*American Institute of Fishery Research Biologists*

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VOL. 17, NO. 1 FEBRUARY 1988

## 1988 AIFRB Outstanding Achievement Award

One of the objectives of AIFRB is to maintain high professional standards; the Outstanding Achievement Award for individuals and the Group Award of Excellence for groups or agencies serve this purpose by recognizing achievement and competence in fisheries science. During 1987 thirteen individuals and six groups were nominated for the Awards. AIFRB members are again invited to participate by submitting nominations for the 1988 Awards. Criteria for these awards are similar: significant publications, exceptional service, outstanding teaching or training of students, important discoveries or inventions, and major contributions to the advancement of fishery science.

AIFRB members should submit nominations for these awards to Gregor M. Cailliet, Moss Landing Marine Laboratories, P.O. Box 450, Moss Landing, CA 95039 by July 1, 1988 and should include a brief summary of noteworthy qualifications of the nominee. Selections for the two awards will be made by the Board of Control at its Annual Meeting.

## Best Student Paper Award Nominations

The W. F. Thompson Award Committee is soliciting nominations for the 1988 W. F. Thompson Award. Nominations must be received by July 1, 1988; the winner will be announced by August 31, 1988.

The award is for the best paper *published* by a student on any topic in the field of freshwater or marine fishery science. The paper must have been published within the last 3 years (1985-1987) and must concern work done while the principal author was a student. Eligibility is not restricted to U.S. citizens, and anyone may nominate qualified papers for consideration.

The winning author will receive a certificate from AIFRB and a check for $750.

Papers are evaluated on the basis of originality, organization and development, and pertinence to current problems in fisheries.

Papers may have multiple authors, but the student nominated for the award must be the principal author. Where the winning paper is multiauthored and includes the academic advisor, the advisor will also receive a certificate acknowledging the advisor's role in producing the outstanding paper.

Please send five copies of each nominated paper to Dr. Elizabeth F. Vetter, Chair, AIFRB W. F. Thompson Award Committee, Southeast Fisheries Center, Box 271, La Jolla, CA 92038 (619-546-7099).

## More Missing Members

The AIFRB Treasurer needs current addresses for the following members, whose last known addresses are shown here:

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The Treasurer would appreciate hearing from anyone who knows a new address for any of these members.

## Recruitment and Stock Assessment

A symposium on recruitment and errors in stock assessment models was held on October 27-29, 1987 in Vancouver, British Columbia. The symposium was sponsored by the International North Pacific Fisheries Commission (INPFC) and the International Recruitment Investigations in the Sub-Arctic (IRIS). The former is a body created by a Convention of three countries—Japan, Canada, and the U.S.; the latter is an organization of university and government oceanographic and fishery institutions in British Columbia, Alaska, Oregon, and Washington.

There were 35 invited papers presented at the symposium by participants from Canada, China, Japan, the U.S., and the Union of Soviet Socialist Republics. Simultaneous translation was provided in four languages. Two main topics were discussed. The first was an evaluation of the accuracy of parameters used in the stock assessment of non-anadromous species and included reports on the effects of errors in the estimation of these parameters and on management decisions. The second main topic was the effects of ocean variability

cont. on page 2

## Recruitment cont.

on recruitment and included papers on the relationships between environmental variables and fluctuations in recruitment. The English version of the Proceedings of the symposium will be published in the Special Publications series of the Canadian Journal of Fisheries and Aquatic Sciences and a Japanese version will be published by INPFC.

After the papers were delivered, general summaries of each topic were presented. In addition, there was an informal discussion on a proposal, endorsed by IRIS, to establish a new international scientific organization in the northern North Pacific Ocean. The Government of Canada has invited several countries from the Pacific Rim to attend a meeting in the near future to discuss this proposal, i.e. the creation of a Pacific organization similar to that of the International Council for the Exploration of the Seas (ICES) in the Eastern Atlantic.

**Bernard E. Skud**
*Executive Director, INPFC*
*Vancouver, BC*

# Development of an Index of Juvenile Striped Bass Abundance for the Chesapeake Bay System

### I: An Evaluation of Present Measures and Recommendations for Future Studies

This is an executive summary of Special Scientific Report No. 120 of the Virginia Institute of Marine Science, Gloucester Point, VA, authored by James A. Colvocoresses and Herbert M. Austin.

There has been very little coherence between annual striped bass recruitment indices generated by summer beach seine surveys for the upper (Maryland) and lower (Virginia) portions of Chesapeake Bay. Analysis of the potential causes of the differing results of the Maryland and Virginia seine surveys was undertaken as a preliminary step toward the development of a possible standardized Baywide index of juvenile striped bass abundance. The survey data strongly indicate that, with the exception of years such as 1970 (when for undetermined reasons relative recruitment was high Baywide), annual recruitment success is largely independent between drainages, but the observed inconsistencies in the relative annual indices appear to be also largely attributable to high sampling variability.

An alternate index of striped bass abundance was calculated from winter trawl survey data from the Virginia tributaries. Agreement between the trawl and seine indices was poor. Multiple regression of trawl survey indices with subsequent commercial landings produced highly variable results, with no relationship being found in one system (York), but a very strong relationship in another (Rappahannock). The later correlation was largely dependent upon a sharp peak in the juvenile index in 1970 being followed by a peak in landings in 1974.

The influence of dominant environmental variables upon survey results was examined. Salinity evidenced the greatest effect on juvenile striped bass distribution during the summer seine surveys, with similar patterns of distribution being observed in both major portions of the Chesapeake Bay. Distribution of juveniles during the winter trawl survey period exhibited complex relationships to temperature, salinity, and depth, which may produce confounded sampling results between years of variable climatic regime.

The seine surveys were originally designed to provide an inexpensive basis for monitoring long-term trends and indentifying dramatically high or low levels of annual recruitment. Unfortunately, recent widespread use of the Maryland seine index in population models and as a regulatory action level trigger has resulted in index values often being interpreted in a much more quantitative sense than the sampling and statistical properties of the original data sets justify. If measures of recruitment success are to continue to play a dominant role in future management strategies, much more quantitative and precise indices of juvenile abundance are highly desirable if not required.

Because of the mandated use of the Maryland seine index, any immediate effort to create an improved Baywide measure of striped bass recruitment must of necessity be structured around it. An obvious first step in the creation of a Baywide recruitment index should be the standardization of seining methodology between the Maryland and Virginia surveys, an effort which has been already undertaken during the course of this study.

Present within-drainage sample sizes are too low to permit meaningful comparisons between systems within years, but there is every indication that recruitment success is highly variable between drainages. Sample sizes should be increased to the extent resources allow, either by adding stations, increasing sampling frequency at the presently occupied stations, or a combination of both. Effective sample size may be able to be increased without a completely commensurate increase in effort by eliminating replicate hauls in favor of more stations or more frequent sampling. Estimation errors associated with the Maryland index may be significantly reduced by applying an appropriate transformation prior to calculation of the index.

Beyond immediate measures to standardize and expand the seine surveys, further research directed at determining the optimal period and habitat for monitoring juvenile striped bass in the Chesapeake Bay should be actively pursued.

# Iowa Lakeside Laboratory Fellowships

The University of Iowa announces the FOUNDER'S FELLOWSHIP in 1988 field studies for pre-doctoral students—a summer at The Iowa Lakeside Laboratory. The stipend is $2,000, tuition free; fellows pay modest fees for room/board and lab space. The fellowships honor our founder, Thomas H. Macbride.

Applicants will be doctoral candidates whose work has a field component for which a summer at the Iowa station would be especially profitable. Applicants should be at the level of independent investigator.

Lakeside Lab is in northwestern Iowa on recent glacial terrain, with adjacent lakes, wetlands, virgin prairie, prairie rivers, and pockets of forest. The lakes country is continuous to the north and the Great Plains to the west. Our own 55-ha grounds border large and deep West Okoboji Lake, and we have forest and manipulable grassland. Conditions: rustic but not primitive, an air of relaxed intensity, food unbelievable. Research labs are relatively new and we have a small library.

Interested applicants should write the director for more about the area and facilities. An application will contain a cover letter, vitae, and a one- or two-page synopsis of the proposed project. Specific reasons why our station is so suitable are critical to the application. Two letters are requested, including one from the research sponsor.

Applications will be considered up to April 1, 1988.

Richard V. Bovbjerg, Director
Professor of Biology
The University of Iowa
Iowa City, IA 52242

## Book Review

**Fisheries Research in the Hudson River,** edited by C. Lavett Smith (sponsored by the Hudson River Environmental Society), State University of New York Press, Albany, 407 p., 1988 (Paper $24.50, Cloth $49.50).

A "Peace Treaty for the Hudson" was signed on December 20, 1980, ending 17 years of controversy over the impact of electric power generation on Hudson River fish populations (Christensen et al. 1981, Sandler and Schoenbrod 1981). The original environmental concerns arose in the 1960s from Consolidated Edison's (Con Ed) proposed Cornwall pump storage facility on Storm King Mountain; and later, in the early 1970s, from Con Ed's Indian Point Unit 2 nuclear power generating station then undergoing licensing before the Nuclear Regulatory Commission (NRC). The U.S Environmental Protection Agency (USEPA) became involved in 1974 in connection with permits issued requiring closed-cycle cooling at Indian Point Units 2 and 3, and new oil-burning generating stations at Bowline Point (Orange and Rockland Utilities) and Roseton (Central Hudson Gas and Electric Corporation). The adjudicatory hearings were terminated by the settlement agreement.

This book grew out of a conference on environmental issues in the Hudson Valley held in September 1981. It is divided into eight parts, and consists of papers dealing primarily with fisheries issues. Hudson River databases created by the utilities and their consultants since the early 1970s are identified, reviewed, and their disposition and accessiblity described (Part I). This will be particularly useful to those researchers interested in further investigations with this historical database. Next, a series of papers describe background biological information on striped bass and white perch (four papers in Part II), sturgeons (III), river herrings (IV), and Atlantic tomcod (V). These papers complement material presented in Barnthouse et al. (1988, section 2 - striped bass, white perch, and tomcod), and present new information on sturgeons and river herrings. Part VI (Food Chains) contains a single paper on the food habits of the amphipod *Gammarus tigrinus* (an important food source) and the effects of diet on growth and reproduction. A more extensive discussion of ecosystem level considerations can be found in Limburg et al. (1986). The several papers in Part VII discuss aspects of pollution in the Hudson estuary (not at issue during the hearings), including uptake of heavy metals by fish and macroinvertebrates, recent trends in dissolved oxygen, and contamination by polychlorobiphenyl (PCB) in resident freshwater, migrant and marine fish species. A final paper on management recommendations for the Atlantic sturgeon fishery based on an age-structured population model is found in Part VIII.

This book covers a wide spectrum of topics. Its greatest general value to a wide audience is found in the guide to the databases in Part I. The remaining papers may be of more limited usefulness, depending on the particular interests of the potential buyers of the book. For instance, the final paper on management of Hudson River Atlantic sturgeon may be of limited interest, except to those actively working with that fish species, since the model uses techniques already in the literature (e.g., DeAngelis et al. 1978). I recommend this book to libraries of universities, consultants, and other institutions actively involved in fisheries research in the Hudson River and to those individual researchers desiring yet another view of environmental research in the Hudson River.

### Citations


Barnthouse, L. W., R. J. Klauda, D. S. Vaughan, and R. L. Kendall. 1988. Assessing ecological impacts of power plants: Lessons from the Hudson River case. Amer. Fish. Soc. Monogr. 4, Bethesda, MD (In Press).

Christensen, S. W., W. Van Winkle, L. W. Barnthouse, and D. S. Vaughan. 1981. Science and the law: Confluence and conflict on the Hudson River. EIA Review 2(1):63-88.

DeAngelis, D. L., W. Van Winkle, S. W. Christensen, S. R. Blum, B. L. Kirk, B. W. Rust, and C. Ross. 1978. A generalized fish life-cycle population model and computer program. ORNL/TM-6125, Oak Ridge Nat. Lab., Oak Ridge, TN.

Limburg, K. E., M. A. Moran, and W. H. McDowell. 1986. The Hudson River ecosystem. Springer-Verlag, NY, 344 p.

Sandler, R., and D. Schoenbrod. 1981. The Hudson River power plant settlement. New York Univ. School of Law, NY, 353 p.



**Douglas S. Vaughan** *(M79:F87)*
*Nat'l. Marine Fisheries Serv.*
*Southeast Fisheries Center*
*Beaufort, NC 28516*


## District News

The Northwest Washington District instituted, in September 1987, a new, attractive format for its newsletter which keeps the membership informed of District and national activities. Volume 1, Number 4 was issued in December 1987, and we trust this monthly *Northwest Washington News* will continue on the same high note as the first four issues.

cont. on page 4

## District News cont.

Included in the publication are announcements of meetings to be held (AIFRB 1988; Gulf of Alaska Pollock; Year Class Success and Oceanography; Antifouling, Organotins and Marine Life; Army, Navy, and Pesticides: The Perils of Life as a Dungeness Crab); news about members and welcome to new members; accounts of programs already given; awards and certificates; professionalism; and miscellaneous announcements.

The District and its leadership are to be commended for producing this great newsletter, and we encourage them to keep up the good work. We also recommend that other Districts follow this lead and give their membership some high-quality communications on a regular basis.

## Announcements and New Publications

### Environmental Regulation Conference

U.S. EPA, Region IV, will hold an *Environmental Regulation Conference* at the Hyatt Regency in Atlanta, Georgia on March 14-16, 1988.

The pace of environmental regulation has increased dramatically as a result of new federal laws and federal and state agency implementation of them. Increasingly, these federal and state initiatives are interrelated and cannot comprehensively be analyzed separately. Equally important is a thorough understanding of the objectives and strategies of the federal and state agencies charged with implementing and enforcing these laws.

This conference will bring together the first integrated program to explore the key developments in federal and state programs within EPA Region IV on those issues of paramount importance and priority in the area, including the Resource Conservation and Recovery Act, Superfund, SARA/Title III, Clean Air, Clean Water, and Right-to-Know.

Information on registration is available from Executive Enterprises, Inc., 22 West 21st Street, New York, NY 10010-6904.

### Larval Fish Conference

The 12th Annual Larval Fish Conference and Meeting of the Early Life History Section, American Fisheries Society, will be held jointly with the 68th Annual Meeting of the American Society of Ichthyologists and Herpetologists at the Univ. of Michigan in Ann Arbor, MI, June 24-29, 1988. Konrad R. Dabrowski, Visiting Professor, Division of Zoophysiology, Instit. of Zoology, Univ. of Innsbruck, Austria, has been invited as keynote speaker of the Larval Fish Conference. Dr. Dabrowski has published numerous papers on swimming and feeding behavior, nutrition, metabolism, energetics, and rearing requirements of larval fishes.

In addition to plenary and contributed paper sessions, three special sessions are being organized: (1) "Functional Development of Sensory Systems and Acquisition of Behavior in Larval Fish" - Howard Browman, Dept. of Systematics and Ecology, Univ. of Kansas, Lawrence, KA 66045, (913) 864-4375; (2) "The Ahlstrom Symposium Revisited," papers representing the forefront of research on the ontogeny of fishes and/or the systematics of fishes as based on their early life stages - J. Richard Dunn, National Marine Fisheries Serv., NW and Alaska Fisheries Center, 7600 Sand Point Way Northeast, BIN C15700, Building 4, Seattle, WA 98115-0070, (206) 526-4116; and (3) "Early Life History of Fishes of the Great Lakes Region" - David Jude, Great Lakes Research Div., 2200 Bonisteel Blvd., Univ. of Michigan, Ann Arbor, MI 48109, (313) 764-2420, and Nancy Auer, Dept. of Biological Sciences, Michigan Technological Univ., Houghton, MI, 49931, (906) 487-2025.

All participants are encouraged to bring manuscript copies of their paper to the conference to submit for publication in the peer-reviewed proceedings. Deadline for titles and abstracts will be April 1, 1988. If you are not already a member of either the Early Life History Section of AFS or the American Society of Ichthyologists and Herpetologists and wish to receive the announcement, contact: Neal R. Foster, Chair, 12th Larval Fish Conference, National Fisheries Center - Great Lakes, U. S. Fish and Wildlife Serv., 1451 Green Road, Ann Arbor, MI 48105, (313) 994-3331.

### Workshop—Stream Habitat Improvement

The Minnesota Department of Natural Resources will host the *Sixth Trout Stream Habitat Improvement Workshop* at Saint Mary's College, Winona, Minn. on August 1-3, 1988. At this biennial workshop, 2 days of field trips in Minnesota and Wisconsin will allow fisheries workers to examine old and new improvement methods, to study work in progress, and to see electrofishing demonstrations. One day will be given to a discussion on the role of beavers and a poster session. Invited papers will review changes in improvement methods and financing over the last 10 years. The deadline for titles of posters or papers is February 19; abstracts are due by March 18, 1988. For more information on programs and registration, contact Mark Ebbers, Minnesota Department of Natural Resources, Box 12, 500 Lafayette Road, St. Paul, Minn. 55155-4012; 612/297-2804.

### Gulf of Mexico Assessment Data Atlas

*Gulf of Mexico Coastal and Ocean Zones Strategic Assessment Data Atlas* has been published by the National Oceanic and Atmospheric Administration, and is the second in a series of four atlases being developed. This definitive work provides intensive coverage of the scientific and economic characteristics of the Gulf of Mexico, offering new possibilities for offshore oil and gas exploration, the designation of sites for ocean dumping or incineration at sea, the designation of marine sanctuaries, and other facets of resource planning to a broad spectrum of professional users. This cartographic encyclopedia has more than 150 maps with data on the Gulf's physical, marine, and environmental

characteristics; patterns of onshore and offshore economic activities, pollution generation and discharge, freshwater usage, important boundaries and jurisdictions, and other aspects of the resources.

The book has information for marine biologists, environmentalists, planners, the fishing industry, geologists, the oil industry, academic institutions, and federal, state, and local agencies.

This atlas is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-9325 for $138.

**Timber Press**

The following new books are available from Timber Press/Dioscorides Press, 9999 S.W. Wilshire, Portland, Oregon 97225:

*The Biology of Perch and Related Fish*, by J. F. Craig has 333 pages, 110 figures, 23 tables, 5½ x 8¾ hardbound, and sells for $42.50. It is a definitive study of the well-known sport and commercial fish of the perch family, which highlights important areas for future research. After an introduction on the taxonomy of the order Perciformes, the main part of the book reviews the biology of perch, walleye, and zander. Special emphasis is placed on external controlling factors of body processes, population dynamics, and fisheries. The final part of the book considers other genera that are economically unimportant but of ecological interest, particularly the darters of North America. For fish biologist and researchers.

CONTENTS/List of Figures • List of Tables • Preface • Acknowledgements • Taxonomy and Distribution • Morphology and Anatomy • Growth, Mortality and Longevity • Reproduction and Development • Food, Feeding and Energetics • Some Physiological Processes and Movements • Parasites and Diseases • Adaptation, Evolution and Genetics • Population Dynamics and Community Structure • Fisheries and Economic Importance • Other Percini • Etheostomatini • Romanichthyini • Bibliography and Author Index • Subject Index.

*Fish Endocrinology*, by A. J. Matty has 267 pages, 89 figures, 5½ x 8½ hardbound, and sells for $27.95. The primary aim of this book is to place fish endocrinology within the context of comparative anatomy and physiology and of the evolution of hormones, as well as to discuss applied aspects. It is assumed that the reader is familiar with the basic concepts of endocrinology and relevant anatomy, physiology, and biochemistry. The book is oriented to the needs of research workers and advanced students in fish biology and endocrinology concerned with the application of hormones in fish or fish farming equipment.

CONTENTS/Introduction • Acknowledgements • The Pituitary Gland • The Thyroid Gland • Pancreatic and Gastrointestinal Hormones • The 'Adrenal' and the Kidney Hormones • Gonadal Hormones • The Corpuscles of Stannius, Urophysis and Pineal • Pheromones • Hormones, Migration and Sea-ranching • Hormones and Aquaculture • Bibliography • General Index • Fish Species Index.

*Fish Migration*, by Brian A. McKeown has 224 pages, 57 figures, 6¼ x 9¼ hardbound, and sells for $29.00. The annual return of migrating fish is a fascinating topic both as an aspect of animal migration in general and in its relevance to freshwater and marine fisheries. This major review includes chapters on the patterns of migration, orientation, physiological adaptation to changing environments, and the ecological and evolutionary aspects of fish migration. Of interest to those involved with animal behavior, behavioral ecology, and fisheries.

CONTENTS/Introduction • Patterns of Migration • Orientation • Bioenergetics • Physiology • Ecology and Evolution.

**Fishes of the Great Basin**

This hardbound book by William F. Sigler (AIFRB Fellow 1960) and John W. Sigler (AIFRB Associate 1980), a landmark volume in the Max C. Fleischmann Series in Great Basin Natural History, discusses the evolution of fish, how these unique animals are classified and named, and the endangered species unique to the deserts of the Great Basin. The authors present a species-by-species account of the fishes that live in the lakes and rivers of the Basin. They also include information on life histories, range, size and longevity, food and feeding behavior, limiting factors, breeding habits, and habitat preservation. Over 90 species are described as to color, shape, body form, and fin and scale pattern; most species are illustrated with beautiful ink drawings. The book also includes an illustrated key to the native and introduced fishes of the Great Basin, and annotated checklist, sections of Great Basin drainages, a history of fishing in Nevada and Utah, and a discussion of the Endangered Species Act. *Fishes of the Great Basin* includes maps, an index, and an extensive bibliography.

The book has 438 pages and is available for $32.50 from University of Nevada Press, Dept. F., Reno, Nevada 89557.

## Dissertation and Thesis Abstracts

### A Systematic Revision of Atlantic Tonguefishes (*Symphurus:* Cynoglossidae: Pleuronectiformes) with a Preliminary Hypothesis of Species Group Relationships

Thomas A. Monroe, Ph.D. 1987

College of William and Mary in Virginia

Four of 29 previously described nominal species of *Symphurus* are junior synonyms; one sub-species (*S. p. plagusia*) is accorded full species status (*S. tessellatus*); two undescribed dwarf species are present in the eastern Atlantic; three new species were found among western Atlantic material; and several Atlantic forms are represented in the eastern Pacific by cognate species. Detailed and expanded descriptions, differential diagnoses, artificial keys, and updated ecological information are provided for 29 species occurring in the Atlantic Ocean.

Preliminary evidence based upon osteological characters, including interdigitation patterns (ID) of dorsal pterygiophores with neural spines, urohyal shape, caudal skeleton, dentition, and other morphological characters, indicates the existence of eight supra-specific lineages among the 66 nominal species of *Symphurus*. Species groupings are

cont. on page 6

also supported by zoogeographical and ecological distributional patterns. Seven species groups are represented among the Atlantic *Symphurus*.

The most generalized species group is nearly worldwide in distribution (absent from the eastern Pacific), and is especially diverse in the Indo-Pacific region (22 nominal species). Most members occur in deep (>200 m) continental shelf and slope habitats. The group is characterized by high caudal ray counts (usually 14), 1-2-2 ID pattern, high meristic features, and, usually, small to medium-sized, elongate bodies. Two species representative of this group occur in the Atlantic Ocean (one each in eastern and western parts). A second species group is predominant in the Atlantic Ocean (only two species occur extra-limitally in the eastern Pacific). Seven species occur in the western Atlantic while another four are found in the eastern Atlantic. Members of this group inhabitat moderately deep continental shelf habitats (50-200 m). These species possess a 1-3-2 ID pattern, 12 caudal rays, and full dentition on both jaws. A third species group is composed of four species characterized by a 1-3-3 ID pattern and 10 or 12 caudal rays. Members of this group occur in shallow to moderate depths on the open shelf of the eastern Atlantic (one species), western South Atlantic (one species), and eastern Pacific (two species). A fourth species group, those possessing a 1-4-2 ID pattern, is composed of four species that occur only in the western Atlantic (three north and one south of the equator). Three of the four species are found at moderate depths (20-80 m) on the open continental shelf while the fourth member inhabits shallow, sandy areas in seagrass beds in the Caribbean. A fifth species group is unique to the New World; seven species occur in the western Atlantic; eight are in the eastern Pacific. Members of this group occupy shallow-water substrates from the shorezone to about 80 m. These species are characterized by 1-4-3 and 1-5-3 ID patterns, reduction or loss of dentition on eyed-side jaws, and are the largest-sized species in the genus.

