



Advocacy Using Science

Submitted by: J. Bartelt 01.20.18

There are different forms of advocacy. The discussion in this essay is limited to scientists and natural resource managers doing “policy advocacy”, defined by Lackey (2007) as “support of a particular policy or class of policies.” To be effective in providing unbiased scientific information to decision-makers, scientists and natural resources managers need to be perceived as neutral in their communication of science. While there is a lot of nuance and gray area between presenting the information objectively and advocating, the key seems to be presenting the information without using value-laden language, ensuring that all statements are supported by solid science, presenting opposing scientific views and limitations of the data, and keeping personal beliefs or values out of the communication. Otherwise scientists and natural resource managers using science may be viewed as biased and advocates for a given position rather than providing unbiased information based on what they know from science or professional experience. Wisconsin Green Fire’s (WGF) goal is not to advocate beliefs or values but rather to provide science and unbiased information for decision-making. However, an equally important goal of WGF is to influence proposed policy and management using science to sustain Wisconsin’s natural resources for this generation and future generations to come.

Many articles have been written and there has been much discussion and controversy about this issue. I tried to glean the best ways to handle the presentation of unbiased science from the scientific literature and the experience of other science-based organizations. In addition, I sought comments and advice on this paper from Karl Martin-Dean UW-Ext, Darrell Zastrow, former Deputy Director-Forestry WDNR, Paul DeLong, former State Forester WDNR, Gary White, Vice President of The Wildlife Society and Colorado State University, and Brenda McComb, Oregon State University. The Environmental and Water Resources Work Group of Wisconsin’s Green Fire also provided their thoughts and comments. Below are suggestions on how WGF members might influence decision-making using science and still maintain credibility as presenting unbiased information. But first let’s define some terms.

Types of information

Science is not a collection or catalogue of facts. Science is a process to determine within a certain probability that the answer to a specific theory, hypothesis, or question is correct. Scientific information is not static but is constantly changing and searching for new and better information. Science is built upon previous scientific information, but previous conclusions may change with new information. Science provides objective information on which to make decisions at a given time because the data were collected using an unbiased and accepted methodology (the scientific method), is based on the probability of being correct (usually at the 95% level), and is peer-reviewed by independent scientists with appropriate expertise. The reliability of scientific information depends on the experimental design, scope of inference, and sample size. It is most reliable when repeated studies produce the same results. Scientific information is based on data and statistics, not on beliefs or opinions.

Professional experience is also a valuable source of information. Sometimes it is the only source of information regarding an issue. Therefore, using professional experience to inform good decision-making is necessary and desirable under certain circumstances. Professional experience is very important and should not be undervalued. Professional experience is often necessary to chart a course of action based on science, but often the results of applying the action is not tested using science, with the exception of adaptive management. In addition, professional experience and Traditional Ecological Knowledge based on the beliefs of indigenous people (TEK) are used to gain new insights and generate new hypotheses that can be tested. However, management recommendations based on professional experience alone may be challenged as not meeting the rigors of the scientific method or that it may contain biases of the presenter. When possible, information should be based on the scientific literature and then on professional experience. This does not mean we should avoid using professional experience as a good source of information, but that we should be clear in our message when information is derived from professional experience and when it is from the scientific literature.

With the increasing use of “adaptive management”, where a management recommendation is applied using an experimental design, testable hypotheses, and collection of statistically analyzable data, then management experience meets the standards of the scientific method. However, when it does not, we should acknowledge that the information is based on professional experience and not from the scientific literature.

What is the difference between science and advocacy?

Science is concerned with being correct, advocacy is concerned about being active (Nielsen 2001) and arguing for a particular policy or action. Scientists are primarily driven by the search for reliable scientific knowledge and understanding. Scientists have a responsibility to provide balanced, understandable information to enable others to make informed decisions (Stenek 2011). Scientists use the scientific method to draw conclusions, consider and present all opposing views and data, identify weaknesses and limitations in their data and conclusions, do not interject personal values or biases into the message, and are willing to change their position if new data proves them wrong. In principle, when science is conducted properly, the findings should speak for themselves (Stenek 2011).

