SCIENTIFIC INTEGRITY IN RECOVERY PLANNING AND RISK ASSESSMENT: COMMENT ON WILHERE

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INTRODUCTION

Conservation biologists have long debated whether it is appropriate for scientists to influence policy decisions (Nelson & Vucetich 2009). Conservation biology, like medicine, is a mission-driven discipline. As medical professionals seek to extend the life of their patients, conservation biologists seek to slow the rate of species' extinction. As scientists, however, we act within a larger society where such objectives compete with other goals. Wilhere (2012) argues, and we agree, that "Scientists in a mission-driven discipline—a mission rooted in ethical values—should understand how science and values must interact to fulfill that mission." We disagree with Wilhere, however, as to the appropriate role of individual scientists and scientific societies in addressing this interaction of science and values. The examples of scientific review of recovery planning that Wilhere criticizes as "inadvertent advocacy" are in our view appropriate and consistent with the role that statutes such as the U.S. Endangered Species Act (ESA) identify for scientists and scientific societies. Criticism of such efforts as inadvertent advocacy demonstrates a misunderstanding of the respective roles of science and policy in ESA implementation, a misunderstanding that obscures debate on the social value of biological diversity and the costs that the public is willing to bear to protect this resource.

We address two questions that are central to the debate concerning the appropriate role of scientists in recovery planning. Are risk assessments such as recovery plans inherently normative (value driven), and if so, what direction do statutes such as the ESA provide for making such normative decisions? Second, is it appropriate for peer reviews by scientific societies to address such normative questions, and if so, how best can this be done?

SCIENTIFIC REVIEW OF THE NORTHERN SPOTTED OWL RECOVERY PLAN

Wilhere points to the scientific peer review of the Northern Spotted Owl (*Strix occidentalis caurina*)(hereafter owl) Recovery Plan (USFWS 2008) as an example of "ethical judgments" inappropriately represented as "scientific judgments" by reviewers (including several authors of this Comment) from the Society for Conservation Biology and American Ornithologists' Union. Habitat loss and associated population decline were the primary reasons for listing of the owl under the ESA and subsequent development of a reserve strategy by the Clinton administration (the 1994 Northwest Forest Plan [NWFP]). Population viability analyses (PVA) projected that alternatives to the NWFP that protected less old-growth forest would trigger substantial declines in owl distribution (Raphael et al. 1994). In the 2008 recovery plan, however, the subsequent administration opted for a less extensive network of reserves, despite earlier predictions that this strategy would result in extirpation of the owl from much of its current range (Raphael et al. 1994).

Wilhere labels the owl peer review an example of inadvertent advocacy because the reviewers criticized the new recovery plan substantially reduced habitat protections as inadequate. Wilhere asserts that the reviewers overlooked a "legitimate justification" for the agency's willingness to accept greater risks to owls, namely that the U.S. Fish and Wildlife Service (FWS) had adopted "a different attitude toward risk...[and] tolerating a greater extinction risk allowed a reduction in habitat protection." However, FWS never communicated to peer reviewers or the public that the agency had adopted a new (and potentially controversial) normative justification for accepting greater extinction risk. Instead they stated that the 2008 recovery plan "builds upon the Northwest Forest Plan," which formed the basis for the agency's prior owl-recovery strategy (USFWS 2008).

Peer reviewers concluded that the proposed one-third reduction in the size of the reserve network, a strategy similar to one explicitly rejected by FWS when it initially drafted the NWFP, was inconsistent with public assurances that the new recovery plan was based on past agency policy. The Department of the Interior (DOI) inspector general ultimately confirmed reviewers' concerns when he concluded that Julie MacDonald, a high-level political appointee, spurred efforts to make the new recovery plan less protective of the owl and its habitat. Rather than encouraging open discussion of the appropriate level of risk to guide owl recovery, MacDonald used methods such as refusing to include leading scientists with expertise in owl ecology as members of the team drafting the new recovery plan and creating a Washington Oversight Committee that explicitly discouraged habitat protections (USDI 2008). Due to these and similar actions, DOI subsequently developed a scientific integrity policy to prevent such interference in agency decision making (USDI 2011).

NORMATIVE ASPECTS OF RECOVERY PLANNING AND RISK ASSESSMENT

Irrespective of the shortcomings of the 2008 owl recovery plan, we agree with Wilhere that consideration of the appropriate risk thresholds in listing and recovery actions necessarily involves both a normative decision (specifying what level of endangerment is acceptable) and a scientific decision (determining whether a species meets that level of endangerment) (Vucetich et al. 2006). Although the U.S. Congress mandated that the Fish and Wildlife Service and National Marine Fisheries Service (hereafter agencies) consider "solely" the best science in making listing decisions (16 U.S.C. §1533 (3b)(1A)(a1)), lawmakers addressed the normative nature of such decisions only qualitatively. Although the ESA's legislative history indicates Congress intended the act to afford a high level of security to listed species, the statute established no numeric risk thresholds. As a result, the agencies must specify what level of endangerment is acceptable.

