

# The Tributary

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Newsletter of the Western Division, American Fisheries Society

Volume 16, No. 2/March 1991

## THE PRESIDENT'S CORNER

As I travel around the Division, I see a large number of you who are trying to prevent our profession from becoming just another bunch of "scientist bean-counters." I support those of you who strive for higher ground and will dedicate as much of my time and energy to our common cause as my family and job will bear.

As President, I seem to work for about 3000 folks who believe that the truth is more important than just facts. Technicians deal only with facts. Professionals believe that ethics are more important than method. Science is only method. Science is important, but less important than integrity. I consistently see the collective integrity of your professionalism.

You and I need to keep on teaching professionalism. You and I need to get out and feel the truth by touching the ground, see the fish under water, feel the currents and see the snow-capped peaks draining fish to the sea. We need to collectively pass these things on to the next generation of fisheries professionals. If we do not, we risk younger biologists being captive to the computer terminal, data tables and mere facts.

You and I can make a difference. We can help the young white male fisheries biologist who grew up in New York and got a job in Sacramento become a professional. We can help the middle-aged Hispanic male in Mexico get more information through AFS and help him be a better professional. We can educate the young black woman in downtown Portland about careers in fisheries and help her become a professional. We can help the young Eskimo go to college in Fairbanks and become a fisheries professional.

You and I can share what we have through the chapters of this division and the work of the division. You have already started with seminars on ethics, with panels on professionalism, and with an Equal Opportunity Committee.

We need to do more. My challenge is to help you move forward on a "Mexican" chapter. I want to help you develop a stronger voice for the Native American Fisheries Committee within the Division and AFS. I want to help you make students a more vital and important unit of every chapter in the division.

We can and must do these things and more, because they are right. We can and must make a difference for ourselves, for our grand children, and for the fish that we all love.

## AFS SECTION MEMBERSHIPS

SECTION	1985	1986	1987	1988	1989	1990
Fish Culture	978	997	940	955	939	899
Fish Health	476	499	541	569	577	610
Fish Admin.	178	200	222	221	226	229
Education	271	269	280	285	305	299
Water Quality	522	577	570	631	624	620
Early Life History	363	365	379	403	426	447
Marine Fisheries	482	507	499	517	472	475
Introduced Fish	192	200	200	209	224	281
Fisheries Mgmt.	1017	1124	1105	1099	1119	1152
Bioengineering	265	264	243	292	314	304
Socioeconomics	140	167	179	189	203	205
Computer Use	---	404	644	756	805	778
Fish Genetics	---	---	1	213	244	253
International	---	---	23	200	277	246
Fisheries Law	---	---	---	---	---	2
Totals	4884	5573	5826	6539	5705	6796

## PARENT SOCIETY NEWS

Get ready for a name change from the American Fisheries Society to the North American Fisheries Society. Plans are moving forward with a proposed name change for the society primarily in response to concerns from Canadian members. A proposal to change the name of the Society was rejected by the membership in 1984, but it's time to reconsider. As Larry Nielsen, AFS President stated in *Fisheries* (Vol. 15, No. 6), "So why consider a name change again now? Quite simply, it's a different Society and a different world today than in 1984. Our interests are broader now, with substantial attention directed at marine fisheries, global pollution, Great Lakes issues, and endangered species, to name a few. All these issues concern the entire continent and the waters surrounding it. An organization's name should accurately reflect what it is, and what it wishes to be. A name change is on our agenda now because many members — including me — believe that *American Fisheries Society* no longer does this."

## AFS JOB BULLETIN

A new job listing service has been formed by AFS. Beginning late last month, AFS initiated a Fisheries News package mailing to every AFS member. The package included a new 4-page newsletter called Fisheries News. Also included is a copy of the AFS Diary and the new *AFS Jobs Bulletin*. Total circulation is projected at 9000 and there is no charge to members or to non-profit advertisers.

Help the AFS get the word out. Show the *AFS Job Bulletin* to personnel in your state or federal agency or at your college or university. The reverse side of this page provides the format and space limitations which governmental agencies or graduate education advertisers should use for their job announcement. AFS has never before found a truly effective way of assisting its individual members find jobs and its official members advertise their openings. Perhaps the *AFS Jobs Bulletin* will fill this critical need.



*The Tributary* is distributed to 3,000 WDAFS members and exists as a forum to present fisheries-related information. As the editor, I cannot accomplish this goal unless YOU participate! The WDAFS publishes three editions of *The Tributary* yearly.

Deadlines for submission of articles are February 15 (for the Winter issue), May 20 (for the Spring issue) and October 15 (for the fall issue).

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

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## THIS AND THAT AROUND THE WEST

## FISHERIES JOBS

(Editor's note: I found this article in the October 1990 *Mainstream*, the North Central AFS Division newsletter.)

For much of the 70s and 80s, the debate raged on whether we in the fisheries profession should encourage students to pursue careers in fisheries and limnology. The job market had been so tight for so long, many thought it was criminal to mislead anyone into thinking they could get a fisheries job with anyone.

But according to a joint panel of officers from the AFS Education Section and the Fisheries Administrators Section, things have changed in the last five years. Following is a report by Education Section President Bruce Menzel on the points made by agency representatives trying to recruit employees and college representatives trying to train good prospects. (The following originally published in the June 1990 issue of the Education Section newsletter, Tom Coon, Editor.)

"On May 15, I participated in a panel on education at the annual meeting of the AFS Fisheries Administrators Section. Others were Bruce Schupp (NY Department of Environmental Conservation), Al Woolf (Southern Illinois University), John Lloyd (U.S. Forest Service) and Larry Nielsen (Virginia Tech). The general purpose of the session was to address concerns by administrators about the quantity and quality of applicants for fisheries position. Bruce Schupp indicated that his agency had only half the number of fisheries job applicants in 1989 compared to 1986, and fewer than half of the 1989 applicants passed the written exam for entry-level positions. Shortcomings of the applicants were especially noticeable in the area of management principles and practices, according to Bruce.

My presentation focussed on trends in fisheries education and environmental employment. Some of the major points were:

1. Although student enrollments increased nationwide in the late 1980s, the number of graduates continued to decline because of lower recruitment earlier in the decade.
2. Minority students comprise less than three percent of undergraduates and only about five percent of graduate students in fisheries and wildlife programs. A little more than 20 percent of the students are women. Most of these students do not seem to be seeking traditional management-oriented careers.
3. Baccalaureate programs in fisheries and wildlife are being affected by a general educational trend toward broader, less technical programs, by a decline in organismal biology at many institutions and growth of non-traditional areas such as aquaculture and socio-economics.
4. Student demographics are changing, with trends toward more adult and transfer students and more students with urban backgrounds and general environmental interests, as opposed to resource management.
5. Although good students continue to be attracted to our field, many institutions are reporting a general decline in educational

preparation and performance among their students.

