Presentations for Wednesday February 23rd

9:45 to 10:00 Jeff Hastings – Opening Remarks

Jeff has been the Project Manager of Trout Unlimited's Driftless Area Restoration Effort for the past sixteen years (he'll be retiring April 29th), Prior to working for Trout Unlimited Jeff spent 25 years managing county land and water conservation departments. Jeff attended the College of Natural Resources at the University of Wisconsin – Stevens Point where he majored in Wildlife Management and Biology. His current duties for Trout Unlimited are managing a small staff of conservationists and working with partners to accelerate cold-water improvement projects in the Driftless Area.

10 to 10:30 Bryan Maitland is a Wisconsin Water Resources Science-Policy Postdoctoral Fellow co-appointed between the University of Wisconsin-Madison and the Fisheries Management Bureau of the Wisconsin Department of Natural Resources. His research focuses on using field studies, quantitative approaches, and diverse data types to gain insight into the ecology of freshwater fishes that can be leveraged to develop actionable solutions to real world problems. In his current position, he is evaluating the effects of climate warming, extreme weather events, and groundwater depletion on stream trout across Wisconsin. He has a passion for the outdoors and being near water and can usually be found stream-side with a fishing pole or a book.

Presentation: Climate change, extreme seasonal weather, and trout populations in Wisconsin streams.

Abstract: Climate change and extreme weather can alter flow regimes that coldwater animals are adapted to, in turn affecting recruitment dynamics and long-term population resilience. However, the relative influence of extreme seasonal weather on trout populations is unknown across broad spatial scales. In this talk, I will present results of analyses that use 25 years of

standardized survey data on brook and brown trout populations across Wisconsin to quantify the effects of extreme seasonal air temperature and precipitation on annual recruitment strength (young-of-year summer abundance). I will discuss results in the context of Driftless Area streams and how anticipated warming and increased flood frequency in the region will have the potential to exert strong and differential effects on brook and brown trout populations. Finally, I'll discuss management actions that can maximize resiliency of populations in response to extreme weather.

10:30 to 11:00 Vaughn Snook: Assistant Fisheries Supervisor at the Minnesota DNR's Lanesboro Fisheries Office. He has been with MNDNR for 21 years. Vaughn has a BS in Fisheries Management from Michigan State University and a MS from University of Nebraska – Lincoln.

Presentation: A Roving Creel Survey of Selected Streams in Southeast Minnesota – 2020/2021

Abstract: Nine trout stream areas were surveyed in southeast Minnesota from July 1 to September 30, 2020, and April 17 to June 30, 2021, in a roving-roving creel survey. The focus was on streams stocked with Rainbow Trout yearlings and fingerlings. Anglers were enumerated and interviewed with a letter and postage paid envelope left on their vehicles to return providing us with trip length. Anglers consisted of mostly males (82.2%) using a variety of bait (35.2%), fly (30.0%), lure (25.2%), and mixed method (9.7%) gear types. Mean angler trip length was 2.92 hours with a catch rate of 0.92 trout/hour. An estimated 52,115 Brown Trout and 36,014 Rainbow Trout were caught in 76,422 angler-hours. This creel provides information that will allow fisheries managers to better manage the trout fishery resource of southeast Minnesota.

11:00 to 11:30 Luke Lunde is a Minnesota Professional Soil Scientist in WSB's Environmental Natural Resources Group, and he has over twenty-two years of natural resource and environmental review experience. Luke's experience includes soil survey mapping, geologic hazard assessments, wetland banking, wetland mitigation, habitat restoration, invasive species management, grant writing, erosion control compliance site management, habitat restoration, invasive species management, natural resource planning, environmental permitting and compliance, for numerous projects throughout the Midwest. He is very knowledgeable in stream survey assessment, stream habitat restoration design, floodplain restoration, vegetation management, habitat conservation, habitat restoration. His experience with habitat restoration ranges throughout Minnesota and Wisconsin working with clients that include municipalities, watershed districts, MNDNR, MN Trout Unlimited and other nonprofit organizations.

Presentation: West Indian Creek Stream Habitat Improvement Project 2020-2021

Abstract: Our coldwater resources are threatened by land use practices that degrade stream banks resulting in increased sediment deposition as well as the growth of undesirable woody vegetation. WSB and Associates Inc. (WSB), in cooperation with MN Trout Unlimited and the MNDNR received funding from the Clean Water, Land and Legacy Amendment through the Lessard-Sams Outdoor Heritage Council (LSOHC) to accelerate and supplement in-stream habitat and restoration on streams within existing Aquatic Management Area easements in SE Minnesota.

