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PERSPECTIVES AND NOTES

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A conservation science agenda for a changing Upper Midwest and Great Plains, United States

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Abstract

The long-term well-being of both people and nature is achievable, assuming major changes in resource distribution and consumption at a global level. This optimistic outlook for the world requires rapid identification of major knowledge gaps that would undermine our ability to achieve a sustainable future if left unaddressed locally and regionally. Our goal was to identify the science needs that would make the biggest contribution to sustaining human society and natural systems in the Upper Midwest and Great Plains, United States. We engaged an interdisciplinary group of scientists and practitioners in an iterative exploration and prioritization process. The resulting list of 50 research questions identified science gaps for strategy implementation to achieve conservation success. Of the original list, 17 questions ranked as highly important in the region. These 17 questions constitute a conservation science agenda for the region. We call for alignment around this common agenda and a concerted, multidisciplinary approach to addressing these priority scientific needs.

KEYWORDS

climate change, forest, freshwater, grassland, restoration, science needs, sustainable

1 | INTRODUCTION

As our understanding of the natural world and its sociological and economic backdrop has evolved, the focus of conservation science and practice has expanded from emphasizing individual species to entire socioecological systems (Kareiva, Groves, & Marvier, 2014; Mace, 2014). In response to this shift, several conservation organizations, including The Nature Conservancy (TNC), amended organizational visions to reflect a feedback loop, where people conserve nature because nature provides benefits to people. This shift in vision aligns with the Sustainable Development goals set by the United Nations, including the alleviation of poverty and hunger while also sustaining terrestrial and freshwater biodiversity (United Nations, 2015).

This optimistic vision for conservation and our planet assumes natural resources will be sufficient to achieve

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these goals simultaneously. Tallis et al. (2018) tested the assumption of sufficiency by modeling the increased demands of human population growth alongside the achievement of ambitious conservation goals. The increasing global demand for food and energy could be met while also accelerating the protection of natural habitats, ending overfishing, reducing water stress and air pollution, and reversing greenhouse-gas (GHG) emissions (Tallis et al., 2018). Although this future is theoretically possible, Tallis et al. (2018) point out that achieving these goals will require substantial changes in business-as-usual production, distribution, and consumption globally.

2 | REGIONAL CONTRIBUTIONS TOWARD GLOBAL GOALS

The actions required to achieve these outcomes worldwide must be implemented at both regional and local scales. Accordingly, we were interested in identifying the research needed to implement the recommendations of Tallis et al. (2018) at local and regional scales in the Upper Midwest and Great Plains (UMGP; Figure 1). The landscape of this region is locally and globally significant because it is a major confluence of freshwater, forest and grassland biomes, agricultural production, and home to millions of people. The grasslands and wetlands in this region are critical for breeding waterfowl and grassland birds (Walker et al., 2013; Zimpfer, Rhodes, Silverman, Zimmerman, & Richkus, 2013), have incurred large-scale conversion to row-crop agriculture (Lark, Salmon, & Gibbs, 2015; Wright, Larson, Lark, & Gibbs, 2017), and face increasing threats from energy development (Allred et al., 2015; McGranahan, Fernando, & Kirkwood, 2017). Forests in this region were altered from late-successional conifer to early-successional deciduous and mixed deciduous-conifer during the logging era of the late nineteenth and early twentieth centuries (Schulte, Mladenoff, Crow, Merrick, & Cleland, 2007), which has increased their vulnerability to threats including wildfire, disease and insects, and invasive plants (Frelich & Reich, 2009; Galatowitsch, Frelich, & Phillips-Mao, 2009). The UMGP region also captures critical freshwater resources connected to global marine systems, including the headwaters of the Mississippi River, the Red River of the North, and the headwaters of the Great Lakes drainage. Maintaining or improving water quality and flow regime within the UMGP is vitally important for water quality in the Gulf of Mexico, the Arctic Ocean, the Great Lakes,

