ECOSYSTEM

ECOSYSTEM APPROACHES FOR FISHERIES MANAGEMENT

16th Lowell Wakefield Fisheries Symposium

University of Alaska Sea Grant College Program
Report No. 99-01

Lowell Wakefield Fisheries Symposium

ECOSYSTEM APPROACHES FOR FISHERIES MANAGEMENT

Proceedings of the Symposium on Ecosystem Considerations in Fisheries Management, September 30-October 3, 1998, Anchorage, Alaska

University of Alaska Sea Grant College Program
AK-SG-99-01
1999

Price $40.00

Elmer E. Rasmuson Library Cataloging-in-Publication Data

Symposium on Ecosystem Considerations in Fisheries Management (1998 : Anchorage, Alaska)

Ecosystem approaches for fisheries management : Proceedings of the Symposium on Ecosystem Considerations in Fisheries Management, September 30-October 3, 1998, Anchorage, Alaska. — Fairbanks : University of Alaska Sea Grant Program, 1999.

x, 756 p. cm. — (Lowell Wakefield Fisheries Symposium ; [16th]), (University of Alaska Sea Grant College Program ; AK-SG-99-01)

The symposium met jointly with the annual (1998) meeting of the Alaska Chapter of the American Fisheries Society.

Includes bibliographical references and index.

ISBN 1-56612-061-6

1. Fishery management, International—Congresses. 2. Fishery management—Alaska—Congresses. 3. Fishes—Ecology—Congresses. I. Title. II. Series: Lowell Wakefield Fisheries Symposia Series ; 16th. III. Series: Alaska Sea Grant College Program report ; AK-SG-99-01.

SH328.S847 1998

Citation for this volume is: 1999. Ecosystem Approaches for Fisheries Management. University of Alaska Sea Grant, AK-SG-99-01, Fairbanks. 756 pp.

Acknowledgments

This book is published by the University of Alaska Sea Grant College Program, which is cooperatively supported by the U.S. Department of Commerce, NOAA National Sea Grant Office, grant no. NA86RG-0050, project A/75-01; and by the University of Alaska Fairbanks with state funds. The University of Alaska is an affirmative action/equal opportunity institution.

Sea Grant is a unique partnership with public and private sectors combining research, education, and technology transfer for public service. This national network of universities meets changing environmental and economic needs of people in our coastal, ocean, and Great Lakes regions.

University of Alaska Sea Grant
P.O. Box 755040
203 O'Neill Bldg.
Fairbanks, Alaska 99775-5040
(907) 474-6707 Fax (907) 474-6285
http://www.uaf.edu/seagrant/

About the Symposium

Alaska Sea Grant invited the Alaska Chapter of the American Fisheries Society to hold its 1998 annual meeting jointly with a Wakefield symposium. At the time discussions began, the Alaska Chapter of AFS had proposed to host the 1998 annual meeting of the Western Division of AFS. The proposal was successful and the three meetings were held jointly. The topic, Ecosystem Considerations in Fisheries Management, was jointly chosen by representatives of the three entities.

The meeting was held September 30 to October 3, 1998, in Anchorage, Alaska. Nearly 250 presentations were made, with several plenary speakers to introduce the topic and discuss the partnership of Sea Grant and the American Fisheries Society. Due to the dedication of the following committee members, the meeting was deemed successful and attracted nearly 500 attendees.

Wakefield Program Committee

Milo Adkison, University of Alaska Fairbanks, Fisheries Division
Brenda Baxter, University of Alaska Fairbanks, Alaska Sea Grant
Cindy Hartmann, American Fisheries Society Alaska Chapter
Gordon Kruse, Alaska Department of Fish and Game
Patricia Livingston, U.S. National Marine Fisheries Service
Clarence Pautzke, North Pacific Fishery Management Council

Local Arrangements Committee

Brenda Baxter, University of Alaska Fairbanks, Alaska Sea Grant
Bill Bechtol, Alaska Department of Fish and Game
Allen Bingham, Alaska Department of Fish and Game
Jane DiCosimo, North Pacific Fishery Management Council
Valerie Elliott, U.S. Minerals Management Service
Steve Fried, Alaska Department of Fish and Game
Lee Ann Gardner, RWJ Consulting
Jeanne Hanson, U.S. National Marine Fisheries Service
Pat Hansen, Alaska Department of Fish and Game
Cindy Hartmann, U.S. National Marine Fisheries Service, Alaska Region
Bill Hauser, Alaska Department of Fish and Game
Gail Heineman, Alaska Department of Fish and Game
Carol Kerkvliet, Alaska Department of Fish and Game
Steve Miller, U.S. Fish and Wildlife Service
Larry Peltz, Alaska Department of Fish and Game
Joe Sullivan, Alaska Department of Fish and Game
Bill Wilson, LGL Alaska Research Associates
Carol Ann Woody, U.S. National Biological Service
Steve Zemke, U.S. Forest Service

