

Elevator speech

It took <72 hours for hunters to kill 16 wolves legally and we estimate another 88-97 illegally in Wisconsin before the government said 'enough' wolves had been killed. But where did the target of 119 come from? And why did the hunters and wildlife agency over-shoot the quota by so much? Now state decision-makers are treating the 1999 state wolf population goal of 350 as if it were scientific and reasoned.

The common predicament worldwide of wildlife managers and policy makers consists of their failure to acknowledge honestly their value orientation, especially where value judgements masquerade as science. On the other hand, scientific research often masquerades as "objective" judgement unsullied by values. Without transparency, both are a problem.

Whereas wildlife managers justify the number as an outcome of 'science', new research suggests that such decisions are ultimately - but non-transparently - derived from personal and organizational value judgments.

New research entitled "Transparency about values and assertions of fact in natural resource management." will be published in the peer-reviewed journal *Frontiers in Conservation Science* by University of Wisconsin-Madison's Dr. Adrian Treves and colleagues from the University of Victoria in British Columbia, Raincoast Conservation Foundation, Little River Band of Ottawa Indians Natural Resources Department, and Slovenia's University of Ljubljana:

We address the general problem that worldwide use of wildlife is often not sustainable despite claims of using the best sustainability science. We identify potential reasons for this that relate to transparency in science communication, transparency about where the science ends and value judgments begin, and transparency in the conduct of science. We provide guidance to scientists, policy-makers, and the public to reach better public policy including scientific remedies to avoid a lack of transparency in natural resource management (NRM). The general remedies we propose are to (1) acknowledge the distinctions between – and interplay of – values and science: Science is observation, measurement and inference describing how things are or predicting the outcomes of action or inaction. Public and policy-maker values then shape if and how we act, not the personal or organization values of scientists. (2) Acknowledging values (e.g., anthropocentrism, public trust principles, intergenerational equity) and identifying winners and losers from policy and management actions would raise public confidence in NRM policy and science. (3) Better NRM science should evaluate multiple scenarios for use and for preservation treated even-handedly), transparency about assumptions and uncertainty, and independent review. Starting with maximum sustainable yield (or similar) paradigm as a goal reflects a value judgment, not a scientific approach. (4) Public scientists are trustees with a legal duty to the broadest public, not to funders, government, or special interest groups.

Specifically, our first case study addressed science communication about endangered northern spotted owls. We observe how strict norms of scientific conduct exist to make scientific assumptions, observations, and inferences transparent, with the goal of accurate, precise,

reliable and reproducible findings (the internal domain of how science is conducted) — but communication of even the most rigorous scientific inferences may be colored by personal or organizational biases that reflect worldviews or competing interests. That external domain of science does not have accepted standards or clear boundaries for how to communicate science in democratic, free societies. Disagreements between scientists about how to communicate science are fundamentally value judgments that pit non-scientific criteria against each other. In such public policy debates we recommend little or no censorship of civil, collegial plural debate.

Our second case study addresses transparency in the conduct of science for endangered gray wolves. Here our case study reveals a long history of submerged value judgments that influenced the practice of science. Protracted use of science that is invisibly influenced by value judgments does a disservice to public policy and may in the end distort scientific findings to the point they are not accurate, precise, reliable, or reproducible. We explore one such case for Wisconsin gray wolves and show that the state's 1999 management plan and 2006 addendum contain substantial omission of methods, unstated value judgments that did not transparently weigh alternative hypotheses or fairly evaluate them, and ultimately misled public policy that led to unsustainable use of gray wolves and inflamed political controversies. If repeated for years or in other regions, the outcomes of non-transparency in science-based policy may be deterioration of public confidence in decision-makers, polarization among groups of scientists that prevents civil, collegial debate, or government policy that unjustly benefits narrow minorities at the expense of broad majorities.

## Abstract

Worldwide, unsustainable use of nature threatens many ecosystems and the services they provide for a broad diversity of life, including humans. Yet, governments commonly claim that the best available science supports their policies governing extraction of natural resources. We confront this apparent paradox by assessing the complexity of the intersections among value judgments, fact-claims, and scientifically verified facts. Science can only describe how nature works and predict the likely outcomes of our actions, whereas values influence which actions or objectives society ought to pursue. In the context of natural resource management, particularly of fisheries and wildlife, governments typically set population targets or use quotas. Although these are fundamentally value judgments about how much of a resource a group of people can extract, quotas are often justified as numerical guidance derived from abstracted, mathematical or theoretical models of extraction. We confront such justifications by examining failures in transparency about value judgments, which may accompany unsupported assertions articulated as factual claims. We illustrate this with two examples. Our first case concerns protection and human use of habitats harboring northern spotted owl (*Strix occidentalis caurina*), revealing how biologists and policy scholars have argued for divergent roles of scientists within policy debates, and how debates between scientists engaged in policy-relevant research reveal undisclosed value judgments about communication of science beyond its role as a source of description (observation, measurement, analysis, and inference). Our second case concerns protection and use of endangered gray wolves (*Canis lupus*) and shows how undisclosed value

judgements distorted the science behind a government policy. Finally, we draw from the literature of multiple disciplines and wildlife systems to recommend several improvements to the standards of transparency in applied research in natural resource management. These will help to prevent value-based distortions of science that can result in unsustainable uses and eventual extinctions of populations. We describe methods for communicating about values that avoids commingling factual claims, and discuss approaches communicating science that do not perpetuate the misconception that science alone can dictate policy without consideration of values. Our remedies can improve transparency in both expert and public debate about preserving and using.

Treves A, Paquet PC, Artelle KA, Cornman AM, Krofel M, Darimont CT. 2021. Transparency about values and assertions of fact in natural resource management. *Frontiers in Conservation Science: Human-Wildlife Dynamics*, in press.