Science and Nature Conservation: Reflections from a Geezer

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I WRITE THIS SHORT ESSAY at the request of David Harmon, a man I have long admired and have difficulty saying "no" to. David asked for some thoughts on the challenges of using science in conservation, particularly in the context of protected areas management. I have had a long career in the science of nature conservation, mainly working in government, but also in universities. These reflections are based on those experiences. They are my experiences and I do not hold them to be either true or universal.

My first thought is about context. We all work in a set of shifting and interacting social and political environments that dictate how well conservation ideas are received and implemented. If we are to successfully bring science to this mix, it is thus fundamental to understand the decision-making environment. The local context, such as hating or loving your boss or coworkers, dictates our day-to-day work, but it is embedded in a larger social environment, such as a university, conservation organization, or government department. That in turn is nested in an even larger political and social environment, and all of them interact constantly. These spheres influence each other in complex and mysterious ways. So to be successful, it is critical for us scientists to understand the context by being active consumers of the news, being involved in our community, and by making contacts and alliances throughout our organizations. All of us tend to live in bubbles and interact primarily with people with whom we agree. Scientists are certainly guilty of staying inside the bubble and not even thinking hard about how their bubble works.

The George Wright Forum, vol. 35, no. 3, pp. 279–281 (2018).

ISSN 0732-4715. Please direct all permissions requests to info@georgewright.org.

In the world of nature conservation, scientists care deeply that their knowledge informs policy. This is OK. But a key lesson is that most managers, who are in charge of policy, are pretty uncomfortable with both science and scientists. There's a perfectly logical reason for this, in that science takes away a manager's control. By necessity, managers like to control their work environment. However, asking advice from scientists can result in uncertain outcomes, and therefore control is lost. So the interaction between the scientist and manager is always potentially dangerous from a manager's perspective. Even worse, science advice is perceived as not being open to questioning by management, because they are said to be "not qualified." This creates a power dichotomy that plays itself out in most workplaces. Many managers will try to control the situation by strictly specifying the roles scientists can have in the decision-making process. This often becomes highly ritualized, with science advice being called for at a particular stage in the decision-making process (see any environmental assessment process as an example). This is generally not a satisfactory arrangement for either party, and certainly does not result in science being well incorporated into decision-making. Scientists are often marginalized from decision-making and treated as the "guru in the corner," to be called on when necessary. Science advice is most effective when it comes from scientists who are embedded in the decision-making process and around the management table. If your organization does not have real scientists at the management table, there is a problem.

Conservation issues should always be treated as non-political. In my experience, the conservation of nature has not been the particular purview of political parties on either the left or right, although this may vary by country. All parts of the political spectrum have an interest in conserving nature, because conserving nature is truly in everybody's interest and the public generally supports nature conservation. In my experience, it has been possible to make conservation gains under all stripes of governments, as well as run into silly roadblocks under all stripes of government. I had the experience of arguing with a conservative minister over introducing prescribed fire in protected areas, which was then a relatively new idea. I spent three hours with the minister that day, just the two of us in his office. We had a knockdown, no-holds-barred conversation about fire management and, in the end, he agreed that we should go ahead with the program of prescribed fire. This was one of the best interactions I have had with any minister and it turns out he was a minister from the right. However, on another occasion I was managing a controversial program to cull wildlife in a national park, which was held up in the prime minister's office. I only received permission to go ahead with the project the night before it was to begin. Everyone was in place at the site, equipment and protocols were in place, and we were on hold until we received permission from the prime minister's office. This is one example of governments being highly risk-averse, but I also see large nongovernmental organizations and universities being the same. In almost all cases, compelling science for a conservation action is a necessary, but not a sufficient, condition. Weak science often kills a project, but good science never guarantees one.

Conservation scientists need to be humble about how much they know about policy or politics. In general, many scientists have little idea about how policy is truly made, or how to influence the political process. They may think they do, but in my experience scientists are often completely naïve in this area. Big conservation actions are generally successful after

long, well-planned campaigns to build the momentum for a decision. Certainly good science is a fundamental requirement for a successful campaign, but it only a small part of that campaign, which includes understanding the decision-making context, targeting and changing minds, and building public and institutional support.

My final thought is on the need to formalize scientific advice. In most government agencies, especially conservation departments, science advice is given on an ad hoc basis. It is critical to have a formalized process for many scientific questions. For example, the first step in such a formalized process is to agree on the question to be asked. In many cases managers ask a question to scientists that makes sense to them, but does not necessarily make sense from a scientific perspective. It is critical that the question being asked with regard to scientific advice is agreed to and formulated in a way that makes sense from a scientific perspective. It should generally follow a format such as "What is the evidence for the effect of action X on value Y?" This is very different than asking a question such as "Can I build a facility/road/bridge in this area?" When a suitable question has been asked, it is the responsibility of scientists to provide all the relevant evidence on the question. This includes evidence that supports a particular conclusion as well as that which does not. It requires specification of the uncertainty around the answer, and the caveats around the answer. In many cases I have found scientists to be guilty of cherry-picking the literature to support their own preconceived policy positions. This is terrible misuse of science, of course, and counterproductive to the whole dialogue between science and policy. On the other hand, managers often demand clear and simplistic answers to questions and are not very open to the caveats and uncertainly that scientists should put around an answer. When scientists provide caveats and specify uncertainty, it is seen by managers as shifting blame for potential failure back to them. So it is critical that scientists work with managers to develop a mutual understanding of the scientific process and the inherent questions of uncertainty surrounding any particular answer. All this should be part of a formal process with clear rules.

Science is a beautiful thing, and the idea of evidence-based decision-making has been with us since the Age of Enlightenment. Evidence-based decision-making is the standard that scientists must fight for in our workplaces and in our societies. We are a very long way from using science well and there are many pitfalls along that way. Scientists serve the cause of nature conservation by bringing sound knowledge to policy-making and by being good stewards of the scientific process.