

The Tributary

A Newsletter of the Western Division, American Fisheries Society

Volume 18, No. 2 June 1993

PRESIDENT'S CORNER

I want to let each of you know that it has been a tremendous opportunity and a pleasure to serve and represent you as President of the Western Division. Of course, we are elected to help organize and conduct the business of the Division, but the sponoff bonus is the chance to know and work with a broader cross section of our members. This year has reaffirmed my belief that western fisheries biologists are just plain good people.

I know that it is easy to become discouraged when you think about the many problems facing western fishery resources. Pacific salmon stocks are declining up and down the west coast; development and land use activities continue to diminish fishery habitat; some marine fish species are being commercially overexploited; and several western fish stocks and species are at risk of extinction.

But there is also a positive side. Water quality from point source discharges continues to improve with upgrades in municipal and industrial waste treatment technologies; the 19 section of the Clean Water Act offers hope that we can begin to get a handle on pervasive non-point sources of water pollution; several western states have secured instream flow reservations on important rivers and streams; the Superfund program has begun cleaning up some of our most severe water quality and habitat degradation problems; dams that have blocked fish migrations for decades may be removed; and there appears to be a heightened public and governmental interest in protecting and enhancing aquatic ecosystems. It is comforting to know that Western Division biologists are providing much of the leadership that is getting these things done.

1992-1993 WESTERN DIVISION AMERICAN FISHERIES SOCIETY COMMITTEE CHAIRPEOPLE AND OFFICERS

Internal Affairs

Audit - John Leppink
Equal Opportunity - Ken Hashagen
Newsletter - Pat Dwyer
Membership - Carl Burger
Nominations - Glenn Phillips
Awards - Carl Burger
Time & Place - Officers

Officers

President - Glenn Phillips
President-Elect - Randy Bailey
Vice-President - Carl Burger
Immediate Past-President - Don Chase
Secretary-Treasurer - Christine Moffet

External Affairs

Riparian - Mark Gorges
Native Peoples Fisheries - Joe Dossantos
Threatened & Endangered Species - Jerry Burton
Resolutions - Dennis Tol
Environmental Concerns - Kelly Hepler
Native Salmon Stocks - Pat Higgins
Habitat Inventory Procedures - Pete Bisson
Old Growth - David Fuller

There are five important legislative items that the American Fisheries Society is tracking. These include: reauthorization of the Clean Water, Magnuson, and the Endangered Species Act; reform of the 1872 Mining Law; and the Large Rivers Interjurisdictional Management Act. During the mid-term EXCOM meeting in Bethesda, we were briefed on each of these.

Each member of EXCOM also had the unique opportunity to meet with congressional delegates from our own states to let them know more about FS and what we have to offer. I can tell you that we were cordially received and that western congressmen enthusiastically welcome AFS input on issues that are important to fisheries. I am confident that AFS position papers and testimony will have a positive influence on the legislative process.

I was delighted to attend the retirement dinner for long time AFS staff member, Mary Frye. Thanks to the custom art work of Dave Burns, the Western Division was able to honor Mary with a handsome plaque and certificate depicting a Snake River Sockeye. It was an honor to let Mary know that Westerners have noticed and appreciated her work.

Jennifer Nielsen has organized an exciting program for this year's WDAFS meeting in Sacramento and Cay Goude has amply handled arrangements. I cannot overemphasize the importance of each Chapter sending a representative, ideally your President-elect, to the July 24-25 WDAFS retreat and EXCOM meeting. This is your best and only opportunity to work with incoming President Randy Bailey to plan our WDAFS agenda for the upcoming year. I am looking forward to seeing you there!

Glenn Phillips

SOCIETY NEWS

MONTANA TAKES A LOOK AT DIVERSITY

An Adhoc Committee to explore the issue of workforce diversity was formed during the 1992 annual business meeting of the Montana Chapter of the American Fisheries Society (MCAPS) by a motion from President Jim Peterson. The continued discussion concerning the lack of minorities and women within the Chapter and a diversity session at the 1992 chapter meeting caused the issue to come to a forefront. President Peterson asked specific proposals be brought to the membership during the annual business meeting in the form of resolutions, motions, or change in by-laws.

Questions initially raised by the committee included: was this truly a problem or some function of our society that we had no control over? If there was a problem, was it nationally or was this a Montana issue? How did fisheries diversity compare to other natural resource professional societies? What was preventing women from entering and/or staying in the profession?