American Fisheries Society Program Committee

Jeff Barrett, Pacific Lumber Co.
Steve Bauer, U.S. Environmental Protection Agency
Robert Bilby, Chair, National Marine Fisheries Service, Northwest Fisheries Science Center
Pete Bisson, U.S. Forest Service
Pete Hagen, Alaska Department of Fish and Game
Jeff Cederholm, Washington Dept. of Natural Resources
Charlie Corrarino, Oregon Department of Fish and Wildlife
Cindy Hartmann, U.S. National Marine Fisheries Service, Alaska Region
Kim Hyatt, Department of Fisheries and Oceans Canada
Carol Kerkvliet, Alaska Department of Fish and Game
Steve Klosiewski, U.S. Forest Service
Eric Knudsen, U.S. Geological Survey, Alaska Science Center
K. Koski, U.S. National Marine Fisheries Service
Tom Kline, Prince William Sound Science Center
Gino Lucchetti, King County, Washington
Alan Maki, Exxon Corporation
Hal Michael, Washington Department of Fish and Wildlife
Duane Neitzel, Battelle Laboratories
Steve Ralph, U.S. Environmental Protection Agency
Dana Schmidt, R.L.&L. Environmental Services
Ramona Schreiber, U.S. National Oceanic and Atmospheric Administration
Kate Wedemeyer, DOD, Elmendorf Air Force Base
Alex Wertheimer, U.S. National Marine Fisheries Service
Mark Wipfli, U.S. Forest Service

Symposium Sponsors

Alaska Sea Grant College Program
Alaska Department of Fish and Game
Commercial Fisheries Division
Division of Sport Fish
North Pacific Fishery Management Council
U.S. National Marine Fisheries Service
Alaska Fisheries Science Center
Alaska Chapter of the American Fisheries Society
Colorado-Wyoming Chapter of the American Fisheries Society
North Pacific International Chapter of the American Fisheries Society
Western Division of the American Fisheries Society

Contributing sponsors

Alaska Crab Coalition
Alaska Longline Fishermen's Association
Aleutian Pribilof Island Community Development Association
Alyeska Seafoods
Anchorage Convention and Visitors Bureau
Kaladi Brothers Coffee Company
Kodiak Vessel Owners Association
Once in a Blue Moon Gift Shop
ProFish International
Sealaska Corporation
U.S. Fish and Wildlife Service.

The Lowell Wakefield Symposium Series

The University of Alaska Sea Grant College Program has been sponsoring and coordinating the Lowell Wakefield Fisheries Symposium series since 1982. These meetings are a forum for information exchange in biology, management, economics, and processing of various fish species and complexes as well as an opportunity for scientists from high latitude countries to meet informally and discuss their work.

Lowell Wakefield was the founder of the Alaska king crab industry. He recognized two major ingredients necessary for the king crab fishery to survive—ensuring that a quality product be made available to the consumer, and that a viable fishery can be maintained only through sound management practices based on the best scientific data available. Lowell Wakefield and Wakefield Seafoods played important roles in the development and implementation of quality control legislation, in the preparation of fishing regulations for Alaska waters, and in drafting international agreements for the high seas. Toward the end of his life, Lowell Wakefield joined the faculty of the University of Alaska as an adjunct professor of fisheries where he influenced the early directions of the university's Sea Grant Program. Three Wakefield symposia are planned for 2000-2002.

About This Proceedings

This publication, the 16th in the Lowell Wakefield Fisheries Symposium series, has 49 papers presented in the Wakefield sessions of the combined meeting.

Layout, format, and proofing are by Brenda Baxter, Sue Keller, and Carol Kaynor, and cover design is by David Brenner of University of Alaska Sea Grant. Copy editing is by Catherine W. Mecklenburg, Point Stephens Research Associates, Auke Bay, Alaska.

Opening Comments

R.K. Dearborn
University of Alaska Fairbanks, Alaska Sea Grant College Program, Fairbanks, Alaska

Welcome on behalf of the University of Alaska Fairbanks and its School of Fisheries and Ocean Sciences. Welcome on behalf of the Alaska Sea Grant College Program.

