

THE TRIBUTARY

A Newsletter of the Western Division,
American Fisheries Society



American Fisheries Society
Western Division

Volume 15, No. 2/March 1990

PRESIDENT'S CORNER

I want to thank all the chapters which hosted the Western Division officers at their annual meetings. The meetings were stimulating, informative as well as professionally conducted.

This month I have been busy finding a replacement for Don Martin as the Riparian Committee Chair. Don did an excellent job in organizing the first and only Riparian Awards of Excellence. Last year the awards were not given to allow Don an opportunity to develop some uniform criteria. Ken Hashagen, California, has agreed to assume this task and we will be presenting the awards this year in Sun Valley, Idaho. If you are interested in either serving on the committee or in presenting a nomination, contact Ken.

Another new committee chair this year is Randy Bailey, Alaska, who has agreed to chair the environmental Concerns committee. We need to get this committee active. I would like to have a regionally diverse makeup on the committee. Call Randy to help.

Recently I was asked what it was like being President of the Western Division. I replied that my tongue was permanently sticky from sending vast numbers of letters to people I am not sure really exist. Seriously, it is difficult to communicate with all the chapters and committees to the level I believe is needed. If you want to give me an idea, volunteer or simply give me a hard time, call 916/978-4613 (work) or 916/362-8373 (home).

Cay

SOCIETY NEWS

NEWS ON THE ALASKA CHAPTER

The Alaska Chapter enters a new decade on a high note after organizing what, by all the comments received, was an extremely successful meeting in Anchorage last September. How does the chapter follow this? Clearly for many of us it feels a bit flat after being focused on the meeting and it has been hard to be motivated for awhile. Nevertheless, we have now formed an active Environmental Concerns Committee which has commented on the assessment plans for the Exxon Valdez oil spill, wetlands issues and buffer strip concerns in the Tongass National Forest. We are also looking at publishing a key to the fishes of Alaska. Our Chapter procedures manual is progressing and hopefully will be available shortly. Temperatures in Anchorage have hardly risen above 0 degrees celsius for the past two weeks. A bit different from September!

Sandy Milne

HUMBOLDT NEWS

The Humboldt Chapter is currently involved in planning for its 16th Annual Conference. The conference will be held in association with the Humboldt chapter of The Wildlife Society and will focus on "Preserving Species Diversity." Speakers include Hiram Li from the Coop Fish Unit, Oregon State University, Jay Nicholas from the Oregon Department of Fish and Wildlife, and Camm Swift of the L.A. County Museum of Natural History. It will be held on the Humboldt State University campus on the 21st of April, 1990. A

banquet will follow in the evening.

Kerry Overton and committee, in conjunction with the California/Nevada Chapter, are busy organizing the 1990 Chinook and Coho Workshop. It will be held on the Humboldt State University campus on September 19-20, 1990. Contact Kerry Overton, P.O. Box 210, Arcata, California 95521, 707/442-1721.

Chris Zimmerman

GREETINGS FROM THE GREAT WHITE NORTH!

Cay has asked me to let you know what's up with the North Pacific International Chapter so here goes!

We are still coming down from sponsoring the very successful Chinook and Coho workshop in October of 1988. The proceedings from that workshop have not yet been sold out. The workshop will continue to be sponsored every two years on a rotating basis by various chapters of the WDAFS. 1990 is Humboldt/Cal-Neva's turn.

Participating chapters get a share of the profits from each workshop, our cheques are now in the mail to you other folks.

We are progressing well in implementing the Visibility Action Plan developed at the WDAFS Retreat in Seattle last July, largely because we had already started some of the activities prior to the Retreat. An ad hoc Membership Revitalization Committee had helped to provide some early and parallel direction in this regard. Doubtless a case of great minds thinking alike. We are distributing Membership

Information Questionnaires with our Chapter Newsletters, and have received returns from 10 percent of the Chapter as a result of the first mailing. Not great, but a start. We have recently established Standing Committees on Environmental Concerns, Fisheries/Forestry, Student Affairs, Continuing Education, Native Fisheries, Aquaculture, and Marine Fisheries. The enthusiasm and progress seen during the start-up of these committees is quite encouraging.