6. Within the past two years, environmental and natural resource employment opportunities have at least doubled. Even though fisheries position vacancies may have increased at an even greater rate, job seekers today have more opportunities than at any time in many years.

7. Low salary schedules, cumbersome civil service procedures and competition with local and federal agencies and industry seem to be some of the factors working against the recruitment efforts of state fisheries agencies.

Larry and Al had similar observations at their institutions, while Jim described the aggressive recruitment effort of the Forest Service's *Rise to the Future* program.

Clearly, fisheries educational issues continue to be a topic of great interest among our profession. Our sections' half-day symposium at the Pittsburgh AFS meeting on *The Making of a Fisheries Professional* will have much to offer. I encourage you to attend this session and to bring a friend or two.

## LEADER-CRAFT

BY ED EASTON

"The only people who really appreciate change are wet babies." I don't know the original source, but it's a perfect description of the crux of leadership. Good leadership always strives for improvement, and that requires change.

I don't think that's a political statement. The theory is usually stated that liberals want change while conservatives opt for the status quo. That's not necessarily so. Conservatives can opt for change just as readily. We've had nine years of conservative government, and there certainly has been plenty of visible and actual change to our country.

Good leadership looks at what is, and seeks to change it for the better, however that might be perceived. That's what makes for good arguments. Poor leadership never inspired arguments, poor leadership avoids proposing anything people might argue about. It seems to me, especially at a time when conservation issues are capturing the support of an overwhelming number of Americans (and every other nationality around the world), that our obligation as leaders is crystal clear. How can we capitalize on our success to become bigger, stronger and more effective? That's the question that should be raised at every meeting of every board of directors, in each committee and with the membership.

How can we change what we do so as to be even more than we are now?

This decade is ours, and what we make of it will have a huge impact on the world our children inherit. Now is not the time to rest on laurels or consider the job done. If you read this column, why not take it to your next meeting? Chances are you may be the only one who has read it... or, if others have, the only one with the guts to bring the subject up.

How can we do more? How can we do what we're doing better? What major change can we seek that would improve habitat for human beings and for wildlife? What aren't we doing that we could?

These are the questions every good leader tries to ask all the time. Without them, an organization settles back into the status quo and eventually dies. Then, everybody wonders why. It's usually clear from the outside that the leadership had no vision of what to change or how.

For voluntary organizations this idea is crucial. Groups only exist to make change occur. When they achieve their goals, when they make the change occur, if they don't seek new changes, they die from boredom. If your organization has problems, this is usually the best place to find the solutions.

Most volunteers end up in leadership roles because they want to make change. Such people are valuable. You must treasure them, nurture them, but above all, if you can't be one of them, then you must support them.

They are the people who will bring us all what we want.

(Ed Easton is the director of leadership development for the National Wildlife Federation.)

## BELT BUCKLES

When the glacial ice retreated some 10,000 years ago, it left behind isolated populations of Arctic grayling in what today are Michigan and Montana. The Michigan populations became extinct earlier in the century due to competition from introduced brook trout and habitat degradation. The last remaining fluvial population in Montana is found in the Big Hole River. This population is now teetering on the brink of extirpation.

Recognizing the plight of the Big Hole fluvial Arctic grayling several years ago, an inter-agency workgroup was formed and has been monitoring the population. The workgroup is actively attempting to restore this population through a variety of efforts. A comprehensive restoration plan has been developed and the first efforts to supplement the population have begun.

The restoration efforts will be expensive and money is hard to come by these days. In an effort to help fund the restoration efforts, the Montana Chapter of the American Fisheries Society, George Grant Chapter of Trout Unlimited and the Big Hole River Foundation have sponsored the development of a beautiful belt buckle, available in bronze or silver, depicting the Arctic grayling in its native fluvial habitat. All funds generated through sale of the buckles will be used to fund restoration efforts.

To order your Arctic grayling buckle and personally help in the restoration of this beautiful salmonid please send your check to MCAFS (\$20.00 for bronze, \$125.00 for silver) to Polly Bailey, 4 Harrison Avenue, Helena, Montana 59601. Montana Centennial Yellowstone Cutthroat Trout buckles are still available from the Montana Chapter of AFS at the same prices as the grayling buckle.

**DEVELOPMENT ON THE FRASER**

The Fraser River in British Columbia has the largest natural run of salmon in the world, is the home to the largest population of wintering waterfowl in Canada, and is the single most important stopping point for millions of migrating birds. At the same time, 1.4 million people live, work and play in the Fraser River basin. Effective management of the Fraser is an immense task that involves a delicate balance between the river's natural environment and the ever-expanding industrial, commercial, recreational and residential development.

Enter the Fraser River Estuary Management Program (FREMP), an inter-governmental, interagency program that took 7 years of background study and review of management options to establish. FREMP was launched in 1985, and its goal is to accommodate continued development while maintaining the quality and productivity of the Fraser's estuary. FREMP's most direct vehicle for managing the estuary is a new

project review mechanism, a *one-step* process. The mechanism coordinates reviews of agencies that examine projects planned for the Fraser River, collects recommendations and offers development guidelines that are environmentally sound. Contact Fraser River Estuary Management Program, 708 Clarkson St., New Westminster, BC V3M 1E2. (Sustainable Development, August 1990)

**LAKE-CLEANING PLANTS**

A contract was awarded by the St. Johns Water Management District for a pilot reclamation project to restore moribund Lake Apopka in central Florida, the state's second-largest lake. Three five-acre test plots will be established adjacent to Lake Apopka, and stocked with a variety of aquatic plants, plant seeds and wetlands mulch. The plots will then be filled with lake water as an experiment involving purification by natural processes.

The water from Lake Apopka, plagued by suspended phosphorus produced by years of agricultural runoff, is pea-green in color and nearly dead, said Charles Bates, president of Plants for Tomorrow, the company chosen for the project. Over time, the company will determine the best combination of plants to purge phosphorus and other oxygen choking materials from the water. Test results, if positive, will be used in planning the subsequent construction of a 5,000 acre flow-through marsh that will act as a natural filtering system for Lake Apopka. Twice each year, the lake water will be pumped through the marsh for cleansing and redistribution back to the lake bed.

**MONTANA**

Researchers at Montana State Fish and Wildlife Cooperative Unit have submitted a journal article to NAJFM that addresses the effects of angler wading on trout recruitment. A number of different aspects of

*This and That continued on page 4*

**PUBLICATIONS**

**FRESHWATER ARTIFICIAL REEFS**

This guide to construction of artificial reefs was produced by the Sport Fishing Institute and Anglers for Clean Water, Inc. using Federal Aid in Sport Fish Restoration Funds. Copies are available from both sources. AFI, 1010 Mass Ave., NW, Suite 300, Washington, DC 20001. Anglers for Clean Water, One Bell Road, Montgomery, AL 36117.

