

Testimony of
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before the

House Resources Committee

on

HR 2829 and HR 3705

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Andrew Dobson is Chair of the NRC/NAS *Diversitas* Committee – the Committee that coordinates inter-disciplinary research on Biological Diversity within NRC/NAS. At an International Level ‘*Diversitas*’ coordinates scientific input into the various conventions that deal with Biological Diversity and the Natural Environment.

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Thank you for the opportunity to present this testimony. As a scientist, I have a range of serious concerns about the legislation before us today. One concern is that the bills would limit scientists’ ability to use some of the most important mathematical tools used widely in the scientific community today and could limit tools of the future. A second concern is that the bills distort and misunderstand the nature of the peer review process.

In the mid-1990s the Ecological Society of America drafted a white paper that addresses science and the Endangered Species Act. Similarly, the National Academy of Sciences National Research Council published a detailed final report entitled “Science and the ESA.” Both these studies, by two of the largest and most eminent associations of scientists in this country, reached the same basic conclusion: “*The Act is a powerful and sensible way to protect biological diversity*” (Ecological Society of America); and “*There has been a good match between science and the ESA.*” (National Research Council). I am one of the authors of the Ecological Society of America report, which I am submitting for the record. In addition, I have here, which I’m also submitting for the record, a letter signed by a number of leading scientists that raises concerns that the bills before you could seriously impact the way best available science is defined and considered. Also submitted is a paper from Science on the geographic distribution of endangered species in the United States, which illustrates that a relatively small area of land is needed to conserve endangered species. I greatly appreciate the opportunity to share a few additional thoughts with you today.

1) There are distinct similarities between conserving endangered species and preventing disease outbreaks:

- A) Preventing an endangered species from going extinct and controlling the spread of pathogens and infectious diseases present similar challenges. Both exercises seek to make the world a healthier place – both require a mix of mathematics, statistics, and the collection and analysis of data from the laboratory and field.
- B) As an important example of this consider last year's outbreak of foot and mouth disease in the United Kingdom. Within two weeks of the outbreak starting the government was entirely dependent upon a group of mathematical ecologists and the models they developed to predict the effectiveness of a control strategy for the epidemic. Their predictions for when the epidemic would die out ultimately determined when the government could hold the National election. If there were a similar disease outbreak in the US – of livestock or humans – you would need the aid of similar models and expertise. It's the same mathematical problem as preventing species go extinct.
- C) Many of the people involved with the conservation of biological diversity are the same people involved with controlling infectious diseases of humans and domestic livestock. All of the people at the cutting edge of those disciplines use a mixture of mathematical models, long-term data, and experiments to understand the natural world.

2) The Endangered Species Act and the proposed changes to the peer review process

- A) The Endangered Species Act is fundamentally sound. It's one of the few pieces of legislation that require many important decisions to be based solely on science. *As the Ecological Society white paper points out: "Biologists in the agencies responsible for implementing the Endangered Species Act generally try to use the best scientific information and methods available. Failure to use the best available information and methods is generally due to inadequate budgets and overworked staff." Ecological Society of America 9.*
- B) From a Scientific point of view the proposed Bills don't seem to have any understanding of how science works. To talk of data as being 'peer-reviewed' simply illustrates a lack of comprehension between the product (data) and the process of producing it and reasoning from it (which may need to be peer-reviewed).
- C) A key point here is that both of these bills propose peer review for jeopardy opinions, but not for non-jeopardy opinions. This creates an egregious asymmetry in the way that species would be dealt with. In particular it will slow the listing process for species for which simple and effective protection may be developed, while focusing agency attention on a tiny minority of species. As the Ecological Society pointed out in their white-paper: *"For species deserving protection, delaying the decision to provide protection and recovery will bring most of these vulnerable species even closer to the brink of extinction, restrict the options available for achieving recovery, and increase the eventual cost of the recovery process."*

D) There also seems to be an underlying assumption that an NAS committee could be assembled at any time to sit in judgement on any vaguely contentious case. While such a committee may eventually come to a suitably august judgement, in most cases the local agency people will know much more about the species in question. However, the last thing that scientists (and agency people) need is to be bogged down in an endless peer-review process. There is no career incentive for scientists to take part in such reviews. Equally there is no incentive for the NAS/NRC to endlessly spend their time reviewing each transgression of the ESA. The proposed Bill effectively suggests the equivalent of removing speed detectors from the police, allowing them to guess the speed of vehicles, and then suggesting that traffic offenders appeal to the Supreme court over speeding tickets.

