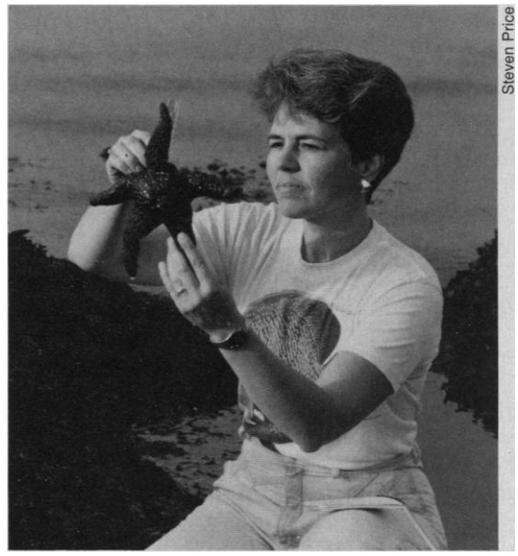
Ecologists Set Broad Priorities for 1990s

The Ecological Society of America gives top billing to research related to environmental problems

THREE YEARS AGO, NATIONAL ACADEMY of Sciences (NAS) President Frank Press issued a challenge to the scientific community: Rank research priorities within your fields, or risk having Congress or funding agencies decide what is scientifically most important. But his challenge met with a resounding silence. With the exception of astronomers, who recently offered their own priorities for the 1990s (*Science*, 22 March, p. 1429), few researchers have been willing to state formally what are the hottest—and, conversely, the coldest—areas of their disciplines. Now, however, the Ecological Society of America promises to give priority-setting a try. This month it published an "ecological research agenda" for the 1990s* that lists broad areas of ecology the society says should be emphasized. Next, the society is planning to take the much more painful step of recommending which specific fields should be funded—or, if necessary, cut.



Steven Price

Hot topic. *Jane Lubchenco's committee urges more research on marine life and global warming.*

Even though the ecologists haven't yet made those hard choices, they have already demonstrated how time consuming priority-setting can be: It took a 16-member committee from a wide array of subdisciplines of ecology 2 years to come up with what they believe should be a blueprint for ecological research in the next decade, even if it contains few specifics. In many respects, the document is a call to arms to ecologists to make their basic research more relevant to pressing environmental problems—such as global climate change, the loss of diversity among species and populations, and the destruction of natural habitats. Accordingly, top priority goes to interdisciplinary research that applies in some way to those problems, perhaps indicating a sea change in a field in which applied research has long been considered a weak stepsister to more elegant basic research.

Still, the society's leadership claims there is tremendous support among its 6200 members for the document. But that might be due in part to the fact that its highest priority seems to be to get more overall funding for ecology—as well as the fact that it doesn't say what should be cut if budgets remain constrained. "There is indeed something in it, if not for everyone, then at least for most people," admits Simon Levin, president of the society and a professor of biological sciences at Cornell University. Levin says, however, that the society has already formed committees that plan in the next year to set detailed funding priorities for specific specialties.

Perhaps to encourage the ecologists to go down this thorny path, the people who do make the tough decisions about funding ecological research—government program analysts and congressional aides—welcome the document as a significant first step, and applaud the ecologists for doing it voluntarily: "What's most immediately useful is that it sends a signal from the community that they're willing to sit down and struggle with the fact that there aren't enough resources to do everything, and to say what they think as a scientific group is most important," says Frank Harris, executive officer for the directorate for biological, behavioral, and social sciences at the National Science Foundation.

The first category the society deems most important, global change, won't strike anyone as counterintuitive—after all, it is hardly a neglected field these days. But the ecologists say more attention (and money) should be devoted to examining how climate changes will affect complex ecological systems, and vice versa. For example, a change in the balance of different species of plankton in the ocean could affect the severity of global warming through a complex chain of events, says Jane Lubchenco, former chairwoman of the committee and chair of the department of zoology at Oregon State University. Some plankton, she notes, emit gases that, in turn, create the seeds for cloud formation. And those clouds affect the rate at which heat escapes the earth's surface. Yet, little is known about these processes, including the factors that lead to one type of plankton's dominance.

The society's second priority—biological diversity—also has been well funded in the past, but the report recommends a shift in emphasis. Traditionally, most work has been aimed at enumerating species and preserving their habitats; the report concludes that more research is needed to understand how changes in climate (such as water, habitat, nutrients, and temperature) affect the genetic diversity of a species or a population. In turn, how a species' behavior affects its habitat is also relevant: When elephants destroy the trees in Kenya's Amboseli Game Reserve, for example, it leads to desertification, which alters the climate.

The ecologists' third research priority—the sustainability of ecological systems—is the least well funded of the three. Its aim is to understand how stresses and other changes—ranging from pests and diseases to human impacts—affect a habitat and its inhabitants. The ultimate goal is to explain these complex processes better, so that threatened habitats can be saved and damaged ones restored.

To pursue all three priorities adequately will require "significantly increased funding" from both public and private sectors, says the report. But the society is working on ways to raise more funds and hopes, perhaps, that more relevant research will have a better chance at being sold to Congress.

Will this research agenda be a model for other fields? There hasn't been a stampede, as of yet, but gerontologists are due to release their own list of priorities in June, and classical systematists have been sufficiently encouraged by the society's results to start a similar exercise of their own. "I think it's a sign of the times," says the NAS's Frank Press. "More fields are beginning to realize they can do better (in funding) if they set their own priorities. A rational approach to national research requires it."

■ ANN GIBBONS

*"The Sustainable Biosphere Initiative: An Ecological Research Agenda," *Ecology*, April 1991, p. 371.