To begin the process of understanding this complex and often emotional issue, the committee went on a "fact-finding" mission as true scientists do. Initially, the Parent Society and members of the AFS Equal Opportunity Section were canvassed to learn of activities on diversity to date. The Society annually tallies its membership with respect to gender and ethnic diversity, has published several articles on diversity issues in *Fisheries*, organized a session on diversity issues at the 1992 annual meeting, and formed the EO Section in 1991.

Diversity does appear to be a problem in our Society with 12% women and 4.5% minorities reported in a 1991 *Fisheries* article. But why? To help address this, the committee sent a questionnaire to all state fish and game agencies, federal land management agencies, AFS chapters, and other natural resource professional societies to learn about existing diversification programs and strategies; successes and failures of those programs; and a "head count" of employees by gender and minority affiliation. Thirty-three states or 65% of the 51 surveys were returned. Percentages of the workforce from women and minorities in other states ranged from 0 to 27% (Alaska and Michigan) and 0 to 33% (New Mexico), respectively. The average percent of women and minorities in the 18 states reporting per-

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The Tributary is distributed to 3,300 WDAFS members and exists as a forum to present fisheries-related information.

The editor is Pat Dwyer.

If you have information you would like included in *The Tributary*, send it to:

Pat Dwyer, *Tributary* Editor
27 Border Lane
Bozeman, MT 59715

WESTERN DIVISION, AMERICAN FISHERIES SOCIETY
27 Border Lane
Bozeman, Montana 59715

013361 DA 9312
Venice Brown Beske
HC 75 BOX 43
Hawk Springs WY 82217

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MEETINGS AND SEMINARS

AFS - WESTERN DIVISION PROGRAM

Western Division American Fisheries Society
Western Association of Fish and Wildlife Agencies

PRELIMINARY PROGRAM

July 24-29, 1993

Red Lion Inn Sacramento, California

Saturday, July 24
WESTERN DIVISION EXCOM
RETREAT (Site to be announced)

Sunday, July 25

8:00 - 5:00 Reception Desk and Registration
8:00 - 5:00 Trade Show
9:00 - 5:00 WESTERN DIVISION EXCOM
BUSINESS MEETING
6:00 - 9:00 Welcome Reception and Wine Tasting at Railroad Museum (Transportation provided)

Monday, July 26

8:00 - 5:00 Reception Desk and Registration
8:00 - 5:00 Trade Show
8:30 - 12:00 General Session - The Changing Face of Conservation
Key Note speakers to be announced

WDAFS SESSIONS:

1:30 - 5:00

Stream Habitat Session
Pete Bissson, Chair

Sensitive/Endangered Aquatic Species
Diane Windham, Chair

Lake and Reservoir Issues in the South
Western U.S.
Don Erman, Chair

WAFWA SESSIONS:

1:30 - 5:00

Ecosystem Management: What Does It Mean?
1:30 - 3:30 Stable Funding: The Impossible Dream?

3:30 - 5:00

Changing Constituencies: Who Are/Will Be Our Customers?
6:00 - 10:00 Western BBQ With Live Band (transportation provided)

Tuesday, July 27

8:00 - 5:00 Reception Desk and Registration
8:00 - 5:00 Trade Show

WDAFS SESSIONS:

8:00 - 11:30

Sensitive Aquatic Ecosystems
Susan Ellis, Chair

The Role of Amphibians and Reptile in California Ecosystems
Mark Jennings, Chair

Molecular Genetics and Fisheries
Kelly Thomas, Chair

11:30 - 2:00

Western Division Awards
Luncheon

Wild Steelhead Management from L.A. to B.C.
Robert Titus, Chair

Contemporary Marine Issues: Innovative Science, Policy and Management
Seth Macinko, Chair

Riparian Management: A Watershed/Ecosystem Issue
Mark Gorges, Chair

WAFWA SESSIONS:

8:00 - 10:00

Management Effectiveness
10:00 - 12:00 Biodiversity: The Challenge
1:00 - 5:00 Federal Demands, Jurisdiction and Partnerships

5:30 - 6:30
6:30 - 10:00

Cal-Neva AFS Business Meeting
AFS Beer Tasting at the Rotunda (transportation provided)

Wednesday, July 28

8:00 - 5:00

Trade Show

WDAFS SESSIONS:

8:00 - 11:30

Conservation and Aquatic Biodiversity
Pat Higgins, Chair
Estuarine Ecology
Jerry Smith, Chair
Ecological Modeling of Salmonid Populations
Ed Cheslak \ Chuck Coutant, Chairs

1:30 - 5:00

River Restoration: Choosing Appropriate Strategies
Scott Wilcox, Chair
Contributed Papers I & II
Salmonid Modeling Workshop

WAFWA SESSIONS:

8:00 - 5:00

Mini-Series on Agency Culture
8:00 - 12:00 New Tools in Law Enforcement
1:30 - 5:00 New Tools in Information & Education

8:30 - 3:30

Thursday, July 29
Special Session: Biology of the Sacramento-San Joaquin River System: Life in the New Regulatory Environment
John Williams, Chair

June 6-12, 1993

The 13th Annual World Fly Fishing Championships (WFFC) are being held June 6-12, 1993, in Kamloops, British Columbia. It is anticipated that teams from nearly 30 countries will participate.

