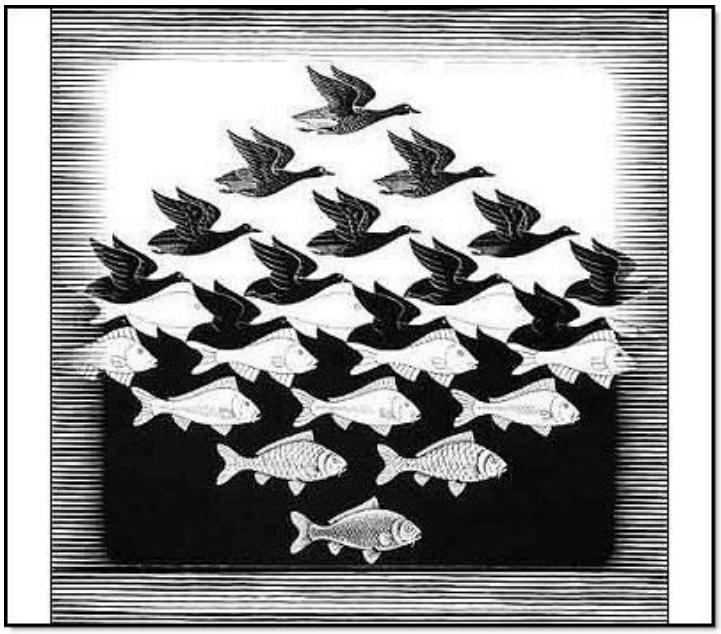
2017 Joint Conferences of the Wisconsin Chapters of the



American Fisheries Society & The Wildlife Society

Wildlife Society Presentation
Full Abstracts

Abstracts - Wed. WCTWS Breakout Sessions (alphabetical by presenter's last name)

Samantha Asper*[1] and Christine Ribic[2]

[1]University of Wisconsin-Madison, Agroecology Program
[2]U.S. Geological Survey, Wisconsin Cooperative Wildlife Research Unit
*Graduate student

Grassland bird species abundance on grazed and non-grazed lands at Buena Vista Wildlife Area, WI

Buena Vista Wildlife Area has mainly been managed for Greater Prairie Chicken (Tympanuchus cupido) habitat, but grassland bird species of management concern also use the Wildlife Area. Grazing is used as a supplement to burning to provide disturbance to reduce woody brush. There are currently two grazing regimes used at Buena Vista: continuous and managed intensive rotational grazing (MIRG). This study presents preliminary data to understand how grassland birds respond to the two grazing regimes.

We used two survey methods to collect data on grassland birds and Great Prairie Chicken. Grassland bird data were collected using 4 rounds of point counts, between mid-May and June of 2016. All birds seen or heard were recorded in 2-minute intervals over a 10 minute period. Greater Prairie Chickens were counted using an experimental procedure of a modified spot-mapping method, to record bird locations. Vegetation-height density measurements were taken to assess vegetation structure and compare habitat among grazing regimes and non-grazed fields.

Preliminary results suggest that there are differences in grassland bird species abundance among the grazing regimes and the non-grazed fields. The experimental prairie chicken method produced varying results. This project is part of a larger research project entitled "Grazing Public Lands: Opportunities and Challenges."

Brooke L. Berger* [1], Greg Gerstenberg [2], Daniel Barton [1] and Richard N. Brown [1]

[1]Department of Wildlife, Humboldt State University, St. Arcata, CA
[2]California Department of Fish and Wildlife, Central Region, Fresno, CA
*Graduate student

Exotic Lice Impacts on Fawn Survival and Hair Loss Syndrome Prevalence

Mule deer populations are declining in portions of California and in Tuolumne County, California mule deer (Odocoileus hemionus californicus) health is of particular concern to managers. Fawns wintering at Jawbone Ridge have been observed with hair loss syndrome (HLS) since 2009 and carry two species of exotic lice that may be linked to the incidence of HLS. Our goals were to 1) determine the prevalence of exotic lice and HLS in fawns, 2) experimentally test if ectoparasite abundance is associated with incidence of HLS, 3) determine how exotic lice influence fawn survival to the age of recruitment. Over three winters 126 fawns were captured and marked, and a subset treated with antiparasitic drugs. During 2010, 2011, and 2012, exotic lice were found on 79 (63%) fawns and 18 (14%) fawns were resighted with HLS in February-May. For every unit increase in the ln(ectoparasite abundance), the probability of hair loss increased by a factor of 1.97. None of the recaptured fawns with HLS had lice and HLS was not found to increase mortality. For every unit increase in ln(ectoparasite abundance) fawn mortality probability increased by a factor of 1.3. We conclude that hair loss does not appear to be an immediate threat to fawn survival in the study area and is unlikely to be a primary cause of population declines. However, lice may pose a greater threat than previously thought, and though widespread treatment of deer for lice is impractical, continued monitoring of exotic lice is warranted in this deer herd.

Adam L. Brandt

Division of Natural Sciences, St. Norbert College, De Pere, Wisconsin

Mitogenomic sequences support a north-south subspecies subdivision within Solenodon paradoxus

Solenodons are insectivores found only in Hispaniola and Cuba, with a Mesozoic divergence date versus extant mainland mammals. Solenodons are the oldest lineage of living eutherian mammal for which a mitogenome sequence has not been reported. We determined complete mitogenome sequences for six Hispaniolan solenodons (Solenodon paradoxus) using next generation sequencing. The solenodon mitogenomes were 16,454-16,457 bp long and carried the expected repertoire of genes. A mitogenomic phylogeny confirmed the basal position of solenodons relative to shrews and moles, with solenodon mitogenomes estimated to have diverged from those of other mammals ca. 78 Mya. Control region sequences of solenodons from the northern (n=3) and southern (n=5) Dominican Republic grouped separately in a network, with FST = 0.72 (p=0.036) between north and south. This regional genetic divergence supports previous morphological and genetic reports recognizing northern (S. p. paradoxus) and southern (S. p. woodi) subspecies in need of separate conservation and management plans. This work includes an additional 15 co-authors from 11 institutions in four different countries.

Shanell Budleski* [1], **Haylee Stangler*** [1], Emma Doden [2], Christiaan Winterbach [3], Scott Hygnstrom [2], Jason Riddle [1], Rob Thomson [3], Gail Potgieter [3] and Hanlie Winterbach [3]

[1]University of Wisconsin-Stevens Point, College of Natural Resources
[2]University of Wisconsin-Stevens Point, College of Natural Resources, Wisconsin Center for Wildlife
[3]Tau Consultants
*Undergraduate student

Prey Density and Biomass of Natural Prey Within the Kavango-Zambezi Transfrontier Conservation Area for the Habitat Suitability of Large Carnivores in Western Ngamiland, Botswana, Africa

Western Ngamiland in Botswana, Africa is a very dry and deserted area which has not had many wildlife surveys conducted. There are a plethora of livestock and wilderness areas that are important for maintaining connective ty between portions of the Kavango-Zambezi Transfrontier Conservation Area. If the amount of natural prey in the study area are feasible for large carnivores survival, then they should avoid livestock, reducing predation. The purpose of this study is to estimate the biomass (in Large Stock Units) of natural prey in Western Ngamiland, which was broken down into six agricultural and conservation zones, to determine habitat suitability in the study area for African lion (Panthera leo), leopard (Panthera pardus), spotted hyena (Crocuta crocuta), African wild dog (Lycaon pictus), and cheetah (Acinonyx jubatus). We conducted 1,872.22 kilometers of transect counts by vehicle from June through late August of 2016 to assess the biomass of eleven prey species, ranging in size from steenbok (Raphicerus campestris) to giraffe (Giraffa camelopardalis). Each spoor (track) that was fresh within twenty-four hours of the prey we came across on the transects were recorded on a software called “CyberTracker”. Using this data, we were able to assess the prey density and biomass for the large carnivores within the agriculture and conservation zones. Smaller prey species seemed to be killed more by leopard and cheetah within the zones, while larger prey species were preyed more by spotted hyena, lion, and wild dog. Since spotted hyenas and wild dogs hunt within a group, it is easier to survive on a single, larger prey. Prey density and biomass between the conservation and agriculture zones varied with each carnivore depending on their home range and habitat suitability from the prey available.

