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The Tributary

Annual Meeting Edition

A Newsletter of the Western Division, American Fisheries Society

Volume 24, No. 3, June 1999

Idaho Chapter Resolution on Snake River Salmon and Dams

by Ted Koch, President - Elect ICAFS

The Idaho Chapter of the American Fisheries Society recently adopted a resolution on Snake River salmon and dams. We submit that resolution to the Western Division for a vote at the 1999 annual meeting. Please review the full text of the resolution, below.

When I was elected to the leadership series for the Idaho Chapter, I decided I would use my position to resolve, at least for myself, if for no other reason, what the role of the four lower Snake River dams are in the survival of Snake River salmon and steelhead. To help do this, the Chapter focused this year's annual meeting on the issue by scheduling a day-long session, with broader perspectives discussed in the morning, and a long afternoon of scientific presentations and a panel discussion. We were honored to have many of the best minds thinking about this issue speak at our meeting.

I drafted for review a rather pointedly worded resolution to try to determine what the feelings were of my fellow Chapter members. Finally, the Chapter Executive Committee agreed to settle for no less than a two-thirds, "super majority" vote on the resolution before the Chapter would actually adopt it. Some were concerned that the resolution would not pass, either because of the strong wording, or the super majority needed to pass it. But my motivation was not to pass a resolution for the sake of passing a resolution. Instead, I simply wanted to discover whether a clear majority of my colleagues felt strongly enough that the four lower Snake River dams had to go in order to save Snake River salmon and steelhead.

Amazing to most of us – and certainly to me – was that 92% of the Chapter membership voted in favor of the resolution saying the dams have to go if we are to save the fish. And in mid-June, with formal adoption of the resolution by the Chapter ExComm, we released the

resolution to those resource managers and other officials we thought would like to be informed of it, and to the public.

The Chapter ExComm then decided to pass the resolution along to the Western Division for another vote, to see if AFS members in the Division agreed with Idaho Chapter members on the role of the lower four Snake River dams in salmon and steelhead recovery in the Snake River Basin. So we submit to you the resolution, as agreed to by the Idaho Chapter, for your review, and to vote on at the Western Division meeting in Idaho in July.

When I came to Idaho in 1988 as a grad student, fresh from trying to recreate a long-extinct run of Atlantic salmon in the Connecticut River, I asked other, more senior ICAFS members how the region had the wisdom and knowledge to keep their salmon runs. The response I got was essentially, "There simply hasn't been enough time to kill them all yet." Over ten years later, after observing endless rancorous debate, it is interesting for me to be in the position I am within AFS on this issue. I hope the Idaho Chapter's efforts to help clarify this issue are useful. I look forward to your input on what is or is not needed to save Snake River salmon and steelhead (see resolution, below, and vote at the annual meeting).

INSIDE HIGHLIGHTS

Annual Meeting Program and Information

Mail-in Ballot - vote today!

Vice President Candidate Statements

Secretary/Treasurer Candidate Biographies

Chapter Best Paper Abstracts

Resolution of the Idaho Chapter of the American Fisheries Society On the Role of Dams and Snake River Salmon and Steelhead Recovery