It would be possible for the agencies to more clearly separate the normative and scientific elements of listing and recovery determinations. The agencies could issue regulations specifying quantitative listing thresholds. These might address extinction probability, time horizon (e.g., >99% probability of persistence for at least a century), and the geographic dimensions of recovery (Carroll et al. 2010). This would provide an explicit normative judgment as to the minimal likelihood of persistence and minimal geographic distribution that would separate species considered secure or recovered from those considered threatened or endangered. Application of these thresholds to make individual listing decisions would then be a more objective scientific process. However, the agencies have never promulgated such regulatory guidance. As Wilhere and others have noted, this approach has resulted in inconsistent decisions about what risk levels warrant species protection (Easter-Pilcher 1996). By not explicitly defining risk thresholds, the agencies have retained discretion in individual listing and recovery decisions, consistent with the principle that administrative agencies act to maximize their own discretion and flexibility (Sax & Keiter 1987).

We recognize that establishing generally applicable risk thresholds for species protection raises challenging normative and scientific issues. Data for many species are too limited for quantitative PVA-based risk estimates. The ESA does not require the agencies to define recovery for a given species as the absolute minimum population size and geographic distribution that equates to a specified persistence level. For species such as the owl that are experiencing severe declines, the recovery goal is often to reverse the decline and restore the population to a previous status rather than some minimum size. Recovery goals may also address the minimum population size necessary for a species to be ecologically functional. For example, society may wish to set a lower acceptable level of risk for species that play disproportionately large roles in

their ecosystems (Estes et al. 2011) in order to increase the probability of conserving "ecosystems on which species depend," one of the ESA's express purposes (16 U.S.C. §1531 (a)(5)(b)).

Additionally, conservation biologists have generally rejected use of a single point estimate of minimum viable population size in recovery planning. They argue that PVA results should be used instead to provide information on the general relation between risk and factors such as abundance, genetic diversity, and distribution (Shaffer et al. 2002). Most estimates of minimum viable population size are probably too low because they underestimate long-term uncertainty in stochastic events. Recovery goals may appropriately include a margin of safety to ensure that unanticipated future events do not cause species to fall below the threshold that would make listing warranted. This approach is consistent with Congress' intent to institutionalize caution to avoid uncertainty about a species' future status.

Despite these complexities, it is feasible to develop an explicit decision framework that would provide the flexibility needed to address the unique biological circumstances faced by different species but limit the abuse of discretion that has allowed political interference to drive listing and recovery decisions. We agree with the DOI inspector general, who stated that "the absence of policy in exercising that discretion has resulted, in MacDonald's case, a wholesale lack of consistency, a process built on guess-work, and decisions that could not pass legal muster...For many years, through several administrations, this appears to be an area of intentional failure to clarify, in order to maximize the agenda *du jour*. The Department owes the public a fair and consistent application of rules in making its ESA decisions...FWS should develop policy to lend a sense of consistency, to guide ESA decisions where discretion is allowed, and to provide

the public the transparency that is fundamentally lacking in this high-profile program" (USDI 2008).

THE ROLE OF SCIENCE AND POLICY IN ESA IMPLEMENTATION

United States statutes such as the ESA, Clean Water Act, and Clean Air Act combine broad language describing key standards with the expectation that the agencies will use subsequent regulations to clarify implementation. The approach apparently advocated by Wilhere implies that because these laws do not explicitly define quantitative thresholds for acceptable risk, administrative agencies may modify these risk thresholds whenever those in political power hold different values than their predecessors. Such an approach is inconsistent with both Congressional intent and sound policy.

Wilhere states that “choosing the acceptable extinction risk is an ethical judgment for the public or policy makers, not scientists.” Lawmakers did make such an ethical judgment when in 1973 they qualitatively emphasized in the ESA the high degree of protection they intended to afford to biodiversity. Congress did not intend that implementation of the ESA would vary dramatically between administrations via a constantly shifting definition of acceptable risk. Although Wilhere correctly highlights inconsistencies in past agency practice, allowing agencies and politicians to arbitrarily shift the normative definition of acceptable risk would further increase this inconsistency. Conservation strategies should be based on the rates of species’ population dynamics--time from endangerment to recovery--not on the faster rate of turnover in the federal executive branch. Clear and consistent regulations are needed that insulate federal agencies from electoral politics so as to maintain the continuity in conservation policy necessary to realize the essentially ethical goals of the ESA.

The ESA identifies roles for scientists and scientific societies as both direct participants in recovery planning and as peer reviewers of listing and recovery determinations (16 U.S.C. §1533 (b)(5)(c); 16 U.S.C. §1533 (d)(2, 4, and 5)). The objective of peer reviews appropriately encompasses both the underlying science and the context in which science is used to inform policy. For example, the FWS directed that scientific reviewers of the 2008 owl plan "may include scientists with expertise in...scientific/public policy." The courts evaluate consistency with past agency practice as one determinant of the legal sufficiency of recovery plans. Scientists and scientific societies have the responsibility to identify when recovery plans deviate from Congressional intent and past agency practice and to suggest revisions that better achieve the goals of the ESA and other conservation statutes.

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