BJ Byers*[1] and Christine A. Ribic[2]

[1]Department of Forest and Wildlife Ecology, University of Wisconsin, Madison
[2]U.S. Geological Survey, Wisconsin Cooperative Wildlife Research Unit,
Department of Forest and Wildlife Ecology, University of Wisconsin, Madison
*Graduate student

Grassland bird response to annual herbaceous biomass harvest on the Leopold Wetland Management District, Wisconsin.

The Leopold Wetland Management District (LWMD) manages over 13,300 acres of federally owned Waterfowl Production Areas (WPA) in Wisconsin. Fire is the preferred habitat management tool, however LWMD is unable to apply prescribed fire at the scale and frequency desired. Therefore the Leopold District is exploring other management tools such as haying. Our project evaluated the responses of grassland birds to annual fall haying as a management tool compared with current management practices. Focal bird species were Grasshopper Sparrow (short-grass species), Bobolink (mid-grass), Eastern Meadowlark (mid-grass), and Henslow's Sparrow (tall-grass). Twelve WPAs were used with 6 randomly chosen for annual fall harvests. Data were collected pre-harvest (2012) and post-harvest (2013-2015). Point count surveys were conducted during the breeding season (mid-May-July). Vegetation structure within fields was measured, specifically vegetation-height density and litter depth. We found that vegetation height density was not affected by the fall harvest, while litter depth was lower on harvested sites. Three of the 4 bird species responded to the treatment with Grasshopper Sparrows densities increasing on harvested sites and Henslow's Sparrows and Bobolinks densities decreasing. Annual fall haying appears to create conditions more favorable to grassland bird species which prefer short grass and less litter cover for breeding.

Christine M. Anhalt-Depies[1], **John D. J. Clare***[1], Timothy R. Van Deelen[1], Philip A. Townsend[1], Benjamin Zuckerberg[1], and Jennifer L. Stenglein[2]

[1]University of Wisconsin-Madison, Department of Forest and Wildlife Ecology
[2]Wisconsin Department of Natural Resources
*Graduate student

Validation of crowdsourced trail camera image classifications

Citizen science is increasingly used to address ecological questions over broad spatial and temporal scales. Despite the advantages of citizen science, there are persistent concerns regarding the quality of biological data collected by volunteers. The goal of our study was to illustrate the potential of crowdsourcing for classifying trail camera data collected by citizen scientists. We evaluate how reliably volunteers classify 1) a species within an image sequence, 2) count the number of organisms within an image sequence, and 3) differentiate between juvenile and adult individuals. To evaluate accuracy, we utilized a dataset (consisting of 11,487 image sequences) classified by both users at Zooniverse (www.Zooniverse.org) and by expert reviewers at WDNR. Expert and crowdsourced classifications generally agreed (92% of crowdsourced classifications concurred with expert species and total animal count), although the probability of agreement between experts and citizen-scientists varied depending upon the species photographed, time of year, time of day, and metrics associated with local camera placement. Our results suggest that crowdsourcing is a valid means of classifying data from camera trap surveys, and we present additional strategies for improving data quality and identifying potential limitations for ecological inference.

Michaela Fisher*, Kara Winter, Jordyn O'Gara and Erik R. Olson

Northland College, 1411 Ellis Avenue, Ashland, Wisconsin
*Undergraduate student

Limitations of gray fox (Urocyon cinereoargenteus) scansorial behavior

Gray foxes (Urocyon cinereoargenteus) are one of two canid species that are capable of climbing trees. Researchers have hypothesized that gray fox climb for food acquisition, predator avoidance, or denning. However, to our knowledge, no one has yet attempted to quantify gray fox scansorial behavior. In the fall of 2014, we initiated a study to quantify the limitations of gray fox climbing ability. Using baited trail cameras from twenty five study sites in Northern Wisconsin, we observed gray fox climbing on 18 separate occasions and we obtained a series of observations from a captive gray fox at the Wildwood Zoo in Marshfield, WI. We used logistic regression to compare tree and site characteristics of climbing events to those where the fox did not climb. We assessed the effects of tree diameter, height of bait, tree limb structure, and bark texture on gray fox climbing ability. We observed gray fox climbing trees up to 5 m and climbing trees with diameters ranging from 14 to 34 cm. Our observations revealed that gray foxes can climb a variety of tree species and both clean bowled and densely limbed trees. We observed gray fox kits climbing trees without bait and two separate gray foxes climbing the same tree simultaneously. Using our data and the observations of others we examined the three hypotheses for gray fox scansorial behavior. Understanding gray fox scansorial behavior can help us better understand this common, yet elusive species.

Elaine Gallenberg*[1], Paula Anich[1], Nicholas Anich[2] and Ryan Brady[2]

[1]Northland College
[2]Wisconsin Department of Natural Resources
*Undergraduate student

Comparison of Point Counts and Citizen Science Data from the Wisconsin Breeding Bird Atlas

The Wisconsin Breeding Bird Atlas II (WBBA II) is an ongoing comprehensive field effort to document the abundance and distribution of birds breeding in Wisconsin to be used for management and conservation purposes. This study compared two of the WBBA II's methods for collecting information on bird presence: citizen science data and standard roadside point counts. These techniques have known strengths and weaknesses and the potential to provide different kinds of information on the breeding birds of the state. We calculated the frequency of each bird species' occurrence in point counts conducted from May 24th through July 7th of 2016 (n=4,038) and in the WBBA II ebird data from May 24th through July 7th of 2015 and 2016 (n=15,295). We then compared the frequencies of species' occurrence in both data sets. This comparison provided valuable information about the ability of these methods to detect certain types of birds. The WBBA II detected more species of ducks, shorebirds, and nocturnal species as well as more rare breeding species. The point counts detected fewer bird species overall, but had higher frequencies of some very common species including the American Crow and American Robin. The point counts had a more even distribution of sampling locations than the WBBA II observations and will be useful in creating accurate species abundance maps. Taken together, the two datasets were largely concordant and provided valuable information about breeding bird abundance and distribution in the state.

Erin Grossman[1] and **Bill Kolodziej**[2]

[1]Wisconsin Department of Natural Resources, Bancroft, WI
[2]Sandstone Ranch/Marathon CO CPZ

Benefits of Managed Grazing to Grassland Habitat

Erin Grossman, WDNR Wildlife Technician and William Kolodziej rancher/grazing specialist will begin their 3rd field season of a 5 year project to utilize rotational grazing to improve wildlife habitat on the Buena Vista Wildlife Area in Central Wisconsin. The project area consists of 320 acres in the central sands. This grazing regime is utilizing cow/calf pairs to apply grazing pressure with varying intensities for vegetation management to improve grassland wildlife habitat. The project goals include; reduce the DNR's use of chemical and mechanical treatments, increase vegetation species diversity, increase diversity of vegetation structure, control livestock parasites organically allowing for increased bugs for wildlife, raise healthy cattle, and build partnerships between the DNR and agricultural community. In addition in 2016 we started some inter-seeding test plots to introduce native grass species and legumes.

This project is designed to meet the grassland management objectives set by land managers, while not reducing cattle performance, which we have been able to accomplish. Results have been very promising for the cattle and wildlife. The cattle are being trained to eat thistle, spiraea, willow and aspen while keeping weight gain at or above industry standards while observations of grassland wildlife have increased.

Michael A. Hardy*[1], Matthew S. Broadway[2], Scott D. Hull[3], Jason D. Riddle[4] and Benjamin Zuckerberg[1]

[1]Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, Madison, WI
[2]Indiana Department of Natural Resources, Bloomington, IN
[3]Bureau of Science Services, Wisconsin Department of Natural Resources, Madison, WI
[4]College of Natural Resources, University of Wisconsin-Stevens Point, Stevens Point, WI
*Graduate student

The Effects of Land Cover and Habitat Management on Vital Rates of Greater Prairie-Chickens in Central Wisconsin

In Wisconsin, Greater Prairie-Chickens (GPC) have experienced a long-term population decline and a significant range contraction coincident with extensive conversion of grassland habitat to other land uses. Until recently, however, the effects of land use change and habitat management on GPC vital rates in Wisconsin have remained largely unexplored. Consequently, we used demographic data collected from 2007-2015 to characterize the effects of 12 land cover types and 10 management practices on the survival rates of nests (N=192), broods (N=23), and hens (N=189) at three core sites in central Wisconsin. Nest survival increased with the amount of shrub and tree removal conducted during the previous year but was negatively associated with high-intensity grazing. Hen survival also increased with shrub and tree removal during the previous year but decreased in areas with development and herbicide spraying. Brood survival was higher in areas with greater amounts of small grain cover, and responded positively to conventional grazing and mowing or prescribed burning during the previous year. Tree cover has increased substantially at all three sites in recent decades whereas small grain cover has been stable or declining. Moreover, prescribed burning has declined considerably and spraying has increased at two of the three sites. Management actions aimed at limiting encroachment of trees, shrubs, and development could have substantial benefits for GPC, particularly if these cover types are converted to small grain production. Prescribed fire and conventional grazing can also be valuable tools for GPC conservation, but intensive grazing and excessive herbicide application should be avoided.