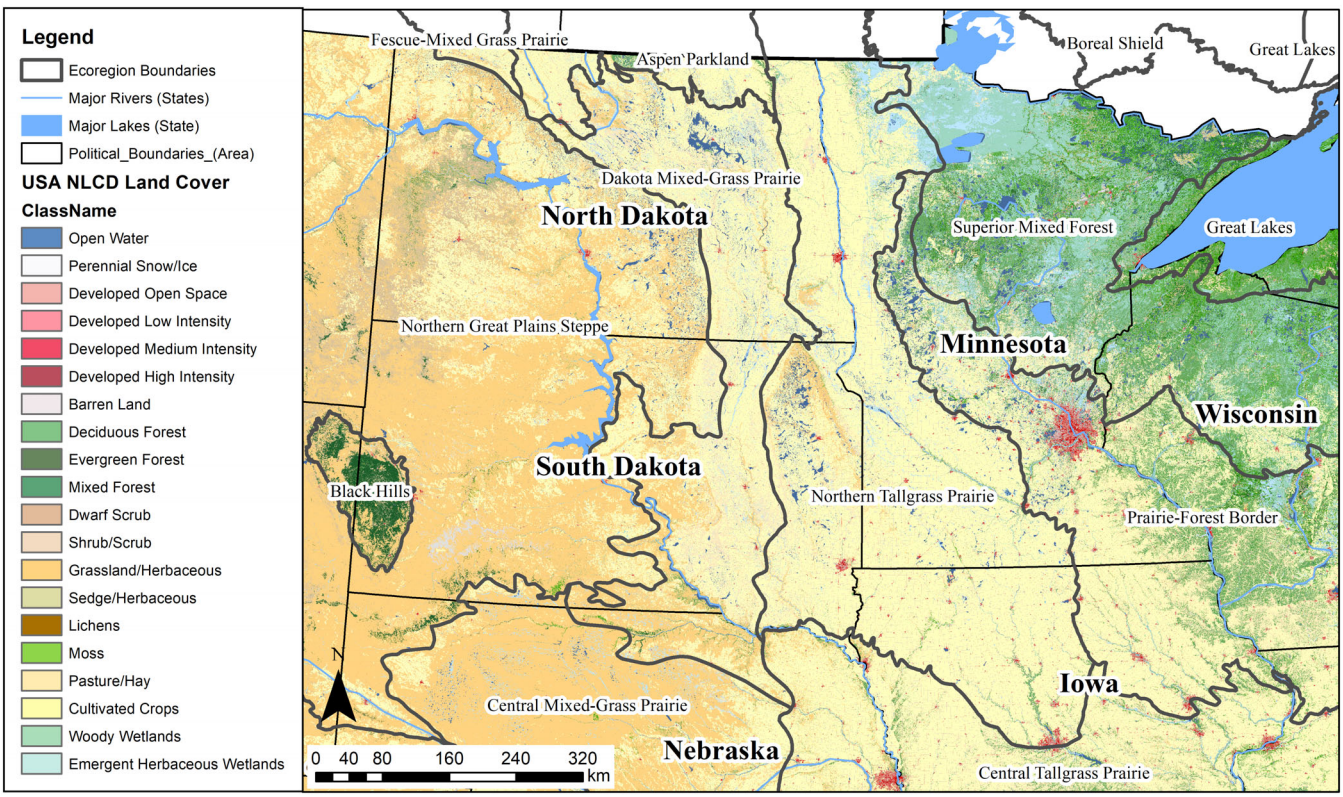

FIGURE 1 Map of the Upper Midwest and Great Plains region depicting habitat types and major water bodies and rivers that were the focus for this conservation science agenda

and as well as the many communities along these rivers that rely upon them for drinking water and other ecosystem services. Climate change will exacerbate these existing threats as both nature and people struggle to adapt (Nolan et al., 2018; Ravenscroft, Scheller, Mladenoff, & White, 2010).

These challenges, along with the important natural resources of the UMGP, create opportunities for conservation both regionally and globally. The region can help mitigate climate change through natural climate solutions that could sequester carbon in natural and working lands (Fargione et al., 2018). Moreover, land management, restoration, and avoided conversion scenarios proposed to achieve natural climate solutions (Fargione et al., 2018) are consistent with those being pursued to improve water quality, flood storage, and reduce nutrient loading to the Gulf of Mexico (Johnson et al., 2016; Lal, 2016). For example, nearly 18 million people drink water from the Mississippi River (Rathbun, 1996; UMRBC, 1982). Even when targeted for carbon storage, lands in the UMGP support multiple functions and provision many services including reducing nutrient runoff to provide clean drinking water, pollination, and so forth (Keeler et al., 2016).

