ANNUAL REPORT OF THE MAFWA TECHNICAL WORKING GROUP ON CONSERVATION SOCIAL SCIENCE/HUMAN DIMENSIONS: 2023

Meeting Time and Place – The Conservation Social Science/Human Dimensions Technical Working Group (CSS/HD TWG) has identified a quarterly meeting schedule.

- The first meeting of the CSS/HD TWG was held virtually on December 9th, 2022.

- The CSS/HD TWG organized a special symposium at the Midwest Fish and Wildlife Conference in Overland Park, KS in February, 2023. A subset of the committee participated in oral presentations and a brainstorming activity intended to inform a workplan for the CSS/HD TWG. Committee members present at the meeting also attended a group dinner.

- A second meeting was held virtually May 12, 2023

- In addition to the quarterly meetings of the CSS/HD TWG, an executive committee of the chair, vice-chair and two at large members have met on an ad hoc basis to further current action initiatives.

Attendance –

- At this time, 12/16 MAFWA states or provinces have a confirmed appointee to the CSS/HD TWG. Representatives have not been appointed from IN, ND, SD, or MB. Appendix A. contains a list of current appointees by state/province.

- Our current distribution list of appointees and parties interested in the work of the CSS/HD TWG contains 63 individuals, all of whom are invited to attend quarterly meetings and other organized activities.

Executive Summary – The CSS/HD TWG is in its first years as an organized technical working group. Since forming we have accomplished several tasks:

- Importantly, no infrastructure existed to organize Midwest social scientists and practitioners prior to the formation of the CSS/HD TWG. We have begun to develop a network of colleagues who will work to accomplish the goals articulated in the group's organizing framework, among others. Participants in CSS/HD TWG activities thus far represent the diversity of roles related to the conduct and translation of social science including university faculty, state, federal and provincial agency scientists and engagement specialists, among others.

- We have secured formal appointments from 75% of MAFWA member institutions (12/16), reflecting the growing importance of social science in the management of fish and wildlife regionally.

- We organized a two-day special symposium at the Midwest Fish and Wildlife Conference comprised of 14 research talks and a facilitated brainstorming activity. Attendance at this symposium was high, and the talks generated great discussion between state and provincial scientists and practitioners, NGO staff, and academics working in the CSS/HD space. Appendix B contains a summary of the presentations made at the symposia.

- We have established a subcommittee to conduct a needs assessment of MAWFA member institutions on topics pertaining to the goals articulated in the CSS/HD TWG organizing

framework. This subcommittee has met several times and should have a draft instrument for distribution to the community in the next quarter.

- We also held a facilitated discussion as part of the special symposia at the Midwest Fish and Wildlife Conference to begin to elicit needs from the community.

- We intend the results of this effort to inform a work plan for the CSS/HD TWG. Under each goal we intend to develop strategies and performance indicators to document efforts toward goals.

Director Action Items –

- If Directors from SD, ND, IN, or MB wish to appoint a member to the CSS/HD TWG, please email Adam Landon: Adam.Landon@state.mn.us.

- There was discussion of the structure of the multistate grant program at the May 12, 2023 meeting. Several concerns and recommendation were raised by appointees and community members. These included:
  - The 1 year timeline for the execution of projects funded under the multistate grant program is very short and may limit the development of social science proposals from state agency employees and university faculty. Agency staff in the human dimensions realm are often planning several years in advance for studies given limited staffing and high demand for data from decision makers. University faculty rely on graduate students to conduct studies, and the one-year timeline is insufficient length to recruit students and may only cover a portion of their program.
  - Members raised concerns about the lack of coordination with states on proposals that would conduct surveys of hunters and anglers within their jurisdictions. A recommendation was made to consider the support of states included in proposals as criteria for funding; potentially as a letter of support to accompany a full proposal.

Director Information Items –

- The CSS/HD TWG revised the goals originally stated in the organizing framework to improve clarity and the development of specific strategies and action initiatives. Appendix C contains a summary of the original and revised goals as presented to the CSS/HD TWG for approval. Approval occurred prior to the May 12, 2023 meeting.

Time and Place of Next Meeting - A virtual meeting will occur in the summer of 2023 at a date TBD.

Appendices –

Appendix A. contains a list of appointees to the CSS/HD TWG by MAFWA member states and provinces as of the time of this report.

Appendix B. contains a summary of presentations given at the symposia organized by the CSS/HD TWG at the Midwest Fish and Wildlife Conference in Overland Park, KS February 2023. Includes the PowerPoint presented by Adam Landon to kickoff the event and introduce the CSS/HD TWG to the Midwest community.

Appendix C. contains a copy of the original goals in the CSS/HD TWG organizing document, and revisions. Appointees voted to approve revisions prior to May 12, 2023 meeting.

Appendix A.

State/Province	Name
IL	Craig Miller (INHS)
IN	
IA	Peter Fritzell
KS	Tom Bidrowski
KY	Brian Clark
MI	Emily Pomeranz
MN	Adam Landon
MO	Ellie Prentice
NE	Jeffrey Lusk
OH	Abby Rhoedbeck
ND	
SD	
WI	Ben Beardmore
ON	Shannon Fera
MB	
SK	Alisson Henderson

Appendix B.