Emily E. Iehl*[1], Keith Warnke[2] and Timothy R. Van Deelen[1]

[1]University of Wisconsin-Madison
[2]Wisconsin Department of Natural Resources
*Graduate student

Modeling retention rates of Learn to Hunt participants in Wisconsin

In hopes of slowing nation-wide declines in hunter numbers, Wisconsin and other state agencies have implemented "Learn to Hunt" programs. These programs aim to increase hunter numbers by recruiting and training people with no prior hunting experience. While children fall into this category, evaluators have criticized the program for catering to the children of hunters, who would likely learn to hunt from their parents regardless of their participation in LTH. As a result, recent hunter recruitment, retention, and reactivation (HR3) efforts have shifted focus from short-term, youth-recruitment LTH programs to extended adult-recruitment-and-retention LTH programs. We will evaluate these programs by modeling the retention rates of novice youth and adult Learn to Hunt participants and comparing them to control groups who have not participated in LTH. These estimates will guide Wisconsin's HR3 programming in the future and cast light on the changing demographics of wildlife stakeholders.

Jessica Jaworski*[1], Shelli Dubay[1] and Brad Strobel[2]

[1]College of Natural Resources, University of Wisconsin - Stevens Point, Stevens Point, WI
[2]United States Fish and Wildlife Service, Necedah National Wildlife Refuge Necedah Wisconsin
*Graduate student

Comparing Incubation Behavior of Nesting Cranes During Black Fly Parasitism.

Blood-feeding black flies (family Simuliidae) serve as vectors for parasites, bacteria, and viruses in wild and domestic birds. Approximately 37% of black fly species that occur in North America are ornithophilic, and can serve as stressors at nests of common loons, great-horned owls, and purple martins, among others. Black flies may be contributing to low nest success of the reintroduced Eastern Migratory Population of federally endangered whooping cranes (Grus americana) nesting at Necedah National Wildlife Refuge in central Wisconsin because emergence of black flies at NNWR coincides with whooping crane incubation. Observations from several video surveillance cameras placed near nests have identified that whooping cranes exposed to black flies exhibit head rubs and bill flicks; behaviors indicative of black fly parasitism and nest desertion coincides with black fly emergence. The Eastern Population (EP) of sandhill cranes (Grus canadensis) are ecologically similar to whooping cranes and nest in close proximity to whooping cranes on and around NNWR. Sandhill cranes in the EP experience an annual population growth of 3.9% and appear to be reproducing despite black fly parasitism at NNWR. Our objective was to compare incubation behavior between sandhill cranes and whooping cranes during incubation by installing camera traps at active nests. Cameras took a photo every 5 minutes and remained at nests until nests failed or were successful (defined as one egg hatching in a nest). We quantified the percent time nesting cranes spent exhibiting various incubation and black fly avoidance behaviors and ran a discriminant function analysis to compare incubation behaviors by species and fate of nest. Our data suggest that behavior indicative of black fly emergence was more prevalent at failed whooping crane nests. Possible management strategies to reduce black fly harassment during incubation and potentially increase nest success will be discussed.

Bijit Khadka* and Dr. Erik R. Olson

Northland College
*Undergraduate student

Wild Madeline: Assessing species diversity and abundance on Madeline Island

Madeline Island is the largest island of the Apostle Islands archipelago located in Lake Superior near the Bayfield Peninsula of northern Wisconsin. To date, there is a lack of baseline data regarding wildlife diversity and abundance on Madeline Island. As a part of a larger wildlife monitoring effort within the Apostle Islands National Lakeshore, we are systematically surveying the wildlife of Madeline Island using camera traps. We will document wildlife diversity and abundance on the island. To better understand how island size, distance to the mainland, habitat composition, connectivity, and human activity influence wildlife diversity and abundance we will compare our data to data from other islands of the island archipelago.

Allie K. Kohler*[1], Mary R. Sellars[1], Charlotte R. Catalano[1], Thomas C. Doolittle[2] and Erik R. Olson[1]

[1]Northland College, Ashland, Wisconsin, USA
[2]United States Forest Service.
*Undergraduate student

Effects of land management type on American kestrel (Falco sparverius) occupancy and recruitment

The American kestrel (Falco sparverius) is the smallest falcon species in North America. F. sparverius has experienced drastic population declines in recent decades, although the reasons for the decline are unknown. To examine the effects of land cover characteristics on F. sparverius nest box occupancy and recruitment, we installed 50 nest boxes on private agricultural lands (n=20) and public lands within the Moquah Barrens of the Chequamegon-Nicolet National Forest (n=30). The national F. sparverius nest box occupancy in 2016 was 37.7% based on American Kestrel Partnership data. The nest box occupancy for this project in 2016 was 69.2%. Nestling survival was relatively high for all nest boxes in our study area, but was slightly higher for nest boxes on public managed lands than those on private agricultural lands. We observed substantial variation in the sex ratio of nestlings (20 males, 34 females in 2016). We aim to examine the effect of land cover composition on nest box occupancy and success across multiple spatial scales. We will also be monitoring nest box temperature and nesting F. sparverius behavior to determine the effects on nest success and sex ratios. The project will provide valuable insights into the factors influencing F. sparverius nest box occupancy and nest success.

Rachel Konkle*[1], Matthew Broadway[1], Jason Riddle[1], Scott Hull[2], Michael Hardy[3] and Benjamin Zuckerberg[3]

[1]College of Natural Resources, University of Wisconsin – Stevens Point, Stevens Point, WI
[2]Wisconsin Department of Natural Resources, Madison, WI
[3]Department of Forest and Wildlife Ecology, University of Wisconsin-Madison, Madison, WI
*Undergraduate student

Determining the Temporal Ecology and Predation of Greater Prairie-Chicken Nests

Nest failure is a limiting factor for many avian populations. Hence, it is important for researchers to understand the causes of nest failure. Predation is a major cause of nest failure, and recent studies have found different predator taxa may depredate nests at certain times of the day. For example, birds typically depredate nests diurnally while mammals tend to depredate nests during crepuscular and nighttime hours. Therefore, the timing of nest failure could identify possible nest predator taxa. Analyzing the temporal and spatial disparities in nest failure times may further determine differences in predator taxa. We collected nest failure times and determined predation classes (e.g., mammalian, avian, or other) of 30 greater prairie-chicken (Tympanuchus cupido) nests in Buena Vista (BV) and Paul J. Olson (PJO) Wildlife Areas in Wisconsin (April-July of 2014 and 2015). We then used circular statistics to compare failure times between years (2014 and 2015) and study areas (BV and PJO). Our results found no significant difference in failure times between years, but a significant difference in failure times between study areas. BV had a mean failure time of 03:13 with a moderately low concentration of failure times in both crepuscular/nighttime and daytime hours, which means disparate predator taxa could have contributed to nest failures. PJO had a mean failure time of 00:39 with a high concentration of mostly crepuscular/nighttime depredations, which may indicate mammals are the primary depredators. These differing results may be due to landscape differences within the two study areas.

Madison M. Laughlin*, Dr. Erik R. Olson and Jonathan G. Martin

Northland College, Ashland, Wisconsin
*Undergraduate student

Arboreal camera trapping provides insight into the extent of canopy-use of Hyla versicolor and Peromyscus spp.