**MONTANA FIELD GUIDE FISHES**

Published by the Montana Department of Fish, Wildlife and Parks, a beautifully illustrated text contains excellent black-and-white art, plus a number of colored photos has just been released. A special feature is a distribution map for each species. For more information contact the Montana Department of Fish and Wildlife, 1420 South Ave., Helena, MT 59620.

**THE INCREDIBLE CARP**

A new video produced by the Arizona Game and Fish Department shows and tells how to catch, clean, pickle, smoke and fry carp while enjoying the experience! Reviews have been excellent. Contact Joe Janisch, Fisheries Supervisor, Arizona Game and Fish Dept., 2221 W. Greenway Road, Phoenix, AZ 85023-4312 to get a copy. Phone 602/942-3000.

*Publications continued on page 7*

**WDAFS TOP BANANAS**

**ELECTED OFFICERS**

Dave Burns, President  
P.O. Box 1351  
McCall, Idaho 83638  
208/634-1432 (w)  
208/634-2553 (h)

Don Chase, President-elect (1991 Program Chair)  
2034 N. Bethel St.  
Olympia, WA 98506  
206/753-3026 (w)

Glen Phillips, Vice-president (Chairs: Membership, Time & Place, and 1989-90 Audit)  
Water Pollution Control Office  
Cogswell Building Room A-206  
Helena, MT 59620  
406/444-2449 (w, AM)  
406/444-2406 (w, PM)

Cay Goude, Immediate Past-president (Chairs: Awards & Nominations, Constitutional Consultant)  
10685 Jackson Rd.  
Sacramento, CA 95830  
916/978-4613 (w)

Lynn Starnes, Secretary-treasurer  
U.S. Fish and Wildlife Service  
P.O. Box 25468  
Denver Federal Center  
Denver, CO 80225  
303/236-8254 (w)

Harry Eng, Society Nominating Rep.  
California Fish & Game  
1416 Ninth St.  
Sacramento, CA 95814.

**APPOINTMENTS & COMMITTEE CHAIRS**

Roger Ovink, Newsletter Editor  
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Randy Bailey, Environmental Concerns Chair  
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1011 E. Tudor Rd.  
Anchorage, AK 99503  
907/786-3466 (w)

Dennis Tol, Resolutions Chair  
BLM  
705 E. 4th Street  
Winnemucca, NV 83669

Jerry Burton, Threatened & Endangered Species Chair  
9704 Admiral Emerson NE  
Albuquerque, NM 87111  
505/883-7877

Pete Bisson, Habitat Inventory Procedures Chair  
Weyerhaeuser Company  
Technical Center WTC-2H4  
Tacoma, WA 98477  
206/924-6329 (w)

John Leppink, 1990-91 Audit Chair  
ODFW  
P.O. Box 59  
Portland, OR 97207  
503/229-5400

Susan Martin, Public Affairs Chair  
Rt. 1, 21691 Bent Ln.  
Star, ID 83669  
208/334-5860 (w)

Ken Hashagen, Equal Opportunities Chair  
3512 N. Lakeshore Blvd.  
Loomis, CA 95650  
916/323-7324 (w)

Wayne Elmore, Riparian Chair  
BLM  
P.O. Box 550  
Prineville, OR 97754  
503/447-4115 (w)

Joe DoSantos, Native American Fisheries Chair  
CSKT  
P.O. Box 278  
Pablo, MT 59855  
406/675-2700

Mike Fraidenburg, Marine Fisheries Chair  
5432 Keating Rd. NW  
Olympia, WA 98502  
206/753-5684 (w)

the effects were addressed. Last year the State of Montana opened up streams to where access can occur if an angler doesn't stray above the high water line. However, if a landowner could demonstrate environmental damage to a reach, access could be denied. The journal article looks at some lab studies that resulted in closure of Nelson Springs Creek to wading during spawning and incubation of cutthroat trout. The study showed that twice daily wading throughout the development stages resulted in mortalities as high as 96 percent. A single wading just before hatching resulted in 43 percent mortality. For more information contact Bob White, 406/994-3491.

### ASSESSING QUALITY OF FISH

There is a need in fisheries management to objectively and feasibly evaluate the quality of fish stocked into waters. In theory, higher quality fish (in terms of health/condition) survive and return to the creel better than lower quality fish. The lack of knowledge concerning quality of fish stocked has hampered research efforts such as strain and stocking evaluations.

Ronald Goede (1989) recently developed a fish health assessment procedure that is both useful and relatively quick. This procedure is based on general observations of tissue systems (fins, mesenteric fat, etc.), organs (liver, kidney, etc.) and blood characteristics (hematocrit, plasma and leucocrit). However, this index does not give an overall rating of the quality fish stocks.

Based on Goede's index, I developed an overall index of fish quality which ranges from 0-4 (poor quality), 4-6 (fair quality), 6-8 (good quality) and 8-10 (excellent quality). I am developing a separating index for body condition and blood quality since it was difficult to incorporate both of these characteristics into one index.

With this index a manager can assess the quality of fish stock and request a certain quality of fish from hatcheries. This will allow for more accurate analysis of stocking regimes and subsequent population, survival and exploitation assessments. Also, as the utility of this index is refined, the benefit/cost of using various *quality fish* can be factored into the decision process. For more information contact Joe G. Larscheid, Natural Lakes Research, Iowa Department of Natural Resources, R.R. Box 7722, Spirit Lake, IA 51355. (Literature cited: Goede, R.W. 1988. Fish health/condition assessment procedures. Utah Division of Wildlife Resources. Fisheries Experiment Station. Logan, Utah. 29 pp.)

### OUTDOOR WRITER HELP

Fisheries biologists with knowledge of catfish biology, particularly channel, flathead and blue catfish should contact outdoor writer Chris Altman. Altman produced a May 1990 *Field and Stream* article on carp which was based on the AFS book *Carp In North America*. If you can help him or know of someone who can, write him at Outdoor Writing and Photography, 88 Hidden Valley, Pikeville, Kentucky 41501 or call 606/478-9666.

### NEW SURVEY OF U.S. SPENDING ON CONSERVATION

The Center for International Development and Environment of the World Resources Institute has just completed a survey of the biological diversity research and conservation activities that U.S.-based organizations undertook in developing countries in 1987. Those surveyed included the U.S. government, non-governmental organizations, universities, museums, charitable foundations, botanical gardens and zoos.