Overview of Midwest Symposia, and presentation

2023 Midwest Fish & Wildlife Conference – Overland Park, Kansas

The State of the Art of Conservation Social Science/Human Dimensions in the Midwest: Symposium Overview

Tuesday 2/14 Part 1: 10:20am– 12pm

Moderator: Adam Landon

1. Symposium Introduction

- **Speaker**: Adam Landon, Conservation Social Scientist, MN DNR
- **Organizers**: Adam Landon, Conservation Social Scientist, MN DNR, Emily Pomeranz, Human Dimensions Research Specialist, Michigan Department of Natural Resources; Kiandra Rajala, Regional Social Scientist, U.S. Fish and Wildlife Service.
- **Abstract**: The conservation and management of fish and wildlife resources is a dynamic interplay between people and nature. State and federal agencies, academia, tribal governments, and conservation institutions are placing increasing emphasis on the 'people' component of that equation. This is evidenced by many new staff positions dedicated to the conservation social sciences in the Midwest region. Responding to this need, the Midwest Association of Fish and Wildlife Agencies (MAFWA) has established a technical working group of conservation social scientists and practitioners. This symposium will serve to 1) introduce this new group to the broader Midwest conservation community; 2) showcase the state of the art in conservation social science research; and 3) provide a forum for the exchange of ideas on how social science can address conservation challenges in the region, and opportunities for collaboration and coordination across boundaries. We anticipate this symposium will fill one day and consist of 50% original research presentations open to submission from members of the Midwest fish and wildlife community on the topic of conservation social science, and 50% open forum and facilitated discussion regarding the new MAFWA technical working group and conservation social science challenges and opportunities.

2. Enhancing Relevancy and Engaging Support from a Broader Constituency: Insights from a Midwestern Wildlife Viewing Survey

- **Speaker**: Jared Emmack, Indiana Department of Natural Resources
- **Authors:** Dr. Ashley Dayer, Virginia Tech; Emily Sinkular, Virginia Tech; Cynthia Osmundson, Minnesota Department of Natural Resources; Kelsey Jennings, Virginia Tech; P. Christy Pototsky, Virginia Tech
- **Abstract:** Wildlife viewing (intentionally observing, feeding, or photographing wildlife) is one of the fastest growing outdoor recreation activities in the United States, with significant implications for the work of state fish and wildlife agencies, especially given stable or declining rates of participation in hunting and angling in the Midwest. Through a project supported by a 2021 Multistate Conservation Grant, researchers at Virginia Tech collaborated with the AFWA Wildlife Viewing and Nature Tourism Working Group and state agencies nationwide to increase knowledge of wildlife viewers with a survey in the region (n = 1,004) and nationally (n = 4,030) focused on how wildlife viewers can better support and be supported by wildlife agencies.

Wildlife viewers in the Midwest most commonly view birds (81%) and most frequently engage in wildlife viewing at their own home or property (77%), followed by state-managed areas (54%). Just under half of all wildlife viewers in the Midwest are consumptive viewers, meaning that they participate in hunting and/or angling in addition to wildlife viewing. These consumptive viewers indicated higher familiarity and experience with their state agencies than their nonconsumptive (i.e., only viewers) counterparts, highlighting an excellent opportunity for state agencies to increase their relevancy with a broader constituency. Roughly of a quarter of both nonconsumptive and consumptive viewers indicated they believe their state agencies weren't prioritizing wildlife viewing enough. This presentation will share survey findings further characterizing Midwestern wildlife viewers, draw comparisons with other AFWA regions, and identify five key approaches agencies in the Midwest can utilize to increase their relevancy: 1) develop programs for and engage with wildlife viewers; 2) broaden constituency of wildlife viewers not currently engaged with agencies, including nonconsumptive and marginalized viewers; 3) develop opportunities for viewers to financially support agencies; 4) support agencies in implementing results; and 5) conduct future research.

3. Using computational approaches to better understand human behaviors in the natural resources

- **Speaker:** Christopher Chizinski, University of Nebraska-Lincoln, Associate Professor of Human Dimensions of Wildlife Management

- **Authors:** Christopher Chizinski, School of Natural Resources, University of Nebraska-Lincoln; Matthew Gruntorad, School of Natural Resources, University of Nebraska-Lincoln; Katherine Graham, School of Natural Resources, University of Nebraska-Lincoln; Sarah Ulrichsen, School of Natural Resources, University of Nebraska-Lincoln

- **Abstract:** Over the past couple of decades, vast repositories of data have been generated as a byproduct of the digitization of social, economic, political, and cultural activities of people. The wealth of this 'revealed' data (often in real time and at an individual level) has provided a means to track trends, make predictions, and inform management decisions concerning human behavior like no other time in human history. Computational human dimensions (or conservation social sciences) combines concepts and practices from computer science, data science, and the traditional social sciences to leverage vast amounts of data and address issues and questions that occur at the interface between biota, habitat, and human users. We provide examples of how computational approaches can provide insight into human dimensions questions using data generated through the purchase of hunting, fishing, and park permits, as well as from posts on social media sites. Using these examples, we highlight the strengths and weaknesses of computational approaches as compared to traditional approaches in addressing human dimensions questions and inquiries. Ultimately, we provide best practices that natural resources scientists and managers may follow to enhance investigations of key human dimensions questions.