The extent of arboreal habitat-use is poorly understood for many arboreal species due to canopy-access limitations. Using single-rope climbing techniques we accessed the canopies of super-canopy (>24m, with crowns extending above the main dominant canopy layer) old and large (>100yrs, >70 cm DBH) Pinus strobus (white pine) in northern Wisconsin, USA. We installed camera traps at various heights (low, ~10m; mid, ~15m; upper, ≥20m) along the stem. Our camera trap images provide evidence of Hyla versicolor (eastern gray tree frog) and Peromyscus spp. (deer mouse) at heights up to 20.5m, the highest recorded height above ground previously documented for either species. Camera trap data indicates that both species likely use the arboreal habitat of these trees more regularly than previously thought. All images captured of H. versicolor were triggered by the presence of Glaucomys volans (southern flying squirrel), suggesting that H. versicolor has a lower probability of being detected by the camera trap on its own because it is a small ectotherm. The co-occurrence of H. versicolor and G. volans raises interesting questions about the ecological interactions between these two species. On the other hand, the relative frequency of observations across all three study sites for Peromyscus spp. suggests that this species commonly uses the upper canopies of super canopy white pines. Why this species frequents these heights is a question worth further examination. These observations are significant in developing a more comprehensive understanding of arboreal habitat use for both H. versicolor and Peromyscus spp.

Robert C. Lonsinger[1] and Lisette P. Waits[2]

[1]University of Wisconsin-Stevens Point, College of Natural Resources
[2]University of Idaho, College of Natural Resources

Coupling noninvasive genetic sampling with capture-recapture and occupancy analyses to facilitate multi-species monitoring of sympatric carnivores

Resource managers worldwide are challenged to monitor elusive wildlife. Still, the status of many species remains unclear, in part, due to the difficulty in developing cost-effective monitoring programs. One approach that has seen increased use is noninvasive genetic sampling (NGS). When employed in an appropriate spatio-temporal design, NGS can be combined with capture-recapture (NGS-CR) and occupancy modeling (NGS-OM) analyses to accurately and efficiently evaluate populations of management interest. We demonstrated the application of NGS to investigate two sympatric carnivores, coyotes (Canis latrans) and kit foxes (Vulpes macrotis), in the Great Basin Desert. In deserts, free-standing water was historically scarce, limiting the distribution of large-bodied predators and offering refugia for smaller, arid adapted species (e.g. kit foxes). At our study site, it has been suggested that the development of artificial water sources facilitated an increase in coyote distribution and abundance, to the detriment of kit foxes. We employed field-based sampling that facilitated multi-species monitoring, and concurrently generated likelihood-based estimates of density and evaluated spatial dynamics via NGS-CR and NGS-OM analyses, respectively. Coyote (0.07/km2) and kit fox (0.02/km2) density estimates were among the lowest reported for either species. Equilibrium occupancy estimates were comparable to observed occupancy, suggesting these species have likely reached stable co-existence. Kit foxes occupied habitats that minimized overlap with coyotes at broad scales, but utilized areas with greater coyote activity at finer scales, presumably balancing predation risk and prey acquisition. Collectively, our results demonstrate that NGS can effectively facilitate multi-species monitoring and ecological investigations to inform resource management actions.

Marcus Mueller*, David Drake and Max Allen

University of Wisconsin-Madison, Department of Forest and Wildlife Ecology
*Graduate student

Space use and interactions between red foxes and coyotes in Madison, WI

Red foxes and coyotes have been intensively studied in rural environments, but until recently, have not been rigorously researched in urban areas. In rural landscapes, coyotes spatially exclude red foxes, but their spatial patterns and interactions in urban areas are not as well understood. Effective management of these species requires an understanding of how urbanization affects the ecology of wild urban canids.

From January 2015 to December 2016, we captured, radio-collared, and tracked 10 red foxes and 11 coyotes in Madison, WI. Preliminary results suggest that mean coyote home range size is larger than mean red fox home range size, although it appears that there is a great deal of individual variation within species. Within our study area, coyote home ranges were composed of a higher percentage of natural areas when compared to red fox home ranges. Conversely, red fox home ranges were composed of proportionally more developed landscapes when compared to coyote home ranges. Both coyote and red fox activity appeared to be largely nocturnal, but may vary by the individual's location. Our radio location data suggested that red foxes and coyotes spatially separated themselves on the urban landscape. The exact mechanism for this separation remains undetermined, but should be the subject of further research. However, we also have evidence of spatial and temporal overlap, suggesting co-existence between red foxes and coyotes in our study area. Understanding urban canid distribution and space use will better inform wildlife managers in developed areas and promote positive co-existence between these urban canids and humans.

Marcus Mueller*, David Drake and Max Allen

University of Wisconsin-Madison, Department of Forest and Wildlife Ecology
*Graduate student

Using citizen-science to inform urban canid management in Madison, WI

Urban landscapes have diverse stakeholders with a wide range of attitudes and opinions towards wildlife. This presents urban wildlife managers with unique challenges, especially when it comes to charismatic wildlife species. Wild urban canids—especially coyotes—have been the subject of much interest throughout North America in recent years. Our research aimed to validate and equip urban wildlife managers with a novel strategy to both inform management decisions and engage stakeholders.

In 2015, we used iNaturalist to collect citizen-generated location data for red foxes and coyotes in Madison, WI. We concurrently captured, radio-collared, and tracked 9 red foxes and 11 coyotes in the same area and over the same period of time. We compared both iNaturalist and radio-telemetry locations to identify how well iNaturalist locations overlapped with known canid locations to identify factors that led to a positive relationship between the two inherently different location-data sets. We had nearly 600 unique individuals report almost 900 red fox and coyote observations. Preliminary results suggest that roughly 30% of our radio-location data overlapped with iNaturalist observations for both red fox and coyote. Greatest overlap between iNaturalist and radio-location data for both foxes and coyotes occurred in areas with high-human density; conversely, there was minimal overlap in natural areas. Despite our radio-location data that indicated greatest canid activity occurred during nocturnal periods, most iNaturalist observations were recorded during crepuscular hours. In addition to location data, we asked observers to report additional information like distance to observed animal and canid's reaction upon seeing observer. This data was used to better understand the interaction between the observer and observed canid.

iNaturalist reports appear to show where humans most often interact with red foxes and coyotes, rather than the true ranges of these species. Understanding this relationship may inform how iNaturalist can be used as an urban wildlife management tool. Recognizing factors that may lead to human-canid interactions could be important to managers interested in proactively avoiding conflict with wild urban canids.

Erik R Olson[12] and Adrian P Wydeven[2]

[1]Natural Resources Department, Northland College
[2]Timber Wolf Alliance, Sigurd Olson Environmental Institute, Northland College

Opinions of the Wisconsin Chapter of The Wildlife Society regarding the Wisconsin Department of Natural Resources wolf population management goal options.

With federal delisting of Wisconsin wolves impending, the Wisconsin Department of Natural Resources (DNR) will likely soon be revisiting the wolf population goal options previously identified during the development of a new wolf management plan. The DNR identified four potential population goals for wolves in the state: 350 +/- 10%, 650 +/-10%, 300-650, and 350 minimum. The Timber Wolf Alliance, an organization that supports the scientific management of wolves, surveyed the opinions of state wildlife professionals on the quality these four wolf population goals. We generated an online survey and distributed it via the Wisconsin Chapter of The Wildlife Society email listserv. We present the preliminary results of the survey (n=100) and explain our intended use of the data.

Meghan Pluemer*[1], Marcus Mueller[2], David Drake[2], Shelli Dubay[1] and Shawn Crimmins[1]

[1]College of Natural Resources, University of Wisconsin - Stevens Point, Stevens Point, WI
[2]Department of Forest and Wildlife Ecology, University of Wisconsin - Madison, Madison, WI
*Undergraduate Student

Canine heartworm infection in urban coyotes and red foxes in Madison, Wisconsin.

Red fox and coyotes are habitat generalists existing in sizeable and increasing populations within urban areas in North America. In urban areas, interactions between wild canids and domestic pets can promote direct and indirect disease transmission across species but little is known about how urbanization influences wildlife disease transmission. In 2014, the UW Urban Canid Project began investigating the health of coyotes and red fox in Madison, WI. Our objective was to identify the prevalence of canine heartworm in urban coyotes and red fox to determine if specific habitat characteristics explain the presence or absence of heartworm. Canine heartworm (Dirofilaria immitis), a parasite transmitted by mosquitoes, produces respiratory symptoms and pulmonary hypertension in domestic dogs, but can also infect coyotes and red foxes. We hypothesized that coyotes would have a higher prevalence of canine heartworm than red foxes because coyotes concentrate their time in natural areas in the urban landscape where more mosquito habitat is present. No foxes were infected, while all infected coyotes inhabited the University of Wisconsin Arboretum, a 1,300 acre natural area. Infected coyotes avoided developed areas and selected for woody wetland land cover within the study area, suggesting that habitat for the mosquito vector influences infection status for coyotes. Foxes, on the other hand, selected for developed habitats where mosquitoes lack the wetland habitat to thrive and mosquito control methods reduce the abundance of the vector, therefore possibly reducing the prevalence of canine heartworm.