In all, 873 projects active in 86 developing countries were analyzed. Of the \$37.5 million spent in 1987, over half went to projects in Latin America and the Caribbean. Another 16 percent went to Asia; 12 percent to Africa; and 11 percent to global or multi-regional projects. Efforts in Costa Rica, Panama and Mexico received 30 percent of all funding.

The survey showed that 44 percent of all funding was spent on projects focussed primarily on research. Projects concerned with site and species management received 23 percent of all funding, most of it for protected areas. Fifteen percent of the funding went to education, which included technical and professional training. Support to developing country institutions totalled 11 percent, and policy planning and analysis accounted for 6 percent of all funding.

The U.S. government contributed over half of the total funding, but implemented projects involving only 24 percent. Non-governmental organizations implemented the most projects, followed by universities and U.S. governmental agencies.

The increasing loss of biological diversity, resulting from loss of genetic diversity, the extinction of species, the destruction of ecosystems, constitutes a global crisis. Compared to the size of the problem, however, the resources being spent to solve it are very small. The \$37.5 million spent in 1987 is not enough to ensure that the world's biological resources will be sustained for future generations.

### HOW EUTROPHIC IS IDAHO'S LARGEST LAKE?

Lake Pend Oreille is Idaho's largest lake. Its depth, volume, water clarity and moderate to low plant production classify it as a poor to moderately nourished system. In recent years, increased density of aquatic plants on docks and shoreline areas have indicated that the productivity of the lake is changing.

In 1986, the University of Idaho, with support from DEQ and U.S. EPA initiated a study of attached algae production in near-shore areas. In theory, changes in trophic status would show up first close to shoreline nutrient sources rather than in deep open waters.

Methods used initially were refined and in mid-July 1989, the study was expanded to evaluate production at 16 nearshore sites around Lake Pend Oreille. Sites were selected to represent development (high nutrient potential) and relatively undeveloped (low nutrient potential) shorelines. Preliminary results indicated that algae monitoring is useful for detecting early changes in lake productivity. The study is headed by C. Michael Falter, Limnologist, University of Idaho. (Idaho Clean Water, Spring/Summer 1990).

### TEST YOUR ECOLOGICAL QUOTIENT

- ⇒ 20 points if you store household chemicals, fertilizers and pesticides properly
- ⇒ 20 points if you sweep your driveway instead of hose off debris
- ⇒ 10 points each if you recycle glass, plastic jugs, tin cans, motor oil, paper, aluminum cans
- ⇒ lose 5 points each if you recycle none of the above
- ⇒ 10 points if you donated money to an environmental cause last year
- ⇒ lose 10 points if you littered
- ⇒ 15 points for writing to a legislator or public official regarding an environmental issue (25 points for 2 or more letters, lose 5 points if no letter)
- ⇒ 20 points if you carpool, ride the bus, or bike instead of driving
- ⇒ lose 5 points if you use rock salt to de-ice your walks
- ⇒ lose 5 points if your car gets less than 20 miles per gallon
- ⇒ 20 points if you use recycled paper
- ⇒ 15 points if you purposely buy products that reduce waste generation
- ⇒ 5 points if you walked someplace instead of driving
- ⇒ 20 points if you compost yard waste and food scraps
- ⇒ 20 points if you're actively involved in an environmental issue

Results: 200 and over, a true friend of the environment

140-199, concerned and doing OK

90-139, you need to try harder

less than 89, you're part of the problem!

Send your score to Duane Neitzel P7-50, Battelle-Northwest, P.O. Box 999, Richland, Washington 99352. If he gets enough responses, he'll publish the EQ for the AFS/WQS in the next newsletter. (Published in Lake Line, March 1990).

Got an interesting or informative photograph to go with your WDAFS news story? *The Tributary* can now publish appropriate photographs, space permitting.

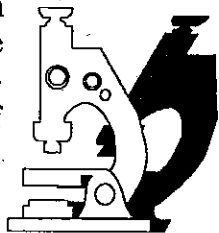
Send your uncropped photo, along with a self-addressed stamped envelope for return, to the editor. Photos can be black and white or color, no *Polaroids* please.

WDAFS ANNUAL MEETING

**SPEND A WEEK IN BIG SKY COUNTRY**

The WDAFS and the Montana Chapter are proud to announce the Western Division Annual Meeting, 1991. The conference will be held Monday, July 15 through Friday, July 19 on the Montana State University campus in beautiful Bozeman, Montana.

Several scientific and technical paper sessions along with lunches, a pitchfork barbecue and banquet have been organized into four days. Time for exploring, fishing, hiking, biking and visiting with other WDAFS members! The WDAFS and Montana AFS Chapter is encouraging all AFS members, fishery and biological professionals and interested sportsmen to attend. Why not bring the family and make a vacation out of it? Visit Yellowstone National Park, historic Virginia City and fish some of the best trout streams in North America.



**WDAFS MEETING SCHEDULE**

**Monday July 15**

**WDAFS Retreat.** The WDAFS Executive Committee, WDAFS Chapter Officers and WDAFS Committee Chairs are encouraged to attend.

**Tuesday, July 16**

**WDAFS & AFS Leadership Workshop.**

**WDAFS Executive Committee Meeting.** The WDAFS Executive Committee, WDAFS Chapter Officers and WDAFS Committee Chairs are required to attend.

**WDAFS "Best in the West" Volleyball Tournament.**

**"Pitchfork" Barbecue and Entertainment.**

**Wednesday, July 17**

**WDAFS Plenary Session:**

**Three concurrent morning sessions.**

1. Marine Fisheries Regulations. Moderator, Mike Fraidenburg, Washington Dept. of Fisheries.
2. Mixed species in trout waters. Moderator, Howard Johnson, Montana Dept. of Fish, Wildlife & Parks.
3. Riparian Papers. Moderator, Mark Gorges, BLM.

Lunch (included in registration).

**WDAFS Business Meeting**

**Three concurrent afternoon sessions.**

1. Water Rights. Moderator, Bob Franklin, Hoopa Valley Tribe, CA.
2. Fish Chelfs. Moderator, Larry Peterman, Montana Dept. Fish, Wildlife & Parks.
3. Contributed papers.

**Trade Show**

**WDAFS "Spawning Run" (1K and 5K runs).**

**Mountain Bike Ride**

**Evening hike and Grayling fishing trip**

**Social Hour**

**Thursday, July 18**

**Trade Show**

**Four concurrent morning sessions.**

1. Rotenone. Moderator, Leo Lenstch, Utah Dept. of Natural Resources.
2. Columbia River "Endangered" Fish. Moderator, Duane Phinney, Washington Dept. of Fisheries.
3. Electrofishing Injury. Moderator, Wade Fredenburg, Montana Dept. of Fish, Wildlife & Parks.