4. Intersection of Economic and Human Dimensions Data in Natural Resources Policy and Planning

- **Speaker:** Craig Miller University of Illinois, Research Program Leader, Illinois Natural History Survey

- **Authors:** Craig A. Miller, Illinois Natural History Survey, University of Illinois

- **Abstract**: We often consider economic contributions primarily from the perspective of license and permit sales by hunters, anglers, and other consumptive and nonconsumptive recreationists. Economic spending also impacts regional, state, and local economies. Conservation spending creates jobs, contributes to tax bases, and maintains both small and large businesses. Economic research typically examines spending and economic impacts as stand-alone studies. In this presentation, we will explore the intersection of economic studies and human dimensions research to provide a more holistic understanding of the application of this approach to natural resources policy and planning.

  We conducted a multiphase study of monetary spending among waterfowl, deer, and spring Snow Goose hunters in Illinois during 2020. Hunters were sampled based on permit or stamp purchases, and in the case of spring Snow Goose hunters, response to the prior year's Harvest Information Program (HIP) registration. Selected hunters were asked to record their spending for pre-determined industry sectors for both durable goods and trip-related expenditures using a log mailed them prior to the start of the respective seasons. Following the close of the respective season for which they were sampled, hunters were mailed a harvest survey that included questionnaire items examining satisfaction, preferences for management options (e.g., season dates, harvest alternatives, etc.), and a section wherein respondents provided spending totals for each spending category. We then entered spending data into IMPLAN for Illinois state and county level economic comparisons. IMPLAN results were then used as independent variables for various attitudinal comparisons across the three hunter strata.

  Employing this method allows for conceptualizing the role spending and monetary investments play in attitudes and preferences among stakeholders. Discussion for this presentation will focus on the value of this approach for wildlife management policy and decision making.

5. Integrating Wetland Conservation Efforts into Multiple Plans: Case Study for Nebraska

- **Speaker:** Zhenghong Tang University of Nebraska-Lincoln, Professor

- **Authors:** Zhenghong Tang, University of Nebraska-Lincoln Ligang Zhang, University of Nebraska-Lincoln Qiao Hu, University of Nebraska-Lincoln

- **Abstract:** The U.S. federal government's requirements and guidance for wetland conservation are reflected in a series of federal laws, regulations, and policies. However, the degree to which these requirements are reflected in local planning efforts is unclear. This study evaluates how well wetland conservation efforts are integrated into local comprehensive plans in Nebraska. The results show that the majority of local comprehensive plans pay little direct attention to wetland conservation, although many

conservation efforts are conducted under the umbrella of an environmental protection frameworks. The indicators include water resource protection received the highest score and was the descriptor of natural or environmental resources and resulted in the highest level of local awareness on natural assets. The indicator of setting goals for no net loss of wetlands received the lowest score among all indicators, demonstrating a clear gap between the national vision and the local reality of wetland conservation. Findings suggest local governments need more direct and proactive inputs to improve wetland conservation. Further findings from this research provide a practical roadmap for planners globally to integrate wetland conservation into local planning system.

Tuesday 2/14- Part 2: 1:20pm–5pm

Moderator: Kiandra Rajala

6. We Need to Change: A Transition to Perennial Agriculture

- **Speaker:** John Strauser University of Wisconsin-Madison, Grassland and Perennial Agriculture Outreach Specialist
- **Authors:** John Strauser, University of Wisconsin-Madison Division of Extension
- **Abstract:** An agricultural paradigm shift is overdue: our waters are clogged and eutrophied with soil and agricultural runoff; farmers and rural communities can't drink their well-water due to nitrate pollution largely attributed to agricultural mismanagement; and biodiversity is facing what's deemed a "sixth extinction," with agricultural land-use as a leading culprit. So far voluntary best management practices (no-till and cover crops) have had minimal influence on enhancing ecosystem services. However, well-managed perennial grasslands offer a way to produce adequate milk and meat while meaningfully improving the broad spectrum of additional ecosystem services ignored by the current productivism paradigm. In the Driftless Region of Wisconsin and Illinois, I engaged farmers, between 2018-2022, in a mixed-methods study to explore the conditions necessary to transition from commodity row crops to animal agriculture on perennial pastures. Farmers suggested that their agricultural practices are influenced by a myriad of societal structures (i.e., government, universities, crop consultants, seed companies, and fertilizer dealers). Farmers were also aware that many of these institutions sought to extract resources from rural farming communities while leaving behind a destructive wake that had negative impacts on rural vitality, individual farming operations, and ecological health. When considering a shift to grass-based agriculture, it is noteworthy that societal, political, and economic contexts impact farmer's autonomy to change their style agriculture. Based on these interactions with farmers, grass-based agriculture would increase if farmers were provided a greater amount of agency in state and federal agricultural policy incentives and were allowed to have a stronger voice in developing agricultural innovations. Considering farmers' expressed desires for conservation and rural vitality, it is paramount that there be concerted efforts that work with farmers to develop coalitions that exert a new vision for agriculture.