### Potential Fish Egg Predation by *Mnemiopsis leidyi* Determined by Hydrography at the Chesapeake Bay Mouth

Harry D. Johnson, Jr., M.A. 1987

College of William and Mary in Virginia

Potential predation on pelagic fish eggs by the lobate ctenophore, *Mnemiopsis leidyi*, was assessed by laboratory experiments and by examining small-scale temporal and spatial co-occurrence related to Chesapeake Bay mouth hydrography. Lab work confirmed *M. leidyi* ingest fish eggs, although a decline in clearance rates with increasing prey density (from 6.1 to 0.5 1/day) contrasts with previous studies. Mucus boli containing embedded fish eggs were egested by ctenophores in response to high prey density (2367 eggs/1). Weak stratification at the Bay mouth resulted in strong spatial co-occurrence between *M. leidyi* and fish eggs throughout the water column, while strong stratification, produced in part by the Chesapeake Bay plume, reduced estimated predation. The northernmost station, near Cape Charles, Virginia, was weakly stratified, and had high *M. leidyi* and fish egg densities, as well as the greatest ctenophore-egg co-occurrence. In contrast, the southernmost station, within the influence of the plume near Cape Henry, presented strong stratification, with eggs confined in high densities at the surface and ctenophores confined in lower densities below the pycnocline. High *M. leidyi* densities and co-occurrence with fish eggs indicated high potential for ctenophore predation at the northern station compared to other Bay mouth locations. Estimated maximum ctenophore predation of eggs was 24.1 eggs/cubic m/day at the southern station and 753.8 eggs/cubic m/day at the northern station.

### Impacts of Suction Dredge Gold Mining on Benthic Invertebrates in Canyon Creek, Trinity County, California

William L. Somer, M. S. 1987

Humboldt State University

In recent years, the popularity of the suction gold dredge for gold mining has greatly increased. The effects of dredge mining on anadromous fish, benthic invertebrates, and habitat are poorly understood at present. This study was conducted to investigate suction dredge mining impacts on Canyon Creek, Trinity County, California. Suction dredge activity was monitored in the lower 18 km of the stream. In 1982, 17 locations were dredged, and in 1983, 7. High stream flow (180 percent normal) and low gold prices resulted in low dredge activity in 1983. The effects of two 4-inch dredges (one mining operation) on benthic invertebrates was investigated on the Big East Fork tributary of Canyon Creek in 1983. Eighty-four basket-type artificial substrate (BAS) samplers were deployed above and below the dredge site in Big East Fork and above and below the confluence of Big East Fork with Canyon Creek. Fifty-six BAS samplers were removed in three 4-week colonization intervals on Big East Fork, and at the end of a 4-week colonization period on Canyon Creek.

Significant alterations to benthic invertebrate abundances below dredging were tested with 2-way analysis of variance. Annelids and dipterans were more abundant below dredging. Functional feeding-group classification provided a morpho-behavioral summary of ecological alterations due to dredging. Shredders were significantly ($P < .001$) more abundant above dredging. Gatherers were significantly ($P < .004$) more abundant below dredging. Filterers and differential colonization patterns resulting from recruitment and siltation of BAS samplers. Benthic invertebrate population changes associated with dredging were localized and downstream impacts were minimal. However, mean number of Annelida was higher downstream of dredging. Other taxonomic and functional groups examined showed abundances probably due more to the different habitat in Canyon Creek than downstream dredging impacts. BAS samplers in Big East Fork below dredging had higher sediment and organic matter fractions than above site samplers.

A multiple regression analysis was performed with the predictor variables (depth, velocity, organic matter, sediment) for the response number of taxa to assist with interpretation of results. Kick samples taken downstream of BAS samplers had similar diversity, while percentage composition of gatherers was lower, and predators higher. Drift samples indicated higher numbers of gatherers below dredging; periodicity of other groups was similar. Water quality at all sites was monitored continuously throughout the study for discharge, temperature, turbidity, and conductivity. Sedimentation rates estimated from sediment traps on Big East Fork were higher 40 m and 113 m below the dredging operation than above. Composite size fractions of dredge mining sediment sampled with traps indicated particle sorting as a function of downstream distance. Winter high flows and bedload movement filled dredge holes and flushed sediment from the study site.

### Life History of the Goosefish, *Lophius americanus*

Michael P. Armstrong, M.A. 1987
College of William and Mary in Virginia

Goosefish, *Lophius americanus*, were collected from NMFS groundfish surveys and commercial fishing cruises primarily between George's Bank and Cape Hatteras. These specimens were examined with regard to food habits, age and growth, and reproduction.

Stomach content analysis indicates that goosefish larger than 200 mm TL are almost exclusively piscivorous. Invertebrates, particularly the red shrimp, *Dichelopandalus leptocerus*, were more important in the diet of goosefish less than 200 mm TL. Goosefish feed opportunistically on a large number of fish species, with red hake, *Urophycis chuss*, silver hake, *Merluccius bilinearis*, sand lance, *Ammodytes* sp., and little skate, *Raja erinacea* particularly important.

Age and growth of *L. americanus* was determined using vertebral annuli. Annuli become visible at the edge of the vertebral centra in May. Females were aged up to 11 years and males to 9. Males appear to experience higher mortality in the older age-classes. Von Bertalanfy growth curves were calculated for males and females and had excellent agreement with back-calculated lengths. *L. americanus* exhibits a growth rate intermediate to its eastern Atlantic congeners, *L. piscatorius* and *L. budegassa*.

Male *L. americanus* mature at 3+ years (about 370 mm TL) and females at 4+ years (about 490 mm TL). Spawning takes place primarily in May and June. Fecundity in 17 individuals of 610-1048 mm TL ranged from 300,000 to 2,800,000 ova, and was linear with total length in that size range. Histological examination of the ovaries showed they are remarkably similar to ovaries from other species within the Lophiiform order. *L. americanus* produce egg veils which may function in dispersion, buoyancy, facilitating fertilization, and protection of the eggs and larvae.

## In Memoriam

**Nigel V. Martin**
**Member 1960; Emeritus 1979**
**March 1986**

**Leonard P. Schultz**
**Fellow 1963; Emeritus 1970**
**September 1986**

Dr. Schultz was a pillar of fishery scientists and ichthyologists—he was Curator of Fishes at the U.S. National Museum in Washington, D.C. During his last years of retirement Dr. Schultz worked on some of his favorite topics at the Chesapeake Biological Laboratory at Solomons, MD. He also promoted the development of a marina in Solomons and studied the problems of shore erosion along Chesapeake Bay at his home area of Scientists' Cliffs in Calvert County, MD.

Dr. Shultz will always be remembered as an especially friendly and interesting colleague.

**Archie F. Carr**
**Fellow 1974**
**May 21, 1987**

Dr. Carr was an internationally renowned authority on sea turtles. His writings and conservation efforts are credited with helping to save them from extinction. He documented the remarkable navigational abilities of adult turtles, and also clarified why green turtle hatchlings, weighing a few ounces at birth, are seen again a year later 1,000 miles from their birthplace as they become 400-pound adults. His conclusion was that the turtles travel amidst rafts of floating seaweed called sargassum, and subsist on small shrimp, crabs, and jellyfish.

Dr. Carr's original interest in English and dedication to biology were combined in the 11 books and more than 120 magazine articles and scientific papers he wrote throughout his career.

Dr. Carr's scientific and literary awards included the Gold Medal of the World Wildlife Fund, the Daniel Giraud Elliott Medal of the National Academy of Sciences, the O. Henry prize for nonfiction, and the John Burroughs Medal for nature writing. He was a member of the American Society of Ichthyologists and Herpetologists and the American Society of Naturalists, and a fellow of both the Linnean Society of London and the AIFRB.

**Wendell E. Smith**
**Member 1959; Emeritus 1984**
**1987**

# Membership Report

| NEW ASSOCIATES | | PROMOTED TO FELLOW | |
|---|---|---|---|
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| Patrick J. Harris | NC | | |

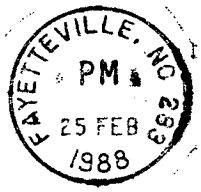
**Sammy M. Ray,** *Membership Chairperson*
*Texas A&M University at Galveston*
*Building 311, Fort Crockett*
*Galveston, Texas 77551*

*Direct membership inquires to the Membership Chairperson*

**BRIEFS,** the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

ISSN-8755-0075

*American Institute of Fishery Research Biologists*
1101 N. 20th St. • Morehead City, NC 28557




FIRST CLASS

*American Institute of Fishery Research Biologists*

# . . . BRIEFS . . .

VOL. 17, NO. 2 APRIL 1988

## Current District Directors

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| Washington, Northwest | Alan J. Mearns |

## Red Tide Alga Extends Its Range 800 Miles Northward

**PAT TESTER,** Ph.D.
National Marine Fisheries Service
Southeast Division, Beaufort Laboratory
Beaufort, NC 28516

Red tides occur worldwide in temperate and tropical waters and date back thousands of years. *Ptychodiscus brevis* is a coastal species, normally present in the Gulf of Mexico in low concentrations (1,000 cells per liter or fewer). The term "red tide" is generally applied to discolored water that has a brownish, rusty, or reddish appearance due to dense concentrations of cells. Often, though, the water is a yellow-green color rather than being red. The effects of *Ptychodiscus brevis* blooms were first recorded off the west coast of Florida in 1844 and occur annually in offshore waters (more than 10 miles) off the Gulf of Mexico. Steidinger (1975) estimates that about 75% of these blooms terminate offshore without developing into major outbreaks. Sporadically (annually to once in 14 years), blooms are transported into the nearshore waters of the west coast of Florida, become established and cause severe economic difficulties (Habas and Gilbert, 1974). There have been only three documented blooms of *Ptychodiscus brevis* off the Atlantic coast of Florida and each one of these was preceded by a bloom off the west coast. Blooms are initiated about 10 to 38 miles off southwest Florida in 36 to 100 feet of water (Steidinger, 1975). Murphy et al. (1975) has documented the transport of cells to the Atlantic coast of Florida via the Florida Current (around the tip of Florida from west to east) and by the Gulf Stream (along the east coast of Florida).

On 2 November 1987, *Ptychodiscus brevis* was identified from water samples taken from Emerald Isle, Carteret County, NC. This is the first occurrence of *Ptychodiscus brevis* north of Jacksonville, FL, and extends its range approximately 800 miles northward. An explanation for this occurrence of *Ptychodiscus brevis* along the North Carolina coast uses the same transport mechanisms that brought cells to the Atlantic coast of Florida on three different occasions. A red tide bloom was reported off Naples, FL, on 24 August 1987, and the event that initiated this bloom offshore is the most likely source for the cells that were entrained into the Florida Current and, subsequently, into the Gulf Stream. The warm, high-salinity water of the Gulf Stream provides appropriate conditions for the survival of *Ptychodiscus brevis.*

Approximately 58 days after the bloom was initiated off Naples, Florida, a strong onshore incursion of the Gulf Stream was detected from Gulf Stream flow charts provided by the National Hurricane Center. From composite sea surface temperature charts provided by the NDS-National Weather Service, it is clear that a parcel of warm water of Gulf Stream origin was onshore near Cape Lookout from at least 22 October through 5 November 1987. By this time, the cells were onshore where they divided once every two days and were concentrated by winds, tides, and currents.

As yet, a true cyst stage has not been confirmed for *Ptychodiscus brevis* and there is no documented evidence that blooms start in nearshore waters. To date, we only know blooms to be initiated from offshore areas and then to be transported onshore by winds and currents. This would lead us to believe that a sequence of events similar to those described as happening last October-November would be necessary before red tides would threaten our coast again.

cont. on page 2

## Red Tide cont.

Also, there is no documented evidence that red-tide blooms are pollution-related. Measurements of nutrient levels in nearshore waters are within a normal range. We have no evidence that this bloom was caused or sustained by higher-than-normal nutrients.

### References

Habas, E. K., and C. K. Gilbert (1974). The economic effects of the 1971 Florida red tide and the damage it presages for future occurrences. Environ. Lett. 6, 139-147.

Murphy, E. B., K. A. Steidinger, B. S. Roberts, J. Williams, and J. W. Jolley Jr. (1975). An explanation of the Florida east coast *Brymnodinium breve* red tide of November 1972. Limnol. Oceanogr. 20, 481-486.

Steidinger, K. A. (1975). Basic factors influencing red tides. In Proceedings of the First International Conference on Toxic Dinoflagellate Blooms (LoCicero, ed.), pp. 153-162. Mass. Sci. Tech. Foundation, Wakefield, MA.

*Reprinted from* ENVIRONS, *Vol. XI, No. 1, Duke University Marine Laboratory, Beaufort, NC*

## Symposium—Fisheries Techniques and Technology

The Southern and Northern California Districts of AIFRB joined the Cal-Neva Chapter of AFS in sponsoring a symposium on February 4, 1988 in Ventura, California. The symposium, *Fisheries Techniques and Technologies,* was organized to make fellow researchers aware of new and upcoming technologies in freshwater and marine science, to provide practical examples of how the technologies have been used, and to provide information on how fellow researchers may acquire and use the new technology.

The 12 papers presented covered telemetry, remote sensing, and oceanic sampling in studying movements of albacore; microcomputer digitizing software in processing two-dimensional data; Whitlock-Vibert boxes for quantifying intergravel sediment deposition in salmonid spawning gravels; pit tags for studying movement and survival of juvenile steelhead and chinook; selective release of reservoir water releases to control stream temperatures; optical pattern recognition systems in fishery management and research; acoustic profiling systems for measuring size-abundance distributions of zooplankton; use of the Stream Corridor Inventory and Evaluation System to evaluate the impacts of hydropower releases; organization of demersal fish communities of the Southern California shelf; stream habitat availability correction in PHABSIM; ease studies in hydroacoustic technology for fisheries assessment; and a chemical index of food web structure and pollutant biomagnification in Salton Sea fisheries.

Our Districts are to be commended for sponsoring this symposium.

## Center for Streamside Studies

The Center for Streamside Studies in Forestry, Fisheries and Wildlife (CSS) in Winkenwerder Hall at the University of Washington began as an effort spearheaded by David Thorud, Dean of the College of Forest Resources and G. Ross Heath, Dean of the College of Ocean and Fishery Sciences to meet the needs for research, continuing education, and the development of an interdisciplinary curriculum which would lead to optimum land and water management decision making. CSS is supported by funding from the forest industry, state management agencies, and the state legislature. CSS will develop teaching and research programs through the Colleges of Forest Resources and Ocean and Fishery Sciences.

Developed in parallel with the Timber/Fish/Wildlife (TFW) Agreement, CSS will also provide consultation and technical backup for TFW. TFW is a management agreement hammered out by management agencies, industry, indian tribes, and environmental groups. This monumental agreement, formed after marathon sessions under the leadership of the Northwest Renewable Resources Center, will resolve conflicts in land use among fisheries, wildlife, and timber industry interests.

CSS organization includes an Executive Board to give advice on policy issues and a Steering Committee to offer directional and technical advice. The first meeting of the Executive Board was held in June 1987 and the first meeting of the Steering Committee was held in early September. After the Steering Committee meeting, there was a joint meeting with the TFW Research and Monitoring Committee to coordinate research plans. Plans for a series of mini-workshops are in the offing.

CSS personnel include Director, Professor Emeritus Ernie Solo; Professor Bob Wissmar, Research Coordinator; and Coordinator for Continuing Education, Professor Ken Raedeke. Val Spooner Kelly, formerly of Dean Thorud's office, is the Administrative Assistant. The budget will include support for graduate studies for which proposals and preproposals are being solicited from supportive faculty and interested students.

On October 15, 1987, the Center began publication of a newsletter, *The Streamside Runoff,* which carries announcements of workshops, seminars, internships, new courses, and other matters of importance to the Center and its constituents. Interested scientists can be placed on the mailing list by contacting 21 Winkenwerder.

## Albacore Fishing in the South Pacific

Exploratory fishing for albacore conducted in the South Pacific in 1986 and 1987 was described in BRIEFS, Vol. 15, No. 4, and Vol. 16, No. 4. The following was taken from Tuna Newsletter, Issue 88, published by the U.S. National Marine Fisheries Service, Southwest Fisheries Center, La Jolla, California. "As a result of the exploratory fishing conducted in 1986 and 1987, 45 U.S. trollers departed from west coast ports in early December 1987 to fish for albacore

in the South Pacific. Vessels hailing from California to Alaska and from Honolulu will participate in the fishery and plan to operate initially in the area from 35° to 40°S and 150° to 155°W, approximately 5000 nm from San Diego. About half the vessels—most are in the size range of 80 to 90 feet—will proceed directly to the fishing grounds; others will stop to refuel in Papeete, Tahiti."

## Our People

**Ron Rinaldo** (AIFRB Member 1979), a NMFS fishery biologist in Washington, D.C., is one of 24 federal executives who won congressional fellowships for 1987-1988. Ron will be a professional staff assistant in a congressional office; he was chosen for his professional experience, career goals, and interest in the legislative process and national politics.

**Raymond Simon** (AIFRB Member 1974), scientist at the FWS National Fish Health Research Laboratory, Leetown, WV, has received the Meritorious Service Award of the Department of the Interior. Ray has received accolades for research on salmonid chromosome studies on the application of immunogenetics to investigate disease resistance based on genetics.

**Joseph W. Angelovic** (AIFRB Fellow 1976) has been named Acting Regional Director of the National Marine Fisheries Service Southeast Regional Office. Joe has been serving as Director of National Marine Fisheries Service's Office of Research and Development Information in Washington, DC. He previously has been Director of the Southeast Fisheries Center when it was headquartered at Galveston.

## Streamside Management

The College of Forest Resources and the Institute of Forest Resources at the University of Washington in Seattle published in 1987 *Streamside Management: Forestry and Fishery Interactions*, Contribution No. 57. Edited by Ernest O. Salo (AIFRB Fellow 1968) and Terrance W. Cundy, this is the proceedings of a 1986 conference sponsored by the College of Forest Resources and others.

The symposium from which this 479-page volume grew aimed at a comprehensive synthesis of the burgeoning number of recent studies on forestry/fishery interactions and at addressing the many changes in regulations governing forest management practices. The scientific papers were given by agency, industry, and university scientists, and the panels were made up of persons representing public agencies, industrial landowners, tribes, and environmental groups. Those familiar with the AIFRB symposium proceedings, *Fish and Wildlife Relationships in Old-Growth Forests*, will wish to examine this volume, for many of the authors and broad topics are seen in both proceedings.

*Streamside Management* covers the problems in *Variables Related to Fish Habitat, Forest Management of the Streamside Zone, Case Studies: Effects of Timber Harvest on Fishery Resources*, and *Panel Discussions*. The fish habitat papers deal with salmonids of western forested watersheds, sediment production in Pacific Northwest landscapes, stream channels, fine sediment and salmonid production, large woody debris in forested streams, stream temperature and aquatic habitat, and influence of forest practices on aquatic production. In the case study section are chapters on the history of studies of fisheries and forestry in southeastern Alaska, effects of streamside treatments on physical conditions and fish populations, impacts of forest management on coho, the Alsea Watershed Study, and a synthesis of case studies.

This volume is a superb update of knowledge about a giant Pacific Northwest problem. The book can be purchased ($30.00 + $1.50) from the University of Washington Institute of Forest Resources.

## Position Announcement

The college of Natural Resources at the University of Wisconsin in Stevens Point is seeking candidates with a Ph.D. degree for a tenure track faculty position. The position involves teaching fisheries management, limnology, limnology and fisheries methods, and introduction to water resources. The normal teaching load is 12 credit hours per semester. The successful candidate will be expected to advise undergraduate and graduate students. Research opportunities are available, and research is required.

Qualifications include an earned doctorate in fisheries or related field and experience with a management agency. Teaching experience is desirable along with the ability to communicate effectively with students, professionals, and members of the public. The applicant should show evidence of scholarly accomplishments, and interest in professional involvement.

The appointment date is January (or August) 1989. Screening of applicants will begin July 1, 1988. Applications received after July 1 are not certain to receive consideration.

Appointment will likely be at the Assistant Professor or Associate Professor level. Salary commensurate with qualifications; summer employment possible.

Send letter of interest and resume, 3 letters of recommendation, and transcripts to:

Dr. Jerry Nienke
Chairman Search and Screen Committee
College of Natural Resources
University of Wisconsin - Stevens Point
Stevens Point, WI 54481

## New Minnesota Research Unit

A cooperative fish and wildlife research unit, one of 34 in the United States, has been established in the Department of Fisheries and Wildlife, University of Minnesota, to facilitate cooperation among the University, the Fish and Wildlife Service, the Minnesota Department of Natural Resources, and the Wildlife Management Institute. The unit will consist of three Fish and Wildlife Service scientists who will be granted faculty status in the Department of Fisheries

cont. on page 4

## New Minnesota Research Unit cont.

and Wildlife and participate in the graduate education and research programming of the department.

The entire Minnesota congressional delegation worked in Congress to establish the cooperative unit, with Congressman Frenzel and Senators Boschwitz and Durenberger taking the major initiative. The unit was authorized by the 1986 Congress and funded in 1987. Many conservation and sporting organizations and private individuals gave support to the effort.

The Minnesota Cooperative Fish and Wildlife Research Unit will emphasize research regarding impacts of human activities on aquatic and terrestrial ecosystems. The research program will address the biological, social, and economic aspects of both game and nongame fisheries and wildlife management.

Minnesota has a vast fishery and wildlife resource and occupies a geographic area containing aquatic and terrestial habitats that are associated with some of the most important regional and national fishery and wildlife research needs. The state is biogeographically unique, with boreal forest, northern coniferous forest, transition zone, and prairie, all of which are, in one way or another, under increasing or changing pressures from human activities.

Research activities of the unit will involve a wide range of applied and basic research projects designed to mitigate or enhance fish and wildlife in habitats with the potential for severe degradation or heavy use or offering considerable possibilities for enhancement. These habitats include urban fisheries, agricultural lands, peatlands, and the agriculture/forest transition zone where land-use changes are accelerating with human expansion in the area. All of these problem areas in Minnesota are representative of similar concerns regionally and nationally.

Because public acceptance is necesssary for successful implementation of fisheries and wildlife management programs, an important focus of the research will be to examine the economic and social ramifications of proposed management programs and to compare alternatives. This integration of ecological, social, and economic research is crucial for decision-making regarding fisheries and wildlife policy and planning. The Minnesota Cooperative Fish and Wildlife Unit is expected to become a center for excellence for this integrated research and thereby serve the state and nation as a source of information for public agencies in their development and implementation of fisheries and wildlife management plans.

# District News

### SOUTHERN CALIFORNIA P. L. Haaker, *Director*

A Symposium entitled "Fisheries Techniques and Technology" was held jointly at the American Fisheries Society, California-Nevada Chapter, Meeting at Ventura, California. The 1-day symposium took place on February 4, 1988, and preceded the AFS meetings. Papers included at the symposium dealt with a variety of high-tech tools and methods which would be of use to fisheries scientists. The symposium was convened by Marty Golden and Pete Haaker of AIFRB and Bill Laudermilk of AFS. About 150 persons attended.

The District also sponsored a *best fisheries research paper* at the AFS meeting. The $50.00 award went to Dr. Jerrold G. Norton, Pacific Fisheries Environmental Group, for his paper entitled "Climatic Influences on Groundfish Recruitment in the California Current."

### NORTHWEST WASHINGTON Alan J. Mearns, *Director*

Next to salmon and oysters, nothing strikes more to the hearts of Washington marineophiles than Dungeness crab (*Cancer magister*). On Tuesday evening, January 19, Drs. David Armstrong and Paul Dinnel, Fisheries Research Institute, University of Washington, presented before a packed room of 40 members and guests a captivating overview of Washington crab research and its management implications.

These investigators and their colleagues have assembled a multi-year crab research program from a diverse array of individual projects that span populations of the coastal shelf, Grays Harbor, Willapa Bay, and bays of northern and central Puget Sound, including Bellingham Bay, Samish Bay, Padilla Bay, and Everett Harbor.

Dr. Armstrong reviewed current knowledge of the basic life cycle of Dungeness crab, with focus on special attributes of coastal shelf and Grays Harbor populations. Lucky yearling crabs that find themselves in Grays Harbor are treated to considerable intertidal refuge in shell piles and to rapid growth in warmer waters than experienced by their coastal shelf cousins. With constant interagency communication, the research team and the Corps of Engineers have succeeded in developing harbor dredging scenarios that maximize crab production and minimize loss due to dredging and disposal. A similar inter-agency working arrangement is pointing toward ways by which pesticide control of burrowing shrimp in Willapa Bay oyster beds is conducted so as to minimize loss and maximize crab survival.

