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Edited by
Richard W. Grigg
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PREFACE

For more than a decade, the state of Hawaii and the nation have recognized the urgency to survey and assess the marine resources of the Northwestern Hawaiian Islands (NWHI). Recommendations for resource surveys of the Hawaiian Archipelago were made by a task force of the Governor of Hawaii in Hawaii and the Sea in 1969 and again in 1974. In 1975, a formal agreement between the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS), and the Division of Fish and Game (since renamed Division of Aquatic Resources) of the Hawaii Department of Land and Resources was established to conduct a 5-year survey and assessment of the marine resources of the Northwestern Hawaiian Islands (Nihoa to Kure Atoll). This agreement, known as the Tripartite Cooperative Agreement, names NMFS as the lead agency and attributes responsibility for research on offshore, bank, and seamount resources to NMFS, nearshore resources to DAR and seabird resources to FWS. The University of Hawaii through its Sea Grant College Program, with matching assistance from the Office of the Marine Affairs Coordinator, joined the study in 1977. The major objective of the joint investigation was resource assessment and ecology for the purpose of protecting unique wildlife and managing potential fishery resources. Since the inception of the joint venture, the participating agencies have attempted to maximize cooperative use of facilities and maintain open interagency communication.

In 1979, it was decided by the heads of the tripartite agencies and the UH Sea Grant College Program that sufficient progress had been made to convene a symposium to interchange research results and ideas and to incorporate this information in planning the remaining 3 years of research. The agency heads who served as members of the steering committee to organize the symposium were Mr. Richard Shomura, Southwest Fisheries Center Honolulu Laboratory of NMFS; Mr. Kenji Ego (replaced by Mr. Henry Sakuda in 1980), Division of Aquatic Resources, Hawaii Department of Land and Natural Resources; Mr. Dale Coggshall, Pacific Islands branch of the U.S. Fish and Wildlife Service; and Dr. Jack Davidson, University of Hawaii Sea Grant College Program. Dr. Richard Grigg of the Hawaii Institute of Marine Biology at the University of Hawaii, and project leader of the Sea Grant Northwestern Hawaiian Islands research program, chaired the committee and was the convener and moderator of the symposium.

The symposium was held on April 24-25, 1980 at the Campus Center Ballroom on the Manoa campus of the University of Hawaii. Twenty-seven papers were presented at the symposium. Authors were asked to give the original objectives of their studies, describe progress to date, and address future research needs. The symposium was attended by 151 invited representatives of governmental agencies, industry, the University of Hawaii, environmental groups, and the private sector.
Manuscripts of the papers delivered at the first symposium along with panel discussions, the keynote and luncheon addresses, and the concluding remarks were all published in a proceedings in 1980 (Grigg and Pfund, eds., 1980; UNIH--SEAGRANT--MR-80-04). After the first symposium, research continued in the NWHI for another 3 years and the steering committee for organizing the research, Council for Coordinating Research in the NWHI (CCR--NWHI), continued to meet monthly. In late 1982, the council decided that a second and final symposium should be held. The date was set for May 25-27, 1983. The council also decided that a film documenting the entire program should be made. All four participating agencies provided equal financial support for its production. A subcommittee responsible for producing the film was appointed by the council. Its members were Jeffery Polovina, Robert Shallenberger, and Reg Gooding. The film, produced by Cinepac Hawaii, is entitled "The Northwestern Hawaiian Islands: A Five-Year Study of Ecology and Fisheries."

The second and final symposium was attended by 211 registered individuals representing state and federal agencies, academia, and the private sector, particularly fishermen and environmentalists. This proceedings contains full-length papers or abstracts of papers presented at the 3-day meeting in 1983 along with the introductory speeches, luncheon addresses, panel discussions, and concluding remarks. It also contains reports on research conducted in the NWHI. The papers delivered at the symposium were designed to be overviews of the research conducted in the NWHI on each major topic of concern. Thus, the symposium papers tend to be summaries, while the reports are detailed descriptions of more specific subject areas.