With regard to cross-linkages, we have contacted the BC Association of Professional Biologists in an attempt to find ways for our organizations to combine forces and cooperate rather than compete. We also recently approached the BC Ministry of Environment requesting a representative on the new BC Round Table on Environment and Economy. Although our request was received too late to be considered, the Minister has indicated that the Chapter could be consulted on issues related to the aquatic environment. We continue to struggle towards developing a timely and effective mechanism to deal with "hot" issues and opportunities; if anyone has any good ideas along this line, we'd like to hear about them.

Preparations are now in the final stages for our Annual General Meeting, to be held March 5-7 in Everett. Hope to see you there.

Bruce Sheperd

AFS CHAPTER COVERAGE

AFS chapter coverage will soon extend to all 50 states with the formation of the Kentucky chapter. AFS members in that state have petitioned for chapter formation and have developed proposed bylaws to be presented at the mid-term EXCOM for approval. We still have a few AFS holes to fill. The Tidewater Chapter covers only part of North Carolina, but according to Scott Van Horn, a fishery workers' group there plans to become a Chapter very soon. In addition, the Central Penn Chapter may broaden to a statewide focus.

NEWS FROM DOUG KRIEGER, PRESIDENT OF THE COLORADO-WYOMING CHAPTER

The annual meeting will be held on March 6-7, 1990 in Fort Collins, Colorado. Over 200 participants are expected for the meeting which will be held in conjunction with the Society of Environmental Toxicology and Chemistry. Special sessions on harvest regulations, point and non-point pollution, and fish culture will be presented, as well as general sessions. Call Steve Puttmann, 303/484-2836 for more information.

The Colorado-Wyoming Chapter has been an active participant in the NEPA process related to the application for a COE 404 permit to construct Two Forks Dam and Reservoir on the South Platte River southwest of Denver by the Denver Water Board. This 1.1 million acre-foot reservoir would have eliminated 30 miles of coldwater stream fishery, 300 acres of wetlands and over 7,000 acres of upland habitat. In particular, the project would have inundated a stretch of the South Platte designated as a Gold Medal fishery by the Colorado Wildlife Commission and as Resource Category 1 by the US Fish and Wildlife Service. Critical habitat for whooping and sandhill cranes, bald eagles and piping plovers within Nebraska would have also been lost with operation of the dam.

Review of the project in 1989 by the Environmental Protection Agency led to a proposed determination to prohibit, restrict or deny the project. This decision was based on the significance of the environmental impact and lack of current need for the water. The final decision is pending. Many of our Chapter members within Colorado are employed by agencies involved in the NEPA process, and would not or could not express their professional opinions because of concern for their careers. It is indeed fortunate to have been able to submit objective and professional testimony under the respected name of the American Fisheries Society.

The Colorado "Fishing Is Fun" program has been a very successful strategy for development of fishery projects for communities throughout the state. Interested groups, usually municipalities,

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INTRODUCED FISH JOURNAL

Creation of a new introduced fish journal is being explored by the Introduced Fish Section in concert with Managing Editor Bob Kendall.

The concept concerns the publication of peer-reviewed papers about the management and culture of introduced species. A key consideration is the potential availability of manuscripts to support such a journal.

If you have comments contact Bob Kendall at AFS headquarters or Paul Shafland, Introduced Fish Section president, at 801 NW 40th St., Boca Raton, Florida 33431.

LIFE INSURANCE NEWS

The AFS-sponsored member life insurance program from Minnesota Mutual netted the Society \$5,003 for the year ending June 30, 1989. \$3,327 is a service fee to cover AFS office administrative costs. The balance of \$1,676 represents dividends assigned to AFS by some of the member insureds. If you are contemplating purchasing life insurance, contact the Planning Corporation at 703/481-0200 for information. There are benefits for you and for AFS.