*Annual Meeting continued on page 6*

**JOBS**

**Position Wanted**

Marine biologist with MS degree and 16 years in private aquaculture and academic research seeks managerial position or consultancy in domestic or overseas start-up or existing aquaculture project. Six years experience as owner/operator of private aquaculture firm. Background primarily in bivalve hatchery and nursery culture. Also extensive work with microalgae, fish and crustaceans. Contact David L. Berg, 77 Abbott Drive, Huntington, New York 11743. 516/385-2417.

**Genetics Positions**

The Florida Game and Fish Commission is seeking qualified candidates for two positions, Genetics Project Leader (Biological Scientist IV) and Genetics Project Biologist (Biological Scientist III). Contact Dr. Bill Coleman, P.O. Box 1903, Eustis, FL 33727-1903, 904/357-6631 or Mr. Paul Shafland, 801 N.W. 40th St., Boco Raton, FL 33432, 407/391-6409.

**Assistant Professor**

The University of Idaho is seeking a qualified candidate for a position as Assistant Professor of Zoology (molecular, cellular, or physiological fish biology). This is a tenure track position. Contact Dr. J.G. Cloud, Dept. of Biological Sciences, University of Idaho, Moscow, ID 83843, 205/885-6388 for more information.

**Nine Month Position**

The University of Massachusetts is seeking someone for a 9 month tenure track position as Assistant Professor of Fisheries Science. Contact Dr. Carl A. Carozzi, Chair, Fisheries Science Search Committee, Dept. of Forestry and Wildlife, 204 Holdsworth Natural Resources Center, University of Massachusetts, Amherst, MA 01003 for more information.

**Striped Bass Coordinator**

The Atlantic States Marine Fisheries Commission seeks a fisheries scientist/administrator to coordinate and administer its striped bass management

and monitoring programs. Applicants should have a graduate degree in fisheries science, marine biology or interdisciplinary preparation for fisheries management. Other qualifications include knowledge of stock assessment, wetlands, writing, speaking and editing skills and willingness to travel. Two or more years experience required. Other desirable qualifications are experience in Atlantic coast fisheries matters and experience in developing policy statements. Salary is \$35,000 to \$38,000 with an annual renewable contract. Send letter of application and transcripts to Atlantic States Marine and Fisheries Commission, 1400 16th Street, NW, Suite 310, Washington, DC 20036, 202/387-5330.

**Fish Genetics**

Fish geneticists are invited to make applications for a 12-month, tenure track assistant professorship (75 percent research, 25 percent teaching) at Southern Illinois University. Specialization should include fish genetics as it relates to aquaculture and fish management. Required completed PhD, demonstrated teaching competence and external research funding capability. Send curriculum vitae, transcripts, published papers, four references and description of research interest to Dr. Roy Heidinger, Dept. of Zoology, Southern Illinois University, Carbondale, IL 62901.

**Biologists**

Two biologist jobs are open with the Coast Fisheries Branch of the Texas Parks and Wildlife Department. Salaries are \$1,975 monthly and candidates must have a BS in fishery biology or related field with 2 years experience. Contact Ted Storck, 100 Navigation Circle, Rockport, Texas 78382, 512/729-2328.

**Fisheries Biologists**

The Bonneville Power Administration has four positions open for Fisheries Biologists (GA-482-11/12) in Portland, Oregon. Salaries are \$29,891 to \$35,825 annually. Contact the Bonneville Power Administration, P.O. Box 3621, Portland, OR 97208-3621, 503/230-3055.

**Director of Wildlife**

The Texas Parks and Wildlife Department in Austin, Texas is seeking a Division Director of Wildlife, D141-Exempt. The position's salary is \$5,075 per month. Contact Landy Johnston, Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, 512/389-4954.

**Executive Secretary**

The Great Lakes Fishery Commission's Executive Secretary Carlos Fetterolf plans to retire in early 1992. The Commission is in the process of seeking candidates. The incumbent is the chief executive officer of the Commission which is charged by the 1955 Canada/United States Convention on Great Lakes Fisheries to develop measures to improve fisheries, coordinate efforts and implement management of sea lamprey. A university degree and extensive experience in natural resources management, planning, administration are desirable. Salary negotiable within \$59,000-\$77,000 (U.S.). Position open early 1992, Ann Arbor, Michigan. Governmental interchanges eligible. For information write or call Barbara Staples, Search Committee, Great Lakes Fishery Commission, 1451 Green Road, Ann Arbor, Michigan 48105, 313/662-3209.

**Marine Fisheries Biologist**

The Louisiana Department of Wildlife and Fisheries is seeking candidates for a position as a marine fisheries biologist program manager (biometrician). The salary is \$31,000 per year and the work station is Baton Rouge. Qualifications include BS (MS or PhD preferred) in a biological science plus 5 years professional experience. To apply contact Karen Foote, Administrator, Fisheries Research Division, P.O. Box 9800, Baton Rouge, Louisiana 70898-9000, 504/765-2383, or FAX 504/765-2489.

4. Native American Fisheries. Moderator, Joe DosSantos, Salish & Kootenai Confederated Tribes.

**Lunch**

**Technology Transfer Sessions.** In these sessions you can design your own session and share information with others.

**Four concurrent afternoon sessions.**

1. Advances-in Fish Culture. Moderator, Greg Kindschi, USFWS.
2. Contributed Papers
3. Student Papers. Moderator, Mike Moberly, Univ. of Washington.
4. Perspectives of Change. . .Our Elders Speak. Moderator, John Fraley, Montana Dept. of Fish, Wildlife & Parks.

**Banquet, T-shirt Exchange, Entertainment and Awards**

**Friday, July 19**

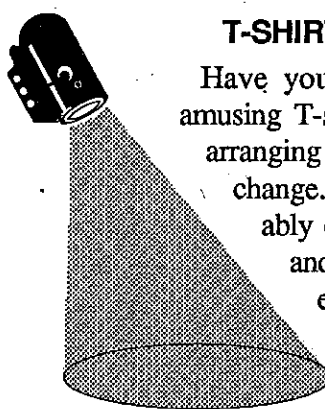
**Fishery Economics Workshop.** Sponsored by the AFS Fish Economics Section.

**Lunch**

**Afternoon/evening tour to Virginia City** (not included in registration).

**Saturday, July 20**

**Tour to Yellowstone National Park** (not included in registration).



**T-SHIRT EXCHANGE**

Have you got an interesting or amusing T-shirt? If you do, we are arranging a "Fishery T-Shirt Exchange." Bring a T-shirt (preferably clean) to the registration and you'll get a chance to exchange it for another T-shirt brought by another member. So bring your favorite "Spawn Till

You Die" or similar T-shirt and exchange it for another. The WDAFS will start the exchange by bringing a collection of "Ray Troll" fish T-shirts.