3 | DEVELOPING A CONSERVATION SCIENCE AGENDA

Conservation implementation relies on science for effective and efficient investments in management, protection, and/or restoration. Good conservation strategies should be both informed by and influence the science on which they are based (Beier, Hansen, Helbrecht, & Behar, 2017). We suggest that conservation science is often most immediately useful when it is done within the context of decision-making for proposed strategies with long-term impact (Possingham, Andelman, Noon, Trombulak, & Pulliam, 2001). Therefore, as a starting point in our process to identify science needs for conservation decisions, we considered a set of current and proposed conservation strategies for TNC in Minnesota, North Dakota, and South Dakota (i.e., a large portion of the UMGP) alongside the global challenges faced by both people and nature. Recognizing the pressing need to advance conservation strategies at regional scales and at a pace that could produce recognizable change, our goal was to lay out a regional research agenda to serve as a call to action for collaboration and attract funding to implement regional conservation strategies.

Specifically, we focused on conservation initiatives coalescing in the UMGP around climate change, sustainable/regenerative agriculture, and ecosystem resilience. Under each initiative, we concentrated on strategies to sustain healthy forests, freshwater and grassland ecosystems. Forest conservation strategies emphasize climate change mitigation and adaptation alongside sustaining water resources and forest products revenue. Freshwater strategies drive toward maintaining water health and appropriate flow. Grassland strategies focus on accelerating protection and resilience of prairie landscapes through restoration of former cropland and sustaining appropriate disturbance and management techniques on remnant prairie to maintain both ecological communities and ranching livelihoods.

We used an iterative solicitation, ranking, and feedback process between conservation practitioners and scientists to develop a list of the most useful science questions (Sutherland et al., 2009; Sutherland et al., 2017). The initial list of questions developed organically from conservation staff working on the above strategies in the forest, freshwater and grassland programs at TNC. Staff were asked to articulate the science gaps and questions most pressing to their work. All questions posed were considered, and the initial set included more than 100 questions. Each of the three habitat programs then synthesized and ranked questions. The grassland program used Survey Monkey (https://www.surveymonkey.com/) to rank questions with practitioner input, and the forest and freshwater programs solicited and summarized feedback from staff.

With global priorities and regional conservation strategies at the forefront, we then convened an interdisciplinary team of 14 scientists with expertise in the fields of prairie ecology, forest ecology, aquatic ecology, hydrology, limnology, forestry, natural resource management, evolutionary ecology, climate change, decision science, sustainability and environmental economics. The team was charged with identifying the biggest assumptions and science gaps in conservation strategies that, if addressed, could deliver greater conservation outcomes, or the same outcomes more cost effectively. The team began with the initial list and rankings of science questions from TNC conservation staff and used a 2-day in-person workshop to revise and supplement this list, drawing from the team's depth of knowledge and experience in many disciplines. After the 2-day workshop, we iterated the process of reviewing and refining questions between the team of scientists and the conservation staff via webinars and written comments twice following the workshop. This process removed redundancies, identified questions for which reliable knowledge already existed, and removed less pressing issues.

The result of this iterative process was a list of 50 science needs arrived at by final consensus between the panel of scientists and TNC conservation staff. All 50

TABLE 1 Priority science gaps critical to implementing conservation strategies to protect and steward land and water resources, tackle climate change, provide food and water sustainably, and address socioeconomic issues for people and nature in the Upper Midwest and Great Plains region (Table S1)

