# VALUE OF SCIENCE



Morrison Stevens, Sr.
PRESIDENT

**This issue's president's column highlights the value of science and the importance of communicating sound science in wildlife management and conservation. Though I am not a trained scientist, I am an accountant and thus understand the importance of communication in my own profession. For example, as an accountant, I rely a lot on facts and data rather than feelings or emotion when I communicate about the decisions I make in the workplace. I think, for the most part, many scientists have the same preference. The challenge therefore, for me and for scientists, is communicating relevant wildlife, forestry, and conservation science to our non-hunting human population, the 70 percent that do not hunt, but directly control our right to hunt.**

When we go back in time to the early 1800s, most of rural America was made up of subsistence hunters. These people were pro-hunting because they required hunting for their meals. As this country grew, market hunting developed alongside rail construction, which opened up more markets for wild game and continued subsistence hunting. Over time, hunting evolved into more of a recreational pastime. However in the late 1800s, it was clear even without scientific evidence that buffalo and passenger pigeon populations were declining dramatically, in addition to elk and deer populations.

Thus in 1887, the Boone and Crockett Club was formed by hunting and conservation advocates to address the obvious decline in big game species. Around this time in 1892, the Sierra Club was formed by John Muir, which focused on conservation of our natural resources. This organization is considered one of our country's earliest leaders in conservation efforts. The Boone and Crockett Club introduced legislation that changed hunting in the United States forever with the advent of seasons, bag limits, and the elimination of market hunting. The practice of hunting was refined and managed by various states based on the populations of the species that were relevant to their geography. This was further refined during the era of Gifford Pinchot, who is considered the father of forestry management in the United States. Then Aldo Leopold, who is considered the father of wildlife management, took scientific management to new levels, demonstrating the value and art of scientific communication.

Until the development of computers, extensive databases, and the Google search engine, the Boone and Crockett Club relied on the publication of papers and books to get important scientific news and research out to resource users in government, other universities, and NGOs. In the current era that we live in, there is an insurmountable amount of data available to us. A lot of this data is generated as a result of huge scientific efforts and billions of dollars spent each year by governments and universities. One of B&C's big challenges is communicating this valid and relevant scientific knowledge in a way that educates our membership and galvanizes policy makers to utilize this information to promote the management and conservation of wildlife and our forests. The scientific community must improve their methods of communication science to the non-technical and often emotional audiences that knowingly or unknowingly have an interest in the health of our shared natural resources.

Scientists should listen to and understand the arguments of the general public if they hope to relate to them. Scientists should also recall that their audience is not an empty vessel and that any audience requires a communication model or method that is able to interest and engage them. It is important to note that the natural resource and wildlife conservation community, including the Boone and Crockett Club and the Sierra Club, has consistently worked towards the development of science-based methodologies to preserve our resources for future generations.

Until the advent of the anti-hunting community represented by the Humane Society of the United States (HSUS), which was organized in 1954, and People for the Ethical Treatment of Animals (PETA), which was organized in 1980, science was geared for use by universities, governments, and NGOs, and not necessarily the general public. While the anti-hunters are a significant minority of the overall human population, so is the hunting community. It is important that our dedicated science professionals become better communicators in order to inform and change policy based on our scientific effort. Effective

