

ICHTHYOLOGY MEETING

Scripps Institution of Oceanography

March 13 and 14, 1997

This is a report of a meeting on the world's oceans fishes sponsored by the Sloan Foundation and the Scripps Institution of Oceanography. Attached are the general terms of reference under which this special review was undertaken. In simplest terms, the object of the review was to enumerate the ocean fish species now identified and to obtain a "best" estimate of the number remaining to be found and where the least explored oceans are and where they are to be found.

The list of participants is attached. It is divided into two groups. The first is the larger and represents the expert ichthyologists. The second group is composed of ocean ecologists, acoustic experts involved in biological assay technologists and generalists concerned with the overall relationship with the goals of the Sloan terms of reference. It is fair to say that the first list represents a significant fraction of the recognized list of ichthyologists as well as covering the world's oceans reasonably completely. There is one exception. It was impossible to schedule a Russian expert to attend and hence an important source was lacking.

Summary Conclusions

The era of exploration is not over!

At the end of the sessions a poll was taken of the experts with respect to the number of remaining species of ocean fishes to be identified. The current total of fish species is now 25,000 of which 60% are marine. To these known 15,000 marine species of fish an estimated 5,000 remain to be identified. Figure 1 (at the end of this document) shows this division with some additional details. It is always to be understood that there are persistent problems of misidentified and duplicate species.

There are major regions of the world that are relatively unexplored. The South Pacific is the outstanding problem. The Western Indian Ocean is another. To these must be added the western equatorial Pacific and the Australasian Seas.

The continental slopes below a depth of 2000 meters are also poorly represented in the current catalogue.

The world's reefs hold the most species diversity. The reef habitat includes rocky reefs as well as corals. Further exploration has been slowed by the understandable growing restrictions on the use of chemicals such as rotenone and cyanide. That much more remains to be done on the reefs has been exposed by the use of submersibles beyond the practical limits of scuba diving. On an expedition to the Galapagos, McCosker identified 36 new fish species by simple diving to new levels.

The most threatening feature of the current status of the field is the declining number of students entering this field of research. The worldwide list of experts is decreasing. This is not a unique situation with respect to ichthyology. Field biology, in general, is similarly affected and the ichthyology is not the worst in this respect.

Collections are also becoming more difficult to maintain. One happy feature is that many collections are establishing ethyl alcohol preserved tissue banks for genetic analysis feasibility. Also, techniques are being developed to utilize formalin-fixed material. (This is not true of other marine collections.)

A synthesis of the previous paragraphs reinforces the desirability to accelerate the development of advanced technical means to maintain what has been, up to now, a fairly slow but steady advance in the field.

An indirectly related statement was produced with respect to the number of benthic invertebrates. A free estimate of an order of magnitude greater number than that for fish was put out at the meeting. This was combined with the note that the number of competent researchers was even less than that for fishes.

Attendees

The meeting began with a round robin set of presentations from each of the ichthyologists both interrupted and followed by general discussion.

One of Dr. Collette's presentations was of special relevance. He gave an overview of the Interagency Taxonomic Information System (ITIS). The efforts are concentrated on establishing a common biological language to manage the nation's living resources. The emphasis is on taxonomy and systematics. The involved departments and agencies are Agriculture, Commerce (NOAA), Interior, EPA and the Smithsonian. The program connects with private and other nations' projects and organizations and encompasses available existing databases. It will be particularly successful, if, in mobilizing the community, it can reverse the current decline in academic taxonomy and systematics.