Brian Russart and Julia Robson

Milwaukee County Department of Parks, Recreation & Culture

Implementing an Effective Citizen-based Monitoring Program to Inform Wildlife and Habitat Management in the Milwaukee County Park System.

The Milwaukee County Park's Natural Areas Program is a creative use of partnerships that engages Wisconsin's largest community through the science and beauty of restoration ecology. The Milwaukee County Park System has 9,200 acres of natural areas. These resources include upland and bottomland forest, fens, oak savanna, remnant wet-mesic prairie, shrub carrs, open marsh, lagoons, pollinator gardens, and surrogate grasslands. These are natural resources that have been historically molded by the influences of a great lake, Wisconsin's ecological tension zone, and over 150 years of settlement. In 2015, the Parks Department formalized its first ever citizen-based wildlife monitoring program in order to assist the Department's natural areas managers in better understanding the occurrence, distribution, and overall status of wildlife populations in Milwaukee County. This Citizen-based Wildlife Monitoring Program assists our natural areas managers in allocating habitat management resources and planning future restoration projects. Data collected by Natural Areas staff and Citizen Scientists is crucial in helping to make sure that common species remain common, and that rare, threatened, and endangered species are protected and properly managed for within the Park System.

Jeremiah Shrovnal*, Dr. Robert Howe, Dr. Erin Wolf, Erin Giese

University of Wisconsin - Green Bay
*Undergraduate

Bat diversity and abundance in the coastal zone of lower Green Bay, Lake Michigan.

Bats play a vital role in many ecosystems, consuming enough insects to save farmers and foresters billions of dollars annually in costs of pest control and improved productivity. In eastern North America, a devastating exotic fungus (Pseudogymnoascus destructans) that infects hibernating bats was first documented in upstate New York during the 2006 winter. The infection, known as white-nose syndrome, has resulted in up to 100% mortality in some bat hibernacula in eastern North America. Over the past decade, the fungus has rapidly and aggressively expanded westward, first documented in Wisconsin during the winter of 2014. Because of the threat of white-nose syndrome, most of Wisconsin's bats have already been added to the state's threatened species list (Eptesicus fuscus, Perimyotis subflavus, Myotis lucifugus, and Myotis septentrionalis) or watch list (Lasionycteris noctivagans, Lasiurus borealis, and Lasiurus cinereus). During summer 2016 we used an Anabat Walkabout detector to conduct nocturnal acoustic surveys near the shores of northeastern Wisconsin's Lower Green Bay and Fox River Area of Concern (AOC), an area that is potentially critical for both migratory and resident bats. The software program Analook was used to identify species by their sonogram signatures. Results provide baseline information on the bat abundance, species richness, and community composition of bats, and will help identify critical habitats for bat conservation in this and other nearshore areas in the Great Lakes.

Jennifer Summers*[1], Dr. Chris Yahnke[1], Dr. Timothy Van Deelen[2], J. Paul White[3] and Heather Kaarakka[3]

[1]University of Wisconsin-Stevens Point
[2]University of Wisconsin-Madison
[3]Wisconsin Department of Natural Resources
*Graduate student

The Influence of Mining Activity on a Hibernating Bat Population in Wisconsin

Bats are known to arouse from hibernation due to disturbances. Frequent arousal from hibernation can cause mortality in bats due to increased energetic costs, especially to bats infected with the deadly fungal disease, White-Nose Syndrome (WNS). An active mine in northwest Wisconsin, uncontaminated with the WNS causing fungus, hosts over 52,000 hibernating bats of four species in an inactive portion of the mine. It is unknown if mining activity (i.e. blasting) causes a disturbance and arouses hibernating bats. We are analyzing environmental and acoustic bat data collected at the mine in northwest Wisconsin by the Wisconsin Bat Program within the Natural Heritage Bureau at the Wisconsin Department of Natural Resources (WDNR). We are examining the relationship between mining activity and bat arousal, using echolocation calls as a measure of arousal. We are determining the relationship between amount of explosives used per blasting event and bat activity. We are also investigating the influence of environmental conditions including temperature, relative humidity, and pressure, within the mine on bat distributions and activity. Results from this study may influence management decisions regarding this bat population, especially considering the threat of White Nose Syndrome.

Julie Van Stappen

National Park Service, Apostle Islands National Lakeshore, Bayfield, WI

Deer Management at Apostle Islands National Lakeshore – a success story and future direction

Deer management within the park is complex. The park's 21 islands have a diverse deer history. A few islands were not historically impacted by browsing and contain rare forest communities dominated by Canada yew (Taxus Canadensis), a species nearly extirpated on the mainland. Hunting is allowed within the park's enabling legislation and deer management is closely coordinated with both the State and local tribes. Beginning in the late 1990's on Sand and early 2000's on York Islands, deer numbers skyrocketed, resulting in severe impacts on Canada yew and other species. Consistent with the park's Wildlife Management Plan, the park implemented aggressive culling activity to reduce the numbers of deer on these islands. Various techniques were used including: State hunting; National Park Service cullers; volunteer cullers; and APHIS-Wildlife Services marksmen. This paper will discuss the park's approach to this difficult and complex natural resource issue, lessons learned, current survey results, and future direction.

Dawson Weik*, Raymond Yunk*, Ashley Pankratz*, Kalvin Tank*, Ethan Weber*, Hunter Minnema*, Mason Palesh* and Paula Zwicke

Class ACT Charter School, Chequamegon School District, Park Falls, WI
*High school student

Tracy Lake Ruffed Grouse & Woodcock Habitat Project

In 2014 we, a team of Class ACT Charter School students, started a research project called the Tracy Lake Ruffed Grouse & Woodcock Habitat Project. The goal of our project is to improve the habitat and management of Ruffed Grouse at our school forest, commonly called Tracy Lake. So far we have made changes to the property by planting trees, shrubs, clover, and oats in order to provide winter food sources for the birds. We have also trapped and collared six grouse that we are tracking with telemetry equipment. The data we collect from tracking will provide information on the habitat the grouse prefer as the seasons change. Throughout our project we have collaborated with experts, Scott Walter from The Ruffed Grouse Society and Matt Schultz with the Ashland County Forestry. We have also received funding through a Ruffed Grouse Society grant and from our school district. The next phase of our project will include developing American woodcock habitat management. In particular, because of the declining population of woodcock due to a lack of suitable habitat, we intend to create forest disturbance areas in numerous transition zones on the property. The Tracy Lake Ruffed Grouse & Woodcock Habitat Project is beneficial because it allows us to learn science and wildlife sustainability in a real-world application, where we can directly impact conservation and wildlife management.

Michael Wheeler*[1], Travis Bartnick[2], Shawn Crimmins[3], Regan Dohm[1], Bryn Evans[1], Emily Iehl[1], Marcus Mueller[1], Erik Olson[4], Kenneth Pemble[2], Brittany Peterson[1], Timothy Van Deelen[1] and Julie Van Stappen[2]

[1]University of Wisconsin-Madison
[2]National Park Service
[3]University of Wisconsin-Stevens Point
[4]Northland College
*Graduate student

Community structure, detection probabilities, and relative abundances of carnivores in the Apostle Islands National Lakeshore, USA.

Mammals move between islands within archipelagos by swimming long distances or crossing ice bridges in winter. Declines in the formation of ice on Lake Superior foreshadow changes in the population dynamics of species inhabiting this Great Lake's island archipelagos. While Isle Royale presents a classic model of predator-prey island biogeography theory, few studies examine the effects of climate change on island communities of large mammals in the upper Great Lakes region. We initiated a long-term camera trap study in the Apostle Islands National Lakeshore (APIS) in order to investigate the implications of declining ice cover on a large mammal community. At the outset, we deployed camera traps in September 2014 to inventory the mammal species on Stockton Island. After detecting the presence of Wisconsin's only state endangered mammal, the American marten (Martes americana), our focus expanded to deployment and maintenance of camera traps on additional islands throughout the APIS. This study presents preliminary data on the mammalian carnivore populations of the APIS from 2014-2016. We tested how distance from mainland, island size, island habitat, human activity, and the presence of competing predator species influenced the distribution of mammalian carnivore species. The resultant data shed light on the structure of communities present in the archipelago and how they may be affected by island biogeography, as well as impending climate change.

