No. 94-1827

IN THE UNITED STATES COURT OF APPEALS

FOR THE SEVENTH CIRCUIT

Sierra Club, et al.

Plaintiffs/Appellants,

v.

Floyd J. Marita, et al.

Defendants/Appellees,

On Appeal from the United States District Court
for the Eastern District of Wisconsin

BRIEF OF AMICI CURIAE THE SOCIETY FOR CONSERVATION BIOLOGY AND THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES

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I. SUMMARY OF THE BRIEF

Amici offer observations on the reliability and methods of science, on the general acceptance by scientists of a set of theories of conservation biology, and on the task of courts reviewing agency claims about conflicting scientific opinions.

So-called island biogeographic principles are like all scientific theories in being susceptible of doubt. Scientific inquiry reduces uncertainty but does not provide conclusive proofs and absolute reliability.

Science has developed several ways to identify and reduce uncertainty about the physical world. These include widespread publication of research results and analysis and formal peer review. They also include application of the "scientific method" and assessment of the likely trustworthiness of predictions and explanations. The United States Supreme Court has recognized the value of these methods in contributing to scientific reliability.

Despite considerable continuing debate over the details, several related principles of conservation biology have achieved widespread acceptance among scientists, and had by the mid-1980s. Prime among these is the need to preserve large area reserves to avoid loss of biodiversity. This, and related principles, bear several of the marks of reliability scientists look for.

Meaningful judicial review of agency claims to have chosen among competing experts cannot simply accept them at face value. _Amici_ suggest that courts can and should determine whether expert analysis or opinion adopted by agencies have at least some

of the same hallmarks of scientific reliability that those views rejected do. This is required for a genuine choice among conflicting views, and to avoid unnecessarily premising agency action on information that would be inadmissible in court.

II. INTERESTS OF THE AMICI[1]

The Society for Conservation Biology is an international professional society of scientists and others concerned with the scientific and technical means for protecting and restoring biological diversity. The Society fosters research into and discourse over these means. It is also dedicated to promoting the highest standards in research, analysis, and reporting of issues related to the conservation of biological diversity. In addition to conservation biologists, its membership includes wildlife biologists, botanists, foresters, entomologists, ecologists, geneticists, biogeographers, other scientists, and professionals from other fields.

The American Institute of Biological Sciences (AIBS) is a non-profit national scientific organization whose mission is to address important public policy issues in the life sciences, including environmental, medical, and agricultural issues. Founded in 1947 as an operating component of the National Academy of Sciences, AIBS is now an independent federation of 47

[1] Consents to the filing of this brief by all parties are reproduced below.

scientific life sciences societies representing more than 80,000 biologists, students, and others concerned with the biological sciences.

Amici take no position on the appropriate outcome of this case, thinking it likely to turn, at least in part, on issues and matters outside of their special expertise or knowledge. Nonetheless, the controversy broaches on issues of great interest and importance to _amici_. Specifically, the meaning of uncertainty in the natural sciences and the approaches scientists exercise to reduce uncertainty are central and omnipresent concerns of theirs. So too is the reliability and acceptance of theories developed in conservation biology and related disciplines. _Amici_ offer comments on these topics which they hope will aid the Court's deliberations. They also include some brief observations on how courts might fruitfully review controversies over scientific uncertainty, as it relates to federal agency decisionmaking.

III. DISCUSSION

A. _Scientific Uncertainty In The Natural Sciences_

1. The Nature Of Scientific Knowledge

A recurring theme in this case has been the uncertainty attached to a particular set of closely related scientific theories. In the administrative decision that preceded litigation, a former Chief of the United States Forest Service argued that: "[t]he island biogeography theory is not new, but until there is conclusive empirical evidence that the conclusions, hypotheses, or predictive capabilities for terrestrial ecosystems are valid, it is proper to acknowledge it as untested theory." Sierra Club v. Marita, ED Wisc., Civil No. 90-C-336, Dec'n and Order (2/9/94) at 26. The District Court articulated a similar concern: "[w]hatever their theoretical validity ... considerable uncertainty seems to surround the question of how exactly these [conservation biology] principles should be applied." Id. at 28; see also id. at 30 (citing "scientific uncertainty" as a reason to uphold the Chief's decision).