This is the first time for the WFFC in North America. Kamloops, with world famous "still water" trout fishing in the region, was selected by the International Federation of Sport Fly Fishing in close competition with venues in Alberta and Quebec.

As well as three days of international teams catch-and-release fly fishing sponsored by the Kamloops World Fly Fishing Championships committee, the B.C. Ministry of Environment, Lands and Parks will host a one-day international conservation symposium June 11, on the theme Clean Water-Wild Trout.

The moderator of the symposium will be Dr. David Narver, Director, Fisheries Branch, B.C. Ministry of Environment, Lands and Parks. He has done research on salmonid ecology and impacts of logging on salmonid habitat, and directs the province's freshwater fisheries management programs.

Speakers will be:
■ Dr. Robert Backman, Director, Freshwater Fisheries, Maryland Department of Natural Resources, a noted authority on the impact of hatchery trout on wild trout.
■ Jim McLennan, a well-known fishing guide and fly shop owner who is dedicated to preserving and enhancing the world-famous Bow River trout fishery near Calgary, Alberta.

■ Tom Pero, immediate past editor of Trout, the official magazine of Trout Unlimited. He is a widely published writer on wild trout and trout management conflicts.
■ Dr. Gary Bergeris, known across North America as a trout and trout habitat lecturer, writer and video producer.

■ Morris Green, former New Brunswick Minister of the Environment and international advocate for Atlantic salmon, especially in the Miramichi River system.
■ Dr. Ray White, a respected researcher, writer and lecturer on wild trout, especially in the streams of the U.S. mid-west.

■ Denise Maxwell, a Skeena River steelhead guide and fly fishing instructor. She has long experience in West Coast fisheries advisory groups.
The symposium will be held at the new 5000 seat Riverside Coliseum in

Kamloops and is open to the public free of charge. For further information, contact John Cartwright or Brian Chan, symposium co-chairs, c/o BC Ministry of Environment, Lands and Parks, 1259 Dalhousie Dr., Kamloops BC V2C 5Z5 (Phone 604/374-7917, Fax 604/828-4000)

June 23-27, 1993

The Natural Areas Association is planning a major international conference to be at the University of Maine, Orono, 23-27 June 1993. A principal focus for this Conference will be "Conservation of Marine Ecosystems" but there will also be themes on endangered species and biodiversity.

The "Conservation of Marine Ecosystems" session will have presentations from leading scientists and manager concerned with national sanctuaries and parks as well as reports from scientists working in the Gulf of Mexico, Middle Atlantic Bight, and Gulf of Maine. These papers will be focused on the general issues of cumulative effects; it is now well known that it is extremely hard to delineate in the field the effects of specific trace metals or artificial organic compounds such as PCBs. Rather, marine organisms, of any type or any life history stage, and living in coastal zones, estuaries, and principal harbors, must face a multiplicity of contaminants. Thus, the Conference will attempt to elicit what the options are for the environmental manager of the 21st Century who is responsible for areas such as the New York Bight, Boston Harbor, or Casco Bay.

For those who might wish to contribute papers to the special session concerned with "Conservation of Marine Ecosystems" please write Dr. J. Pearce, NOAA/NMFS, Northeast Fisheries Science Center, 166 Water Street, Woods Hole, MA 02543 or telephone him at 508-548-5123, ext. 261/278.

July 24-29, 1993

The Changing Face of Conservation, New Players in the Game. 1993 Western Division AFS Conference hosted by the California-Nevada Chapter, Red Lion Hotel Sacramento, California. (See program outline elsewhere this issue).

August 28-September 3, 1993

AFS Annual Meeting in Portland, Oregon. Announcing a series of symposia sponsored by the Physiology Section at the '93 AFS Annual Meeting in Portland, Oregon.