7. Using Anonymous Location Data to Measure Changes in Natural Resource Usage

- **Speaker:** Tommy Johnson Iowa DNR, Graduate Student
- **Authors:** Presenting Author: Tommy Johnson, Iowa DNR/University of Florida Co-author: Rebecca M. Krogman, Iowa DNR
- **Abstract:** Anonymous Location Data(ALD) was investigated for use in measuring visitation and other behaviors at Iowa's significantly publicly-owned waters. ALD is collected when a smart device with location-based services enters a designated study area, and can include time spent within the area, home and work census block location, travel distance to the area, probable demographic characteristics, and weekday and time patterns. Raw ALD is able to be expanded, similar to a creel survey, to yield total estimates of visitation and effort. ALD may allow resource managers to understand how a resource is used across time and space for a relatively low cost. For instance, visitation patterns can show the importance of natural resources and how far people are willing to travel to recreate, even beyond the state's border.

  We conducted several case studies to better understand how people used Iowa's public natural resources and whether the ALD could measure known changes (e.g., renovations, stocking events) . Specifically, we present examples of using ALD to assess remote trout stream fishing efforts, urban river access and user demographics, visitation to a popular lake with multiple uses, visitation and behavior before and after a reservoir renovation, and response to the provision of specific trout stocking dates in an urban fishery. Each example will be compared to alternative data sources, and limitations and biases will be discussed.

8. A bird in the hand: Impacts of hands-on experiences with birds on children's environmentalism

- **Speaker:** Seunguk Shin University of Illinois at Urbana-Champaign, Ph.D. Candidate
- **Authors:** Seunguk Shin, Henry S. Pollock, Julia I. Knauz, Mark E. Hauber, Carena J. van Riper
- **Abstract:** Children's care and love for nature are critical for conservation and can be fostered by meaningful interactions with wildlife species. Birds represent an ideal taxon to explore children-wildlife interactions due to their colorful plumage, melodious songs, and relative ease of identification that provide learning opportunities. Previous research on human-bird interactions has gained traction over the past three decades; however, there remains a paucity of knowledge about how children's hands-on experiences with birds catalyze the development of values and environmentalism more broadly. To address this gap, we developed a bird education program that provided children with experiences that involved mist-netting and handling local bird species, as well as discussing their traits. We recruited children (n = 21) of ages 11 to 15 from a nature camp during summer 2022 at a local nature center in Illinois, USA. We used a pre- and post-test experimental design to examine the impacts of engagement in the program on children's bird knowledge, connection to birds, connection to nature, and environmental values. We also analyzed the role of social learning in moderating the program's effects on these outcome variables. Results from self-guided surveys administered before the program, one week afterward, and three months afterward revealed immediate positive effects of hands-on learning about birds on children's connection to birds and connection to nature. Bird knowledge and environmental values were not

significantly influenced by participation in the program. Our findings, to our knowledge, are among the first to demonstrate the effectiveness of hands-on experiences with birds in environmental education and programming, as well as the importance of children's social and inclusive learning to support the development of long-term wildlife conservation initiatives.

9. Barriers to participation in aquatic invasive species prevention among recreational water users

- **Speaker**: Elizabeth Golebie University of Illinois, Postdoctoral Research Associate
- **Authors:** Elizabeth Golebie, Department of Natural Resources and Environmental Sciences, University of Illinois Urbana-Champaign; Carena van Riper, Department of Natural Resources and Environmental Sciences, University of Illinois Urbana-Champaign; Greg Hitzroth, Illinois-Indiana Sea Grant, Illinois Natural History Survey, Prairie Research Institute; Amanda Huegelmann, Illinois-Indiana Sea Grant, Illinois Natural History Survey, Prairie Research Institute; North Joffe-Nelson, Department of Natural Resources and Environmental Sciences, University of Illinois Urbana-Champaign
- **Abstract:** Invasive species are a global challenge for environmental management, causing numerous problems for social-ecological systems. Invasive species may also be spread by recreational anglers and boaters as they move between waterbodies. There have been considerable outreach efforts to encourage recreationists to minimize the spread of invasive species, however many people have yet to take action. Thus, understanding the barriers to taking action and how those barriers may interfere with belief-behavior relationships is essential. In this study, we sought to understand how risk perceptions, benefits, self-efficacy, and response-efficacy influence aquatic invasive species preventative behavior, how barriers moderate those relationships, and what characteristics may be related to the level of barriers experienced. In a pooled sample of all respondents, self-efficacy and response-efficacy had the strongest strong positive relationships with behavior; however, different belief-barrier relationships emerged for subgroups defined by strength of perceived barriers. For recreationists experiencing low barriers, perceived benefits were the sole predictor of behavior, whereas for recreationists experiencing moderate barriers, only self-efficacy was a significant predictor. Recreationists perceiving high and very high barriers were influenced by multiple factors including risk perceptions, self-efficacy, and response efficacy. Strength of perceived barriers was negatively correlated with years of experience fishing and boating, indicating that as people spend more time recreating, they may be more exposed to information about invasive species and better able to overcome barriers. Additionally, a comparison between boating and angling behaviors indicated that boaters need more information about how to complete prevention steps, whereas anglers need more information about why such actions are necessary. Ultimately, these results highlight a suite of outreach approaches that can be implemented to reach diverse groups of recreationists that perceive barriers in different ways.