Also contained in this proceedings are unpublished abstracts and copies of abstracts of papers published in the scientific literature prior to the second symposium. The abstracts are produced herein in an attempt to make these volumes as complete a reference document as possible on the results of the tripartite-Sea Grant 5-year study.

The maps which appear in this proceedings contain several slight place name inconsistencies, viz. Kure Atoll versus Kure Island. For purposes of official reference, the place names in the Hawaiian Islands are as follows: Brooks Banks, French Frigate Shoals (La Perouse Pinnacle, Tern Island, Trig Island, East Island, Whale Island, Skate Island, Shark Island, Gin Island, Little Gin Island), Gardner Pinnacles, Hancock Seamounts, Kure Atoll (Green Island, Sand Island), Laysan Island, Lisianski Island, Maro Reef, Midway Islands (Sand Island, Eastern Island, two Spit Islands), Necker Island, Neva Shoal, Nihoa, Pearl and Hermes Atoll (Grass Island, Little North Island, Seal-Kittery Island, Southeast Island, Bird Island, Planetree Island, Sand Island), Penguin Bank, Raita Bank, St. Rogatien.

The section in the proceedings covering the panel discussions consists of two sessions: the first is entitled
"Optimum Use Scenarios" and the second "Reaction Panel." The first panel was designed to permit recognized experts on various aspects of the NWI an opportunity to present their views as to optimum use of the islands. The reaction panel, also consisting of recognized experts, was set up to provide the symposium participants with alternative views. Following the panel discussions, the public was invited to participate in the dialog. All three discussions are published in the proceedings verbatim.

The tripartite-Sea Grant study of the NWI has been a monumental effort. The success of the program is owed to some 200 researchers of various governmental agencies and universities, as well as interested fishermen and lay-persons. The results document one of the largest and most complete multidisciplinary ecological investigations ever attempted. In addition, they have laid the groundwork for a master plan under preparation by the U.S. Fish and Wildlife Service containing management guidelines for a whole variety of commercial as well as endangered or threatened wildlife species. The final measure of the success of the 5-year study perhaps will be the degree to which the master plan successfully meets the needs of preserving wildlife while also providing for limited developmental opportunities throughout the NWI chain. A number of management plans under preparation by state and federal agencies as well as the Western Pacific Regional Fishery Management Council will be incorporated into the master plan.

Presentation of the symposia as well as publication of the proceedings in 1980 and in 1984 involved the talent and commitment of a large number of people. The staff of the University of Hawaii Sea Grant College Program are largely responsible for both. Particularly valuable contributions during the second symposium were made by Joan Yamada, Nancy Preston, and Rose Pfund (production and overall layout of the proceedings), Joan Choy, Peter Rappa, Wendy Nakano (artist), and Jo Ann Lee. The symposia contents and the proceedings volumes were planned by members of the CCR-NWI. Considerable logistic support for running the second symposium was provided by Kitty Simonds and the Western Pacific Regional Fishery Management Council staff. Valuable comments were made by reviewers of the papers and reports. Financial support for conducting the symposia and publishing both proceedings was provided equally by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, the Division of Aquatic Resources of the Hawaii Department of Land and Natural Resources, and the University of Hawaii Sea Grant College Program. The editors gratefully acknowledge these organizations for their professional talent and funding support that together have resulted in an unprecedented example of cooperative intergovernmental multidisciplinary research.