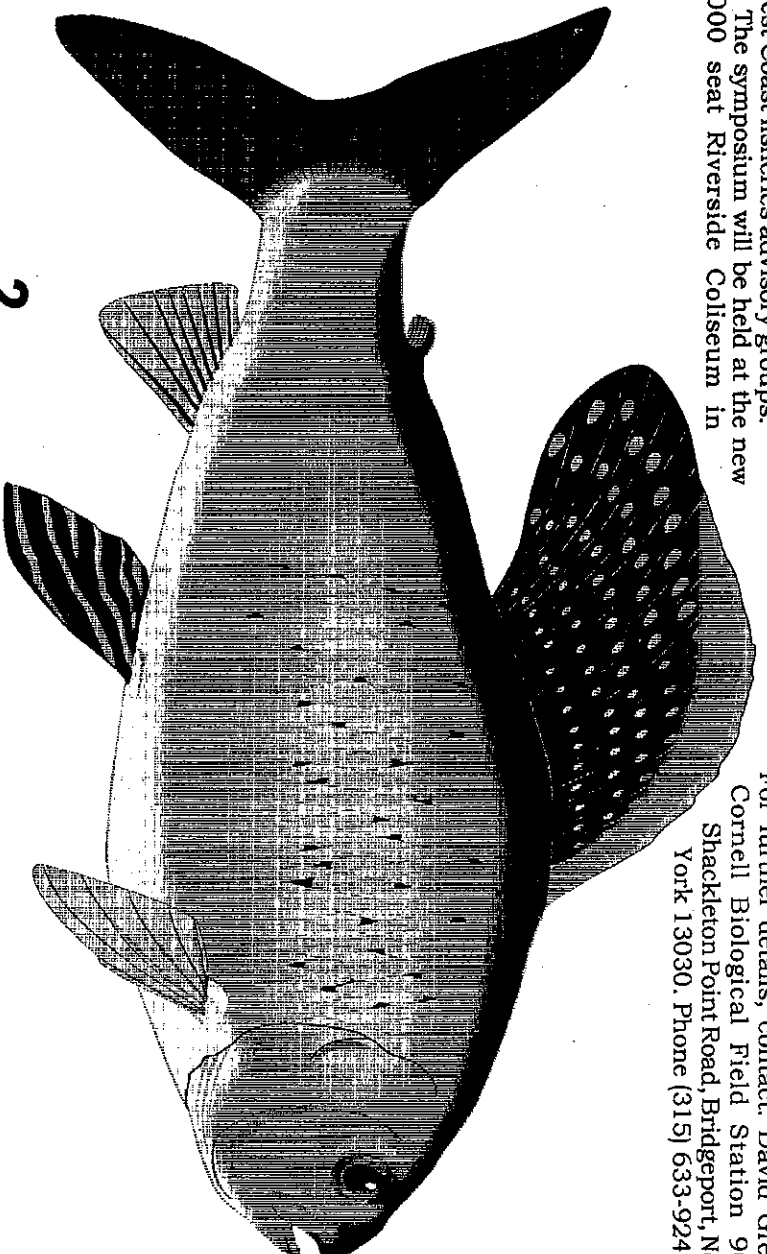
August 26-27, 1993

Using Hydroacoustics for Fisheries Assessments. Two-day short course conducted by Hydroacoustic Technology, Inc. Seattle, WA. Offered **Aug. 26-27 in Portland, OR.** Covers hydroacoustic theory, deployment logistics, data collection and processing techniques, and typical results. Included are detailed discussion of single-beam, dual-beam, and split-beam data collection and processing techniques. Highlights examples from current and past hydroacoustic projects. Contact Bruce Ransom, HTI, 715 NE Northlake Way, Seattle, WA 98105 (206) 633-3383 for an outline and further information.

October 5-6, 1993

Workshop on Black Bass Management in Northern Waters. The Northeast Division of the American Fisheries Society will sponsor a warmwater workshop concerning largemouth and smallmouth bass on October, 1993 at the Bonnie Castle Resort in Alexandria Bay, New York.

For further details, contact: David Green
Cornell Biological Field Station 900
Shackleton Point Road, Bridgeport, New
York 13030. Phone (315) 633-9243.



(Continued from page one)

sonnel statistics was 9.7% and 5.2%, respectively. Montana Department of Fish, Wildlife, and Parks ranked among the lowest in the country for employee diversity, with 4% women and 4% minorities of their 106 technical fisheries personnel. Only 3 of these 8 employees had permanent status. Region 1 of the USFS, has diversified their ranks to include 14% minorities and 25% women over the last 10 years. Retention and acceptance are still issues facing these two groups of employees.