At the outset, amici believe it important to note that uncertainty is inherent and ubiquitous in science. See, e.g., J. Ziman, Reliable Knowledge: An Exploration of the Grounds for Belief in Science 26 (1978). The absence of "conclusive empirical evidence" and the correlative presence of "uncertainty" surrounding the precise application of a theory is the norm in science, rather than the exception. Empirical research and scientific analyses reduce uncertainty about processes in the physical world. They do not, however, produce conclusive explanations or predictions.

Given any limited set of observed phenomena, alternative explanations can always as a logical matter (and normally as a practical matter, too) be constructed to account for them. See Platt, "Strong Inference", 146 Science 347, 350 (1964); D. Futuyma, Science on Trial 168 (1983); Shrader-Frechette and

McCoy, "Statistics, Costs and Rationality in Ecological Inference", 7 Trends in Ecology and Evolution 96 (1992). The scientific method of testing and rejecting null hypotheses can only dismiss that which has been tested. Thus, it is axiomatic in science that the general propositions derived by scientific endeavor -- hypotheses and theories -- are never affirmatively proved. See, e.g., W. Beveridge, The Art of Scientific Investigation 118 (1950); Romesburg, "Wildlife Science: Gaining Reliable Knowledge", 45 J. Wildl. Manage. 293, 294-97 (1981); Oreskes, Shrader-Frechette, Belitz, "Verification, Validation, and Confirmation of Numerical Models in the Earth Sciences", 263 Science 641, 641-43 (1994). "Scientists realize, if they have any sense at all, that all their currently accepted beliefs are provisional." Futuyma, op. cit. at 163.

The United States Supreme Court, in a discussion not long ago of the predicates for admission of scientific evidence into federal court noted that "it would be unreasonable to conclude that the subject of scientific testimony must be 'known' to a certainty; arguably there are no certainties in science." Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S.Ct. 2786, 2795 (1993). The Court went on to quote from a brief, filed in that case by the National Academy of Sciences, which explained that science "represents a process for proposing and refining theoretical explanations about the world that are subject to further testing and refinement". Id. In short, science is not the acquisition of truth, but rather the perpetual quest for it.

Futuyma, _op. cit._ at 164.

The inevitable uncertainty of scientific inquiry does not diminish its worth. One could appropriately describe science as the systematic effort to generate the most reliable possible explanations and predictions about physical phenomena, in the face of inevitable uncertainty. The methods of science are, simply, those that have proven most able to provide reliable information and predictions about the physical world. Explanations developed through application of the scientific method may be uncertain, but they are nonetheless the best explanations available. _See, e.g., id._ at 163. Thus, scientific information, when it is to be had, is more reliable, that is, less uncertain, than is information obtained without benefit of the scientific method, like the other sources relied upon in planning exercises. Romesburg, _op. cit._ at 308, 310.

It therefore represents a fundamental misconception to speak -- as people sometimes do -- of a scientific theory or hypothesis as "unproven" or as "just" (or "merely") a theory. _See, e.g.,_ Moore, "Science As a Way of Knowing", 24 _Am. Zool._ 467, 474 (1984); P. Medawar, _The Art of the Soluble_ (1967). Use of the term "theory" in descriptions like "theory of gravity" or "theory of evolution" is not pejorative; rather, it reflects the scientific community's acknowledgement of inherent uncertainty. Theories in science are broad hypotheses that are well supported by the available evidence, and these _are_ the "facts" of science. _See, e.g.,_ Futuyma, _op. cit._ at 166.