**ANNUAL MEETING COSTS**

How much does all this cost? We have arranged for an inexpensive pre-registration fee of only \$100 for AFS members, \$60 for AFS Student members and \$125 for non-AFS members. On-site registration

is \$125 for AFS members, \$70 for AFS Student members and \$150 for non-AFS members.

Housing packages (dorm room style) for only \$9 per person per night (double occupancy) are available. A list of local motels and campgrounds in the Bozeman vicinity will be provided with the registration form.

**PRESENTING A PAPER**

If you are interested in presenting a paper in one of the above sessions or a contributed paper, contact the session moderator or Don Chase at 206/753-5723. If you have any questions about the meeting call Don or Pat Dwyer at 406/587-9265.

We hope to see you all there!

**POPULATION EXPLOSION: EXHAUSTING RESOURCES**

The statistics on the population explosion are staggering. When we were born, there were 2 billion people on the planet. When *The Population Bomb* was written in 1968, there were 3.5 billion. Today, there are 5.3 billion. Since "The Bomb," more people have been added to the human race than existed when World War I was fought. Each year the population grows by numbers equivalent to the combined citizenry of Great Britain, Ireland, Iceland, Belgium, Denmark, Norway, Sweden and Finland. This unprecedented expansion fuels virtually every human problem, from hunger, global warming and AIDS to smog, traffic jams and international conflict.

Furthermore, people require the services of natural ecosystems to live, and human population expansion constitutes a massive assault on those systems. Indeed, the entire globe is now overpopulated by a simple standard: Humanity cannot now be supported on income — that is renewable resources. Even though billions of people live in poverty that would appall the average American, civilization endures only by using up a one-time bonanza of "capital" — especially deep, rich agricultural soils, Ice Age ground water and "biodiversity" populations and species of other organisms that are working parts of life-support systems. Earth's farmers must feed 95 million more mouths annually with 25 billion tons less topsoil, trillions less gallons of ground water and diminishing help from natural systems with climate control, pest management and pollination. We are squandering our inheritance and calling it "growth."

The most serious population problems are centered in the United States, not only because it is the fourth most populous nation, but also because the average American has an enormous impact on environmental systems and resources compared to citizens of poor countries.

Overpopulation among the rich, barely one-fifth of the world's people, now accounts for well over half the deterioration of global life-support systems. But poor nations will soon pose greater threats to those systems as their expanding populations struggle to develop. Suppose that Indian and Chinese populations increase their per-capita commercial energy consumption (using their abundant coal) to 7 percent and 14 percent of our present level respectively. Their populations are so huge that each would contribute as much to global warming from coal burning as the United States now does — and coal supplies almost one-quarter of our commercial energy.

There is no question that the greatest threat to the security of the United States is environmental, nor that an unsustainable expansion of human numbers is partly to blame. Americans are aware of global warming, acid precipitation, ozone depletion, loss of biological diversity, deforestation, desertification, the garbage crisis and increased vulnerability to epidemics. But most have yet to recognize that these are all symptoms of one potentially lethal disease: the expansion of human numbers and the human economy.

For nine years now, the United States has moved backward in both environmental protection and dealing with population problems at home and abroad. The first retreat can be traced largely to the "get ours now and the hell with posterity" philosophy of the Reagan era. The second is the result of disastrous national policies reinforced by taboos of both left and right.

Those on the left are afraid that focusing on population would distract attention from the increasingly desperate social needs of the nation. That must be guarded against.

On the right, confusion of family limitation with abortion has led anti-abortion forces to oppose needed measures. But both they and supporters of legal abortion could join hands and work to see that all sexually active people have access to safe and effective contraception. History shows that the only effective way to reduce the number of abortions is to give people control over contraception.

No one, of course, thinks that simply lowering birth rates below death rates and bringing population growth to a halt will solve all human problems. Environmental deterioration, warfare, hunger, racism, sexism, religious prejudice and gross economic inequity could still persist. Those problems must all be tackled as well, especially because diverse groups must cooperate if civilization is to survive the environmental crunch and a new and sustainable human community is to evolve. But non of those problems will ever be solved without population control.

Those who think these notions impossibly idealistic should reflect on how fantastic it would have seemed a year ago that East Germany would now be selling pieces of the Berlin Wall on the open market. When the time is ripe, societies can change with blinding speed. Our only chance is to ripen the time.

*(This article was written by Paul and Anne Ehrlich who teach at Stanford University. Their latest book is "The Population Explosion" published by Simon & Schuster, 1990. Reprinted from The Corvallis Gazette-Times, 1990, from the L.A. Times-Washington Post News Service.)*

**BIOLOGICAL INDICATORS OF STRESS IN FISH**

Those concerned with the well-being of fish and their habitats should get a copy of this 191-page book written by leaders in the field. Edited by Marshall Adams and published in December 1990 as AFS Symposium 8, it covers the nature and diagnosis of stress at every level of organization from molecules to ecosystems. Included are comprehensive reviews, syntheses and methods. Members pay \$24.00, non-members \$30.00. Contact AFS for more information.

**WALLOP-BREAUX VIDEOTAPE**

AFS Chapters can now acquire the Wallop-Breaux videotape for viewing in their localities. The tape features an opening message from President Bush and segments featuring Senators Wallop and Breaux. The 12-minute tape is available free to Chapters from the American League of Anglers and Boaters, 1331 Pennsylvania Ave. NW, Suite 726, Washington, DC 20004. Please enclose \$2.40 in postage. Chapters receiving a copy are encouraged to show the tape to as many sport fishing and conservation groups as possible.

**LIVESTOCK GRAZING ON WESTERN RIPARIAN AREAS**

Produced for the Environmental Protection Agency by the Northwest Resource Information Center, Inc., this report is aimed at the broad and growing audience of people interested in improved management of livestock grazing on western riparian areas and adjacent uplands. Its purpose is to provide general insight into the problems and opportunities associated with this land use activity. The report addresses the following:

- the function and values of western riparian areas
- the causes and effects of riparian area degradation
- the case studies representative of the problems and opportunities for improving livestock grazing on riparian areas
- common denominators and practical rules of thumb for developing riparian grazing strategies
- social, economic and institutional obstacles to widespread application of proven riparian grazing technology
- opportunities for cooperative efforts to enhance the social, economic and environmental benefits derived western riparian areas.

The report is available for free from the Environmental Protection Agency, Region 8 Office, 999 18th Street, Suite 500, Denver, CO 80202, 303/293-1603.

**BROWN TROUT WORKSHOP PROCEEDINGS**

The proceedings of a workshop held in Asheville, NC during 1988, sponsored by the Trout Committee, Southern Division AFS and Georgia and North Carolina Councils of Trout Unlimited is now available.