- Whereas: Many, and perhaps most, stocks of Snake River salmon and steelhead now are extinct;
- Whereas: The remaining stocks of Snake River salmon and steelhead populations have declined to perilously low levels from historical levels, and all are currently listed as threatened or endangered under the Endangered Species Act;
- Whereas: Snake River salmon and steelhead extinctions and declines occurred as a result of the impacts from a variety of physical, chemical, and biological factors, including those that have been summarized as the “four H’s” - Hatcheries, Harvest, Habitat, and Hydropower facilities;
- Whereas: Recent incremental improvements and adjustments in management of hatcheries, harvest, habitat and hydropower facilities have not led to any apparent significant increases in Snake River salmon and steelhead stock abundances;
- Whereas: Dramatic action must be taken soon to prevent some, or perhaps even most remaining Snake River salmon and steelhead stocks from extinction;
- Whereas: Recent scientific reviews, including those conducted as part of the Independent Scientific Advisory Review process and the Plan for Analyzing and Testing Hypotheses (PATH), have indicated that restoration of natural river conditions where the lower four Snake River dams occur has the highest likelihood of preserving and recovering listed salmon and steelhead and poses the least risk of unanticipated side-effects¹;
- Whereas: The U.S. Fish and Wildlife Service Lower Snake River Compensation Plan Office, charged with compensating for salmon and steelhead losses associated with turbine mortality at the four lower Snake River dams, has concluded it cannot meet its salmon compensation objectives;
- Whereas: The first objective in the constitution of the American Fisheries Society is to promote the conservation, development, and wise use of the fisheries, and the AFS further commits to promote enlightened management of aquatic resources for optimum use and enjoyment, by the public;
- Whereas: Past management of Snake River salmon and steelhead stocks and their environment has resulted in a failure to conserve and use wisely the fisheries, or to provide for optimum use and enjoyment by the public; and
- Whereas: At least two important decision points soon will be reached by federal agencies regarding management of the lower four Snake River dams and recovering Snake River salmon and steelhead: one by the Army Corps of Engineers for managing federal dams on the lower Snake River, and one by the National Marine Fisheries Service on whether the operation of those dams jeopardizes the continued existence of Snake River salmon and steelhead;

Therefore be it resolved that:

Based on the best scientific information available, it is the position of the Idaho Chapter of the American Fisheries Society that the four lower Snake River dams are a significant threat to the continued existence of remaining Snake River salmon and steelhead stocks;

Let it be further resolved that:

If society-at-large determines that Snake River salmon and steelhead are to be restored or recovered in their native ecosystem, then one biologically required action is to eliminate or greatly reduce impacts to salmon and steelhead from the four lower Snake River dams by removing, breaching, or bypassing the dams, or otherwise allowing the lower Snake River to flow freely, without impoundment; and

Let it be further resolved that:

In conjunction with actions to allow the lower Snake River to flow freely, without impoundment, actions to address detrimental impacts to habitat, from harvest, or from hatcheries likely will be required to further increase the likelihood of recovering Snake River salmon and steelhead stocks.

¹ The PATH findings on fall chinook and steelhead (reported in December 1998) are more preliminary than those for spring/summer chinook.

Thomas W. H. Backman
Candidate Statement
WDAFS Vice President

Thomas W. H. Backman is a Senior Fisheries Scientist for the Columbia River Inter-Tribal Fish Commission. He received a Bachelor of Science (1973) and a Master of Science (1976) from San Diego State University. During this period he was deeply involved with marine fisheries work and issues. He then shifted from abalone, lobsters and warm water fish to the Pacific Northwest. Dr. Backman received his Doctorate in Fisheries from the University of Washington in 1984. Tom taught marine ecology in Ensenada, Mexico and developed a Panaied Shrimp bio-economic production model for the Mexican Department of Fisheries. In 1986 he moved to Washington, D.C where he administrate the Anadromous Fisheries Grant and Emergency Stripped programs for the U.S. Fish and Wildlife Service. In 1998, he started an American Shad ecology and supplementation research program of the USGS-BRD laboratory in Wellsboro, PA. His responsibilities since joining CRITFC in 1991 focus on ESA, restoration and production issues for the Columbia River salmonids. For the past three years he has conducted research on Gas Bubble Disease in migratory salmon.

A member of the AFS society since 1985, Backman has been active in the Potomac, Pennsylvania, and Oregon Chapters and the Society. He served as president of the Oregon Chapter (1997-8). While on the OR EXCOM he organized a successful annual meeting, and dealt with a very difficult state legislature. At the society level, Dr. Backman has served on the ethics, computer, and Fishery Action Network committees. He has organized sessions at two national meetings. Tom has published several articles in society journals.

Vision

Our aquatic resources are depleted and stressed to the point where many species and populations have fallen into threatened and endangered status. The ecosystems are broken and in need of protection and restoration. Governments, tribes, and the public are seeking our members' expertise to understand aquatic ecology, fish genetics, population ecology, and fisheries management.

