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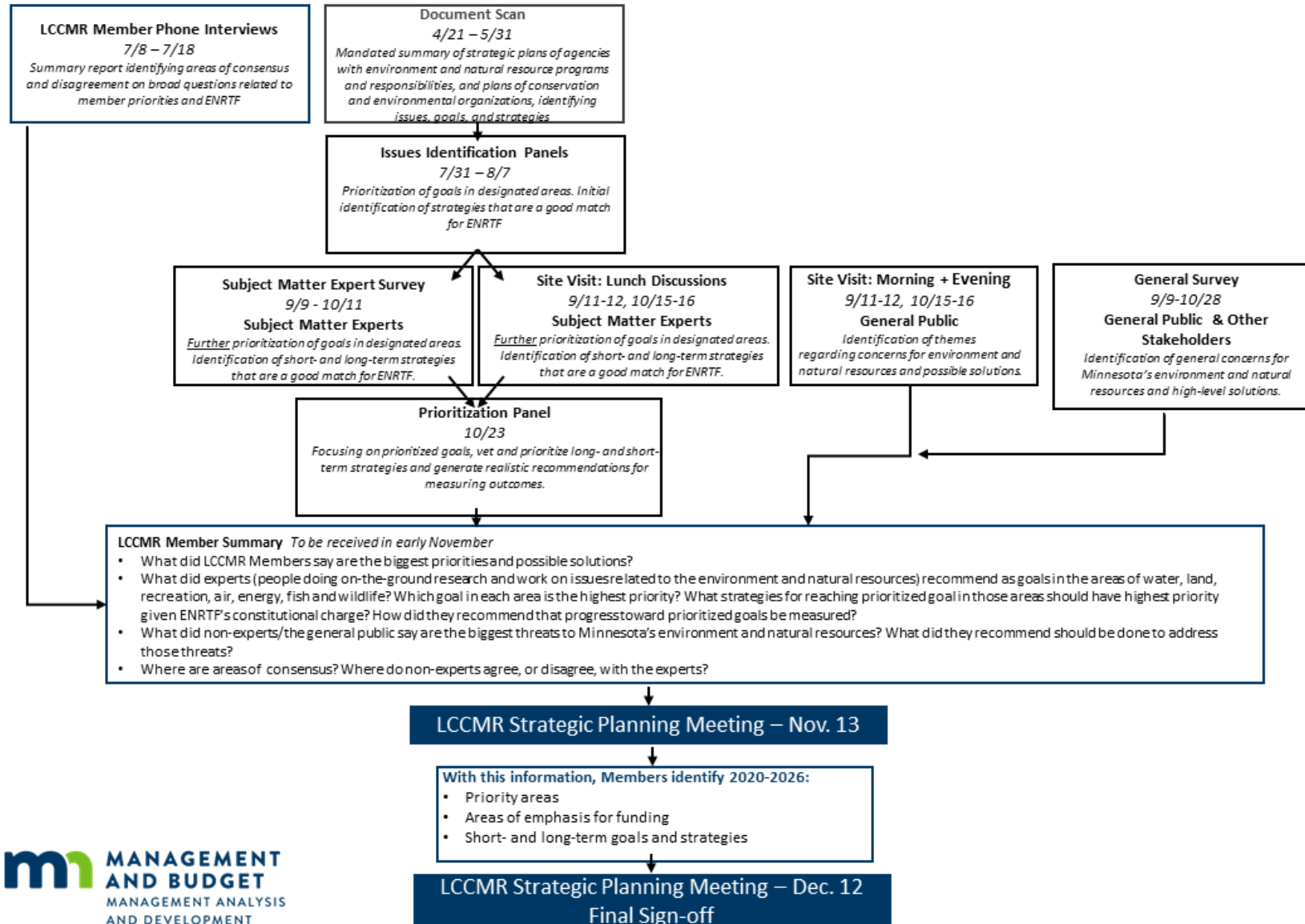
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Appendix A: ENRTF Strategic Planning Stakeholder Input Process Visual

ENRTF Strategic Planning – Stakeholder Input Process



Appendix B: LCCMR Member Interviews Summary

Between July 2 and July 18, 2019, Management Analysis and Development (MAD) staff conducted phone interviews with 16 of the 17 members of the Legislative-Citizen Commission on Minnesota Resources (LCCMR) to gather their personal perspectives on key questions at the start of the 2020-26 Environment and Natural Resources Trust Fund (ENRTF) strategic planning process. MAD contacted members via email, through their legislative assistants, and by phone to schedule interviews.

This document summarizes the themes that emerged across LCCMR member responses to questions regarding their top concerns for Minnesota's environment and natural resources, emerging threats, successes to build on, and bold funding strategies. Members were asked the following questions:

1. What does the vision for the ENRTF mean to you?
2. What top three concerns related to the environment and/or natural resources do you feel are most urgent to address?
3. What one or two bold funding strategies do you think LCCMR should pursue?
4. What is your opinion on striking the right balance between funding research versus funding implementation?
5. What do you believe is the greatest emerging threat regarding Minnesota's environment and/or natural resources?
6. What successes related to the environment or natural resources could ENRTF funding build upon to have an even greater impact on Minnesota?

Throughout this document, the numbers in parentheses indicate the times that certain topics or themes were mentioned in member comments. An individual member's comments may be counted more than once across different themes, as MAD was not always able to neatly separate comments on some topics into just one theme.

Top Concerns and Emerging Threats

The majority of members indicated that clean water or water quality is one of their top concerns for Minnesota's environment and natural resources (13). Other concerns mentioned multiple times included invasive species (7), climate change (6), pollinators (4), and habitat or land preservation (4).

Concerns that may fall into one or more of these topics, but which were mentioned fewer than four times included: trails and parks (3), waste water treatment infrastructure in rural areas (2), forests (1), overpopulation (1), funding (1), chronic wasting disease (1), and encouraging youth to experience and enjoy the outdoors (1).

Almost all members said that their top concerns were statewide issues, rather than regionally specific concerns. Some members did say that solutions to these issues may need to be different or adapted, depending on the area of the state impacted.

There was clear overlap between members' top concerns and what members indicated is the greatest emerging threat for Minnesota's environment and natural resources. Climate change (4), invasive species (4), and clean water (3), were all mentioned more than once as the greatest emerging threat.

Other emerging threats that may fall into or overlap with those three main areas, but which were mentioned only once each included some specific issues: habitat preservation, plastics, chemicals, chronic wasting disease, and livestock

epidemics. Also mentioned once each were broader emerging threats: depletion of the ENRTF, skepticism of science, and general world-wide environmental impacts.

When asked about the barriers to addressing these problems, members cited disagreement among stakeholders (including among LCCMR members) about both the problems and solutions, politicization of the issues, lack of trust in science, challenges with getting stakeholders on board and working together, the complex nature of the issues, and lack of funding.

Most members responded that they feel like the ENRTF is already addressing many of these challenges and emerging threats, but that more work needs to be done. Multiple members cited such successes as the creation of the research centers on aquatic and terrestrial invasive species, research on triclosan that led to a statewide ban, and work on state trails and parks.

Ideas for Bold Funding Strategies

Members were asked to identify bold funding strategies for the LCCMR to pursue. A few members indicated that they like the current way that the LCCMR determines which projects to fund (4). Some talked about appreciating the broad scope within the current approach. One member expressed concern that limiting the scope for proposals may result in missing out on funding innovations that are not yet on their radar.

A few members recommended that the 2020-26 strategic plan limit the scope of the ENRTF (3). One member recommended picking one big issue to focus on, like climate change, while another recommended picking four to five issues for each year of the strategic plan. Members who talked about the need to limit the scope referred to an overwhelming number of proposals for review each year, in addition to a desire to help potential grantees better target their proposals to the interests of the Commission. One member who recommended limiting the scope also recommended maintaining some funding each year specifically for emerging issues.

A few members' comments indicated that members of the Commission come with their own bias toward certain topics, issues, or strategies (4). These members recommended, for the sake of transparency, having the LCCMR members clearly identify their personal priorities, and to set-aside funds for them at the start of the process. Two members recommended designating a specific amount of money for research projects. The next section explores issue of funding research versus implementation.

At least a few members disagreed on funding small projects. One member cited the small projects funding as a success of the ENRTF, while another expressed concern over how allowing small project proposals increases the number of proposals that must be reviewed.

Other bold ideas for funding strategies included:

- requiring projects to have multiple benefits or impacts;
- creating new opportunities, or enforcing current requirements, for projects that will return money to the trust;
- funding pilot and test programs to address climate change;
- funding more demonstration projects;
- staying involved with projects longer-term;
- allowing for more than 5% of the principal of the trust be made available for projects each year;
- using more funds for waste water/sewer treatment facilities in small communities;
- having research projects go through a peer review or other process, rather than being reviewed and approved by the full LCCMR membership;
- requiring research project proposals to identify how the research will lead to action;

- partnering more closely with Commissioners and Executive Branch; and
- coordinating more with Legacy Amendment funds.

Funding Research v. Implementation

On the topic of funding research versus funding implementation, there was not consensus. Although several members' comments indicated that research is important for finding "what works" (6), comments were then divided between members who would rather "see things get done" (6) versus members who want a balance between funding both research and implementation (6).

One member recommended requiring proposals for research to include how the project would be followed-up by implementation.

One member said there was a need for research for its own sake, indicating that the ENRTF is one of the only current government sources of funding for research and that research projects selected by LCCMR in the past have been successful.

The topic of supplanting will be explored more in the next section, but a couple of members' comments related to concern about whether funding a large number of research projects at the University of Minnesota is supplanting. One member instead saw using the trust funds for U of M research as helping fulfill the land grant mission of the University.

In addition to the tension between research and implementation, a few members brought up perceived tension over the issues of funding capital projects and land acquisition projects. These issues were also raised by some members when talking about issues around supplanting.

Avoiding Supplanting

A few of members' comments recommended that if LCCMR focuses only on innovative proposals or brand new projects, then it would help avoid supplanting (4). Other comments recommended continuing to have members take responsibility for "calling it out" when they think a proposal would supplant (3), and continue to have LCCMR staff point out when proposals may be supplanting (1).

A couple of members' comments expressed concern that the trust fund was becoming a "slush fund" (2). However, concerns about who was using it in such a way were divided. Some comments, as stated above, expressed concern – or perception of a concern – over too much funding going to the University of Minnesota and the Department of Natural Resources. While other comments expressed concern about using the funds for waste water treatment infrastructure or capital projects. One member expressed concern about getting proposals from private businesses.

Several members made comments about the unique nature of the ENRTF, and how valuable it is for the state. However, opinions were divided about whether the fund should be used to "fill gaps" where other funding sources may be falling short, and what types of projects members would support funding when there are questions of supplanting.

Appendix C: General Public Survey Summary

There were two methods used to gather broader input from additional stakeholders who were identified as having interest in the outcome of the strategic plan but who were not identified as subject matter experts, including the general public. One method was through a publicly accessible, online survey.

From September 9 through October 28, the online survey was publicly available to anyone who wished to participate. A link to the survey was publicized by LCCMR staff via social media. The link was also emailed directly to a list of over 200 stakeholders, including organizations who have signed-up to receive the LCCMR's regular email communication. Those who received the link were encouraged to share it with others.

The survey was brief, and asked respondents to identify their area of biggest concern for Minnesota's environment and natural resources and what should be done about that concern. It also invited respondents to offer a bold idea for protecting the state's environment and natural resources.

A total of 2430 responses were received. Below is a table showing the demographic breakdown of survey respondents.

Table 1. Demographics of respondents to the general public survey

	Count	%
Race/Ethnicity		
American Indian	13	< 1%
Asian	16	< 1%
Black	6	< 1%
Latino/a	5	< 1%
White	2098	86%
Two or more	37	2%
Did not answer	256	11%
Age		
Under 25	83	3%
25 to 34	284	12%
35 to 44	348	14%
45 to 54	318	13%
55 to 64	497	20%
65 to 74	544	22%
75 or older	156	6%
Did not answer	201	8%
Area of Minnesota		
Northwest	151	6%
Northeast	271	11%
Central	269	11%
Southwest	145	6%
Southeast	286	12%
Seven County Metro	1117	46%
Outside Minnesota	22	1%
Did not answer	170	7%

Based on self-reported data, the majority of survey respondents were white (86%) and almost half (49%) were 55 or older. There was balance between respondents who reported living in Greater Minnesota (46%) and those who reported living in one of the seven counties of the Twin Cities metropolitan region (46%). The survey results provided below are not meant to be representative of the general population of Minnesota.

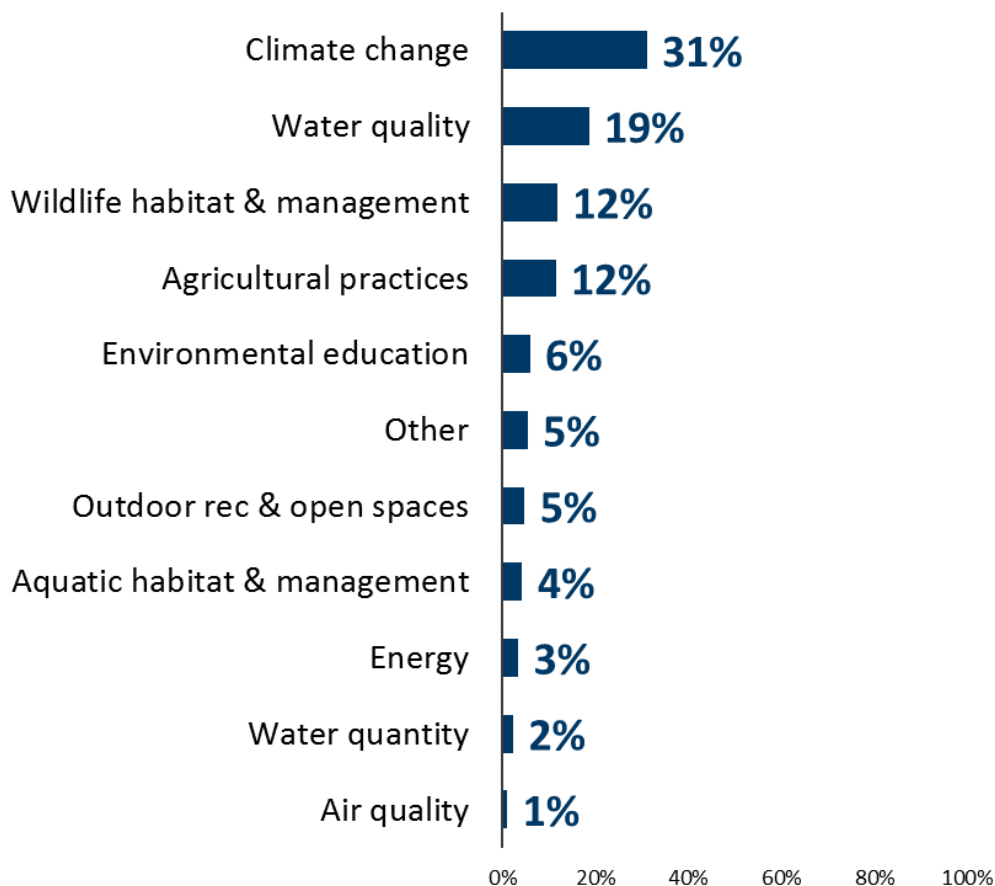
Respondents were asked if they had participated in another stakeholder engagement opportunity, like one of the subject matter expert meetings or during a Site Visit. Only 2% of respondents reported that they remembered having participated in the strategic planning process in another way.

Respondents were also asked if they work for or are affiliated with an organization, agency, or program that works on issues related to the environment and natural resources. Forty percent of respondents said yes, with 5% of respondents not providing an answer. Among those 963 respondents who reported working for or being affiliated with such an organization, agency, or program, 39% reported that it was a governmental organization, 37% reported that it was a non-profit, and 11% reported that it was an academic institution. Among those who reported working or being affiliated with an organization, agency, or program that works on issues related to the environment and natural resources, 31% reported that it had received ENRTF funding in the past, and 33% reported that they didn't know.

Survey respondents' biggest concerns for Minnesota's environment and natural resources

Survey respondents were asked to identify their biggest area of concern for Minnesota's environment and natural resources.

Figure 1. Percent of survey respondents identifying their biggest area of concern



Climate change and water quality were the biggest concern for respondents, regardless of where they live. However, among the 145 respondents from Southwest Minnesota, the area selected most often as the biggest concern was agricultural practices. The table below shows the percent of respondents, based on where they indicated they live, who selected each option as their biggest area of concern. Keep in mind that this survey is not meant to be representative of all Minnesotans, nor the views of all Minnesotans who live in these areas of the state.

Table 2. Percent of survey respondents identifying their biggest area of concern by area where they live

	Northwest	Northeast	Central	Seven County Metro	Southwest	Southeast
<i>Number of respondents</i>	151	271	269	1117	145	286
Agricultural practices	8%	5%	15%	11%	21%	18%
Air quality	1%	0%	1%	1%	1%	2%
Aquatic habitat and management	9%	9%	5%	2%	3%	5%
Climate change	20%	27%	23%	40%	15%	28%
Energy	1%	2%	5%	3%	4%	4%
Environmental education	8%	6%	9%	4%	13%	7%
Other	8%	5%	9%	3%	10%	4%
Outdoor rec & open spaces	9%	4%	5%	4%	6%	5%
Water quality	21%	30%	13%	18%	16%	18%
Water quantity	1%	1%	3%	3%	1%	2%
Wildlife habitat and management	14%	11%	12%	13%	9%	9%

Climate change and water quality also emerged as the biggest concern for survey respondents, regardless of whether they identified themselves as employed by or affiliated with an organization, agency, or program working on issues related to the environment and natural resources, or whether the organization, agency, or program had received ENRTF funding in the past.