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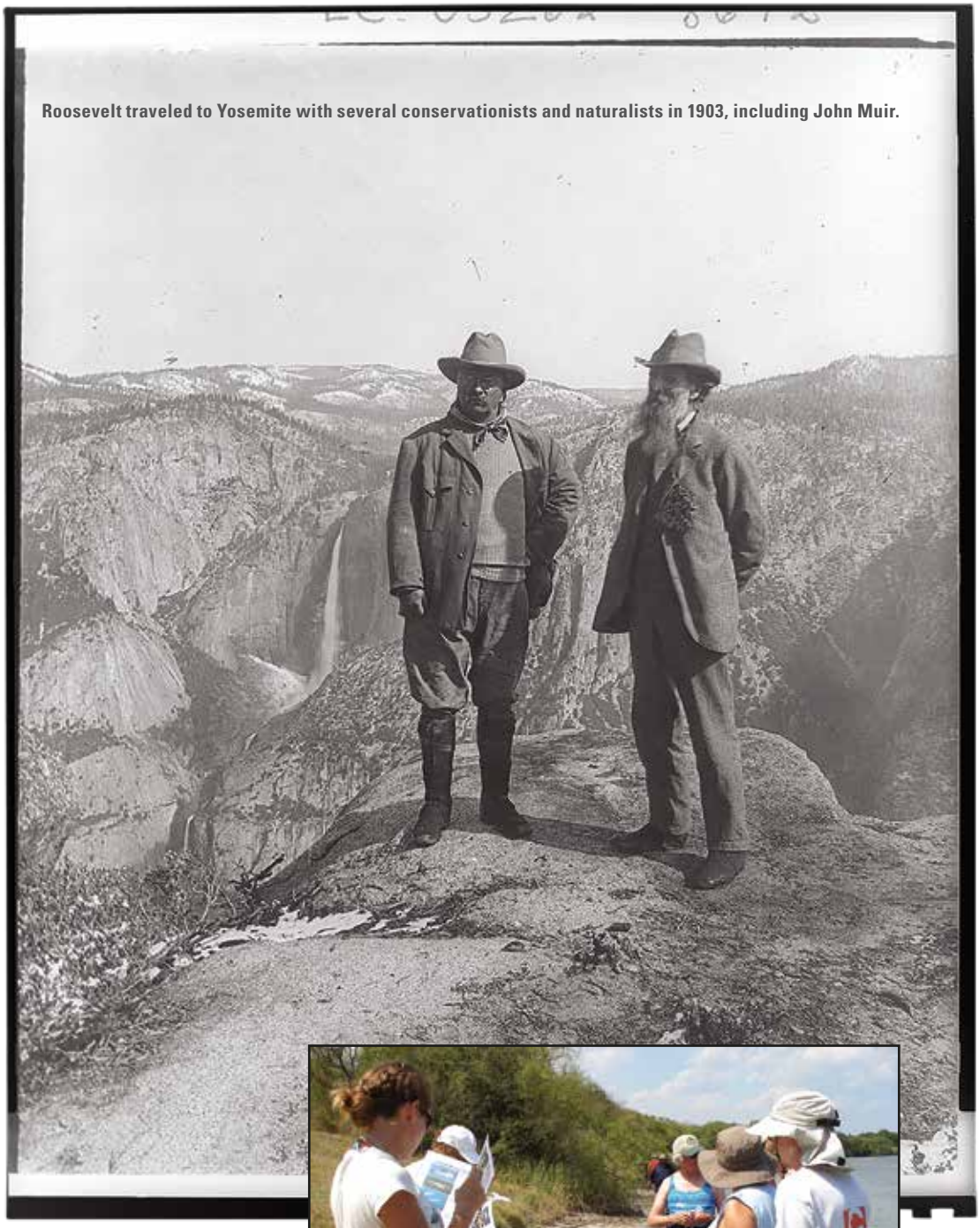
communication does become more challenging when the issues are complex. However, it is critical that we learn how to share and communicate our scientific messages in credible, policy-neutral ways. Proper communication of the results of major, groundbreaking scientific work can impact policy and government decisions, which can then drive sound management of our resources with the consensus of the public.

The Boone and Crockett Club encourages all university science and conservation departments to design programs to educate undergraduate students, graduate students, and post-doctoral fellows in effective communication. With the rise of technology, the ability for these students and professionals to reach even bigger audiences increases.

Our Club has taken on a responsibility to train bright students in effective communication through our university endowed professorships and research fellowships at major universities around the country. It is important that sound science is developed for the proper management of forests and wildlife. It is almost more important that this science be appropriately shared and communicated to the audiences that need it the most, which are the government, NGOs, and the 70 percent of Americans that are non-hunters.