This presentation discusses the work required to complete trout stream habitat restoration and enhancement within the riparian corridor of a DNR Aquatic Management Area Easement on West Indian Creek located in Wabasha County, MN. The overall project was approximately 11,400 linear feet (2.16 miles) which took two years to complete. Restoration techniques included construction of in-stream habitat improvement structures, streambank habitat structures, bank shaping within the riparian corridor and site stabilization through native plantings. Construction of the project began in July of 2020. Completion of the project was in August of 2021. The restoration project has resulted in enhanced stream quality, eliminating streambank erosion and increase stream productivity including trout populations, wild trout reproduction and aquatic and terrestrial biomass.

11:30 to 12:00 Bradd Sims - Bradd Sims is the statewide stream and river systems biologist with the Wisconsin DNR stationed at Madison. Bradd has worked 24 years with the Wisconsin DNR. Most of this time has been dedicated to habitat assessment and fish population dynamics of Driftless Area smallmouth bass and trout streams

Presentation: Chase Creek Brook Trout Establishment

Abstract: Located in the southwest Driftless Area of Wisconsin, Chase Creek supports a natural reproducing brook trout population which approaches Class I status. The story of Chase Creek is relatively short and simple. Land acquisition, motivated land stewards, and a quality stocking program established brook trout in a stream once thought to be finished supporting trout.

Lunch 12:00 to 1:00

1:00 to 1:30 Mike Miller: Mike Miller is a stream ecologist with Wisconsin's Department of Natural Resources in Madison. Current projects include quantifying the concentrations of neonic insecticides in Wisconsin surface waters, developing drone technologies to be used to assess stream habitat and wetland conditions, and refining an order-level macroinvertebrate index used by citizen scientists to assess stream health. When Mike is not thinking, talking, or writing about stream resources, he can be found getting outwitted by animals with pea-sized brains when fly fishing in the Driftless Area (hence the fishless bio picture).

Presentation: An Overview of Environmental Risks Neonicotinoied Insecticides Pose to Aquatic Environments.

Abstract: Neonicotinoids (“neonics”) are the most widely used class of insecticides in the Upper Midwest and the world. In the Driftless Area the primary use of neonics is for coating corn and soybean seeds prior to planting. These chemicals are long-lived, water soluble, and mobile in the environment. While these chemicals are highly toxic to insect pests, they are also toxic to many non-target terrestrial and aquatic insect species. Neonics have been implicated in significant declines in various insect populations across the planet and are a suspected cause of hexagenia mayfly population declines in the Mississippi River. In addition to an increasing number of studies reporting environmental harm caused by neonics, there is also an increasing number of studies indicating no improvements in crop yields associated with the use of these chemicals as seed dressings. Preliminary results of stream sampling in Wisconsin suggests numerous streams have water column concentrations of neonics that are chronically or acutely toxic to aquatic invertebrates.

1:30 to 2:00 Emma Lundberg is a recent Ph.D. graduate of the Nelson Institute’s Environment & Resources program at UW-Madison. She is an interdisciplinary freshwater scientist primarily focused on inland coldwater streams and the people, organisms, and systems that rely on them. Lundberg is a new Fish Biologist with the US Fish & Wildlife Service out of the Green Bay Area.

Presentation: A Q-method Survey of Stream Restoration Practitioners in the Driftless Area, USA

Abstract: Stream restoration has become increasingly common, both globally and specifically in the United States. Though stream restoration has become a common freshwater management practice, there are debates around what constitutes “success” in restored systems and whether this success should incorporate both scientific and stakeholder-defined endpoints. In our study context, the Upper Mississippi River Basin’s Driftless Area, conflicts over stream restoration practices often center on the management and use of Driftless streams, as practitioners navigate competing perspectives about restoration approaches alongside conflicts over whose needs and interests should be prioritized in restoration planning and implementation. Based on the importance of stream restoration practitioner perspectives for mediating uncertainty and shaping on-the-ground projects, we asked (1) What are main areas of conflict that emerge around Driftless Area stream restoration? (2) Can stream restoration practitioners be categorized into distinct groups based on their varying perspectives on stream restoration practices in the Driftless Area? (3) If so, what are these groups and how do they map onto the main areas of stream restoration conflict in the Driftless Area? We use Q-method to identify and describe four perspectives about stream restoration practices and priorities in the Driftless Area. Our results suggest that (1) the differences between groups are related to concerns about best practices for stabilizing streambanks and about post-restoration monitoring. We found that (2) all four Q-method identified groups agree that floodplain-stream channel re-connectivity is an important aspect of restoration projects and that erosion is a big concern in the Driftless Area.