Table 3. Percent of survey respondents identifying their biggest area of concern by whether or not they work for or are affiliated with an organization, agency, or program that works on issues related to the environment and natural resources

	Identified employment or affiliation	No employment or affiliation
<i>Number of respondents</i>	963	1342
Agricultural practices	14%	10%
Air quality	0%	1%
Aquatic habitat and management	4%	5%
Climate change	30%	33%
Energy	3%	4%
Environmental education	7%	5%
Other	4%	5%
Outdoor rec & open spaces	5%	5%
Water quality	21%	17%
Water quantity	2%	3%
Wildlife habitat and management	12%	12%

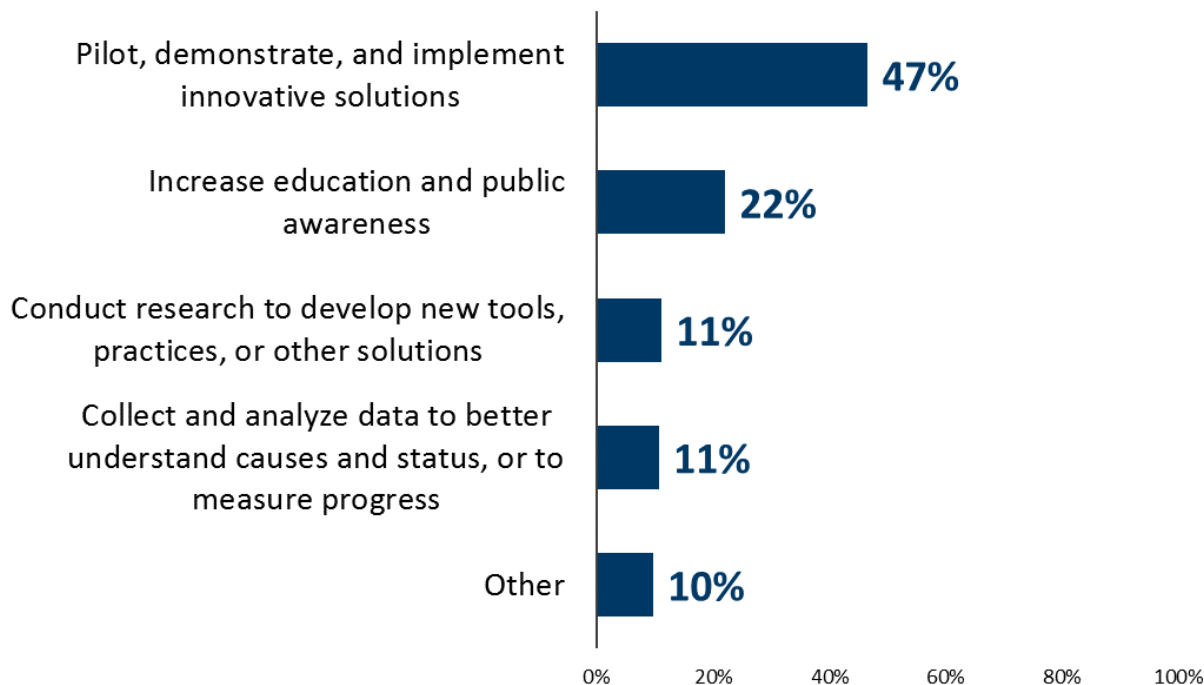
Table 4. Among survey respondents who reported working for or being affiliated with an organization, agency, or program that works on issues related to the environment and natural resources, the percent identifying their biggest area of concern by whether or not the organization, agency, or program has received ENRTF funding

	Affiliated program has received ENRTF funding	Affiliated program <u>has not</u> received ENRTF funding	Unsure if affiliated program has received ENRTF funding
<i>Number of respondents</i>	296	346	317
Agricultural practices	15%	12%	14%
Air quality	0%	1%	1%
Aquatic habitat and management	5%	3%	3%
Climate change	25%	31%	33%
Energy	2%	3%	3%
Environmental education	4%	7%	8%
Other	4%	6%	3%
Outdoor rec & open spaces	6%	4%	4%
Water quality	22%	22%	20%
Water quantity	2%	2%	2%
Wildlife habitat and management	15%	10%	11%

Survey respondents’ preference for how to address their biggest concern

Survey respondents were also asked what they think is the most important thing Minnesota could do address their biggest area of concern.

Figure 2. Percent of survey respondents identifying what Minnesota should do to address their biggest concern



Generally, most respondents said that Minnesota needs to pilot, demonstrate, and implement innovative solutions, across most of the selected areas of concern. However, respondents whose biggest area of concern was air quality, environmental education, or outdoor recreation and open spaces preferred increasing education and public awareness over other options. Also, respondents who selected an “other” biggest concern not already specified also tended to offer an “other” solution to address that concern.

Table 4. Percent of survey respondents identifying what Minnesota should do to address their biggest concern by area of biggest concern

	<i>Number of respondents</i>	Collect and analyze data to better understand causes and status, or to measure progress	Conduct research to develop new tools, practices, or other solutions	Increase education and public awareness	Pilot, demonstrate, and implement innovative solutions	Other
Agricultural practices	280	8%	13%	17%	53%	10%
Air quality	24	17%	8%	38%	25%	13%
Aquatic habitat and management	103	20%	24%	18%	35%	3%
Climate change	757	4%	11%	19%	63%	3%
Energy	81	11%	15%	14%	47%	14%
Environmental education	142	9%	3%	66%	19%	4%
Other	130	12%	9%	21%	17%	37%
Outdoor rec & open spaces	115	5%	9%	33%	29%	23%
Water quality	454	17%	12%	18%	43%	9%
Water quantity	55	35%	13%	7%	38%	7%
Wildlife habitat and management	289	14%	8%	22%	42%	14%

General public and other stakeholders’ big, bold ideas

Finally, survey respondents were asked to identify their big, bold idea for protecting Minnesota’s environment and natural resources. While many of these recommendations do not fit within the mission of ENRTF, a word cloud visualization, provided on the next page, helps show the most common words that came up in survey respondents’ big, bold ideas. This visualization includes big, bold ideas that came from LCCMR listening sessions, as well.

Appendix D: Site Visit Listening Sessions Summary

There were two methods used to gather broader input from additional stakeholders who were identified as having interest in the outcome of the strategic plan but who were not identified as subject matter experts, including the general public. In addition to the survey described in Appendix C, the other method was via in-person events during the LCCMR Site Visits, which took place September 11-12 and October 15-16.

At the LCCMR Site Visits, LCCMR staff advertised opportunities for interested people from the local community to come talk with LCCMR members about Minnesota's environment and natural resources. Different methods were used, depending on the time and location, but all engagements gathered input from participants on questions that mirrored those in the public survey:

- What are your biggest concerns for the state's environment and natural resources? Or, what is the biggest threat to the state's environment and natural resources?
- What should be done about those concerns?
- What is your bold idea for protecting Minnesota's environment and natural resources?

Based on evaluation forms that were completed by participants, at least 90 people participated in an input session during LCCMR Site Visits, which included specific discussions that were held just for invited subject matter experts. Of those who submitted an evaluation form at the end of one of the events, a little over 80% reported that they work for or are affiliated with an agency, organization, or program that works on issues related to the environment or natural resources. Among those with such an affiliation, about 70% reported that the organization, agency, or program has received ENRTF funding. As noted previously, these evaluation forms also included those collected during specific events for subject matter experts, and it was not possible to determine these percentages just for the listening sessions open to the general public.

During the listening sessions, participants comments were hand written either on a large poster paper by participants themselves, or on a piece of paper by LCCMR members who were leading discussions. The individual comments recorded during Site Visit listening sessions were analyzed using the same themes from the general public survey.

Below, a summary analysis of the comments from the listening sessions is provided in a set of tables. Each comment was considered separately and was coded only once. So, each comment was only counted once, based on the overall most significant theme found in the comment. These counts may, in some cases, be over-representations of what was said at the listening sessions, if more than one comment form or note was submitted capturing the same conversation.

Listening session participants' areas of biggest concern

Of the comments recorded during listening sessions that could be coded into one of the categories from the general public survey, the majority of comments regarding participants' biggest concern or what they thought was the greatest threat to Minnesota's environment and natural resources had to do with wildlife habitat and management (including birds and pollinators). This was followed by comments about water quality, agricultural practices, and climate change.

Table 1. Number of comments from listening sessions coded by area of biggest concern or greatest threat

Wildlife habitat and management	17
Water quality	15
Agricultural practices	14
Climate change	12
Water quantity	7
Energy	5
Environmental education	5
Outdoor recreation and open spaces	5
Air quality	1
Aquatic habitat and management	1
Other	21

Several comments could not be coded into one of the categories, and instead were coded as “other.” Some of these other issues were very general, or identified philosophical issues behind different approaches to addressing challenges. Others were outside the bounds of the ENRTF’s authority and mission, such as comments about mining or corporate accountability.

Listening session participants’ recommended strategies

Of the comments recorded during listening sessions that could be coded into one of the categories from the general public survey, the majority of comments regarding what participants think should be done to address their biggest concerns or the biggest threats, the majority of comments reflected a desire to see strategies that pilot, demonstrate, or implement innovative solutions.

Table 2. Number of comments from listening sessions coded by type of strategy to address biggest concern

Pilot, demonstrate, and implement innovative solutions	41
Increase education and public awareness	18
Conduct research to develop new tools, practices, or other solutions	9
Collect and analyze data to better understand causes and status, or to measure progress	3
Other	25

Several comments could not be coded into one of the categories, and instead were coded as “other.” Some of these comments recommended things like collaboration, better planning, sustainable funding, or other things, some of which seemed outside the bounds of the ENRTF’s authority and mission, like enforcement.

Listening session participants’ big, bold ideas

Finally, listening session participants were also asked about their big, bold idea for protecting Minnesota’s environment and natural resources. These comments were included in the analysis of the general public survey, which asked the same question of respondents, and are visualized in the word cloud that is part of Appendix C.

Appendix E: Subject Matter Expert Input Process Overview

Subject matter experts in areas related to the ENRTF mission were engaged in a multi-stage process. Overall, over 200 subject matter experts were engaged. They represented a broad range of organizations and issue areas, including conservation and environmental organizations, local and state government, and academia. A list of organizations that were engaged in one of the stages described below is included in Appendix F.

Document Scan

In the first stage of the process, a scan was conducted of recent long-term strategic plans of agencies that have environment and natural resources programs or responsibilities, and plans of environmental or conservation organizations. Review of such strategic plans is required by MS 116P.08, Section 3 as part of the ENRTF strategic planning process. This scan resulted in a document, over 30 pages in length, that identified goals, strategies, and issue areas that were found across all of the plans reviewed.

Issue Identification Panels

A group of experts with broad experience across many areas were asked to review the final document scan. These experts were identified by LCCMR staff. This group gathered in-person on one, or more, of three different days in July and August, as Issue Identification Panels. They used the document scan and identified where progress had been made in Minnesota within each of the ENRTF areas, where progress had not been made, what goals should be prioritized for ENRTF funding moving forward, and what strategies could help achieve those goals.

In the second stage of the process, the goals that were identified by the Issue Identification Panels were then shared with additional subject matter experts via two methods described more below. One method was an online survey. The other method was at in-person discussions during the LCCMR Site Visits in September and October.

Subject Matter Expert Survey

The online survey was sent to 434 subject matter experts, who were identified by LCCMR staff and generally included project managers of all ENRTF-funded projects over the last 10 years. The survey administration was open from September 9 through October 14. A total of 189 subject matter experts completed the survey. The survey gave these experts the opportunity to further prioritize the goals developed by the Issue Identification Panels, and to provide ideas for strategies to achieve the prioritized goals.

Survey respondents had expertise across many areas. Respondents could identify expertise in any of the following areas, and many reported expertise in more than one area.

Table 1. Reported expertise among Subject Matter Expert Survey respondents

Expertise areas	Count	Percent of all respondents
Water quality	92	52%
Environmental education	86	48%
Wildlife habitat and management (including birds and pollinators)	74	42%
Climate change	67	38%
Water quantity	63	35%
Outdoor recreation and open spaces	61	34%
Agricultural practices	60	34%
Aquatic habitat and management (including fish and other aquatic species)	50	28%
Energy	31	17%
Other	30	17%
Air quality	11	6%

Group Discussions during Site Visits

At the LCCMR Site Visits, which took place September 11-12 and October 15-16, LCCMR staff invited staff from organizations or programs that were part of the Site Visits, plus other local subject matter experts, to join LCCMR members for small group discussions. At these events, LCCMR staff and members facilitated participants through a process of reviewing cross-cutting issues that emerged during the Issue Identification Panels, to prioritize among goals that cut across multiple areas of the ENRTF mission, and to identify and prioritize strategies that could help achieve those goals.

Prioritization Panel

The feedback received from the subject matter expert survey and the Site Visit discussions were analyzed, and then shared back with experts who participated in the Issue Identification Panels, along with additional subject matter experts identified by LCCMR staff. These experts were invited to an in-person meeting on October 23, 2019, to participate in a final Prioritization Panel. The Prioritization Panel used the feedback from the survey and Site Visit discussions to recommend the highest leverage strategies needed to achieve prioritized goals, and to provide input on how progress toward the goals could be measured.

The ultimate output from the Prioritization Panel, priority goals and strategies, is the content provided in the body of this summary report. The additional following appendices, Appendix G through Appendix L, contain the entire list of goals voted on through the subject matter expert survey, as well as the full list of strategies offered by subject matter experts through the survey.

Appendix F: Participating Organizations, Agencies, and Programs

The following organizations were represented by staff that participated in at least one of the subject matter expert activities: the Issue Identification Panels, Subject Matter Expert Survey, or the Prioritization Panel. Over 90 different organizations, agencies, or programs are represented.

- Alexandria Lake Area Sanitary District (ALASD)
- Audubon Minnesota
- Bell Museum
- Blue Earth County Drainage Authority
- Carver County Water Management Organization
- Cedar Creek Ecosystem Science Reserve
- Center for Energy and Environment
- Central Lakes College
- City of Fairmont
- City of Morris
- City of Ranier
- City of Silver Bay
- City of Vergas
- Conservation Minnesota
- Dakota County
- Dakota Wicohan
- Dovetail Partners Inc
- Environmental Quality Board
- Fresh Energy
- Freshwater Society
- Friends of the Mississippi River
- Grand Portage Band of Lake Superior Chippewa
- Great River Greening
- Hawk Ridge Bird Observatory
- Hennepin County - Environmental Services
- Hiawatha Valley Resource Conservation & Development, Inc.
- Institute on the Environment
 - Institute on the Environment - Energy Transition Lab
- LCC Water Policy Subcommittee (formerly known as the Legislative Water Commission)
- LCCMR staff
- League of Minnesota Cities - Environment committee
- Leech Lake Division of Resource Acquisition
- Lincoln Pipestone Rural Water System
- Long Lake Conservation Center
- Minneapolis Parks and Recreation Board
- Minnesota Association of County Surveyors
- Minnesota Association of Environmental Education
- Minnesota Association of Soil and Water Conservation Districts
- Minnesota Board of Water & Soil Resources
- Minnesota Conservation Federation
- Minnesota Department of Agriculture
- Minnesota Department of Education

- Minnesota Department of Health - Well Management Section
- Minnesota Department of Natural Resources
 - Minnesota DNR - Conservation Focus Area
 - Minnesota DNR - Fisheries Habitat Program
 - Minnesota DNR - Nongame Wildlife
 - Minnesota DNR - Parks and Trails Program
 - Minnesota DNR - Prairie Habitat
- Minnesota Environmental Partnership
- Minnesota Farmers Union
- Minnesota Indian Affairs Council
- Minnesota Land Trust
- Minnesota Outdoor Heritage Alliance
- Minnesota Pollution Control Agency
- Minnesota State University - Bemidji
- Minnesota State University - Southwest
- Minnesota State University, Mankato - Water Resources Center
- Minnesota Valley National Wildlife Refuge Trust Inc
- Minnesota Zoological Garden
- Mississippi Park Connection
- MN Wildflowers Information
- Moorhead State University
- Morrison Soil and Water Conservation District
- National Park Service
- Northeast Climate Adaptation Science Center
- Pioneer Public Television
- Prairie Woods Environmental Learning Center
- Project Get Outdoors Inc
- Ramsey County
- Ramsey County Parks & Recreation
- Red River Basin Commission
- ReUse Minnesota
- Rural Renewable Energy Alliance
- Saint John's University
- Science Museum of Minnesota - St. Croix Research Station
- Shell Rock River Watershed District
- Southwest Research and Outreach Center
- St. Cloud State University
- St. Croix River Association
- St. Louis County
- St. Thomas University
- Stearns County Soil and Water Conservation District
- The Nature Conservancy
- The Trust for Public Land
- Town of Crane Lake
- University of Minnesota
 - U of MN - CFANS
 - U of MN - Duluth
 - U of MN - Duluth NRRI
 - U of MN - Landscape Arboretum

- U of MN - MAISRC
- U of MN - MITPPC
- U of MN - MN Geological Survey
- U of MN - Morris
- U of MN - St. Anthony Falls Laboratory
- U of MN - WCROC
- US Fish and Wildlife Service
- US Geological Survey
- Voyageurs National Park
- Washington County
- Wilderness Inquiry
- Winona State University
- Wolf Ridge Environmental Learning Center

Appendix G: Water – Increased Knowledge

As a result of the Issue Identification Panels, there were **four goals** that emerged in the area of water that had to do with increasing knowledge, in order to achieve better outcomes.

These four goals were voted on by respondents who participated in the subject matter expert survey.

Table 1. Percent of subject matter experts who prioritized each goal in the area of Water – Increased Knowledge

		Count	Percent selected
Goal 1.	Minnesota water resources are better managed for both water quantity and quality, as a result of better understanding of the connections between surface water and groundwater.	103	66%
Goal 2.	Priority ground water issues for Minnesota have been identified and Best Management Practice (BMP) options to address them have been developed, evaluated, and promoted.	25	16%
Goal 3.	The limits of Minnesota’s water supply are defined and known by local units of government, tribal nations, industry, and other decision makers.	13	8%
Goal 4.	Agencies, permittees, and public policy in Minnesota are all better informed with improved state-specific storm water data and Best Management Practice (BMP) maintenance research.	11	7%
	Other	3	2%
Grand Total		155	100%

Subject matter experts who participated in the Prioritization Panel were asked to review strategies recommended by survey respondents relating to Goal 1. All of the strategies submitted by survey respondents are included in the next section below. Panel participants were invited to revise strategy ideas or come up with their own, and as a group they prioritized five strategies that would be necessary to achieve the goal. Those five strategies, in no particular order, are:

- Research and demonstrate innovative, market-based policies and partnerships that solve local water issues in both forest-based regions and agriculture-based regions.
- Educate local officials on how to improve and protect water resources, including model projects and policies that can be emulated at all scales.
- Research, demonstrations, incentives, and policies to hold back water and increase evapotranspiration opportunities to prevent water pollution.
- Increase understanding of weather and future weather/climate patterns, and how these align with anticipated water needs across Minnesota.
- Research on the impacts of nitrogen and effective agriculture and urban practices to improve surface and groundwater quality, as well as manage water quantity and mitigate the impacts of agriculture drainage and urban stormwater runoff.