While commercial crab fisheries are the focus of coastal attention, it is the recreational fishermen and general public that benefit from crab research in Puget Sound. Dr. Dinnel enlightened everyone as he described how the team discovered bands of spawning female crabs along slope isobaths near Anacortes and in Port Susan (near Everett). Diving, and use of a mini-sub, confirmed how female populations dominate along the 20-40 m isobath and then migrate annually up- and down-slope. Inshore, intertidal eelgrass beds provide critical refuge for recently settled young-of-the-year. Again, this information has been successfully applied to developing alternative marina and hotel construction projects and for the disposal of dredged sediments during upcoming development of a new U.S. Navy homeport in Everett.

It was a welcome relief to this audience to see how fisheries scientists and coastal managers can cooperate in a productive fashion. We wish the crab team continued success!

*Timber, Fish, and Wildlife: An AIFRB Watershed*

Interagency cooperation continued as a theme of our February 9 evening meeting in Olympia. Through the efforts of past-president Ron Westley, members and guests were treated to a discussion of Washington's new Timber, Fish and Wildlife Initiative by four panelists who were intimately involved in this exciting development.

The Initiative is an agreement among state agencies, private industry, Indian tribes, and environmental organizations to explicitly work together in determining timber harvest and habitat protection actions on a case-by-case basis. For years state agencies, tribes, and environmental organizations have been fighting and sueing each other in a no-win situation to protect fish and wildlife from forestry practices. The Initiative, in one fell swoop, ended those battles overnight.

The four panelists, Curt Smith (currently, Governor's office), Stewart Bledsoe (Washington Forest Protective Association), Terry Williams (Fisheries Director, Tulalip Nation), and Arden Olson (Department of Natural Resources) each described from their point of view how the conflicts were resolved through a several-week process of agency, tribal, and environmental give-and-take. The process started with closed-door meetings of top managers from all organizations who vowed somehow to bury swords and start anew. The process was then immediately transferred to technical representatives from each organization who were given additional authority of give-and-take. From those technical meetings came a suite of sub-agreements that were quickly ushered through the legislature and codified.

Each panelist testified to the complete success of the Initiative in terms of developing productive harvest strategies and identifying specific habitat protection and mitigation measures on specific tracts of forest reserve. Now, because the give-and-take process was allowed to work, the future is bright indeed for this state's forestry/fisheries and wildlife decisions.

*Salmon Farming in Washington*

Mr. John Forster, Sea Farms, Inc., spoke at our March 15 meeting, discussing details of his firm's activities in farming salmon in Washington.

# Announcements and New Publications

**Lake and Reservoir Management Symposium**

A *Regional Symposium on Lake and Reservoir Management,* presented by the North American Lake Management Society and co-sponsored by the Virginia Lakes Association and Virginia Power Company (with major contributions by the Virginia Environmental Endowment, National Audubon Society, American Fisheries Society, and Appalachian Power Company), will be held at The Hyatt at Brookfield, Richmond, Virginia on April 20-22, 1988. These meetings will be held in conjunction with *Forum on Virginia's Waters: Current Developments,* presented by the Virginia Water Resources Research Center.

The Regional Symposium on Lake & Reservoir Management focuses on the lake and reservoir management issues of Virginia, West Virginia, North Carolina, Maryland, Delaware, and Pennsylvania. This Regional Symposium offers sessions for every segment of the Lake management community: the citizen, the lake manager, the educator, the public official, and the scientist.

Virginia's Waters: Current Developments has been organized by the Virginia Water Resources Research Center as part of its effort to disseminate the results of research important to Virginians involved in protecting water. The symposium and forum are being held in joint conference to promote the exchange of ideas and information among their participants.

For information on programs, registration, accommodations, etc., call Judith Foster, NALMS Development Coordinator, Washington, DC, 202/466-8550.

**Fish-Marking Symposium and Workshop**

*International Symposium and Educational Workshop on Fish-Marking Techniques* will take place on June 27-July 1, 1988 at Kane Hall, Room 120, on the University of Washington campus. Sponsored by the American Fisheries Society and the U.S. Fish and Wildlife Service Sport Fish Restoration Program and supported by Wallop-Breaux funds, the meetings will feature addresses, technical paper presentations, exhibits, tours, and entertainment.

The Symposium and Educational Workshop will be the first international meeting to bring together fisheries biologists and managers with equipment manufacturers to discuss all aspects of marking and tagging fish. Fish-marking technologies have rapidly improved and diversified in recent years. They embrace physics, electronics, chemistry, genetics, and morphology. Sophistication of experimental design and analysis has grown with the technologies. Each technological and analytical approach has advantages and disadvantages in particular situations, which may involve small ponds or the open ocean, resident or migrant fish, aquaculture or ecology, basic science or interjurisdictional resource management. Experiences with fish marking have been widespread and worldwide, but current information is scattered and often informal. A synthesis is needed.

The symposium will address these matters in several ways. Technical and poster sessions will cover every facet of fish-marking techniques and applications. A trade show and equipment demonstration will allow biologists, managers, and manufacturers to explore technical opportunities and constraints face-to-face. The peer-reviewed symposium proceedings will collate today's (and tomorrow's) state of the fish-marking art and science in published form. Finally, and most importantly, a manual of fish-marking techniques will be distilled from information presented at the symposium. Everyone with a professional interest in fish marking and tagging will gain valuable information by participating in this symposium and workshop.

Information on programs, registration, accommodations, etc., is available from Conference Registration, GH-25, Seattle, WA 98195.

**California Marine Sportfish**

*California Marine Sportfish Identification* is a handy 164-page guide for California sport anglers who need help identifying commonly caught sport fish in California waters. The book's introduction explains how to compare your catch among the 81 color photos of fish grouped by similar appearance. Line drawings and descriptions of the California offshore fish species, from albacore to yellowtail rock fish, will help you identify your fish.

This book was sponsored and produced by the California Department of Fish and Game, Marine Resources Division; National Marine Fisheries Service, Southwest Region; and the University of California Sea Grant Extension Program.

The price for the guide is $3.50 each, unless ordering 3 or more copies in which case they are $2.00 each. To obtainl a copy please make checks payable to Regents of the University of California, and send your request to Pamela Tom, Food Science & Technology Dept., University of California, Davis, California, 95616-5224.

**Marine Animals of Baja California**

This is the second edition of Daniel Gotshall's (AIFRB Fellow 1978) beautifully illustrated book, which is a guide to the common fishes and invertebrates of the region. Completely revised and updated, the volume has descriptions of 156 species of fish (142 illustrated with color photos) and 46 species of invertebrates. It is a most useful guide to invertebrates and fish that occur off the Pacific Coast of Mexico and Central America and including the Galapagos Islands.

The book has 112 pages and costs $17.95 + $1.85 shipping/handling. Order from Sea Challengers, 4 Somerset Rise/Skyline Forest, Monterey, CA 93940.

cont. on page 6

# Announcements cont.

**Marking and Tagging Bibliography**

*Marking and Tagging of Aquatic Animals: An Indexed Bibliography*, is by Lee Emery and Richard Wydoski. Published as Resource Publication No. 165 by the U.S. Fish and Wildlife Service in 1987, this helpful reference contains 1,436 citations of published articles dealing with marking and tagging of fish and other aquatic animals.

The bibliography lists selected references gleaned from thousands of publications dealing with tagging operations which have been conducted over the years.

The authors have made a special effort to include references concerning the different kinds of available marks and tags, techniques of application, retention rates and/or recovery of marks and tags, and the effects of marks and tags on the organisms. The references are arranged alphabetically by author, consecutively numbered, and indexed by key words that enable easy access to references on particular subjects. The references are about equally divided between topics dealing with fish and other aquatic animals.

Copies may be obtained from the Publications Unit, U.S. Fish and Wildlife Service, Matomic Building, Room 148, Washington, D.C. 20240, or may be purchased from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161.

**International Aquaculture Congress**

Aquaculture International will hold the *Aquaculture International Congress and Exposition* in Vancouver, B.C. on September 6-9, 1988. Co-hosted by seven Canadian organizations and agencies, the meetings will interest producers, investors, suppliers, government officials, and scientists. The programs will include plenary sessions, concurrent sessions, contributed papers, and poster papers, all of which will focus on marketing and sales, finance and investment, post-harvest technology and harvest, and production breakthroughs. Finfish, molluscs, nutrition, algae, crustaceans, and disease will be discussed in the production concurrent sessions.

Information on registration is available from Aquaculture International, 801-750 Jervis Street, Vancouver, B.C., Canada V6E 2A9.

**Southeastern Association Annual Conference**

The 42nd Annual Conference of the Southeastern Association of Fish and Wildlife Agencies will be held at the Hyatt/Regency Hotel, Hilton Head Island, SC on November 6-9, 1988.

The deadline for submitting technical papers to the appropriate program committee is May 1, 1988, and nontechnical session papers are to be submitted to the program chairperson by the meeting date. All authors of fishery papers will submit five copies of their paper in final form to the Fisheries Associate Editor, Dr. Joe Tomasso, Dept. of Aquaculture, Fisheries, and Wildlife, Clemson University, Clemson, SC 29634.

For information on registration, accommodations, etc., write the S.C. Wildlife and Marine Resources Department, Box 167, 1000 Assembly St., Columbia, SC 29202.

**Stock Identification Workshop Proceedings**

The Panama City Laboratory of the Southeast Fisheries Center, National Marine Fisheries Service, announces the availability of the publication, *Proceedings of the Stock Identification Workshop*, edited by H. Kumpf, R. Vaught, C. Grimes, A. Johnson, and E. Nakamura. The proceedings include six plenary papers covering applications in fishery management, morphology and meristics, protein electrophoresis, mitochondrial DNA, monoclonal antibodies and multivariate methods, along with abstracts of contributed papers representing the latest efforts in the field. Copies of the publication are available by phoning or writing: Rosalie Vaught, National Marine Fisheries Service, SEFC, Panama City Laboratory, 3500 Delwood Beach Road, Panama City, Florida 32407-7499; (904) 234-6541.

**Hudson River Reports**

The Polgar Fellowship Reports of the Hudson River National Estuarine Research Reserve Program, 1986 have been published. Elizabeth A. Blair and Jon C. Cooper are the editors of this large volume emanating from the Program, a joint effort of the New York State Department of Environmental Conservation, Hudson River National Estuarine Research Reserve; the Hudson River Foundation; and the NOAA Office of Ocean and Coastal Resource Management, Sanctuary Programs Division.

The reports cover feeding ecology of the banded killifish; feeding biology of the tessellated darter; spawning and nursery habitats of large-mouth bass; bacteria and benthic processes in the Hudson River Estuary; aquatic algae and herbivores in marshlands of the Research Reserve; colonization of artifical substrate by Chironomidae; geology and hydrology of areas in the Hudson River basin; freshwater tidal wetland communities in relation to elevation and substrate; and the flora of freshwater tidal swamps at Tivoli Bay.

The report is available at no cost from Dr. John Waldman, Hudson River Foundation, 122 East 42 St., Suite 1901, New York, NY 10168.

**Pike Bibliography**

The Royal Ontario Museum has issued *An Annotated Bibliography of the Pike*, Esox lucius (*Osteichthyes: Salmoniformes*), by E. J. Crossman (AIFRB Fellow 1981) and J. M. Casselman. This is a comprehensive bibliography of the professional and popular literature on the pike, encompassing its entire geographic distribution.

The authors compiled most the references over a 27-year period in conjunction with their research on this species and closely related fishes. This information was supplemented by printed and electronic bibliographic aids, and by references solicited from biologists and anglers through the Northern Hemisphere.

Annotation is provided wherever possible, describing the nature of the information contained in the reference and the geographic location of the study or story. An index organizes the references under 37 subject categories.

This bibliography is a companion to two other ROM publications: *An Annotated Bibliography of the Muskellunge*, Esox masquinongy (*Osteichthyes: Salmoniformes*) by E. J. Crossman and Cheryl D. Goodchild (1978), and *An Annotated Bibliography of the Chain Pickerel*, Esox niger (*Osteichthyes: Salmoniformes*) by E. J. Crossman and G. E. Lewis (1973).

This 1987 book has 408 pages, paperbound, and costs $18.00 + 15% postage and handling from the Royal Ontario Museum, Publications Services, 100 Queen's Park, Toronto, Canada M5S 2C6.

# Dissertation and Thesis Abstracts

**Studies of Pipefish Foraging in Simulated Seagrass Habitats**

Clifford H. Ryer, Ph.D. 1987

College of William and Mary in Virginia

Laboratory experiments determined the effects of two levels of habitat complexity upon pipefish (*Syngnathus fuscus*) foraging for amphipods. Habitats were composed of equal densities of either narrow (low complexity) or wide (high complexity) leafed artificial seagrass. The response to habitat, as measured by rate of encounter with amphipods, probability of attack after encounter, probability of success after attack, and overall rate of amphipod consumption, was determined for combinations of two fish size-classes and three amphipod size-classes. Small fish did not respond to decreased habitat complexity, while large fish did. Small fish apparently did not experience visually inhibitive effects in either habitat, while large fish had their visual fields impinged upon in the wide-leaf habitat and encountered fewer amphipods. There was a general trend for encounter rate to increase with amphipod size. Large fish attack probability was positively related to amphipod size in the narrow-leaf habitat, but negatively related to amphipod size in the wide-leaf habitat. Small fish attack probability was

negatively related to amphipod size in both habitats. This pattern of attack probabilities was predicted by a conceptual model of prey vulnerability which considers prey size relative to the predator, and size-specific refugia. Success was negatively related to a ratio of prey size to fish size, and showed no overall effect of habitat. Large pipefish in seagrass madows could maximize energy intake by utilizing areas where vegetation is sparse or patchy. Pipefish have flexible behaviors, allowing them to minimize unsuccessful attacks. Due to their position in the structure of vegetation, amphipods have a distribution of vulnerabilities, a criterion by which pipefish select prey.

Size-selective predation on gammarid amphipods by pipefish (*Syngnathus fuscus*) was examined utilizing simulation modeling and laboratory experimentation. Three computer simulation models were developed: 1) a mechanistic model based on empirically derived size-dependent mechanisms of pipefish-amphipod interaction, 2) an optimal diet breadth model in which the rate of energy intake is maximized, and 3) an optimal diet breadth model where switching from energy maximization to time minimization occurs as consumption becomes limited by gastric processing (i.e. satiation). None of these models successfully accounted for the observed pattern of prey size selection. Pipefish concentrated their feeding upon smaller, energetically more profitable amphipods, in excess of what was predicted by either the mechanistic or optimal diet breadth models. This pattern of selection was evident throughout 4-hour feeding bouts, indicating that diet breadth compression did not occur.

It is suggested that pipefish may use a simple tactical rule for size-selection when multiple prey are simultaneously encountered: attack the energetically most profitable prey. The possible relevance of this proposed mechanism of prey selection for planktivorous fish is discussed.

**Nonlinear Numerical Simulation Models for Assessing Tropical Fisheries with Continuously Breeding Multicohort Populations**

Jerald Stephen Ault, Ph.D. 1988

University of Miami

The resources of tropical fishery systems (TFS) provide important economic and social benefits, but are extensively exploited. Poor data and infrastructure, system interactions and nonlinearities, and the dubious utility of traditional age-based models required new insights into TFS stock assessments and general procedures for validating length-based assessment and yield models. Continuous mathematical models and numerical simulation techniques were developed to explore optimal resource utilization strategies the decision maker (DM) might pursue. The literature on the life history attributes of economically important tropical marine fish and their fisheries was reviewed and characterized relative to temperate fishery systems. To deal with the nontraditional conditions of the TFS a hierarchial structure of models was developed: (i) a stochastic first-order age-independent multicohort simulation model, (ii) tests of efficacy and extensions of traditional analytical assessment techniques, and (iii) coupled second-order abundance/density equations with realistic nonlinear interactions for age-structured multicohort populations.

CORECS (COntinuous RECruitment Simulation model) is a generalized age-independent multicohort population simulator that incorporates probability relations for recruitment, growth and survivorship. CORECS simulated length-frequency data produced according to a variety of hypotheses, based on empirical evidence from populations exhibiting tropical characteristics. It provided excellent representations of autonomous multicohort TFS behavior. The efficacy of traditional assessment techniques were benchmarked against the CORECS model of ensemble conditions. Three genera: (i) grouperoids, (ii) scombroids, and (iii) engrauloids, which encompassed the spectrum of commercial-scale life histories indigenous to tropical seas, were used. The Beverton and Holt (1956), Ssentongo and Larkin (1973), and Jones (1981) length-based mortality estimation methods were not efficient nor robust when compared against simulated outputs characterized by errorless data and exact initial conditions.

A new statistical algorithm was developed for estimating total mortality from average length in the catch data and growth parameter estimates. In a Monte Carlo study, the new formulation was more accurate and precise than any of the previously best methods. All estimators were biased with intra-annual trends in recruitment; however, the new estimator was least affected. Populations are ergodic if a cycle is stationary over a given period. A sensitivity approach using inverse theory and the continuous model may facilitate parameter estimation and understanding of system responses to perturbations. The dynamics of any arbitrary number of $n$-interacting population cohorts were modeled by coupled second-order nonlinear differential equations. The high dimensionality of the TFS apparently influences deleteriously the results obtained when constant parameterization and density-independent state interactions are assumed. In the study, even rigidly deterministic systems showed dynamic limit cycles suggesting that traditional "fixed-space equilibria" assumptions may be unrealistic for TFS resources. Determination of system state space probabilities was discussed. This approach may indicate the framework necessary for moving expert systems for fishery management from diagnostic analysis to optimal decision making.

**Population Structure of the White Perch, *Morone americana*, in Lower Chesapeake Bay as Inferred from Mitochondrial DNA Restriction Analysis**

Brian W. Bowen, M.A. 1987

College of William and Mary in Virginia

White perch (*Morone americana*) populations in lower Chesapeake Bay are defined with mitochondrial DNA restriction analysis. A total of 123 individuals from the James, York, Rappahannock, and Potomac tributaries are analyzed with three informative restriction enzymes. The frequency of clone types in the James, Rapahannock, and Potomac drainages differs significantly from a pooled mean frequency, due to the presence of unique clone types confined to each of these tributaries. These data suggest that migration between drainages is sufficient to prevent microevolutionary divergence, but too low to impact stock integrity. The four drainage basins of lower Chesapeake Bay must therefore be managed on an independent basis.

## In Memoriam

### Reuben Lasker

Dr. Reuben Lasker, fisheries scientist with the National Marine Fisheries Service at La Jolla for 30 years, died March 12 at the University of California San Diego Medical Center from cancer. Known world-wide as an expert on food chain dynamics, larval fish physiology, and the nutrition of marine organisms, Dr. Lasker was the Chief of the Coastal Fisheries Division at the fisheries laboratory since 1975.

He received his bachelor's degree and master's degree from the University of Miami and his Ph.D. from Stanford University in biology.

Dr. Lasker came to San Diego in 1956 as a Rockefeller Foundation Post-Doctoral Research Fellow at the Scripps Institution of Oceanography and subsequently held the Lalor Faculty Fellowship at Scripps. At the time of his death he also held the post of Adjunct Professor of Marine Biology at the Scripps Institute of Oceanography.

In 1958, Dr. Lasker came to work at the then Bureau of Commercial Fisheries, housed on the Scripps campus, to begin a lifetime of pioneering work on the energy exchange between fishes and their food supply, ultimately to help answer one of the most important and fundamental questions in fisheries—what determines how many young fish will survive the rigors of life in the sea to become reproducing adults.

During his productive lifetime, Dr. Lasker received many honors. The U.S. government awarded him the Meritorious Service Award of the Department of the Interior (Silver Medal Award) in 1970, and the Distinguished Service Award

cont. on page 8

## In Memoriam cont.

of the Department of Commerce (Gold Medal Award) in 1974 in recognition of his scientitic contributions. The Canadian government's Bedford Institute of Oceanography awarded him the Huntsman Medal for Excellence in Biological Oceanography. Many of his 65 plus scientific papers are considered citation classics.

Dr. Lasker served on the Ocean Stuides Board of the National Academy of Sciences and as advisor and consultant to the Southern California Coastal Water Research Project, the University of Southern California Institute for Marine and Coastal Studies, Rosenstiel School of Marine and Atmospheric Science, California Sea Grant Executive Committee, and many others.

He was a member of Sigma Xi, Fellow, the Western Society of Naturalists, the American Society of Limnology and Oceanography, and American Fisheries Society. He was also a Fellow of the American Association for the Advancement of Science.

Contributions in memory of Reuben Lasker may be sent to the Reuben Lasker Memorial Fund, P. O. Box 271, La Jolla, CA 92038. The proceeds will be used to facilitate the attendance of students to the annual meeting of the California Cooperative Oceanic Fisheries Investigations, one of Reuben Lasker's fond interests.

updated membership to here, April 29, 1988

## Membership Report

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| Gregory T. Ruggerone | WA |
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*Direct membership inquiries to Membership Chairperson*

**BRIEFS,** the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

ISSN-8755-0075

*American Institute of Fishery Research Biologists*
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# . . . BRIEFS . . .

VOL. 17, NO. 3 JUNE 1988

## Alaska District Divides

At the 1987 AIFRB Board of Control meeting, Alaska and Western Canada Region and Alaska District Director Koski suggested that the Alaska District be divided into two Districts to better serve the membership. Members at the meeting approved the move, provided the Alaska District membership voted to separate. After the November 24 District meeting, the members were polled. About 20% of the membership responded, and the majority favored the separation into two Districts.

On April 11, 1988, President Hunter authorized the division of the Alaska District into a Southeastern Alaska District and a Northern Alaska District. William J. Wilson in Anchorage was appointed Interim Director of the Northern Alaska District, and K V. Koski remains as Director of the Southeastern Alaska District.

Each new District will have a director, a Director-elect, a Secretary-Treasurer, and a Membership Chair. These officers, plus a Past Director, will comprise the Executive Committee. The Director and the Director-elect will serve for 1 year instead of 2 years, and the Director-elect will serve as Program Chairman.

AIFRB congratulates the leadership in Alaska for these steps toward adding more continuity and vitality to the Districts, and offers every good wish for success.

## The Royce Editorials

BRIEFS carried two editorials by Dr. William F. Royce last year—*Erosion of Our Professional Image* in the October issue and *How Can We Enhance Public Trust in Our Profession* in the December issue. These articles generated considerable interest among our readers, and several members wrote letters to comment on Bill's ideas about the fishery profession. Because AIFRB and our members have a deep interest in the welfare of the profession, its shortcomings, and ways to improve it, some of the views expressed in the critiques are discussed here.

On the positive side, some correspondents were lavish in their praise of the articles. Expressions such as "right on the money", ". . . hope that all of us heed the wisdom of his words", "I sincerely appreciate the view in your editorial since I harp on *credibility* with my staff and co-workers frequently", "your points . . . echo the concern I've harbored for some time vis-a-vis our professionalism and ethics. This airing of the matter was overdue" came through as dominant impressions of the editorials.

Some letters expressed mixed feelings, as "While I might argue with a few of the observations Bill makes in the editorial, he raises many issues which an organization like AIFRB must take into account if it is to be an effective professional society for fishery scientists and, I might add, fishery managers."

Other correspondents showed disagreement with some of Bill's assertions. ". . . I do not feel that the lack of political activity is a basic professional problem." "I would rate this movement (emphasis on economics) as a sign of professionalism." "I do not feel that fishery workers are neglecting the applied scientists." "While Dr. Royce's points are well taken, I am unconvinced they signal a deterioration of our professionalism." ". . . I find it difficult to identify and generalize about eroding professionalism. The instances cited by Dr. Royce may simply reflect the excessive compulsions of a few serving their own self interests rather than an illness affecting a specific profession."

It has been observed that most of the correspondents praising Royce's comments were closely involved with practical and troublesome problems of fishery management. Some of those who disagreed were involved with laboratory or academic work where they could deal almost entirely with scientific issues instead of political issues.

The disagreements reflect the diversity of our profession. However correct or otherwise, Bill Royce's expressed views may be in the minds of fishery professionals, it is obvious that his editorials set many to thinking about our future and what to do about it, and we are in Bill's debt for his concern for managing fishery resources in a professional manner and for having the fortitude to put it into print.