OK, so it was a problem, but why? A questionnaire was then mailed to the 26 women from Montana State University graduate programs in fish or wildlife and expanded to include all female employees of the USFWS western region (9 more). The questionnaire asked what personal and/or academic experiences made you want to consider the career; impediments faced related to your gender; do you see high dropout rates and reasons; post graduate employment experiences that expanded/limited your horizons and barriers faced; steps that could be taken by universities and employers to encourage women to enter/stay in career; and advise to young women entering the profession. Twenty-three surveys (or 64%) were returned. The results shed a tremendous amount of "real life experiences" as to the difficulties women face entering and staying in a field such as fisheries. All questions were posed in a narrative style and the results are difficult to present in a short article. A few highlights: Most women entered the field because of a love of the outdoors, excelled in science and math, or had a positive educational and employment experiences as high school or college students. Many women felt as students they were not taken seriously in a male-dominated profession and missed important educational opportunities to learn and interact with professors and supervisors in informal settings. Conditions that hindered career satisfaction included feelings of resentment from other employees for getting jobs because they are a woman, not being treated as a competent professional, being one of the few women in the workplace or at meetings of professional societies, being excluded from promotion from within or that required physical skills, feeling excluded from the 'agency culture', and a lack of positive role models. Drop out rates were high due to lack of flexible work schedules, lack of flexibility in moving especially for dual career couples, feelings of isolation and fatigue from being judged on the basis of gender rather than individual performance; sexual harassment, and restricted career opportunities. On a positive note, a variety of temporary jobs in the field, working with other dedicated professionals, having a mentor, and having work environments where supervisors clearly supported career advancement and made it clear that discriminatory behavior would not be tolerated, were important factors in career satisfaction.

All survey results were compiled into a report presented at the 1993 annual business meeting. It was concluded that there are no easy answers; diversification is an extremely complex issue and to be successful, efforts need to occur personally, professionally, and at all school grade levels. Awareness of the value and complexity of diversity in the workforce and workplace is the key to any long term solution. Through products provided, surveys conducted, value defined, and strategies outlined, awareness can begin. Mentoring was the most often mentioned successful strategy at any level of career development. Diversity of the workforce can not be successfully achieved without diversity of workplace/workspace.

A lengthy and positive discussion ensued at our annual meeting with the following actions being recommended for 1993-94: put many of the strategies outlined under **What Can I Do?** into place, track diversity activities of state and federal agencies; provide the Committee's report to all division administrators and supervisors; write an article for *AFS Fisheries* on surveys and results; and exploring further the question of "Why Diversity?"

WHAT CAN I DO?

In the Classroom:

- No gender bias during presentations in classroom settings.
- Call on as many girls as boys.
- Talk about the need for boys and girls to choose fisheries as a profession.

In the chapter:

- Match up university undergraduate and graduate fisheries students with chapter members, creating a "Buddy System."
- Be conscious of inviting women on panels; women as moderators.
- Investigate several national programs (Student Conservation Association) that offer summer work programs for high school students.
- Actively participate in AFS Parent Society Equal Opportunity Section.
- Share all of the information collected by the

diversity committee with MC Wildlife Society, state and federal agencies.

At the Universities:

- Establish internship programs between FWP and Universities; identify projects and employees who are willing to participate. The program would allow college credits to be earned and would introduce the students to the professions, encourage their interest in a career, and increase their future employment opportunities.
- Encourage mentoring between women students and women already in the profession.
- Include all students in outside activities.
- Provide students with increased opportunities to experience and understand the realities of the fish and wildlife profession. Incorporate a freshman or sophomore-level seminar that introduces students to fish and wildlife into the curriculum.
- Leadership by example goes a long way to alleviating obstacles that women and minorities face.

On the Job:

- As a supervisor and/or co-worker, let it be known discriminatory behavior will not be tolerated.
- Make sure equipment fits everyone on your crew and train all employees so they know how to fix it.
- Mentor new employees in your agency.
- Be flexible.

For the agencies:

- Educate employees as to the benefits of having a diverse workforce; create a one-day **Diversity in the Workplace Seminar** and have all employees attend.
- Perform an "Exit Poll" when any employee leaves, addressing issues as to why they left, etc.
- Create employment/recruitment booklet to provide pertinent employment information to prospective applicants and to promote a positive public image of the department.
- Make accommodations for your employees - take the risk of making working conditions more flexible; provide flexible work schedules to accommodate family responsibilities.
- Leadership by example goes a long way to alleviating obstacles that women and minorities face.

If you would like to receive the MC/AFS Committee on Diversity report, write Janet Decker-Hess, MDPWP, 490 N. Meidhan, Kalispell, MT 59901 or call her at 406-257-6645.