FISHERIES SCIENCE CONSULTANT SECTION

Interest in a fisheries science consultant section has been voiced by a few members and the matter is being explored to determine the possible existence of the "critical mass" necessary to make a section succeed. The section movement which began in 1973 with the Fish Health Section has now grown to 15 sections with all doing well. If you have comments about a possible Consultant's Section we urge you to contact Karen Pratt, 1300 Ranch Rd., Boise, Idaho 83702, phone 208/344-3257.

THIS AND THAT AROUND THE WEST

VALDEZ ALASKA UPDATE

A third round of tests conducted on subsistence fish and shellfish collected in Alaska from the path of the Exxon Valdez oil slick confirms earlier tests that found higher than normal levels of cancer-causing hydrocarbons. But contamination levels are still below those of commonly eaten processed foods, said University of Alaska scientist Dr. John French.

The results of the third round of tests were released in late November by the National Oceanic and Atmospheric Administration (NOAA). The tests indicate oil-contamination remains in fish and shellfish in subsistence areas. The first round of testing done in July found little oil contamination in fish or shellfish. However, more tests in August revealed that fish and shellfish from subsistence areas are contaminated with above normal levels of hydrocarbons.

"We know that some polycyclic aromatic hydrocarbons (PAHs) can and do cause cancer," said Dr. Eula Bingham, professor of environmental health specializing in toxicology at the University of Cincinnati. "We know that one hydrocarbon, benzo[a]pyrene, can cause cancer in various organs, complications of the circulatory system, and of the gastrointestinal tract. This is a potential problem."

Still, scientists don't expect aromatic hydrocarbons in Alaska fish and shellfish to cause health problems in humans, since only a few samples contained levels high enough to arouse concern. One such sample, a pink salmon from Kodiak Harbor collected in the second round of tests, contained one group of aromatic hydrocarbons at levels as high as 91 ppb, according to the study. Salmon from uncontaminated waters near Angoon, in Southeast Alaska, contained hydrocarbons at levels of only 2 ppb.

According to findings of the expert committee, "The levels of PAH found in most subsistence samples were very, very low. A few shellfish samples have levels of PAH high enough to cause concern for human health. Although fish show signs of exposure to crude oil, PAH levels in

muscle tissue were too low to cause immediate concern."

Although fish showed low levels of exposure to aromatic hydrocarbons, shellfish were found to contain high levels of aromatic hydrocarbons. In Windy Bay, an area at the southern tip of the Kenai Peninsula that was hit hard by the oil spill, certain aromatic hydrocarbon levels in shellfish ranged from 2,400 ppb to as high as 16,000 ppb in the second round of tests.

High levels of aromatic hydrocarbons persisted in shellfish tested in the third round of studies. In Chenega, a village on Kodiak Island, scientists found contamination levels higher than in tests done during the second round of studies. High levels of hydrocarbons in shellfish were also found in Old Harbor and Kodiak. The high levels have prompted the Alaska Department of Fish and Game to issue warnings not to eat clams and mussels from oil contaminated areas.

Since precise danger levels are unknown for aromatic hydrocarbons, French offers some perspective to the study's findings by comparing the results to known aromatic hydrocarbon levels in other commonly eaten foods. For example, many of the same aromatic hydrocarbons found in crude oil are present in the wood smoke that wafts over and is absorbed into salmon flesh inside thousands of smokehouses throughout Alaska, French said. According to a 1983 study published in the *Handbook of Polycyclic Aromatic Hydrocarbons* (PAH), other smoked foods, such as ham, salami, bacon, herring, and nori — a seaweed — were found to have as high or higher levels of aromatic hydrocarbons than oil-contaminated Alaska fish and shellfish.

French hypothesizes that PAH doses smaller than those considered dangerous to human health could be hazardous to fish and shellfish, and to the ecology of the marine system. He is concerned that PAH may hamper reproduction and survival of marine organisms. It is not known what effect these hydrocarbons will have on reproduction in marine species, French said.

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SACRAMENTO RIVER LEGISLATION

During the past two years something unique has been accomplished in California. A twenty-five member Advisory Council, representing federal, state and local water developers, farmers, landowners, fishermen, and environmentalists, was brought together by California Senator Jim Nielsen in 1987 to develop a fisheries and riparian habitat restoration plan for the Sacramento River, and to complete a "Report to the Legislature" by January 1989.

