many audience members, and we hope it will influence the lives and actions of all of these people for years to come. We can't wait to visit Guthrie again next year.



Sutton's "Measure your wingspan" is always a popular exhibit.



The Sutton Center has shown a number of interesting birds at the Wildlife Expo over the years, including this Spectacled Owl.





Sutton 30 Year Anniversary Gala!

Celebrating the past and looking toward the future...

The Sutton Center celebrated its 30 years of rich history (see Winter 2013 Anniversary newsletter) November 14th with a fun-filled evening of delicious food and a conservation themed program at the historic Mayo Hotel in downtown Tulsa. Event Chair and television personality Becky Dixon introduced the patrons and a 30-year snapshot video of the Center's myriad accomplishments. The Sutton Center's Bald Eagle recovery project that brought back the Bald Eagle in the southeastern United States, and our prairie bird work were featured among many other programs. The Center has produced over 150 publications and compiled two major bird atlases. It has been featured in a variety of national magazines and appeared on several well known TV programs.

Businessman Joe Williams, *National Geographic* photographer Joel Sartore, and famed rock musician Don Henley of the "Eagles" gave special "video-clipped" well-wishes. The attendants were treated to an appearance by a magnificient Bald Eagle and an excerpt of the Sutton Center's live bird education program *It's All About Birds!*. Major sponsors of the evening included Barbara Bates, The Mary K. Chapman Foundation, Devon Energy, The Hodges Companies & Hodges Transportation, Susan Prescott, Harold and Sandy Price, Joseph H. Williams, Williams, and the Wolf Creek Charitable Foundation. NatureWorks was a collaborating partner.

As the Sutton Center pauses to celebrate, the organization's conservation efforts continue with new challenges. In addition to ongoing programs, the Sutton Center's major new project is to breed and release the Attwater's prairie-chicken, one of the most endangered birds in North America, back into the wild.

With this 30 year milestone, Dr. Steve Sherrod, the Sutton Center's Executive Director since its inception, will become Executive Director Emeritus and Director of Conservation, allowing him to devote his full attention to Attwater's prairie-chicken recovery. Sherrod says: "Oklahomans can take great pride in all that has been accomplished toward wildlife conservation, research, and education by the greatly talented and hardworking staff at the Sutton Center. It has often been challenging but always a true labor of love."



Sutton Award 2015...10 Years!

by Karen A. Kilbourne

For the tenth year, the Sutton Avian Research Center in partnership with NatureWorks and other sponsors, will honor talented Oklahoma high school students, grades 10-12, for excellence in conservation communication. This is a great opportunity for students to receive significant funding for their continuing education or other aspects of their futures!

Students are required to create and submit a presentation piece that tells an intriguing story about a current conservation topic, such as water, air or soil quality, or wildlife conservation. Applications and scholarship requirements can be found on www.suttoncenter.org. The top winning scholarship entries will be featured at the NatureWorks Wildlife Art Show March 6-8 at the Renaissance Convention Center in Tulsa (see www.natureworks.org).

We are now fundraising for the Sutton Award Scholarship program. Every dollar counts towards supporting the future of Oklahoma's youth, and we hope that you can help in this endeavor. If you would like to make a donation or need information about the Sutton Award Scholarships, please call 918-336-7778 or e-mail kkilbourne@ou.edu!

Wild Brew 2014

Story by Karen A. Kilbourne Photography by Dan Reinking



Thanks to a fantastic volunteer committee, and many others, the 16th year of Wild Brew continued to be the greatest party ever hatched! This year's volunteer committee was chaired by Mary Vrooman, co-owner of TriArch Architecture, and Wade Huntsman with AuxArc iMC.

Over 150 domestic and international beers were available for attendees to enjoy in addition to amazing foods from over 35 restaurants across Tulsa. Special thanks go out to all of the beer vendors and restaurants for their generosity and contributions to the event. A complete list can be viewed at www.wildbrew.org.

Each year the "Golden Tap" award is presented to the beer brewery, distributor or group who contributed "above and beyond." This year's award was presented to Dead Armadillo Craft Brewing. Dead Armadillo is one of the newer brewers, had a great selection, and was an overall crowd favorite. The "Golden Spoon" is awarded to an outstanding restaurant for their contributions to Wild Brew. This year's Golden Spoon went to Albert G's. They went "all out" with their carving station, and satisfied a great crowd. People raved over the delicious food and setup!