Mike Wheeler*[1], Tim Van Deelen[1] and Jeb Barzen[2]

[1]University of Wisconsin, Madison
[2]International Crane Foundation
*Graduate student

Modeling transition rates of sandhill cranes using a multi-state model and estimating stage-specific elasticities

Long-term trends in Midwestern sandhill crane populations indicate positive growth despite much yearly variability, and continued monitoring will be required for effective management. This study is being conducted to explore relationships between life-history stage and recruitment in sandhill crane populations, as well as to estimate the size of the study population. Since 1990, the International Crane Foundation (Baraboo, Wisconsin) has collected long-term re-sightings data on territorial and non-territorial sandhill cranes in southcentral Wisconsin. We used these data in a multi-state model to estimate survival and state-transition probabilities of different demographic groups. Results suggest high annual survival rates (~90%) and low annual rates of territory acquisition or loss (~5). Stage-specific elasticities were calculated from mark-resight transition rates. Preliminary results suggest that survival of territorial adults and their continued tenure on territory have appreciable effects on growth rate – hence availability of suitable territories may regulate growth rates. Consequently, management of crane populations in the Midwest may depend on creating habitats that support territory establishment.

Though this research is most relevant to crane management in Wisconsin, the information from these models is transferable. Many aspects of sandhill crane biology are shared with the other 14 crane species, many of which are threatened or endangered. The model's information regarding territoriality dynamics could also be applied to other long-lived, territorial species such as swans and geese; this last premise is even more applicable to management of game species.

Beth Wojcik*[1], Daniel J. Storm[2] and Timothy R. Van Deelen[1]

[1]Department of Forest and Wildlife Ecology, University of Wisconsin – Madison
[2]Wisconsin Department of Natural Resources, Madison, Wisconsin
*Graduate student

Deer recruitment in Wisconsin: new estimation methods

As the product of reproduction and neonate survival, white-tailed deer (Odocoileus virginianus) recruitment is the most variable component of deer herds. This variability applies both spatially and temporally as numerous density dependent and independent factors affecting recruitment change in relation to ecological location, predation risk, and hunter harvests. Thus, it is important to monitor year-year changes of this metric. Traditional methods for measuring deer recruitment involve herd composition counts from roadside surveys. The opportunistic and convenient nature of this method has likely resulted in small sample sizes and biased estimates. Our goal is to investigate new methods of surveying deer which may provide improved reliability and precision. Research will occur during August and September of 2016 and 2017 in 12 counties representing 4 regions (Northern Forest, Central Forest, Central Farmland, and Southern Farmland) of Wisconsin. We standardized roadside surveys by establishing routes, training observers, and creating procedural protocols. Influence of habitat type, survey time, weather, and deer behavior on detection, sample size, and precision will be examined. Standardized roadside surveys in areas with good visibility and high deer populations (woodlots intermixed with hay/alfalfa/soybean fields) resulted in many deer observations, but few deer were observed in habitats with poor visibility from roadsides and low deer populations (heavily forested and corn-dominated landscapes). Methods providing improved estimates of recruitment will allow wildlife managers to better compare spatial and temporal differences of recruitment, monitor recruitment trends, and model population

Daniel Wolcott*[1], Christine Ribic[2], Rosalind Renfrew[3] and David Sample[4]

[1]Department of Forest and Wildlife Ecology, University of Wisconsin-Madison
[2]US Geological Survey, Wisconsin Cooperative Wildlife Research Unit
[3]Vermont Center for Ecostudies
[4]Wisconsin Department of Natural Resources
*Postdoctoral research associate

Potential impacts of Wisconsin public land management on grassland bird productivity

Grassland birds use disturbance-adapted habitats that have evolved with fire and grazing. In many grassland landscapes, habitat alterations have interfered with these natural processes, therefore, managers must design programs to mimic natural disturbances to achieve desired results. Timing of management programs can have important effects on grassland management and these dates often overlap the grassland bird nesting season. We used 20 years of grassland bird nesting data from Wisconsin (2,252 nests) to determine the potential impact of disturbances on bird productivity. Specifically, we compared the potential losses of grassland bird nests and fledglings for dates used during early-season burning and late-season mowing on Wisconsin public lands. Disturbance dates considered for prescribed fire and mowing ranged from 15 April–15 May and 20 July –31 August, respectively. When considering nestlings, prescribed fire and mowing could potentially impact 11% and 16%, respectively, of all nestlings, however, the proportion of nests impacted varied widely between species. For example, prescribed fire could potentially impact 48% of Upland Sandpiper nests and mowing could potentially impact 47% of Dickcissel nests. When considering fledglings, prescribed fire and mowing could potentially impact 0% and 36% of all nest-dependent fledglings, respectively. This varied by species with as much as 92% of Dickcissel fledglings potentially impacted by mowing. Current recommendations for restricting disturbance on grasslands appear to limit potential nest mortality, however, if late-season disturbances increase, these timelines may need to be reassessed to consider fledglings (which are dependent on parents for 2-3 weeks post-fledging) to protect overall bird productivity.

Lisa Zoromski*[1], Dr. Cady Sartini[1] and Robert Hanson[2]

[1]University of Wisconsin - Stevens Point, Stevens Point, WI
[2]Wisconsin Department of Natural Resources, Wildlife Management, Grantsburg, WI
*Undergraduate student

Effects of distance from water control structures on furbearer occupancy on track plates in Crex Meadows Wildlife Area, Grantsburg, Wisconsin

Non-invasive sampling techniques may be impacted by site-specific variables such as prey availability. Track plates with the aid of lure or bait are relatively inexpensive and a commonly used non-invasive technique for sampling furbearers. Aquatic prey of many furbearers appear to congregate around water control structures, making these structures attractive areas to sample furbearer populations through non-invasive means. The purpose of this study was to compare furbearer occupancy at varying distances from water control structures at four wetland flowages at Crex Meadows Wildlife Area in Grantsburg, Wisconsin. Chalked track plates with lure were placed along the dikes in 50-m increments up to 250-m away from water control structures. Track identification with plate distance from structures was recorded each morning from July 1-11, 2016. Chalk and lure were reapplied daily after each plate check. This sampling technique was shown as a simple and effective way of detecting furbearer tracks, with 13 plates visited, mainly by raccoon (Pryocyon lotor). We predicted that across the four flowages, track plates closer to structures will show higher occupancy of furbearers. Data were analyzed with AIC models, and showed a negative track plate occupancy trend as distance to water control structures increased. Understanding site-specific factors that impact detection can help improve non-invasive sampling techniques, such as track plate placement from water control structures.

Abstracts - Thur. WCTWS Breakout Sessions (alphabetical by presenter's last name)

Ben Beardmore, Bob Holsman, Brian Dhuey and Dan Storm

Wisconsin Department of Natural Resources

Assessing compliance with electronic deer harvest registration

Wisconsin eliminated mandatory in-person deer registration stations in 2015, and moved to online or phone-in harvest registration instead. Because data from mandatory check stations has historically served as the back-bone for deer population estimates, verifying that hunters were participating in the system became essential for continuing these efforts. Drawing insights from research on socially undesirable behaviors, we developed and tested a novel questionnaire design that would allow us to measure compliance rates within the deer hunter population without individuals having to implicate themselves as having failed to register a deer. Results of the study indicated acceptable rates of compliance in the first year of E-registration and were consistent with comparisons of registration data with hunter reports of deer harvests on surveys. This approach holds promise for using surveys to capture noncompliance rates on a whole suite of behaviors in the future.

Kay Brockman-Mederas

Bureau of Wildlife Management, Wisconsin Department of Natural Resources

Riparian Management & Species Considerations in the Lower Wolf River Bottomlands

The Lower Wolf River Bottomlands Natural Resources Area master plan and environmental assessment was approved by the Natural Resources Board in September 2012, after a feasibility study was approved in 2002. The Wolf and its tributaries have the largest, most intact floodplain in eastern Wisconsin. The corridor of habitat is important for movement of populations and genetic material in a landscape increasingly dominated by human impacts. Management of the riparian habitat along the Wolf, Embarrass, Shioc, Little Wolf, Waupaca, Rat Rivers, plus creeks and tributaries of this landscape scale project takes into consideration many aspects of its terrestrial and aquatic features. The extensive tracts of floodplain forest will be the focus of this presentation, covering forestry, fisheries, wildlife, endangered resources and recreation.