Because of the great diversity in its make-up, few people gave the Advisory Council much chance for success. However, the report was not only completed on schedule, but was endorsed by all members of the Council. It contained a plan comprised of 22 specific actions to be completed over a 10-year period, at a cost of more than \$200 million. Since the plan requires large state and federal expenditures, additional legislation is needed to implement it.

In September 1989, the California legislature approved SCR62, making it the policy of the State of California to support implementation of the plan.

Federal legislation to implement the plan has been introduced by Congressman Doug Bosco (author of the successful Trinity and Klamath River fisheries restoration legislation), and U.S. Senator Pete Wilson. This legislation (HR3613 and S1857) is expected to be heard in Congressional committees beginning early this spring. These bills will need the strong support of AFS at the local, state, and national levels.

In supporting these bills, it is important to point out that the Sacramento is the most important salmon stream in California. It produces more than 60 percent of all salmon caught off the coast of California. It also contributes substantially to catches in Oregon and Washington. The Sacramento River is also the spawning and nursery area of the unique and endangered winter-run chinook salmon, which exists in no other river in the world. (See the December 1989 article in *The Tributary*). Over the past four

decades, these fish runs have declined dramatically. This legislation will help to bring them back.

Letters supporting HR3613 and S1857 should be sent to Congressman Bosco, Senator Pete Wilson, the Merchant Marine and Fisheries Committee, and your individual Congressional representatives. With the support of AFS and other fisheries groups, these bills have an excellent chance of passage.

RELEASED BASS SURVIVAL

An extensive study of hooking mortality of smallmouth bass in a California lake appears to indicate that a fair percentage of released bass survive, even after swallowing hooks.

The study was part of an evaluation of catch and release fishing conducted by biologists of the California Department of Fish and Game at Shasta Lake, and the results should have significance for management of largemouth, smallmouth, spotted and Guadalupe bass in Texas, according to officials of the Texas Parks and Wildlife Department (TPWD).

The 20-day post-capture mortality of smallmouths taken by anglers using artificial lures ranged from zero in mid-April to 15 percent in May when the fish were "lip-hooked" and released, investigators said.

Hooking mortality rates were higher among fish caught on live baits, either crickets or minnows, according to Dr. Bill Harvey, research coordinator for the TPWD's Inland Fisheries Branch. "Approximately 37 to 40 percent of all sublegal (under 12 inches long) fish caught using live baits swallowed the hook," Harvey said.

Harvey noted that hook size was an important factor in survival of released fish. Mortality was 19 percent for fish caught on size 8 hooks, but 47 percent for those caught on larger size 4 hooks.

"One of the surprising findings was that only 4.2 percent of the sublegal fish that swallowed the hook died within 20 days when the leader was cut and the hook left in place," Harvey said.

"The strong correlation between hook size and mortality suggests that more released fish will survive if anglers use the

smallest hook size that is effective in catching bass," Harvey continued. "It also showed that cutting the leader rather than attempting to remove a swallowed hook by hand or with pliers is also a positive technique for conservation."

Harvey said the California study's conclusions are valid for all species of "black" bass in all areas. "this, plus the fact that most bass caught and released in Texas are taken with artificial lures, appears to indicate that properly releasing fish is a valid conservation measure and not a waste."

Fish survival after release has become an important consideration in recently years because of increasing publicity enjoyed by the catch and release concept, and also because of more restrictive length and bag limits that have become necessary to maintain stocks of sport fish species.

For more information contact Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744, 512/389-4800.

THE INVASION OF THE MUSSELS

A government scientist predicts that the exotic zebra mussel, now spreading throughout the Great Lakes, will soon attack water and sewage systems across two-thirds of the United States.

The vermin bivalve, which arrived in the Great Lakes in the ballast of ships from Europe, is already established in Lake Erie and Lake St. Clair near Detroit, and it has begun to show up in Lake Ontario.