This last audience group is a particularly important one, since the hunting population in this country has declined substantially throughout the years. Thus, the future of our hunting privilege is dependent upon our ability to educate and inform the non-hunting community and others through effective and thoughtful communication. ■



Roosevelt traveled to Yosemite with several conservationists and naturalists in 1903, including John Muir.

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Read more about our University Endowed Professorships and Programs on page 66.

# VALUE OF SCIENCE

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**Science matters for the obvious reason that we need to know what we are doing to manage wildlife, and why we are doing it.**

But there is more to it than just that. We follow science past our questions to test our beliefs and to check our assumptions and biases—those blind spots we may not even realize color our thinking. Obtaining reliable knowledge to accept, modify, or reject long-held beliefs distinguishes wildlife management from professions guided by pure judgment, inclination, preferences, or craftsmanship. Sound and perfectly logical arguments are still incorrect if based on false premises. Science is a way to improve knowledge and uncover flaws in our understanding of biology using specialized knowledge to answer questions about the ecology of plants and animals.

Some outcomes from scientific research are counterintuitive, which may make simple descriptions of biological processes difficult to understand and interpret. Without the scientific method, one argument is as good as another—there is no effective way to sort among differing opinions or test different hypotheses. The scientific method generally involves making observations; developing hypotheses to potentially explain the observations; designing research to test the hypotheses; gathering reliable data and refining, altering, and expanding or rejecting hypotheses which may result in the formation of more general theories. Science provides that mechanism, thereby aiding in the sound understanding of biology and wise management of wildlife.

Science has been called the refinement of everyday thinking because common sense is less reliable. For instance, controlling wolves to increase elk will not work if elk are near ecological carrying capacity, or near the maximum population size for a particular environment that resources can support. But controlling wolves when elk are below the level of what their preferred habitat can support will yield greater elk productivity. Similarly, for decades elk managers thought the availability of winter habitat was the key to elk getting enough to eat, but recent studies supported by the Boone and Crockett Club have revealed that summer habitat quality can be the limiting factor for elk survival during the winter in certain areas. There also may be nutritional "carryover" effects from one season to the next, whereby resources garnered in one season are essential for survival and reproduction in the next.

Science matters because it is the plumb line between what we know and the decisions we make. Deciding what to do is the realm of policy. But how do we know the "right" amount of wolves or elk in a given space and time? There are sustainable options for elk below carrying capacity. For wolves, we know from science there is a minimum number of individuals that comprise a self-sustaining population. But how far we choose to set a population goal above the minimum is determined by other reasons, such as creating a margin of certainty or reducing depredation on livestock.

Leaders in conservation need to be involved in both the science and the policy. Leadership ensures we have the best science and the best decisions based on science. This is conservation science and policy at work together.

The population dynamics of elk and wolves are good examples that illustrate how science sets up a realm of possibility and leaves a realm of questions on the policy side. We describe several other examples below. Boone and Crockett Club is actively involved in the following examples, and there is a place in them for you, too. Where you can, step up to participate in the questions of science, policy, or both.

## PREDATOR MANAGEMENT: THE WOLF AND THE GRIZZLY BEAR

The basic scientific questions for both wolves and grizzlies are: how many are there; how many are necessary to sustain populations; and how do we move that number up or down, or keep it stable? Wolves reproduce faster than bears, but we have less of an idea how to manage wolf populations than

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Of all the issues we review here, the cases of the wolf and grizzly are the most local and therefore the easiest in which to get involved. The pros and cons for the people and wildlife most affected all play out in the northern Rocky Mountains area and in Alaska, and also, for wolves, in the Great Lakes region and areas of the desert Southwest. If you live or hunt in these areas, you can participate in public meetings held by the state wildlife commissions and the Interagency Grizzly Bear Committee.

we do with grizzlies, which are more sensitive to changes in the numbers of males and females, and young and old in their populations.