2. Scientific Responses To Uncertainty

Scientists have, over time, developed methods for responding to and reducing uncertainty, and for assessing the reliability of their results and theories. Utilization of these methods is what allows scientists to develop confidence in their own and in others' work. See Ziman, op. cit. at 130 ("[t]he intellectual authority of science ... resides in the processes by which reliable knowledge is created and accredited"). When scientists describe a proposition as "generally accepted" they mean that its development and evaluation in keeping with these approaches has produced a high degree of confidence, relative to the particular discipline involved.

The approaches scientists take to identifying and reducing uncertainty include external review processes for their work, a set of experimental and analytic procedures known collectively as "the scientific method," and a growing number of techniques for quantifying the level of uncertainty associated with scientific statements. All of these approaches are used by conservation biologists and scientists in related disciplines, as well as in the scientific community at large. Indeed, they constitute not so much a check upon science, but very largely what defines scientific inquiry. See Ziman, op. cit. at 130-32 (1978). Most of these characteristic processes and methods are familiar to the courts, which have recognized their value as indicia of the reliability of scientific conclusions and predictions.

a. Institutional Checks: Publication and Peer Review

The broadest check on unreliability in science is the exposure of results and conclusions to the scientific community at large. Scientific inquiry is a cumulative process in which individual researchers build and rely upon the prior work of others. To contribute to this process and gain acceptance for their work, scientists describe it in publications, accompanied by explicit references to the work of other scientists and, where original research is reported, explanations of the methods used and results obtained.

The publication process by which scientific information is widely disseminated also ensures that it will be subjected to critical scrutiny, as part of what is sometimes referred to as the "self-correcting" process of science. See, e.g., Futuyma, op. cit. at 164; Moore, op. cit. at 472. Scientists working in the same discipline review a publication critically and decide whether they are willing to incorporate the conclusions in their own work and publications. Should they find problems with the research reported or flaws in the reasoning, they may offer their critique in letters to the journal involved, in responsive articles, or in papers delivered at professional meetings (the proceedings of which typically are themselves published). Where significant controversy arises, scientific journals often solicit and publish an exchange of views and responses. This collective process of publication, as the Supreme Court has recognized, while it does not guarantee reliability, does significantly enhance it. See Daubert, 113 S.Ct. at 2797.

Publication in a scientific journal usually also entails the more formal "self-correcting" procedures of peer review. See Futuyma, op. cit. at 164. Peer reviewers scrutinize submitted papers for the proper use of scientific methods and protocols, for the sufficiency of their data, and for the rigor of the authors' analysis. See id. at 165. Papers deemed deficient are rejected or returned for further work. Many research projects have also been through at least one round of peer review prior to submission for publication, often during initial research design when financial support is sought. See Nudds and Morrison, "Ten Years After 'Reliable Knowledge': Are We Gaining?", 55 J. Wildl. Manage. 757 (1991). Again, while acknowledging that formal peer review is neither an absolute prerequisite for scientific merit nor a categorical assurance of reliability, the Supreme Court has recognized its value. See Daubert, 113 S.Ct. at 2797.

b. Application of the Scientific Method

As mentioned above, multiple explanations for physical phenomena are always possible. The history of scientific inquiry is replete with examples of highly plausible explanations that have not withstood the test of time. Scientists rely on several principles or strategies to guard against reaching conclusions prematurely or without adequate support.

Most familiar of these principles may be the requirement of replicability. Experimental results, to be viewed as reliable, should be obtainable by other researchers. See, e.g., Moore, op. cit. at 472. In addition, the reliability of conclusions drawn from empirical evidence turns largely on the steps researchers take to discount or eliminate alternative explanations. These include the use of controls and large sample sizes, repetition of experiments, and demonstration of similar results under a variety of conditions. See Romesburg, op. cit. at 306. The last of these is especially important for field tests involving large scale natural processes, ecological relationships, or biotic communities, because of the difficulty or impossibility of achieving true replication of results from such experiments.[2] See Eberhardt, "Testing Hypotheses About Populations", 52 J. Wildl. Manage. 50 (1988); see also Sinclair, "Science and the Practice of Wildlife Management", 55 J. Wildl. Manage. 767, 769 (1991); N. Hairston, Ecological Experiments: Purpose, Design, and Execution 27 (1989); Ludwig, Hilborn, and Walters, "Uncertainty Resource Exploitation, and Conservation: Lessons from History", 260 Science 17 (1993).