The Editors
Richard W. Grigg, UH
Karen Y. Tanoue, UH
ACKNOWLEDGMENT*

At mid-point in the 5-year tripartite-Sea Grant studies I expressed a great deal of concern that if we were going to get to the results, to answer the questions in need of answering, we had to be more adroit and more active in program management. As a result, a Council for Coordinating Research in the NWRI was formulated and the tripartite program was expanded to the tripartite-Sea Grant program to recognize the important role that the University of Hawaii Sea Grant College Program was playing in this endeavor. And by the good graces of Sea Grant Director Jack Davidson and with the willingness of Rick Grigg, we were able to designate Rick as the chairman of the council. I and my conspirators on the council want to acknowledge the key role that Rick has played in helping to keep us on track during meetings and helping to bring together this symposium as well as the first one which occurred at the mid-point of the study period. Also, we would like to acknowledge his contributions as a researcher, as a coordinator of the council, and as the principal person behind the scenes for the development of the two symposia. As we’ve acknowledged fishermen and individual researchers, I think today we should take a moment to acknowledge Rick Grigg for his valuable contributions.

*Message read to the symposium participants by Dale Coggeshall of the U.S. Fish and Wildlife Service on the third day during the panel discussions.
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WELCOMING ADDRESS

Governor George R. Ariyoshi*
State of Hawaii, State Capitol, Honolulu, Hawaii 96813

The Governor, as of last night, had full intention of being here to discuss the conference, the contents, and the objectives of the symposium and of participating in this morning's session. Unfortunately, something serious came up this morning. He called about a half hour ago indicating that he would not be able to participate and asked me to deliver his message. Before I deliver the Governor's message, I would like to express my appreciation on behalf of the Board of Land and Natural Resources and the staff of the Department of Land and Natural Resources in being permitted to participate in the tripartite-Sea Grant study on resources in the Northwestern Hawaiian Islands. This study is one of the most satisfying accomplishments that we have been involved in. Professionally our staff has been able to participate and benefit from this particular project, and the results that you are getting through this joint effort will help us tremendously as we move towards the next phase. The next phase is not going to be any easier than what we've gone through, but what has resulted from 5 years of research will give us a sensible direction so vitally needed in solving the management problems of conserving wildlife while allowing some opportunities for fishery development.

It is a pleasure to be here this morning to welcome you to this symposium on Resource Investigations in the Northwestern Hawaiian Islands. When we mention Hawaii we often tend to focus on only the eight major Hawaiian islands that comprise our state. This is understandable because almost all of us live within this short stretch (450 miles) of prominent islands. And because of the great distance that separates our main islands from those to the northwest, we sometimes forget that the Northwestern Hawaiian Islands are a very important part of Hawaii. Although they amount to little more than 3 square miles of dry land stretching as they do for over 1,000 miles beyond Kauai, they greatly expand the territorial limits of the state and vastly extend the jurisdiction of our nation to the northern and western Pacific. The Northwestern Hawaiian Islands are the home and breeding grounds for some of our most precious forms of native wildlife -- green sea turtles, monk seals, unique birds, and other terrestrial species. The nearshore waters of these islands hold stocks of

*Delivered by Mr. Susumu Ono, Chairman of the Board of Land and Natural Resources, State of Hawaii
fish and possess scenic resources of tremendous potential value to our people and offer a possible basis from which the use of these resources can be expanded. The existence of these resources has been known for some time; however, the development of a strategy for their use has been precluded by a lack of detailed information. We also have lacked information on how the various components of the Northwestern Hawaiian Islands ecosystem can be expected to interact. Without this data it is impossible to formulate a plan to manage the resources and develop a strategy which could conserve and nurture them while also opening them up to careful use by the public sector. Thus, we agreed in 1978 to be a principal in the tripartite agreement between our Department of Land and Natural Resources and two federal agencies -- the National Marine Fisheries Service and the U.S. Fish and Wildlife Service. We noted with considerable satisfaction at the 1980 symposium that this original core of participants had widened and that the much-needed information I alluded to earlier was indeed being obtained. I am particularly pleased with the concept of and the participation in this well-coordinated Northwestern Hawaiian Islands research program. Cooperation between the federal and state governments is a result of a common desire to ensure that the full spectrum of environmental, resource, and economic concerns is addressed. The additional support from the University of Hawaii Sea Grant College Program and from our Office of the Marine Affairs Coordinator has contributed significantly to the scientific merit and socioeconomic value of the results and has added prominence to this endeavor. And so with great pride and appreciation I address you today as you assemble here to present your findings. I look forward to the proceedings -- fruits of many years of labor. I also await with great interest the results of your deliberations on how we may best proceed with plans for the Northwestern Hawaiian Islands. The knowledge you have gained and the recommendations you will make are certain to be of inestimable value to the people of Hawaii and the Pacific. I wish you well in this endeavor.
INTRODUCTION