Protect land and water	
Forest	How do we integrate geophysical data—Including data on landform diversity, local connectedness and wetlands—With forest condition data to create a forest restoration action map?
Freshwater	How does changing land cover in grassland and forest systems (due to climate, land use, management, policy, etc.) influence water budgets, flows, and water quality in lakes and streams in those landscapes? What are the cultural and economic drivers behind the changing land uses and what can we do to address those?
	How much nutrient, sediment and water runoff reduction is achieved in rivers and streams when upland vegetation is protected from conversion compared to its loss to different land uses?
	What is the minimum threshold needed for protection and restoration of natural infrastructure (forests, wetlands, soil health, natural floodplains) to ensure watersheds are resilient to climate change?
Grassland	What levels of native diversity are required to maintain ecosystem services in our grasslands, and how do we achieve that goal in the most cost-effective way?
	How do we ensure adaptability of our remnant and restored grasslands in fragmented landscapes?
Tackle climate change	
Forest	How can we prioritize forest landscapes and sites for restoration using mapped compositional and structural categories and other data? How much of the forest is "stuck" in an undesirable state with high brush density and low tree reproduction, and what are the best strategies for shifting these sites to a more productive state?
	What are the policy and/or market mechanisms that could advance needed forest restoration and adaptation work? For example, federal fire policy could more effectively use prescribed fire as restoration tool. Carbon markets could provide incentives for improved forest management.
	How can we be more cost-efficient in forest restoration implementation? What are the relative costs and benefits of establishing a large number of scattered restoration plantings compared to a smaller number of larger planting projects? Is there a tradeoff in ecosystem services that results from these distinct approaches?
Freshwater	How do changes in water use and availability with climate change impact the viability of our working lands in priority grasslands and forests? Might these changes (e.g., lower productivity) drive further land conversion/perennial loss, and in turn further degrade hydrology, water quality and aquatic health? What kinds of strategies might help landowners and land managers modify practices in response to changes in water availability?
Grassland	What are the economic consequences of degradation of existing grassland and wetland complexes or the loss of this system to conversion (e.g., loss of productivity, decreased soil health, increased risk of extinction for pollinators or functional diversity, increased runoff, etc.)?
	Are there economic consequences to a private livestock operator's bottom line to maintaining soil health or productivity in resilient grassland and wetland complexes and are there cultural or social obstacles to implementing best practices?
Provide food and water sustainably	
Freshwater	How do different conservation actions (e.g., protection, restoration) rank both ecologically and economically to achieve the same desired outcomes for habitat, nutrient and sediment loss, and water storage/runoff? How much perennial cover and wetland/riparian/floodplain restoration is needed to meet basin-wide nutrient reduction goals and sustain aquatic community health?
Grassland/agriculture	What are the most cost-effective strategies and best management practices for restoring hydrology/reducing nonpoint source loads in agricultural watersheds?
Socioeconomic interactions	
All systems	What is the full range of watershed and ecosystem services that provide economic, social, and/or ecological benefits? How can we best quantify the economic value of these benefits and internalize them into decision-making? Can we quantify tradeoffs between different scenarios in terms of costs and benefits to public and private beneficiaries?
	What are the socioeconomic barriers to the uptake of new information or best management practices for all the science questions outlined?
	What are the economic benefits from changes to water quality, flood reduction, drought mitigation, carbon storage, and soil health provided by creating resilient grassland and wetland complexes, and can we leverage this knowledge for conservation?

questions were kept on the full list, and this same group of scientists and conservation staff completed a prioritization process. For each of nine sets of questions grouped by strategy and habitat type (e.g., Forest questions under the Protect Land and Water strategy), staff were asked to rank questions based on the likelihood of conservation failure if left unanswered. For the three longest lists (Freshwater—Protect Land and Water, Grassland—Protect Land and Water, Forest—Tackle Climate Change), questions were ranked altogether as one list, and weighted averages were used to score the final rankings. For the other six lists, questions were ranked using pairwise comparisons, and simple averages across the pairs were used for the final score. We used natural breaks in the scores to categorize the 50 questions into a high, medium and low priority (Table S1). The result was a final list of 17 high priority questions critical for conservation success in the region (Table 1). Although a different group of people may not have created this exact set of questions, the major themes and uncertainties identified would likely be similar, and our approach could be used by others to accomplish similar goals (Sutherland et al., 2012).

4 | CONSERVATION SCIENCE NEEDS

The science gaps identified tended toward complex issues involving the interaction between social and ecological sciences. We grouped them under three broad conservation strategies corresponding to emerging initiatives (mentioned above) in the UMGP: protect land and water, tackle climate change, and provide food and water sustainably. In most cases, the questions identified would fill important science gaps for many different conservation actions under each strategy. Finally, socioeconomic science needs figured prominently across all initiatives and habitat types, although there were a few overarching questions that we called out separately.