Advocates, on the other hand, have a responsibility to make the best case they can for a given position or policy (Stenek 2011). They are not obligated to present opposing views or data that do not support their case. Advocacy occurs when communications move beyond reporting or explaining results to urging others to take a particular course of action or to reach a particular conclusion. Scientists and resource managers move into the advocacy realm when they go beyond reporting, interpreting, and explaining information and begin advising and recommending a course of action (Stenek 2011). The challenge becomes presenting scientific information fairly and without bias or personal values and staying within the constraints of science to inform decision-makers of the likely outcomes that could occur from their actions, based on what we know from sound science and professional experience.

Scientists and resource managers, like all people, have values. Scientists and resource managers need to be cognizant of their own values regarding natural resources and how it may differ from others (e.g., sustainable management vs resource exploitation). Scientist and resource managers, like all people, have biases, both explicit and implicit. An explicit bias could be our approach or philosophy on natural resource management. An implicit bias could be to listen more carefully to a person of the same race or gender rather than someone different. Scientist and resource managers need to understand their own

values and biases before dealing with others. Therefore, we need to be cautious and self-conscious to not allow our personal beliefs, values, or biases influence the presentation of information (Nielsen 2001).

A dilemma can arise when the goals of science and advocacy conflict. To advocates, presenting only data that supports their cause is acceptable. To scientists and resource managers using science, it is not. When scientists and resource managers act as advocates they can be in conflict with the rules of responsible science (Stenek 2011).

Fusing science and advocacy has been controversial for many decades. There is disagreement on the role scientists should play in public policy. Some say scientists should provide and interpret information based on applicable research or information and leave it up to decision-makers to decide on the best policy. Others think scientists and resource managers using science should advocate policy positions based on their research and experience, especially if they are funded by public money. Both positions have drawbacks. If scientists and resource managers using science only present information, they risk failing to adequately contribute to policy development. If they argue for a position or policy based on their research or professional experience, they may be labeled as an advocate and lose credibility as an objective scientist or manager.

So how do we avoid this dilemma? Advocacy can be viewed as a continuum between only presenting scientific information and advocating for a policy or management action, with a large gray area in between. One way to avoid this dilemma is to follow good scientific practice when presenting scientific information. Using honesty, accountability, fairness, integrity, reporting any personal interests in an issue, limitations of data, and competing scientific views, are a good foundation for following scientific practice (Stenek 2011). When the responsibilities of science and advocacy conflict, the International Council for Science concluded that scientists and resource managers using science should adhere to the responsible practices of science (ICSU 2008). Although there is not total agreement in the scientific community, there is some consensus that scientists and resource managers using science can speak in favor of policies based on the best information available, but that they should be aware of the potential problems it may generate, and that they should adhere to the principles of responsible science.

How do other science-based organizations handle presenting science information and advocacy?

A good collection of information on this issue is from a workshop entitled “Advocacy in Science” conducted by the American Association for the Advancement of Science (AAAS 2011). The workshop discussed the issue of science and advocacy in detail and attempted to develop a “code of conduct for advocacy in science”. The workshop produced a wealth of useful information (see their website listed in the Literature Cited) but only the “take home” messages are included here.

Some scientific organizations have developed guidelines for how their members handle science and advocacy. For example, The Wildlife Society has an “Advocacy Toolkit” that provides its members guidance and knowledge regarding policy advocacy (TWS 2014). The Society for American Foresters has a bimonthly newsletter and guidance on its website for its members that engage in policy advocacy (SAF 2017). The American Fisheries Society has specific policy for their members advocating for issues (AFS 2017) and provide training for emerging organization leaders, which includes a section on advocacy. Although the specific advocacy guidance may vary among these organizations, they stress the importance of ensuring any statements made are supported by solid science, that a respectful

demeanor be used, and that their organization is presented as a resource for scientific information and professional experience.

Some techniques for using science in presentations and analyses

When scientists and managers address an issue, they should present both “positive” and “negative” outcomes of a proposed policy (based on our values). And then based on that analysis, summarize the likely impacts that the policy will have, before speaking in favor or against a policy. We should be clear when we are providing data-based information and when we are providing a professional opinion. This can be done as simply as preceding all statements with, “Based on the scientific literature ...,” vs. “In our professional opinion...”.