Thomas Nalepa of the National Oceanic and Atmospheric Administration (NOAA), said it won't be long before the rogue mussel makes its way into the Hudson River and New York's Finger Lakes. The

marauding mollusk, which survives in fresh water of moderate temperature, will probably also stow away aboard ships and show up in Lakes Huron, Michigan and Superior. From Superior, the mussel might be carried down the Illinois and Mississippi rivers.

The inch-long zebra mussel wreaks havoc on water lines and sewage systems because it attaches itself to any hard surface such as intake and outflow pipes. When enough mussels gather in the pipes, they clog them. The diameter of an intake pipe in Monroe, Michigan, for example, was narrowed from three feet to one foot.

WORLD FISHERY RESOURCES

The Food and Agriculture Organization of the United Nations (FAO) recently released a report on the state of world fishery resources. Major conclusions of the report are the following:

"Fishery resources around the world are closer now to their maximum catch limits and many show signs of biological degradation and economic waste. Many of the recent global changes in landings appear to be more the result of climatic fluctuations of stock sizes of fishery development or management processes. More is now known about the stability of fish species assemblages and their resilience to fishing, and despite the fact that not enough knowledge is available on coastal fisheries in many developing countries, it is clear that integrated management is urgently required if fisheries are to be rehabilitated or even sustained.

The frailty of maximum sustainable yield (MSY) estimates and their variability should be remembered. As most fisheries are now fully fished, the average of the last

NCRI NEWS ERRATUM

The NCRI News is a fine publication by the National Coastal Resources Research and Development Institute in Newport, Oregon. In the last issue of *The Tributary*, I presented an article about salmon and algae polyculture from the NCRI News but neglected to acknowledge the publication. I apologize for that omission.

NCRI is dedicated to promoting the responsible development of ocean and coastal resources. To find out more about NCRI, please contact Jessie Page, NCRI News Editor, 2030 S. Marine Science Drive, Newport, Oregon 97365. *Editor*

10 years' catch might, in many cases, provide a good estimate of MSY and its variance.

Management should now encompass all factors affecting the resources and not only the fishing activity. Long-term variability (for climatic or other reasons) must be recognized as a major characteristic of the resources. As the fishery reaches its upper limit in yield, other human activities may become critical for resources productivity, (i.e., chemical pollution, eutrophication, destruction of nursery grounds by land reclamation or by trawling, deforestation of mangroves, modification of freshwater drainage, etc.)"

The report is in limited supply. For further information, contact: Food and Agriculture Organization, 1001 22nd Street NW, Washington, D.C. 20437, 202/653-2402. *SFI bulletin*

A RECYCLING CHALLENGE

From *Fishlines* comes this bit of good news concerning recycling: carp skin makes beautiful and durable leather.

According to Bruce J. Bott of Vancouver, his company has perfected a process for tanning the skin of carp. Bott even has uses for the remainder of the fish after skinning!

Bott's Canadian firm is willing to establish tanning plants in the United States, in locations where adequate tonnage of carp can be assured. The processor of carp skins wants the largest piece of skin available with both sides of the skin left-joined at the belly. Skins, scraped free of flesh and scales, must be soaked for four to five hours in heavy salt solution and packed in plastic for shipment.

Anyone interested in providing carp skins should contact Bruce J. Bott for more information at Suite 908, 510 W. Hastings St. Vancouver, BC, Canada V6B 1L8 or phone 604/683-6880. His FAX line is 604/683-6885.

FISH CONSUMPTION

NOAA's National Marine Fisheries Service reported that per capita consumption of commercially produced seafood fell to 15.0 pounds in 1988. The downturn,

from a record 15.4 pounds per person the year before, was a reversal of 5 straight years of increases. NMFS marketing experts said the reversal was not unexpected because of record-breaking seafood exports combined with lowered imports that reduced the amount of fish available to U.S. consumers. While fresh and frozen

fish consumption fell from a record 10 pounds to last year's 9.6 pounds, per capita consumption of shrimp climbed to a new record of 2.4 pounds, up from 2.3 pounds in 1987.

BALLARD LOCKS' BATTLE CONTINUES

The Battle of Ballard Locks, detailed in past issues of *The Tributary*, has escalated recently. For those unfamiliar with the story, a brief summary.