4.1 | Protect land and water

We identified 21 science needs related to the protection of land and water, three for forested systems, nine for freshwater systems, and nine for grassland systems (Table S1), and six of these questions were categorized as high priority (Table 1). The relationship between land and water protection is vital given the region's position within major watersheds and importance to the Prairie Pothole Region. Additionally, identifying science needs for good stewardship of land and water was considered integral to successful execution of land and water protection strategies. How climate change will manifest in the UMGP, which lies on the prairie-forest boundary, remains a confounding question, and the potential for land and water management in sustaining ecosystems under climate change has yet to be tested.

In the UMGP, science gaps around land and water protection relate most to management strategies designed to improve the condition of the forests, freshwater and grassland systems. Forest conservation has shifted to adaptive forest management that embraces resilience (change within the range of natural variation) and transition (facilitated change to new conditions) strategies (Millar, Stephenson, & Stephens, 2007; Nagel et al., 2017), and key areas of uncertainty include: determining the existence of an adaptation lag of species perhaps maladapted to a new climate (Etterson, Cornett, White, & Kavajecz, 2020; Gray, Gylander, Mbogga, Chen, & Hamann, 2011), understanding the risk associated with cryptic maladaptation, and species distribution models that incorporate plant traits, abiotic factors and climate models to help predict where and what plant material to use (Park & Talbot, 2018). Freshwater conservation strategies in the region have long focused on protecting, restoring and managing the lands most important for healthy waters—"land for water's sake" (Jacobson, Cross, Dustin, & Duval, 2016)—and yet critical uncertainties remain regarding "how much is enough?," "where are the 'right' places?," and "what are the 'right' practices and timing" that will provide sustainable solutions over time? Finally, the loss of grasslands and the fragmentation of the landscape by large-scale agriculture is the greatest threat to most grassland species in the UMGP (Comer, Hak, Kindscher, Muldavin, & Singhurst, 2018) and creates challenges for the grasslands that remain as well as the people who wish to remain on the grasslands. The key science needs around grassland protection include how to balance native and invasive species, restore connectivity and resilience, and best practices to help the ecological systems and ranching communities adapt to climate change.

4.2 | Tackle climate change

We identified 20 science needs related to tackling climate change, 12 for forests, three for freshwater and five for grasslands (Table S1), and six of these questions were categorized as high priority (Table 1). The process of improving condition and adaptability of our natural systems through the Protect Land and Water strategies can also result in increased carbon sequestration and storage, and climate change is likely to influence how the heavily

agriculturally reliant communities in the region interact with water. The science questions identified focused on uncertainties related to implementing a natural climate solutions strategy (Fargione et al., 2018) and gaining a better understanding of how climate change, productivity, and water use and availability will interact to affect people and nature in the region.

Tackling climate change is one of the most important prerequisites for achieving a world in which people and nature thrive (Tallis et al., 2018). Natural climate solutions have the potential to deliver >37% of carbon capture and storage needed to deliver on the Paris Climate Agreement (<2°C degrees warming) globally (Griscom et al., 2017). Fargione et al. (2018) optimistically estimate that Minnesota, North Dakota and South Dakota together have the potential to sequester ~90 million tons additional CO_2e annually by scaling up the implementation of a set of ~10 specific conservation practices. This would account for approximately 10% of the US contribution to the global natural climate solutions target. Among the most basic science needs for natural climate solutions in the UMGP is mapping and quantifying the greatest opportunity areas for each of the above practices. A map of prioritized opportunities will make it possible to identify clear strategies for reaching carbon sequestration goals for our region through policy, finance, and collaboration.

4.3 | Provide food and water sustainably

We identified five science needs related to providing food and water sustainably, three for freshwater and two for grassland or agricultural systems (Table S1), and two of these questions were categorized as high priority. The UMGP is an important agricultural producer in both row-crop agriculture and livestock, and strategies to provide food and water sustainably across the region focus on improving practices in consideration of the impending need for climate change adaptation. Key freshwater questions focus on how climate change will influence hydrology, stream flows, water quality, and aquatic systems, both directly through changes to temperature and timing and amount of precipitation and indirectly through agricultural changes to land use and land cover.