The following provides the full list of strategies for the area of **Water – Increased Knowledge** that were recommended by subject matter experts who responded to the survey. They are organized by goal.

Please Note: These strategy recommendations are provided verbatim, as they were submitted through the survey. Therefore, they may contain errors or typos. They have also **not** been vetted for alignment with the ENRTF mission or charge, and may therefore not be allowable strategies for the ENRTF to pursue or include in its strategic plan.

Goal 1 – 66% of survey respondents prioritized: Minnesota water resources are better managed for both water quantity and quality, as a result of better understanding of the connections between surface water and groundwater.

- Additional research on the connections between ground and surface water. Support of UM Forever Green Initiative
- Further research into water quality aspects: increased micro plastics, increased toxic algal blooms. What causes these, what are their sources, and how can we adapt?
- Identifying incentives for private land owners to hold back water to slow the drainage from ag lands and other intensive-use lands, to prevent sediment and nutrient eutrophication. It would also lead to stream bank stabilization, and recharge of aquifers.
- Research in this area has fallen from the Federal level to the State of Minnesota. So, it is an important area for the State to undertake.
- We need to develop a strategy that balances the needs and uses of water resources, with the impact on everyone. For example, restricting agricultural uses - some peoples livelihood, but ensuring adequate quantity and recharge for all people's use is a hard balance to maintain. Realistic and compromising strategies will be needed. Education, provided by a trusted source, may be the best place to start.
- All of these statements are good so I picked the one that I know the most about. A large amount of expertise, money and time needs to go into this strategy to make it work. But I believe it can pay off if the political will is there.
- Education and supportive applied research on climate change limits/ temporary excesses on surface water. Key contributors and what it will take to reduce their role in surface water contamination.
- Research and management. Added to the connection between surface and ground water, MN should take steps to understand and make decision around other factors in the cycle (pollution, climate change, etc..)
- Prioritizing issues likely to impact human and ecological health, which will require a combination of funding research to understand these issues and funding potential practical, sustainable solutions.
- Increased funding for continuous monitoring
- additional measurement and monitoring of the impact of surface waters on groundwater
- developing some innovative implementation strategies
- measurement
- Investing in research
- Better understanding of small molecule pollutants in waterways and strategies to remediate these
- Funding of projects like wetland restorations that can address both water quantity and quality.
- Water Re-use
- Increase funding support for counties to implement the Wetland Conservation Act.
- We have impaired surface waters, can we fix that in connection with groundwater/surface water connection as well?

- Willingness to spend the money necessary to take drastic large-scale actions/acquisitions to improve water quality and restore natural flow regimes.
- Support geologic mapping and groundwater research that aims to characterize the groundwater system.
- mapping and research into aquifers and surface waters.
- Clearly defined water quality and quantity goals and thresholds are established and enforced by state agencies.
- The role of public and private forests in long-term water quality and quantity are appreciated and supported.
- less regulation and more education
- geologic mapping, hydrologic characterization, and ground water modeling
- Research
- Minnesota needs new innovative, market-based policies to address farming economics in order to make substantive conservation efforts financially feasible (research and demonstrations needed)
- Focus efforts to engage more community members and diverse partnerships to help solve local water issues such as in high nitrate DWMSAs, areas of ground-surface water conflicts (DNR interference areas). These can serve as models for communities to learn from.
- More research is needed to develop an integrated approach that takes into consideration land-use needs and water management. Research on cleaning water is also needed.
- Research on groundwater-surface water connections
- Not sure on this one, could be additional research on groundwater flow but I don't know how much is known.
- More information provided to communities and citizens directly impacted by poor water quality and/or flooding due to drainage of water resources.
- Local elected officials become more knowledgeable leaders on water related subjects and as a result make zoning and land use decisions that protect our water resources.
- Continued investment in basic science of understanding water/groundwater resources - including groundwater observation well network, stream and lake monitoring networks, and county geologic/groundwater atlas program.
- We have to identify the sources of water and ultimately the wastewater and stormwater that is the result from use. Funding is needed to find answers and to implement solutions. This may include infrastructure assistance like water and wastewater plant. I think we know a lot already, but have not acted as quickly on the solutions
- Education and outreach
- More research is needed including rural area
- Research related to Minnesota's public and private drainage systems (drainage impacts on aquifer recharge, capacity of current system to properly handle larger, more frequent rain events, etc.)
- research and application of research results
- Need to continue research on the impacts of Nitrogen and what are effective agricultural and urban practices to improve surface and ground water quality, as well as manage the quantity of water and mitigate the impacts of ag drainage and urban stormwater runoff.
- Determine direction and quantity of water movement within ground watersheds statewide
- Additional groundwater and surface water future conditions modeling at a water level.
- Demonstrate the it can be done by targeting a watershed at an appropriate level and implementing all of the best strategies
- Demonstration/education of impacts and implementation/education on BMPs. Targeting areas: agricultural land, municipalities, etc.
- Additional research on water quality--emerging issues like microplastics and changing temperatures as well as longer term problems like phosphate and mercury.

- Increase research in defining the connections between ground and surface water. Focus on the heterogeneities that focus water movement.
- More coordination or consolidation of state water agencies, somehow get more control over Ag management practices.
- Education in the biotic dimensions of water quality and the benefits to overall environmental health, rather than water clarity, safety for swimming
- research and measurements collected across space and time; surface and groundwater quantity and quality monitored across small-to-large systems across time in such a way that concentrations and fluxes can be computed. This requires contemporaneous quantity AND quality measurements across different spatial scales.
- fund research in remediation of contaminants
- Research and education are both needed to achieve this goal.
- Start with Data: Assess chemicals sold/purchased/used in MN and the amounts and set clear reduction targets. Research is showing U.S. women of childbearing years have high numbers of different types of chemicals in their bodies and breastmilk.
- More research and measurement of ground water - surface water connection
- More extensive monitoring of non-point source pollution of surface water and then taking active steps to make corrective measures (EX producers farming the ditches/right-of ways and hills leading to continuous run-off etc). A survey of out of date septic systems (regardless of grandfathering) and cost share to correct them if you qualify based on income bracket. All septic systems should be in compliance. Failing septic systems lead to eutrophication of lakes and rivers and depleted dissolved oxygen.
- Smart salt workshops statewide
- Research on the relative influence of groundwater to surface water quality and quantity is needed because it differs greatly across the state.
- Research initiative that includes the role of land use and changing climate
- education and implementation of buffer strips, natural plant communities, etc.
- Communications are key, as Minnesotan's, and all upper Midwesterners, have a hard time grasping water quantity challenges and limits. We don't have the everyday visuals that western states do for understanding water quantity
- Research
- This is a local, regional, and global issue. Fund educational programs and model projects that can be emulated at all scales.
- Support research that evaluates and informs on contaminants (legacy and emerging) in drinking water.
- Technical assistance and support for improved agricultural practices
- I chose the most inclusive goal as I think meeting this goal will encompass several of the other goals. Surface and groundwater connections vary widely across our large, geologically-complex state. Meeting this goal will require important hydrologic research in locations where such research is quite difficult and, thus, has been rather ignored.
- research: locations and sectors that are majority nonpoint sources and incentive and BMP approaches that are most effective at reducing nonpoint source pollution
- Support research such as the spring study in SE MN
- Explain case studies ie White Bear Lake that show examples of too much permitting reduces volume of water
- Understanding how different factors influence water
- Research on regional water balance, including future risk to surface water features like wetlands and lakes from combined impacts of climate change and groundwater development.

- Research to better understand groundwater and surface water connections. Research and education on BMPs to minimize groundwater pollution.
- Funding research that affects water quality as it relates to agriculture practices - develop BMP's that are more site specific.
- Understanding the role that drain tiles have in our surface-to-ground water hydrology, exploring alternatives to existing drain tile installation practices. to both meet the needs of the agricultural sector and the environment.
- Demonstration - people need to see impacts to believe them, sometimes - and then some still may not believe demonstrated connections.
- This is just a note: knowledge and understanding are two different things and should be well defined when developing this plan.
- fund monitoring for agencies that are not responsible for regulation and enforcement
- managing the quality and quantity of water impacting our lakes and rivers
- modeling
- education
- Allowing for projects that may not achieve full accomplishment of habitat goals when water quantity is a major concern for sites downstream. For example, allowing for an impoundment in special circumstances in the red river valley if it has significant impacts on the immediate downstream area for fish & wildlife, including less in-channel erosion.
- Permit flexibility regarding Wastewater re-use opportunities
- Support initiatives which work to document drainage ways, tile and wetland areas.
- Seal those abandoned wells!
- Waters, surface and ground are prioritized by the multiple benefits they provide and decisions and resources are allocated accordingly.
- Meaningful and simple model to analyze your specific land owned/operated for both rural and urban landowners/users. Increase awareness and then offer opportunities for assistance.
- include local water systems (municipal) in water planning
- Make sure information is provided to all who have a roll.
- Many solutions for substantive water quality and quantity improvements are the same solutions needed for habitat restoration for grassland species, monarchs and pollinators. Integrating water and habitat strategies from a funding and political perspective will help both ends be achieved, and in the most cost-effective manner.
- Provide targeted research and outreach around water quantity issues making the case for multiple benefits of water storage, particularly in the high loading Minnesota River Basin.
- A demonstration site that shows differences in water quality in ag lands with buffer strips vs. none would be a valuable educational tool.
- Develop funding mechanism specifically for longer term programs needed to build out our water resource monitoring network, so programs are less susceptible to changing priorities at the capital.
- Education to change the culture to understand how we use water and get rid of our wastewater and stormwater. Salt, organic material like grass and leaves, chemicals whether commercial, farming or household and being wasteful.
- Need to develop more long term data layers derived from LiDAR to provide baseline maps/data to be the foundation of future research and practice implementation to meet water quantity and quality goals.
- Identify locations and strategies that have lowest cost and biggest reward to target with funding and implementation of protection and prevention and clean up
- Additional understanding of weather and future weather and climate patterns and how these align with anticipated human demands for water across MN.

- Charge way more for water use, especially highest users.
- Monitoring and a higher bar/more oversight (at the county or state level) for approval of tile permits for ag tiling. Little if any, monitoring of where the tile is going in or what will change with the granting of tile permits from Watershed Districts. The amount of tiling that is going in will have compounding negative effects on water quality, increased water volume (damage to ditches and water control structures), wells running dry, flooding of neighboring land, depletion of groundwater etc.
- Large public exhibits, incorporating both science and arts, to show the flow of water (above and below ground) and inputs (natural and anthropogenic) into those systems
- Education
- Support efforts to communicate on the effects of contamination of surface and groundwater.
- Support for maintaining and expanding forest-based economic opportunities that help continue forested watershed benefits
- Climate change scenarios must be used to meet this goal (after we understand the hydrology of various geologies around the state). More water is running off now due to increased intense rainfalls; this will leave many areas even more vulnerable to groundwater overuse. We must understand this and then research ways to live with it and/or combat it.
- Show research in plain language not technical terms--like a graph of land adjacent to farming rates and TMDLs
- Development of draft administrative rules to implement protection for lake and wetland water levels during groundwater development (i.e., pumping by new Ag production wells)

Goal 2 – which 16% of survey respondents prioritized: Priority ground water issues for Minnesota have been identified and Best Management Practice (BMP) options to address them have been developed, evaluated, and promoted.

- ongoing active management of shallow lakes and wetlands is imperative to maintaining healthy watersheds and groundwater
- There are many agencies out there monitoring and studying our water resources in Minnesota. They need to work together to establish best practices based on science and make sure everyone, whether they be an individual homeowner or a business owner or a city leader, need to be aware of the Best Practices and have access to the mechanism that allow them to implement those BMPs. Informed citizens will demand responsible use of our water resources from within the community.
- Share research with decision-makers at all levels--government, tribal government, municipality, non-profit, community org, schools, family.
- Since much of Minnesota's drinking water comes from groundwater, more emphasis should be placed on groundwater systems. Accomplished through the means of education and demonstration, showing cause-effect scenarios, for example.
- Research
- Increased research and outreach about sensitive groundwater areas and how local partners and landowners can collaborate to protect the resource
- Demonstrate improved water quality in a popular river or lake. Showcase the before and after along with the collaboration to achieve this improvement.
- Research, demonstrations and education are all important. All of the goals in this area are very important, but this seemed the most comprehensive.
- Demonstration projects and assistance with implementing best practices

- BMPs for most forms of surface water
- A full (as full as can be) atlas of ground water resources, and the connections they share with surface water.
- improve soil conservation and control agricultural runoff. examples include reduced tillage and chemical applications, cover crops and encouraging further development of perennial crops promoted by Dr. Wyse at the University of Minnesota, St. Paul.
- Education is always key. Case studies that can be shared to show real communities and businesses and neighborhoods and how they adopted best practices and were able to conserve water and reduce water pollution would be powerful.
- Assign more emphasis on monitoring and measuring outcomes and results.
- Demonstrate improved drinking water quality for a community.
- In addition to addressing ground water issues and BMP, it is important that all stakeholders are educated on the limits of Minnesota's water supply. I believe the prevailing attitude is that water is an unlimited resource in Minnesota.

Goal 3 – which 8% of survey respondents prioritized: The limits of Minnesota's water supply are defined and known by local units of government, tribal nations, industry, and other decision makers.

- Research to further define sustainability within the term "limits" - sustainability includes both quality and quantity.
- I include the general public as "decision makers": use an educational campaign to educate MN governments, tribes, industry and the public ("decision makers") in the fact that clean water resources are limited in MN. The myth of a limitless clean water supply has been persisting for too long in MN.
- There are many conferences and events that this information can be shared at.
- reduce ag irrigation use for surplus commodity crops
- Foster projects that focus on understanding our water budgets on a stateside basis
- Education
- Local governments do not have enough information on water supply. They are asked to provide data to the state but data is not provided to local Councils and decision makers.
- education of the complex interaction of the hydrologic system components
- We need to complete the installation of an adequate monitoring network, so we can know the limits of geographically specific water supplies. Knowing those limits will drive investment and innovation into alternative sources and efficiency efforts that are otherwise ignored until a crisis develops. Minnesota has a lot of water that can be used for economic activity, it's just not distributed equally and the quality is variable depending on geography.
- Broader scale outreach with accessible but accurate information on the state of the State's water supply so all Minnesotans have functional knowledge on the value and limits of this critical resource and use it for personal decision making.
- Highlight real examples from around MN where clean water has become a limiting resource for development, recreation or ecology.
- develop educational materials that simply and clearly lay out the basics of groundwater hydrology and the status of the groundwater resources we are working with
- Demonstration
- use of interactive simulations to help explain and educate the public on the complex interactions of resource management

Goal 4 – which 7% of survey respondents prioritized: Agencies, permittees, and public policy in Minnesota are all better informed with improved state-specific storm water data and Best Management Practice (BMP) maintenance research.

- All agencies across the state are involved and share data with each other that gather information. In consultation with all agencies we can develop an improved best practice management measures that reflect everyone's needs. When information and data is shared we can all make use of the information available to make guided decisions.
- Developing farmer friendly ways to retain more storm water on the land rather than "getting rid" of it as quickly as possible. The benefits of early workable cropland needs to be balanced with stream friendly discharge of the water being exported from the fields.
- available data and BMP on websites with public meetings and disclosure
- fund data synthesis to use information we have and identify knowledge gaps;
- fix the flawed political and idiosyncratic proposal selection process

Other goal ideas offered by subject matter expert survey respondents for the area Water – Increased Knowledge:

- Better connecting land use practices (fall tillage, inappropriate N application, wetland drainage) in the watershed to water quality/quantity.
- Minnesota water resources are better managed for quantity, quality, biological integrity, and watershed health as a result of better understanding of the connections between surface water, groundwater, biodiversity, and watersheds..
- Educate citizens about the connections between land and water by helping them understand that healthy watersheds with intact and diverse plant communities are essential to clean water.

Other strategy ideas offered by subject matter expert survey respondents for the area Water – Increased Knowledge:

- Demonstrating how what one person does on their land affects their neighbors downstream.
- Develop and enhance integrated water and biological data collection, data management, data analysis and delivery of information.
- Education, assistance to landowners and others in creating/maintaining diverse native plant communities and understanding that they are essential to clean water and healthy habitats.
- Expand, enhance, and accelerate statewide baseline biological surveys in all of Minnesota's lakes and rivers.

Appendix H: Water – Improved Outcomes

As a result of the Issue Identification Panels, there were **five goals** that emerged in the area of water that had to do with improving outcomes overall.

These five goals were voted on by respondents who participated in the subject matter expert survey.

Table 1. Percent of subject matter experts who prioritized each goal in the area of Water – Improved Outcomes

		Count	Percent selected
Goal 1.	Minnesota is prepared for water volume changes and extreme runoff events resulting from climate and land use changes.	60	37%
Goal 2.	All Minnesota water meets quality standards and there are zero impaired waters in Minnesota.	39	24%
Goal 3.	All Minnesota waters show biologic indicators of strong aquatic health.	34	21%
Goal 4.	Storm water across Minnesota is managed through effective, innovative, and long-lasting approaches.	19	12%
	<i>Other</i>	5	3%
Goal 5.	Risks for water re-use in Minnesota are better understood and mitigated where needed.	4	2%
	Grand Total	161	100%

Based on feedback received from the subject matter expert survey, Goal 1 was revised to read as: *Minnesota is prepared for water volume changes, both excesses and shortages, and extreme runoff events resulting from climate and land use changes.*

Subject matter experts who participated in the Prioritization Panel were asked to review strategies recommended by survey respondents relating to Goal 1. All of the strategies submitted by survey respondents are included in the next section below. Panel participants were invited to revise strategy ideas or come up with their own, and as a group they prioritized five strategies that would be necessary to achieve the goal. Those five strategies, in no particular order, are:

- Research and demonstrate market-based policies that are economically viable and help pay for the land use and conservation practices needed to achieve water resources protection, especially in agricultural areas.
- Research effective water use scenarios to identify improvements needed to ensure the state’s water resiliency and sustainability (including modeling water scenarios, managing water on land, optimizing use to prevent overuse of groundwater, improve water reuse, and waste water management).
- Identify and promote workable, holistic, multi-benefit, diverse, and viable (economically and socially, etc.) solutions for storing more water on the land, through both engineered and natural solutions targeted at critical areas.
- Support cities, counties, and watershed districts with developing climate resiliency and adaptation plans, and processes for funding and implementing those plans.

- Compile existing research, identify gaps, and develop research to quantify land use and land cover changes, in order to identify restoration and protection needs to achieve sustainable water systems.