2:00 to 2:30 Avery Schnaser and Neal Mundahl – Winona State University

Avery Schnaser conducted the trout research as part of the requirements for a Professional Science Master's degree from Winona State University. She also interned with the MN DNR-Fisheries and Doug Dieterman during the 2021 field season.

Neal Mundahl is a biology professor at Winona State University, where he and his students have been assessing stream habitats and fish and invertebrate communities in the Driftless Area for the past three decades.

Presentation: Recovery of a headwater fish community after a "complete "fish kill in Garvin Brook.

Abstract: After a complete fish kill on the spring-fed headwater section of Garvin Brook, the Brown Trout and Slimy Sculpin populations were followed over the next 25 to 28 months to examine the relative roles of spawning migration of adults and natural reproduction in the population recovery process. Trout spawning redd counts during two spawning seasons post-kill and repeated electrofishing population surveys of both trout and sculpin in kill and reference zones were conducted to assess adult and total population changes and shifting age structures. Based on redd counts, an estimated 126 to 196 adult trout spawned in a 900-m reach of the kill zone during the two spawning seasons after the fish kill. Electrofishing surveys conducted six to 16 months post-kill estimated 170 to 220 adult trout were present within the kill reach, well below the estimated 585 to 885 adult trout present during that time period in the 900-m reference zone. Adult trout numbers were not similar between zones until 25 months after the kill, even though total trout populations were similar between kill and reference zones beginning 12 months after the kill due to proportionally larger numbers of young trout spawned within the kill zone. Sculpin recovery followed a similar pattern: total population and adult abundance significantly lower in the kill zone six months after the kill, total populations similar after 10 months, adult populations lower in the kill zone until 28 months post-kill, and juvenile sculpin significantly more abundant in the kill zone 10 to 18 months post-kill. Complete, natural recovery of the Brown Trout and Slimy Sculpin populations in Garvin Brook were accomplished through a combination of spawning migrations of adult trout (but not sculpin) from downstream unimpacted reaches, reproduction producing large numbers of young fish, and subsequent recruitment of those fish to the adult age classes.

2:30 to 3:00 Dan Rosauer: Dan is a Hatchery Biologist at the Iowa DNR Manchester Hatchery. He has been with the Iowa DNR for 11 years. Dan has a BS from Iowa State University in Animal Ecology and a MS from University of Wisconsin-Milwaukee.

Presentation: South Pine Brook Trout Propagation Efforts

Abstract: The South Pine Creek strain of Brook Trout is the only remaining Iowa native salmonid. Sustaining the population and strain has been a focus of the Iowa DNR for many years. Culture of the South Pine Creek strain begun in 1996 on a whim and continued annually. A new emphasis on culture and establishing more populations across the Iowa driftless started in 2017. A history of production, overview of techniques, and goals for the future will be discussed.

3:00 to 3:30 Eric Booth Eric Booth holds a bachelor's degree in environmental engineering from UW-Madison (2004), a master's degree in hydrologic science from UC-Davis (2006), and a PhD in limnology from UW-Madison (2011). He is broadly interested in the intersection between water, land, climate, and humans with recent projects related to stream-floodplain restoration and agricultural water quality. He uses a combination of field monitoring and biophysical modeling as well as collaborations with social scientists to understand stream-floodplain ecosystems.

Presentation Title: Grass vs. Trees: Competing Perspectives about Restoring Riparian Areas in the Kickapoo Watershed

Abstract: Healthy streams and floodplains are essential to the economy of the Driftless Area. They support a nationally recognized coldwater fishery, heterogenous riparian plant communities, and diverse agroecosystems, while also providing an opportunity to attenuate damaging flood peaks. In the face of climate change and associated increases in extreme flooding and stream temperatures, the Driftless Area community is heavily invested in stream restoration. But managers, anglers, and landowners hold contending views about the use of riparian forests as a stream restoration tool to potentially enhance habitat, provide shade to mediate extreme stream temperatures, and stabilize banks to lessen flood impacts.