Titled *Brown Trout Workshop: Biology and Management* and edited by J.C. Borawa, this 140-page publication addresses brown trout habitat, management and regulation as related to the biology of the species. Panel discussions on habitat improvement, management from the administrative and policy perspective, trout stocking and regulations are included. The cost of the publication is \$12.50 US, \$15.00 Canadian. Send checks payable to Brown Trout Workshop, Rt. 1, Box 1638, Clarkesville, GA 30523.

**CLEAN LAKES**

The *Clean Lakes Program Annual Report for 1989* has been published by the North American Lake Management Society for the EOA. Copies have been mailed to every member of Congress. For your copy, sent \$5.00 to NALMS, P.O. Box 217, Merrifield, VA 22116.

**FISHES REFERENCE**

*Methods for Fish Biology* by Carl B. Schreck and Peter B. Moyle, is both a reference and a handbook for the study of fishes. Standard methods and their theoretical frameworks are presented for research into fish genetics, systematics, anatomy, physiology, developmental biology, toxicology, behavior and ecology. The book is available for \$50.00 (\$40.00 to AFS members) from the American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, Maryland 20814-2199.

**HANFORD REACH RESEARCH**

Water Quality Matters member Dale Becker has published *Aquatic Bioenvironmental Studies, the Hanford Experience 1944-1984*. A historical review of research in the Hanford Reach, Columbia River this 306-page hard-bound book is available from Elsevier Science Publishers, New York, NY for \$102.50 as Studies in Environmental Science 39.

**BIOLOGICAL DIVERSITY REPORT**

A recently release report written by Deborah Jensen, Margaret Torn and John Harte is available free to state government offices and at cost to others. Titled *In Our Own Hands: A Strategy for Conserving Biological Diversity in California*, it's available from California Policy Seminar, 109 Moses Hall, University of California, Berkeley, CA 94702, 415/642-5514.

**PRESERVING AMERICA'S RIVERS**

*River Conservatory Directory for 1990* lists over 1,000 public and private organizations dedicated to preserving America's rivers. To order, send \$6.00 and request document #024-005--1058 from the United States Government Printing Office, Washington, DC 20402-9325.

**CSEB NATIONAL CONFERENCE PROCEEDINGS**

The proceedings from the 1989 Canadian Society of Environmental Biologists' national conference held in Montreal in April 1989 is now available. *Joules in the Water: Managing the Effects of Hydroelectric Development* is a 650-page report providing the latest technical and scientific information on the ecological effects of producing electricity from dams and impoundments. To order sent \$15.00 to 1989 Proceedings, c/o CSEB, Alberta Chapter, Box 12, Substation 11, Edmonton, AB T6G 2E0.

**AQUATIC PLANT VIDEO**

Videotapes on *Aquatic Plants* may be ordered for \$10.60 each from the Center for Aquatic Plants, Institute of Food and Agricultural Sciences, University of Florida, 7922 NW 71st St., Gainesville, FL 32606, 904/392-1799.

**VIDEO-BASED TRAINING**

Two new video-based training packages are available from the National Audiovisual Center, 8700 Edgeworth Drive Capitol Heights, Maryland 20743-3701. U.S. EPA *Culturing Methods for Ceriodaphnia dubia and fathead minnow Pimephales promelas*, and *U.S. EPA Test Methods for Freshwater Effluent Toxicity Tests* are available for \$90.00 each.

**WATER PLANTS**

*Water Plants for Missouri Ponds* is a 151-page publication by J.R. Whiteley, B. Basset, J.G. Dillard and R.A. Hoefner. Accounts include the unique features, historical uses and ecological and commercial values of 68 aquatic and shoreline plants. Cultivation methods and the suitability of each plant for ponds are also described. Although written for Missouri pond owners, this book has much valuable information for pond owners in other states as well as anglers, boaters, naturalists, water gardeners and anyone else intrigued by the natural history of plants and ponds. Send \$9.00 to Department of Conservation, P.O. Box 180, Jefferson City, MO 65102.

**STRUCTURES ASSISTING**

A paper summarizing data available on structures designed to help fish surmount migration-hindering obstacles is available for \$9.00. *Structures Assisting the Migration of Non-Salmonid Fish: Latin America* analyzes installation designs, modes of operation and efficiency and discusses the reasons behind the decisions to construct dams. Call 1/800/274-4888 and ask for Copescal Technical Paper No. 5, 1989, ISBN 92-5-102683, F6831.

NEW MEMBERS

Rowland O. Adeniyi, Tiburon, California  
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 Marshall E. Bloom, Hamilton, Montana  
 Robert P. Burns, Hines, Oregon  
 Chris H. Burris, Las Cruces, New Mexico  
 Mary. E. Coburn, Carson City, Nevada  
 Patrick H. Davies, Ft. Collins, Colorado  
 Karen L. Dodge, Corvallis, Oregon  
 Kieran E. Donahue, Eielson AFB, Alaska  
 Joseph M. DuPont, Moscow, Idaho  
 Debra L. Eddy, Tualatin, Oregon  
 Lawrence R. Espinosa, Monterey, California  
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 Thomas G. Giese, Portland, Oregon  
 Daniel R. Goodwin, Honolulu, Hawaii  
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 Mimi Heggelund, Seattle, Washington  
 Daryl H. Hodges, Big Timber, Montana  
 Robert S. Hooton, Smithers, B.C.  
 Wayne L. Hunt, Sublimity, Oregon  
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 Eric D. Jeanes, Helena, Montana  
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 James P. Szyper, Kaneohe, Hawaii  
 Joel Tohtz, Libby, Montana  
 Joel F. Waldo, Eugene, Oregon  
 Robert L. Walker, Anderson, California  
 George Watter, Seattle, Washington  
 Paul Wraith, Potrero, California  
 Tim Zadina, Ketchikan, Alaska

CALENDAR

March 21-23, 1991

53rd Annual Meeting, Pacific Fishery Biologists, Sunriver Resort, Bend, Oregon. Contact James Newton, Oregon Department of Fish and Wildlife, 3701 W. 13th St., The Dalles, Oregon 97508, 503/296-4628.

April 16, 1991

*Municipal Landfills and Groundwater Quality.* A course offered by the Hazardous Substances Program, University Extension, University of California, Davis. One day course held in Sacramento, California to review the impact of municipal landfills on groundwater quality. Course material to be presented by G. Fred Lee, PhD, PE, who has actively explored groundwater quality problems caused by municipal landfills since the 1960s. For more information on the course, contact Dr. G. Fred Lee, 27298 East El Macero Dr., El Macero, CA 95618, 916/753-9630.