## More Missing Members

AIFRB Treasurer Joseph Rachlin reports that he cannot locate the whereabouts of 11 more AIFRB people. Anyone knowing the current addresses of any of the following members will do AIFRB and Joe Rachlin a service by letting Joe know where he can find them:

Dennis Michael Bassin
Paul H. Bewick
Thomas P. Calkins
Dr. Harold Hodgins
Dr. Gary G. Lawley
Walter M. Matsumoto
Raymond C. Oligher
Douglas A. Randle
Dr. Richard A. Straty
Richard N. Ushida
Roy O. Williams

cont. on page 2

## More Missing Members cont.

If you know where any of these members are, please notify Dr. Joseph Rachlin, Department of Biological Sciences, Lehman College, CUNY, Bedford Park Blvd. West, Bronx, NY 10468-1589.

## Tribute to Dr. Fred Fry

Dr. Fred Fry of the University of Toronto will be honored at the 1988 AFS/AIFRB meetings in Toronto. The fishery community knows of Dr. Fry's accomplishments in fishery science, most recognize that he is a former President of AFS, and AIFRB members remember that he was President of AIFRB in 1973 and 1974. It is difficult for many of us to realize that Fred Fry is now 80 years old and still going strong.

A group of Dr. Fry's colleagues and former students are organizing a 1-day "Fred Fry Symposium" as a session of the AFS meetings, with a summary paper to be given by Dr. Fry himself. Also, at a noon-hour luncheon, Dr. Hugh MacCrimmon, Past-President of AIFRB and a former student of Dr. Fry, will give recognition on behalf of AIFRB.

## 1988 Travel Assistance Awards

Dr. Joseph Rachlin, Travel Awards Program Chair, announces that selections have been made for awards to nine associate members to help the recipients present papers at national and international meetings. $2,000 will be distributed among the winners, who will be presenting the results of their research in England, Norway, Canada and the U.S. The selectees, their affiliations, and abstracts of their papers are presented here:

**Mr. Roman V. Jesien,** a Ph.D. student of Dr. Charles H. Hocutt, University of Maryland, will be presenting two papers on aspects of his thesis research at the 1988 International Symposium on Fishing with Electricity in Hull, United Kingdom.

### METHOD FOR EVALUATING FISH RESPONSE TO ELECTRIC FIELDS

Typically, when results of electrofishing surveys are presented, the only mention of electric field strength is in terms of voltage or current output of the power source. Since fish response is dependent on the power density produced in water, voltage or current output does little to describe the level of effort expended in fish capture. We describe experimental apparatus designed to investigate fish response to electric fields to determine power density requirements. The experimental apparatus consisted of an observation chamber in which fish were exposed to uniform electric fields, a voltage gradient probe, and a timer to control the time of exposure. Commercially produced electro-fishers were used to generate electric fields.

Threshold power density gradients required to tetanize channel catfish (*Ictalurus punctatus*) are presented. Fish were held and tested in 20 C water with conductivity of 100 uS/cm, 1000 uS/cm, and 10000 uS/cm and were exposed to pulsed DC and AC fields for 1 sec. Fish orientation with respect to the anode and cathode was controlled.

### THRESHOLD POWER DENSITIES TO TETANIZE THREE FISH SPECIES

Threshold power densities required to tetanize striped bass (*Morone saxatilis*), bluegill (*Lepomis macrochirus*), and channel catfish (*Ictalurus punctatus*) are presented. Fish were held and tested in 10 C water with conductivities of 100 uS/cm, 1000 uS/cm, and 10000 uS/cm. Fish were exposed to pulsed DC and AC fields for 1 sec and fish orientation with respect to the anode and cathode was controlled.

**Dr. Standish K. Allen, Jr.,** working in the laboratory of Dr. Dale B. Bonar of the University of Maryland, will present aspects of their research at the Third Annual Symposium on Genetics in Aquaculture, in Trondheim, Norway, June 1988.

### GROWTH FACTORS IN BIVALVES: A MOLECULAR APPROACH

In molluscs, little is known about the types of growth factors which occur or the role these factors play in control of growth and development. Studies in gastropods have shown that neuroendocrine cells located in ganglia produce growth hormone and other biologically active peptides (BAPs). For bivalves, we have shown that homogenates of growing oyster (*Crassostrea virginica* and *C. gigas*) and mussel (*Mytilus edulis*) tissues showed reactivity to antibodies raised against several vertebrate growth factors. CDNA libraries of *M. edulis* and *C. virginica* tissues constructed in lambdaphage GT11 produced fusion proteins able to cross-react with antibodies against somatostatin.

A bioassay system for growth induction was established using organ culture of adult bivalve gill. Indices of growth in these systems are defined as stimulation of tritiated thymidine and 14C amino acid incorporation. Putative growth factors were prepared from bivalve tissue (e.g., ganglia) and tested for growth induction *in vivo*; successive purifications were carried out to isolate individual factors. Assay conditions and successive fractionations and molecular characterization of BAPs are described.

**Mr. Richard D. Brodeur,** a Ph.D. student of Dr. Thomas P. Quinn, University of Washington, will be presenting aspects of his thesis research at the 1988 meeting of the American Society of Zoologists and Western Society of Naturalists in San Francisco, California.

### INTRA-SPECIFIC PATTERNS OF MIGRATORY BEHAVIOR IN MARINE ANIMALS

A wealth of information exists on the movement patterns of marine animals, based on tagging experiments and the utilization of protein variations, parasite faunas, morphology, and other differentiating characteristics. This information suggests two basic patterns, each with a variant. Many species are basically migratory and most individuals move between breeding and feeding areas. A few individuals,

however, do not home to these areas but rather stray to other sites. There are also many species generally thought to restrict their movements and not display long-range migrations. Tagging studies on such species often reveal that a few individuals move great distances. This paper reviews the variations on the general patterns of migration and home range, and suggests explanations for such intra-specific variation in behavior.

**Mr. Gregory T. Ruggerone,** a Ph.D. student working under the direction of Dr. Thomas Quinn of the University of Washington, will be presenting aspects of his thesis research at the 1988 National Meeting of the Animal Behavior Society, Missoula, Montana.

### THREESPINE STICKLEBACK (*GASTEROSTEUS ACULEATUS*) AGGREGATIONS AS A REFUGE FOR SOCKEYE SALMON FRY (*ONCORHYNCHUS NERKA*) FROM PREDATION

Coho salmon frequently consume sockeye salmon fry in Chignik Lake, Alaska, but have never been observed to consume sympatric threespine stickleback. To determine the influence of threespine stickleback presence on the number and size of sockeye salmon fry consumed by coho salmon, an experiment was conducted in three net pens in Chignik Lake. Each pen contained two predators, eight small fry, and eight large fry, but differed in the number of stickleback (0, 30, or 60 stickleback). Significantly fewer fry were consumed in the pen containing 60 stickleback (avg. 2.76 fry/day) than in the 30 stickleback (4.68 fry/day) and 0 stickleback (4.40 fry/day) treatments. The percentage of large fry consumed by coho decreased from 36% to 23% as stickleback abundance increased. On average, significantly fewer large fry than small fry were consumed by coho in each stickleback treatment. These results are discussed from the perspective of heterotypic fish aggregations and predator behavior.

**Dr. Raymond R. Newman,** a post-doc working in the laboratory of Dr. David B. Schroeder of the University of Connecticut, will be presenting aspects of his research at the 1988 Annual Meeting of the Ecological Society of America in Davis, California.

### POTENTIAL CHEMICAL DEFENSE OF STREAM MACROPHYTES (WATERCRESS AND *GAMMARUS*)

We investigated the potential role of defensive chemicals in the avoidance of watercress (*Nasturtium officinale*) by the amphipod *Gammarus pseudolimnaeus* with observations and experiments at two springbrooks: Carp Creek, MI (in Aug) and Squabble Book, CT (Oct-Nov). Fresh frozen watercress was toxic to the amphipods. Toxicity tests gave 48-h LC50 values of 475 mg wet tissue/L (95% CI=402-528 mg/L) in MI and 1122 mg/L (996-1262 mg/L) in CT. A secondary compound, phenylethyl isothiocyanate, which occurs in watercress, was quite toxic in solution. Forty-eight-h LC50 values were 3.6 $\mu$g/L (2.8-4.7$\mu$g/L) in MI and l$\mu$g/L (0.7-1.4 $\mu$g/L) in CT. Choice (preference) trials in CT indicated little consumption of fresh green watercress leaf disks in 24 h; overall, $<10\%$ of the fresh cress offered was consumed. About 60% of yellowed (light deprived) cress was consumed. Frozen cress that was preleached was readily consumed, indicating loss of the toxic compounds. These results and associated chemical analyses suggest that watercress may possess defensive chemicals which reduce herbivory by aquatic invertebrates such as *Gammarus*. This may be just one of perhaps many examples of the use of defensive chemicals by stream and lake macrophytes.

**Ms. Haejung An,** a Ph.D. Student of Dr. Cheng-i Wei, University of Florida, will present aspects of her thesis research at the June 1988 Annual Meeting of the Institute of Food Technologists in New Orleans, Louisiana.

### SPECIES IDENTIFICATION OF SHRIMP BY UREA GEL ISOELECTRIC FOCUSING

Isoelectric focusing conditions, along with incorporation of 9.2 M urea and 6.2% ampholytes into the gel, was used to improve resolution and banding patterns for species identification. This technique required a 17-hr focusing time and was applied to differentiate pink, white, and rock shrimp species. Water extracts of raw shrimp showed excellent banding patterns capable of distinguishing each shrimp species, while water and SDS were effective for cooked shrimp. This system may potentially be capable of detecting shrimp species in a seafood mixture.

**Ms. Suzanne E. Boltz,** a Ph.D. Student of Dr. Jay R. Stauffer, Jr. of The Pennsylvania State University, will present aspects of her thesis research at the September 1988 Annual Meeting of the American Fisheries Society, in Toronto, Ontario, Canada.

### TEMPERATURE PREFERENCE AND TOLERANCE AND SALINITY TOLERANCE OF AN INTRODUCED SPECIES, THE MAYAN CICHLID, *CICHLASOMA UROPHTHALMUS*

The Mayan cichlid, *Cichlasoma urophthalmus*, has become established in two locations in Everglades National Park, Florida. The primary limiting factors for range expansion of cichlids in North America appear to be temperature and salinity. The purpose of this study was to determine the upper and lower incipient lethal temperatures, the preferred temperatures, and the salinity tolerance of the Florida population of Mayan cichlids. The incipient lethal temperatures were determined by exposing fish ($n=10$) to five temperatures above and below the initial acclimation temperature (25 C). Fish were reacclimated to the most extreme temperature at which there was 90% survival or better and tested. This continued until survival was not increased by acclimation. All fish used were naive. Preference was determined by acclimating fish to five temperatures covering the range of tolerance and testing in a horizontal gradient. Salinity tolerance was determined in the same way as the incipient lethal temperature. The upper and lower incipient lethal temperatures were 38 C and 14 C, respectively. The final preferendum was 32.7 C. The Mayan cichlid is able to survive at salinities to 40 0/00; thus, salinity will not

cont. on page 4

## Awards cont.

pose a barrier to further range expansion. The tolerance of low temperatures appears to be the major factor limiting range expansion.

**Mr. Bradley M. Wetherbee** has recently completed his master's degree under the advisement of Dr. Samuel H. Gruber of the University of Florida and will present his thesis research at the Fourth Annual Meeting of the American Society of Ichthyologists and Herpetologists - American Elasmobranch Society, in Ann Arbor, Michigan, June 1988.

ABSORPTION EFFICIENCY OF THE JUVENILE LEMON SHARK, *NEGAPRION BREVIROSTRIS,* AT VARYING LEVELS OF ENERGY INTAKE

The efficiency with which the lemon shark, *Negaprion brevirostris,* is able to absorb energy, organic matter, and dry matter was measured at five levels of energy intake. An indirect method was used by incorporating Celite, an inert reference substance, into food. Absorption efficiencies for energy, organic matter, and dry matter was 68.79%, 80.82% and 76.73%, respectively. Absorption efficiency increased as energy intake increased and declined at the highest level of intake. Growth rate and production efficiencies (K1 and K2) increased with ration. Time required for a meal to be completely eliminated from the digestive tracts of sharks also increased as rate of intake increased. Feces were egested at a constant rate, and fecal composition varied little throughout the duration of voidance. Estimates of absorption efficiencies using a total collection method overestimated first measurement of absorption efficiency reported for any elasmobranch species, and demonstrates that the lemon shark is capable of absorbing energy as efficiently as most teleosts.

**Ms. Barbara E. Warkentine,** a Ph.D. Student of Dr. Joseph W. Rachlin, Lehman College of the City University of New York, will present aspects of her thesis research at the 1988 meeting of the Northeast Fish and Wildlife Conference, in White Sulphur Springs, West Virginia.

SPECIES DIVERSITY OF THE VERTEBRATE AND INVERTEBRATE FAUNA FROM THREE SELECTED STATIONS OF THE NEW YORK BIGHT.

As part of an ongoing evaluation of the ecology of the western arm of the New York Bight, three stations; Seaside Heights (39°55.7'N:74°03.7'W), Sea Grit (40°08.0'N:74°00.9'W), and Elberon Ground (40°18.6'N:73°53.1'W) were sampled in June and November 1984 to evaluate the species diversity and seasonal shifts which occur in the benthic fish and invertebrate assemblages. Fish and macroinvertebrates were collected using a 35-foot trawl net. The stomach contents of all fish collected were identified to the lowest achievable taxon and enumerated (in this way the fish served as a collection mechanism for the invertebrate populations of importance to them) and these data, combined with data on macroinvertebrates brought up in the nets, were pooled by station and season. Shannon diversity calculations indicate that in June, for the invertebrates, Elberon Ground is the most diverse, followed by Sea Girt and then Seaside Heights. However, in November, Seaside Heights has the greatest invertebrate diversity followed by Elberon Ground and then Sea Girt. For benthic fish assemblages, the diversity calculations show that all stations are more diverse in both seasons. There was no significant difference in diversity between Sea Girt and Elberon Ground in the summer. However, Sea Girt was more diverse than Elberon Ground in winter, and there was a significant difference between all stations during this season. These data clearly show spatial and temporal variation in the diversity of fish and intertebrate assemblages within the New York Bight.

## AIFRB Writing Symposium

AIFRB will sponsor a symposium on September 13, 1988 at the Annual Meeting of the American Fisheries Society at Toronto, Ontario, Canada. The topic will be *Writing for Fishery Journals.* The papers and supporting material will use examples drawn from fishery science, but the general principles will be applicable to all science writers from graduate students to "old hands." The program will cover much more than what is seen in style manuals, although the three sections on style will be strong ones. The focus of the symposium will be wide-ranging and will cover numerous topics of interest to fishery scientists at many levels of publishing experience.

Among the prominent symposium speakers, some of whom are AIFRB members, are:

**Paul H. Eschmeyer** of the Fish and Wildlife Service Office of Information Transfer in Fort Collins, CO, speaking on *Usage and Style in Fishery Manuscripts.* Dr. Eschmeyer will discuss details of style and usage that commonly cause writing problems and will emphasize improved readability and comprehension through clear, simple writing and avoidance of usages disputed by authorities on English.

**Bruce E. Collette** of the National Marine Fisheries Service Systematics Laboratory in Washington, DC, dealing with *Problems with Gray Literature in Fishery Science.* Gray literature is written information that is produced and distributed without adequate review. It takes time and effort to produce, but lacks credibility. It is hard to locate. Agencies and scientists should avoid producing gray literature and concentrate on issuing good papers for the permanent scientific literature.

**Victor S. Kennedy** of the University of Maryland Horn Point Experimental Laboratories, Cambridge, MD, presenting *Tabular and Visual Display of Fisheries Data.* Dr. Kennedy will discuss ways to present quantitative data so it is readily comprehended and so efficient and effective comparisons can be made within a table. Data graphics can often be used to replace tables, and Kennedy will show how to decide between tabular and graphic presentation.

**Andrew E. Dizon** of the National Marine Fisheries Service Southwest Fisheries center at La Jolla, CA, dealing with *The Relationship Between the Scientific Editor and the Author(s).*

Here, we shall learn about submitting a manuscript that is appropriate for the journal, preparing a manuscript that does not deviate from accepted form, syntax, and spelling standards, providing illustrations and tables that do not lose detail when reproduced, and not treating critical reviews as an affront to our professional image.

**Carl J. Sinderman** of the National Marine Fisheries Service Oxford Laboratory, Oxford, MD, speaking on *Scientific Writing as English Prose.* He will show how scientific papers can be examples of excellent prose, though forced into a standard format. Signs leading to good prose include correct grammar, sensible paragraphing, adequate transitions from paragraph to paragraph, and introductions to all sections and subsections. As an overlay, the writer may use the turn of a phrase, a spark of wit, a superb treatment of the literature, or a unique graphic presentation.

**Johanna M. Reinhart** of Allen Press, Inc., Lawrence, KS, discussing *Editorial Policy and Scientific Writing: If All Else Fails, Read the Directions.* Miss Reinhart will tell of the importance of journals' editorial policy and of writing style. Editors, authors, and referees must have a 3-way partnership to ensure rapid dissemination of validated scientific information, and must respect each other's roles.

**Douglas G. Chapman** of the University of Washington Center for Quantitative Science in the School of Fisheries, Seattle, WA, speaking on *Statistical Problems in Fishery Research.* Dr. Chapman will tell of the importance of quantitative methods in modern fisheries research, including mathematical and computer models and computer simulation, and especially statistical analysis. He will point out some aspects of statistical design, and discuss analysis concerning catch-per-unit-of-effort and age analysis, and talk about neglect of the question of sample size.

AIFRB is seeking a publisher and distributor of a printed volume to cover the content of this symposium.

## Fellowships in Population Dynamics

The Electric Power Research Institute invites proposals for graduate level (M.S. or Ph.D) fellowship grants for research relating to mechanisms of self-regulation by fish populations. The program goal is to improve understanding of the dynamics of fish populations potentially impacted by operations at power generation facilities and especially the role of density-dependent controls on fish population size and structure. The program initiated in 1988 and has a 7- to 9-year time frame. A total of 15 to 30 fellowships will be awarded over a 3-year period, with the exact number depending on the nature of the individual projects selected. Three awards were made in the first half of 1988. This solicitation is for awards to be granted in October 1988 - March 1989. There are no limitations on topical content of the proposals beyond the general focus on population regulatory processes. Proposals relating to genetic, endocrine, or physiological processes or to the quantification of density-dependent response under manipulative field conditions are especially encouraged.

The EPRI Fellowship Program is administered by the Sport Fishing Institute. An advisory panel composed of academic and industry scientists is responsible for screening proposals and final approval of projects. Proposals must be submitted prior to September 15, 1988 for consideration in this round. All proposals should be submitted by the Applicant's supervisory professor. No awards will be made at the undergraduate level. The Program will consider requests for cosponsorship of projects submitted to other funding agencies.

Requests for applications should be addressed to the Sport Fishing Institute, EPRI Fellowship Program, 1010 Massachusetts Avenue, N.W., Washington, D.C. 20001.

## Announcements and New Publications

**Fish Bioenergetics Workshop**

TITLE: Fish Bioenergetics: A Computer Modeling Approach
WHEN: Saturday and Sunday, September 10 & 11, 1988, 8:30AM-5:00 PM both days.
WHERE: 118th Annual Meeting of the American Fisheries Society, Royal York Hotel, Toronto, Ontario, Canada.
DESCRIPTION: Participants will use a microcomputer model of fish bioenergetics to address questions of fish growth, consumption, and production. We will discuss the basic ideas behind the bioenergetics approach, general strategies for its application, and data requirements, then construct data files, run the model, and analyze output on IBM microcomputers. Participants are encouraged to bring their own data to address a question of interest to them.
PARTICIPATION: Enrollment will be limited to 20 people with a registration fee of $200 US. In addition, participants will need a copy of the microcomputer model and documentation which can be purchased for $20 US either at the time of, or prior to, the workshop.
INSTRUCTORS: Barry L. Johnson and James F. Kitchell, University of Wisconsin Center for Limnology. During hands-on sessions, there will be 3 additional instructors (total of 1 for every 4 participants).
FOR MORE INFORMATION, contact Cathy Catanzaro, UW Sea Grant Institute, at the phone number below.
TO REGISTER, mail name, affiliation, address, telephone number, and your registration fee to:

Cathy Catanzaro, UW Sea Grant Institute
1800 University Avenue, Madison, WI 53706
Phone (608) 262-0645

Checks should be in the amount of $200 and made payable to "UW Sea Grant Institute". Payment must be made in US currency and drawn on a US bank. Registration forms and fees must be received by August 15, 1988, and will be accepted on a first-come, first-serve basis.

**Bathymetric Fishing Maps**

The National Ocean Service of NOAA in October 1987 made available 12 bathymetric fishing maps, and more will be published in 1988. These new maps add to the mapping products already available from the agency. Bathymetric

cont. on page 6

## Announcements cont.

maps (showing the characteristics of the sea floor—shape, size, and distribution of underwater features), topographic/bathymetric maps (displaying both land and submarine topography, available in three scales), and bathymetric regional maps and seamaps complete the list of products which serve as the basic tools for performing scientific, engineering, marine, and marine environmental studies required in the development of energy and marine resources.

Bathymetric fishing maps are available for four areas off the Washington Coast, four off the Gulf of Mexico coast, and four off the New England coast. Ten more should be off the press in 1988. These maps (1:100,000 scale) cost $4.00. A customer order form and Bathymetric Map Catalog 5 are available from the NOAA Distribution Branch (N/CG33), National Ocean Service, Riverdale, MD 20737.

**Fish Physiology**

Volume 11 of *Fish Physiology* is to be published in 1988 by Academic Press. Edited by W. S. Hoar, D. J. Randall, and E. M. Donaldson of the Department of Fisheries and Oceans, West Vancouver, B.C., this latest volume in the classic series on fish physiology will appear in two parts.

Part A, *The Physiology of Developing Fish Eggs and Larvae,* covers Pattern and Variety in Development, Respiratory Gas Exchange, Aerobic Metabolism, and Effects of Hypoxia during Early Life, Osmotic and Ionic Regulation in Teleost Eggs and Larvae, Sublethal Effects of Pollutants on Fish Eggs and Larvae, Vitellogenesis and Oocyte Assembly, Yolk Absorption in Embryonic and Larval Fishes, Mechanisms of Hatching in Fish. Index. Part A has 499 pages and costs $89.00.

Part B, *Viviparity and Posthatching Juveniles,* covers The Maternal-Embryonic Relationship in Viviparous Fishes. First Metamorphosis, Factors Controlling Meristic Variation, The Physiology of Smolting Salmonids, Ontogeny of Behavior and Concurrent Development Changes in Sensory Systems in Telecost Fishes. Index. Part B has 395 pages and costs $89.00.

These books can be ordered from Academic Press, 1250 Sixth Avenue, San Diego, CA 92101-4311.

**Reversibility of Acidification**

H. Barth is the editor of *Reversibility of Acidification,* a 175-page 1988 book on a topic of interest to fishery biologists. This book addresses important questions on how, and how well, acidification processes can be reversed. One main section presents papers on field studies and experiments that were given at an international workshop organized by the NTNF and CEC. The second major section contains theoretical studies and models. Highlights include conclusions on the recoverability of aquatic ecosystems once acidifying depositions are reduced, emphasis on modelling of the expected effects of reduced atmospheric sulphur and nitrogen deposition, and, exclusive of discussion on mitigation by measures such as liming, the effects of depositional changes in land use.

Elsevier Science Publishing Co., Box 1663, Grand Central Station, New York, NY 10163-1663, is the publisher and distributor. The price is $39.75.

## Dissertation and Thesis Abstracts

**The Reproductive Cycle of the Rock Scallop, *Hinnites giganteus* (Grey), in Humboldt Bay, California**

Mark Malachowski, M.S. 1987

Humboldt State University

The annual reproductive cycle of the rock scallop, *Hinnites giganteus* (Grey), from Humboldt Bay, northern California, was examined. Rock scallops were collected at 3-6 week intervals between June 1984 and June 1985 and histological sections of the gonad were made. An indefinite annual spawning cycle was observed. Scallops were in the active or ripe stages throughout most the year. Only one hermaphrodite out of 115 scallops was found, and protandry is doubtful. Induced spawning, attempted at 2-6 week intervals by injecting serotonin into the gonad, was successful in both sexes every month but November 1984 and January and February 1985.

