

The Ecological Society of America

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RESPONSE OF THE ECOLOGICAL SOCIETY OF AMERICA TO A REQUEST FROM THE NATIONAL RESEARCH COUNCIL TO REVIEW THE PROPOSED NATIONAL BIOLOGICAL SURVEY

The Ecological Society of America endorses the concept of the National Biological Survey.

The diversity of life on Earth constitutes both a unique heritage from the past and a unique resource for the future. Despite widespread acknowledgement that the quality of life of future generations of humans depends critically on the conservation of biological diversity, this resource is now being threatened by the unsustainable activities of our generation. The National Biological Survey (NBS) will be an important and necessary step toward meeting our national goal of conserving biological diversity.

In 1991, the Ecological Society of America launched the Sustainable Biosphere Initiative (SBI) by issuing a report¹ presenting the Society's views concerning the research priorities in ecology for the 1990s. This report concluded that "an ambitious program of biological inventory is needed not only to catalog and map the world's major distributions of species and species associations, but also to link the pattern of distribution of species and habitats with natural and anthropogenic processes that affect biological diversity." The SBI report also called for "coordination among ecologists, systematists, and natural resource biologists working across very different spatial and temporal scales" to inventory the world's biological diversity. The establishment of the National Biological Survey in the United States will not only be critical to our national needs but will also set a standard for international efforts to survey and conserve global biological diversity.

The NBS should include the major functions of survey, monitoring, and research, all focused on understanding patterns of biological diversity.

The National Biological Survey should include survey, monitoring, and research components, all focused on understanding patterns of biological diversity at all levels—genes, species and ecosystems. It is essential that the surveying and monitoring efforts of the NBS not focus solely on endangered, threatened, or charismatic species, but rather include all biological taxa and the habitats they require. Although providing better information on the abundance, distribution, and population trends of organisms should be a major goal of the NBS, the interpretation of such patterns and trends requires that the NBS also undertake a major research effort to understand better the causal mechanisms promoting change.

The information gathered by NBS will be useful for setting public policy only if it is scientifically and statistically sound. National survey and monitoring programs must be designed for statistical and inferential reliability. This will require a substantial planning effort and the formulation of statistical guidelines before new data are gathered. The NBS must not, however, make the mistake of confusing statistical soundness and ecological relevance. Documenting the changes in abundance and distribution of species will ultimately be futile unless we understand the ecological processes controlling rates and direction of change. To contribute significantly to the long-term goal of preserving biological diversity, the NBS should include a strong hypothesis-driven research program aimed at understanding the processes controlling biological diversity at all levels of organization.

The NBS must build on and strengthen the existing biodiversity information network.

To be successful, the NBS must complement existing public and private efforts to catalog and understand patterns of biological diversity. The State Heritage Programs provide an invaluable source of information on biological diversity and have a proven track record of providing information to agencies, private citizens and other decision-makers. The NBS must cooperate with professional societies, non-government organizations, such as the Nature Conservancy and the World Resources Institute, and multi-national organizations, such as the UN Environmental Program, the International Geosphere-Biosphere Program and the Sustainable Biosphere Program.

The success of the NBS will be intimately tied to how well its programs are coordinated with research programs of other federal agencies. The NBS is being created to consolidate and coordinate efforts within the Department of the Interior, but on-going and planned activities in the US Forest Service, the National Science Foundation, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and other federal agencies are also critical to the nation's efforts to understand and preserve our biota and ecosystems. The Biodiversity Research Consortium, created to coordinate the existing biodiversity programs of several federal and private groups, must be expanded. Furthermore, consideration should be given to moving the management of the Biodiversity Research Consortium to the NBS once it is created.

Interest in biological diversity and other ecological topics has created an expansion of federal environmental programs at a time when increased cooperation and coordination are more important than ever. The strength of the NBS proposal is that it brings together functions of several federal agencies, albeit several agencies of a single federal department. The nation needs a stronger, more integrated, and more cohesive federal environmental research program, and the government should be seeking ways to coordinate and consolidate existing and new federal environmental activities. The creation of the NBS should not be seen as a substitute for other, more comprehensive, proposals aimed at improving the scientific basis for making decisions about the environment.

Research conducted by the NBS must be derived from management and policy needs.

Considerable progress has been made in recent years to improve communication between federal land managers and research scientists. For example, recent efforts to house research scientists in national parks have improved the quality of scientific research done in parklands and have helped to ensure that science is incorporated into decision making at the local level. The NBS needs a formal mechanism for making certain that strong links are maintained between research scientists and local managers and for ensuring that its research priorities are derived from interactions between managers and scientists at a local level. The NBS must also ensure that its research results are rapidly disseminated and made available in a form useful to local decision makers.

The dual problems of maintaining high scientific standards and serving the immediate needs of managers are bound to lead to conflicts over research priorities and approaches. Scientists and policy makers at the national level will want to know about long-term and broad-scale trends in biological diversity and will insist on the most statistically-reliable and scientifically-defensible information, even if the results are slow in coming. Managers at the state and local level will usually want site-specific information, and they will want this information quickly even if this means some sacrifice in scientific precision.

To meet the dual needs of both national policy makers and local land managers, the NBS will require a dual approach to setting research priorities. A "top-down" approach will be necessary to plan and conduct national-scale surveys and monitoring. This approach should include broad-scale, long-term studies designed to indicate the status and trends of the nation's biota. The second approach must be "bottom-up" with research priorities being set by those working in the local area where the problems to be addressed exist. NBS projects at the local level must, of course, still be responsive to national goals and standards, but local research priorities must derive from the interaction between managers and scientists on the local level.

One possible means to link the national goals and local needs would be to establish state NBS offices, perhaps through cooperative agreements with universities. These state NBS offices could function as a liaison to local management personnel, and thereby, help to define research goals responsive to local needs but consistent with national policies. Once research needs are

identified, a formal merit-based, peer-review process should be used to prioritize and fund projects. Each state office would also be charged with ensuring that research results are communicated back to the local level and incorporated into local management decisions.

An infusion of new scientific and administrative staff is needed to invigorate the NBS.

Current plans call for the NBS to be staffed largely by existing Department of Interior (DOI) employees, particularly Fish and Wildlife Service career scientists. The DOI has many outstanding scientists who are well qualified to meet many of the needs of the NBS; however, the NBS will have a broader mission than the Fish and Wildlife Service has had in the past. To survey and monitor the nation's biota, the NBS will need to recruit new staff scientists, particularly ecologists and systematists who work at various levels of ecological organization and on taxonomic groups not currently investigated by DOI scientists. Furthermore, not all of the current mid-level DOI administrators are committed to the NBS and some have little interest in changing the status quo. It is critical that individuals appointed to influential positions in the NBS be fully committed to achieving its goals.

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The purpose of the Ecological Society of America is to foster the study of the interrelations of organisms and their environments, to facilitate an exchange of ideas among those interested in ecology, and to instill ecological principles in the decision making of society at large. The 7000 members of our society represent one of the largest sources of information on biological diversity and other ecological topics. We appreciate having the opportunity to comment on the establishment of the NBS, and we hope to be a cooperator in ensuring its success.

¹ Lubchenco, J., A.M. Olson, L.B. Brubaker, S.R. Carpenter, M.M. Holland, S.P. Hubbell, S.A. Levin, J.A. MacMahon, P.A. Matson, J.M. Melillo, H.A. Mooney, C.H. Peterson, H.R. Pulliam, L.A. Real, P.J. Regal, and P.G. Risser. 1991. The Sustainable Biosphere Initiative: An Ecological Research Agenda. *Ecology* 72(2):371-412.