Most importantly I wish to welcome you on behalf of a partnership that for 18 years has brought together scientists on topics chosen by the fishery scientists and managers in this region through the mechanism of the Lowell Wakefield symposia. Although the symposium series is hosted by Alaska Sea Grant, and symposium manager Brenda Baxter works for Alaska Sea Grant, the Lowell Wakefield symposia are really the result of a partnership between the University of Alaska Fairbanks and its Sea Grant Program, the Alaska Department of Fish and Game, the National Marine Fisheries Service, and the North Pacific Fishery Management Council. The program committee always includes members from these five partners. This year's symposium committee includes: Milo Adkison of our School of Fisheries and Ocean Sciences in his first committee assignment; Gordon Kruse of the Alaska Department of Fish and Game, who has served on many of the Lowell Wakefield committees and to whom we all owe a significant debt of gratitude; Patricia Livingston of the National Marine Fisheries Service (NMFS) Alaska Fisheries Science Center; Clarence Pautzke, Executive Director of the North Pacific Fishery Management Council; and this year, because of our special partnership with the American Fisheries Society (AFS) for this meeting, Cindy Hartman of AFS and the NMFS Alaska Region. As for every Wakefield Symposium, this communal effort has been guided by the tender buggy whip of Brenda Baxter. There is no such thing as a non-working assignment to one of Brenda's committees. You will note that every one of these committee members, plus Bob Bilby of NMFS, is also serving as a session chair.

Because the Lowell Wakefield Symposium series is driven by a partnership of university and agency scientists, a retrospective look at the symposium topics also provides a look at our growth and the growth of the science. There are three striking signals in the data:

1. The early symposia addressed the biology of single commercial species—crab, herring, sablefish—but more recently the symposia have addressed topics like the role of forage fishes, combining multiple information sources in stock assessment, and this year, ecosystem considerations in fisheries management. The series has not abandoned

single-species topics, but I think there is a clear signal of the complexities that have entered fisheries management.

2. If one reads the proceedings of one of the very early symposia, and especially the discussions of "where do we go from here," it is clear that the learning that takes place at these symposia and the resulting discussions influence work over subsequent years. The tremendous progress that is reported in a subsequent proceedings volume is clearly a rewarding extension of the priorities discussed in the early symposium on a related topic. I trust that this year will be no exception to our trek up the learning curve.

3. Last, the symposia reflect an increasingly multinational flavor. We have long recognized that even though Alaska has more than half of our nation's shoreline and lands half the nation's fish, we do not have as residents half of the nation's, and certainly not half the world's, fishery or ocean scientists. Over the past decades, leaders of the fishing industry have pushed the industry beyond national boundaries and often ahead of our scientific knowledge base. Responsible leaders in the industry, such as Lowell Wakefield, recognized that the development of the industry has moved at a faster pace than knowledge can be developed and encouraged the kind of scientific information exchange that takes place at these meetings. This region's fisheries are of world scale. Our Canadian colleagues to our south have for many years been contributors to our discussions, and we have valued that tremendously. As the questions addressed by these symposia have become increasingly complex, we have been blessed by a continuing enrichment of talent from around the globe. We welcome with greed this international participation.

Thank you for joining us, both for the Wakefield symposium and for the meetings of the Alaska and Western Divisions of the American Fisheries Society.

Let me introduce you to your next speaker. Those of us from Alaska who think of lakes like Becherof and Iliamna as vast and productive lakes are reminded by people like our next speaker, a former executive secretary of the Canada–U.S. Great Lakes Fishery Commission, that there are larger lakes. I have had the privilege of working with him over recent years as a member of the National Review Panel to the Sea Grant College Program. You may know him better as a past president of the American Fisheries Society. At any rate, he is a long and faithful friend of us all. Let us welcome Mr. Carlos Fetterolf.

Sea Grant, the American Fisheries Society, and Essential Fish Habitat: A Developing Relationship

Carlos Fetterolf
National Sea Grant Review Panel, Ann Arbor, Michigan

Carlos Fetterolf is a past president of the American Fisheries Society and a current member of the National Sea Grant Review Panel. This paper contains his unique perspective on these two organizations and how they interact.

Abstract

Dr. Ronald Baird, Director of the National Sea Grant College Program, and Paul Brouha, then Executive Director of the American Fisheries Society (AFS), created an AFS/Sea Grant Intern Program in 1997. A guidance committee decided on aquatic habitat as the focus for the intern, Lee Benaka, thus fitting with the Congressional reauthorization of the Magnuson Fishery Conservation and Management Act. The act calls for designation and special management of "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity" as essential fish habitat ("fish" includes other aquatic organisms, e.g., lobsters, clams). The National Marine Fisheries Service (NMFS) will carry out the provisions of the act. Discussions with Rolland Schmitten, NMFS director, resulted in agreement to develop a symposium on essential fish habitat for the 1998 annual meeting of AFS in Hartford, Connecticut. NMFS and Sea Grant agreed to publish the symposium proceedings (25 papers) in the AFS book program with intern Benaka as editor.