A useful technique to use when analyzing a proposed policy is a SWOT analysis (Strength, Weakness, Opportunities, Threats). A SWOT analysis is an objective analysis that can organize information and expected outcomes from a proposed policy in an unbiased way. SWOT analysis has been used since the 1960s and 1970s by the business community (and other organizations) and involves specifying the objectives of the policy or project being undertaken and then identifying the internal and external factors that are favorable and unfavorable to achieve that objective (https://en.wikipedia.org/wiki/SWOT_analysis). Summarizing the results of a SWOT analysis in a 2X2 text box is an effective way to communicate the results of a SWOT analysis in an unbiased and objective way.

In addition, developing guidelines on how to use the scientific process when presenting information can be helpful when responding to an issue or policy.



Proposed guidelines for presenting scientific information

These guidelines were synthesized from articles in the scientific literature on science and advocacy, from what other science-based organizations are currently doing, and from comments suggested by reviewers. Below are some things to keep in mind when providing scientific information to decision-makers to maintain credibility that the information is unbiased science. The list is divided into separate sections following the process of providing information to others. Most of these guidelines are common sense, known by most, but putting them all in one place might be helpful.

Understanding the audience:

- Understand the needs of policy-makers or the audience and make sure the message provides the information they need to make a decision.
- Know the audience's understanding of science and the scientific method. If necessary, briefly and simply explain the role of science and scientific process (experimental design, peer review, repeatability of results, acknowledgement of differing scientific views, and limitations of data).
- Mention the organization's philosophy. "Wisconsin's Green Fire believes that we should be using the best available scientific information to make sound decisions that will result in the long-term sustainability of our natural resources."
- Inform audience that WGF is a source for additional information and professional experience.
- Consider having local people who are trusted in a community deliver the message rather than someone who is not known locally.

Preparing the message

- Base the information on the published literature as much as possible. Use professional experience to suggest management actions and likely outcomes from these actions.
- Insure all statements based on science are scientifically documented and have been rigorously reviewed. Be clear to the audience when you are offering an opinion based on professional experience rather than being based on data.
- Recognize the limitations of the data or personal experience. Don't overstate what the science or experience can support.
- Put the message into language easily understood by all. To expect policy makers or others to learn scientific language or jargon will not work.
- Put the message in value-neutral language. Avoid using value-laden words such as "negative consequences", "massive degradation", "great conservation interest", "profound ecosystem consequences", or "suffered from lower nest success". For example, a sentence such as "Anthropogenic pools function as ecological traps for breeding amphibians in most years, and thus, they should be avoided or designed with adequate size, depth, and shading" is considered advocacy. The sentence could be rewritten as "Anthropogenic pools function as ecological traps for breeding amphibians in most years. If the management goal is to reduce ecological traps for breeding amphibians, then this can be avoided if such pools are not created or are designed with adequate size, depth, and shading" (Scott et al. 2007). Using nuances of language may seem trivial but can be effective in maintaining the perception of neutrality.
- State clearly the policy implications of proposed actions based on science. Suggesting alternate policies and their expected impacts based on science is acceptable but do not go too far to convince the audience to your point of view.
- Offer additional help to those that request it on an issue.
- If there is time, solicit independent review of an issue by subject experts, including those who have differing views.

Presenting the information

- Use the highest standards of professionalism including language and a calm demeanor.

- Instill confidence and credibility, but also have humility that we don't know everything. "Science is the process of being less wrong over time."
- Consider all alternative scientific views on an issue. Address differing views respectfully according to what the science tells us. Respectfully state that there are differing interpretations of the data.
- Be sensitive to the rights and opinions of others.
- Refrain from embellishing the science with personal opinions or values.
- If you use personal opinion or professional experience, be clear that it is your personal opinion or experience and that your ideas may not have been tested by science. Always ask yourself "what if I am wrong".
- Speak only to issues on which you have expertise. Don't be afraid to say "I don't know, but can I put you in touch with someone who can help you".

Distributing information transparently

- Send the same information to all parties interested in an issue, including those that disagree with us. Don't leave anyone out that may be interested in an issue.
- Have a central registry on the organization's analyses that interested people can find.