A particularly highly valued component of the scientific method is the formulation and testing of explicit hypotheses in what is known as the hypothetico-deductive process. This entails

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[2] In point of fact, because neither any two scientific observers nor any two points in time are identical, perfect reproduction of experimental evidence is an unattainable ideal in any field. See Ziman op. cit. at 42-43, 56. Accepting one experiment as equivalent to another, like the acceptance of an experiment as validating a theory (see id. at 36), entails an exercise of scientific judgment.

constructing a general statement about the physical world (an hypothesis), deducing consequences which must follow if the hypothesis is true, and then testing through observation or experiment to verify whether the predicted consequences occur. If they do, corroborative support for (but not proof of) the hypothesis is obtained; if not, the hypothesis is said to be falsified.[3]

Utilization of the hypothetico-deductive method can significantly enhance the reliability of scientific inquiry. See Moore, op. cit. at 471-72; Futuyma, op. cit. at 168-69; Platt op. cit. at 347. Repeated unsuccessful efforts to falsify an hypothesis serve to strengthen it. This process is applicable to research in conservation biology and related disciplines. See Murphy, "Conservation Biology and Scientific Method", 4 Conservation Biology 203, 203-04 (1990); MacNab, "Wildlife Management as Scientific Experimentation", 11 Wildl. Soc. Bull. 397, 400-01 (1983); Romesburg, op. cit. at 294-97. And its centrality has also been recognized by the Supreme Court. See Daubert, 113 S.Ct. at 2796-97.

c. Measuring and Responding to Uncertainty

The increasing use by scientists of elaborate models and

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[3] In general, it is regarded as an essential criterion of the scientific status of a statement or hypothesis that it be "falsifiable", i.e. capable of disproof through observation or experiment. See, generally, Popper, "Science, Pseudo-Science, and Falsifiability," in R. Tweney, Doherty, and Mynatt, eds., On Scientific Thinking 92-99 (1981); Ziman, op. cit. at 38.

statistical analysis for generating and testing hypotheses has been accompanied by development of specialized tools for assessing some of the associated uncertainty. Among these is "sensitivity analysis", which quantifies how the predictions from a model may vary with changes in the assumptions incorporated into it. See H. Caswell, Matrix Population Models, Chap. 6 (1989). In statistical analysis, "confidence limits" estimate the likelihood that the characteristics of a sample match those of the larger population from which the sample is drawn. See R. Sokal and F. Rohlf, Biometry: The Principles and Practice of Statistics in Biological Research 138-42 (1969). Scientists using statistics to test hypotheses also estimate the "statistical power" of their tests, i.e. the tests' ability to identify and reject false hypotheses.[4] See Taylor and Gerrodette, op. cit.; Peterman, "The Importance of Reporting Statistical Power: The Forest Decline and Acidic Deposition Example", 71 Ecology 2024 (1990). The use of all these analytic tools parallels the Supreme Court's observation that information

[4] More precisely, statistical power is the probability that, based on statistical analysis of a sample of a particular size, a researcher will correctly reject one of two alternative hypotheses, the one known as the null hypothesis, when it is in fact false and the alternative true. Sokal and Rohlf, op. cit. at 163. The framing of alternative hypotheses, one of which (the null one) predicts that an outcome will not occur or a relationship does not hold and the other of which predicts that it will or does, is a technique that scientists sometimes use to produce better defined and more reliable hypotheses. See Taylor and Gerrodette, "The Uses of Statistical Power in Conservation Biology: The Vaquita and Northern Spotted Owl", 7 Conservation Biology 489 (1993); Shrader-Frechette and McCoy, op. cit. at 96.

about the "known or potential rate of error" associated with a scientific technique facilitates evaluation of its reliability in judicial proceedings. Daubert, 113 S.Ct. at 2797.