Following the symposium, a dozen Sea Grant and NMFS personnel met to decide how to continue their symbiotic relationship, and how the resources of the 29 individual Sea Grant college programs could be brought to bear on the identification, evaluation, and protection of essential fish habitat. In the words of Dr. Baird at this meeting, "Sea Grant has a ready cadre of researchers, educators, communicators, and outreach experts."

A foundation has been established for continued and expanded AFS intern programs with not only Sea Grant, but with NMFS, the National Oceanic and Atmospheric Administration, the Fish and Wildlife Service, the Geological Survey and its Biological Resources Division, the Environmental Protection Agency, the Department of Agriculture (aquaculture), the Forest Service, and others.

Introduction

Many of the attendees at today's plenary session from the United States and Canada are either members of, or familiar with the American Fisheries Society, but we also have attendees and authors from Australia, China, Denmark, Italy, Jakarta, Malaysia, New Zealand, the Philippines, Russia, South Africa, Sweden, and the United Kingdom. While the American Fisheries Society has more than 9,000 members in over 70 countries, it is unlikely our guests are familiar with AFS, the oldest and largest society of fisheries and aquatic scientists in the world.

American Fisheries Society

AFS and its members are dedicated to:

- The advancement of fisheries and aquatic science;
- Communication of scientific and technical information to other professionals, decision makers, and the public;
- Encouraging the teaching of fisheries and aquatic sciences in colleges and universities; and
- Continuing education and development for fisheries and aquatic science professionals.

AFS takes reasonable and informed positions on resource issues that affect aquatic environments and resources. To this end, AFS:

- Supports research to identify and understand fishery resources and ecosystems;
- Publishes four peer-reviewed journals focused on fisheries and aquatic sciences, fish health, aquaculture, and management;
- Supports managing aquatic resources and habitats for sustained yield;
- Supports regulation of aquatic pollutants;
- Supports strong, scientifically defensible government policies and effective interjurisdictional management structures; and
- Organizes science seminars, workshops, and technical meetings.

AFS is structured into 51 chapters, four geographic divisions, and 21 discipline-oriented sections ranging from fisheries management, to fisheries law, to physiology, to socioeconomics. In short, AFS has something for everyone involved with the fisheries profession. AFS is not just about fish.

When elected to the AFS presidential succession in 1988, I had served for many years on the Michigan Sea Grant Policy Committee, and had often thought of the potential win-win relationship if the two organizations could be brought together. Upon retiring from the Canada–U.S. Great Lakes Fishery Commission, which, by the way, is a sister organization to the commissions you are more familiar with on our Northwest Coast—the Pacific Halibut Commission and the Pacific Salmon Commission—I was appointed by the Secretary of Commerce to the National Sea Grant Review Panel in 1993, and the win-win relationship concept returned strongly.

National Sea Grant College Program

Sea Grant is a partnership and a bridge among federal and state government, academia, industry, scientists, and citizens to help Americans understand and sustainably use our precious coastal, ocean, and Great Lakes resources. Through the 29 Sea Grant institutions, which draw on faculty from over 200 colleges and universities, Sea Grant addresses such areas as aquaculture, aquatic nuisance species, coastal economic development, coastal habitat enhancement, coastal hazards, education, fisheries, marine biotechnology, and seafood technology. In the early days of Sea Grant, the programs very often dealt with fisheries and Sea Grant was colloquially known as Fish Grant, but now, as with AFS, it is not just about fish.

The Sea Grant effort is three-pronged: research, outreach, and education. Scientists tackle the important questions and the research. Extension specialists take the information to the users. Communication specialists build public understanding for science-based resource management. Educators, on a fourth front, bring the discoveries to the nation's students.

Bringing AFS and Sea Grant together

In June 1996, Dr. Ron Baird became Director of the National Sea Grant College Program, and he began building partnerships and working relationships. My AFS/Sea Grant win-win concept came to the front and I wrote a combined letter to Ron Baird and Paul Brouha, then Executive Director of AFS, urging them to meet and consider the potential for a symbiotic relationship which would benefit both organizations and the fishery resource. Both leaders quickly seized the opportunity; a memorandum of understanding was drafted; a guidance committee was formed (Dr. Jeffrey Reutter, Ohio Sea Grant; Dr. Robert Stickney, Texas Sea Grant; and the author); a position description was agreed upon; and AFS/Sea Grant intern Lee Benaka was hired. The committee met at the 1997 AFS annual meeting in Monterey, California, and settled on aquatic habitat as the intern's focus. This fit with the 1996 Sustainable Fisheries Act (P.L. 104-297) which amended the 1976 Magnuson Fishery Conservation and Management Act, in part,