Examples of "advocacy" using science approach

(If the board chooses another approach we can adjust the section below to accommodate that decision. See "Decision Document 1.20.18. Jab).

Analysis of proposed legislation or policy: State the values of WGF ("Wisconsin's Green Fire believes that we should be using the best available scientific information to make sound decisions that will result in the long-term sustainability of our natural resources for this generation and generations to come."). Use SWOT analysis to objectively evaluate

Strengths	Weaknesses
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proposed policy. Document every statement made with scientific information as much as possible or use professional experience. Use scientific literature as first choice of information, followed by professional experience. Be clear which type of information is being used. Avoid the use of value-laden language. State the likely outcomes of proposed legislation or policy, including unintended consequences. List both the strengths and weaknesses in achieving the stated goals of the proposed legislation or policy. Summarize likely results of the proposed legislation or policy in a SWOT text box (such as modified above) to avoid perception of bias. Send analysis to authors of legislation or policy first and offer to provide more information and consultation before it is released to public. After authors of legislation or policy have had a chance to review WGF analysis, release to advocacy groups and press.

Testimony at hearings on proposed legislation and policy: In most cases, check the "information only" box to register to speak. State the values of WGF ("Wisconsin's Green Fire believes that we should be using the best available scientific information to make sound decisions that will result in the long-term sustainability of our natural resources for this generation and generations to come."). State upfront that both beneficial and undesirable results of the bill or policy will be presented. Provide the likely outcomes of proposed legislation or policy, including unintended consequences. Use nonvalue-laden language. Summarize the

analysis by recommending, based on the best science we could find, that the proposed legislation or policy will achieve/not achieve the desired outcome. Offer alternative solutions to problems, based on science.

If making a statement “for” or “against” proposed legislation or policy, state that “it is the policy of WGF to not lobby or advocate for a proposed law or policy but to provide both sides of an issue based on the best science available to help make sound decisions”. But also state “in our professional opinion based on the best science we could find, we believe that the proposed law or policy would benefit/harm the long-term sustainability of Wisconsin’s natural resources.” Offer alternative solutions to problems based on science.

Position statements on issues: State the values of WGF (“Wisconsin’s Green Fire believes that we should be using the best available scientific information to make sound decisions that will result in the long-term sustainability of our natural resources for this generation and generations to come.”). May want to use a SWOT analysis. Document every statement made with scientific information (citations) as much as possible, or use professional experience (e.g., J. Jones, pers. comm.). Use scientific literature as first choice of information presented, followed by professional experience. Be clear which type of information is being used. Do not use value-laden language. List the threats and opportunities possible regarding the issue being evaluated. Suggest possible solutions to the issue based on the best science available. Be clear if these solutions have been tested or are based on professional opinion.

Press releases: State the values of WGF (“Wisconsin’s Green Fire believes that we should be using the best available scientific information to make sound decisions that will result in the long-term sustainability of our natural resources for this generation and generations to come.”). Document every statement made with scientific information as much as possible or use professional experience. Use scientific literature as first choice of information, followed by professional experience. Be clear which type of information is being used. Use nonvalue-laden language. Offer alternative solutions to problems based on science. Make sure that everyone that may be interested in the issue gets the information, including those that oppose our views.

Requests for information and analyses: State the values of WGF (“Wisconsin’s Green Fire believes that we should be using the best available scientific information to make sound decisions that will result in the long-term sustainability of our natural resources for this generation and generations to come.”). Specifically address the question or analysis requested using the best science available. Use the SWOT analysis as appropriate. Document every statement made with scientific information as much as possible or use professional experience. Use scientific literature as first choice of information, followed by professional experience. Be clear which type of information is being used. Use nonvalue-laden language. State that it is the policy of WGF to not lobby or advocate for a proposed action but to provide the best science to help make the best decision. But add “in our professional opinion, we believe that these actions would benefit/harm the long-term sustainability of Wisconsin’s natural resources based on the best science we could find”. Offer alternative solutions to problems based on science.

Evaluation of approach: Over the next year evaluate if this approach is working and adjust as needed to become more effective in achieving the desired outcomes.

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