10. Chronic Wasting Disease Management – a social-ecological systems approach

- **Speaker:** Brad Milley U.S. Fish and Wildlife Service, Senior Social Scientist

- **Authors:** Brad Milley, U.S. Fish and Wildlife Service; Nicholas Cole, U.S. Geological Survey

- **Abstract:** Chronic Wasting Disease (CWD) is a fatal, neurological degenerative disease that has infected cervid species (deer, elk, moose, reindeer) in North America, Northern Europe, and Korea and has no known cure. A transmissible spongiform encephalopathy (TSE), abnormal prions proliferate within infected cervids and pass directly between individuals or persist in the environment and result in further spread of the disease. CWD exists heterogeneously across North America with some areas having identified outbreaks going back to the mid-1980's and others having not identified outbreaks yet. A great deal of investigation has been conducted across many disciplines and has culminated in comprehensive guidance in managing CWD. Organizations like the Association of Fish and Wildlife Agencies have developed highly effective descriptions of best management practices that inform and list an array of strategies for managing chronic wasting disease. These best management practices are grounded in current and effective scientific information. CWD management in North America should be viewed as a complex system and efforts to map the broad interactions between social and ecological factors are needed to support existing best management practices. Through a virtual multi-day workshop we attempted to map the social-ecological factors of CWD management. Social-ecological systems (SES) conceptual models are commonly used to visualize the interactions between social and ecological factors. We then worked with States, Tribes, and NGOs to identify theories of change – those points within the model where interventions are theorized to have a positive impact on the conservation target, Cervids. This presentation will outline the challenges surrounding CWD management, what an SES model and theories of change are, how to create these using the Conservation Standards, our process using an expert elicitation workshop, and how the resulting SES model and theories of change can be used to improve CWD management outcomes.

Tuesday 2/14- 3:20 – 5pm: Facilitated Discussion

Moderators: Emily Pomeranz, Adam Landon, Kiandra Rajala, Peter Fritzell, Ellie Prentice

- **What:** This exercise is intended to inform a needs assessment of MAFWA member institutions, and regional partners regarding conservation social science/human dimensions research, practice, and capacity. The guiding questions for the facilitated discussion relate to the goals established in the organizing framework for the technical working group. Results of the needs assessment, of which this activity is a part, will inform the development of a work plan for the technical working group.

- **World Café format discussion of:**
  - *Goal 1: Elevate fish & wildlife governance in Midwestern states and provinces by enhancing the capacity of partner institutions to conduct and understand social science research.*

    1. What challenges do you and your organization face related to Goal 1? For example:

    a. Challenges conducting or working with partner institutions to conduct social science research?

b. Challenges using or translating social science research to be relevant to your organization or to partner institutions?

- *Goal 2: Form action initiatives to elevate the integration of social science into fish and wildlife management and resource-based recreation in Midwestern states and provinces. Identifying opportunities and strategies to increase social science integration will part be part of the committee's ongoing work.*

    1. What critical Midwestern fish and wildlife conservation and management efforts would benefit from the involvement of social scientists?

    2. What are the key social science research priorities in the Midwest?

- *Goal 3: Enhance communication and engagement, facilitate inclusive collaboration and decision-making, and foster innovation among agencies and conservation partners, as it pertains to social science research and practice.*

    1. What challenges do you and your organization face in responsive decision making, including:

    a. Strategic communication to inform outcomes

    b. Public engagement to inform decision making

    c. Including historically underrepresented perspectives in decision making

    d. Processes to integrate social science into decision making

- *Goal 4: Support social science researchers and practitioners across Midwestern states and provinces through a formal network of colleagues.*

    1. What types of support are you most interested in receiving from the Midwest social science community?

    a. Please identify the top 3 areas that you need support in.

    2. Are there current support or capacity structures that are working well for you that may be useful for other Midwest social scientists?