The scientific community also sometimes uses risk analytic techniques to assess the potential consequences of incorrectly embracing or rejecting an hypothesis. See, e.g., Maguire, "Risk Analysis for Conservation Biologists", 5 Conservation Biology 123 (1991). Of particular concern in medicine and the applied sciences is so-called "Type II" error (failure to perceive or predict real effects of an action like administering a drug or logging a forest) when the unpredicted consequences are serious and/or irreversible (for example, allergic reactions, or the extinction of a species). Scientists investigate this issue both because experimental design can reduce the risk of Type II error (provided increased risk of another kind of error is accepted), and because of the implications for decisionmakers faced with substantial uncertainty. See Shrader-Frechette and McCoy, op. cit.; Taylor and Gerrodette, op. cit.; Peterman, op. cit.

B. The Reliability of Conservation Biology

As the previous discussion suggests, for scientists the relevant question is not whether some statement or theory is certain, but rather how reliable or valid it is and what the basis is (or bases are) for evaluating its reliability. From this perspective, the scientific community was already in remarkable accord over some of the central theories of conservation biology by 1986, when the initial administrative appeal upon which this case rests was filed. If anything, even greater consensus on these points existed in 1990, when the Chief of the Forest Service dismissed them, under the rubric of island biogeographic theory, as "untested theory", for want of "conclusive empirical evidence." Marita at 26. Spirited discussion over the precise causal mechanisms and detailed site-specific implications of the principles detracted nothing from their general acceptance.

The most central, and perhaps best established, of these theories is the proposition that, other factors being equal, large reserves are superior for purposes of conserving biodiversity than small ones. In 1986, two eminent researchers could state emphatically and without contradiction in the published literature that "[n]ature preserves should be as large as possible." Soulé and Simberloff, "What Do Genetics and Ecology Tell Us About the Design of Nature Reserves?" 35 Biological Conservation 19, 32 (1986). The same year, another group of scientists addressing the need for protected areas concluded "[a]ll other things being equal, priority should go to the largest remaining fragments." Wilcove, McClellan and Dobson, "Habitat Fragmentation in the Temperate Zone", in M. Soulé, Conservation Biology: The Science of Scarcity and Diversity 237, 253 (1986). Four years earlier, Simberloff and Abele wrote that "[n]either we nor, to our knowledge, anyone else has ever suggested that a smaller total area of any configuration will conserve more species than a larger one, all other things being equal." Simberloff and Abele, "Refuge Design and Island Biogeographic Theory: Effects of Fragmentation, 120 Am. Nat. 41 (1982). And as early as 1980, Bruce Wilcox could unequivocally report that "[i]t has become axiomatic in ecology that if isolates or sample quadrats are censused, those of greater area will have more species."[5] Wilcox, "Insular Ecology and Conservation", in M. Soulé and B. Wilcox, eds., Conservation Biology: An Evolutionary-Ecological Perspective 95, 96 (1980). That same year, other researchers noted that "[t]he most far-reaching result of past studies is the demonstration that extinction is strongly area dependant." Terborgh and Winter, op. cit. 119, 120.