The policy questions are the "should" versions of the science questions: how many should we have and where should they be?

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## FOREST MANAGEMENT

Managing forests has been an issue since the beginning of the conservation movement and has been a focus of the Boone and Crockett Club since then as well.

The science questions are about how forests can complete their cycles of growth, fire, decay, and reseeding with people living in and around them. Letting nature take its course could turn your favorite camping or hiking spot into an impassible jackstraw of blow-down or a sooty mess; or it may change your scenic vista, or it even may burn your home. If we suppress natural fire and prevent timber harvests, we run other risks such as losing habitat quality for the large mammals and forest birds we value and cherish.

The policy questions are not only where and when we let a forest burn or set a controlled fire to preempt a disaster fire, but also how often to use timber harvest instead of, or in addition to fire as management tools. Because forest management is expensive, the policy questions include how to support an industry to do the work and how much of the economic value goes to the market and how much goes back to conservation work.

Forestry affects more people in more places than do wolves and grizzlies. People living and working in and around the forests are closest to the issues, but the economics of forestry is now global, wrapping local timber towns in worldwide competition. Meanwhile what happens in forests affects the headwaters of streams and rivers and the amount of carbon in the atmosphere, so forest policy involves these regional and global factors, too. Aspiring conservation leaders can get involved in local forest management and science, and there are also opportunities at national and international levels.

## ENDANGERED SPECIES ACT (ESA)

Lastly and most broadly, the Endangered Species Act raises the farthest-reaching questions that call for conservation leadership.

The science question is twofold: Which species might be heading toward extinction and what might be done about it? The importance of the science questions is clear. Many of the species removed from the Lists of Threatened and Endangered Species were removed because they were found later to not belong on the lists. Many listing decisions are supported by existing literature rather than field data. The results of listing species are unclear; most species protected under the Act have not recovered, but they have not become extinct, and some have not been listed for long enough to allow recovery. There have been some spectacular success stories, such as the recovery of the peregrine falcon and bald eagle, but problems with listing and de-listing remain.

Many of the policy questions boil down to how much conservation we can afford, which raises excruciating ethical questions. The United States supports very few active recovery programs compared to the 1,300+ listed species in the nation. By relying more on protection for species, we are limiting development where listed species live, but the cost and tradeoffs of this are hard to measure. This is the tip of an iceberg-size policy question: How much of the planet and its economy can we devote to species conservation if this devotion takes land, water, and money away from other people who wish to use these resources for other purposes? How can we conserve these valuable natural resources for future generations in the face of our existing constraints?

The implications here clearly are enormous, but there are still openings for new conservation leaders to take them on. Most of these spots are in state or national jobs for government agencies, congressional staff, or advocacy groups including the Boone and Crockett Club.

Building a career in conservation and management may take time, but the hunter-conservationists who have gone before us have already identified some major keys to success. For example, most of the successful species recovery in American history was accomplished by sportsmen who organized both the recovery of bison and pronghorn in the early 1900s (the bison obviously is not recovered to much of its historic range at 1% of its original distribution, yet they are not listed under the ESA), and the restoration of the Pittman-Robertson game species from the 1940s to present. Their experience and leadership show the need for economic incentives, policies focused more on results than precautions, and the knowledge to decide how big a recovery is enough. The ESA is struggling on all of these points. We cannot be sure today how much of the costs of ESA are producing results or precisely what directions should be taken in the future. We need to more clearly define criteria for listing and de-listing species, and provide yardsticks for success and failure of programs. The future of wildlife in North America rests with the next generation of biologists, managers, policy makers, and those interested in conservation.

## CONCLUSION

Leadership in science and policy is about personal responsibility. Hunter-conservationists must get involved personally in both the science and the policy questions for the effective conservation and management of wildlife. Employment opportunities in these realms are often available in government and many of the opportunities to participate are defined in law. Indeed, nothing gets done unless regular folks make the leadership move of getting involved, sharpening the questions, and helping find the answers. ■