January through March, sea lions pull up to the dinner table at Ballard locks, connecting Puget Sound with Lake Washington and the rivers and streams of inland Washington, to feast on steelhead trout on their way to spawning waters. The annual feast attracts tourists, who would pay dearly for a much smaller portion of steelhead, were they lucky enough to find it on a menu. Wildlife experts estimate that sea lions ate about 65 percent of last year's run.

Curt Smitch, Washington State Wildlife Department Director, tentatively approved a plan to try an ancient weapon in the battle of the sea lion bulge.

Department officials have armed themselves with crossbows, from which they fire rubber-tipped fiberglass arrows at the sea lions while underwater speakers blare a tape of sounds made by beluga whales and Weddell seals (creatures whose sounds aren't normally heard by sea lions). Their "aim," according to Steve Jeffries, a state marine biologist, is to get the sea lions to associate the unfamiliar taped sounds with an unpleasant bop on the blubber. If the conditioning works, the sea lions will scurry whenever the tapes are played, although occasional "re-bopping" may be necessary to remind them.

Scaring sea lions has become a Seattle pastime, as wildlife experts go to great lengths to get rid of the federally protected mammals each winter. Under the federal

Marine Mammal Protection Act, it is a crime to kill or harass sea lions. The wild steelhead, on the other hand, is a state-protected fish and Washington's wildlife officials say Lake Washington's wild steelhead run is in danger of vanishing because of the opportunistic sea lion.

State wildlife officials are waiting for approval of a plan to trap the sea lions and haul them back to southern California. This plan would have to be funded by Congress and coordinated with the National Marine Fisheries Service. Last year 37 sea lions

Department officials have armed themselves with crossbows; from which they fire rubber-tipped fiberglass arrows at the sea lions

were trapped and trucked to the southern Washington coast. Twenty-nine were back to the dinner table within 15 days. The state has also asked the federal government for a ruling on whether it would be legal to kill a protected marine mammal such as the sea lion if it is harming

another protected species. This option has brought considerable opposition, however.

Washington wildlife officials are hoping that Greenpeace Action, the environmental activist group, will support the crossbow plan. Cynthia Russel of Greenpeace said the idea sounded crazy and didn't appear to offer a long-term solution. Greenpeace has suggested creating a barrier at the locks to block sea lions from the steelhead.

Meanwhile, back at the locks, the first arrows brought startled reactions from the dining sea lions, sending the victims rushing for deeper water, presumably for better digestion. Stay tuned for the next exciting episode of the battle of Ballard Locks.

MEETINGS, SEMINARS, SHORT COURSES & PUBLICATIONS

WARMWATER FISHERIES

A warmwater fisheries management symposium is planned with AFS, the Native American Fish and Wildlife Society, the U.S. Forest Service, and possibly Bass Anglers Sportsman Society cosponsoring. The idea was explored during a meeting hosted by Jim Cooper, U.S. Forest Service regional fisheries program manager on November 15 in Albuquerque, New Mexico.

The enthusiastic group identified 32 topics in seven categories that should be of interest to managers in the western states. If you want to get involved or have ideas to share, call Jim at 505/842-3264.

CALENDAR

March 29-31, 1990

52nd Annual Meeting of Pacific fishery Biologists. Held at the Konocti Harbor Inn, Kelseyville, California. An excellent program has been developed including the following sessions: Trout Ecology, Predation on Anadromous Salmonids, Salmonid Smolt Indices, Marine Fisheries, Ocean Gill Netting, San Francisco Bay-Delta Ecology, Coastal Estuaries, Reservoir Management, Fisheries Data and Methods Abuse, Habitat Typing, Physiological Ecology, Current Efforts to Resolve California's Water and Fishery Resource Conflicts, and Contributed Papers.

A record 35 members will deteriorate into mossbacks at this meeting, and Dr. Carl Bond and Dr. George Allen will serve as banquet speaker and mossback coordinator, respectively. Special rates for lodging and use of the Konocti Inn's extensive recreational facilities have been arranged. For information contact Phil Dunn, president, Jones & Stokes Associates, 916/444-5638; Pat Coulston, secretary-treasurer, California Department of Fish and Game, 209/466-4421; or Gene Geary, program coordinator, Pacific Gas & Electric Company, 415/866-5821.