April 26, 1991

*Regional Aquatics Workshop.* Participating institutions from a number of aquarium facilities in the Great Lakes region and nearby states take turns hosting meetings which provide a relaxed atmosphere where aquarium personnel and professionals from related fields can exchange information and present updates on current projects at their facilities. The next meeting is held in Milwaukee, Wisconsin. Contact Rich Sajdak, 414/771-3040 for more information. Involvement by aquatic biologists from outside of the Great Lakes region is both welcomed and encouraged.

May 1-4, 1991

Five technical workshops on urban stream management will be presented in the Chicago area by the North Central Division of AFS in cosponsorship with the U.S. Fish and Wildlife Service and Illinois natural resources agencies. Urban stream restoration, citizen participation in urban stream management, creel census and angler diary surveys, use of 35mm video cameras in documentation and vegetative bank stabilization will be addressed. Fee of \$175.00 includes materials, lunches, dinner, refreshment breaks and transportation. Contact Don Roseboom, IL State Water Survey, 2204 Griffith Dr., Champaign, IL 61820, 309/671-3196.

May 27-June 2, 1991

Technical Session: *Introduction of Aquatic Organisms in the Pacific Basin*, XVII Pacific Science Congress 1991. Sponsored by the Hawaii Chapter of AFS. Submit titles and brief abstracts for papers or posters for presentation to the chairperson. Dr. James D. Parrish, Hawaii Cooperative Fishery Research Unit, 2538 The Mall, University of Hawaii, Honolulu, Hawaii 96822. 808/956-8350, FAX 808/956-6751. Posters will be accepted upon arrival and displayed at a central location.

May 30-31, 1991

*Groundwater Quality Management in California: Policy and Implementation* is a conference offered by the Hazardous

Substances Program, University Extension, University of California, Davis in Sacramento. This program will explore several aspects of California groundwater quality management, with special emphasis on important and timely groundwater quality protection issues. For additional information contact Dr. G. Fred Lee, 27298 East El Macero Dr., El Macero, CA 95618, 916/753-9630.

June 4-8, 1991

Warmwater Fisheries Symposium I, Phoenix, Arizona. Contact USDA-Forest Service, 517 Gold Ave. SW, Albuquerque, New Mexico 87102 or Jim Cooper 505/842-3264.

June 17-20, 1991

International Symposium on Biological Interactions of Enhanced and Wild Salmonids. Coast Bastion Inn, Nanaimo, B.C. Canada. Contact Ann Thompson, Department of Fisheries and Oceans, Pacific Biological Station, Nanaimo, B.C. Canada V9R 5K6, 604/756-7260.

June 23-July 5, 1991

A NATO Advanced Study Institute on Genetic Conservation of Salmonid Fishes will be hosted jointly by the University of Idaho and Washington State University. The institute will be held in Moscow, Idaho, during the first week of this period and will be in Pullman, Washington during the second week. The meeting will review the current status of salmonid fishes around the world and methods for their characterization and conservation. An important goal of the meeting is to identify scientific advances that are required to preserve the populations and germplasm of salmonid stocks. The ASI will be at the postdoctoral level and the resultant proceedings of the institute will be published. The number of participants will be restricted to about 85 and the selection of applicants will be based upon scientific qualifications. A limited number of fellowships are available. For further information, contact either of the co-organizers. J.G. Cloud, Dept. of Biological Sciences, University of Idaho, Moscow, Idaho 83843, 205/885-6388 or G.H. Thorgaard, Dept. of Zoology, Washington State University, Pullman, Washington 91163, 509/335-7438.

July 4-8, 1991

Warmwater Fisheries Symposium, Phoenix, Arizona. To promote communication and interaction among scientists, managers, educators and anglers concerning warmwater fisheries and fishing opportunities in the western states. A call for papers has been issued. Contact William D. Zeedyk, Director of Wildlife and Fisheries, USFS, SW Region, 517 Gold Avenue, SW, Albuquerque, New Mexico 87102.

July 29-July 31, 1991

*Second International Symposium on Viruses of Lower Vertebrates.* Held at the LaSells Stewart Center on the campus of Oregon State University in Corvallis, Oregon, formal presentations as well as poster sessions will concentrate on Viruses of Amphibia and Reptilia, Viruses of Cyclostomata and Chondrichthyes, Viruses of Osteichthyes, Immunology

and Defense Mechanisms, Evolution and Taxonomy and Diagnosis of Viral Diseases. The Symposium has been scheduled in conjunction with the Annual Meeting of the American Fisheries Society, Fish Health Section which will be held at the Mark O. Hatfield Marine Science Center in Newport, Oregon from August 1-3, 1991 and the Fifth International Congress for the Society of Developmental and Comparative Immunology which will be held at Reed College in Portland, Oregon from August 5-9, 1991.

Abstract and registration forms for the viruses symposium may be obtained by contacting J.L. Fryer, Department of Microbiology, Oregon State University, Corvallis, Oregon 97331-3804, 503/737-4441 or FAX 503/737-0496.

November 11-16, 1991

*The International Symposium on Lake, Reservoir, and Watershed Management* sponsored by the North American Lake Management Society (NALMS) will be held at the Sheraton Denver Tech Center, Denver, Colorado. The theme of this 11th annual meeting of NALMS is *Lake, Reservoir and Watershed Management in a Changing Environment*. Topics include climate change, demographic and social change, political and legal issues, toxic pollution, acidification, eutrophication, basinwide management, point and nonpoint source control, wetland utilization, recreation management and bioremediation. Technical presentations are sought for any of these topics or for any other lake management topic. June 1, 1991 is the deadline for submittal of abstracts. Anyone desiring to present a poster, video or oral paper at the 1991 symposium must submit four copies of each abstract by June 1, 1991 to NALMS '91 Symposium, P.O. Box 101294, Denver, Colorado 80250.

Other events include a youth program for high school students from the Denver area, a citizens workshop and sessions, special courses in lake modeling, computer program utilization and algae identification, a mini-symposium on environmental considerations in reservoir construction and management cosponsored by the U.S. Committee on Large Dams. Also included will be a Tailwaters Workshop, exhibits featuring new products, services, consultants, and manufacturers and special events such as a 5-km race, field trips and banquets.

Anyone interested in sponsoring an exhibit, contact Jim Flynn, Hydrolab Corporation, P.O. Box 50116, Austin, TX 78763, 512/255-8841. To get additional information write or call Jim LaBounty, Bureau of Reclamation, P.O. Box 25007 (D3742), Denver, Colorado 80225, 303/236-6002 or Bob Schroeder, Denver Water Department, 1600 West 12th Ave., Denver, Colorado 80254, 303/628-6382. A poster describing the symposium is available upon request.

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