Richard S. Shomura

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Distinguished guests, ladies and gentlemen, it gives me great pleasure this morning to welcome you to the opening of the Northwestern Hawaiian Islands Symposium. I have been asked to say a few words as an introduction for the beginning of the formal presentation of this symposium. Since a number of you were present at the first symposium held here in April 1980 I will try not to repeat what I said in my opening remarks at that time. In that talk I focused primarily on the background that led to the tripartite-Sea Grant cooperative study of the Northwestern Hawaiian Islands.

I will make my comments very brief since I would prefer that you be wide awake for the presentations by the scientists who are involved in this multi-agency undertaking. Furthermore, the film that you will see shortly will more effectively touch on the points that I wish to make. During a preview of the film shown last week, I was very impressed by its quality and content.

In reflecting upon the results of the 5-year program, I thought it might be useful to review some of the highlights. First, the study is indeed unique in that it was initiated before a crisis occurred. Although I refer to this study as a 5-year field program, much of the planning was done several years before then. Even before the formal planning of the program some early discussions were held with University of Hawaii personnel in 1973 and 1974. Even the formal planning took place well before the passage of the Magnuson Fishery Conservation and Management Act of 1976. In the early 1970s, there were very few preliminary questions being raised about the resources or the status of the monk seals and the green sea turtles. The fact that support was obtained for this cooperative undertaking before a crisis occurred is indeed remarkable. I'm sure all of you will agree that this type of research is what is needed; that is, anticipating future needs, developing the ground work, and providing the necessary information for future decisionmaking. If nothing else, the process of conducting research based on this rationale is cost effective.

Another highlight of the study is that attempts were made to look at problems in a context of an ecosystem, in this particular case, the Northwestern Hawaiian Islands ecosystem. By this I mean we did not look at resources in isolation, but rather looked at potential impacts and the interactions of these resources among themselves.
A third aspect of this study which I believe deserves mention is that it was a cooperative undertaking by several agencies. Administrators often extoll the virtues and advantages of cooperative research which unfortunately does not happen too frequently. An example of cooperation during the Northwestern Hawaiian Islands study is the use of the NOAA research vessel *Townsend Cromwell* as the platform vehicle by the Honolulu Laboratory as well as the other participating agencies, including the U.S. Fish and Wildlife Service, the Hawaii Division of Aquatic Resources, and the UH Sea Grant College Program. Other examples of cooperation include the study of the food habits of seabirds as well as the studies of the monk seals that were carried out between the Fish and Wildlife Service and the Honolulu Laboratory. I'm sure that all of you, after hearing the talks on the Northwestern Hawaiian Islands investigations over the next several days, will be pleased with the study results. I certainly am. Having said this, and while I am generally pleased with the program, there is no question there are some gaps in the research. One of the more obvious is that we lack a full understanding of the physical and chemical environment of the waters surrounding the Northwestern Hawaiian Islands, especially as they relate to living resources. At this time I can only partially respond to this shortcoming by saying that we could not cover all of the areas of needed research. Some research, as Mr. Ono mentioned, will have to await attention in the future. I feel confident however that most of the important resource problems were addressed by the study. We leave for other researchers the responsibility of addressing the many questions that have surfaced from this investigation. Since I may not have another opportunity during the symposium this week I would like to thank the heads of all the agencies involved in this study for their support and encouragement while the work was going on. Perhaps, more importantly, and I say this sincerely, I would like to extend my personal thanks and congratulations to all of the researchers for a job well done.