**Age and Growth of Brown Trout (*Salmo trutta* L.), McCloud River, Shasta County, California**

Peggy J. Mundy, M.S. 1988

Humboldt State University

Brown trout (*Salmo trutta*) were trapped and angled from the lower McCloud River, California from 16 June to 10 November 1985. Scales collected from these fish were analyzed for age and growth. Scale samples from 104 fish were analyzed. Ages ranged from 1 to 7 years. Age and growth results were compared with reported values for California brown trout. Growth of McCloud River brown trout was found to exceed that of brown trout elsewhere in California for age-class III and above. This may be due to variable life histories, ecosystem productivity, or low angling pressure.

**Emigration of Young Chinook Salmon from the Tehama-Colusa Fish Facilities**

Stephani A. Spaar, M.S. 1987

Humboldt State University

The effects of water temperature, turbidity, precipitation, lunar phase, date, time of day, and artificial illumination at night on intensity and timing of downstream movements of fall-run chinook salmon (*Oncorhynchus tshawytscha*) sac fry and fry were studied at Tehama-Colusa Fish Facilities, Red Bluff, California. A sampling program and sampling gear were developed to estimate numbers and sizes of young chinook salmon as they left the single-purpose spawning channels. Catch data and environmental data were collected twice daily from January through March 1984 and January and February 1985. Young chinook salmon were collected with a fyke net and catch was expressed as the number of fish caught per hour (CPUE). Multiple regression analysis showed that turbidity, time of day, and date accounted for

32% of the variability in CPUE for 1984, in that order of importance. In 1985, time of day, turbidity, date, and lunar phase accounted for 71% of the variation in CPUE. Under conditions of low turbidity in 1985, artificial illumination and time of day accounted for 66% of the variability. The fork length of young chinook salmon that migrated at day and night did not differ significantly in 1984, but fish that migrated at night in 1985 were significantly shorter than fish that migrated during daylight.

### Skin Tumors on English Sole (*Parophrys vetulus* Girard) from Humboldt Bay, California

William E. Foster, M.S. 1987

Humboldt State University

Trawl surveys were conducted in Humboldt Bay, California from September, 1984 to June, 1985, to examine flatfish for skin tumors. English sole (*Parophrys vetulus* Girard) were the only flatfish with tumors. Thirty-five-hundred English sole were examined and 326 (9.3 percent) had a total of 998 tumors. Most tumored fish were small (61-120 mm TL). Tumored fish were distributed geographically by size, with most the larger fish (90+ mm TL) coming from North Bay. Prevalence of tumored fish was significantly higher in North Bay than in South Bay. Mad River Channel had the highest prevalence of tumored fish, followed by the remaining sample areas (North Bay, Arcata, Eureka, Hookton, and Southport Channels). The seasonal prevalence of tumored fish occurred in Mad River Channel between September, 1984 and February, 1985. The most frequent number of tumors on tumored fish was 2.0 and the average number of tumors on tumored fish was 3.0. Tumors occurred in significantly higher numbers on the eyed side and head half of the fish.

Histological studies revealed three characteristic forms of tumors: Angioepithelial nodules (AEN), epidermal papillomas (PAP), and angioepithelial polyps (AEP). These tumors are successive transitional stages of X-cell neoplasia that is commonly found on English sole in the Pacific Ocean.

### Seasonal Fluctuation in Food Availability and Feeding of Juvenile Steelhead Trout (*Salmo gairdneri*) in a Small Coastal Stream

Steven D. Eggers, M.S. 1987

Humboldt State University

Seasonal fluctuations in benthic and drift invertebrate abundance and feeding of juvenile steelhead trout (*Salmo gairdner*) were examined in three different habitat types from November 1978 to October 1979 on Jacoby Creek, a small coastal stream in northern California. Benthic invertebrate abundance was greatest from August to October and lowest in February and March. Drift abundance, in terms of total number of organisms, was greatest in winter and spring and lowest in summer and fall. Flow appeared to have the greatest affect on drift; as discharge declined over the summer so did aquatic drift abundance. Terrestrial drift was only abundant in the fall. Observed differences in absolute and relative abundance and distribution between sites of some benthic invertebrate groups and taxa, and terrestrial drift, was reflective of differences in canopy and substrate composition.

Juvenile steelhead utilized Trichopteran nymphs throughout the year, but most extensively in winter and spring. Organisms which were in the drift were consumed in greater frequency than benthic organisms, with the exception of Trichoptera. Size and visibility of prey items, and the type of habitat in which fish resided, appered to be more important tha invertebrate abundance in determining food selection by juvenile steelhead. Diversity was examined for drift, benthos, and stomach composition. Differences in diversity were observed between sites for benthic invertebrates, but not for drift of stomach composition.

### Fish Food Habits and Their Interrelationships in Lower Redwood Creek, Humboldt County, California

Timothy J. Salamunovich, M.S. 1987

Humboldt State University

Eleven species of fishes within the lower Redwood Creek watershed were examined for food habits from February to December 1980. Seasonal and spatial intraspecific patterns were analyzed, as well as interspecific diet overlaps. The fishes of lower Redwood Creek relied almost entirely on autochthonous production for their food resources. The food habits of these fishes suggested that most of the species were benthic predators. The exception was juvenile chinook salmon, which appeared to rely more heavily on drift organisms. The limited contribution to the food habits by terrestrial prey items was, at least partially, a result of the lack of riparian habitat along the main channel of lower Redwood Creek. Such productive areas were eliminated during levee construction.

The food habits of most fish suggested opportunistic feeding strategies, except for the more specialized Humboldt sucker. The fishes that were generally considered freshwater species fed most heavily on aquatic dipterans, specifically chironomids, at least while residing in the main channel portions of the study site. The most notable exception to this was the heavy utilization, by some fishes, of the abundant *Corophium* resource that was present in the embayment in the fall. The euryhaline fish species relied more on benthic crustaceans throughout the study. In the sloughs, all fish ate primarily crustaceans.

Most of the intraspecific food habit comparisons showed significant temporal and spatial variations, although there were a few cases of significant diet overlaps between sites and between seasons. This variability was attributed to the diversity of the food habits of most of the fishes. The most notable exception to this variation in food habits was for the Humboldt sucker that resided in the main channel of Redwood Creek. For this species, the almost sole reliance on chironomid larvae was responsible for the extreme similarity of diets.

All interspecific comparisons of diets were significantly different. Common utilization of certain food resources,

cont. on page 8

## Dissertation cont.

mostly chironomid larvae or *Corophium*, by different species of fish resulted in some significant overlaps of food habits. Most of the overlaps were between nonsalmonid fish species. There were no cases of biologically significant diet overlaps between any of the salmonids. This might not have been the case if the berm had not been permaturely breached and the fish and been allowed to rear and compete in the embayment throughout the summer and fall. In any case, most of the biologically significant diet overlaps occurred during the summer when food was probably not a limiting factor. Fish predation on other fishes within lower Redwood Creek was insignificant for all species examined.

## Membership Report

| NEW MEMBERS | | EMERITUS | |
|---|---|---|---|
| Charles T. Mitchell | CA | A. C. Lopinot | IL |
| Dr. John Lyons | WI | Dr. Richard Gard | AK |
| Dr. Douglas J. Martin | WA | | |

| NEW ASSOCIATES | |
|---|---|
| Suzanne E. Boltz | PA |
| Chi-Lu Sun | FL |
| Karen E. Young | OR |
| Richard D. Brodeur | WA |

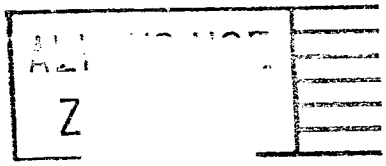
**Sammy M. Ray,** *Membership Chairperson*
*Texas A&M University at Galveston,*
*Building 311, Fort Crockett*
*Galveston, Texas 77551*

*Direct membership inquiries to Membership Chairperson*

**BRIEFS,** the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

ISSN-8755-0075

*American Institute of Fishery Research Biologists*
1101 N. 20th St. • Morehead City, NC 28557

FIRST CLASS

*American Institute of Fishery Research Biologists*

# . . . BRIEFS . . .

VOL. 17, NO. 4 AUGUST 1988

## 1988 Board of Control Meeting

The 1988 Annual AIFRB Board of Control Meeting will convene at 8:00 a.m. on Saturday, September 10 in the Boardroom of the Royal York Hotel, Toronto, Ontario, Canada and adjourn at 5:00 p.m. on September 11. All AIFRB members are invited to attend.

President John Hunter announces the following agenda for the meeting:

Call to Order
Adoption of Agenda
Introduction
Determine if Quorum Present

1. Approval of Minutes of 1987 Annual Meeting and Secretarial Report (Nakatani)
2. President's Report (Hunter)
3. Report of Treasurer (Rachlin)
4. Reports on Publications
   A. Report of BRIEFS Editor (Cope)
   B. Report of Production Editor (Reintjes)
5. Report on Membership Committee (Ray, Jow)
6. Reports on Awards
   A. Travel Awards (Rachlin)
   B. W. F. Thompson Best Paper Award (Vetter) Approval of selection
   C. Outstanding Achievements Award Committee (Cailliet)
   D. Best Paper Award at local meetings (Hunter)
   E. Special AIFRB Award to F.E.J. Fry (MacCrimmon)
7. Reports from Districts
8. Other Business
   A. 1988 Scientific Writing Symposium (Hunter)
   B. Liaison with AFS (MacCrimmon)
9. New Business
   A. Series on essays in BRIEFS on Career Opportunities in Fishery Science
   B. Rotation of Achievement Award and W. F. Thompson Award chairs
   C. Criteria for advancement to Fellow
   D. Publication cost for book on Scientific Writing
   E. Policy regarding long term delinquent dues
   F. National fiscal support for districts
   G. Location of 1989 Board of Control meeting; alternatives to Alaska AFS location
10. Transfer of chair to incoming President - Cole (Hunter)
11. Adjournment

## Northern California District Directorate

BRIEFS carried a list of AIFRB District Directors in the April 1988 issue. We are reminded that the Northern California District had previously held an election that resulted in the choice of Robert N. Tasto to succeed Edward Ueber as District Director.

The Editor regrets this error and hopes that there was little inconvenience or embarrassment caused by the misprint.

## AIFRB Members Honored

The Publications Advisory Committee of the U.S. National Marine Fisheries Service has announced what it judged to be the best papers authored by NMFS scientists and published in the Fishery Bulletin for 1986 and Marine Fisheries Review for 1985. The following papers were selected:

Starvation-induced mortality of young sea-caught jack mackerel, *Trachurus symmetricus*, determined with histological and morphological methods, by Gail M. Theilacker. Fishery Bulletin, 84 (1): 1-17.

Biology of the red sea urchin, *Strongylocentrotus franciscanus*, and its fishery in California, by Susumu Kato and Stephen C. Schroeter. Marine Fisheries Review, 47 (3): 1-20.

Susumu Kato became an AIFRB Associate Member in 1965 and a Member in 1968; Gail Theilacker became a Member in 1987. AIFRB is proud of these Members, who have demonstrated their abilities as researchers and writers.

## Another Honor for Peter Larkin

In recognition of his long service to the University of British Columbia, the Board of Governors has appointed Dr. Peter Larkin, outgoing UBC Vice-President of Research, to the position of University Professor. Peter Larkin was the recipient of AIFRB's Outstanding Achievement Award for Individuals for 1985.

Larkin is only the fourth UBC academic to receive the honor since it was instituted in 1965. All University Professors were department heads or deans, noted scholars with extensive publications and many awards and had track records of outstanding academic leadership.

Since coming to UBC in 1955, Larkin has served as Director of the Institute of Fisheries, Head of the Department of Zoology, Dean of the Faculty of Graduate Studies, Associate Vice-President, Research, and Vice-President, Research.

He instituted the Office of University-Industry Liaison at UBC and is the principal architect of the university's Patent and Licensing Plan.

As a University Professor Larkin is now free to devote himself to scholarly interests and policy matters and to undertake teaching assignments in any faculty he chooses.

"The Board is pleased to have this opportunity to recognize Dr. Larkin's many contributions to the university over the years," said President David Strangway. "His influence here will be a lasting one."

This latest accolade is one of many Larkin has received over the years. He has been awarded the Canadian Centennial Medal, the Queen's Jubilee Medal and the Fry Medal of the Canadian Society of Zoologists, among others. He has been a Fellow of the Royal Society of Canada since 1965.

## Recent Fishery Legislation

George Lapointe of the Atlantic States Marine Fisheries Commission advises of the status of some items of fishery legislation as of June 1988.

The House passed the FY89 Commerce appropriations bill, which has been approved by the Senate Appropriations Committee. This budget generally provides for level funding at FY88 levels before the Budget Deficit Reduction Act reduced line items by approximately 6.3 percent. However, the Senate Appropriations Committee increased the budget for some items.

The Senate Environment and Public Works Committee approved S.2030, the Ocean Dumping Reform Act. This bill would end ocean dumping of sludge by 1991. In the House, H.R.4338 was approved and reported by the Merchant Marine and Fisheries Committee (H.Rept. 100-747). The bill was referred to the Public Works and Transportation Committee, which will report the bill by 5 August. A vote on the House floor could take place between 8 and 11 August. The Senate Appropriations Committee provided $100,000, in the report on the FY89 Commerce budget, to initiate a sampling program of shellfish and finfish at the 106-mile dumpsite. These samples will help assess the environmental impacts of sludge dumping at the 106-mile dumpsite.

The President signed H.R.2210, the Organotin Antifouling Paint Control Act, into law on 17 June (P.L. 100-333). Additionally, the President signed S.1989, the South Pacific Tuna Act (P.L. 100-300), on 8 June and H.R.4621, to approve the Governing International Fishery Agreement with East Germany (P.L. 100-350), on 28 June.

The House passed H.R.1841, the Fishing Industry Vessel Safety and Compensation Act. This bill would establish guidelines for timely compensation of temporary injury incurred by fishermen and would also require additional safety requirements for fishing vessles.

## District Activities

**NORTHERN CALIFORNIA** **Robert N. Tasto,** *Director*

Recently the District has hosted two dinner meetings with featured speakers. Zeke Grader, Executive Director of the Pacific Coast Federation of Fishermen's Associations (PCFFA) addressed the membership in San Rafael on March 18. The PCFFA is a confederation of most of the coastal fishermen's organizations in California and Oregon. Mr. Grader presented his views on current and future fishery research and management needs. He expressed the opinion that a great amount of creativity will be needed to solve the conservation and management problems which lie ahead. Eight years ago, Mr. Grader spoke to the District on a similar subject and both sessions were characterized by very large turnouts, indicating the high interest fishery professionals have in the opinions of industry representatives.

On Thursday, May 12, our featured speaker was Mark Jennings, Research Associate with the California Academy of Sciences and a Research Fishery Biologist with the U.S. Fish and Wildlife Service. Mr. Jennings made an interesting and insightful presentation entitled "Fishery Science Then and Now: The Exploits of Cloudsley Lewis Rutter in the American West", highlighted with many slides from historical photographs.

The District will reconvene in September, after its annual summer break, for a business and planning meeting. A report on the 1988 Board of Control meeting is expected.

## Dissertation and Thesis Abstracts

### Socio-Economic Profile of Non-Resident Sportfishermen and Their Economic Impact on Humboldt and Del Norte Counties, California

Stepehn G. Ahern, M.S. 1987

Humboldt State University

Onsite interviews and mail questionnaires were used to develop a socio-economic profile of non-resident anglers who visited the Humboldt Bay area, Humboldt County, California, during 1982, and who participated in sportfishing. Main length of stay was 45.9 days, gross daily expenditures were $30.76, and total expenditures per visitor were $1411.00.

The majority of surveyed non-resident anglers live in southern California (36.5%) and central or eastern California (31.7%). The average age of non-resident anglers was 54.9 years for males and 55.3 years for females. Non-resident anglers reported that their awareness of the fishing opportunities available to them in the study area occurred by means other than advertisement or promotion of the area. Survey results suggest that advertising the assets of the counties might attract more non-resident anglers and produce a positive affect on local economies.

Non-resident sportfishermen fished on an average of 5.1 hours per day and 25 days per visit. Chinook salmon (*Oncorhynchus tschawytscha*) and silver salmon (*Oncorhynchus kisutch*) were the favorite fish species targeted by non-resident sportfishermen. Visiting sportfishermen rated their fishing success as fair, good, poor and excellent, in that order. Ninety-seven percent of the non-resident sportfishermen planned to return to Humboldt County to fish.

## Diet, Feeding Habits, and Daily Ration of Young Lemon Sharks, *Negaprion brevirostris*, and the Effect of Ration Size on their Growth and Conversion Efficiency

Enric Cortes, M.S. 1988
University of Miami

The diet of a tropical elasmobranch, the lemon shark, *Negaprion brevirostris* (Poey), was intestigated through analyses of stomach contents collected during three sampling periods. Data set 1 consisted of the stomach contents of 78 young and sub-adult specimens caught in the Florida Keys and at Bimini, Bahamas, from 1981 to 1985. Data set 2 (N=86) and data set 3 (N=30) consisted of newborn and young specimens only, captured in the Florida Keys during the summer of 1986 and April 1987, respectively.

In the three data sets teleosts were the dominant prey, followed by crustaceans and mollusks. Stomach contents from data sets 2 and 3 were used to study food consumption parameters and estimate daily ration. About a quarter of the stomachs in each data set were empty. No pattern in diel feeding activity or difference in the amount of food consumed by males or females were found. Feeding in the population was asynchronous and intermittent, with a maximum duration of 10-11 h.

Five methods were applied to estimate daily ration. Three methods were based upon collection of data on stomach content of sharks caught in the wild. The other two were laboratory-based approaches. Estimates of daily ration ranged from approximately 1.5 to 2.1% of the shark's wet body weight. Gastric evacuation in young lemon sharks was studied in three experiments at different temperatures in a field enclosure. Regression analysis was used to evaluate the adequacy of three models in describing the decrease in stomach contents with time after feeding. The linear model produced the best fit overall and was used to compare gastric evacuation at the three temperature regimes. The relations between feeding rate and growth rate and between feeding rate and gross conversion efficiency ($K_1$) were studied in the laboratory at 25 °C. A von Bertalanffy growth curve best described the feeding rate/growth rate data. $K_1$ values did not reach an asymptote or decrease at high ration levels.

## Age Validation of Tetracycline-Labeled Vertebral Centra in a Tropical Marine Predator, the Lemon Shark, *Negaprion brevirostris* (Poey)

Craig A. Brown, M.S. 1988
University of Miami

A multiple-mark tagging program involving two lemon shark populations was conducted from 1979 to the present. In the Florida Keys, 1,935 sharks were measured, marked with a variety of tags, injected with tetracycline hydrochloride, and released, as were 280 sharks in Bimini, Bahamas. The tetracycline, injected intramuscularly at a rate of 12.5 mg/kg, was deposited at sites of active calcification on the vertebral centra and served as a fluorescent marker along the periphery of each centrum at the time of injection.

Vertebral centra were removed from 56 recaptures and subjected to a variety of techniques to differentiate growth zones. Light-dark banding patterns were visualized optimally by exposing whole centra or centra bisected along a frontal plane to a 1% alizarin red S solution and subsequently differentiating with a 3% hydrogen peroxide solution. More closely spaced circuli were revealed by grinding centra along a frontal plane to a thickness of 150$\mu$m. These sections were then stained with alizarin red S, differentiated with hydrogen peroxide, and exposed to a light green counterstain. Other techniques were found to be less successful in demonstrating the circuli, which are more frequently laid-down growth zones which make up the larger banding patterns. Etching whole and half-centra only revealed a portion of the circuli. When siver nitrate staining was conducted, many circuli were obscured by the resultant crystals, even though sodium thiosulphate was used to stop the reaction. Sectioning techniques which required decalcification of the centra were found to be inadequate in that the tetracycline marker was lost in the process.

On each section, circulus counts were conducted from the tetracycline marker, which was visible under UV light on the unstained half of each bowtie-shaped section, to the edge. These counts were correlated versus the number of days since injection, providing an estimate of one circulus forming every 28 days, a lunar periodicity which may be the result of the inshore habitat of this species. Using this validated rate of circulus formation, the recaptures and nine additional large sharks up to a precaudal length of 215 cm were aged from circulus counts. Precaudal length was plotted versus estimated age, with the data points closely fitting a von Bertalanffy growth curve with the parameters $L_{oo}$ = 310.6, k = 0.06, and $t_O$ = −2.28. This curve predicts maturity near age 12 and 95% $L_{oo}$ after 50 years. These results show that this shark is slow-growing and long-lived.

# Announcements and New Publications

### Scientific Diving Conference

The American Academy of Underwater Sciences (AAUS) has announced their upcoming annual symposium for 1988 will be held in La Jolla, California at Scripps Institution of Oceanography, September 29 - October 2, 1988. The theme for this year's symposium is *Advances in Underwater Science.*

The AAUS symposium has been organized to bring together diving scientists on a national scale and to provide the opportunity to share information on a variety of aspects of underwater science. In addition to the symposium, diving workshops and local diving excursions have been scheduled before and after the symposium.

For additional information on the symposium please contact Mike Lang, Dept. of Biology, San Diego State University, San Diego, CA 92182. Tel. (619) 265-4676 (days) 265-8985 (eves).

### Symposium on Riparian Management

The Montana Chapter and the Western Division of the American Fisheries Society will sponsor a symposium, *Practical Approaches to Riparian Resource Management* in conjunction with cosponsors, the Bureau of Land Management, the U.S. Forest Service, and the Society of Range Management. The symposium will take place on May 9-11, 1989 at the Montana Convention Center, Holiday Inn, Billings, Montana.

Subjects to be covered in the workshop will include strategies for maintaining and improving riparian values, inventory and monitoring techniques, regional considerations in riparian inventory and management, riparian grazing strategies, watershed dynamics, streamside silviculture and harvesting alternatives, urban and suburban development, road construction practices, riparian habitat rehabilitation, and riparian-stream processes.

For symposium details write to Glenn Phillips, Montana Department of Fish, Wildlife and Parks, Capitol Station, Helena, MT 59620.

### Symposium—Coldwater Fish Culture

The China Society of Fisheries will sponsor on September 19-23, 1989 an *International Symposium on Coldwater Fish Culture* in Beijing, China.

The Symposium will deal with coldwater fish culture practices and theoretical research. The suggested topics are as follows:

1. Biology of coldwater fish (such as salmon, trout. esox, pond smelt, etc.).
2. Technology on coldwater fish culture.
3. Technique in hatching and larval rearing.
4. Fish feeds and nutrition studied on coldwater fish.
5. Gonadal maturation and induced breeding.
6. Coldwater fish diseases.
7. Genetics

English will be the official language at the Symposium.

For information on registration, accomodations, manuscripts, and tours, write Mr. Huang Kejia, the China Society of Fisheries, 31 Minfeng Lane, Xidan, Beijing, China.

### Salmon Production, Management, and Allocation

William J. McNeil (AIFRB Member 1961; Fellow 1971) has edited this 208-page illustrated, hard-cover volume, which is the proceedings of the *World Salmonid Conference* held in Portland, Oregon on October 2-3, 1986.

This collection of 20 papers, entitled *Salmon Production, Management, and Allocation: Biological, Economic, and Policy Issues,* examines issues ranging from salmon ecology to social policy. The authors write from a variety of perspectives to evaluate current policies in salmon production, management, and allocation; to address issues of importance to the integration of aquaculture in the overall production of salmon; and to explore new options. The authors include fisheries scientists and managers, economists, aquaculturists, legal experts, and public policy analysts from the U.S., Canada, Japan, and Norway.

Chapters include treatments of trends in salmon production, salmon farming, survival of coho, release strategies of coho and chinook, chum salmon as indicators of ocean carrying capacity, Bristol Bay smolt migrations, mixed-stock salmon fisheries, Pacific salmon in the Great Lakes, the market for salmon, sport fishing economics, spread of infectious disease through transplantation, genetic selection in salmonid culture, and other topics.

This book is available from the Oregon State University Press, 101 Waldo Hall, Corvallis, OR for $29.92 + $2.00 p & h.

### Fisheries Research—A Journal

*Fisheries Research,* an international journal on fisheries science, fishing technology, and fisheries management, is currently in its sixth volume of publication.

This journal provides an international forum for the publication of papers in the areas of fisheries science, fishing technology, and fisheries management. As these areas inevitably impinge on, and interrelate with each other, the approach of the journal is multidisciplnary. Authors are encouraged to emphasize the relevance of their own work to that of other disciplines covered by the journal. The scope covers salt, brackish and freshwater systems, and fishing as an economic activity but not as a recreational one. Both practical and theoretical papers are eligible for publication. Review articles are also published. The journal will interest

fisheries biologists, gear technologists, naval architects, fisheries economists, administrators, policy-makers and legislators.