The following provides the full list of strategies for the area of **Water – Improved Outcomes** that were recommended by subject matter experts who responded to the survey. They are organized by goal.

Please Note: These strategy recommendations are provided verbatim, as they were submitted through the survey. Therefore, they may contain errors or typos. They have also **not** been vetted for alignment with the ENRTF mission or charge, and may therefore not be allowable strategies for the ENRTF to pursue or include in its strategic plan.

Goal 1 – which 37% of survey respondents prioritized: Minnesota is prepared for water volume changes and extreme runoff events resulting from climate and land use changes.

- Research ideas to help manage volume changes and runoff events.
- Better quantification and mapping of current water bodies sediment loading and water capacity
- Research
- Research exploring both climactic and land use impacts. For example, increased annual precipitations coupled with expanding drain tile installations.
- Research on adaptation to potential climate change needs to be further supported, because it will be a lot of work.
- Develop comprehensive analyses to understand where runoff is likely to become more severe and develop multiple strategies to minimize this threat.
- a subset of previous response, specifically better define what the excesses will be, implications for infrastructure, forestry and ag production, and pollution. Previous question response: Education and supportive applied research on climate change limits/ temporary excesses on surface water. Key contributors and what it will take to reduce their role in surface water contamination.
- funding for continuous monitoring
- education and demonstration are critical
- Policy changes surrounding tiling
- Drastic measures may be needed to address the results of climate change. LCCMR should take a look at what circumstances would be acceptable for bending its standards when justifiable.
- Continue to fund projects which seek to understand drainage, tile and wetland basin protection.
- Clarify responsible entities for management of the volume and flow in rivers and lakes.
- Need to prepare for extreme events including drought potential--water storage solutions, recharge, erosion
- Adequate funding for development of runoff & climate data collection and assessment. These data would be used for evaluating storm events and for the revision of flood and storm frequency
- Encourage projects that focus on climate change resiliency
- Research and demonstrate market-based policies to would help pay for the currently cost prohibitive level of conservation practices (in Ag areas) required to achieve this goal.
- Provide more research, demonstrations and outreach related to preparing for climatic forecasts of increasing runoff events and storing more water on the land to reduce flashy flows. Work with stakeholders to strategize workable, affordable, diverse solutions for storing more water on the land.
- Changing the socio-economic drivers to favor minimizing runoff and maximizing water storage
- research funding to help predict expected changes with the goal of mitigating effects and strategies for land use change (i.e. agricultural impacts)

- Cities, counties, watershed districts have climate resiliency and adaption plans, and a process to implement those plans.
- Demonstration with research in various scales (landscape to pipe). Water quality should be part of discussion as impacts of extreme runoff events
- Develop Best Management Practices for water volume changes/extreme runoff events that insure long-term improved water quality and quantity
- Increased rainfall is overwhelming all the systems (ag, urban, forestry) and is causing not only impacts to water quality, but is destroying infrastructure. We need to learn to deal with the new normal and not expect rainfall patterns of 50 years ago to come back.
- Develop "priority watershed" climate adaptation demonstration projects focusing on the most at risk for climate change watersheds based on U of M downscaling modeling data.
- Climate change precipitation model, followed with demonstration/education of impacts and implementation/education on BMPs with specific greenspace components. Targeting areas: agricultural land, municipalities, etc.
- Include both excesses and shortages of water.
- Funding is needed to plan risk management strategies in different regions of the state based on current trends and future forecasts.
- Interface of water quantity and quality research with weather and climate resources - currently there is limited funding for person-time to bring existing data together across the diverse landscapes of MN.
- Again, education and outreach in a fun and engaging way rather than using scare tactics, but the impacts of climate and land use change on water is not well understood.
- Use predictive climate and flooding models (100 yr, 200 yr, 300 yr flood events etc) to see where the greatest needs will be geographically and figure out how to fund restoration projects along water bodies and waterways, buy up critically threatened properties along lakes and rivers. It is nearly impossible to choose between these. #2 and #3 are the most critical, however. To have #2 happen, you would already need to have dealt with #3.
- Research focused on quantifying threshold land use and land cover changes on changes in water quantity
- large area modeling to provide guidance for future infrastructure projects
- Urban and rural BMPs
- Research into effective water use scenarios to define improvements needed to ensure State's water resiliency. This includes modeling water scenarios, managing water as it comes to the State's land in increasing intensity and volume, optimizing use to prevent over use of groundwater resources, improving water reuse and wastewater management processes.
- I'm an aquatic ecologist; I do my research on impaired waters and biotic indicators. But I did not chose either of those goals because I think the water volume changes are more threatening to the water future of many areas in Minnesota. Meeting this goal will be very difficult. We need good research on innovative options for mitigating extreme events, preparing our population for these, and getting everyone to work on this mitigation.
- Laws and rules governing various agriculture programs get aligned around keeping water on the ground, rather than sending it to creeks, rivers and lakes via tile and ditch systems. e.g., FSA / USDA rules for CRP lands allow retention of water by county ditch authorities, even though wetland standards may not be met.
- support the purchase of land that can meet demand for more parks and trails in Minnesota AND at the same time help mitigate flooding impacts to towns and cities, etc. trails & park infrastructure would be designed to withstand flooding or be easily cleaned up after an extreme runoff event
- We need to keep more water on the ground, not running off. Wetland restoration
- Go big picture--next generations are already on board, for most part, about environmental issues. Tie past and current volume changes is relevant and meaningful

- All of the above goals are important (meeting water quality standards, and strong aquatic health), but to meet all of these goals stormwater systems need to be designed to accommodate volume changes and extreme runoff events. Research is needed into 1) projected water volume changes and storm events, 2) the design of stormwater approaches in changing hydrology, and the impacts of changing hydrology on water quality standards and aquatic health
- Prediction and mapping for the future
- Highlight examples of the adverse consequences of runoff events across MN - these examples should be of regional relevance.
- data collected for the purpose of understanding the science, not for meeting regulatory requirements
- monitoring and evaluation can't be left behind
- Education about wetlands
- Consolidate knowledge of flood levels and flow patterns within one place and provide access to decision makers.
- Provide targeting funding for water storage, particularly in the high loading Minnesota River Basin. Funding should include both engineered (wetlands, storage ponds, multipurpose drainage management) and technical and financial support for management (soil health - cover crops and tillage changes).
- Research and demonstration of improved water management
- Developing water storage in agricultural areas that can have multiple benefits is going to be a challenge and more research and demonstration of new techniques will be needed to fully be prepared to address climate changes and increased rainfall.
- Currently, there are perceived barriers to working on issues of future conditions that include changing climate and weather. In order to predict future water conditions, we should openly consider climate change and how this will effect the more extreme runoff events or even the largest annual events tied to snowmelt. We also have to consider landscape changes through land cover shifts and increased drainage infrastructure.
- Most of what we can change that will have impacts on water outcomes is related to land use changes and by what we regulate and permit and how we manage the changes. Climate change research predicts that MN will receive more precip yet we are converting more land from grassed or forested cover to conventional ag or to mining which will compound the issues with increased water volume.
- High resolution monitoring of land use and landcover trends to identify regions susceptible to water volume changes
- Attention to flood prone areas...limit development
- We need innovative solutions that involve all aspects (research, policy, outreach to the public). In my opinion, this will be a huge challenge that we must tackle to have a secure water future and enough water to continue farming and have drinking water wells, while not at times being swept away by large floods.
- Increase protection and restoration of agricultural land in targeted areas to increase storage of water on lands through restoration of historical wetlands, improve wildlife habitat and reduce runoff to creeks, rivers and lakes.
- identify land along streams, creeks, and rivers (or shallow wetlands & large areas that were consistently flooded the last five years) that has formerly been enrolled in CRP and work with farmers to PURCHASE this land for flood mitigation and wildlife habitat/corridors (& public access/hunting).

Goal 2 – which 24% of survey respondents prioritized: All Minnesota water meets quality standards and there are zero impaired waters in Minnesota.

- Improving the quality of effluent from point-sources and the quantity of discharge from non-point sources are two means to get closer to toward that is goal. To do so, continue monitoring for ambient water quality,

measuring against standards, establishing effluent limits where necessary, and incentivizing improvements through bonding recommendations for capital investment.

- Broad education efforts to advise the general public of the condition of their local ground and surface waters and the sources of pollution responsible for impairment. Make concerted efforts to educate elected officials and public servants and provide assistance with designing local and state regulations that carry enough authority to directly address the issues.
- I don't even know where to start. This is obviously the ultimate goal - but probably unrealistic.
- This is the correct goal. Again education and political will are needed.
- Protect/buy the land surrounding the water bodies (focus on headwater ecosystems) so they are natural buffers
- Standard definition. Human, agriculture and wildlife standards may be different and overlap. Work on defining how those interactions and water used will be key to implement water management practices.
- Research, education and continued citizen involvement in doing AIS testing and reporting. I think all of these are important so it is really hard to choose.
- This is a big one; I think within the purview of the ENRTF it's a combination of measurement and education.
- Lots of research
- see previous
- This seems like an ambitious goal, but I like it. The first thing I would like to see is a definition of what 'clean water' is (i.e. where do you draw the line). This may already exist, so in that case this would be an education goal (i.e. spread the word).
- Provide education and information to help people better understand their local water resources. The Watershed Health Assessment Framework created by MN DNR is an incredible tool that is available for folks to use to explore their local watershed. We need something simple, like a water quality threat sign for each water body (like the fire threat signs with Smokey Bear that the forest service uses) to show folks how their local waters are impacted daily by storms, runoff, and pollution.
- Research, infrastructure investment, policy, education--this is critical.
- Aquatic life standards are established and management actions are taken using statutes and local land use authority.
- establishing agriculture systems that don't rely on fossil fuel derived chemical fertilizers (requires changes in food system and markets)
- This one is ok if the effect of water volume/extreme runoff is included in it (i.e., #1 and #3). Goal of zero impaired waters unlikely to be met, but worthy to strive for. A important strategy for this is monitoring.
- I think we need to test all waters and keep testing to understand where we are now. This could be both education and demonstration
- Continued focus on Water Watershed One Plan efforts and funding to implement plans
- demonstrating the ability grow agricultural products without degrading surface or groundwater quality, soil health initiatives widely adopted across the state, cover crops that evapotranspire water rather than having to drain water through a tile or ditch, more precise nutrient management requirements in the most sensitive areas
- Within each watershed in Minnesota, determine what are the major sources of impairment on each watercourse and make that information publicly available
- Support policy and fund strategies that affords the greatest protection
- Implement plans for pollutant source reduction
- research: see before, incentive approaches for reducing NPS
- Address the impacts of train tile on water quality/quantity.

- Increasing low-cost treatment solutions through research and small-scale pilot testing of emerging treatment technologies. We should fund small-scale and side-stream treatment - greater than bench-test scale - to better understand the new and emerging technologies that might use biological- and membrane-types of treatment.
- I'm not a huge fan of excessive government regulation; but we obviously need to move forward with more 50-foot buffer types of requirements. Businesses and people are just not going to make changes unless some of them are forced to - I hate to say it, but it's true.
- At some point we may need to use regulations and fines more heavily to achieve this goal. We need to increase enforcement and make an example out of those who pollute our waters; like the Wall of Shame that the Conservation Officers use to deter poachers.
- Minnesota establishes zero impaired waters as not just a goal, but with a defined date and well defined incremental requirements to achieve this goal. this c
- Identify best practices that can be done to reduce our impact on water quality.
- Lending institutions that incentivize and encourage the above strategies rather than current practice that encourages the opposite.
- Identify locations and strategies that have lowest cost and biggest reward to target with funding and implementation of protection and prevention and clean up
- Support research to identify pollutant sources and how to reduce them
- Provide recommendations for stream crossings that reflect the changing nature of stream volatility.

Goal 3 – which 21% of survey respondents prioritized: All Minnesota waters show biologic indicators of strong aquatic health.

- research
- I think you're on track with the WRAP and one water one plan initiatives
- Completion of and implementation of strategies in WRAPS.
- Devil is on the details here: 'strong aquatic health' and 'zero impaired waters' seem to be similar outcomes. I chose the former as 'strong' seems to show more resolve than meeting some minimum standard that can be changed without scientific support.
- With early rounds of watershed planning and programming, efforts including research, education, measurement should continue on impaired waters.
- Protect healthy bodies of water and aquifers.
- retain more water on the land, restore natural nutrient processing mechanisms such as wetlands and organisms that filter and process organic matter and other pollutants
- State pays for buffer zones along waterways
- Advance and enhance data collection, management, analysis and delivery sufficient to have biological indicators that represent the full range of aquatic biological systems.
- Develop practices for individual homeowners as well as municipalities to achieve biological water benefits when making needed infrastructure changes. For example, sizing culverts for optimal fish passage as well as drainage. That gets at goal number 2, but in a more holistic way.
- Provide funding for lake and river assessments of biologic indicators.
- Wild rice bed restoration
- Tighter restrictions and improved measurement of chemical release by industry, residential areas and farm chemical use. Stronger enforcement.

- Minnesota needs systematic ways for measuring biotic (and abiotic) health of our aquatic systems that will continue in perpetuity, both for baseline data and also to recognize downward trends when they begin and not when it is already too late to remedy.
- Research
- Intensive water quality monitoring
- research into what indicators are important, what alternative stable states may exist, and how to move among them if needed.
- education
- focus on voluntary, not regulatory
- Top-down enforcement strategies coupled with incentive-based and knowledge transfer strategies with landowners/local governments.
- Education, research, and monitoring are all methods by which to improve our waters.
- Partnerships and community involvement should be emphasized, creating an "ownership" to develop resolving those issues.
- Restore free flowing streams that allow for fish movements in and out of lakes and tributaries, reintroduce lost species groups that restore ecological resilience.
- Provide incentives, such as water banks, for farmers and others to keep water on the land, slow the flow, and enhance biodiversity.
- Educate about and fund projects that restore shorelines of rivers and lakes to appropriate, locally sourced native plant communities.
- Fund projects that show water quality improvement as indicated by quantity or condition of bioindicator fish and invertebrate species.

Goal 4 – which 12% of survey respondents prioritized: Storm water across Minnesota is managed through effective, innovative, and long-lasting approaches.

- Storm water causes more pollution than we think, managing stormwater will reduce run-off from many sources.
- continued monitoring and measurement of new storm water treatment technologies
- Have funds allocated to stormwater specific projects.
- focus on storm water management that conserves runoff locally while protecting local waters from pollutants commonly carried by storm water runoff
- push wetlands as methods for handling ag field runoff
- Buffers and rain gardens of native vegetation that filter contaminants
- Support development of innovative storm water runoff solutions.
- Green infrastructure investments
- Allow the use of credit trading for water quality to help MS4 communities.
- fund replacements and alternatives to field tiling.
- Smart salt, fertilizer, and pesticide application training workshops and public education campaigns
- Support projects that develop infrastructure for water reuse in MN.
- Support for forestry, forest businesses, and forest investments across rural and urban landscapes

Goal 5 – which 2% of survey respondents prioritized: Risks for water re-use in Minnesota are better understood and mitigated where needed.

- Research on new ways to address the nutrient pollution concerns
- Advanced treatment education
- gray water demonstration projects
- Education
- Research on how to implement some technologies into the field, instead of just working in the lab

Other goal ideas offered by subject matter expert survey respondents for the area Water – Improved Outcomes:

- Better, more efficient use of water... reducing groundwater use... improving quality of groundwater (protecting public health)... a more holistic approach to wastewater treatment.
- Prevention and management of aquatic invasive species are better understood.
- Agricultural communities and policies are focused on reducing their negative impacts on our states water resources.
- All water outcome goals in the sentences above are fundamentally related to climate and people, and are all inter-related. Understanding short and long-term impacts of climate and people on water is critical.
- All for the above

Other strategy ideas offered by subject matter expert survey respondents for the area Water – Improved Outcomes:

- Increased research and collaboration.
- Applied research funding that targets development of solutions for all of these goals
- Added funding for successful research projects to implement identified solutions

Appendix I: Habitat, Fish, and Wildlife

As a result of the Issue Identification Panels, there were **six goals** that emerged in the area of habitat, fish, and wildlife. These six goals were voted on by respondents who participated in the subject matter expert survey.

Table 1. Percent of subject matter experts who prioritized each goal in the area of Habitat, Fish, and Wildlife

	Count	Percent selected
Goal 1. Minnesota has healthy and diverse wildlife populations that sustain and enhance the state's environment, economy, and quality of life.	61	38%
Goal 2. All public and private conservation lands in Minnesota provide long-term, multiple benefits for fish, wildlife, and people.	27	17%
Goal 3. Minnesota lakes, rivers, streams, and wetlands support aquatic biodiversity, including species vulnerable to human impact.	24	15%
Goal 4. Minnesota prevents, detects, and reverses the establishment of aquatic and terrestrial invasive species, and is able to effectively mitigate their negative impacts.	20	12%
Goal 5. The hydrologic function of Minnesota's watersheds supports healthy and diverse biological communities.	19	12%
Other	8	5%
Goal 6. There are diverse and sustainable fisheries and aquatic game populations that are accessible to all Minnesotans for safe consumption.	2	1%
Grand Total	161	100%

Based on feedback received from the subject matter expert survey, Goal 1 was revised to read as: *Minnesota has healthy and diverse wildlife **and plant** populations that sustain and enhance the state's environment, economy, and quality of life.*

Subject matter experts who participated in the Prioritization Panel were asked to review strategies recommended by survey respondents relating to Goal 1. All of the strategies submitted by survey respondents are included in the next section below. Panel participants were invited to revise strategy ideas or come up with their own, and as a group they prioritized five strategies that would be necessary to achieve the goal. Those five strategies, in no particular order, are:

- Monitor the biologic and environmental health of systems through high quality research, to support management of lands and waters.
- Research key issues and develop strategies to combat them (ex. bird/insect crash).
- Species-specific and habitat-level research and management to effectively maintain, protect, and restore habitats and populations.
- Research to inform managing plant, fish, and wildlife communities to adapt to climate change.
- Conservation of additional lands and support for management of currently protected lands.

The following provides the full list of strategies for the area of **Habitat, Fish, and Wildlife** that were recommended by subject matter experts who responded to the survey. They are organized by goal.

Please Note: These strategy recommendations are provided verbatim, as they were submitted through the survey. Therefore, they may contain errors or typos. They have also **not** been vetted for alignment with the ENRTF mission or charge, and may therefore not be allowable strategies for the ENRTF to pursue or include in its strategic plan.