September 12-14, 1990

Seventh International Workshop on Trout Stream Improvement, sponsored by

the AFS Fisheries Management Section along with the Ontario Ministry of Natural Resources, held in Waterloo, Ontario. Similar workshops have been held biannually since 1978. The 1990 gathering will focus on habitat improvement technology in eastern Canada with emphasis on planning, construction, and monitoring of habitat and associated fisheries population. For details contact Jack Inhoff, Ontario DNR, 416/625-5662.

March 26-31, 1990

International Symposium and Workshop on Creel and Angler Surveys in Fisheries Management. Doubletree Hotel at the Houston International Airport, Texas. For information contact E.A. (Mac) McCune, Lake Management Services, P.O. Box 923, Richmond, Texas 77469, 713/342-6018.

May 6-9, 1990

14th Larval Fish Conference and Annual Meeting of the Early Life History Section of AFS. Duke University Marine Lab Auditorium, Beaufort, North Carolina. For information contact Stanley M. Warlen, NOAA, Fisheries, Beaufort Lab. Beaufort, North Carolina 28516-9722, 919/728-3595.

COLORADO-WYOMING CHAPTER

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counties or sportsmen's groups who have proposals for fishery projects can apply through the Colorado Division of Wildlife for matching federal funds. With a minimum 25 percent matching contributions in the form of dollars or in-kind services, these groups have been able to open new lakes and streams to fishing, build angler facilities and handicapped fishing access, improved habitat and produce fishing guides for their areas. The program, which began in 1987, has operated with an annual budget of approximately 1 million dollars of federal Wallop-Breaux funds. The result has been a multitude of excellent and high visibility projects which have stimulated interest in fishing and provided more fish for more people.

August 27-31, 1990

The 120th Annual Meeting of AFS. Pittsburgh Hilton, Pittsburgh, Pennsylvania. For information contact Carl R. Sullivan, AFS, 5410 Grosvenor Lane, Suite 110, Bethesda, Maryland 20814-2199, 301/897-8616; FAX, 301/897-8096.

VALDEZ

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Many of the highly toxic chemicals, such as the 20,000 gallons of benzene contained in the Exxon Valdez spill, evaporated in the days following the grounding of the supertanker. What remains, said French, are toxic chemical compounds that break down more slowly. Degradation is further hampered when oil forms into tar balls and mousse, as it did in most areas of the spill.

As oil breaks down, marine species absorb or ingest the small aromatic hydrocarbon particles. Fish, such as salmon, absorb the particles through their gills or after eating oil-tainted prey. Once inside the fish, aromatic hydrocarbons are filtered from the blood by the liver, where they are metabolized and accumulate in the bile.

Although scientists expected shellfish to show aromatic hydrocarbons in their tissue, their presence in the muscle of fish caught scientists off guard.

"The dogma before the spill was that finfish metabolic systems were fast, that we wouldn't see a buildup of aromatic hydrocarbons in muscle tissue, but rather in organs and in bile. The buildup in muscle means that either the contamination was greater than expected or metabolism is slower. We have not assessed this yet," said French.

For more information, contact: Alaska Sea Grant College Program, 138 Irvin II, Fairbanks, Alaska 99775-5040, 907/474-7086. *SFI bulletin*

JOB OPPORTUNITIES

AQUATIC BIOLOGIST

Staff position in Environmental Sciences and Engineering Division. Minimum educational requirements are a B.S./B.A. in fisheries, zoology, biology or closely allied field with emphasis on aquatic biology. M.S. or equivalent work experience desirable. Applicants will be evaluated on ability to develop study plans and experience in conducting field evaluations of instream flow, hydroacoustic assessment, entrainment/mortality, aquatic habitat, and fish protection. Send application and statement of interest to Personnel at Stone & Webster Engineering Corporation, P.O. Box 5406, Denver, Colorado 80217-5406. Applications accepted until position filled. Equal Opportunity Employer.