Catherine C. Dennison, Nicholas Forman, Timothy M. Watson and Nathan M. Roberts, PhD

Wisconsin Department of Natural Resources

Bobcat home range size, home range overlap, and habitat utilization in Northern Wisconsin

Bobcats (lynx rufus) are an important carnivore in Wisconsin; providing ecological benefits as well as sustainable consumptive use opportunities for hunters and trappers. However, there are still key uncertainties regarding the status and habits of bobcats within the state. From October 2014 through January 2017 we fit bobcats in Northern Wisconsin with GPS collars programmed to record two to six locations per day. We monitored 51 bobcats (26 male, 25 female) for an average of 170 days. We calculated home ranges with kernel density estimation using plug-in bandwidths. Average adult 95% home range size was 52.9 km2 (n = 33). The average male home range (55.8 km2, n = 17) was slightly larger than the average female home range (49.9 km2, n = 16). The home ranges of 22 bobcats overlapped with the home range of at least one other active bobcat during monitoring. One adult female bobcat's home range overlapped with that of 5 other bobcats. We observed 20 total occurrences of home range overlap. Half of these occurrences (n = 10) were home ranges of adult females overlapping with those of adult males, 15% were home range overlap between two females (n = 3), 10% were home range overlap between two males (n = 2) and the remainder (25%, n = 4) were overlap between home ranges of juveniles or between home ranges of juveniles and adults. A better understanding of bobcat space and habitat use in Northern Wisconsin will aid managers in refining population estimates, and continuing to sustainably manage bobcats.

Susan Frett, Jennifer Stenglein, Christina Locke, Joe Dittrich, Dan Storm and Kevin Wallenfang

Wisconsin Department of Natural Resources

Using Cameras and Volunteers to Monitor Elk Reintroduction in Wisconsin

The Snapshot Wisconsin Elk Monitoring Project is a volunteer based wildlife monitoring project using trail cameras which is focused on monitoring the areas where elk have been reintroduced in Wisconsin. The goals of the project are to provide a more cost efficient and long-term method of measuring calf survival, bull:cow ratios, and other herd aspects to inform annual population estimates as well as to involve the public in the monitoring effort. Two camera grids were setup during the summer of 2015 by WDNR, Ho-Chunk Nation DNR, Jackson County Forest and Parks and the US Forest Service. The launch of Snapshot Wisconsin in Spring 2016 provided the infrastructure to turn the camera monitoring effort over to volunteers in the Summer of 2016. Volunteer recruitment efforts were extremely successful due to the support of elk reintroduction partner, the Rocky Mountain Elk Foundation. We currently have 72 volunteers monitoring over 300 cameras between the two areas with most volunteers monitoring 4 cameras each. We will share some initial results that we have been able to gather from the photo data as well as successes and challenges that we have experienced developing this volunteer based project. Finally, we will discuss next steps for the project.

Eric Fromm[1], Rick Engeman[2], Brad Koele[3], Dave Ruid[1] and Robert Willging[1]

[1]USDA-Wildlife Services, Rhinelander, WI
[2]USDA-Wildlife Services, National Wildlife Research Center, Fort Collins, CO
[3]Wisconsin Department of Natural Resources, Wildlife Management, Woodruff, WI

Trends in Wolf/Livestock Conflicts in Wisconsin: Does the Federal Status of Wolves Affect Rates of Conflicts?

Gray wolves (Canis lupus) have recolonized most of the suitable habitat in the Western Great Lakes Distinct Population Segment which includes Minnesota, Wisconsin, Michigan, and portions of adjacent states. There has been a concomitant increase in wolf/livestock conflicts in Wisconsin with the growth of the wolf population since 1995. Successful litigation by organizations remanded the 2012 final rule that delisted gray wolves and reinstated Endangered Species Act (ESA) protections in December 2014. Depredation management options are constrained by ESA protections. We highlight some non-lethal techniques and efficacy of these techniques to mitigate wolf livestock conflicts. We compared rates of conflicts between periods of ESA protection (2009 – 2011, 2015) and state management (2012 – 2014). The average number of confirmed/probable wolf conflicts per year (2009 – 2011) during ESA protection was 105 compared to 82 during state management. The number of livestock farms with confirmed/probable depredations averaged 39 per year during ESA protection compared to 27 per year under state management. The average number of cattle depredated by wolves per year was 60 under ESA protection compared to 40 per year during state management. The number of complaints, farms with depredations, and cattle depredated by wolves increased from 2014 to 2015 when wolves were relisted as an endangered species. During periods of state management, the number of confirmed/probable wolf complaints, farms with verified depredations, and cattle depredated by wolves declined compared to periods of ESA protection. An integrated program using a combination of non-lethal and lethal strategies has had the greatest effect on reducing wolf/livestock conflicts in Wisconsin.

Robert H. Holsman, Jordan B. Petchenik and Ben Beardmore

Wisconsin Department of Natural Resources

Funding our Work: What the Public Thinks

The Wisconsin Department of Natural Resources, like its counterparts in most states, relies heavily on state hunting and angling license fees and federal excise taxes to fund management and conservation of species and their habitats, especially work done on state-owned properties. These revenues have not kept pace with rising costs and expanded responsibilities. Current and anticipated declines in the sale of hunting licenses and flat sales of fishing licenses are expected to exacerbate this problem. We measured attitudes of Wisconsin residents for changes in the current funding model through two separate surveys during the spring and summer of 2016. We found support throughout the state for the notion of shifting from a user-pay model to one built more on broad based funding. We also measured support for specific funding strategies like raising license fees or adding fees to access state wildlife, fishery, and natural areas. Support for specific fee increases differed among users groups. This presentation will highlight the key findings from that survey work.

Shari Koslowsky

Department of Natural Resources – Bureau of Natural Heritage Conservation

Building a conservation plan that's relevant: Wisconsin's Wildlife Action Plan

All states and territories have developed State Wildlife Action Plans (SWAPs) to receive funds through the federal State Wildlife Grants Program. SWAPs provide information and strategies for species and habitats most in need of conservation. Keeping these plans, which are entering their second decade, current and relevant is challenging. Wisconsin's second SWAP reduced species of greatest conservation need (SGCN) from 682 to 417, more accurately defining some as species with information needs (SINS). Association ranks were assigned to combinations of 417 species, 108 natural communities and 16 ecological landscapes. Habitat loss and fragmentation, water quality/quantity and invasive species are primary stressors, but are now exacerbated by changing precipitation and temperature patterns. Conservation actions like citizen-based monitoring, integrated pest management and partnerships on working landscapes are crucial additions to traditional preservation and management of resources on public lands. Databases and search tools help strengthen the links between issues, actions and outcomes. In this presentation, these results and their potential application to conservation decisions are shared along with a tour of the recently-updated WWAP web pages.

Eva Lewandowski, PhD

Wisconsin Department of Natural Resources

The Wisconsin Citizen-based Monitoring Network: A resource for studying and managing wildlife

The Wisconsin Citizen-based Monitoring Network is a collaboration of citizen science volunteers, professional scientists, educators, land managers, and others working together to improve volunteer monitoring of natural resources in the state. Wisconsin has over 180 citizen-based monitoring projects and organizations that collect long-term data on subjects ranging from water quality to white-tailed deer abundance to frog and toad distributions. To support these efforts, the Wisconsin Citizen-based Monitoring Network offers funding, equipment lending programs, technical advice, communication resources and more. This talk will discuss the wide array of citizen-based monitoring projects involved in the Network and how they benefit wildlife science, management, and conservation. Learn how you can participate as a volunteer, scientist, or manager.

Christina Locke, Susan Frett, Jennifer Stenglein

Wisconsin Department of Natural Resources, Office of Applied Science

Snapshot Wisconsin: Updates from our first year of volunteer-based wildlife monitoring with trail cameras

Snapshot Wisconsin is a volunteer-based, statewide trail camera project to monitor wildlife populations on behalf of the Wisconsin Department of Natural Resources. We currently have >350 volunteers monitoring > 550 cameras, as well as >3500 volunteers classifying photos on our crowdsourcing site. The question facing us now is: how can we use volunteer-collected data from trail cameras to estimate important wildlife population metrics? Using photo data from our first year on the ground, we demonstrate how this project allows us to estimate fawn-to-doe ratios, map species range distributions, and chart seasonal and daily animal patterns. We explain the unique challenges in working with volunteer-collected trail camera data – e.g., classification accuracy, inflated counts, and volunteer retention—and how to address those challenges. Finally, we expand on the directions we hope to take these data in the future and how they might inform broader research goals and wildlife management decision-making.

