

Genetics Conference Draws 300 Attendance

More than 300 field scientists and resource managers from Federal, State, and private sectors met for five days in Washington, D.C., August 9-13 to listen to two dozen of the world's leading geneticists and to consider the state of the art in managing natural populations, including the newest developments from the fields of evolution and genetics.

The international symposium and workshop was billed as "The Application of Genetics to the Management of Wild Plant and Animal Populations," and the actual proceedings hewed closely to the five workshop aims:

- to review the scope, magnitude, and sources of worldwide plant and animal species losses;
- to assess the economic, social, ecological, political, and strategic implications to the U.S. and other countries of a continuing decline in species diversity, particularly as it may relate to world food supply, energy demand, and industrial output;
- to identify and evaluate technologies, institutions, and scientific knowledge available for conserving biological diversity;
- to review the nature and effectiveness of U.S. government domestic and international policies and programs, and
- to recommend initiatives the U.S. should undertake to stimulate and assist an expanded worldwide effort in this area.

Each morning session consisted of five lectures by such authorities as Sir Otto Frankel, Paul R. Ehrlich, and Michael E. Soule; the afternoon sessions were given over to workshops on specific problems. The bringing together of people from a variety of communities — zoos, small state parks, huge National Parks — had much the same effect as a series of overlays, showing up the similarity of problems faced by all. If we choose to

interfere in natural genetic events, what measures are available to us? How can we find out more about the long-term effects of implementing these measures? For instance, what happens when historically isolated populations are mixed?

The week-long discussions pointed steadily to one conclusion: that the health or collapse of ecosystems frequently depends on management's ability (or failure) to foresee the vulnerability of populations and how various populations interact in the long time-frame.

General topics for the five days were (1) isolation of populations, (2) extinction of populations, (3) founding populations, (4) merging of naturally diverging populations, and (5) preserving the natural integrity of populations.

Christine Schonewald-Cox, who organized and ran the conference, is presently compiling and editing a volume to be published by Addison-Wesley of Reading, MA 01867, scheduled for publication in May 1983 for about \$25 a volume. In addition to a compilation of the conference papers, with editorial inserts, the book will contain a complete glossary of terms, a set of exercises in genetics, and an extensive literature list.

Schoenewald-Cox observed that most of the park areas now in existence are relatively small, static ecosystem scraps, containing what are, in effect, enlarged captive populations. She suggested that what is most needed by managers is an understanding of their role in dealing with the problems of managing genetic material in small areas. "The reasons for this are two," she said. "First, the aesthetic (and possibly the moral) obligation to keep as many species as possible from disappearing. Second, the possibility that in some future time we might again be able to re-establish sustaining populations of the species we have kept alive."

The book that is growing out of this conference is envisioned by Shonewald-Cox as "a reference/text, primarily for those interested in managing natural populations."

A mailing list of all those who attended is available from Schoenewald-Cox at the Natural Sciences Division, National Park Service, Department of the Interior, Washington, D.C. 20240.

From the Everglades One Scientist's View

By James A. Kushlan
Research Biologist, Everglades, NP

One should feel fortunate if the benefits of attending meetings match, over the long run, the time and energy expended in attending them. The Symposium on Application of Genetics to the Management of Wild Plant and Animal Populations will balance many ~~more~~ of the more usual sorts of meetings. Arriving with no special expectations, a nearly open mind, and an active interest in the topic (a matter of concern for a park faced with a small and in many cases rapidly decreasing animal populations), I found myself a few days later with many expectations, a well exercised mind crammed with ideas and information, and an increased concern for the genetic consequences of resources management.

I judge the symposium to have been an outstanding success. It was, first of all, exquisitely organized. Facilities, readily available background material (actually homework), selection of topics, progression of ideas, and choice of participants left little to be desired. Clear goals and crisp execution allowed the real work to move unrelentingly forward without distraction. That work was to have been the transfer of information and techniques from scientific practitioners to conservation-oriented biologists and managers. This the symposium accomplished, but not, perhaps, in ways some might have expected. Few simple recipes for management action were provided, but the ingredients were identified and mixed well. Early in the conference, which provided ample opportunity for discussion, the scarcity of answers was viewed with disappointment. Few thought so by the end, when everyone had been taught what questions to ask.

Simple solutions do not exist for management of wild populations. Ecology and genetics under the best of circumstances can provide their theories and their new ways of approaching old problems. This conference supplied both, and any manager willing to concern himself seriously with resource problems could not help but benefit from the new ways of thinking offered by the speakers, workshop leaders, and participants. Such a manager would now realize that preservation of genetic resources is as

fundamental a concern as preservation of species diversity, population size, demography, community structure, and ecosystem processes. Ignoring any of these concerns will lead to the loss of resources.