    3. Via what modes would you prefer to engage with other Midwest social scientists?

Wednesday 2/15 - PART 3: 10am– 12pm

Moderator: Emily Pomeranz

11. Conservation Planning to Benefit Birds and People

- **Speaker:** Mohammed Al-Saffar U.S. Fish and Wildlife Service, Wildlife Biologist
- **Authors:** Mohammed A. Al-Saffar, U.S. Fish & Wildlife Service; Gregory J. Soulliere, U.S. Fish & Wildlife Service
- **Abstract:** Breeding populations of many birds have been declining in the Midwest region for decades while human population is increasing. The Upper Mississippi / Great Lakes Joint Venture (JV) aims to understand and address this condition while integrating objectives across bird groups, as well as human dimensions, to increase the relevance of bird conservation to society. Although the JV lacked sufficient demographic and density data to develop population models for birds and predict species response to conservation actions, we developed spatial models to target habitat objectives using species occurrence and land cover data. To guide conservation actions, we generated decision support tools (DSTs) that focus on breeding and non-breeding habitats while integrating predictions for current human use and benefits from these landscapes (bird hunting and watching as well as other recreation activities and ecological goods and services). Using combinations of spatial data representing both biological and social objectives, and weighting those objectives to reflect stakeholder priorities, provided a transparent framework to integrate conservation concerns with a family of large-scale DSTs. Bird habitat loss is irreversible when covered by human developments, so we recommend using our DSTs along with forecasted footprint of developed lands in the year 2100 to inform local-scale habitat delivery for birds while keeping and expanding the benefits to people.

12. Exploring Undergraduate Environmental Citizenship Through Personal Narratives

- **Speaker:** Katherine Graham, University of Nebraska - Lincoln, Graduate Research Assistant
- **Authors:** Katherine Graham, University of Nebraska - Lincoln; Kjersten Hyberger, University of Nebraska - Lincoln; and Christopher Chizinski, University of Nebraska – Lincoln
- **Abstract:** Environmental citizenship behaviors (ECBs) include actions like writing letters to political officials and joining and contributing funds to environmental organizations. ECBs are an important step in developing more sustainable structures, laws, practices, and policies. Additionally, by promoting environmental citizenship and ECBs, the conservation community may engage broader constituencies to expand financial and political support for conservation. We sought to explore the experiences of university students who engage in ECBs through a qualitative phenomenological study. We used semi-structured interviews to explore active environmental citizens' life histories, including how and when they became involved in ECBs, why they stay involved, and what participation meant to them. The results of this research convey participants' stories of dedication to the environmental cause and the belief in one's ability to influence societal change. Narratives consistently supported arguments that childhood experiences with nature and place attachment are important for those practicing ECBs. Our findings build on the body of research regarding participation in ECBs and provide insight into encouraging student environmental citizenship.

Further, our research can be applied to engage broader populations in ECBs, encourage more environmentally sustainable practices and policies, and expand financial and political support for conservation.

13. Knowledge Gained from On-site Interviews of Anglers

- **Speaker**: Kevin Pope U.S. Geological Survey--Nebraska Cooperative Fish and Wildlife Research Unit, Unit Leader

- **Authors**: Kevin L. Pope, U.S. Geological Survey—Nebraska Cooperative Fish and Wildlife Research Unit; Christopher J. Chizinski, School of Natural Resources, University of Nebraska-Lincoln; Keith L. Hurley, Nebraska Game and Fish Commission; Richard S. Holland, Nebraska Game and Fish Commission; Tony J. Barada, Nebraska Game and Fish Commission; Mark A. Kaemingk, Department of Biology, University of North Dakota; and Derek S. Kane, Nebraska Cooperative Fish and Wildlife Research Unit

- **Abstract:** On-site interviews of recreational anglers are common in fisheries management; these interviews have a historical connection to creel surveys, named after the wicker basket for carrying fish. Scientists with the Nebraska Cooperative Fish and Wildlife Research Unit and biologists with the Nebraska Game and Parks Commission have spent a decade interviewing anglers at public reservoirs throughout the state of Nebraska. During this scientific journey, these scientists and biologists have simultaneously developed and maintained a strong monitoring program and a strong research program. Gains were made in centralizing the creel program, including greater consistency in standardization, development of a single repository that provides quicker and easier access to data, and development of generic- and specialized-assessment tools. Lessons were learned about how to develop a centralized creel program, who anglers are, how anglers behave, how anglers affect the resource, and how the resource affects anglers. An overview of their story and knowledge gained will be provided.

14. Predicting Support and a Typology for Wildlife Management Area Funding

- **Speaker:** Barbara Avers Michigan Department of Natural Resources, Waterfowl and Wetland Specialist

- **Authors:** Barbara A. Avers, Michigan Department of Natural Resources and Michigan State University; Heather A. Triezenberg, Michigan State University

- **Abstract:** State wildlife agencies (SWAs) primarily rely on hunter-based funds to pay for wildlife and habitat management at wildlife management areas (WMAs) and have concerns about this funding model with declining trends in hunter numbers. There is a need to understand stakeholder support for a broad suite of funding mechanisms to pay for WMA management and wildlife conservation more broadly. We surveyed four key stakeholder groups at six intensively managed WMAs in southeastern Michigan to explore support for funding mechanisms, as measured by the likelihood of taking actions in the next 12 months to support WMA management: birdwatchers (n=1,133), waterfowl hunters (n=316), anglers (n=254), and community members (n=84). Study objectives were to 1) compare key WMA stakeholders on their support for WMA funding options; 2) explore influences on support for WMA funding options; and 3) develop a typology of WMA stakeholders

based on support for WMA funding options. We found significant differences among stakeholders in their likelihood of taking actions to support funding of WMAs. Regression results revealed that factors influencing support for funding varied by the type of funding mechanism (purchase a duck stamp, purchase a songbird stamp, contribute directly to WMAs, and pay increased tax), but frequency of conservation behavior had a positive association with all funding options. Identity salience as a birdwatcher, waterfowl hunter, and conservationist and membership in a conservation organization were also important predictors. A k-means cluster analysis resulted in a typology of five groups related to funding options: 'opposed', 'traditional support', 'traditional + songbird', 'new funding', and 'strong universal support'. Results inform SWA decisions about potential funding mechanisms as well as tailored marketing and engagement strategies to build support for WMA management and funding. SWAs should consider a diversified portfolio of traditional and new funding mechanisms that are supported by a wide range of stakeholders.