Volume 6 (4 issues) is priced at $130.25. Information on subscriptions is available from the Journal Information Center, Elsevier Science Publishers, 52 Vanderbilt Avenue, New York, NY 10017.

### Largemouth Bass Bibliography

*Indexed Bibliography of Largemouth Bass Literature* is an indexed bibliography for largemouth bass that includes all citations listed in the systematic index of *Sport Fishery Abstracts* from Volume 1 through Volume 32, Number 3. The bibliography was printed by the South Dakota Department of Game, Fish and Parks. Copies can be obtained by writing to the Fisheries Staff Specialist, South Dakota Department of Game, Fish and Parks, 445 East Capitol Avenue, Pierre, SD 57501-3185.

### Pollutant Studies on Marine Animals

This book, by C. S. Giam and Lee E. Ray, discusses the chemical, physiological, and biological changes which take place in marine animals exposed to toxic pollutants. Biochemical, biological, chemical, histopathological, and immunological techniques and results are discussed. Topics include: analytical methods, including dosages and sample handling and preparation; concentrations of the pollutants in water and sediment; accumulation of test pollutants in the tissue of exposed animals; activity of biotransforming enzymes, particularly the cytochrome P-450 dependent microsomal mixed-function oxidase system; concentration and turnover of metabolites associated with stress reactions; cell and tissue structure and ultrastructure; and cellular and humoral immunocompetence. This book is intended for researchers and scientists dealing with environmental pollution and its effect on aquatic species.

The 224-page volume sells for $115 from CRC Press, 2000 Corporate Blvd., N.W., Boca Raton, Florida 33431.

## In Memoriam

### Wen-hwa (Tony) Kwain

The scientific community mourns the early death of Tony Kwain who died from liver cancer on 11 May, 1988. Dr. Kwain, one of the most outstanding authorities on salmonid fishes in the Great Lakes, earned his Ph.D (with distinction) under the supervision of Dr. Hugh MacCrimmon at the University of Guelph in 1968 prior to employment as a fisheries research scientist with the Ontario Ministry of Natural Resources. He was elected a Member of the AIFRB in 1973, and became a Fellow in 1980. His service to the AIFRB as an enthusiastic Chairman of the Outstanding Student Awards Committee will long be remembered by the Institute membership.

## Membership Report

**NEW FELLOW**

Dr. Gordon A. Robilliard CA

**PROMOTION TO MEMBER**

Gregg H. Williams WA

**PROMOTION TO FELLOW**

Dr. Ronald A. Fritzsche CA

**EMERITUS**

F. Heward Bell WA
John G. Carlisle, Jr. CA
C. J. "Jack" Hanel OR

**Sammy M. Ray,** *Membership Chairman*
*Texas A&M University at Galveston*
*Building 3311, Fort Crockett*
*Galveston, Texas 77551*

*Direct membership inquires to the Membership Chairperson*

**BRIEFS,** the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

ISSN-8755-0075

*American Institute of Fishery Research Biologists*

1101 N. 20th St. • Morehead City, NC 28557


FIRST CLASS

*American Institute of Fishery Research Biologists*

# . . . BRIEFS . . .

VOL. 17, NO. 5 OCTOBER 1988

## Financial Report

AIFRB Treasurer Joseph Rachlin submitted the following report at the Board of Control meeting in Toronto on September 10, 1988.

**AIFRB Treasurer's Report, Fiscal 1988 as of 1 September 1988**

| | |
|---|---|
| **CREDITS:** | |
| Dues Receipts | $19,522.22 |
| Alaska Book Sales | 9.00 |
| Return of Advance from K. Warner | 100.00 |
| Transfer from Pete Cole's Treasury | 1,000.00 |
| Transfer from Prudential-Bache Acct. | 2,000.00 |
| Pete Cole's Treasurer's Bond Refund | 24.00 |
| Return of Travel Excess from O. Cope | 13.20 |
| Postage Check Advance Returns | 8.99 |
| Closeout of Ohio AIFRB Business Acct. | 488.23 |
| Rental of Mailing List | 120.00 |
| **Total Credits** | **$23,285.64** |
| **DEBITS:** | |
| Assistant | $ 1,032.00 |
| Insurance Bond | 100.00 |
| Office Supplies | 28.46 |
| Computer Supplies | 222.10 |
| Treasurer's Stationery Stock | 230.30 |
| Dues Notice Postage | 269.28 |
| Second Dues Notice Postage | 84.04 |
| Bank Charges | 36.17 |
| Canadian Exchange Costs | 40.00 |
| Dues Overpayment Returns | 25.00 |
| **Subtotal** | **$ 2,067.35** |
| **BRIEFS:** | |
| Production and Postage | $ 2,039.92 |
| Coastal Press, Printing | 3,585.27 |
| Editor's Costs | 19.23 |
| **Subtotal** | **$ 5,644.42** |
| **AWARDS:** | |
| Associate Member Travel Award Program | $ 2,000.00 |
| W. F. Thompson Award: | |
| R. J. Olsen | 375.00 |
| C. H. Boggs | 375.00 |
| **Subtotal** | **$ 2,750.00** |
| **OTHER:** | |
| AIFRB-Letterhead, Coastal Press | $ 101.85 |
| Travel to 1987 AIFRB Board Meeting | 1,195.85 |
| Inter-American Tropical Tuna Commission (Membership Directory) | 794.05 |
| District Support | 599.96 |
| AIFRB Elections | 334.00 |
| Contribution to 1988 AFS Annual Meeting | 300.00 |
| Contribution AFS/AIFRB Dr. Fry Symposium | 150.00 |
| Sammy Ray-Membership Costs Reimbursement | 638.16 |
| Travel Adv. to 1988 AIFRB Board Meeting | 2,491.88 |
| **Subtotal** | **$ 6,605.75** |
| **Total Debits** | **$17,067.52** |

**ASSETS:**

| | |
|---|---|
| I - Liquid: | |
| Prudential-Bache Money Market | $ 2,278.00 |
| Prudential-Bache Cash Account | .47 |
| Checkbook Balance | 6,218.12 |
| II - Asset Funds: | |
| Blackstone Income Trust, Inc. 360.00 sh. | $ 3,600.00 |
| P-B. Incomvertible Fund 570.089 sh. | 5,712.29 |
| P-B. Equity Fund 599.551 sh. | 5,353.51 |
| P-B. Govt. Sec. Int. 1,116.722 sh. | 11,183.95 |
| P-B. Utility Fund 256.367 sh. | 3,535.30 |
| **Total All Assets $37,881.64** | |

### Overdue Dues

Members with dues in arrears for 3 years will be dropped from the rolls of the Institute and from BRIEFS mailing, following the Board of Control meeting in September of the 3rd year.

# 1988 Awards

The committees concerned with AIFRB awards in 1988 have performed splendidly, both in eliciting large numbers of good nominations and in displaying sound judgement in making the selections of winners. Elizabeth Edwards, chair of the committee dealing with the W. F. Thompson Award for best paper published by a student, reports that her group considered 18 outstanding papers during the deliberations. Gregor Caillet chaired the committee dealing with the Outstanding Achievement Award for an individual and the Group Award of Excellence for an organization; the committee used a comprehensive, fair system for arriving at their choice.

**W. F. Thompson Award**

The winner of this award is Kathleen S. Mayer, whose publication showed careful design and analysis of her study and had results that showed important implications. The abstract of the publication, which appeared in the Transactions of the American Fisheries Society (114:869-886, 1985), is printed here:

### Waste Transformer Oil and PCB Toxicity to Rainbow Trout[1]

Kathleen S. Mayer[2] and Foster L. Mayer[3]

*Columbia National Fisheries Research Laboratory*
*U.S. Fish and Wildlife Service*
*Route 1, Columbia, Missouri 65201*

Arthur Witt, Jr.

*School of Forestry, Fisheries and Wildlife*
*University of Missouri—Columbia*
*Columbia, Missouri 65211*

**Abstract**

Young rainbow trout *Salmo gairdneri* (starting age, 17 d) were exposed to nominal concentrations of 0, 0.38, 0.75, 1.5, 3.0, and 6.0 $\mu$g/L total polychlorinated biphenyls (PCBs) for 90 d, then held in fresh water for 60 d. Sources of PCBs were (1) waste transformer oil containing various hydrocarbons plus a 1:2 ratio of Aroclors 1254 and 1260, and (2) pure technical PCBs of the same Aroclor ratio as that in the transformer oil. Survival of fish was much lower in transformer oil than in technical PCBs at day 90. Growth was reduced at day 30 by the transformer oil, but not until day 90 at the highest concentration of technical PCBs. Fin erosion was severe and vertebra integrity was reduced in fish exposed to transformer oil but not in fish exposed to technical PCBs. Abnormal swimming behavior of fish exposed to transformer oil was attributed to reduced volume of the swim bladder. Exposures to transformer oil decreased hematocrit, and increased serum cortisol to twice that of controls and of fish exposed to technical PCBs. Exposure to either PCB source increased disease resistance of fish to flush (external) challenges of the bacterium *Yersinia ruckeri*, but intraperitoneal injection of *Y. ruckeri* caused faster mortality of fish exposed to transformer oil than of control fish or fish exposed to technical PCBs. All routes of disease exposure should be considered in contaminant-disease interactions. Disease susceptibility or any clinical endpoints measured were never more sensitive indicators of contaminant stress than those endpoints normally examined (growth and survival) in chronic toxicity studies. Because fish took up more PCBs from the technical solutions than from transformer oil, presumably due to petroleum hydrocarbons in transformer oil, environmental assessments of PCBs should include testing the form of the material that may enter the environment.

[1]Research for partial fulfillment of Master of Science degree.

[2]Present address: U.S. Department of the Navy, Naval Aerospace Medical Research Laboratory, Naval Air Station, Pensacola, Florida 32508.

[3]Present address: U.S. Environment Protection Agency, Environmental Research Laboratory, Sabine Island, Gulf Breeze, Florida 32561.

**Outstanding Achievement Award**

The winner of this award is Reuben Lasker, deceased, who received an overwhelming majority of votes from committee members. Dr. Lasker's many accomplishments were detailed in BRIEFS (Vol. 17, No. 2, April 1988).

**Group Award of Excellence**

The Southwest Fisheries Center of the National Marine Fisheries Service at La Jolla, California is the winner of this award. The Center's continued contributions to marine fishery science form the basis for this selection, and the science of marine biology owes a large debt for the excellent work done in the laboratory and in the oceans.

# Letter to the Editor[1]

Dr. Oliver B. Cope
Editor, AIFRB Briefs
15 Adamswood Road
Asheville, NC 28803

June 24, 1988

Dear Dr. Cope:

The National Marine Fisheries Service journals *Fishery Bulletin* and *Marine Fisheries Review* are once again under siege, as a result of the current Administration policy to privatize government activities, and what appears to be continued pressure from the American Fisheries Society (AFS) which wants to publish these journals.

The American Fisheries Society has attempted several times to take over the publication and editorial control of the *Fishery Bulletin*. AFS made two attempts during the 1970's which were declined by NMFS. A third major AFS campaign was undertaken during 1983-84, this time using the present Administration's policy to privatize government activities as the rationale. NOAA was looking for ways to implement the policy, and accepted the AFS proposal as a political expedient. This provoked a strong protest from the scientific community, which was concerned not only about the fate of *Fishery Bulletin*, but objected to the AFS ambition to gain a monopolistic control over all major US publications in fishery science, and thus set itself up as the sole spokesman in the field. As a result of that appeal, Congress intervened on behalf of *Fishery Bulletin*, and it is through their efforts that *Fishery Bulletin* as we have known it exists today. Moreover the Congressional Joint Committee on Printing undertook to help NMFS with problems it was having getting the journal published on time, with the result that the turnaround time between acceptance and publication of a manuscript declined from 22 months in 1983 to 5-6 months today.

At that point, with the technical problems relating to timeliness of publication solved, and with strong support from the scientific community, *Fishery Bulletin* seemed secure.

However, the policy to privatize government activities continued, and NOAA was under intense pressure to comply. AFS continued to lobby for privatization of NMFS scien-

[1]*The views expressed are those of the writer and do not reflect policy of AIFRB.*

tific publications, although publicly they claimed to no longer want editorial control, just the right to publish and distribute (and make money from) the NMFS publications. Frankly, AFS past history and continued pressure regarding FB and MFR makes me skeptical about their intentions regarding editorial control. With regard to privatization being a money-saver, note that since AFS took over the *Progressive Fish-Culturist* from the US Fish and Wildlife, the subscription fee increased from $10 to $16 and the page charges went from zero to $50 per page.

At the present the situation appears to be as follows:

(1) NMFS has been directed by the NOAA Office of Privatization Initiatives to draft a contract giving the production and distribution of both *Fishery Bulletin* and *Marine Fisheries Review* to an outside vendor. This transfer includes the duties of the Managing Editor. Loss of the Managing or Technical Editor, who is responsible for overseeing the transformation of a manuscript into the final printed journal, jeopardizes quality control. How many of us would send an important manuscript to a journal which has replaced the managing editor with an outside contractor with no stake in, or commitment to, the journal? One of the proposals for the Marine Fisheries Review is to hand it over to the advertisers and let them publish it, thus relieving the readers of the $8.75 subscription fee. Personally I would rather pay the modest fee and continue to enjoy the present scholarly format, than have to hunt for articles buried in a sea of advertisements.

(2) At present NMFS will be allowed to retain editorial control of FB and MFR, although this is subject to change. NOAA is not going to consider how privatization will affect costs, or whether there will be a negative impact on FB and MFR. This is a purely political initiative and is frankly acknowledged as such.

I am troubled by the continuing ambition of the American Fisheries Society to have a role in NMFS publications. I feel it is inappropriate for AFS or any professional society to aggressively pursue independent scholarly journals, in order to increase its own revenues or its influence within a scientific discipline. There is a need for AFS members to take a careful look at how their society is being used, and to ask whether hounding NMFS over their publications is in the best interest of science, or to the credit of the AFS.

AFS already publishes 3 journals of its own: the *Transactions, Fisheries,* and the *North American Journal of Fisheries Management,* plus the former US Fish and Wildlife *Progressive Fish-Culturist.* With 4 journals of its own to sustain, AFS would at the least have a strong conflict of interest if it undertook to publish NMFS journals as well. In fact, if we are to retain any semblance of editorial independence among scholarly publications in fishery science, it is essential that AFS refrain from any involvement in the publication of the NMFS journals, which are the only ones now independent of AFS.

*Fishery Bulletin* has a long and distinguished publication history dating to 1881. It provides an outlet for research on marine fishes and fisheries oceanography for both NMFS and the general scientific community; by my last count, about half the articles in FB come from NMFS and about half from the private sector, mostly academic institutions. *Marine Fisheries Review* is likewise an excellent, peer reviewed journal focusing on the fishing industry and related NMFS programs. MFR is about to celebrate its 50th anniversary. NMFS is a science organization involved in basic research as well as management and policy issues; it both needs and deserves to be able to continue publication of its high quality, peer reviewed journals. These journals benefit not only NMFS, but all of us in the scientific community who are interested in fisheries and biological oceanography. NMFS publications should not be put on the block merely to solve a short-term political crisis, or because someone in the private sector wants to exploit them.

Scholarly publications provide our major avenue to bring new ideas before the scientific community, serve as our link to past research, and strongly influence the direction of future work. The integrity and editorial independence of these journals are of vital importance, and we should be prepared to defend them when necessary.

Letters written by concerned scientists were instrumental in making it possible for Congress to act and rescue FB in 1983. I urge the AIFRB membership to express support for *Fishery Bulletin* and *Marine Fisheries Review,* by sending a letter to the Secretary of Commerce, with copies to the Administrator of NOAA and members of several key Congressional committees. I would appreciate receiving a copy as well.

Thank you for your help.

Sincerely,
Ann G. Durbin, Ph.D.
Associate Research Professor,
Univ. Rhode Island
(401) 792-6695

## Response

*Editor's note: This response to the letter printed above is offered by the Executive Director of the American Fisheries Society. The views expressed do not reflect policy of AIFRB.*

Dr. Oliver Cope
Editor, AIFRB Briefs
15 Adamswood Road
Asheville, NC 28803

September 2, 1988

Dear Dr. Cope:

*Fishery Bulletin* is an important journal worthy of Dr. Durbin's support. It is a mystery to me, however, why she feels it necessary to couple this support with strident attacks on the American Fisheries Society. She has been circulating comments like these for several years, but she has never, to my memory, brought her criticisms to us nor asked us about our position with respect to the journal. I am glad for this chance to give our side of the story.

cont. on page 4

**Response** cont.

Yes, we are interested in publishing *Fishery Bulletin*, and have been for a dozen years, but we hardly have placed the journal under siege. Our discussions have been with officials of the National Marine Fisheries Service (NMFS) and the National Oceanographic and Atmospheric Administration (NOAA); we have not pressured upper echelons of the Department of Commerce, we have not lobbied Congress or other branches of the Administration, and we have not tried to rally constituent support. Our specific written proposals were invited by the government following informal conversations between us and NMFS officials. Although our earliest proposals were opposed by some NMFS scientists (who were justifiably proud of their journal), this opposition has waned over the years, and a recent internal review of NMFS publications by staff scientists recommended that *Fishery Bulletin* be contracted to an organization like AFS. (It was the government's idea to package *Marine Fisheries Review* with *Fishery Bulletin;* the former had not been part of our proposals before that initiative.)

In our proposals, worked out in consultation with NMFS officials, the agency has been assured a dominant role on a policy board for *Fishery Bulletin* and a strong role on the journal's editorial board. We have supported the agency retaining the editorships of both its journals within its technical staff. We have tried to accommodate NMFS concerns as they have arisen. Perhaps this is a new definition to "hounding."

Why do we want to publish *Fishery Bulletin?* Money and higher marine profile for AFS are the quick, superficial answers. Both the money and profile, however, will serve the Society's constitutional mandate to "promote the conservation, development, and wise use of the fisheries."

We would hope to make a modest "profit" from publication of *Fishery Bulletin,* as we do from our other journals, but any profit would come from libraries, not from individual subscribers. We actually subsidize individual subscriptions (i.e., the editorial production cost per subscription is greater than combined income from page charges and individual subscription fees). Even so, our library package—which includes all our journals, monographs, special publications, and symposium volumes—costs less then many commercial publishers charge for a single journal. Another of our constitutional mandates is to disseminate scientific information, and we do so without gouging anybody. Our publication program is a very important source of income for our other activities on behalf of fishery resources and the agencies that manage them.

What do we do with these "profits"? Some of them go into preparation of detailed annual Congressional testimony supporting restoration of NMFS budgets that the Administration has cut (I think we're as effective as Dr. Durbin in this respect). Many of them went into our successful 7-year effort to bring about the Wallop-Breaux fund, which has injected hundreds of millions of new dollars into state fishery programs, including marine programs; more of the "profits" are used annually to protect this Congressionally mandated account. Still others are going into strengthened fisheries programs with the National Forest System, i.e. the "Rise to the Future" campaign, and efforts to consolidate federal fisheries responsibilities, which, if successful, could relieve NMFS of its orphan status in the Department of Commerce. We are supporting marine sanctuaries and preservation of estuarine habitats, and have a major wetland enhancement initiative underway. These are only a few of the ways in which we use publication income to support fisheries conservation, research and management.

Our desire for a higher profile in the marine community is similarly motivated. The better we're known, the more effectively we can work for marine resources. Despite our 400-member Marine Fisheries Section, our publication of many marine papers, our meetings at coastal sites, and our symposia on marine topics, we are perceived by some in the marine science community as a freshwater organization. We believe that an association with *Fishery Bulletin* can help counter this inaccurate perception, and that we can better help the profession reach its broader goals as a result.

But not all benefits flow to AFS; we feel we can materially help *Fisheries Bulletin* as well. We would never undermine editorial quality; since Reuben Lasker rebuilt the journal 20-odd years ago, editorial standards have remained high. But, for starters, we can improve the journal's circulation. The Government Printing Office produces about 2,100 copies of *Fisheries Bulletin,* 70% of which are given away. In contrast, all AFS journals have *paid* circulations that exceed 3,000 copies, and our subscribers include nearly 500 research libraries outside the USA. We can improve the manufacturing quality, so that *Fishery Bulletin* does not fall apart in one's hands, as our copies, at least, are prone to do. Although we would need NMFS subscription support at the outset to produce the journal during the first few years, that expense would be half the amount the government now pays to produce the journal. (The same would be true for *Marine Fisheries Review.*)

Our experience with the Department of Interior's *Progressive Fish-Culturist* (PFC) is instructive. The U.S. Fish and Wildlife Service subsidized PFC for the first two years that we published it, at 50% savings to the Service, and we increased the journal's circulation during this period. The Service withdrew its subsidy earlier than expected because of federal budget problems, but we have been able to make the journal self-supporting through further promotion of subscriptions, a modest increase in subscription price (the journal still costs a professional aquaculturist no more than a family trip to the movies), and institution of page charges (which do not come out of authors' pockets). The PFC is still a government journal, but it is sheltered from federal budgetary uncertainties, it costs the tax payer nothing but the subscriptions they buy for professional staff, and the government can take it back on 60 days' notice if it wants to.

Given the U.S. Government's well-publicized efforts to muzzle mathematicians, it is strange that Dr. Durbin feels a journal will be more "independent" in government hands than under the aegis of a nonprofit professional organization. Indeed, the PFC is still contractually subject to

government censorship; the Project Officer can order a paper to be deleted from the journal (at the proof state!) if he or she judges that it does not comply with Fish and Wildlife Service policy. The thought that AFS might put some sort of editorial "spin" on its publications reflects ignorance of the Society's character. In addition to five elected Society officers and the administrative office, the Society's leadership comprises elected representatives of four regional divisions, 50 chapters, and 13 discipline-oriented sections. This leadership changes almost completely *each year*. The last 15 Society presidents have included five academics, two private-sector people, and two state employees. An institutional bias that is not a consensus of the Society's 8,000 members would be difficult to achieve, let alone sustain. The leadership's consistent—and only—directive to its editors has been to strive for excellence. Our credibility and usefulness depend on this.

The Society is an active publisher, but the producers of *Copeia, Limnology and Oceanography, Bulletin of Marine Science, Canadian Journal of Fisheries and Aquatic Sciences, Journal due Conseil, Journal of Fish Biology, Aquaculture,* and countless other journals and books will be quite surprised to hear that AFS might gain a monopoly over fisheries and aquatic ecology in the United States or North America. Until a couple of decades ago, one agency of the federal government held the closest thing to a monopoly in fisheries publication that the USA has known—and that was not very close at all. Dr. Durbin has assigned us "credit" that we haven't earned.

We *will* submit a competitive proposal to publish *Fishery Bulletin* if NOAA again issues a public solicitation. As we present our case, we will not try to spuriously discredit our competitors or those who oppose privatization of government journals on philosophical or policy grounds. In the meanwhile, I join Dr. Durbin in urging letters of support for NMFS. The agency as a whole is under siege within the Administration, and it deserves advocacy from its professional constituents. Simultaneously, I urge Dr. Durbin to become a member of the American Fisheries Society and to get constructively involved in our fisheries science editorial activities.

Sincerely,
Carl R. Sullivan
Executive Director

## Our People

**Paul Brown** (AIFRB Associate 1973) has taken a position with the Illinois Natural History Survey at Sam Parr Research Station. Paul was formerly at the Department of Wildlife and Fisheries at Texas A and M University at College Station.

**Bernard L. Griswold** (AIFRB Member 1973; Fellow 1978) has moved from the Great Lakes Fish Laboratory of the Fish and Wildlife Service, 1451 Green Road, Ann Arbor, Michigan to the National Sea Grant Program of NOAA, 6010 Executive Boulevard, R/SE1, Room 826, Rockville, Maryland 20852.

**Ben D. Jaco** (AIFRB Member 1987) is retiring from TVA, where he has been Senior biologist in the Fisheries and Aquatic Ecology Branch, Division of Air and Water Resources for some time. The occasion for Ben's early retirement is a total agency reorganization with realignment and reduction in all TVA programs. Fisheries will suffer drastic reductions in activities and personnel and the the Branch will be moved from Knoxville to Chattanooga. Ben emphasizes that he is *not* retiring from fisheries, but intends to continue working to improve the fisheries profession and our public and private fish and wildlife resources. He will remain at 5004 Malibu Drive, Knoxville, Tennessee 37918 (615-687-6034).