Through interviews with 16 stream managers and a workshop-based survey with 35 stream managers and stakeholders, supported by field-based geomorphic and habitat surveys and stream temperature monitoring at multiple restoration sites, we found that there are open questions about the impacts of tree removal on bank erosion and stream temperature. Despite that uncertainty, managers tend to hold strong and divergent views about the practice of tree removal. Some managers cite concerns about box elder-induced erosion and ease of recreational access as reasons for removing riparian trees; others cite stream shading and deformability as reasons for keeping them. Ultimately, we find that manager decision-making about riparian tree removal in restoration projects is based primarily on differing values, priorities, and assessments of future risks associated with climate change and flooding.

Presentations for Thursday – March 3rd, 2022

10 to 10:30 Mike Majeski: Mike has 21 years of experience as a conservation biologist and project manager designing and implementing stream and lakeshore restoration projects. His focus on wildlife and water resources has included rare species surveys, biological sampling & monitoring, pollinator habitat restoration, invasive species detection & management, and implementing diagnostic water quality projects. He has worked on numerous stream projects in east-central and southeastern Minnesota, including over a dozen trout streams in the Driftless Area. His work has included geomorphic assessment and project design, permitting, construction management, invasive species identification and management, and ecological restoration. Mike received a Bachelor of Arts degree in Environmental Biology from Saint Mary's University, Winona in 2002.

Presentation: Incorporating Nongame Habitat in Stream Projects

Abstract: Part of a holistic approach to stream restoration involves creating or improving nongame habitat within the riparian corridor. As is common with many trout streams in southeastern Minnesota, channel incision, accelerated bank erosion, and channel widening have negatively impacted instream habitat, yet these processes can be viewed as an opportunity through the lens of restoration to improve habitat by creating shallow slack water refugia and oxbow wetlands, and preserving or enhancing cutbanks for cavity nesting species. In addition, many streams in the Driftless Area occur in landscapes with steep topography and groundwater discharge that can lend to the creation of unique habitat features. Following the completion of several trout stream habitat projects, we will discuss practical methods to incorporate or preserve nongame habitat features within both streams and floodplains.

10:30 to 11:00 Ellen Voss: Ellen joined River Alliance of Wisconsin in October 2019 and brings nearly 20 years of aquatic conservation, fisheries, and science communication experience to her role. Prior to becoming River Alliance's Aquatic Invasive Species Program Director, Ellen worked extensively throughout the US, Africa, and South America with various state agencies, private organizations, and, most recently, UW-Madison's Center for Limnology. She has an MS in Environmental Science from the University of Idaho. Ellen and her husband Nick live on a small farm in Wisconsin's Driftless Area. They spend their free time wrangling their coonhound Loki and ever-evolving cast of farm animals, fly fishing for trout and muskies, road biking, and foraging for whatever's in season.

Presentation: Sniffing for snails: Using K9s for the early detection of New Zealand mudsnails in Wisconsin.

Abstract: Professional scent detection dogs have been trained to sniff out everything from cancer to narcotics, and in 2020, another target odor was added to the list: New Zealand mudsnails. These tiny snails first showed up in Wisconsin nearly a decade ago, and they've been slowly expanding their territory ever since, very likely with the unintentional help of paddlers and anglers. Current detection methods are slow and expensive, and "man's best friend" could be an invaluable ally in early detection efforts. Conservation Dogs Collective, Inc., River Alliance of Wisconsin, and statewide partners teamed up to see if K9s could be trained to use their incredible noses to detect one of the most worrisome aquatic invaders to Wisconsin's waters.

11:00 to 11:30 Carter Borden, Kent Johnson (picture right), Dan Dauwalter (picture far left). Carter has a background in water resource management and natural sciences, and is principal at MobileH2O, LLC. Kent is retired from the Metropolitan Council Environmental Services and active in the Kiap-TU-Wish Chapter of Trout Unlimited. Dan is Fisheries Science Director with TU's national science program.