Indo-West pacific fishes: Kent Carpenter, Dept. of Biological Sciences, Old Dominion University, Norfolk, VA

Pelagic fishes: Bruce B. Collette, Syst Lab-Natl Mar Fish Serv., U.S. National Museum, Washington, DC

Southern Ocean, South Africa: Phillip C. Heemstra, Institute of Ichthyology, Grahamstown, South Africa

Mesopelagic and bathypelagic fishes: Robert K. Johnson, Grice Marine Biological Lab., Charleston, SC

Deepsea benthic fishes: Nigel Merrett, Department of Zoology, The Natural History Museum, London, UK

Reef fishes, use of submersibles: John E. McCosker, California Academy of Science, San Francisco, CA

Larval fishes: Geoffrey Moser, MBRD (SIO), La Jolla, CA

Far East, Asian fishes: Tetsuji Nakabo, Graduate School of Agriculture, Kyoto University, Kyoto, Japan

William A. Nierenberg, Scripps Institution of Oceanography, La Jolla, CA

North Pacific fishes: James Orr, National Marine Fisheries Service, Alaska Fisheries Science Center, Race Division, Seattle, WA

Australian, East Indies fishes: John R. Paxton, The Australian Museum, Sydney, Australia

Indo-Pacific, Red sea reef fishes: John E Randall, Bishop Museum, Honolulu, HI

Western Atlantic fishes: C. Richard Robins, Lawrence, KS

Eastern tropical pacific, Southeastern fishes: Richard Rosenblatt, Scripps Institution of Oceanography, La Jolla, CA

Eastern Atlantic and Mediterranean fishes: Luiz Saldanha, Dept. de Zoologia, Guia Marine Laboratory, Universidade de Lisboa, Cascais, Portugal

Paul Smith, National Marine Fisheries, La Jolla, CA

Coastal pelagic fishes: William F. Smith-Vaniz, U.S. Geological Survey, Biological Resources Division, Florida Caribbean Research Center, Gainesville, FL

Indo-west Pacific reef fishes: Jeffrey T. Williams, Div. of Fishes/Natural History Museum, Smithsonian Institution, Washington, DC

Indo-west Pacific reef fishes: Richard Winterbottom, Royal Ontario Museum Dept. of Ichthyology and Herpetology, Toronto, Ontario, Canada

Special Invitees:

Jesse Ausubel, Director, Program for Human Environment, The Rockefeller University, New York, NY

Paul Dayton, Scripps Institution of Oceanography, La Jolla, CA

Jules Jaffe, Scripps Institution of Oceanography, La Jolla, CA

Letter of invitation

This letter is an invitation to you to attend a meeting with fellow ichthyologists at the Scripps Institution of Oceanography on March 13 and 14. All travel expenses will be borne by SIO.

We anticipate an attendance of ten US scientist plus about seven from other countries and several experts in related technologies such as acoustics assay technologies.

Professors Richard Rosenblatt and William Nierenberg are the co-convenors and the meeting is under the aegis of the Sloan Foundation.

The mode of the meeting is a two-day working session on the state of knowledge of the world's ocean fish species and what can be done to accelerate the accumulation of knowledge in feasibility, new technology and cost of an intervention of resources and manpower that would yield significant results. The basis is not on fisheries application but is primarily to increase the scientific knowledge base. Neither will the question of abundance be paramount except as it affects the basic technology.

A fundamental question to whose resolution this meeting will contribute is the sense of the community as to the desirability of a major augmented effort and the willingness of the members to participate in the effort.

If the responses are positive, the Sloan Foundation has indicated a willingness to pool their resources with the other concerned governmental and private agencies in a cooperative effort to achieve the goals that various preliminary working groups and other interested parties may outline.

Given your recognized status in this field we hope very much that you will accept this invitation to participate. A paragraph is attached giving a brief program as presently perceived and presented to Sloan. It is subject to change after discussions with you and the other invitees. I add the usual caveat that we expect the participants to choose the least costly travel fare. We will make hotel reservation in hotels situated conveniently to SIO. I am sure the odds are high that you have been here before and so you may wish to make your own arrangements.

Sincerely,
William A. Nierenberg

Tentative Program:

Day One:

Morning: Round table stimulated by a document circulated before the meeting posing the questions to be addressed. Reef fishes.

Afternoon: Polar region fishes. Benthic and demersal fishes.

Day Two:

Morning: Borderland fishes

Afternoon: Outline of summary reports