That approaches and insight were offered rather than recipes is not surprising in retrospect. Population genetics, especially at the molecular level, is one of the most rapidly developing, changing, and diversifying fields of biology. All but a few population geneticists, supported solely and poorly by funding for pure research, have had little opportunity to think about the practical application of their work to wild populations. The guidance of the pioneers of conservation genetics was much in evidence at the conference, which should be viewed as a beginning, not the end, of the difficult task of transferring ideas and techniques across disciplines. The beginnings were mutualistic, most of the geneticists benefitted as much as did the field people. The geneticists had their interests broadened, their fruit-fly oriented ideas debated, and their contributions appreciated. Some of the most distinguished of evolutionary geneticists will be devoting much more effort to real-life problems in the years ahead, and that may be the most lasting accomplishment of this landmark symposium.

We should not, though, let the excitement of discovery cause us to swallow new approaches in their entirety. In the recent past, uncritical acceptance of the management applicability of concepts such as island biogeographic theory and the once axiomatic correlation between species diversity and community stability has become somewhat embarrassing when more thorough debate revealed fundamental weaknesses and ambiguities.

Likewise, application of molecular genetics, to ecosystem management stands in need of thorough and prolonged debate. By the conference's end nearly all participants had converted to the belief that conservation of genetic diversity was a worthwhile goal under nearly all circumstances.

But an ecosystem manager might need to search a bit further for guidelines. The logic of maximizing the genetic diversity of captive tigers does not necessarily hold for all wild populations. In some parks where natural selection has been highly directional, might not genetic diversity be naturally low in populations specifically adapted to their local environment? We have, for example, found that Everglades alligators have very low levels of

electrophoretic variability but are genetically distinctive from other populations. Should it not be the purpose of a national park to preserve the genetic distinctiveness of the local populations irrespective of how genetically diverse they might be or what portion of their species' genes they might retain? That we may have more thinking to do should not detract from what has been accomplished. The symposium forcefully opened the way to exploring such problems, and that is as much or more than anyone should have hoped for.

And From Hawaii Another Observation

By Charles P. Stone

Research Scientist, Hawaii Volcanoes NP

The Genetics/Management Conference was one of the top three meetings I have ever attended. I especially enjoyed the interaction among the geneticists. The workshop served to bring me up to speed and made me feel more confident about recommending things to management. Several others expressed the same feeling.

I had long conversations with two managers who also felt it was excellent. Their main criticism the last night, was that there should have been more biologists other than geneticists. I was surprised too that more State Forest Service and Fish and Wildlife biologists didn't show up, but unless distribution of the brochures was badly skewed that is not the fault of the organizers.

My one criticism is that not nearly enough was said about preserve size and design with respect to genetics, island biogeography theory, etc. I guess maybe Craig Shaffer will have a workshop to handle that; but it can come none too soon. I really think we're wasting time and effort on tracts that are unmanageable for the long term. Preserve strategy, to me, is one of the most important applications of genetics to management.

I would encourage more efforts of this kind. Please keep them in a workshop

format so people can attend. Whoever decided to do that for NPS people should find out how to do it for other agencies and organizations so more of them can attend

Congratulations to Dr. Briceland, Chri Schonewald-Cox and the others involved for conceiving and hosting this landmark Conference-Workshop.

If It's Loose and Dry SIR Can See Thru It

The Sahara Desert unmasked! This is the possibility raised by a strip of film bearing picture-like data from SIR-A, a synthetic aperture imaging radar system that has been carried over the region on the space shuttle's second test flight in November 1981.

Science News (A Science Service Publication), for June 26, 1982, describes the excitement felt by U.S. Geologic Survey's Carol Breed when she rolled the film out on her light table: "My God, what is the sand sheet?" The image revealed a vast network of channels, "their dendritic patterning reminiscent of riverbeds and tributaries, from little ditches just at the radar's limit of resolution to huge swaths as wide as the Nile Valley." Mauri Grolier, one of Breed's colleagues, has been to the area barely a month before. He had driven over the terrain and testified that there was no trace of what the imagery showed. "Just thousands upon thousands of square kilometers of sand; sand, in places piled tens of meters thick."

In effect, the radar acted as an x-ray. Instead of reflecting the radar beam, a solid surface or a layer of water will do, a low-density surface of loosely packed sand allowed most of the beam's energy to pass right through and be reflected whatever lay beneath. Modifications of the method will be tried on another shuttle flight in the summer of 1984 on SIR-B, being developed at Jet Propulsion Laboratory, Pasadena, CA, under direction of Charles Elachi.

Most of the geological work on the Saharan core that was unveiled is being done at the USGS Branch of Astrogeologic Studies in Flagstaff, AZ. The desert study group is headed by Jack McCauley.