3) Funding for the Endangered Species Act

- A) The main problem with the ESA is it is massively under-funded. The annual funding for implementation of the ESA in the Department of Interior is around \$125 million. This year the Administration has requested just \$9 million for listing and critical habitat designations. Last year the FWS estimated that it needs \$120 million to process the current backlog of needed listings and critical habitat designations. According to the FWS there are more than 250 species waiting for protection under the ESA. The longer we leave them unlisted, the harder and more expensive it will be to effectively protect them once listed.
- B) Let me make a pertinent comparison here: the current levels of funding for Endangered Species are equivalent to less than six hours of the annual Pentagon budget and less than half their Advertising budget. Yet conservation of biological diversity is an equally important National and International Security issue. As a scientist and epidemiologist, I would argue that the health and security of my children is as dependent upon a healthy and intact environment, as it is upon military preparedness.
- C) As an example consider that more than half the people in this room will probably die from a natural resource exhausted in our lifetimes – antibiotics capable of effectively controlling harmful bacteria. Antibiotic resistance is a direct example of misuse of natural resources (and a wonderful example of evolution in action). This proposed bill will allow similar misuses of natural resources that will ultimately reduce the quality of life for most Americans. Again its ironic that we see biological weapons as a threat to National Security, while discussing bills that have all the potential to create biological disasters that may have a huge impact on human health.

4) The importance of conserving biological diversity

- A) Biological diversity is the world's ultimate resource – it supplies humans with food, medicine, and ecosystem services. The global economy and whence global security are wholly dependent upon a healthy and intact environment.
- B) Biological diversity is produced by the world's most powerful force – evolution by natural selection. This creates the ultimate irony. The Endangered Species Act isn't designed

solely to protect biological diversity. Its long-term goal is to protect us from the folly and short-term greed of our own actions. Nature can ultimately and relatively effortlessly recover from some of the effect of human activity, although the loss of any species is irreversible. The more pertinent question is can humans coexist with nature in a way that will maintain a healthy and secure world for our children?

- C) The proposed Bills change the definition of best available science by removing some of the principal scientific tools such as mathematical modeling and population viability analysis and replacing them with 'expert opinions' that may be easily distorted by significant conflicts of interest. This again illustrates a deep lack of understanding of the scientific process. Science is only viable when it uses the most up-to-date variety of tools to develop insights into the underlying process. Each member of the committee should ask themselves "If you were ill, would you trust a physician who restricted himself to the use of nineteenth century technology and diagnostic techniques?"
- D) The Bills we have discussed today cannot easily be tinkered with and fixed –they will suffocate the Fish and Wildlife Service under a flood of pointless additional bureaucracy. This is most clearly illustrated by its emphasis upon inappropriate peer-review and the removal of the use of mathematical analysis from the Listing Process. This is the direct equivalent of saying: "We have lots of 'soon to be unemployed friends' at Arthur Anderson, let's get them to run the economy and lets also do away with the models developed by Alan Greenspan and his colleagues at the Federal Reserve". Instead members of the committee should realize there are deep similarities between the mathematical models that economists use and those used by ecologists. In essence, economics is just the ecology of money and jobs. As the global economy is a wholly owned subsidiary of the natural economy, the future health and wealth of the planet depends upon a dialogue between economists and ecologists. The common language of this dialogue is mathematics. As it is in all the sciences.
- E) I personally find it unfortunate that these bills are under discussion. Today's debate is occurring at a time when we should be strengthening the science and funding for the Endangered Species Act. Indeed, if the US is genuinely concerned with long term, global security, we should actually be debating the ratification and signing of the Convention on Biological Diversity. The continuing failure of the US Congress to endorse and strengthen these fundamental pieces of environmental legislation increasingly reflects a chronic long-term misunderstanding of the major underlying processes that determine human health, wealth, and global security.