Once again Wild Brew was filled with fabulous tunes by Shelby Eicher and Mark Bruner followed by the Mid-Life Crisis Band. We are very fortunate that these talented musicians continue to help make Wild Brew such a great success!

This year there were four patron areas named after historical sites and areas around Tulsa. Each area featured original pieces of art created by local talent.

This event would not be possible without the support of our sponsors, especially Cox Media Group, SilverTree Technology, Idea Studio, JD Young and One2One Marketing, John Steele Zink Foundation, and Oklahoma Magazine along with many others. The committee and the Sutton Center also thank David and Carrie Zenthoefer for hosting the Wild Brew thank you party in their lovely home. Lastly, a huge thank you goes out to our incredible committee of volunteers who worked tirelessly to provide a fun and vibrant event! Their support for the Sutton Center is truly appreciated.

Find us on Facebook: Wild Brew Tulsa, and Twitter: #wildbrew, and download our app in the iTunes App Store or the Google Play Store by searching: Wild Brew. Visit www.wildbrew.org for more info on the event, pictures, and the upcoming 2015 event!





BIRD BREAK!

Bird is the Word!



- There are two types of vultures in North America; the black vulture and the TURKEY vulture.
- The black vulture is a CARNIVORE, and only eats meat.
- Vultures will eat almost anything dead, but their most common meal is road kill, or CARRION.
- Vultures help prevent the spread of DISEASE by eating carrion.
- Turkey vultures rely on their sense of SMELL to locate their next meal.
- Vultures SOAR high in the sky during the summer months in Oklahoma.

YOU CRACK ME UP!

As migration approached, two elderly vultures doubted they could make the trip south, so they decided to go by airplane.

When they checked their baggage the attendant noticed that they were carrying two dead raccoons. "Do you wish to check the raccoons through as luggage?" she asked. "No, thanks," replied the vultures. "They're carrion."



The Sutton Center's Black Vulture, Lola, is 18 years old and started out her career at Six Flags Marine World in Vallejo, California. She came to live with us in 2005.

Black Vulture: There are two types of vultures in North America; the turkey vulture and the black vulture. The black vulture has a black head, and the turkey vulture has a red head. The turkey vulture is very common in Oklahoma, especially during the summer. The black vulture is not as common and a little bit smaller, weighing 4-5 pounds and has a 5 foot wingspan; the turkey vulture has a 5½ foot wingspan. They usually live about 5 years in the wild, but can live over 20 years in captivity. They eat carrion, or dead animals. As that carrion lies in the hot Oklahoma sun, it will start to rot and expel a very strong odor. Turkey vultures rely heavily on their sense of smell to find food. Black vultures have a less highly developed sense of smell than turkey vultures, so they soar high in the sky and keep an eye on the lower-soaring turkey vultures. When the turkey vultures descend for a meal, the black vultures follow. The vultures aren't picky and will eat pretty much anything that is dead. They are one of nature's important recyclers and are very helpful in decreasing the spread of disease. Vultures are very beneficial and beautiful in their own way.



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Cox Media Group, National Fish and Wildlife Foundation, Harold & Sandy Price, The University of Oklahoma, Wild Brew attendees 2014.

Memorials and Honoraria

In honor of Ellen Adelson: David & Carol Adelson. In honor of Gary & Judy Bryant: the Carlson Family. In honor of Lee Holcombe's birthday: Frederick & Janet Drummond. In memory of Lambert Hollinga: Carl & Nan Reinking. In honor of Penny Williams: Margaret French.



Sutton Center's Recent Publications



Elmore D, **Wolfe DH**, and Allen K. (2014) Impacts of lead ammunition and sinkers on wildlife. Oklahoma Cooperative Extension Service NREM-9015-2. 4pp.

Grzybowski JA, Cox JA, Fazio VW III, Gall BL, Husak MS, Loyd MJ, **Reinking DL**. (2014) Oklahoma Bird Records Committee Date Guide to the Occurrence of Birds in Oklahoma. 6th edition. Published by the Oklahoma Ornithological Society. 44pp.

Sutton Center's Recent Presentations

Larsson LC. (2014) Bald eagle nest monitoring in Oklahoma. Oklahoma Environmental Education Expo, 7 Feb.



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