Goal 1 – which 38% of survey respondents prioritized: Minnesota has healthy and diverse wildlife populations that sustain and enhance the state’s environment, economy, and quality of life.

- Put all proposals in the arena on equal footing, i.e. don't block grant to MAISRC
- Private and industrial lands included in planning process - not just public lands
- Develop a realistic assessment of habitats and their ability to sustain healthy and diverse populations while recognizing that not all aquatic habitats will remain/return to pristine conditions. Using limited resources in a more focused way will ensure better outcomes - even if limited in geographic scope.
- Again, I'm not sure where to start, except to say that maintaining these living resources have multiple benefits as listed in the goal; and developing strategies that can support multiple benefits will require careful and reasonable management.
- Research that supports management related questions
- continue to develop opportunities for the public to enjoy all of the state's natural resources
- Demonstrations
- demonstrating the multiple benefits of wildlife habitat for people (filtering water, recharging groundwater, C storage) to make wildlife issues relevant to everyone, not just those with binoculars or guns.
- The goals over emphasized animals and should also emphasize habitat. Think bigger than producing more fish and deer. Could word as: Minnesota has healthy and diverse wildlife AND PLANT populations that sustain and enhance the state’s environment, economy, and quality of life.
- Research and monitoring
- At some point we may have to give up the fight against invasive species and look at adapting. Many of our native landscapes will not be able to adapt to climate change and invasive species are extremely adaptable. Supporting research that looks at managing plant and wildlife communities to adapt to climate change while accepting invasive species as part of the "community" would be beneficial and could allow us to invest dollars in other areas where we can have a bigger impact..
- Provide funding for habitat restoration projects that can be owned by private entities. Most people dont like selling their ground but still want to make a difference.
- Expand beyond hunters and fishers in your concept of critical stakeholders.
- Best management use of public lands/waters
- ENTRF is a tremendous funding source for applied fish/wildlife research. Since OHF funds cannot be used for these activities; thus, the strategy would be to prioritize these activities ahead of acquisition (OHF eligible)
- Robust investment by LCCMR in on-the-ground conservation outcomes.
- Research and commitment to a HOLISTIC approach for managing MN's lands to maintain the unique biodiversity.
- Continued and improved collaboration between public and private lands conservation programs/goals.
- Quantifying the economic and social benefits of healthy and diverse wildlife populations, and then passing that information on to decision makers
- Changing people's (individuals, consumers, leaders, industry, farmers, etc.) behaviors to positively impact the environment

- Provide funding for studying poorly understood components of Minnesota's biological diversity
- We are all about the water here in MN we have to protect it, and the habitat, but we have to use common sense.
- Increased planning of key habitat corridors and refuges areas for species ranging from pollinators to birds and mammals.
- A concentrated effort to demonstrate success in two or three areas of the state on a large scale would go a long way to convince the majority of landowners to adopt more sustainable practices and approaches. By large scale I'm talking about 10,000 - 40,000 acre efforts not the typical small project by project piecemeal efforts we are currently seeing.
- Maintain viable populations of all of Minnesota's native species
- Fund management of public and private natural areas at higher levels
- Support land protection actions that focus on building corridors and networks of habitat, to help with climate change adaptation.
- Cooperation! I chose this option as I think it encompasses most of the others. We want overall healthy ecosystems that can resiliently adapt to future conditions (that include allowing native species to outcompete invasives, are pinned on hydrology in that both the terrestrial and aquatic communities are considered together, and that vulnerable species are supported).
- Enhance native habitats that support wildlife populations.
- We lack information on many important wildlife populations. Research is key to developing programs to sustain their health and diversity.
- In order to maintain healthy and diverse wildlife populations, we need to actually understand what we do have. There is poor knowledge of most of these elements. We must support surveys and ecological research to establish better baseline information about the status and interactions of Minnesota's species.
- Providing quality habitat is the best way to ensure a healthy and diverse wildlife population, continuing to protect and expand conservation lands is critical to this
- invest in monitoring the health of fish and wildlife populations to be able to detect concerns before they are critical
- Research
- Work with the Division of Forestry to manage the forest age class distribution
- protection of diverse habitats, both terrestrial and aquatic
- Development of hunting opportunities as well as wildlife viewing/non-consumptive tourism (i.e., Map of viewing areas, festivals, etc)
- a combination of research and outreach that focuses on managing many species and educating the public about them.
- This is a cruel choice; I want them all for Minnesota. I chose # 2 in hopes that it encompasses a number of the others (particularly 1,3, 5, 6). To meet this goal we need to look at the bigger picture - what is causing the big drop in bird populations across the US? What is causing the huge crash in insect abundances? How can MN combat these in our state?
- Land protection, restoration, and management
- By prioritizing areas for rehabilitation, a discussion can be started on why some habitats are less prioritized which will create much controversy but may also help the public understand that we cannot fix every wrong - especially not without local buy-in.
- Continued research and trend measurement to clearly indicate changes (good and bad) to help guide decision making.
- Protection/purchase of land in headwater ecosystems
- More youth programs.

- Conservation of additional lands, funds for adequate management of lands currently protected, funds to prevent and manage invasive species
- Habitat restoration
- Increased awareness of private lands to public land benefits and biological diversity
- Exploration by LCCMR in how they can complement OHF and other legacy funds in this arena - not avoid it altogether.
- Development of an integrated multi-disciplinary and multi-agency team (not just DNR) to draft of plan for managing ALL wildlife (not just game species)
- Research/evaluation of existing management plans (e.g., MN Prairie Plan) to ensure that they are as effective as they can be.
- Raising the importance of the effects of aquatic and terrestrial invasive species.
- Species-specific as well as habitat-level in situ and ex situ management and research to effectively maintain, protect, and restore habitats and populations
- Use common sense!
- Ensure that all of Minnesota's native prairies have some level of protection and that they are managed to maintain native species permanently
- Protect more continuous tracts of land create roadless areas
- Projects conducted by interdisciplinary teams that include both terrestrial and aquatic scientist and practitioners. Specific to the ENRTF, one small change could be not having to group projects into either terrestrial or aquatic upon submission, as focusing on a healthy watershed will include both.
- Support non-consumptive research and management on our rare resources.
- More actions plans and resources are needed to support species of conservation concern.
- Remembering that single species management problems are usually the result of broader ecosystem problems. Targeted efforts (while still justified) should keep in mind, and hopefully also inform solutions to larger issues.
- In order to ensure the way we are managing our lands and waters is the best for wildlife, we need to be vigilant in our monitoring of the biologic and environmental health of these systems through high quality research.
- protect critical habitats, educate about invasive species
- Education
- increased attention to wildlife and aquatic habitat in cities and suburbs
- Investigation of wildlife related economic and business opportunities that could be supported in policies and programs
- Getting people engaged with the natural world may be one of the most important ways to ensure the public supports this goal.
- We need to learn to live WITH the natural world. Having strong and diverse biotic populations means living with them, accepting their presence in our midst, and leaving high quality space for them to thrive. This goal cannot be met if we keep gobbling up habitat and land. We must learn to live on less land so that more land can be preserved in a natural state. But no one wants to hear this or do this. How can we move people's attitudes?
- Incorporate high-diversity native plantings into projects for stormwater mitigation, shoreline stabilization, buffers, reclaimed mine lands, snow fences, etc., as appropriate.

Goal 2 – which 17% of survey respondents prioritized: All public and private conservation lands in Minnesota provide long-term, multiple benefits for fish, wildlife, and people.

- Continue to build on successful programs, explore what other States are doing,
- Continued funding in support of conservation land easements.

- Management of areas for habitat are more likely if there is an economic incentive. For example, forest management can provide income but also ensures there are young growth forests for the wildlife that depend on that habitat type.
- Support bringing together community members in local conservation groups to lead and implement programs in their community - it has to be long-term support for on-going groups - not one and done events or meetings
- Support conservation easements on private land.
- Identify gaps and create action plans
- Research that assesses wildlife and fish populations. Management actions that rely on sound science.
- Restoration and Enhancement of Minnesota's most at risk habitats
- expand allowable uses on some public lands
- Invest in restoration and long-term maintenance of restored habitats
- Economic incentives to alternatives to corn production right up to waters edges
- several of these objectives sound the same
- Develop a long term funding strategy for conservation (see Relevancy Roadmap, Association of Fish and Wildlife Agencies).
- I would like to see more research on how to maximize particular benefits and/or optimize habitat to provide multiple benefits. It would be great to bring in social scientists and biologists to address these issues.
- Talk about conservation and benefit--also really like bringing in environment, economy and quality of life
- More an anti-strategy. Way to much ENRTF funds are being putting into individual responsibility of managing aquatic invasives (i.e. boat access monitoring). Until policies are put into requiring boat and trailer manufacturers to design products that do not move invasives (i.e. left over water in trailers and livewells), we are wasting money focusing on inspections.
- Continuing to 'wall off' ENRTF and Legacy funds from distribution to Agencies by legislators - after they cut Agency programs.
- Research and Best Management Practices for Conservation Working Lands
- Invest in research of best management practices and monitoring of outcomes at protected/restored sites
- Advocate for a better Farm Bill that provides lasting conservation (not temporary CRP-like programs).
- Combine two topics and bring it down to a personal level--everyone loves outdoors, nature, wildlife

Goal 3 – which 15% of survey respondents prioritized: Minnesota lakes, rivers, streams, and wetlands support aquatic biodiversity, including species vulnerable to human impact.

- I selected the broadest possible goal since its all connected. Citizens need to be re-educated regarding the benefits of biodiversity.
- education
- Aquatic systems that support biodiversity and represent aquatic health are designated for protection with enhanced state rules.
- Watershed improvements through more wetland restorations and establishing more grass on the landscape.
- We need more research on how to maintain biodiversity in the ace of climate change and other human impacts, and determine which impacts (hydrology, nutrients, habitat connectivity etc.) are the most crucial to address.
- Monitor biodiversity
- Education and research
- Devote adequate resources to non-game species
- Educate the public on the ecosystem services provided by healthy fish and wildlife habitats

- Securing habitat buffers through conservations easements and habitat preserves with private land owners by taking advantage of generational change in farm ownership, with market changes in large natural resource landowners, and with County governments under 1W1P.
- Research focus on vulnerable species and biodiversity linked with education and outreach.
- research
- State conservation funding is directed at the states healthiest yet most vulnerable freshwater systems.
- Work with the ag. community to establish more grass based agriculture on the landscape.
- Support research on reducing human impact aquatic and terrestrial habitats
- Work with farmers to reduce run-off , phosphorus and nitrate pollution
- Combine water quality solutions with habitat conservation solutions for win-win solutions

Goal 4 – which 12% of survey respondents prioritized: Minnesota prevents, detects, and reverses the establishment of aquatic and terrestrial invasive species, and is able to effectively mitigate their negative impacts.

- Research
- The MIASRC has proven to be bottle neck to innovative solutions in invasive species. The center is primarily concerned with funding their own researchers and proposals from outside this sphere are dismissed without adequate peer review or explanation.
- Invasive species impacts all the other goals listed. Terrestrial is proportionally underfunded compared to aquatics considering the scope of the problem.
- Research and testing to find the right methods to mitigate aquatic and terrestrial invasive species.
- Leverage resources from multiple agencies to make bigger-scale impacts.
- Release of GE biocontrol agents to combat invasive species (I am biased on this one)
- Research into mitigation strategies for invasive species and implementation of research findings
- Foster projects that provide practical solutions to invasive species problems
- Educating users on the dangers of spreading invasive species is key in halting the spread of these species from various water bodies has to be a top priority.
- Research, early detection, management implementation and education all required to mitigate ecological and subsequently human health impacts. Targeted areas vary based on invasive however, people are consistent contributors to the spread of invasives (increasing need for education) and simultaneously significantly impacted (increasing need for direct management implementation).
- Fund long-term invasive species removal efforts.
- Support research relevant to Minnesota
- Education and outreach
- Research the impacts of terrestrial invasive plants such as buckthorn on fish and invertebrates in streams, rivers and lakes.
- Support local initiatives to prevent, respond, and monitoring AIS

Goal 5 – which 12% of survey respondents prioritized: The hydrologic function of Minnesota’s watersheds supports healthy and diverse biological communities.

- Increased coordination of multi-agency activities to address issues more holistically
- apply the principles of strategic habitat conservation, that is , focus on habitat protection and management that benefits an array of species, examples include native prairie and other grasslands, wetlands and shallow lakes

- Continue to fund those projects which work to put on the ground projects in the right places.
- Fund community engagement at subwatershed scale to engage diverse stakeholders in conservation targeting and finding locally-driven solutions for water storage. Provide education so citizens better understand the hydrologic impacts on biological communities and clarify what could be done to improve conditions. .
- Retain more water on the land in seasonal and permanent wetlands
- We have streams overflowing and streams drying up because of altered hydrology. Need to find a balance in order to preserve the function of our riparian ecosystems.
- Measure how biological communities each of the 81 watersheds will be affected by projections in climate change data and identify actions to address.
- Getting serious about preventing the movement of invasives.
- Research into how this is quantified
- Acknowledging the relative contributions of agricultural and urban effects on the water balance
- Fund diverse approaches that will lead to more water storage on the landscape. These can include wetland and drained lake bed restorations, storage along ditch systems and multi-purpose drainage management, and support soil health initiatives that promote farmer peer-to-peer learning to advance cover crop and reduced tillage.

Goal 6 – which 1% of survey respondents prioritized: There are diverse and sustainable fisheries and aquatic game populations that are accessible to all Minnesotans for safe consumption.

- Support projects that aim to restore moose. Support projects in Indian country on subsistence species used by MN ojibwe and dakota people.
- Support ecosystem health research projects.

Other goal ideas offered by subject matter expert survey respondents for the area Habitat, Fish, and Wildlife:

- Minnesota has healthy and diverse wildlife populations and habitats that sustain and enhance the state’s environment. (The human dimensions component is mostly addressed on the other three areas, this area should mostly focus on habitats, fish and wildlife)
- All of the above are extremely important, I can't pick just one.
- Maintaining or improving terrestrial and aquatic biodiversity within the state (and region) through habitat improvement on a qualitative and quantitative basis.
- Minnesota's aquatic and terrestrial habitats are managed to anticipate and respond to a changing climate.
- Minnesota aquatic and terrestrial systems support native biodiversity, including species, habitats, and ecological functions and services that are vulnerable to human impact.
- Ensure that significant areas of biodiversity are protected and sustainably managed throughout the state, in every ecological subsection.
- Instead of focusing on wildlife populations we need to focus on landscape level conservation. Without the natural habitat you lose many non-game species(insects, non-game birds etc) and your wildlife populations will not be as adaptable and flexible as the climate changes unless the natural communities are intact and functioning.
- Minnesota protects and enhances its most vulnerable, significant habitat AND reverses the decline in loss of habitat across the state to benefit healthy ecosystems, wildlife and people.

Other strategy ideas offered by subject matter expert survey respondents for the area Habitat, Fish, and Wildlife:

- Climate adaptation strategy, natural environments will change and a proactive approach to assess mitigation and adaptation opportunities is needed.
- Continue to promote outdoor recreation and provide education so that people care enough about the resources that they want to continue to protect and conserve them.
- Addressing loss of critical habitat, habitat fragmentation and species relationships via research and education.
- Advance research and measurement of ecological functions and services and their economic impact.
- Set goals for Minnesota that will help contribute to the United Nations goal of protecting 50% of the world's biodiversity by 2050, and establish a plan that helps to accomplish this.
- Focus on connecting already conserved lands and increasing the amount of land that is permanently conserved. We only have 1% (or less) of our historical prairies in MN left. Secure habitat is the best safeguard for
- Habitat protection, restoration and enhancement.
- Monitoring and evaluation, to increase the long term return of investment the effort to understand the impact of different conservation efforts has to continue. Uncertainty will increase and we cannot just rely on old practices or untested ideas.
- Develop partnerships, and find collaborative funding mechanisms to achieve goals.
- Maintain and enhance investments in Minnesota natural heritage data and information systems sufficient to provide people with the information necessary to achieve sustainable, systems-based conservation and management solutions.
- Use the data from the Minnesota Biological Survey, as well as from other sources, to set statewide goals for protection similar to those already established in the Minnesota Prairie Plan.
- Lots and lots of education to private landowners and in schools (grade 2 on) on the importance of natural and native functioning ecosystems and all the ecosystem services/benefits they provide. EX Runoff reduction, increased water quality, resiliency with storm and flood events, groundwater recharge, healthier soils, pollinator habitat (pollination for crop species), wildlife habitat, unknown future uses (medicines etc) etc.
- Education

Appendix J: Outdoor Recreation & Open Space

As a result of the Issue Identification Panels, there were **three goals** that emerged in the area of outdoor recreation and open space.

These three goals were voted on by respondents who participated in the subject matter expert survey.

Table 1. Percent of subject matter experts who prioritized each goal in the area of Outdoor Recreation & Open Space

		Count	Percent selected
Goal 1.	Outdoor recreational users in Minnesota understand the environmental issues that impact those activities (e.g. habitat loss, invasive species, toxic ammunition), are meaningfully engaged in conservation efforts, and have adopted more sustainable practices when needed.	65	38%
Goal 2.	All Minnesotans, especially young people, have access to and take advantage of opportunities for culturally relevant and innovative outdoor recreation.	62	36%
Goal 3.	Parks and trails receive funding for maintenance and enhancement, on par with the funding for developing or creating new parks and trails.	41	24%
	<i>Other</i>	5	3%
	Grand Total	173	100%

Because Goal 1 and Goal 2 were closely matched, in terms of the amount of support from respondents to the subject matter expert survey, participants at the Prioritization Panel were asked to prioritize one of them.

The Prioritization Panel participants selected Goal 2 as the highest priority, but modified it slightly to read as: *All Minnesotans, especially young people, have access to and take advantage of opportunities for culturally relevant and innovative **connections to the lands and waters of Minnesota.***

Subject matter experts who participated in the Prioritization Panel were asked to review strategies recommended by survey respondents relating to Goal 2. All of the strategies submitted by survey respondents are included in the next section below. Panel participants were invited to revise strategy ideas or come up with their own, and as a group they prioritized six strategies that would be necessary to achieve the goal. Those six strategies, in no particular order, are:

- Address the social, economic, and physical barriers to outdoor recreation through programs that encourage inclusivity and address inequities.
- Research people's interests in outdoor recreation and understand barriers to participation.
- Assess programs, activities, and physical spaces for their accessibility; support changes to adapt and retrofit to welcome more people.
- Through collaborative efforts, provide curriculum, programs, and outdoor environmental events that teach K-12 students what public lands are, introduces them to public lands near them, and encourages them to explore local public lands.