The record in this case, to the extent that amici are familiar with it, confirms the unanimity of opinion on this central point: large reserves preserve elements of biodiversity

[5] Wilcox attributed this primarily to greater total habitat area and greater habitat diversity. Other researchers have noted a variety of related factors. Some species directly require large areas for viable populations. See Wilcove, McClellan, and Dobson, op. cit. at 253; Soulé and Wilcox, "Conservation Biology: Its Scope and Its Challenge" in Soulé and Wilcox, eds., Conservation Biology: An Evolutionary-Ecological Perspective 1, 5 (1980). Other species are likely to be lost through secondary extinctions, following the loss of area sensitive species. See Wilcove, McClellan, and Dobson, op. cit. at 251; Terborgh and Winter, "Some Causes of Extinction", in Soulé and Wilcox, eds., Conservation Biology: An Evolutionary-Ecological Perspective 119, 129 (1980); Soulé and Simberloff, op. cit. at 34. Large areas are needed in order to accommodate ecologically important large scale disturbance regimes (like fire). See Soulé and Wilcox, op. cit. at 5; Appellants' Appendix at 232. Hedges are needed against the presence of undiscovered species and unanticipated vulnerability in known species. Soulé and Simberloff, op. cit. at 35; Appellants' Appendix at 241.

that disappear from smaller ones. A considerable number of preeminent scholars expressed this view to the Forest Service directly. See generally Appellants' Appendix (A.A.) at 226-250; id. at 226 (Prof. Jared Diamond: "many studies"), 228 (Prof. Paul Ehrlich: "many studies"), 232 (Prof. Richard Forman: "[l]arge remote tracts ... are required"), 235 (Prof. Larry Harris: forest interior "species do require large blocks"), 237 Dr. Daniel Janzen ("wasting your time with forest blocks less than about 50,000 hectares"), 239 (Prof. Robert May: "scientific need for some areas of this size"), 240 (Dr. Peter Raven: "large block of old growth ... is ... critical"), 242 (Prof. Daniel Simberloff: his writings do not imply "no need for very large blocks"), 245 (Michael Soulé: "overwhelming consensus"), 248 (Dr. Bruce Wilcox: "overwhelming scientific evidence"), 250 (Prof. E.O. Wilson: "fully endorse"). In addition, a lengthy bibliography appears in the record, listing published articles bearing on this fundamental theorem about large reserves. A.A at 217-225.

This central proposition about large reserves bears several of the indicia of reliability discussed earlier. A voluminous literature had, even by 1986, aired the issue. Many of the periodicals carrying relevant articles were (and are) peer reviewed. Many of the articles reported field studies, conducted under a variety of conditions and in differing locales, the results of which are consistent with (i.e. fail to falsify) the theory.[6] In addition, accepting the proposition's validity, which results in conservatism about alteration of the natural landscape, takes some account of the irreversible effects of Type II error in conservation planning.[7]

Plainly, the literature and administrative record of this case also reveal considerable uncertainty and disagreement about how large forest reserve blocks should be to ensure conservation of the biodiversity currently found in, for example, national forests in Wisconsin. From a scientific viewpoint, however, nothing in this continuing debate supports abandoning the basic theory so thoroughly as to designate no large blocks at all for diversity purposes. In particular, it would seem inappropriate to treat scientists' candor about uncertainty, and the scientific dialogue through which uncertainty is reduced, as a reason to reject the superior reliability gained through scientific

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[6] Some similar indicia of reliability were enjoyed by related elements of island biogeographic theory, lemmas which may account in part for the increased diversity of larger reserves, especially the reduction of effective habitat area through so-called "edge effects", and the adverse effects of habitat isolation on population persistence. See Saunders, Hobbs, and Margules, "Biological Consequences of Ecosystem Fragmentation: A Review", 5 Conservation Biology 18 (1991); Wilcox and Murphy, "Conservation Strategy: The Effects of Fragmentation on Extinction", 125 Am. Nat. 789 (1985); Noss, "A Regional Landscape Approach to Maintain Diversity", 33 BioScience 700 (1983); and references collected therein.