Reviewers Needed for National AFS Meeting

Attending the annual meeting in Portland? Please consider volunteering to serve as a reviewer for student papers and posters. We need as many volunteers as possible. Over 40 volunteers reviewed 37 papers and 14 posters last year in Rapid City. The Best Student Paper and Poster awards are one of the best ways AFS can encourage student participation and provide valuable experience for the future generation of fishery biologists. Contact: Tom McMahon, Chair, Student Paper Awards Committee, Biology Dept., Montana State University, Bozeman, MT 59717. (406) 994-2492. FAX (406) 994-3190.

Western Division Election

The election of officers for the Western Division is coming up. This issue of the Tributary contains the biographical sketches of the candidates. You will be receiving the ballot in the mail in the near future. Read the resumes and return your mail ballot as soon as possible.

For the office of Vice-President:

Dennis P. Lee is a Senior Fishery Biologist employed by the California Department of Fish and Game (DFG). He is assigned to the Inland Fisheries Division Field Office located in Rancho Cordova and administers several state programs associated with warmwater and reservoir fisheries. Lee is a native Californian and was born and raised in the San Joaquin Valley near the Tulare Lake basin. He earned an Associate of Science Degree from the College of the Sequoias in 1968 and Bachelor of Science Degree in Fisheries from Humboldt State University in 1970. Lee has been employed by the DFG since 1972.

Lee's first assignment with the DFG was as a Fish and Wildlife Assistant assigned to the Nimbus Salmon and Steelhead Hatchery located in Rancho Cordova. He was promoted to Junior Aquatic Biologist in Yountville in 1976. Since 1974, Lee has worked in Eureka, Yountville, Fresno and Rancho Cordova.

In 1982, Lee transferred to the DFG's Anadromous Fisheries Branch in Rancho Cordova as the Project Leader for the Klamath River Salmon and Steelhead Research Study.

Lee was placed in charge of developing the DFG's Reservoir Research and Management Project in 1986. Through his efforts, this Sport Fish Restoration Pro-

gram research and development program has expanded to a statewide program employing eight Fishery Biologists. He was promoted to his present position as Senior Fisheries Biologist in 1992 and continues to directly supervise staff reservoir research activities and provide direction for regional reservoir research.

Supporting the American Fisheries Society has been a high priority for Lee. He became an AFS and California/Nevada Chapter member in 1970 while at Humboldt, served as editor of the chapter newsletter in the late 70s, and chapter president in 1984. Lee is a member of the Fishery Management, Computer User, and Introduced Fish sections, a member and presently chair of the Fisheries Administrators and Fishery Management sections Ad Hoc Competitive Fishing Committee. He has reviewed manuscripts for the North American Journal of Fishery Management, made technical presentations at California/Nevada and Oregon Chapter AFS meetings, AFS Annual Meetings including "Status of Competitive Fishing in North America," September 1991, San Antonio, Texas, and "Contribution of Introduced Fish to California Angling," September 1989, Toronto, Canada, and was co-author for recent Fisheries articles.

Lee feels that AFS offers an excellent opportunity for fishery scientists to express themselves and influence decisions that affect the environment. He believes it is our challenge to identify problems, discover appropriate solutions, and find the means to implement those solutions. The Western Division and its membership are important resources that help all of us meet that challenge. Through active leadership, effective communication, working partnerships, and the support of our membership, AFS will continue to play an important role in those decisions.

Jerry Burton is a senior staff biologist for the New Mexico Ecological Services Field Office, U.S. Fish and Wildlife Service in Albuquerque, New Mexico. For the past 16 years he has been working primarily with listing and recovery of threatened and endangered southwestern fish species. Jerry received a B.S. in biology from the University of Wisconsin, Oshkosh in 1967 and started working for the Service in 1968. During the 25 years he has worked for the Service, he has been a Fishery Biologist for the Division of River Basin Studies in Tulsa, Oklahoma; a Fisheries Project Leader, Fisheries Assistance Office, Vancouver, Washington; Assistant Area Manager for Fisheries and Endangered Species, Phoenix, Ariz.; Staff Fisheries Biologist, USFWS, Regional Office, Albuquerque; and his present position as senior staff biologist in the Albuquerque Field Office.

Jerry has been a member of AFS since 1971 and has served as Secretary/Treasurer, Vice-President and President of the Arizona/New Mexico Chapter. He is currently Chairman of the WDAFS Endangered Species Committee, and is a member of the Parent Society's Endangered Species Committee. He has presented papers at numerous WDAFS annual meetings and Chapter meetings. He is also a member of the Desert Fishes Council and most recently represented the Council in a Fisheries Action Network meeting with the U.S. Forest Service. He believes fisheries professionals should, through active participation in AFS, give of their time and talents.