- Through partnerships between schools, environmental learning centers, and other community resources, provide evidence-based, engaging programs to bring students to outdoor experiences.
- Capital projects that develop culturally relevant, accessible, and resilient outdoor recreation facilities, infrastructure, and equipment rental programs that create innovative experiences (including parks, trails, fishing piers, shoreline fishing areas, birding trails, shelters, etc.).

The following provides the full list of strategies for the area of **Outdoor Recreation & Open Space** that were recommended by subject matter experts who responded to the survey. They are organized by goal.

Please Note: These strategy recommendations are provided verbatim, as they were submitted through the survey. Therefore, they may contain errors or typos. They have also **not** been vetted for alignment with the ENRTF mission or charge, and may therefore not be allowable strategies for the ENRTF to pursue or include in its strategic plan.

Goal 1 – which 38% of survey respondents prioritized: Outdoor recreational users in Minnesota understand the environmental issues that impact those activities (e.g. habitat loss, invasive species, toxic ammunition), are meaningfully engaged in conservation efforts, and have adopted more sustainable practices when needed.

- Research for invasive species, improve existing habitat, add more habitat in appropriate areas
- Continued monitoring, analysis, strategy development, and implementation of methods to manage and eradicate invasive species. Additionally, engaging stakeholders in these strategies will be critical.
- Education and outreach
- Remonument all Section corners in the State
- Effective education through on-the-ground demonstrations at Parks, Nature Center and other points of confluence for people using recreational opportunities in MN
- Since the focus of the goal is users, the strategy should be education and outreach.
- Research/demonstration projects that include a communication/education component.
- education/Extension outreach and programs and applied research to support it
- Hard to achieve this goal with out maintenance and enhancement so the goal should have components of both. More than education the strategy would be to quantify the level of understanding that people has on the impact/importance of open spaces and recreation have on their life and livelihoods.
- More research and education on invasive species is essential
- incentive programs for adopting sustainable practices.
- Continued education on invasive species for all boat users
- research and education
- education
- better communication strategies to explain the issues beyond boring govt agency press releases
- Education
- Greater access to environmental education
- Changing the culture of outdoor enthusiasts by using community based social marketing techniques - identifying barriers, promoting behaviors, securing commitments, etc. We can develop a culture that takes pride in performing activities that promote environmental conservation by changing social norms.
- Education and research into how to most effectively deliver that education

- Education of the public is most important when trying to engage them in conservation efforts and best practices. They need to know why doing these things is important and how it might affect them if they don't.
- ENRTF needs to support environmental education programming for all ages, in particular, a dedicated funding mechanism for educational organizations and community groups to get support and resources to integrate EE.
- Engage user groups to expand their recreational interests into environmental awareness and action.
- Environmental education - connection to the natural world occurs through recreation and after people connect we need to educate them on how to wise stewards of what they are enjoying.
- Research and demonstration associated with adaptive forest management techniques to address invasives and global change
- Establishing clear checks and balances when permitting activities
- State agency staff have part of their work program dedicated to providing outreach and education to citizens, developing partnerships and meaningfully engaging community groups and members.
- Educating the public. Particularly at the local level to get buy-in in order to promote for larger audiences.
- Education
- Education
- More outreach and education to MN citizens is needed to make them aware of impacts of habitat loss, water quality degradation, and invasive species
- environmental education activities offered at the various parks- maybe working towards a 'badge' of some kinds that indicates a wide range of exposure to these activities.
- integrate educational information to the places (real and virtual) used by those recreating
- Education and outreach
- collaborative efforts on research, education/engagement, and assessment. It cannot be done by one strategies.
- On a regular and sustained basis, provide articles, videos, descriptive content, and other materials dealing with key open space issues for use by newspapers, newsletters, webpages and other communication outlets
- Work with sporting goods stores to develop a culture of protecting natural resources.
- Find ways to restrict movement between areas with invasives and non-impacted areas. Move beyond research, education, and measurement to serious demonstration by enforcement.
- Education, perhaps including park areas that highlight problems
- Education - a concerted effort to provide ecologically accurate information in a variety of ways to help people understand how our actions affect habitat and outdoor recreation.
- Develop partnerships with community-facing organizations with ability to reach and educate a wide variety of Minnesotans (zoos, botanic gardens, museums, schools, volunteer organizations)
- Outreach campaign to educate hunters and anglers regarding (and the general public) about threats to resources.
- Research, particularly research engaging the community (citizen science), can directly engage users while enhancing understanding of issues.
- Adopting and training the public in Broman and Robert's 4 science-based, peer reviewed sustainability principles
- More environmental education and outreach to the general public on how research, natural resource management and restoration impacts their enjoyment of the outdoors.
- Funding to umbrella user groups to educate their members
- Connect the impact of the climate crisis to the harm inflicted on habitats water and air through research and demonstrations to combat the harmful impacts
- Education and Demonstration

- Fund education experiences for users where it is facilitated by professionals, e.g. not simply outdoor recreation. Also, fund users to engage with individuals and organizations where the user sees/learns of models that support positive change toward addressing the issue.
- Support projects to evaluate effectiveness of toxic ammunition replacement programs. Support research to evaluate the effectiveness of habitat restoration.
- Promoting an integration of research and outreach would help.
- Offer opportunities to subscribe to news or Facebook postings with current information
- diverse and innovate education and engagement
- research and education
- Measurements especially related to invasive species
- More educational signs at parks and trail entrances - there are some and they are great.
- Each park could develop an educational experience identifying how the park is affected by the issues
- Look to our neighboring States and see what they are doing, what is working, and what is not
- Research
- Find ways to engage new communities (for example Native American; urban dwellers, recent immigrants) in outdoor activities and make environmental issues an integral part of this effort.
- Demonstration - people often need to see the impacts and/or results of conservation efforts and practices.
- Behavior, efforts have to be made to promote positive behavior towards nature by using recreation and open spaces as vehicles.
- education
- Research to develop strategies to either remove, treat, or somehow utilize invasive species.
- Providing more opportunities for youth to get involved
- leading/demonstrating activities in the field
- Research
- Taking down the large organizations who exploit our natural resources - you know who they are.
- Continued research to better understand what methods are effective for counteracting these issues.
- Effectively communicate the importance of natural resources for ecological value, not just recreation.
- Marketing Campaign specific to user groups
- Dedicated funding for more environmental education in K-12 to expose students to natural resource issues and help them understand what it means to be effective stewards.
- Measuring the impacts, or showing cause-effect, to determine a programs success.
- Demonstration
- PSAs or pop-up ads on cellphones, etc.
- Case study and exemplary demonstration
- Find more ways to engage people in citizen science, habitat restoration activities, and other hands-on activities, perhaps through new partnerships between various conservation agencies and organizations.
- Signage at public access points.
- Sharing best practices through education is key to achieving environmental sustainability
- Training county parks and open space commissions and city park commissions on their potential to move policies through the local democratic process.
- Support projects to remove invasive species and research long-term effectiveness of those efforts.
- Ask resource users to report invasive species or provide information to help people ID invasive species
- Research in how people view and interact with management

Goal 2 – which 36% of survey respondents prioritized: All Minnesotans, especially young people, have access to and take advantage of opportunities for culturally relevant and innovative outdoor recreation.

- Education and outreach
- Use demographics to define groups so as to provide all Minnesotans with an environmental experience. This is important for building support for environmental initiatives.
- Provide investments for DNR and local resource professional to engage with school districts to establish outdoor extra curricular events e.g. high school fishing clubs
- Provide assistance to schools, parks and environmental learning centers to enable all Minnesota youth to make a connection with their parks and outdoor recreation resources.
- Impactful education for all groups, especially minority groups because they usually either don't have access to or are not introduced to these outdoor activities.
- Land purchase for conservation/recreational use
- Early education and engagement so that youth learn to value natural resources and want to invest in their protection.
- Looking at access opportunities, identifying gaps, and funding work to protect open space and provide recreational opportunities
- Public programs for taking inner city youth to the parks. I would love to help out with such a program, but don't have the bandwidth to get it off the ground
- providing outdoor, experiential educational opportunities
- We need curriculum and transportation funding for K-12 schools to introduce kids to the concept of public lands and that allows them to explore or encourages them to explore their local public lands. Most of our citizens cannot define "public lands" and cannot list the public lands nearest to them or the recreational activities available at these locations. This is a public health concern as well as an environmental/conservation concern. How can we protect what we don't even know exists?
- Increasing the amount of and quality of accesses to water resources (e.g., boat ramps, shore fishing locations) and preventing any barriers to water recreation (e.g., boat ramp fees, off-site inspection requirements).
- I think you should expand on your definition of "outdoor recreation." I think we should think of this as connections to the outdoors and land of MN.
- Educational outreach in particular with public schools with a high percentage of students with free/reduced lunch.
- Ensuring that local green spaces (and not just baseball fields) are valued and supported and preserved in neighborhoods of small, medium sized towns. Large cities have some capacity already, but can also be enhanced. Large state and regional parks are wonderful and much better for non-human habitat, but daily visual and physical access to local green spaces is very important for human habitat.
- Put more emphasis on creating opportunities for underrepresented people in urban areas
- Review of already developed strategies that are related and getting to the target audiences to listen to them.
- building trails, landings, parks, hosting events, introducing young people to outdoor activities
- Research that identifies effective ways to increase outdoor participation by Minnesotans. Answer this: what will get people outside and lead (presumably) to valuing wildlife and the outdoors?
- Education via demonstration
- Research on barriers to outdoor recreation
- Create more areas for outdoor recreation.
- Develop programs that encourage inclusivity and address inequities that lead to unequal participation in outdoor recreation

- Providing culturally relevant programming combined with a research/evaluation component to measure effectiveness and impact and contribute to the field of knowledge
- Provide funding for in-classroom and in-field exposure to outdoor recreation
- In all areas regarding outdoor and recreation space we have seen a decline in avid outdoors people. I know firsthand on Leech Lake Band of Ojibwe Reservation we are seeing the number drop dramatically when it comes to hunting and gathering and keeping to our traditional ways that we are not seeing as many young people pick up the ways of our older outdoor generations. I think we can combat this issue as well as others by offering education and demonstration.
- Determining what recreational activities or modifications to physical spaces would welcome more people to outdoor recreation areas
- Outreach to underserved communities
- citizen science-based activities that educate while participating in assessments of species, habitats, etc.
- promotion and adapting to social changes/patterns
- Stipends for low-income households to increase participation in camps, and/or reducing other barriers such as time away from work to take a child to camp.
- Creation and maintenance of green space for outdoor recreation where Minnesotans live and work.
- Resources in multiple languages and formats
- Developing outdoor recreation opportunities in underserved urban areas.
- Programs that introduce young people to the outdoors
- Schools (pre-K through college) should have outdoor education opportunities built into their curricula.
- Education segments on the health of the environment (addresses lead shot, invasive species etc) and the ecosystem services that natural lands provide for all grades K-12. If kids understand and enjoy being in nature and in natural lands they will be stewards for the future.
- Providing funding for environmental learning centers across the state. Our experience with these organizations has been more beneficial than Girl scouts and Boy scouts for learning the value and fragility of our public lands. Environmental learning centers teach about the outdoors and ecology but also leadership, team work and many other qualities.
- Funding access and camp programs, like through schools that foster contact with wild spaces, that tell the stories of how those landscapes have changed through time and the peoples that have depended on them, and actions that can help us learn about those landscapes (like through community science activities).
- educational opportunities to take kids outdoors, establishing their relationships with the natural environment early in life
- Emphasize innovative outdoor recreation, that has an impact. Offer different levels of recreation engagement: casual, introductory, meaningful, etc.
- Staffing commensurate with numbers of users
- partnership with local school systems to develop curricula for outdoor recreation and education
- Support projects that get youth Outdoors
- Guided activities accessible to underserved communities. Nature based experiential learning opportunities like Wolf Ridge and Eagle Bluff provided to students in underserved school districts.
- Figure out (research) what will entice young people outside to use Minnesota's amazing natural areas, then (second step) work to implement these things across our state.
- Increase the diversity of staff and volunteers within the organizations (governmental and nonprofit) that are delivering outreach, interpretive programming and environmental education programming. Objective is that all young people may be able to recognize themselves in the people delivering those programs, receive culturally-appropriate programming and be inspired to become conservationists, whether professionally or as citizens.

- Addressing barriers to participation (transportation, access to public spaces, understanding what is available).
- Consider outdoor recreation/participation beyond traditional park use as a way to engage broader audiences - extended school experiences, preschool family opportunities in local parks, enhance state forest promotion for gathering and other cultural uses
- Developing more opportunities for inexpensive outdoor recreation, such as shorefishing sites or kayak sites.
- Engagement - learning about interests in outdoor recreation and barriers to participating in outdoor recreation; addressing social, economic, and physical barriers; offering facilities and programs appropriate to these participants. Programs and efforts may need to be intergenerational in nature. An important aspect of these efforts may need to be staff professional development.
- Thinking about innovative programs to get people out into natural areas. Using things such as iNaturalist etc. It would be great to key into what kids are using - snapchat, instagram - instead of highlighting these as the enemy.
- Removing state park parking pass to encourage greater participation and in return greater support for funding state parks
- Improving opportunities to access and discover outdoor spaces and recreation benefits linked to education and public engagement on environmental impact and conservation efforts has benefits in public valuing of outdoor recreation and open space and thus environmental issues.
- Bring students to more outdoor experiences. Use applied scientific research to facilitate engagement. Perhaps a natural resources internship that are short and engaging.
- Education programs and developing facilities such as fishing piers and shore fishing areas, shelters for summer and winter use, affordable equipment rental programs.
- Regional distributions so socio-economics (e.g., access to transportation) does not influence access to recreation.
- Technology is continuing to be the source of entertainment for youth. Recommend investments to study or develop technology (as entertainment) that requires greater interaction and understanding of outdoor recreation. Geocaching comes to mind as one effort but I'm sure there other ideas that haven't been created yet
- All students have multiple opportunities to experience outdoor recreation. Encourage partnerships between schools and community resources including environmental learning centers to facilitate sharing of staff expertise and equipment. Promote and provide training for formal and informal educators to integrate outdoor experiences and outdoor recreation across the curriculum.
- Another strategy might be to fund transportation and lunches for these young people so they actually are exposed to these activities.
- Research to determine what engagement strategies work (i.e., what strategies help engage MN citizens and lead to a lifelong connection with natural places and spaces)
- Focus on innovation. Digital connections and non-consumptive uses are rising. Using apps like iNaturalist or taking photos can help get people outside and connected to what they see.
- More 'free days' at state parks, and possibly buses from large cities to the parks (only needs to run on select weekends)
- Work with the health care industry to promote outdoor recreation as a health prevention tool. Work with health insurance providers to offer free park permits, like gym memberships, to allow low income folks to access these public spaces.
- Include historic and ongoing connections to the land of indigenous peoples as a model for interacting with the landscape.

- Offering financial park aid to towns & cities, BUT only if these entities create & enforce planning & zoning ordinances that preserve green space. e.g. Towns should require a green space/landscape plan with every development and require at least 25% of land stay as open space or green space. Towns must not fear they will lose a developer over green space. Note that the argument that we need denser housing for affordable housing means that poor people will have homes without green space!
- Share the stories of culturally relevant and innovative outdoor recreation with those same audiences to motivate others to have fun outdoors.
- Management strategies that open up lands to recreation - WIA, for example - and acquisitions of new lands for Minnesotans to use. Sometimes the hard part is finding a nearby place to go.
- Developing programs that are not "one time" experiences.
- Education and outreach
- Support for capital projects that develop culturally relevant outdoor recreation facilities and/or infrastructure for innovative experiences
- If you look at the permits issued across the state off and on the LLBO Reservation and gather the age of the permits issued, you will see a pattern of no new outdoors people taking part in the various activities. The younger generation is less inclined to seek out that knowledge and in part of that is the fearfulness of rejection or not having anyone to teach them. If we could develop a state broad approach to increasing outdoors activities I believe all would see an incline.
- Focused curriculum in schools about natural resources and outdoor recreation opportunities
- Getting young people out of classrooms and into the outdoors, visiting streams to explore what lives there while learning what supports the life they see.
- Welcome activities for new immigrants that include outdoor programming or information on outdoor recreation opportunities in MN
- Support for outdoor events that feature a park, trail or conservation issue.
- Have all kids have a certain amount of "field days" as part of MN science curriculum. These would be influential and memorable field trips to private natural lands, state parks or state natural areas where kids would be able to explore and learn from experts about the habitat, wildlife, and why it benefits us all to have "wild" lands.
- Funding partnerships that will work to preserve and maintain parks as well as provide programming. Organizations like local river and lake groups support volunteer work and the YMCA has been working to provide programming in local parks. Make the money go further by investing in partnerships.
- Demonstration spaces of actions people can also take in their own spaces that have tangible impacts, i.e. native plant rain gardens, smart usage of winter salt , etc.
- access to these areas of the state; more opportunities closer to the metro to experience outdoor recreation
- Work with Division of Forestry to manage the vegetation age class and related features within parks
- Expansion and continued protection of parks and wilderness
- I suspect that native americans don't see themselves much in our concept of parks and preserved natural areas. We need to figure out how to engage these communities as well as recent immigrant communities.
- Ensure all young people have ready access to high-quality natural spaces near them. This will involve strategic protection of land, restoration of degraded habitats, improved accessibility via public transportation, and making programs more culturally-diverse (e.g., through use of language, deeper historical and cultural interpretation).
- Determine how all Minnesotan's want to participate in outdoor recreation. What will increase participation?
- Education - increasing opportunities for outdoor recreation and environmental education in formal and informal settings

- Include environmental studies and statewide initiative like National Park System for all students in i.e. 4th grade free parking pass
- Improving access should include not only young people, but also people of all abilities.

Goal 3 – which 24% of survey respondents prioritized: Parks and trails receive funding for maintenance and enhancement, on par with the funding for developing or creating new parks and trails.