DIRECTOR OF ECONOMICS

The Sport Fishing Institute is seeking an economist with research and practical experience in fishery economics or resource economics. Applicants should possess a M.S. or Ph.D. (preferred) in resource economics or economics with emphasis in quantitative methods and microeconomics. The candidate should be familiar with fisheries issues and management.

The successful applicant will be expected to work in a multi-disciplinary team to develop innovative, positive solutions to contemporary fisheries and aquatic resource problems. The individual will be responsible for designing, initiating, and conducting a program of economic research and public advocacy to promote the conservation and enhancement of the nation's fisheries resources. Excellent oral and written communication skills are essential.

The Sport Fishing Institute is a 40-year-old, non-profit, scientific and educational organization dedicated to the conservation and enhancement of America's sport fishing resources. Salary based on experience. Send resume to: Gilbert C. Radonski, SFI, 1010 Massachusetts Avenue, NW, Suite 100, Washington, D.C. 20001.

Sun Valley 1990

Western Division Annual Meeting

Last Call For Papers!

The Western Division annual meeting in Sun Valley, Idaho, July 7-11, 1990 will be a joint meeting with the Western Association of Fish and Wildlife Agencies. Watch your mail for forthcoming reservation information.

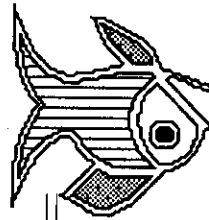
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| JULY 6 | EXCOM Retreat |
| JULY 7 | 1-2 PM Freshman Orientation, Paul Brouha instructor. |
| JULY 8 | 8 AM-Noon AFS General Session
Glenn Phillips - How to Walk Your Talk: Ethics for the Professional
Peter Bisson - Aquatic Diversity: Symantics and Systematics
Noon-3 PM AFS Business Meeting / Luncheon
3-5 PM AFS General Session
Jerry Burton - Aquaculture: The Future for Folks Who Like to Eat Fish
6 PM - ? FUN |
| JULY 9 | 8 AM-Noon WAFWA/AFS Joint Keynote Session
Governor Cecil Andurs (tentative keynote)
Dominick Portolese - Social Aspects of Managing Fish and Wildlife
1-5 PM AFS Concurrent Sessions of Contributed Papers
Bob Gresswell (concurrent sessions organizer)
Pat Dwyer - Dissolved Oxygen in Hatcheries
Tim Moody - Brook Trout Management
6 PM - ? More FUN |
| JULY 10 | 8 AM-NOON & 1-5 PM AFS Concurrent Sessions of Contributed Papers
Bob Gresswell (concurrent sessions organizer)
Bob Wiley - Fishery Managers: How Broad a Perspective?
Gordon Reeves - River Basin Survey Techniques
Brad Shepard - Fluvial Grayling
6 PM - ? Lots more FUN: Tentative Award of Prizes
Rick Stowell (raffle organizer) |
| JULY 11 | 8 AM - ? Wrap-up |

There is presently room for about 40 more contributed papers. Deadline for submission of abstracts is March 30! Submit abstracts to Bob Gresswell, U.S. FWS, P.O. Box 184, Yellowstone National Park, Wyoming 82190.

Abstracts must state clearly the study's objectives, principal results, and conclusions. Abstracts may not exceed 200 words. The name of the author(s), address, and phone number must be included along with the abstract. Presentation will be limited to 15 minutes, including questions. Slide projectors or large posters are accepted visual aids. Overhead projectors are not permitted.

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P.O. BOX 428
CORVALLIS, OREGON 97339-0428

ELECTION ALERT
WDAFS elections
will be upon us
very soon.
If you would like to run
for office or would like
to nominate someone
for office,
please contact
Pat Dwyer
27 Border Lane,
Bozeman, MT 59715
406/587-9265

**ON THE ROAD
TO REEL
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FISHIN' & FRIENDS
It's Catching On

NATIONAL FISHING WEEK JUNE 4-10, 1990

The **Tributary** is distributed to 3000 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 will publish three editions of **The Tributary** in 1990. Deadlines for submission of articles for **The Tributary** 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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