Agricultural subsurface drainage, which continues to expand and intensify in the UMGP, has altered stream and landscape hydrology with significant implications for aquatic ecosystems (Blann, Anderson, Sands, & Vondracek, 2009; King, Williams, & Fausey, 2015; Minnesota Groundwater Association, 2018). Consequently, large increases in stream and river flows have been documented throughout the UMGP, resulting in increased sediment and nutrient loading downstream (Kelly, Takbiri, Belmont, & Foufoula-Georgiou, 2017; Lenhart, Peterson, & Nieber, 2011; Schilling & Libra, 2003; Schottler et al., 2014; Zhang & Schilling, 2006). Furthermore, climate change is likely to exacerbate these patterns through alteration of precipitation and the human use of aquatic systems. Finally, the soils that the native grasslands built have been the backbone of agriculture in the region. As we need to produce more food from the same land area, critical science needs lie in understanding the role of cover crops, other field-based practices to improve soil health, and edge-of-field practices to treat runoff and capture sediment. This most recent movement is encapsulated in the term "regenerative practices" because we must rebuild our soils toward historic levels for long-term food security.

4.4 | Overarching socioeconomic needs

Implementing conservation strategies often requires behavioral change at a societal level. However, behavioral change is only possible if individuals understand the rationale for change and have a personal stake in the outcome; this is a major challenge. We identified five socioeconomic science needs that fell outside the bounds of the other three categories (Table S1), and three of these questions were categorized as high priority. The focus of these science needs was on understanding economic benefits of practices and understanding how human behavior influences outcomes or adoption of new practices.

Throughout the process and across the habitat types and conservation initiatives, socioeconomic and socioecological questions arose. In fact, many of the science needs occur at the intersection of social science and ecology. As the climate changes, it is not clear how people in the UMGP will respond, and in turn how that will impact natural systems. For example, some cities in the region have been designated "climate refuges"—locations where the impacts of climate change can be more readily managed, for example with an abundance of freshwater—suggesting a shift in demographics that will place additional pressure on both natural and built systems (Lovrien, 2019). These social science gaps are critical to conservation success.

5 | DIVERSE EXPERTISE AND PARTNERSHIPS WILL BE REQUIRED

As evidenced by the science needs, the problems we face in securing a better future for people and nature are

TABLE 2 Examples of the intersectional science questions identified and the potentially diverse expertise and complex partnerships that may be necessary to address these questions

Science need	Expertise	Potential partnerships
How do we incorporate knowledge of plant functional traits into adaptive forest management? Which plant functional traits best predict species responses and can be used to monitor change and effectiveness?	Forest ecology Climate modeling Ecological genetics Species modeling Plant physiology	U.S. Forest Service Forestry industry Academic institutions Natural resource agencies Nonprofits
How does changing land cover in grassland and forest systems (due to climate, land use, management, policy, etc.) influence water budgets, flows, and water quality in lakes and streams in those landscapes? What are the cultural and economic drivers behind the changing land uses and what can we do to address those?	Freshwater ecology Hydrology Behavioral economics Policy Landscape ecology Spatial modeling Environmental economics	U.S. army corps Municipal water Academic institutions Nonprofits Private landowners Farmer groups Corporations
Are there economic benefits to a private livestock operator's bottom line to maintaining soil health or productivity in resilient grassland and wetland complexes and are there cultural obstacles to implementing best practices?	Grassland ecology Rangeland ecology Soil health Wetland ecology Behavioral economics Livestock production Ranching economics	Academic partnerships University extension offices Grazing associations Private landowners Nonprofits Natural resource conservation service

complex. The results of this process elucidated the need for a diverse set of expertise directed at a more comprehensive and intersectional set of scientific questions than we could have otherwise articulated, which will require interdisciplinary coordination and collaboration. A diversity of expertise can bring critical nuances to discussions and problem solving that would otherwise be missed, thereby avoiding the risk of identifying questions or solutions that may be either irrelevant or already addressed. With the complexity of the problems, we face and the urgency with which we need to make progress, the science we invest in must be laser-focused on the most important issues and questions.