Colleen Sutheimer, Nathan Holoubek and Jed Meunier

Wisconsin Department of Natural Resources

Relating Fire Intensity to its Impacts on Woody Vegetation in Southern Wisconsin

In an analysis of prescribed burn evaluations and burn coordinator surveys, managers throughout Wisconsin identified woody vegetation control as their primary objective. Knowing this, we set out to determine how fire intensity effects woody vegetation in spring burns. Study sites were located within state owned lands throughout southwestern and southcentral Wisconsin. Within 10 sites, temperature loggers were deployed the day of the burn to record temperature and residence time of passing flames. Impacts on woody vegetation were measured through stem counts by size class and species within a 2-meter radius of each logger before and after prescribed burning (n =210). The most prevalent brush species at our sites were sumac (Rhus spp.), buckthorn (Rhamnus spp.), dogwood (Cornus spp.), honeysuckle (Lonicera spp.), and black cherry (Prunus serotina). Maximum temperature and residence time (total number of seconds temperature > 60°C) were binned into quartiles creating fire intensity designations of low, medium low, medium high, and high. We compared these designations to changes in counts of large stems (1 to 5 cm diameter) and small sized re-sprouts (<1 cm diameter) within our 2-meter radius plots to determine how intensity relates to top kill and subsequent re-sprouting. Preliminary results demonstrated higher intensity fires produce increased top kill and reduce re-sprouting, whereas low intensities may produce limited top -kill yet stimulate vigorous re-sprouting. Continued research will determine if prescribed burning is achieving management objectives given different weather and site conditions, as well as how prescribed burns may be optimized to effectively meet brush control objectives.

Kelly VanBeek

US Fish and Wildlife Service

I Want YOU To Apply For The Wildlife Society's Leadership Institute!

The Wildlife Society's Leadership Institute (LI) has been in existence since 2006. Designed to prepare the next generation of leaders in the wildlife profession, LI selects 10-15 TWS members each year to participate in an approximately 6 month program in leadership development. A series of independent activities and group discussions aimed at challenging the participant's view of what constitutes "leadership" along with self-reflection are undertaken prior to the course's culmination at the TWS Annual Meeting. A variety of activities including assigned mentors from both LI Alumni and current TWS Council members, conducting an interview with someone viewed as a key contributor to our profession, and a unique opportunity to present ideas and concerns at the conference Council meetings provide significant networking possibilities that can only enhance a participant's skillset. Kelly will recap her reflections on her time as a 2015 LI participant, future directions of the program, and why it's important for Wisconsin Chapter Members to consider participation in future years.

Keith Warnke

Wisconsin Department of Natural Resources - Bureau of Law Enforcement, Hunting and Shooting Sports Specialist

Recruiting, retaining, and reactivating (R3) hunters, anglers, and trappers. What R3 is and the urgency of now

Fish and wildlife conservation in North America has been accomplished largely through a user-pays system in which hunting and angling license fees and excise taxes on equipment are one critical funding source for scientific management. Participation in hunting has been declining in Wisconsin for the past decade. Wildlife and fisheries professionals and partners must realize the impact of reduced participation and apply the scientific method to develop tools to effectively reduce or reverse the decline. License fees and excise taxes will continue to provide primary funding for conservation in the future; hence maintaining a positive hunting brand and strong participation must be a priority. DNR's strategic alignment resulted in integration and consolidation of hunter, angler, and trapper recruitment, retention, and reactivation (R3) efforts in an R3 unit. This new alignment will facilitate strategic program development, implementation, and evaluation resulting in adaptive, effective programming. Alignment will also create a pathway for workload reduction if commitment to ineffective strategies is curtailed. But R3 success can only be accomplished through an approach that acknowledges and champions the importance of strategic programming in cooperation with partners. One first step is communication and marketing to reach professionals and partners convincing them of the urgency of now. Then we must work to expand recognition of that urgency and follow up with strategic programming.

Henri Woods

USDA-Wildlife Service, Milwaukee, WI

How GIS Technology is Used to Manage Wildlife at General Mitchell International Airport (GMIA)

One component of the FAA regulations for certificated airports is to manage wildlife hazards. By utilizing GIS and GPS mobile mapping techniques when collecting field data, we are able to better understand, and manage our wildlife hazards. The goal of our geospatial technology is to create a thorough record of our wildlife management activities and to show the FAA inspectors steps we take to meet our FAA requirements. In addition to using the geospatial data for annual FAA inspections, viewing our wildlife management activities layered over the airport aerial photo gives us the ability to show different airport departments where our efforts are most used or needed.

We collect data using laptops or tablets and asset management software, in our vehicles, as we patrol the airport property. As we patrol the property, we geocode all active harassment and lethal management activities to address hazards created by wildlife in the airport environment. In addition to active management, we also document and geocode passive management such as use of traps (set, checked, unset, removed), effigies (set, removed), decoys (set, removed), exclusion installation, etc. We also geocode wildlife strikes with aircraft and include a layer with free hand coyote evasion paths.

Adrian P. Wydeven

Timber Wolf Alliance, Sigurd Olson Environmental Institute, Northland College, Ashland, WI

Timber Wolf Alliance 1987-2017, 30 years of educating about wolves

The Timber Wolf Alliance (TWA) was established in 1987 to help promote education about wolves while the Wisconsin DNR was establishing a wolf recovery plan for the state. The recovery plan passed in 1989 had public education as a major strategy for recovering wolves in the state. In 1990, TWA and Wisconsin DNR initiated Wolf Awareness week in October and distributed educational wolf posters across the state. Wolf Awareness Week has since grown to a national event. In the early 1990s as wolves recolonized the UP of Michigan, TWA expanded its efforts to that state. In the late 1990s as recovery goals for Michigan and Wisconsin were achieved, educational focus have shifted to promoting wolf-human co-existence and encouraging sound science in setting wolf management policies and plans. Along with giving talks, providing workshops, and various educational materials, TWA serves on the state advisory committees in both Wisconsin and Michigan, being the main wolf education group on these boards. Recently TWA explored potential goals for the state of Wisconsin with members of the Wisconsin Chapter of TWS. In the future will continue to do surveys to promote wolf conservation, work with tribes on wolf issues, and promote science and education in new state wolf plans.

Seth Zesiger[1], Alec Sundelius[1], Nathan Roberts[2], Dave Ruid[1] and Robert Willging[1]

[1]USDA-Wildlife Services, Rhinelander, WI
[2]Wisconsin Department of Natural Resources, Rhinelander, WI

Evaluation of Body-grip Trap Trigger Placement to Reduce Captures of Incidental Otters while Conducting Beaver Damage Management

The unintentional capture of otters (Lontra canadensis) while conducting beaver (Castor canadensis) damage management is a concern for wildlife managers. A field evaluation was conducted in 2015 and 2016 in Wisconsin to assess the effectiveness of two different trigger placement configurations (off-set and centered) in reducing captures of incidental otter during beaver damage management efforts using body-grip traps. USDA-Wildlife Services personnel used 330 sized body-grip traps equipped with identical triggers and alternated trigger positions between trapping sets during beaver removal operations. There were 103 and 116 beavers captured in traps with off-set triggers and traps with triggers placed in the center, respectively. There were 8 otters captured in traps with each trigger placement configuration. There was no difference ($\alpha = 0.05$, $p = 0.70$) in overall captures for any species between the two trigger placement configurations. Trap jaw strike locations on beaver differed between trigger placement ($\alpha = 0.05$, $p = 0.01$). More beavers were captured by both jaws and by the lumbar vertebrae region in traps with off-set triggers. Traps with triggers placed in the center had more cervical vertebrae strikes. There was no difference in the duration required to capture beavers between trigger placement configurations ($\alpha = 0.05$, $p = 0.20$). Our results indicate that trigger placement does not reduce the capture rate of incidental otters and reduces the efficiency of body-grip traps for beavers.