15. What Google Trends Can (and Can't) Tell us About Factors Driving Public Interest in Endangered Species

- **Speaker:** Michael Moore, United States Geological Survey Iowa Cooperative Fish and Wildlife Research Unit, Assistant Unit Leader

- **Authors:** Michael Moore, U.S. Geological Survey, Iowa Cooperative Fish and Wildlife Research Unit; Amanda Hyman, Postdoctoral Researcher, Virginia Tech

- **Abstract:** Freshwater ecosystems are disproportionately threatened biodiversity hotspots. They cover 0.01 % of earth's surface area, but contain 9.5 % of the animal species. Since 1973, the United States' Endangered Species Act has established protections for species and their associated habitats. Furthermore, some have suggested that an ancillary benefit of listing may be that it increases the public's awareness of endangered and threatened species, which may also increase available resources to reverse their population declines. Google Trends, referred to as an "infoveillance", "culturomics", or "infodemiology" tool in the environmental, economics, and public health fields has been used to track public interest in search engine terms and topics. Environmental "infoveillance" has been used in a variety of applications including to infer interest in environmental issues over time, and to describe factors driving differences in public interest among taxonomic groups. However, this potentially powerful tool lacks transparency raising concerns about data reliability. The algorithms Trends uses to compile data samples are not fully explained and Google offers little customer support. In this study, we evaluate the reliability of Google Trends to explain factors driving temporal changes in public interest for 365 ESA listed aquatic species by addressing three questions: 1. For which aquatic listed species do reliable Trends data exist? 2. Which factors, such as ESA status changes (i.e., listing, down listing/up listing, or delisting), influence public interest in ESA listed species and 3. Do spatial patterns in interest align with species distributional ranges?

The State of the Art of Conservation Social Science/Human Dimensions in the Midwest

Adam Landon, Ph.D – MNDNR
Emily Pomeranz, Ph.D – MIDNR
Kiandra Rajala – USFWS

MIDWEST Association of Fish & Wildlife Agencies

Technical Working Group on Conservation Social Science/Human Dimensions

Agenda

- Orientation to the symposia
  - Agenda of events and presentations
  - Logistics for presentations
- Introduction to technical working group
  - History and need for group
  - Structure
- Invitation to Part IIa: Moderated Discussion
  - Midwest conservation social science/human dimensions needs assessment

Symposia Details

- Part I: Research presentations: Tuesday 10:20 to 12:00
  - **Adam Landon**, Introduction (that is this)
  - **Ashley Dayer et al. (Jared Emmack presenting)** – Enhancing relevancy and engaging support from a broader constituency: Insights from a Midwestern wildlife viewing survey
  - **Chris Chizinski et al.** – Using computation approach to better understand human behaviors in the natural resources
  - **Craig Miller** – Intersection of economic and human dimensions data in natural resources policy and planning
  - **Zhenghong Tang and Ligang Zhang** – Integrating wetland conservation efforts into multiple plans: Case study for Nebraska

Symposia Details

- Part II: Research presentations: Tuesday 1:20 to 3:00
  - **John Strauser** - We need a change: A transition to perennial agriculture
  - **Tommy Johnson and Rebecca Krogman** – Using anonymous location data to measure changes in natural resource usage
  - **Seunguk Shin et al** – A bird in the hand: Impacts of hands-on experiences with birds on children's environmentalism
  - **Elizabeth Golebie et al** – Barriers to participation in aquatic invasive species prevention among recreational water users
  - **Brad Milley and Nicholas Cole** – Chronic wasting disease management – a social ecological systems approach

Symposia Details

- Part II: Moderated Discussion: Tuesday 3:20 to 5:00
  - Circle back to this momentarily
  - Elicitation of conservation social science/human dimensions needs of MAFWA members and regional partners
- Poster session happy hour starts at 6pm, continue discussion (with a beer)

Symposia Details

- Part III: Research presentations: Wednesday 10:00 to 12:00
  - **Mohammed Al-Saffar and Gregory Soulliere** – Conservation planning to benefit birds and people
  - **Catherine Graham et al** – Exploring undergraduate environmental citizenship through personal narratives
  - **Kevin Pope et al** – Knowledge gained through on-site interviews of anglers
  - **Barbara Avers et al** – Predicting support and a typology for wildlife management area funding
  - **Michael Moore and Amanda Hyman** – What google trends can (and can't) tell us about factors driving public interest in endangered species