**Johanna Reinhart** (AIFRB Member 1986) has left her position as director of the Scientific and Publications Branch of the Department of Fisheries and Oceans, Ottawa, Ontario to accept the post of director general of editing and composition services at Allen Press of Lawrence, Kansas. Allen Press produces international scientific and scholarly journals.

**Saul B. Saila** (AIFRB Member 1959; Fellow 1984) has retired from his post at the University of Rhode Island. He served for 32 years at URI and was professor of oceanography and zoology, as well as chief scientist in the Office of Marine Programs.

**Frieda B. Taub** (AIFRB Member 1986) is an American Association for the Advancement of Science Environmental Science and Engineering Fellow this summer. Her appointment for 10 weeks is at the U.S. Environmental Protection Agency in Washington, D.C.

Frieda received her Ph.D. degree from Rutgers University in 1959 and received both her M.A. and B.A. degrees from Rutgers in 1957 and 1955, respectively. She has been affiliated with the University of Washington since 1961, serving as a professor in the School of Fisheries since 1971 and adjunct professor in the Institute of Environmental Studies since 1975.

The AAAS Environmental Science and Engineering Fellows Program is intended to assist the EPA fulfill its responsibility for identifying and assessing the significance of long-range environmental problems and opportunities. The Fellows carry out research in areas of significant environmental interest. Dr. Taub's professional interest is in testing the environmental safety of genetically engineered organisms.

## Luncheon Honors Dr. F. E. J. and Irene Fry

At the close of the AIFRB Board of Control meeting on Sunday, September 11, 1988 in Toronto, a luncheon was held for those attending the Board of Control meeting to honor

cont. on page 6

**Luncheon Honor** cont.

Fred (AIFRB President in 1973-1974) and Irene and to give Fred a copy of Scott and Scott's new edition of "Atlantic Fishes of Canada". In addition to the Board were Dr. William F. Royce, Mrs. Hunter, Mrs. Cole, Mrs. MacCrimmon, Mrs. Ray, and Mrs. Reintjes.

## Conservation Award Nominations

The Chevron Conservation Awards Program, in its 35th year, honors dedicated Americans who have made outstanding contributions to conservation, often without recognition. Sponsored by Chevron since 1986, it recognizes the achievements of volunteer citizens, professionals and nonprofit organizations—those people and organizations that work to protect our environment.

The 1989 Chevron Conservation Award winners will be honored at a Washington, D.C. banquet in May 1989. Each will receive a $1,000 honorarium, an engraved bronze plaque and a trip to the nation's capitol for the awards presentation.

Colleagues, friends, and the general public are invited to nominate deserving candidates. Nominations should include a letter of recommendation that describes the nominee's achievements in detail. Complete information should be provided within the letter, including the nominee's address, telephone number, and available documentation, such as magazine and newspaper articles. Also, a brief biographical sketch of the nominee should be included. At least two additional letters of endorsement must support the nomination. Nominations are being accepted through December 31, 1988.

This information should be sent to: Chevron Conservation Awards Program, P.O. Box 7753, San Francisco, CA 94120-7753.

Making a contribution to conservation can take many forms, from research to field work to legislative action, but one of the most powerful opportunities is available right now: the opportunity to recognize and reward those who protect and enhance our natural resources. 1988 honorees included the director of Oregon's Berry Botanical Gardens, who supported and helped win passage of the state's first Endangered Species Act for rare plants and animals. Another is a Wisconsin citizen who is the founder, publisher, and editor of a journal that provides current, non-political information on environmental issues and encourages public involvement and informed decision-making on legislation. Yet another winner is a Missouri husband-and-wife team who made it possible for the Department of Natural Resources to acquire a segment of land and reclaim the Missouri River Trail, the route originally taken by Lewis and Clark.

Additional information about this program and its honorees can be obtained by calling (415) 894-2457 in San Francisco or (412) 456-3880 in Pittsburgh.

## Fisheries Dean Position Vacancy

Nominations and applications are sought for Dean of the newly created School of Fisheries and Ocean Sciences, University of Alaska Fairbanks. The School, with an annual Budget of $13 million and about 50 faculty, includes the Institute of Marine Science in Fairbanks and Seward, the Juneau Center for Fisheries and Ocean Sciences, the Fishery Industrial Technology Center in Kodiak, the Marine Advisory Program, and the Alaska Sea Grant College Program. The School operates the R/V Alpha Helix.

The University seeks a leader with broad knowledge, experience and appreciation of how interdisciplinary approaches in marine and fisheries science can lead to understanding ocean and freshwater systems and human interaction with those systems. Candidates should have significant experience in academic, research, and public service areas appropriate to fisheries and ocean sciences, including a strong publication record and administrative background. The person selected must be tenurable as a Professor within the School.

Candidates should submit: a resume; letter of interest indicating experience, ideas, and agenda that will be brought to the job; a brief statement indicating recent relevant accomplishments; and, names of three references. The complete application and all inquiries should be referred to: Dean Michael Rice, School of Management, Chair, Dean of SFOS Search Committee, 107 Bunnell, UAF, Fairbanks, AK 99775-1070.

Completed applications must be postmarked by November 1, 1988. Screening of candidates will begin October 1, 1988.

The University of Alaska, Fairbanks is an affirmative action/equal opportunity employer and educational institution.

## Announcements and New Publications

**Fishing Gear Symposium**

*World Symposium on Fishing Gear and Fishing Vessel Design* will take place at St. John's, Newfoundland, Canada on November 21-24, 1988. The sessions will be held at the Radisson Plaza Conference Centre. Co-sponsors are Canada/Newfoundland Ocean Industry Development Subsidiary Agreement, with participation by the Newfoundland and Labrador Institute of Fisheries and Technology, Canada Fisheries and Oceans, FAO, Massachusetts Institute of Technology, and the International Council for the Exploration of the Sea.

The main objective of the Symposium is to bring together leading experts from fishing countries for an information exchange which will help to maximize the benefits from the resource for the world. Sessions will include: Conservation-oriented fishing; energy optimization; small-scale fisheries; monitoring of fishing vessel and fishing gear performance; onboard fish handling and preservation; industrial fisheries techniques; and discussion and recommendations.

Workshops, demonstrations, and tours will be additional features of the Symposium.

Information on registration, accommodations, and fees is available from Dr. C. M. Campbell, Symposium Office, Newfoundland and Labrador Institute of Fisheries and Marine Technology, Box 4920, St. John's Newfoundland A1C 5R3, Canada.

**Halibut Symposium**

*Symposium on the California Halibut* (Paralichthys californicus) will take place at the Cabrillo Marine Museum, San Pedro, California on May 23-24, 1989. The California Department of Fish and Game and the American Institute of Fishery Research Biologists will sponsor the meeting, which will be held to review and evaluate present knowledge on the biology, ecology, and fishery of this species. Plenary sessions on key management issues, and sessions on all other aspects of the biology and ecology of the California halibut, are scheduled.

Papers on any aspect of the biology, ecology, and fishery of California halibut are invited. Papers, accepted after peer review, will be published in the *California Fish and Game Fish Bulletin*. Deadlines for submission are: Title and outline, October 31, 1988; first draft, February 1, 1989; and second draft, April 14, 1989. Please direct outlines, papers and inquiries to John Sunada, Coordinator, Marine Resources Division, 330 Golden Shore, Suite 50, Long Beach, CA 90802.

**Atlantic Fishes of Canada**

In October 1988, *Atlantic Fishes of Canada* by W. B. Scott (AIFRB Fellow 1961) and M. G. Scott will be published by the University of Toronto Press. With 850 pages, 357 illustrations, and 23 color figures, the book is a compilation of the latest information on 533 species.

Since 1966, the standard reference on the varieties of species native to the Canadian Atlantic region was A. H. Leim and W. B. Scott's *Fishes of the Atlantic Coast of Canada*. This new work by W. B. Scott and M. G. Scott replaces the earlier volume with almost twice as many species. There has been a remarkable increase in knowledge of marine fauna as a result of more sophisticated fishing gear used in ichthyoplankton surveys conducted on the Scotian shelf. This new volume includes the latest discoveries. It is the result of three years of intensive scholarship using worldwide contacts and centering at the Huntsman Marine Laboratory in St. Andrews, New Brunswick, where W. B. Scott is Senior Scientist and former Director.

Each species shown has the following descriptive categories: habitat, reproduction, growth, food, predation and competition, parasites and diseases, distribution, relation to man, systematic note, description, common name.

This beautifully produced volume will be the classic reference for many years, and will be an indispensible resource for interested professionals, fishermen, scientists, food processors, students, science writers, and many others.

The book can be ordered from Direct Mail Marketing, University of Toronto Press, 63A St. George St., Toronto, Canada M5S 1A6. The price is $45.00 plus $2.00 shipping charges.

**Culture of Abalone and Other Marine Gastropods**

The *CRC Handbook of Culture of Abalone and Other Marine Gastropods*, edited by Kirk O. Hahn of the Bodega Marine Laboratory, will come off the press in November 1988.

The contents cover: BIOLOGY OF ABALONE: Survey of the Commercially Important Abalone Species in the World. Gonad Reproductive Cycles. Artifical Induction of Conditioning (Gonad Maturation). Artifical Induction of Spawning and Fertilization. Larval Development of Abalone. Induction of Settlement in Competent Abalone Larvae. Biotic and Abiotic Factors Affecting the Culture of Abalone. Nutrition and Growth of Abalone. Abalone Seeding. CULTURE TECHNIQUES: Abalone Aquaculture in Japan. Japanese Abalone Culture Techniques of the Oyster Research Institute. Abalone Aquaculture in California. Abalone Culture in an Urban Environment. Abalone Cultivation Methods Used at the California Department of Fish and Game's Marine Culture Laboratory. Abalone Farming in Korea. Farming the Small Abalone, *Haliotis diversicolor supertexta* in Taiwan. Culture of *Haliotis tuberculata* at the Argenton Experimental Station, France. Abalone Aquaculture in New Zealand, Australia, and Ireland. Culture of the Tropical Top Shell, *Trochus niloticus*. Culture of the Queen Conch, *Strombus gigas*, in the Caribbean. Index. c. 408 pp., 7x10.

This volume is available for $165 from CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, Florida 33431.

**Aquatic Science & Fisheries Abstracts**

Cambridge Scientific Abstracts of Bethesda, MD is publishing a series entitled *Aquatic Sciences & Fisheries Abstracts*, which has three parts—Part 1, *Biological sciences and living resources*, ASFA 1 ($685, monthly); Part 2, *Ocean technology, policy and non-living resources*, ASFA 2 ($495, monthly); and *Aquaculture Abstracts* ($225, quarterly).

ASFA 1 covers all biological and ecological aspects of marine, freshwater and brackish organisms and environments (including pollution, productivity, conservation, and legislation). There are approximately 2,400 abstracts per issue. *Aquaculture Abstracts* covers management and economics of aquaculture, including biology and ecology of cultured species, techniques, equipment, methodology, engineering, and feasibility studies. It contains approximately 1,000 abstracts per issue.

For information and ordering, write Cambridge Scientific Abstracts, 7200 Wisconsin Ave., Bethesda, MD 20814.

**New Books from Academic Press**

The following books can be ordered from Academic Press, Book Marketing Dept. 80904, 1250 Sixth Avenue, San Diego, CA 92101-4311. *Fish Nutrition, 2nd Edition.* Edited by John E. Halver (AIFRB Member 1960, Fellow 1971), this comprehensive sourcebook on all elements of fish nutrition is an update of the first edition, which has been used extensively for 15 years. It covers nutrient requirements of fishes, nutrient role in metabolism, digestive physiology, intermediary metabolism, and diet formulations and preparations. It will appear in December 1988, have 704 pages, and cost $140.

*Fish Vaccination*, edited by A. E. Ellis, treats the theory of vaccination; the commercial production, legal restrictions, and marketing of vaccines; the practical use of vaccines on fish farms—limitations and problems; and vaccination strategies for common and commercially important bacterial, viral, and parasitic diseases of fish. December 1988 is the publication date for this 288-page book, which will cost $39.90.

# Dissertation and Thesis Abstracts

**Early Life History of Weakfish**
*Cynoscion regalis* **(Bloch and Schneider)**
Stephen T. Szedlmayer, Ph.D. 1988
College of William and Mary in Virginia

Juvenile weakfish, *Cynoscion regalis*, life history was studied in the York River estuary, Virginia. To verify daily aging methods of juvenile fish, both male and female adults were induced to spawn by injection of 200 IU Human chorionic gonadotropin/Kg wet weight. Subsequent larval and juvenile fish were reared up to 275 days with wild plankton and a daily rotating diet of squid, liver, *Anchoa mitchilli*, and *Menidia menidia*. Otoliths and scales were examined for daily microincrement patterns. Otolith ring counts were highly variable (31% varied by > 15% among 3 counts). Two problems were evident: 1) Microincrements frequently split to form two increments; and 2) Otoliths from a size series of fish (6.12-13.1 mm) indicated that weakfish otoliths grew by bud formation rather than concentric deposition. Scale circuli showed little variation between counts (99.5% of 2 counts from an individual scale were the same). Daily scale deposition was suggested by rearing to 100 days, after which ring deposition was less than daily; however, further research is needed because only one fish was reared past 25 days. The advantages of scale circuli counting over otolith increment counting were increased precision and ease of preparation.

Field samples were collected weekly from the York River channel, at night, using a 4.9 m, 1.5 mm cod end, trawl, during the weakfish nursery period (Aug-Oct 1983). The new technique of daily aging by scales, was applied to 845 of 922 weakfish collected. Counts ranged from 3 to 100 circuli/scale. Three cohorts were defined from the 1983 0-age fish. Growth rates estimated from scales (0.76-1.13 mm/d) were similar to those from length frequencies (1.0-12 mm/d). Analysis of covariance showed a significant difference (0.05 level) in growth rates among cohorts and among stations, but third-order interactions (station, cohort, growth rate) were not detected. Mortality/migration rates estimated from decline in mean catch were significantly different between cohorts 1 and 2 (0.05 level, t-test). Weakfish were first abundant as new recruits at the river mouth, and moved upriver as they grew. In the fall a reverse migration occurred. Birthdate frequency by station and date indicated that different cohorts used different areas of the York River.

# In Memoriam

**Richard A. Wade**

Dr. Richard A. Wade (AIFRB Member 1973; Emeritus 1983) passed away on February 2, 1988 in Alamogordo, New Mexico after an illness of nearly 4 years.

cont. on page 8

## In Memoriam cont.

Dick was born in Fitchburg, Massachusetts in 1930 and served in the U. S. Marine Corps for 5 years. He received a B.S. degree in 1956, an M.S. in 1962, and a Ph.D. in 1968 in biological oceanography, all from the University of Miami. He was a member of several honorary societies, was awarded several scholarships and fellowships, and was the first recipient of the Rust Foundation Scholarship of the University of Miami School of Medicine. His employment following the Ph.D. included research aquatic biologist in the Federal Water Pollution Control Administration, head of the Department of Ecology-Pollution and senior scientist at the Virginia Institute of Marine Science, chief of the National Marine Water Quality Laboratory at Wadmalaw Island, South Carolina, executive secretary of the Sport Fishing Institute, executive director of the American Fisheries Society, project officer in the Fish and Wildlife Service, regional activities leader of coastal ecosystems in Albuquerque, New Mexico, and regional team leader for the Fish and Wildlife Service in Atlanta, Georgia.

Dr. Wade's research dealt with the biology and effects of pesticides on tarpon, as well as other pollution and water-quality matters.

Dick retired to Alamogordo. The people of that community and his friends and colleagues in fisheries will miss him.

# Membership Report

| NEW MEMBERS | | EMERITUS | |
|---|---|---|---|
| Chares P. Meacham | AK | Daniel W. Gotshall | CA |
| Dr. Alexander M. Milner | AK | Dr. William A. Smoker | AK |
| Barra L. Gots | Ont. | John A. Thomson | B.C. |

| NEW ASSOCIATES | |
|---|---|
| Tracy W. Hillman | WA |
| Frank C. Shrier | OR |

**Sammy M. Ray,** *Membership Chairperson*
*Texas A&M University at Galveston,*
*Building 311, Fort Crockett*
*Galveston, Texas 77551*

*Direct membership inquiries to Membership Chairperson*

**BRIEFS,** the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

ISSN-8755-0075

*American Institute of Fishery Research Biologists*
1101 N. 20th St. • Morehead City, NC 28557


FIRST CLASS

*American Institute of Fishery Research Biologists*

# . . . BRIEFS . . .

VOL. 17, NO. 6 DECEMBER 1988

## John W. Reintjes Dies

We lost a giant in the recent history of AIFRB with the death on November 15, 1988 of John W. Reintjes, Production Editor of BRIEFS since 1983. Because we must deliver the copy for this issue of BRIEFS to our printer without delay, we shall wait until the February issue to run an appropriate article about John and his contributions to AIFRB.

## Board of Control Meeting—1988

President John R. Hunter called to order the 1988 meeting of the AIFRB Board of Control at 8:30 a.m., September 9, 1988 at the Royal York Hotel in Toronto, Ontario, Canada. Officers and members present were: John R. Hunter, President; Charles F. Cole, President-Elect; Roy E. Nakatani, Secretary; Joseph W. Rachlin, Treasurer; Hugh R. MacCrimmon, Past-President; Sammy M. Ray, Membership Chairman; John W. Reintjes, Production Editor; William J. Wilson, Director, Northern Alaska District; John F. Karinen, Director, Southeastern Alaska District; Alan J. Mearns, Director, Washington NW District; Barbara Warkentine, Secretary, New York-New Jersey District; and William Royce, Emeritus Fellow. A quorum being present, the meeting proceeded.

*John Hunter, outgoing AIFRB President, passes the gavel to incoming President Pete Cole at the Board of Control meeting in Toronto in September 1988.*

### President's Report

I want to thank the dedicated members who have supported our organization over the last 2 years. In particular, I wish to thank Sammy Ray, Ollie Cope, and John Reintjes who have provided such excellent and continuing support of our organization for so many years. I want to thank Joe Rachlin who took over the difficult job as Treasurer and kept our finances and dues subscription on track without missing a beat, and Roy Nakatani who served as Secretary. My thanks also go to the various Chairmen and District and Regional Directors who have supported our organization in the last 2 years.

My service as President of AIFRB was a great experience for me, as well as a fine honor. The best part was meeting and working with all the wonderful people who serve our organization. The difficult part of leaving is that I was not able to accomplish as much as I had hoped. I am very pleased that Pete Cole is our President-elect because I know that AIFRB could not be in better hands.

The next sections of this report are a miscellany of thoughts, events, and reflections on my past 2 years of office. This may be of help in administering the Institute over the next years and could serve as useful topics for discussion over the next 2 days. I include some items for the record to help avoid lapses of institutional memory.

### District Activities

The most exciting event during my term of office was the revitalization of the Northwest Washington District of AIFRB—an outstanding performance by the District's membership and officers. Congratulations on a job well done! The annual local symposia sponsored by the Southern California District continue to be highly successful and an important contribution to local fishery science. The establishment of a Northern Alaska District was an important development which will strengthen the Institute in Alaska. I want to thank all District Directors for their efforts in maintaining our local organizations over the last 2 years.

### Scheduling of the Annual Board of Control Meeting

I was very pleased to see our Board of Control Meeting listed in *Fisheries,* along with the AFS agenda. Hugh was a great help as our AFS Liaison Officer; it is vital that this link be maintained, especially in regard to the annual Board of Control Meeting. I think it is critical for the President and

cont. on page 2

## President's Report cont.

Liaison Officer to work with AFS early in the year to ensure that the Board of Control Meetings are scheduled and coordinated with AFS. If we hold the meetings somewhere else next year because of the cost of travel to Alaska, it is important that AFS be notified that we will not attend. If we meet somewhere else in 1989 but return to AFS in 1990, it will probably take a special effort from AIFRB officers to regain the smooth relationship we now have.

**An Open Door to Opportunity and Innovation**

Unlike many organizations, AFIRB is unincumbered by extensive rules, regulations, governing committees, and salaried administrators, and we have few long-term commitments such as Journals and national meetings. AIFRB is small and flexible, and the President and local Directors have a great deal of freedom. We could move rapidly into new areas and take some chances. We have not taken full advantage of this asset. I want to see a dialogue develop on some of the new approaches we could take in the future and the people in our organization who would be able and willing to take a leadership role. The President cannot do it alone; he would need a corps of active volunteers. Ideas that have occurred to me include: service as an administrator of private or public research funds and award programs, bidding on management of the *Fishery Bulletin* (in competition with AFS), and support of a lecture circuit.

**The Best Gift to an Incoming President**

I believe that the best gift we can give an incoming President is a list of names of people we believe would be willing to serve AIFRB. It would be even better if the list included phone numbers, as well as annotations regarding skills or interests. If the President wants to start an action in a new direction, the initial problem is finding dedicated people to support that action.

**Relationship with AFS**

It is critical for AIFRB to maintain our present useful and informal association with AFS. As I mentioned in my previous report, I explored (as have other Presidents) the development of a more formal association with AFS. My conclusion was that no advantage existed for AIFRB for a formal association under conditions acceptable to AFS. Our challenge is to strengthen AIFRB as an alternative professional society.

**BRIEFS Editorials**

I believe continuation of the editorial series in BRIEFS strengthens the newsletter. I wrote one and successfully solicited four editorials during my term and obtained promises for many more. It will take a great deal of persistance to sustain a flow of editorials; the job really requires a volunteer willing to take over this responsibility.

We received one *unsolicited* editorial critical of AFS policies, which I believe will be published in the next issue. I debated whether we should publish it, but I felt if AFS was offered ample time for rebuttal it should be published. After all, if we are afraid of publishing anything critical of AFS, then we are relinquishing our role as an alternative society. Of course, such controversial editorials must be published with the qualification that the views are those of the author alone and do not reflect policy of AIFRB.

**Editorials on Careers in Fishery Science**

I have received a number of requests for information on careers in fishery science. I have turned down all of them because of lack of information. I think this is an area where AIFRB could make an important contribution. My suggestion is that a group of potential employers could be requested to contribute BRIEFS essays on this subject. I might be able to write one from the NMFS perspective if volunteers could be found for other areas, such as state conservation agencies (marine and freshwater) and the private sector (including large corporations such as public utilities, consulting firms, aquaculture companies, etc). The key topics would include: the kind of training desired by employers, entry-level salaries, chances for upward mobility, academic training vs. experience, and present demand for trained people. As it would be an editorial, it could be considered the *opinion* of at least one potential employer (which may be reflective of a segment of the field). I think this would make an interesting dialogue for BRIEFS, could lead to further action by AIFRB, and if the series seemed sufficiently informative we could reproduce the collection of essays for distribution.

**BRIEFS and Membership News**

In all my correspondence with Districts, Officers, and award Chairmen, I have stressed the importance of passing along membership news to BRIEFS. I believe this effort has improved the flow of information to the editor. This is an important effort that must be continually sustained and nurtured.

**Symposium on Scientific Writing**

With the help and advice of Eric Prince, I organized an AIFRB-sponsored symposium on Scientific Writing in Fisheries which will be published as a book by AFS. I think that it will be an excellent and very useful book for our profession. AFS is willing to provide the up-front costs for publication; this indicates that AFS believes that they will make money on it. The contents of the symposium are indicated in the AFS program with the exception of one statistical paper which will be included in the book, but not in the symposium.

It was with some regret that I decided on AFS as the publisher and distributor. No other publisher that I contacted was interested; although most thought AFS could make money on it, they believed that they would lose money because of the limited audience (Fishery Science). The book's strength was its focus on fisheries, but it was a liability from the standpoint of other publishers. I discussed the matter with our National Officers and we all felt that it was more

preferable for AFS to publish it than for AIFRB to publish and distribute it. I intend to continue my responsibilities on this project until the book is published, but felt I did not have time to organize an independent publication effort.

**Award Programs in General**

I believe the award programs of AIFRB have been steadily improved during my term of office. In each year we have had more participants. This aspect of the Institute is in good health. Joe Rachlin is doing an excellent job on the student travel awards and should continue as long as he is willing to do the job. I think it is preferable, however, that the W. F. Thompson Award Chairperson and the Achievement Award Chairperson be changed frequently to provide regional (fresh vs. marine) balance. This year the W. F. Thompson Award program received 19 nominations. In the last 2 years we have had top fishery scientists as judges. Judges were not necessarily members of AIFRB.