- Allow agencies and LUG's apply for maintenance funding.
- As much as outdoor spaces are required, it is equally important to understand where these can be developed with minimal env impact. Education around land use, wetland, rezoning in cities needs to be encouraged
- Maintaining existing facilities should be a priority.
- Monitor funding year over year
- This is basically an infrastructure question. Similar to aging infrastructure outside the world of parks and trails people don't seem to understand how quickly these resources fall apart. Education of citizens and elected official is critical.
- Maintaining what we already have is vitally important. If we do not have resources to maintain and enhance what we have, we should not build new sites.
- Timely repair and maintenance of high-demand facilities to provide high quality recreational experiences.
- Identification of the gap for maintaining the asset and public value of the asset.
- Rain Gardens, educational parks
- Providing funding for the basics especially to smaller municipalities or other managing bodies.
- Have funding for current trail maintenance, but to include trail connection via new trails. Make the trails have a meaningful route
- A crumbling infrastructure necessitates repairing/maintaining existing facilities, rather than acquiring more.
- Prioritization of state outdoor rec strategies for use by LCCMR in recommending resources and for legislature in awarding funds.
- A program for funding all trail upkeep. A per mile contribution to trail maintenance to all public trails.
- Education of lawmakers and governing officials, as well as the public, about the benefits of parks and trails (Return on investment)
- Consistent funding would provide for the ability to maintain existing facilities while providing the opportunity to focus enhancements and improvements to those areas of highest quality recreational opportunities.
- Complete a comprehensive assessment of all Minnesota State Parks & recreational areas to understand current conditions and usage, then develop a funding plan to address the highest needs over the next five years.
- The trails could be enhanced to provide learning experiences for users to include things like plant species and pollinators
- We must maintain what we have as well...no real worth in creating a park and not keeping it functional.
- I selected funding to maintain and enhance because it's the most elusive, easily overlooked strategy but critical to providing all Minnesotans the opportunity to experience and benefit from outdoor recreation
- With the legacy amendment, we have focused a lot of "new things" and not maintaining the heritage and infrastructure of our parks and trails.
- ENRTF funds are allocated for rehabilitation and enhancement of existing parks and trails at a sufficient level.
- Fund projects that not only repair/maintain what was there, but change to become more resilient and responsive to climate change.
- funding for maintenance and upgrade

- Educating the general public about this relatively self-explanatory issue, hopefully building support for this type of funding. This is a big issue
- Develop trail centers/facilities to increase park use, especially in the winter.
- Community-based efforts to maintain parks and trails.
- Creating Trailhead Centers where people have safe access to both non-motorized and motorized trails.
- Investment in recreation infrastructure.
- adaptive management research: the use of the funding includes some type of monitoring and evaluation to assess whether the goals have been met so that modifications can be made to improve the outcomes
- develop and use equity metrics to help prioritize trail and park projects; prioritize projects that address issues identified in MPOSC's study of regional park use by people of color - such as wayfinding (presumably this list of issues would be common to state & county parks too); prioritize projects that enhance visual & sound buffers between parks/visitors and manmade infrastructure (esp roads); require fund recipients to follow dark sky standards for lighting and bird safe designs
- Re-evaluating ways to connect existing parks to reach more communities rather than trying to create more parks, especially when there is so much land being developed for residential use, more so in suburbs than the metro area.
- Design, develop, rehabilitate and manage outdoor recreation facilities to encourage use by people with all abilities.
- Maintenance and enhancement will need to be tied to a relevant water/habitat improvement metric.
- Find ways to measure maintenance of existing resources.
- Include trails that go from state parks to local cities. Increase connection for users.
- Outreach programs not only to youth, but communities of color as well.
- Clarity for LCCMR and legislature as to what constitutes supplanting.
- A gas tax for non motorize trails to help encourage people to develop habits to not use our vehicles for trips along trails.
- Saving native prairie sites is a key goal for us here
- Need to make sure that the parks have facilities for education and experiential activities to engage a new generation of Minnesotan's. Don't develop with boomer's or X'ers in mind, but what will millennials want. Also, we don't have a Yellowstone or Glacier park that is national park that is accessible to all. So, need to determine what state park is a crown jewel that can be enhanced and promoted.
- Fund projects that pay high school aged youth to do some of the maintenance work, helping achieve goal #2 and teach job/life skills
- flexibility to research and try new strategies (e.g. different accessibility strategies; ecosystem management with fire; variety of vegetation and/or wildlife management strategies)
- Increase the quantity of permanent staff who do maintenance and enhancement.
- Leadership group to evaluate recreation needs and establish statewide strategy for proving next generation opportunities
- as much as the statement is 'maintain and enhance' - a missing key word is protect. how can parks receive funding to better protect existing high quality areas instead of funding after the fact to remove invasives - terrestrial or aquatic?

Other goal ideas offered by subject matter expert survey respondents for the area Outdoor Recreation & Open Space:

- I would broaden the first goal noted above tied to Parks and Trails to also include other public lands that allow recreational uses.
- Outdoor Recreation and Open Space is available and funded proportional to user type e.g. mountain biking opportunities available proportional to users or atv opportunities proportional to users and conflicting uses have proportional exclusive opportunities e.g. atv vs quite hiking
- All Minnesotans have access to opportunities for relevant and innovated outdoor recreation and are a part of understanding of the environment, activities impact it, and how to reduce negative environmental impacts.
- All Minnesotans have access to community-based public lands and open spaces that represent the full range of native biodiversity for their area.
- Securing additional open space by developing new parks and trails in areas without critical recreational opportunities in natural habitats

Other strategy ideas offered by subject matter expert survey respondents for the area Outdoor Recreation & Open Space:

- Monitor/research tied to the impacts of different recreational uses and the pros/cons to the public associated to each (Environmental impact, cost to the tax payer, etc.)
- Conduct analysis of existing opportunities and needs
- Co-locating projects at certain locations around the state maximizes the educational, research, and outdoor experiences. A habitat restoration or research project in isolation doesn't hold as much education, outreach, or outdoor value as a collection of projects that reinforce the importance of a given habitat. But DO NOT simply locate these at State Parks. LCCMR was not meant to simply replace DNR funding for things DNR should already be doing.
- Identify, protect, and restore representative sites of Minnesota's full range of biodiversity throughout the state.
- Developing new parks and trails in urban core areas, in suburban areas undergoing conversion to high-density development, and in new ex-urban developments
- Maintenance and Enhancement of our Public Recreation Units (invasives controlled, access/parking improved, trails fixed, campgrounds updated, etc.)
- Develop plan to fund and implement strategy to address opportunity needs identified in analysis above
- Make open space trails and parks a requirement of any new developments or redevelopments, including increases in density in urban environments.

Appendix K: Air & Energy

As a result of the Issue Identification Panels, there were **three goals** that emerged in the area of air and energy.

These three goals were voted on by respondents who participated in the subject matter expert survey.

Table 1. Percent of subject matter experts who prioritized each goal in the area of Air & Energy

		Count	Percent selected
Goal 1.	Minnesota achieves reliance on non-polluting, renewable energy in all sectors (including transportation, building, industry, agriculture, and others).	120	75%
Goal 2.	Minnesota has a growing consumer and manufacturing economy that is increasingly non-toxic and is efficient regarding use of resources and waste production.	32	20%
Goal 3.	Minnesota reduces indoor and outdoor air pollution, with a significant positive impact for Minnesota's most vulnerable communities.	6	4%
	<i>Other</i>	1	1%
	Grand Total	159	100%

Subject matter experts who participated in the Prioritization Panel were asked to review strategies recommended by survey respondents relating to Goal 1. All of the strategies submitted by survey respondents are included in the next section below. Panel participants were invited to revise strategy ideas or come up with their own, and as a group they prioritized five strategies that would be necessary to achieve the goal. Those five strategies, in no particular order, are:

- Encourage bundling renewable energy production and battery storage.
- Demonstrate the ability and statewide potential to generate solar energy on perennially vegetated lands, reducing CO2 and water runoff, while making the enterprise economically viable.
- Incentivize the use of non-polluting renewable energy in agriculture, industries, and commercial transportation.
- Demonstrate community-scale, net zero renewable energy systems.
- Fund energy efficiency improvements and renewable energy for rental properties, small businesses, and schools.

The following provides the full list of strategies for the area of **Air & Energy** that were recommended by subject matter experts who responded to the survey. They are organized by goal.

Please Note: These strategy recommendations are provided verbatim, as they were submitted through the survey. Therefore, they may contain errors or typos. They have also **not** been vetted for alignment with the ENRTF mission or charge, and may therefore not be allowable strategies for the ENRTF to pursue or include in its strategic plan.

Goal 1 – which 75% of survey respondents prioritized: Minnesota achieves reliance on non-polluting, renewable energy in all sectors (including transportation, building, industry, agriculture, and others).

- Making renewable resources based products more accessible to people and building infrastructure for sustainable use of such products
- Research on understanding all impacts of resource/energy use and extraction - not just direct impacts.
- Demonstrations
- More Solar farms are popping up all the time
- Provide incentives for rapid adoption of proven renewable energy and energy conservation technologies and behaviors. Provide dis-incentives for continuing those practices that contribute to pollution.
- Make this a law that is enforced by the PCA.
- Renewable energy should be the most important goal. Research, measurement and education should all work together toward this goal. I don't know exactly how.
- Take a look at what some of the Northern European countries are doing in relation to sustainable clean energy. Some of these countries (Sweden & Norway) are really working hard to make this happen successfully.
- Financial investment in renewable resources.
- Demonstration and measurement
- energy storage for solar and wind generation
- Technology transfer, ENRTF funds can be directed to investigate and support the strategies to transition MN economy and ways of life into non-polluting/renewable options.
- Support GreenStep Cities and GreenStep Schools in reaching city officials and schools. These organizations have the framework to make a big impact by implementing clean energy strategies and educating our youth.
- More research on renewal energy is needed
- Encourage solar and wind power development through incentives and tax breaks.
- Research to identify sustainable energy resources and ways to ensure they can be distributed throughout the state in a cost-effective manner
- Research and demonstration projects in renewable energy
- Increase accessibility of renewable energy to consumers.
- education
- Divesting
- Fund the research and development of innovative new technologies; subsidize their implementation, even if they aren't currently cost effective;
- If a project offers an opportunity to reduce reliance on vehicular transportation (e.g. new or maintaining bike access)
- Green Energy Grants
- Funding more renewable energy projects.
- Once again, education through our schools and through local town hall meeting events, etc. to share information about how renewable energy sources can also help our communities to be healthier and save millions of dollars in health care costs in the long run.
- Continue with solar and wind sources but make it available LOCALLY for benefit.
- Support the use of electric vehicles and small engines
- Moving in this direction is key to our well-being. Help Minnesotans engage in these topics in their own spheres of influence, e.g., home projects, yard projects, community green space.
- Research
- Renewable energy that also does not pollute, like perennials, not corn or soybeans.

- Continue to support renewable energy projects
- Continued research and development on cost effective capture and storage of renewable energy. Storage is the key to renewable energy sources that are intermittently available during the course of a day...for example sun and wind.
- Marketing of opportunities
- demonstrations of new products or technology in renewable energy generation and use
- Development and implementation of statewide strategy to achieve those goals. Unclear if LCCMR has a significant role in this, however.
- Research that identifies 'best' energy options.
- Support outreach and education to citizens about personal impacts of energy use and air pollution impacts (can be through K-12, community groups etc)
- Demonstrating the long-term economic benefits of clean energy.
- Research
- We need to demonstrate ways to achieve our goals.
- Research
- funding for research to include investigating and demonstrating new methods (things that may not be 'mainstream' but have potential applications).
- Fund demonstration projects to help accelerate adoption of new technologies.
- I believe our future is sustainable, renewable energy, to include bundling energy production and battery storage to become self sufficient. This could be a funding goal, especially for key assets like city water and sanitary sewer systems, and hospitals.
- R&D for developing MN-specific strategies
- Provide funding for decentralized renewable energy
- We start by maximizing our efforts to offsetting the greenhouse gasses that are emitted into the atmosphere we can eliminate the effect it has. Currently we do offer some support in this effort but i think we should be doing even more and should increase that offset even further. We can do so by developing projects through mitigation measures that will further offset greenhouse gasses. Renewable energy has to be the main point of discussion when identifying a proper way to move forward.
- Continue promotion of habitat friendly solar projects
- Education regarding the problems that conversion to more renewable energy solves - the payoffs to people's health and the environment they enjoy
- demonstrating the ability to generate solar energy on perennially vegetated lands making the entire enterprise economically viable while reducing CO2 and water runoff.
- Focus on developing new renewable energy sources that will sustain MN for the next century. Need to promote research that industry is not willing to take on for various reasons. MN needs to be a leader in this area to protect our resources and our economy. We can't take the easy route like North Dakota and pump oil and mine coal for short term solution to a long term problem of energy needs. Also, ND's strategy is out of date and out of touch.
- Support policy that directs Minnesota to do so
- Demonstration projects that show the viability of EV transportation and net zero new construction in highly visible applications
- There is constant resistance to changes in energy, mostly based on outdated information and an the thought that renewable energy technologies will not change. Education and research to address the knowledge and practical gaps in renewable energy will help move people to more sustainable systems.
- Research and demonstration in associated with substantial development seem key here.

- Develop incentives for agriculture, forest industries, and commercial transportation to increase use of non-polluting, renewable energy.
- Economic and engineering studies demonstrating feasibility and cost effectiveness of efficient energy utilization
- Increased use of renewables should have significant positive impacts on air pollution and manufacturing. Increase research, measurement, and education to quantify.
- I think the weak link is energy storage for solar and wind - needs research and funding for pilot projects.
- Clean and renewable energy is a central challenge of our time. Minnesota should lead through research and development of new energy conversion and storage technologies.
- Create incentives for businesses and other organizations to convert to renewable energy sources.
- Support for innovative ideas to reduce pollution, conserve energy and/or reduce waste.
- renewable energy mandate
- More research is needed in this area. This would be a huge achievement.
- Education about the feasibility and best practices to achieve goals.
- Research to improve renewable energy technologies.
- Requiring counties and cities to have a solar and electric vehicle implementation plans to their comp plans aligned with state goals, gov't must lead.
- Support move away from coal and petroleum for energy and transportation
- Partner solar energy research and demonstration with energy storage.
- Agriculture-More research/investment on perennial non-invasive agricultural crops, more diversified crops, more alternating crop strips, and cover crops more widely used=less fertilizers needed, less wind and water erosion, less time/fuel spent working soil and planting, less herbicides needed
- Funding incentives for energy efficiency improvements not only for homeowners but rental properties, businesses, schools, etc.
- Improved subsidies for renewables, particularly towards innovation research
- Demonstration of how the newest renewable strategies can be implemented by Minnesotans in their homes and businesses
- Many different demonstration projects to help develop a regenerative economy
- Research
- Providing support to model strategies to achieve the goals.
- Mix of solar, wind, biomass, natural gas and hydro power depending on location, resources and community capability
- Support projects that assist in the development of renewable energy infrastructure for MN.
- research to support MN energy transition and independence
- Invest in renewable energy such as solar for the public sector (schools, local govt).
- Support research into more perennial crops rather than just corn and soybeans
- Not sure on technology here but private-public partnerships would be key.
- Phrase environment in economical terms rather than environment to fend off political criticism
- Research on viable personal, motorized-vehicle transportation that is non-polluting;
- Help make geothermal, wind and solar power more available to small businesses and private homes.
- Tax policy that would create incentives for movement in the desired direction
- More grants for people to switch to renewable resource use
- Education and outreach
- Mobilize students in every school and community to promote sustainable practices and technology. Learn by doing- Do by learning.

- Incentivize the transition from fossil fuels at an accelerated capacity,
- I think we should be looking at nuclear as a potential clean energy. There definitely are some challenges with this kind of energy, however, this country should have the technology and ability to implement nuclear. This may be a lost cause however, because nuclear has a huge stigma attached to it.
- Outreach/education
- Research and Development of new technologies.
- Discourage use of corn-based ethanol fuel for operating vehicles.
- Education that helps consumers understand the true costs (financial and environmental) from using different energy sources.
- Education
- research
- Education
- More e-car charging stations
- Taking down fossil fuel empires.
- Continue to provide cost incentives for businesses and communities to invest in renewable energy. Many homeowners want to do the right thing but cannot afford solar panels and residential wind turbines. We want clean energy and we want to support businesses that invest in clean energy.
- Support solar energy on ROOFTOPS
- Share research and techniques through workshops and other sources of info.
- Easy to use on-line assessments/models to run for your life situation. I have not found an easy/good model to assess my energy use and improvement opportunity.
- promoting change in building and transportation practices
- Incentivizing (carrot and stick) industry to use renewable energy.
- Use state departments and properties as demonstration - state agencies use renewable vehicles, state buildings rely on renewable energy, state lands (e.g. farm lands) are used as test plots for potential energy crops
- More research is needed to assess the "life-cycle" impacts and develop new technologies and processes using local resources
- Demonstration and outreach
- Provide incentive programs for the industry to achieve success.
- Cultural Change needs to take place and this is one area where education could be done to inform the public about the possibilities for doing things different.
- Linking solar and wind projects
- Fund strategies that facilitate this goal
- Education, outreach, and research that can help manage potential land use disputes of increasing renewable energy development in rural MN
- Create incentives and educational and financial assistance to farmers who want to run small organic farms that also sustain biodiversity.
- Enhance education and outreach to inform citizens about how they can contribute to air and energy conservation.
- Demonstrations particularly for agriculture to show practical value of regenerative agricultural practices
- Research and outreach to provide practical strategies for farmers to use less fossil fuels.
- Fund local gov't transitions to solar and electric vehicles
- Education on life cycle of products.
- Develop sustainable and environmentally benign strategies for said technologies.

- Strategic investment in common sense renewables (wind, solar, geothermal, wave action?! (north shore and large lakes) where appropriate and sensible) as a state (start with public buildings, state park facilities etc) and from outside sources like the federal government and for profit companies.
- Fund solar plus electric vehicle charging projects at workplaces to offset the cost of on-peak charging taking place at workplaces.
- Subsidies for organizations to install renewable energy elements, like rooftop solar.
- Increase affordability (and thus access) of renewable energy options
- Help fund policy analysis and efforts to changes policy to support a net zero economy
- Demonstration
- Provide education facilitated by professionals
- Support projects that assist individuals in converting to renewable energy sources.
- Like Xcel Energy tries to brand itself as an environmental advocate, environment needs to brand itself as business/utility fiscal bottom line
- Implementation of non-polluting electrical-generation capabilities including dispersed-grid solar (on buildings and houses as opposed to solar "farms")

Goal 2 – which 20% of survey respondents prioritized: Minnesota has a growing consumer and manufacturing economy that is increasingly non-toxic and is efficient regarding use of resources and waste production.