Presentation logistics

- 20 minutes total
  - Warnings at 15, 17, 19, and 20 (stop)
  - Try to end at 15, leaving time for questions and transition

History of technical working group

- Need: growing group of researchers and practitioners in the region, desire to better coordinate and foster connections (agency-academy-NGO-private), support growth and implementation of CSS in agencies, provide forum for professional development.
- Officially approved as a technical working group within the Midwest Association of Fish and Wildlife Agencies (MAFWA) in summer 2022
  - MAFWA is…
- Began groundwork over a year ago to make happen, big thanks to Faren Wolter (formerly SDGP, now with USFWS), Kelly Myers (USFWS), Ollie Torgerson (MAFWA)

Organizing framework

- Worked to develop an organizing framework
- Mission and goals
- Rules of operation (following MAFWA)

MIDWEST Association of Fish & Wildlife Agencies

Midwest Association Fish and Wildlife Agencies'

Conservation Social Science/Human Dimensions

Technical Working Committee

Executive committee

- The charter calls for the establishment of an executive committee
  - Chair: Adam Landon, Minnesota DNR
  - Vice chair: Emily Pomeranz, Michigan DNR
  - Executive officer 1 (must be voting member): nominee to be confirmed
  - Executive officer 2 (may be non-voting member): Kiandra Rajala, USFWS
- And an appointee from each MAFWA member state

Appointees

- IL – Craig Miller (IL Natural History Survey)
- **IN – Vacant**
- IA – Peter Frizell (IA DNR)
- KS – Tom Bidrowksi (KS Dept of Wildlife & Parks)
- KY – Brian Clark (KY Dept of Fish and Wildlife)
- MI – Emily Pomeranz (MI DNR)
- MN – Adam Landon (MN DNR)
- MO – Ellie Prentice (MO DOC)
- NE – Jeff Lusk (NE Game & Parks)
- OH – Abby Rhodebeck (OH Division of Wildlife)
- **ND – Vacant**
- **SD – Vacant**
- WI – Ben Beardmore (WI DNR)
- ON – Shannon Fera/Taylor Phillips (ON M. Nat. Res. F.)
- **MB – Vacant**
- SK – Allison Henderson (SK Ministry E.)

MAFWA Members

Mission and goals

- **Mission:** Advance conservation and management of public trust resources in MAFWA member states and provinces by providing a forum to promote awareness of practical social science applications to conservation challenges, and to elevate the integration of social science research and practice into agency management and decision making.

- Goal 1: ***Elevate fish & wildlife governance*** in Midwestern states and provinces by enhancing the capacity of partner institutions to conduct and understand social science research.

- Goal 2: ***Form action initiatives to elevate the integration of social science*** into fish and wildlife management and resource-based recreation in Midwestern states and provinces. Identifying opportunities and strategies to increase social science integration will part be part of the committee's ongoing work.

- Goal 3: ***Enhance communication and engagement***, ***facilitate inclusive collaboration and decision-making***, and ***foster innovation*** among agencies and conservation partners, as it pertains to social science research and practice.

- Goal 4: ***Support social science researchers and practitioners*** across Midwestern states and provinces through a formal network of colleagues.

Broader structure and benefits

- Only appointees of member institutions can vote in formal governance
  - Resolutions, elections, etc.
- Only a minor part of what we hope this working group will be
  - Foster connections between agency staff and NGOs/University staff
  - Disseminate findings to folks on the ground
  - Organic research collaboration, rooted in actual problems
  - Service to the people through extension

Needs assessment

- First order of business for group is a needs assessment of MAFWA member institutions and partners
  - What are the Midwest conservation challenges that require social science inquiry?
  - What are the practical challenges of incorporating social science in decision making?
  - What needs to researchers and practitioners have that institutions cant provide?
- Results of this needs assessment will inform a work plan for this technical working group for the next few years
- Will build an instrument for broader collection beyond this group
- **Pass out worksheets**

MIDWEST Association of Fish & Wildlife Agencies

Technical Working Group on
Conservation Social Science/Human Dimensions

Questions and Discussion

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Appendix C.

Original and revised goals

Goal 1

- **Original:** ***Elevate fish & wildlife governance*** in Midwestern states and provinces by enhancing the capacity of partner institutions to conduct and understand social science research.

- **Revised:** Elevate fish & wildlife governance in Midwestern states and provinces.

Goal 2

- **Original:** ***Form action initiatives to elevate the integration of social science*** into fish and wildlife management and resource-based recreation in Midwestern states and provinces. Identifying opportunities and strategies to increase social science integration will part be part of the committee's ongoing work.

- **Revised:** Increase coordination and opportunity for regional social science research.

Goal 3

- **Original:** ***Enhance communication and engagement***, ***facilitate inclusive collaboration and decision-making***, and ***foster innovation*** among agencies and conservation partners, as it pertains to social science research and practice.

- **Revised:** Enhance outreach and engagement with the public.

Goal 4

- **Original:** ***Support social science researchers and practitioners*** across Midwestern states and provinces through a formal network of colleagues.

- **Revised:** Support social science researchers and practitioners across midwestern states and provinces.