I sent to each chairman a folder, which contained past actions of the chairman, addresses for sending out advertisements, form letters, etc. This forms a vital link with the past for the chairman, makes his job much easier, and insures continued success and improvement. Apparently, such vital links have been lost in the past. In fact, I had to struggle to complete a list of all award recipients, which is included in the folder. It is essential that such transfers of information be preserved with a backup so that a successful chain can now be maintained. It would also be useful if BRIEFS occasionally published tables listing such items (Achievement winners, and other listings of historical interest), as well as all W. F. Thompson Award winners.

**Best Paper Award**

My introduction of an AIFRB $50 Best Paper Award to be given at local meetings was a success where it was tried. Two of the tests were the result of my direct solicitation and another by a volunteer District Director who attended the last Board of Control Meeting. I had no inquiries from other members or districts, although it was open to anyone who could put together a committee of AIFRB members (also, it was advertised in BRIEFS). I believe it is still a great opportunity for AIFRB to form links to regional meetings. Meetings other than those sponsored by AFS seem particularly attractive because it is a way we can gain local recognition and increase member participation and recruitment. It is also something AFS will not do.

Since my term is ending, I have included it on the agenda because we need to consider if this award program should be continued or abandoned. As I mentioned last year, a useful addition would be a small certificate to accompany the award.

**Inactive Districts**

We have a number of districts in which no meetings have been held for a long time. In some cases new leaders have been elected and nothing happened; in other districts elections were promised but never held. In some others the position is vacant and I was not able to find a person to appoint who I felt could effect a change. This is an unsuccessful aspect of my presidency and one clearly in need of attention by the next President and Board of Control.

If the demography or interests of fishery scientists are insufficient to support a local district, then the district should be removed and deleted from the stationery and other documents. The President was given authority last year by the Board to appoint a new Director if there has been no action in 2 years. I define inaction as no meetings and no report to the Annual Board of Control Meeting.

**Standard Letter to District Directors**

We need a standard letter of encouragement and advice to new District Directors in regions where districts have been weak or nonexistent. The letter should outline key responsibilities, but not be so detailed and full of rules, regulations, and responsibilities as to discourage all but the strongest of heart. I composed and distributed such a letter, but it needs improvement. The central theme is to be creative and find an activity or service that local members will support. The national organization's role is to then support the district in getting some events started.

My experience is that sometimes newly elected Directors have no idea of their responsibilities or the opportunities open to them. This seems most common in districts without a strong tradition.

**Membership Directory, Brochure, and Letterhead Stationery**

During my term of office we produced a new Membership Directory, a new Brochure and, each year, new stationery. I have several comments regarding these documents. 1) *Directory:* we have in storage at the InterAmerican Tropical Tuna Commission in La Jolla a considerable quantity of the 1987 Membership Directory. Copies may be obtained from Bill Bayliff, who produced it from the Treasurer's computerized membership files. Bill did a fine job and developed the software to produce the directory from the files. He could probably be recruited to do it again when a new directory is needed. 2) *Stationery:* I believe we should eliminate District Director names from the stationery. Directorships are now changing on an annual basis and at different times in the year and it is hopeless to include up-to-date names of District Directors. I strongly suggest we eliminate all names or just include the ex-officio officers and President names which are less transitory. If it is felt we need more personalized stationery for the Districts, I suggest each District to be given AIFRB stationery with the official name of the District on it, but no personal names. This stationery would last forever. A separate run could be made for the President and ex-officio officers if needed.

I do not know of any Board of Control-approved plan for revision of either the Brochure or Directory. These documents must be revised at regular intervals or be eliminated. It would be helpful for the next President if a decision were reached on this matter and recorded in the Board of Control minutes.

## President's Report cont.

### Archives

I have a full file drawer of AIFRB papers, most of which are not of much value for running the presidency. I believe the official archives are at the University of Washington. We need to reach some decisions regarding archives, including complete sets of BRIEFS, which is the best historical record we have. I have generated probably ⅓ of a file drawer of correspondence in my 2 years, but little or none of it has historical merit.

### Articles of Incorporation and Bylaws

This little blue booklet (the 1983 edition) is essential for all officers. I have on hand about 14 copies which I will transfer along with the Great Seal and gavel to President-elect Pete Cole. Are there more copies stored somewhere? If there are none, it will need to be reproduced sometime in the near future. It would be a good time to revise some of the bylaws as some are totally unrealistic. One of the more irksome is the arrangement of districts and regions. I also note that according to the bylaws the term of District Directors is 2 years.

### Correspondence

A small but important point is the mailing of copies of correspondence between officers. I have mailed copies of all pertinent correspondence to all ex-officio officers during my term. This has proved to be very useful and should be maintained as it is needed to maintain communication.

### Treasurer's Report

Treasurer Joseph Rachlin submitted his report on AIFRB finances (see BRIEFS Vol. 17, No. 5, October 1988) and explained some facets of the report. As of September 1988, AIFRB had total credits of $23,285.64, total debits of $17,067.75, and total assets of $37,881.64. AIFRB had 1,207 members, of which 163 are emeritus, 232 are delinquent in dues, and 812 are paid-up members.

Because a formal audit of the Institute's books would cost at least $1,000, it was moved and seconded that the President constitute the Board of Control as a formal audit committee of the treasury, that the Treasurer's Report and supporting documents be circulated for review and audit, and that the formal Treasurer's Report, followed by a statement of approval by the Board of Control, be published in BRIEFS. The motion passed.

AIFRB is now classified by the Internal Revenue Service as 501-C6, but we are in the process of being reclassified as 501-C3. The C3 category means we are not involved in political activity and that we are education-exempt.

### BRIEFS Editor's Report

The Editor's Report by Dr. Cope was presented to the Board. The six issues of BRIEFS (Vol. 16, Nos. 5, 6 and Vol. 17, Nos. 1-4) totaled 46 pages and contained four halftones. The general content of BRIEFS was essentially as in previous years, with articles on AIFRB activities, guest editorials, news items about Institute members, announcements of meetings and new publications, obituaries, dissertation and thesis abstracts, membership reports, reports of awards, general fishery concerns, a little District news, and position announcements.

### Production Editor's Report

John Reintjes delivered a report on production activities for the year, describing the printing of 1,200 copies of each of six issues of BRIEFS. Postage rates increased on first-class and foreign mailings, resulting in total postage of $2,039.92 for BRIEFS this year. Total cost of printing was $3,584.87.

New letterhead stationery was printed in May. Because District Directors change so frequently, a new format was used to show the names of the Districts but not the names of the District Directors.

Some copies of AIFRB's Alaska symposium remain in storage, and members are encouraged to search for buyers who would pay $10 postage per case of 14 books.

John Reintjes agreed to serve as Production Editor for another year.

### Membership Committee Report

Dr. Sammy Ray submitted his Membership Committee report for the year, revealing that AIFRB accepted 20 new Associate Members, 15 new Members, and 1 new Fellow. Most were recruited through nomination by the membership, and 30 were graduate students. Sixteen promotions were granted (8 to Fellow and 8 to Member), and Emeritus status was given to 19 persons.

Discussions were held on definitions of *Associate Member, Member,* and *Fellow,* and their qualifications. Dr. Ray pointed out the need for another person on the Membership Committee, and it was decided that the President will appoint a new committee member.

### Travel Awards

Dr. Rachlin reported on funds awarded for travel to professional meetings for Associate members. $2,000 was awarded this year. This program is considered to be cost-effective and useful in recruiting, so the Board voted to increase the total to $2,500 for next year, with a cap of $350 per award for foreign travel.

### Honor Awards

As noted in BRIEFS (Vol. 17, No. 5, October 1988), the W. F. Thompson Award for the best paper published by a student went to Kathleen S. Mayer for her article on waste transformer oil and PCB toxicity to rainbow trout. The Outstanding Achievement Award was given to Dr. Reuben Lasker, and the Group Award of Excellence to the Southwest Fishery Center of NMFS.

The District Best Paper Award was discussed, especially the need for a special certificate of recognition for this award. Alan Mearns will design a model certificate for use by District Directors.

### 1989 Meeting

The matter of travel costs for AIFRB people to attend the Board of Control meeting, if it is to be held in conjunction with the AFS meeting in Anchorage, Alaska in 1989, was brought up. After alternatives were discussed, the Board voted to hold the meeting in Alaska.

### District Business

President Hunter appointed Dr. Sammy Ray as Director of the Texas District in the Southeastern Region. This action resulted in District Director attendance at the meeting from five Districts and three Regions. A vote on the By-Laws resulted in the omission of Region representation for constitution of a quorum at Board of Control meetings; the requirement thus becomes one elected officer and four District Directors.

### District Reports

**Carolina District**

John Reintjes submitted the report of District Director John Merriner. Little activity was reported, and an election is scheduled for late 1988.

**Northern Alaska District**

This newly formed District was represented by Director William J. Wilson, who described the history of AIFRB activities in the former Alaska District and its division in 1988 into two Districts—the Northern Alaska District and the Southeastern Alaska District (see BRIEFS Vol. 17, No. 3, June 1988). The present organization of the District was defined, and the implementation of the plan will proceed at an organizational meeting in the fall of 1988. Plans are afoot for monthly meetings on tentative topics already on paper, and the District has formulated plans for several other activities of importance to the area.

**Southeastern Alaska District**

District Director John F. Karinen presented his report, also telling of the split of the old Alaska District, and describing the new organizational structure to be used by both the new Districts. There are now 76 members in the District, 16 of whom reside in western Canada. Planned activities of the District were described, and a detailed list of 17 Alaska fisheries issues (salmon, groundfish, and general) was presented.

**Washington-NW District**

Alan Mearns presented a review of the District's past activities. Five technical meetings were held during the year, with an average of 38.9 (30-50) people in attendance. Professors Chew and Nakatani were especailly active in recruiting outstanding graduate students as new Associate Members.

Alan Mearns sought advice on how the District may legally raise and administer its own local funds, and he requested that Treasurer Rachlin draw up a "white paper" on the subject.

**Southern California District**

The District Director, Marty Golden, was not present, so President Hunter presented the report and highlighted its contents. The District had an active year, with a meeting approximately every 6 weeks from September through June. Each meeting has a guest speaker, and the second meeting of the year is a guest night, at which spouses, friends, and prospective members are present.

The District cosponsored a symposium this year, with the California-Nevada Chapter of AFS, on *Fisheries Techniques and Technology*. About 150 persons attended, and abstracts of the papers are available from the District. At the AFS meeting following the symposium, the District presented an award for the best fishery-related paper to Dr. Jerrold G. Norton.

Plans for the coming year include programs on abalone culture, a debate on the practice of trading off-site habitat restoration for development permits, and a 2-day sympsoium on the California halibut.

The gavel was passed from outgoing President John Hunter to the new President, Charles F. "Pete" Cole, who adjourned the Board of Control meeting at 12:10 p.m.

## W. F. Thompson Award

BRIEFS recently announced the winner of the 1988 W. F. Thompson Award (Vol. 17, No. 5, p. 2, October 1988)—Mrs. Kathleen S. Mayer. In a surprise ceremony at the U.S. Naval Aerospace Medical Laboratory in Pensacola, Florida, Dr. Thomas Duke of AIFRB made the presentation to Mrs. Mayer on November 7, 1988. Mrs. Mayer was very pleased to receive the award, and AIFRB is pleased to give it.

*Dr. Tom Duke, representing AIFRB, presents the 1988 W. F. Thompson Award to Mrs. Kathleen Mayer during a ceremony at the Naval Aerospace Medical Laboratory at Pensacola, Florida.*

## 1989 Travel Assistance Awards

AIFRB Treasurer Joseph W. Rachlin, who manages the Institute's Travel Assistance Program, is soliciting applications for the awards for 1989. The awards are given to provide travel assistance for qualified graduate students and other associate members so that they may present a paper at a scientific meeting of their choice.

All Associate Members of AIFRB are eligible for awards.

Applications should be in the form of a written request and a letter of support from the applicant's research mentor or supervisor for a specific meeting. Also, the applicant should submit a copy of an abstract of the paper to be given, and notification of the paper's acceptance. Applications should be directed to Dr. Joseph W. Rachlin, Department of Biological Sciences, Lehman College of C.U.N.Y., Bedford Park Boulevard West, Bronx, New York 10468-1589.

Deadline for applications is April 1, 1989.

Recipients of Travel Assistance Awards will have their name and abstract published in BRIEFS.

## District News

**Washington, NW District** **Alan J. Mearns,** *Director*

The District got off to a running start in the autumn of 1988 with three meetings. In October, Dr. Ronald Thom of the University of Washington spoke on *The Lincoln Avenue Wetland: Functional Status of a Man-Made Ecosystem.* The November meeting featured *Climate and Fisheries of Puget Sound: A Panel Discussion,* which included *Marine Fishery Trends,* by Greg Bargmann of the Washington Department of Fisheries, and *Oceanography and Hydrologic Cycles,* by Curtis Ebbesmeyer of Evans Hamilton, Inc. The December meeting had *Marine Debris: Distribution, Impacts, and Action,* by Dr. James Coe of NMFS. The membership turned out in force for a banquet celebrating (?) the retirement of Roy Nakatani (AIFRB Secretary) from his post at the Fisheries Research Institute of the University of Washington.

District officers for the new year are Alan J. Mearns, *Director,* Kate W. Myers, *Vice-Director,* and Ron E. Westley, *Past Director.*

The membership heard a report from Alan Mearns on the proceedings at the AIFRB Board of Control meeting in Toronto. The District received advice from Treasurer Joseph Rachlin on setting up a District account for management of local funds.

## Our People

**Clark Hubbs** (AIFRB Fellow 1970) received the American Fisheries Society Award of Excellence for 1988 to recognize his outstanding contributions to the field of fisheries science. Dr. Hubbs will also hold the Clark Hubbs Regents Professorship in Zoology which was established by the University of Texas at Austin where he has been a faculty member since 1952. He was chairman of the Department of Zoology from 1978 until 1986 and is now curator and professor of ichthyology at the Texas Memorial Museum.

**K. W. Myers, C. K. Harris,** C. M. Knudsen, R. V. Walker, **N. D. Davis,** and **D. E. Rogers** won the Best Paper Award in the North American Journal of Fisheries Management, Vol. 7, for their paper, *Stock Origins of Chinook Salmon in the Area of the Japanese Mothership Salmon Fishery.* The paper appeared in Volume 7, Number 4 in the Fall 1987 issue.

**Tony Novotny** (AIFRB Member 1981) received the American Fisheries Society Distinguished Service Award for 1988 for exemplary service to the Society.

**Elwood A. (Woody) Seaman** (AIFRB Member 1975) was awarded the Meritorious Service Award of the American Fisheries Society for 1988 for his many years of dedicated service to the Society. Woody was the AFS secretary-treasurer in 1957-1965, was Society president in 1969-70, and for 5 years operated the Society office and edited the newsletter from his home in McLean, VA.

**George R. Spangler** (AIFRB Member 1972) has been awarded the Great Lakes Fishery Commission's Meritorious Service Award for his service and leadership as co-chair of the steering committee for the *International Symposium on Stock Assessment and Prediction of Yield.* George is professor of fisheries in the Department of Fisheries and Wildlife at the University of Minnesota.

## University of Maryland Position Opening

The University of Maryland Center for Environmental and Estuarine Studies, Horn Point Environmental Laboratories (HPEL), and the UM Sea Grant Extension Program seek to appoint a tenure-track position at the Assistant/Associate Professor level. The successful applicant will be responsible for development of a research program in aquaculture-associated diseases which should complement existing University and State programs in aquaculture research. Research will be directed toward identification, treatment, prevention, and cure of diseases of shellfish and finfish with major emphasis being with oysters and striped bass.

Extension responsibilities will be coordinated by the University's Sea Grant Extension program of the Cooperative Extension. Send CV and names of 3 references by 1 January 1989 to Dr. R. Harrell, Horn Point Environmental Laboratories, UMCEES, P. O. Box 775, Cambridge, MD 21613. The UM is an AA/EOE.

## Announcements and New Publications

**Salmon Workshop**

The *14th Biennial Northwest Pacific Pink and Chum Salmon Workshop* will take place on February 22-24, 1989 at Fort Ludlow, Washington. The

goal of the meeting is to promote informal communication among those working with pink and chum salmon. The focus will be on salmon biology, enhancement, management, marketing, and case histories. Information is available from Duane E. Phinney, Washington Department of Fisheries, 115 General Administration Building, Olympia, WA 98504.

**Fish Viruses and Viral Diseases**

*Fish Viruses and Viral Diseases,* by Ken Wolf, Senior Research Scientist (Retired) at the Fish and Wildlife Service National Fish Health Laboratory at Kearneysville, WV, has been published by Cornell University Press, 124 Roberts Place, Ithaca, NY 14851-0250.

This book is a comprehensive, generously illustrated, and up-to-date reference on the virology of fishes—predominantly species of the class Osteichthyes, but including representative members of the classes Chrondrichthyes and Myxini. The long-awaited work of a recognized pioneer researcher and authority, it covers some 30 years since the first virus was isolated from a fish, and describes 63 diseases and agents of viral, viruslike, or mistaken viral nature.

Ken Wolf has arranged his material in six parts: isolated viruses causing diseases of low to high virulence; isolated viruses whose role in fishes remains to be determined; viruses seen by electron microscopy but not yet isolated; viruslike particles; chlamydial infections; and nonviral conditions, agents, and artifacts. Each of the 63 chapters follows essentially the same format: definition of the disease or agent, detailed history, signs and pathology, biophysical properties of the agent, transmission and incubation, host of hosts, geographic distribution, immunity, and control. There are abundant references. Appendixes include a list of common and scientific names of fishes and descriptions of methods of fish cell and tissue culture.

The first book to be devoted in its entirety to fish virology, this volume will fill a need for those researchers, culturists, practitioners, production managers, and others concerned with the health of fishes and the role of viruses. It will also provide necessary information for those who are primarily interested in the viruses themselves.

The book sells for $57.50 and can be ordered from the publisher.

**Pesticide Contamination in Fish and Shellfish**

*PCB and Chlorinated Pesticide Contamination in U.S. Fish and Shellfish: A Historical Assessment* has recently been published by NOAA's Ocean Assessments Division Seattle Office.

Geographic and long-term trends of polychlorinated biphenyls (PCBs) and chlorinated pesticide contamination were examined in U.S. coastal fish and shellfish using existing historical data. The study identified 35,000 samples from over 300 projects, surveys, and monitoring programs. The 35,000 samples represent over 540 species collected between 1940 and 1985.

Despite many sources of variability (tissue type, species diversity, season, size, age, sex, sample size, and analytical techniques) trends were evident when at least some of these factors are taken into account and when data encompassed long time intervals, such as decades.

Using data from 13 national and seminational programs, involving 12,000 records or one-third of the total data base, it was possible to map regional and nationwide patterns of fish or shellfish contamination for PCBs, DDT, dieldrin, and, to a limited extent, other pesticides during three data-rich periods: 1965-72, 1976-77, and 1984. Using both federal and locally generated data, it was also possible to discover trends in specific bays for specific chemicals and target species. Small-scale geographic patterns, long-term (20-year) declines, and short-term variations of PBC, DDT, and dieldrin contamination were apparent in the Chesapeake Bay, San Francisco Bay, and in the Arroyo Colorado adjacent to Southern Laguna Madre, Texas. Past surveys were nationally comprehensive for bivalves but not necessarily for flatfish—two groups of organisms monitored in NOAA's National Status and Trends (NS&T) Program. Finally, it was possible to develop a 15- to 20-year history of pesticide and PCB contamination in stocks of several commercially important species: striped bass and Atlantic and Gulf menhaden.

Decreasing DDT contamination was clearly evident on a nation-wide basis during the 1970s. Decreasing contamination by PCBs, dieldrin, and toxaphene was evident for selected species and sites. Dramatic nationwide declines of DDT contamination and local declines of PCB contamination have already occurred and the annual rate of declines are now small. The report concluded that toxaphene, dacthal (DCPA), endosulfan, endrin, and pentachlorophenol (PCP) should be re-surveyed on a national basis to confirm that past or recent hot spots are localized and that previously identified declines have continued. Mirex, aldrin, HCB, methoxychlor, heptachlor, and, perhaps, lindane may have once been important estuarine contaminants, but this is not currently the case.

The report suggests additional monitoring should focus on edible tissues (such as muscle) of larger coastal predatory fish and on poorly surveyed areas such as the Florida East Coast, Oregon, Alaska, and Hawaii, and high seas fish. A nationally centralized and easily accessible PCB and pesticide data base should be completed and used to receive and process new data from local, state, and federal programs on a continuing basis.

The report, authored by A. J. Mearns, M. B. Matta, D. S. Beatty, M. F. Buchman, G. Shigenaka, and W. A. Wert can be obtained by writing to Pacific Office, NOAA/OAD, 7600 Sand Point Way NE, Seattle, WA 98115.

**Cambridge University Press Books**

The following books are available from Cambridge University Press, 32 East 57th Street, New York, NY 10022:

*Nutrition of Pond Fishes,* by Balfour Hepher. The science of aquaculture has advanced considerably in recent years, its application being an important factor in the agricultural economics of many countries. This book reviews the subject of fish nutrition, one of the key aspects of aquacultural systems. 1988, 310 pp. Cloth. List: $69.50, Discount: $55.60.

*Acid Toxicity and Aquatic Animals,* by R. Morris, E. W. Taylor, D. J. A. Brown, and J. A. Brown, Editors. This book reviews and presents recent research on acid waters and their effects on aquatic animals. Starting with the environment, in order to assess why the problems have arisen in particular areas, the volume then deals with field and survival studies on invertebrates and vertebrates; examines the extent of the biological problem and the attempts that have been made to relate water quality and the susceptibility of animals.
1987, 300 pp. Cloth. List: $49.50, Discount: $39.60.

*Pesticide Impact on Stream Fauna,* by R. C. Muirhead-Thomson. This volume offers a detailed review and assessment of the problem of pesticide contamination of running waters, based on experiences reported from a wide variety of fields. The author examines three aspects of pesticide contamination: the origins of the pollutants, laboratory evaluation techniques, and case studies in which effects on streams of widely used pesticides are analyzed. 1987, 288 pp. Cloth. List: $54.50, Discount: $43.60.

*Acidification of Freshwaters,* by M. S. Cresser and A. C. Edwards. Gives an integrated account that draws not only on the main branches of chemistry but also on soil physics, hydrology, meteorology, geography, geology, plant physiology, soil microbiology and zoology.
1987, 144 pp. Cloth. List: $34.50, Discount: $27.60.

**Standing Crop Models**

The U.S. Forest Service has published a 52-page document entitled *Models that Predict Standing Crop of Stream Fish from Habitat Variables: 1950-85,* by Kurt Fausch, Clifford Hawkes, and Mit Parsons. The paper reviews mathematical models that predict standing crop of stream fish (number or biomass per unit area or length of stream) from measurable habitat variables and classifies them by the types of independent habitat variables found significant, by mathematical structure, and by model quality. Habitat variables were of three types and were measured on different scales in relation to stream channels: variables of drainage basins were measured on the coarsest scale from topographic maps; channel morphometry and flow variables were measured in the field along transects perpendicular to flow; and habitat structure, biological, physical, and chemical variables were measured on the finest scale in the field.

This document may be obtained free from the U.S. Forest Service, Pacific Northwest Research Station, 319 W. Pine Street, P. O. Box 3890; Portland, Oregon 97208.

## In Memoriam

Robert T. Baade passed away in June 1988. Bob became a Member of AIFRB in 1967 and became Emeritus in 1975. Baade was involved in fishery work in Alaska, and lived in Petersburg at the time of his death.

## Membership Report

Inquiries regarding membership should be addressed to the Membership Chairperson, Dr. Sammy Ray, Texas A & M University at Galveston, Building 311, Fort Crockett, Galveston, Texas 77551.

**BRIEFS**, the newsletter of the American Institute of Fishery Research Biologists, is published six times a year. It is intended to communicate the professional activities and accomplishments of the Institute, its Districts, and Members; the results of research; the effects of management; unusual biological events; matters affecting the profession; political problems; and other matters of importance to the fishery community. Comments and contributions should be sent to the Editor, Dr. Oliver B. Cope, 15 Adamswood Road, Asheville, NC 28803. Subscription $20 a year to Institutions and Non-Members.

ISSN-8755-0075

*American Institute of Fishery Research Biologists*

1101 N. 20th St. • Morehead City, NC 28557



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