For the office of Secretary Treasurer

(this is a two-year position. Christine Moffitt was elected last year)

For National nominating committee:

Charlie E. Smith has been employed by the U.S. Fish and Wildlife Service for the past 32 years. He has worked at the Fish Technology Center in Bozeman, Montana, since 1978 and is currently Director for the Center, a position he has held for the past 8 years. He worked for 7 years at the Western Fish Nutrition Laboratory in Cook, Washington, prior to moving to Montana. He received a bachelor's degree in biology from Walla Walla College and has completed graduate work in microbiology and pathology at Montana State University. Charlie was president of the AFS Fish Health Section in 1990-1991 and has served on the nominating committee for the Fish Health section.

Terry D. Roelofs, Professor of Fisheries at Humboldt State University at Arcata, Calif., has been nominated for the National Nominating Committee.

He has been in his present position since 1970. He has a bachelor's degree in Fisheries from Michigan State University; a master's of science in Engineering from the University of Washington, and Ph.D in Fisheries, Oregon State University.

Dr. Roelofs was president of the California/Nevada Chapter of the AFS in 1980, received the AFS Award of Excellence in Fisheries Education in 1988, and in 1993 was named a member of the National AFS Award of Excellence Selection Committee.

Chapter Happenings?

Let me know what you would like to see in the newsletter and send news releases to me. I would like to have a section in future Tribs for Chapter News.

Chapters, if you're interested in letting the rest of us know what your chapter is doing, send a short summary to me by August 1 to: Pat Dwyer, Editor, 27 Border Lane, Bozeman, MT 59715.

THIS & THAT

Zebra Mussels, the Silent Invaders, Expected to Spread West after leaving \$4 billion in Damage to Great Lakes

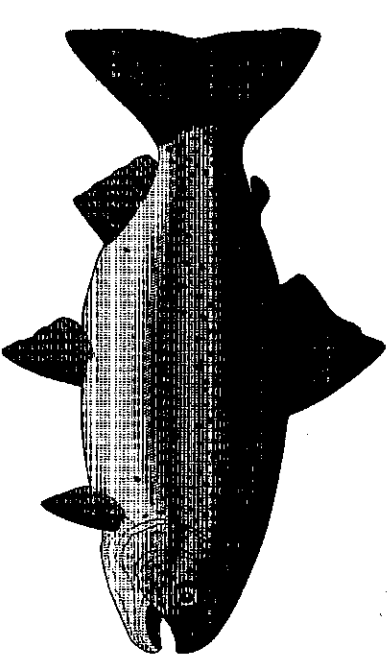
The exotic Zebra Mussel, *Dreissena polymorpha*, is an unwelcome invader of North American freshwater systems. Native to the Caspian region of western Russia, Europeans have experienced continuing invasion through shipping canals for nearly 200 years. By 1830, it had covered most of Europe and had reached Great Britain. Although scientists have speculated since 1921 that zebra mussels might be transmitted to the United States by shipping, little has been done to reduce the likelihood of such invasion. The U.S. Congress passed the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (PL 101-646) in an attempt to reduce the spread of a host of exotic species that are already established, and to further limit new introductions. The zebra mussel will perhaps spread to 3/4 of North America, and there is no prospect for its eradication.

Zebra mussels were presumed spread to North America in 1986 when one or more transoceanic ships discharged ballast water into Lake St. Clair. The freshwater ballast, obtained in an European port, probably discharged mussel larvae that thrived in the food-rich lakes Eric and St. Clair. First detected in 1988, the zebra mussel spread through the Great Lakes in the U.S. and Canada, and into 11 U.S. states. It has been detected in the Mississippi River above and below the mouth of the Missouri River, and it probably has invaded the Missouri River.

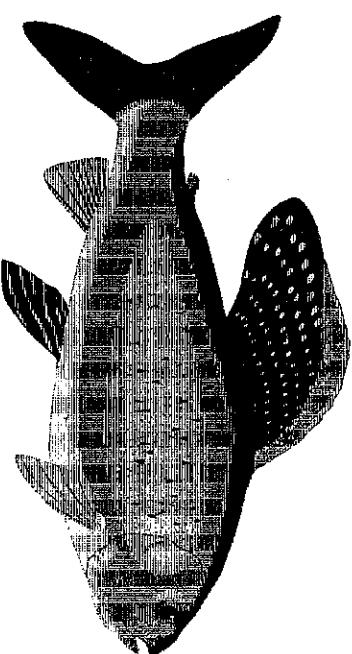
The adult, barnacle-like zebra mussel attached to hard surfaces with byssal threads that are generated from a gland in its foot. Maturing within a year in favorable environments, production of more than 30,000 eggs per season is possible from one female. Fertilized eggs develop into free-swimming larvae that can remain suspended in water for a month. Drifting with the current, larvae attach to hard surfaces and transom into the hard-shelled form. The striped, yellow/brown mussels grow nearly an inch in the first year. Reach a size of about 2 inches and live 4-6 years. The small clam poses a multibillion-dollar threat to industrial and public drinking water supplies, and a costly nuisance to shippers, boaters, fishermen and others.