Complex issues and science questions are likely to need more robust partnerships and funding mechanisms to effectively address them (Table 2). Research teams headed by multiple principal investigators with expertise from diverse complementary fields will be important to address issues that include people and nature, and joint fundraising and pooling of resources to support the science will be necessary. New modes of problem solving, such as collective impact initiatives (Kania & Kramer, 2011) or systems thinking and dynamics (e.g., Turner, Gates, Wuellner, Dunn, & Tedeschi, 2013) may be useful. Additionally, it is important at the outset to consider who will need to use or be influenced by the research outcome. Who delivers the message to a particular audience can change people's receptivity to the information (Kahan, 2010). Furthermore, organizations funding projects need to be invested in the ultimate outcomes of that science as well as the broader impacts. Depending on the project, different types or combinations of funds may be beneficial: government funds, private funds, public–private partnerships, national funds, regional funds, local investment, bottom up approaches, top down approaches, and so forth. For example, projects using large tracts of public lands to test or demonstrate new ideas may be best suited for government funds. To address many of the science gaps identified here in a way that will further conservation, researchers will need to be more intentional in their process of developing partnerships, raising funds, and integrating managers and decision makers in the process.

6 | ROLE OF SCIENCE-BASED CONSERVATION ORGANIZATIONS

The results of this process highlight the role that science-based conservation organizations can play as a convener and advocate of strategic science initiatives. Science-based conservation organizations can bring together a diverse set of scientists and practitioners to conduct the science as well as imbed science and learning into

conservation action. Furthermore, testing scientific recommendations and using adaptive management to learn and improve on practice, requires a land base where new ideas can be tried with low risk to private businesses or landowners. Conducting real-world research on conservation lands is important to scaling up new strategies, and the network of existing public lands (e.g., national forests, national grasslands, state parks, etc.) and private conservation lands (e.g., TNC's nature preserves) can play an important role as testing grounds for new strategies.

Importantly, the UMGP priorities as identified through the collaborative process we describe, are linked to the United Nation's Global Sustainable Development goals (https://sustainabledevelopment.un.org/?menu=1300), which are shared by many organizations worldwide. Therefore, despite the initial TNC context, answers to the questions and issues identified should move all conservation action forward faster. For example, if we can identify the necessary extent and location of wetland restoration for reducing nutrient runoff, wetland restoration resources can be deployed more strategically to achieve the greatest impact from conservation action in a shorter amount of time. To move from complex questions to answers and greater conservation impact, TNC is convening a Conservation Science Summit for the UMGP region. The goal for the Summit is to bring together partners from across government agencies, academics, and nongovernmental organizations to develop working groups around many of the questions identified to begin the process of attaining answers. This conservation science agenda will drive the Summit and initial working groups, but the hope is that over time the working groups can answer questions and evolve the conservation science agenda itself as global and regional conditions change.

We do not yet have all the necessary answers to solve some of Earth's greatest challenges, but the good news is that these science gaps can be addressed. Tallis et al. (2018) suggest that doing the hard work can achieve success for people and nature. The UMGP has a need for scientists representing diverse, complementary disciplines who can produce the knowledge needed for conservation and management actions to have the greatest global impact. In many cases, simply introducing sustainability practices will not suffice. Instead, shifting the mindset and the goal toward regenerative practices may be necessary. In natural systems degraded by overuse or pollution, such as some rangelands, croplands, and freshwater systems, science and practice must find ways to maintain livelihoods while also rebuilding the natural capital and resilience of the ecosystem (Sherwood & Uphoff, 2000). As the process of change in our human and natural systems increases its pace, it is imperative that we tackle these complex questions now.

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CONFLICT OF INTEREST

The authors declare no financial or other conflicts of interest to report.

AUTHOR CONTRIBUTIONS

Marissa A. Ahlering leads the initial draft of the paper. Meredith Cornett, Kristen Blann, Mark White, Christian Lenhart, Cami Dixon, Michele R. Dudash, Bonnie Keeler, Brian Palik, John Pastor, and Hugh Possingham all contributed to the initial writing and organization of the paper. All authors contributed substantially to the content and question generation in the paper as well as read and reviewed the final manuscript.

DATA AVAILABILITY STATEMENT

The only data used in this paper was the full list of questions developed by the coauthors. All of this information is provided in the Supplemental information published with the paper.

ETHICS STATEMENT

No ethics review for animal handling or human subject research was necessary for the work reported on in this paper.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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