[7] This precaution may be particularly significant in the context of reserve design for national forest lands, because they harbor a disproportionately large percentage of the country's residual diversity and relatively undisturbed land. See Brussard, "The Role of Ecology in Biological Conservation", 1 Ecological Applications 6, 9 (1991).

inquiry, on those points that are generally accepted.

Moreover, although the record in this case does not reveal the degree to which the conservation biology principles involved were derived and tested according to the hypothetico-deductive method, it has elsewhere been shown how that method can be brought to bear on the task of designing specific reserves in keeping with those principles. Specifically, contemporaneous with consideration of the administrative appeal in this case by the then-Chief of the Forest Service, the biologist who now serves as Chief was heading an inter-agency team of scientists charged with constructing a scientifically credible conservation strategy for northern spotted owls on national forest lands.[8] See Murphy and Noon, "Coping With Uncertainty in Wildlife Biology", 55 J. Wildl. Mange. 773, 776--78 (1991); Murphy and Noon, "Integrating Scientific Methods With Habitat Conservation Planning: Reserve Design for Northern Spotted Owls", 2 Ecological Applications 3-17 (1992). The interagency team started with five "generally accepted" principles, including that population persistence increases with population size and habitat patch size. These principles inspired a tentative reserve

[8] As this process was getting under way, and shortly before the Forest Service rejected island biogeography theory as "untested", this same scientist who is himself now Chief of the Forest Service published an article calling on conservation biologists to lend their urgently needed expertise to management agencies faced with the task of conserving biodiversity. See Thomas and Salwasser, "Bringing Conservation Biology into a Position of Influence in Natural Resource Management", 3 Conservation Biology 123-27 (1989).

design, which was refined through an iterative process of hypothesis testing. Ultimately a reserve design was generated that was consistent with (i.e. not falsified by) available data from field studies and modeling. See Murphy and Noon, "Coping With Uncertainty" at 776-77; Murphy and Noon, "Integrating Scientific Methods" at 7-15.

C. Reviewing Agency Assertions of Scientific Expertise

This case involves a widely accepted scientific principle, applicable to a major land management decision, which principle the managing agency, as far as amici can discern, effectively chose to discount altogether. It thus raises a significant question about what grounds, if any, agencies should have for dismissing the best information available from the relevant scientific community. By well-established judicial rule, "[w]hen experts express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts, even if, as an original matter, a court may find contrary views more persuasive." Marsh v. Oregon Natural Resources Council, 490 U.S. 369-378 (1989). However, if courts simply accept asserted choices among competing experts at face value, the distinct possibility exists that agencies, by regularly making such claims, could immunize their decisions from all meaningful judicial review.

Amici suggest that there is an important role for courts under the circumstances described here, consistent with the governing case law. For there to be an authentic choice between "conflicting views", the choice must have some minimum plausibility. That is, for a genuine conflict to exist, the views must enjoy at least a modest parity. This is implicit in both the meaning of the words and the Supreme Court's emphasis on the "reasonable opinions of ... qualified experts." Id.

The factors relied upon by the relevant scientific community to enhance and evaluate a proposition's reliability provide courts with a sensible, appropriate, non-intrusive means to gauge whether an asserted conflict of scientific views is in fact genuine. Without examining the substantive merits of the expert analyses or opinions, courts could assure themselves that the views share at least some of the basic indicia of reliability, (publication or review, use of scientific method, and/or estimates of error). This is just the sort of inquiry which the Supreme Court is "confident that federal judges possess the capacity to undertake." Daubert, 113 S.Ct. at 2796. If the rejected views are not qualitatively more reliable, gauged by the scientific community's criteria, the court's inquiry would end. Where rough parity of reliability is not apparent, however, the court would look further at the relative merits of the opinions, in order to ensure that federal agency decisions do not rest wholly on claims that would not even ordinarily be admissible in federal court, at least when securer grounds for decisionmaking are available.

Respectfully submitted, this 24th day of May, 1994.

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The Society for Conservation Biology,
and the American Institute of Biological
Sciences.