Presentation: Water quality screening in the Driftless Area using community scientists and the WiseH2O mobile app

Abstract: We have been encouraging anglers and other community scientists to collect water quality information in the Driftless Area using the WiseH2O mobile application. Since the pilot program in 2019, 607 total water quality observations have been made, with 547 observations being made during 2020-2021 and most in the northern half of the Driftless Area. Of the 2020-21 observations, 95% have been on state designated trout streams and 42% have been made on brook trout streams. Observations have been made by 102 unique observers (participants), and 53 unique observers (42 new) submitted an observation in 2021. Of the 403 observations made in 2021, 88 occurred during the "September Sampling Blitz" contest used to encourage participants to make observations during the last part of the fishing season. Three TU Chapters have set up their own monitoring programs. Enhancements to the WiseH2O app and program infrastructure continue to be made, and 2022 will include development of an actionable data framework for water quality screening information collected using the WiseH2O app. More information can be found at: https://www.mobileh2o.com/driftlessprogram.

11:30 to 12:00 Matt Mitro is a fisheries research scientist with the Wisconsin Department of Natural Resources. Based in Madison, Matt works on statewide fisheries issues with a focus on trout in Wisconsin's inland streams.

Presentation: Beaver Influence on Driftless Trout Streams in Wisconsin.

Abstract: The control of beaver to maintain free-flowing conditions in select coldwater streams has been core part of the Wisconsin DNR's management of trout. However, beaver control on trout streams is often misunderstood, with deeply divided opinions among both the public and managers and many questions about the science behind it. In this presentation, I will provide an update—with a focus on the Driftless Area—of an ongoing study that addresses research questions raised in the DNR's beaver and trout management plans on how beaver influence trout populations and habitat in Wisconsin streams.

Lunch 12:00 to 1:00

1:00 to 1:30 Kasey Yallaly: Kasey began her career in natural resources at Southeast Missouri State University in 2011 where she graduated with a degree in Wildlife Conservation and Management while working for the Missouri Department of Conservation for 3 years as a forestry research technician and fisheries technician on large rivers. From there she worked for Idaho Department of Fish and Game for 3 years on coldwater and warmwater fisheries. She then attended Southern Illinois University-Carbondale and graduated with her Master's degree in Fisheries Management in 2018. Kasey has been working as the Fisheries Biologist for the Wisconsin DNR out of the Baldwin office since 2018 where she manages fisheries resources in Pierce, St. Croix and western Dunn counties.

Presentation: Pierce and Dunn County Brook Trout Habitat Project Updates – Plum and Wilson Creek

Abstract: With the changes in trout species dominance in some Wisconsin Driftless Area streams from brook trout to brown trout dominance, habitat practices in some DNR trout habitat improvement projects on Streambank Easements have been altered with an attempt to focus on enhancing brook trout habitat. Currently, these techniques have been experimentally applied to 2 projects on 2 streams in which both brook and brown trout are present. These projects are in southern Pierce County on Plum Creek and in central Dunn County on Wilson Creek. Initial findings of the trout species responses within these projects will be discussed in this presentation.

1:30 to 2:00 Loran Hass and Nate Anderson (pictured): Loran has 6 years on the board of directors Kiap TU Wish, 'UW-Stout Graduate 1978, Industrial Technology-Manufacturing Engineering

Nate's Bio: Habitat Specialist for the WDNR for NW WI. Been with the department since 2000, mostly with the habitat crew.

Presentation: ERO: Optimized Velocity and Volume to Scour Sand from Low Gradient Streams.

Abstract: Power point presentation of 33 slides and information on four stream sites with a total of 19 ERO units. Discussion of cause-and-effect results, threshold, the science behind the data and evaluation of the sites in the first 3 years.

2:00 to 2:30 Mike Siepker, Mike joined the Iowa DNR's Fisheries Management team in 2014 as the Natural Resources Biologist for the Decorah District in Northeast Iowa. He manages coldwater and warmwater streams and lakes, investigates fish kills, and works with private landowners to manage private land for public fishing in an eight-county area. Prior to his work in Iowa, Mike spent 10 years in Missouri serving as the Missouri Department of Conservation's Sportfish Population Ecologist. During that time, Mike led statewide research efforts to improve the management of Missouri's bass, trout, catfish, and walleye fisheries. Mike holds a Bachelors in Animal Ecology from Iowa State University and a Masters in Natural Resources and Environmental Sciences from the University of Illinois at Urbana-Champaign.