- Research and innovation
- provide more incentives to wind and solar
- Waste minimization and re-use. Find an economic process to benefit from the waste re-use.
- If, and that's if, we've done enough research and measurement, we need to move toward developing tangible, measurable ways to show change; and legislators need to support changes that could impact MN businesses. This goal would seem to be the route toward achieving the other goal choices listed.
- Facilitating meaningful partnerships between various stakeholders: researchers, private industry, non-profits, government sector to develop and implement innovations.
- Fund more air quality research
- Promotion of reuse and waste reduction
- education and research
- Research and implementation of environmentally friendly manufacturing techniques and products
- Identify key areas needing improvement and create a work plan to get to that goal
- Research on relative and real costs of different businesses, e.g., consider ecosystem services costs of a business in addition to actual costs.
- More research on recycling additional household and industrial waste is needed to increase cost effectiveness.
- research and implementation of diversified options
- Promote widespread and expanded recycling and reuse of discarded materials
- better testing residue of pesticides in surface and ground water with lower levels reported and not limited to EPA standards
- Partnership and publicity for companies that are already doing these things.
- Research and education on the environmental and health effects of everyday products we take for granted and don't think about their long-term impact, particularly plastic bags and excess packaging.
- promoting transportation mechanisms that rely on clean fuels

- Develop local recycling industry - do not ship overseas or out of state
- Emphasis on renewable, bio-based materials from Minnesota 's farms and forests
- Communicate best practices that are proven to work to the larger manufacturing community.
- Catalyze research and technical assistance activities to ID and create new best practices. Support technical assistance to bring these new best practices to businesses and embed them in business culture.
- Focus on diversifying energy production including research on new renewable energy options. Full reliance on renewable energy may not be achievable, but energy conservation should be part of the solution. Education for consumers on alternatives and energy conservation practices.
- Continued research in this area will help develop and improve processes that are eco friendly.
- Fund to bridge the gap between the research and the company to implement some technologies for minimizing environmental pollutions
- This isn't really my area of expertise; but I'd say we need to look more closely at some of impacts of the renewable strategies we're already putting in place (e.g., significant runoff and its impacts from impervious solar panel "farms/gardens."
- demonstration
- Find ways to utilize waste products without damaging the environment.
- Meet with key groups and develop action plans
- Passing results of research onto users
- Additional research at higher education institutions and industry through grant proposals.
- working together with industry.
- Present the information to Minnesotans in a fun and engaging way, rather than technical lingo.
- connecting communities through bike paths to encourage less driving, more biking and better health as a result
- increased state regulation regarding packaging materials and bags, especially plastic
- Application of circular economy concepts, goals, policies and incentives
- Provide cost sharing or rebates
- Support internship programs to engage student workers for experiential hands on internships that teach sustainable operations practices and simultaneously embed these practices within participating businesses. This also has work force development aspects so our next generation of business leaders has understanding of the business case for sustainability from firsthand experience.
- Research to understand the tradeoffs and between renewable energy and the environment and minimize the risk (i.e. wind turbines and birds and hydrokinetic and fish)

Goal 3 – which 4% of survey respondents prioritized: Minnesota reduces indoor and outdoor air pollution, with a significant positive impact for Minnesota’s most vulnerable communities.

- Measurement
- Hopefully a focus on this will also encompass a move to non-polluting renewable energy. I had trouble making the choice between these two. Both are very important. Minnesota must hold the line as EPA slips in enforcing and improving air pollution.
- Environmental justice is a key component of this goal and these are the folks who don't know how to call attention to the injustices pushed upon them by society. We need to do a better job of figuring out how much these communities are being impacted and then work to resolve these injustices and improve their air quality; this should provide a health care cost savings in the long run.

Other goal ideas offered by subject matter expert survey respondents for the area Air & Energy:

- Minnesota reduces indoor and outdoor air pollution, and energy consumption, with a significant positive impact for Minnesota's most vulnerable communities.

Other strategy ideas offered by subject matter expert survey respondents for the area Air & Energy:

- Assist communities in strategically increasing canopy cover in areas with high rates of vulnerable populations reducing energy needs and reducing particulate matter and other pollutants.

Appendix L: Cross-Cutting Goals

As a result of the Issue Identification Panels, there were **five goals** that cut across multiple areas, and didn't fit neatly into one area or another.

During the LCCMR Site Visits, invitation-only group discussions were held with local subject matter experts. These conversations included participants reviewing the following five goals and working together to decide which one was most important for Minnesota to achieve:

1. Water is stored on the land for the mutual benefits to water quality, habitat, and flood mitigation.
2. Models, projections, and management strategies that take into consideration changes in weather patterns and land uses are available at a localized level.
3. Our natural and built communities are resilient to withstand changes in weather patterns, including extreme changes in precipitation.
4. Minnesotans have the information needed to make sound personal decisions that affect our environment and natural resources.
5. Working lands, including forestry, grasslands, and agricultural lands, provide long term benefits to fish, wildlife and people.

Group conversations were recorded by LCCMR members or participants. Over the course of all the small group discussions, Goal 5 emerged as the highest priority across discussions.

Table 1. Number of times each cross-cutting goal was identified as most important during Site Visit subject matter expert discussions

Cross-Cutting Goal Options	Number of times identified as most important
5. Working lands, including forestry, grasslands, and agricultural lands, provide long term benefits to fish, wildlife, and people.	7
1. Water is stored on the land for the mutual benefits to water quality, habitat, and flood mitigation.	4
3. Our natural and built communities are resilient to withstand changes in weather patterns, including extreme changes in precipitation.	2
4. Minnesotans have the information needed to make sound personal decisions that affect our environment and natural resources.	2
2. Models, projections, and management strategies that take into consideration changes in weather patterns and land uses are available at a localized level.	0

This goal is identified in the stakeholder summary report in the section on [Working Lands](#).

Subject matter experts who participated in the Prioritization Panel were asked to review all of the strategies recommended during the Site Visit discussions, regardless of which goal was preferred.

All of the strategies they considered are included in the next section below. Prioritization Panel participants were invited to revise strategy ideas or come up with their own. Unlike with the other goals, they were not asked to identify five strategies total, but five per area (water; outdoor recreation; habitat, fish and wildlife; air and energy). Therefore, there is a longer list of recommended strategies for the Working Lands goal than the other goal areas. These are listed below:

- Through demonstration, educate people on the benefits of working lands to slow and store water for multiple benefits (water quality, habitat, flood mitigation, carbon sequestration, etc.).
- Develop innovative, market-based policies to make substantive conservation efforts financially feasible.
- Preserve and protect the watersheds that are already in good shape.
- Support and provide technical assistance to private landowners on cost-effective ways to develop and restore diverse, native habitat.
- Conservation actions that prioritize the needs of vulnerable, declining, poorly-understood, and sensitive species.
- Improve and demonstrate how working lands can be economically productive and good habitat.
- Increase understanding and assessment of tradeoffs among different environmental and societal goals to improve decisions on working lands.
- Evaluate, prioritize, and demonstrate how working lands and renewable energy can be mutually beneficial.
- Use public open space to demonstrate climate change adaptation, mitigation, and prevention.
- Create or use existing open spaces, or use them to demonstrate, CO2 storage, heat sinks, flood prevention.
- Promote, research, and evaluate Best Management Practices (BMPs) on working lands, in order to provide long-term benefits to fish and wildlife.
- Encourage landscape-level and eco-type planning, instead of parcel-level.
- Identify high-quality habitat, recreation open-spaces, and other high-priority areas for action.
- Outreach, education, and engagement through citizen science for landowners, operators, and others on how to economically manage for water resiliency.
- Create market mechanisms for carbon sequestration on working lands.
- Demonstrate how to add diverse cropping systems and incentivize continuous living crops.
- Research and demonstration that show the practical value of regenerative agriculture.
- Development and implementation of agricultural cropping systems with diverse crops that provide multiple benefits, including exploring markets and supply chain.
- Education and public outreach to change landscape and ecosystem norms.

- Research and evaluation of approaches that achieve goals.
- Projects that enlist the support of multiple agencies and organizations.

Cross-Cutting Goals – All strategies recommended during Site Visit discussions

- Demonstrate and educate on the benefits of working lands for storing and slowing water for multiple benefits (water quality, habitat, flood mitigation).
- Incentivize practices that use working lands for storing and slowing water.
- Outreach and education on how to economically manage and enhance wildlife.
- Outreach to land owners to highlight research findings on what works.
- Education and public outreach.
- Projects that enlist the support of multiple agencies/organizations.
- Incentivize best practices.
- Research and evaluation on what works.
- Education to change landscape and pesticide norms.
- Improve the cost-effectiveness of habitat restoration.
- Support the development and implementation of ag cropping systems with diverse crops that provide multiple benefits.
- Support and provide technical assistance to private landowners for developing/restoring diverse, native habitat.
- Collaborate with agriculture and horticultural industry to develop standards of native seed and live plants.
- Demonstration of how lands can be economically productive and good habitat.
- Research on vulnerable, declining, or poorly understood invertebrate groups.
- Conservation actions that prioritize needs for declining and sensitive wildlife SPP.
- Identify high-quality habitat and high-priority areas for action.
- Engage Minnesotans in education and citizen science.
- Encourage landscape-level planning, instead of parcel level.
- Reduce nitrogen use.
- Development and incentives for continuous living crops.

Appendix M: Letter from University of Minnesota Morris Student Association President

On the next page is a scanned image of a letter submitted by Samuel Rosemark, University of Minnesota – Morris Campus Student Association President. This letter was submitted during the LCCMR Site Visit to the University of Minnesota – Morris in September. Since the scanned image is not accessible, the text of the letter is reproduced below:

University of Minnesota
Morris Campus
Morris Campus Student Association
600 East 4th Street
Morris, MN 56267-2132
320-589-6086
www.morris.umn.edu/mcsa
umnmsca@morris.umn.us

September 11th, 2019

Dear member of the Legislative-Citizen Commission on Minnesota Resources,

The University of Minnesota Morris is a top environmental school and leader in sustainability within the State of Minnesota and across the country. UMN Morris was ranked number one in Minnesota by the Sierra Club and produces the most renewable electricity on-campus per student in the United States. We have wind turbines, a biomass plant, a cold-weather composting program across campus, LEED certified buildings, electric bikes, and multiple solar arrays with plans to build another array soon.

We lead in sustainability because we have to, this generation has to. Many UMN Morris students have an Environmental Science major, Environmental Studies major, or a Sustainability major. A 2006 Chronicle of Higher Education article titled, “Sustainability: the Ultimate Liberal Art” exemplified this. In it, it explains that the liberal arts give students the necessary problem solving skills and holistic education they need to lead in sustainability. Leaders in sustainability are being developed here. With this land belonging to Dakota and Anishinaabe people, a Native American proverb best explains how we need to view our environment: “We do not inherit the earth from our ancestors; we borrow it from our children.”

Where do we, the students and young people, want to see MN ENRTF funds going? 1) We want to see continued investments in renewable energy in order to slow climate change. 25% in renewable energy is not enough in Minnesota if we want to make a true impact. 2) Waste reduction and recycling should be a higher priority as methane is much more potent than carbon dioxide and thus has a larger effect on our climate. Less trash and waste means less methane. Minnesota should follow the lead of UMN Morris and Hennepin County as they both are working to compost high levels of food waste. The 2019 Environment and Energy Report Card by the Minnesota Environment Quality Board lists Minnesota’s recycling as “poor.” 3) Greener transit should also be a priority. The report by the MN EQB also listed transit as “poor.” Rural transit options, such as electric buses and vehicles, would benefit rural communities and the environment. 4) Minnesota is the “Land of 10,000 Lakes” but the level of nitrates in our water is ranked by the MN EQB in the report card as “poor.” Our water is a precious resource that needs to be cared for and protected.

Lastly, we know the climate is changing and we have the means to slow or even reverse that regardless if it is human caused or not. We should use our means to do that, not only for us, but for our children and the generations to come.

We, the UMN Morris students, are grateful for your visit and thank you for coming to our campus.

[Signature]

Samuel Rosemark
President
Morris Campus Student Association

UNIVERSITY OF MINNESOTA

Morris Campus

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September 11th, 2019

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Lastly, we know the climate is changing and we have the means to slow or even reverse that regardless if it is human caused or not. We should use our means to do that, not only for us, but for our children and the generations to come.

We, the UMN Morris students, are grateful for your visit and thank you for coming to our campus.



Samuel Rosemark
President
Morris Campus Student Association

Appendix N: Letter from the Steering Committee for the collaborative Health Impact Assessment: *Effects of Wild Rice Water Quality Rule Changes on Tribal Health*

The text of a letter submitted by the members of the Steering Committee for the collaborative Health Impact Assessment: “Effects of Wild Rice Water Quality Rule Changes on Tribal Health” is included below. This letter was submitted via email to LCCMR Director, Becca Nash, on October 19, 2019.

October 19, 2019

Becca Nash
Director
Legislative-Citizen Commission on Minnesota Resources
65 State Office Building
100 Rev. Dr. Martin Luther King Jr. Blvd.
St. Paul, Minnesota 55155
Becca.Nash@lccmr.leg.mn

Dear Director Nash,

As members of the Steering Committee for the collaborative Health Impact Assessment: *Effects of Wild Rice Water Quality Rule Changes on Tribal Health published in October of 2018ⁱ*, we are writing to provide input to the LCCMR’s important current strategic planning effort and to encourage a more robust focus on manoomin/wild rice therein. We note that the current draft LCCMR Strategic Plan is not sufficient in its scope or detail regarding the pressing need for state funding in support of wild rice related projects and programming.

Our Steering Committee membership included stakeholders and subject matter experts relating to water quality, ecosystem health, treaty-protected natural resources and tribal community health. As the LCCMR sets its funding priorities for the Environment and Natural Resources Trust Fund for the next six years, we strongly endorse an explicit and intensified focus on manoomin (wild rice) preservation, promotion and research. Manoomin is a treasured state resource for humans and wildlife. It is threatened and because of this, it demands our immediate prioritization and dedicated funding support from the Environment and Natural Resources Trust Fund (ENRTF).

Over the past few years, several Task Forces have met and reached the same conclusions. The 2018 Tribal Wild Rice Task Force Reportⁱⁱ included the following recommendations:

- Adopt a more comprehensive wild rice monitoring, assessment, and mapping strategy
- Establish long-term funding... to prioritize wild rice protection, management, and restoration
- Preserve and protect manoomin/wild rice for future generations

Governor Dayton’s 2019 Task Force on Wild Rice Final Reportⁱⁱⁱ included a major recommendation to “invest in wild rice” and a recognition that the following are necessary:

- Comprehensive, state-wide wild rice management plan
- Additional research on wild rice
- A statewide education and promotion outreach campaign to raise awareness about the ecological, nutritional, and cultural value of wild rice

The Governor’s Task Force Report explicitly references the role that the LCCMR may play in achieving these objectives, stating, “Encourage the use of funding sources such the Legislative Citizen Commission on Minnesota Resources (LCCMR)...for wild rice protection, management, research, and restoration activities through priority setting in the grant making process, and guidance to entities seeking funding for wild rice protection and restoration efforts” (page 24).

In our own document, *Expanding the Narrative of Tribal Health: The Effects of Wild Rice Water Quality Rule Changes on Tribal Health: Fond du Lac Band of Lake Superior Chippewa Health Impact Assessment* (2018), the Executive Summary includes the following key recommendations:

- increase food security and food sovereignty in tribal communities through treaty harvest of manoomin and supporting the healthy ecosystems it depends upon
- elevate public awareness about the ecological, nutritional and cultural values of manoomin
- promote a comprehensive and protective regulatory framework for wild rice waters that involves both the MPCA and MNDNR
- implement a concerted effort to inventory all wild rice waters in Minnesota; implementing a coordinated and standardized monitoring and assessment program for wild rice waters across the state and engaging citizen scientists/volunteer monitors to help accomplish that
- continue research into climate change impacts and manoomin ecology, as well as additional health and nutrition studies

We strongly support the elevation of manoomin as a statewide priority in the LCCMR's Strategic Plan. The July 11, 2019 draft of the LCCMR Strategic Plan provides minimal guidance or emphasis on manoomin conservation, preservation, promotion or research. It merely mentions the need to "increase awareness and protection of lakes containing measurable stands of wild rice" (p. 8) with a similar statement on page 29. It is *time to act* on the recommendations of these expert committees and task forces and help make the recommendations a reality in Minnesota.

The current draft plan lacks specific emphasis on funding wild rice education, promotion, research and conservation--activities that are urgently needed for our state grain. We encourage you and your colleagues to enhance significantly the language of the current LCCMR Strategic Plan for 2019-2025 to direct the LCCMR to explicitly emphasize and fund programs, projects and proposals that involve manoomin/wild rice in Minnesota. Furthermore, we would be pleased to provide sample language to assist in the planning process at your request.

Respectfully submitted,

Nancy Schuldt
Water Projects Coordinator, Fond du Lac Environmental Program

Darren Vogt
Resource Management Division Director, 1854 Treaty Authority

Emily Onello MD
Family Physician, Assistant Professor University of Minnesota Medical School Duluth Campus

Nikki Crowe
Tribal Conservation Coordinator, Fond du Lac Resource Management

Kari Jacobson Hedin
Watershed Specialist in the Office of Water Protection for Fond du Lac Reservation

Joy Wiecks
Air Coordinator, Fond du Lac Resource Management

Elizabeth Jaakola
Faculty at Fond du Lac Tribal and Community College & Fond du Lac Ojibwe Band Member

Debra Dirlam
Director, Office of the Environment, Lower Sioux Indian Community

Melissa Walls, PhD
Associate Professor, Department of International Health
Director, Great Lakes Hub, Johns Hopkins Center for American Indian Health
Johns Hopkins Bloomberg School of Public Health

Wayne Dupuis
Environmental Program Manager, Fond du Lac Band of Lake Superior Chippewa

ⁱ *Expanding the Narrative of Tribal Health: The Effects of Wild Rice Water Quality Rule Changes on Tribal Health. Fond du Lac Band of Lake Superior Chippewa Health Impact Assessment*, 2018.

Available at <http://www.fdlrez.com/RM/downloads/WQSHIA.pdf>

ⁱⁱ *2018 Tribal Wild Rice Tribal Task Force Report*, available at <http://mnchippewatribe.org/pdf/TWRTF.Report.2018.pdf>

ⁱⁱⁱ *Governor's Task Force on Wild Rice*, January 3, 2019, available at

<https://www.egb.state.mn.us/sites/default/files/documents/FINAL%20Governor%27s%20Task%20Force%20on%20Wild%20Rice%20Report%20January%203%202019%20v2.pdf>