by adding provisions for the care of essential fish habitat. These provisions require the designation and protection of essential fish habitat defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." Essential fish habitat (EFH) is destined to be the fisheries buzz phrase of the decade as we work to define it, refine it, and fully understand it. EFH is not just about fish. It's about other aquatic organisms as well, and living systems. The National Marine Fisheries Service is the agency responsible for carrying out the provisions of the act, which is landmark environmental legislation. The NMFS is to provide the national fishery management councils with ecologically sound guidance that is both feasible and scientifically defensible as required by the act, and has strived valiantly to do so. Much work remains, however, to expand what we know about marine habitats and the interactions of aquatic organisms with them. NMFS clearly needs help to support this breakthrough in marine legislation which adds huge new responsibilities and duties. Early discussions with Rollie Schmitten, NMFS director, resulted in agreement for Lee Benaka and the guidance committee to develop a symposium on EFH at the 1998 AFS annual meeting in Hartford, Connecticut. Further, NMFS and Sea Grant agreed to provide equal funding to publish the symposium proceedings as an AFS book edited by Benaka.

The Resulting Symposium

We titled the symposium "Fish Habitat: Essential Fish Habitat and Rehabilitation" and addressed various viewpoints on EFH by government, industry, and nongovernmental organizations; EFH identification; protecting habitat from fishing impacts; protecting habitat from nonfishing impacts; fish habitat rehabilitation; and socioeconomic issues. The 25 oral presentations plus posters showcased the habitat-related research capabilities of both NMFS personnel and Sea Grant–funded investigators which demonstrated what we know and the vast amounts we do not know. The symposium brought together researchers and policy makers from the Sea Grant network and NMFS under the umbrella of the AFS and further strengthened relations in pursuit of filling in the information gaps.

Despite the facts that the essential fish habitat mandate represents a new recognition by Congress, that Congress overwhelmingly endorsed reauthorization of the act, and Senator Hollings stated that "habitat protection has become a greater concern because coastal development and pollution threaten the environment and subsequently the effect of fish stocks," the impact of the EFH provisions have not been fully recognized by government, fishermen, developers, and industry—yet. But wait until a few enforcement actions are under way. Essential fish habitat is not glamorous—yet, but it should ultimately shift to those who would alter the habitat the burden of proof to show they will not damage its production potential.

I hope it is not the same old story as when I joined the Great Lakes Fishery Commission staff in 1975. When the sea lamprey control persons talked, the fish folks slept. When the fish folks talked, the lamprey guys slept. And when the habitat guys talked, everyone's eyes glazed over. The situation in the Great Lakes is very different now, but how different it was then from the theme of today's conference: "Ecosystem Considerations in Fisheries Management." Essential fish habitat will suddenly become glamorous when the dollars begin to flow, but what will be the consequences if we begin to call all waters EFH, instead of concentrating on the "essential essential fish habitat"? Will there be a backlash? Has it already started? What will be the outcome?

American Fisheries Society and Future Internships

In Hartford, a dozen ranking Sea Grant and NMFS personnel considered how Sea Grant might undertake a National Strategic Investment for Research, Education, and Outreach on EFH, how the resources of the two agencies could be brought together; how research priorities could be coordinated; how Sea Grant researchers could provide the "scientifically defensible data base" the act calls for; and how Sea Grant communicators and extension agents could be effective in educating and informing stakeholders with regard to compliance, intent, value, and legal aspects.

As Ron Baird stated at the meeting, Sea Grant has "a ready cadre of researchers, educators, communicators, and outreach experts," and as some NMFS regional folks said following the meeting, "It seems like a perfect fit."

Given a successful ending to this initial internship, there is potential for continued and expanded AFS intern programs not only with Sea Grant, but with NMFS, the Fish and Wildlife Service, the Geological Survey and its Biological Resources Division, the Department of Agriculture for aquaculture issues, the Forest Service, the Corps of Engineers, the Environmental Protection Agency, and others in a variety of areas. I am confident NMFS and Sea Grant are pleased with their exposure and the information accrued on a topic of critical current concern under the umbrella of the American Fisheries Society. AFS benefited from the services of a bright young person, and Lee Benaka, the intern, benefited. Most important of all, living marine resources and their habitats will benefit in the future. The internship was a good fit and a good start.

Index

A

B

C

D

E

F

G

H

N

O

P

Q

R

S

T

U

V

W

Y

Z