Economic damages caused by the mussel have been widely publicized, but even greater is the threat to natural systems. Each mussel feeds by filtering about one liter of water per day. It removes virtually all of the plankton, thus competing with other aquatic species, including fish. Huge colonies of up to 20,000 individuals per square meter have been reported, covering every hard surface. Many species of native freshwater mussels are at risk of extirpation from smothering by attached zebra mussels, and the feces and pseudofeces they produce can change bottom communities.

Public assistance is essential in detecting and monitoring for the mussel, and to prevent its spread on boat hulls, live wells, bilges, bait buckets, etc.



Contact: Sharon Rose, Public Affairs, 303-236-7904
Harold Tyus, Zebra Mussel Coordinator, 303-236-2985
Mailing address for both: U.S. Fish and Wildlife Service, P.O. Box 25486-DFC, Denver, Colorado 80225 USA



PUBLICATIONS

OFF THE PRESS

Reviews in Fisheries Science, edited by Robert R. Stickney, University of Washington at Seattle, provides an important forum for the publication of up-to-date reviews, historical articles, and original research covering the broad range of subject areas in fisheries science. These areas include management, aquaculture, taxonomy, behavior, stock identification, genetics, nutrition, and physiology. Issues concerning finfish and aquatic invertebrates prized for their economic or recreational importance, their value as indicators of environmental health, or their natural beauty area addressed.

An important resource that will keep you apprised of the latest changes in the field, each issue of *Reviews in Fisheries Science* present unique information that will be useful to fisheries scientists in academia, state and federal natural resources agencies, and the private sector.

First Issue: March 1993. Subscription Rate per 4-Issue Volume: Individual, \$79.95; AFS Member, \$39.00; Institution/Foreign, \$195.00. Available from Lewis Publishers/CRC Press, Inc., 2000 Corporate Blvd., NW, Boca Raton, FL 33431 800-272-7737 or 407-994-0555.

Predicting Ecosystem Risk: Advances in Modern Environmental Toxicology (Volume XX), edited by J. Cairns Jr., B.R. Niederlehner and David Orvos, calls attention to the urgency of our need, as a nation and part of the global community, to develop a system for estimating ecosystem risk. While the book is not intended to be encyclopedic in its coverage, diverse chapters illustrate many facts of the problem. Specific topics include the economic consequences of our poor predictive capabilities and the drastically differing problems that face developing versus developed countries. Various views of ecosystem risk analysis and the investigation of promising methods of detecting ecosystem risk are discussed. This informative and fascinating hardcover book is available for \$65.00 (plus \$3.00 shipping and handling) from Princeton Scientific Publishing Company Inc., P.O. Box 2155, Princeton, New Jersey 08543; (609) 683-4750.

Native Trout of Western North America, written by Robert Behnke and published by the American Fisheries Society, details the evolutionary diversity and complexity of the native trout of Western North America. The author has drawn not only on published literature and agency reports, but on his own vast experience with these fish as well. Behnke has integrated the biology and ecology of these fish with their taxonomy, classification, and evolutionary history to provide the most comprehensive survey of indigenous western trout available in one document.

A strong subtext of this publication is preservation of the diversity still available among these remarkable animals. Few groups of fish are more venerated by the public, yet few fish have been more abused.

The natural ranges of western trout have been sharply truncated by dams, abusive land practices, and introductions of exotic species; some distinctive subspecies and populations have been lost forever. By demonstrating not only the scope of trout diversity but why this diversity is important for enhancing fishery resources, Behnke has made a major contribution to resource management in North America.

Native Trout of Western North America is available in both hardcover (\$41.00; \$33.00 AFS members only) and paperback (\$33.00, \$26.00 AFS members only) from the American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, Maryland 20814; (301) 897-8616.

Methods of Marking Fish and Shellfish is a practical synthesis of current ways to tag and mark fish, crustaceans, and mollusks for later identification.

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