Presentation: Wild South Pine Brook Trout

Abstract: The discovery of the South Pine Creek population of Brook Trout changed trout management in Iowa. Although Brook Trout were likely native to Northeast Iowa, early degradation of streams led to widespread extirpations with stocking required to restore populations. Often times, the sources of these stockings were not well documented. An early genetic evaluation of the South Pine population suggested a unique population, but with low genetic diversity. South Pine fingerlings were used to restore Brook Trout fisheries in Iowa beginning in the mid-1990s. Recently, another genetic evaluation confirmed the population was unique and that it contained adequate genetic diversity. Additional fisheries are being developed to protect the unique South Pine strain from a catastrophic loss. Since the mid-1990s, 30 streams have received restoration stockings totaling 117,388 South Pine fingerlings. Today, work continues to expand Brook Trout fisheries in Iowa beyond the 11 streams currently open to public fishing.

2:30 to 3:00 Niti Mishra: Niti Mishra teaches GIS in the Geography & Earth Science dept. at UW-La Crosse. His research focuses on using geospatial data (such as satellite and drone acquired imagery) for environmental monitoring.

Presentation: Can Satellites Detect Coldwater Streams: Lessons from the Driftless Region, Iowa

Abstract: Coldwater streams are crucial habitats for many types of biota. Climate change is projected to alter the prevalent thermal characteristics of coldwater streams in the Driftless region. To protect these habitats, we must first know where they exist on the landscape. A preliminary assessment in northeast Iowa showed that coldwater stream sections were erroneously misclassified as warmwater streams or not classified at all. Field based approach (e.g. using temperature loggers) although accurate for stream classification, is not suitable for identifying coldwater coverage over large geographical extents. Our ongoing study focuses on developing a methodology which uses high resolution satellite imagery for detecting and mapping coldwater streams in driftless Iowa. This talk will highlight findings from this research project.

3:00 to 3:30 Kirk Olson: Kirk is a Fisheries Biologist with the Wisconsin DNR out of La Crosse, WI. His position covers the trout waters of Vernon, La Crosse, Monroe, and Crawford Counties. He has been in his current position for just under five years. Previously, he worked as a Fisheries Biologist with the WDNR on Lake Superior and its Tributaries. He holds a Bachelors in Fisheries from the University of Wisconsin Stevens Point and a Masters in biology from the University of Minnesota – Duluth

Presentation: Brook Trout population response to Brown Trout Removal in Maple Dale Creek, WI

Abstract: In 2019, the La Crosse WDNR Fisheries Management crew initiated a project to restore Brook Trout populations in Male Dale Creek through removal of Brown Trout. Between 2019 and 2021, 6,880 age 1 and older and 13,100 young of the year Brown Trout were removed from 3.5 stream miles of stream upstream of a flood control structure, which also acted as a fish passage barrier. Relative to a nearby reference stream, biomass and density of Brook Trout increased substantially after removal efforts began, while Brown Trout density and biomass decreased, though the decline in Brown Trout biomass was not statistically significant. These findings are in line with other Brown Trout removal studies in the Driftless Region and support Brown Trout removal as a feasible option for Brook Trout restoration where fish passage barriers prevent continuous re-colonization from downstream.

3:30 to 4:00 Ben Sellers is a Research Technician in the Department of Agronomy at the University of Wisconsin-Madison. His research interests revolve around stream restoration and remote sensing. With his advisor, Dr. Eric Booth, he strives to support the understanding of ecosystem responses to restoration in the Driftless Area.

Presentation: Monitoring the response of stream temperature to restoration in a small Driftless Area stream with a drone, precision GPS, and temperature probes.

Abstract: Water temperature is one of the most important variables in stream ecosystems driving biogeochemical processes, metabolic activity for various biota, and water quality. Enhancing our understanding and ability to estimate changes in stream temperature in response to changes in stream and land management and climate is imperative for better management of these valuable ecosystems. We present a novel monitoring framework that captures not only changes in stream temperature following a stream restoration project but also the major drivers of stream temperature such as shading and channel geometry. Utilizing consumer grade unmanned aerial systems (UASs), structure from motion photogrammetry, RTK GPS, and temperature sensors we are able to tell the story of a restoration's impact on peak stream temperature in summer months at a relatively low cost. Our observations using these tools allow for cataloging of changes in solar radiation, channel geometry, and temperature at the reach scale while undergoing a shift in vegetation from riparian trees to a cool season grassland community. This research aims to give an example of the application and benefit of cutting-edge monitoring techniques and tools to restoration projects in the Driftless Area and offer a framework of continuous systematic restoration monitoring.