My vision is a Society of professionals prepared to meet the challenges facing us. The division can facilitate our members through professional development,

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E. Eric Knudsen
Candidate Statement
WDAFS Vice President

I began my fisheries science career by entering the University of Massachusetts in 1970, graduating in 1974 with a B.S. in Fisheries Biology. Some summertime fish-squeezing convinced me I was on the right path. Next stop was Louisiana State University for an M.S. in Fisheries Science, completing research on brown shrimp and Atlantic croakers. I was then selected for a fisheries biologist position with the U.S. Fish and Wildlife Service in Olympia, Washington, working primarily on fisheries biology issues surrounding the "Boldt Decision". I returned to LSU in 1981 to research the effects of water control structures on estuarine-dependent fisheries resources and used that opportunity to obtain my Ph.D. In 1987, I returned to the USFWS in Olympia to serve as Assistant Project Leader. I took an opportunity in 1994 as Fisheries Research Team Leader at the USGS-Alaska Biological Science Center. In fall of 1998, I was selected as Chief of the Marine and Freshwater Ecology Branch at USGS-ABSC. My recent professional focus has been on Pacific salmon population ecology, most notably serving as Senior Editor of the book Sustainable Fisheries Management: Pacific Salmon to be published in September, 1999.

I have been a member of AFS since 1972. In Louisiana, I served as Chapter Secretary/Treasurer/Newsletter Editor for two years and organized and chaired the Chapter annual meeting in 1984. Back in Olympia in 1987, I became involved in North Pacific International Chapter activities, serving a stint on the Environmental Concerns Committee and organizing several symposia for annual meetings. I am now a member of the Alaska Chapter and chair the Chapter's Environmental Concerns Committee, having organized sessions and workshops for annual meetings. At the Western Division level, I have organized and chaired meeting sessions, and served on the Program Committee for the 1998 annual meeting in Anchorage. I have participated in many parent Society annual meetings over the years, organizing several symposia, chairing sessions, and often presenting papers.

Vision

The American Fisheries Society is a vital and essential organization and I want to do my small part to keep it that way. The AFS Divisions have at times been

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Thomas W. H. Backman**Candidate Statement (*continued*)
WDAFS Vice President**

communication, education and member support. Both the division and its chapters provide a means for fishery workers to interact, learn, and support each other. We must maintain the respect and provide advice to policy and decision-makers seeking solution to our environmental problems. A goal is to aid the Chapters in meeting their needs and the demands placed upon them. I want all the Division and Chapters to grow and provide leadership from the watershed level to Eco-regions within the western United States. I will draw upon my experience with the very successful Oregon Chapter. Many of the challenges facing us are common through out the west. The division needs to facilitate the sharing of information across the chapters and insuring that we have a strong voice in the region and at the Society Level.

I will encourage the Division and chapters to advocate for fisheries restoration. Individuals within organizations or in small firms find it difficult to affect positive changes. Collectively we can bring sound science to for-front. The society is here for you and I will work to maintain your access and voice. Diversity and inclusion is what leads to good decisions. As a member of the EXCOM I will seek your advice and insure that important decision be made with the broadest of support.

Dan Schill**Candidate's Statement - AFS Nominating Commi**

Dan Schill received a BS in Biology from Clarion State University in 1960 and an MS in Zoology/Fisheries from Idaho State University in 1984. He has been employed by the Idaho Department of Fish and Game since 1982 in various research and management positions; currently as Principal Fisheries Research Biologist.

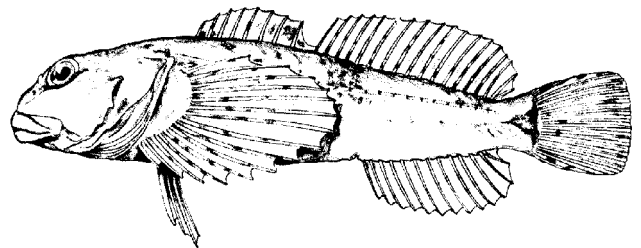
Dan has been a member of AFS since 1980. At the Idaho Chapter level he participated on the riparian committee and also served as chapter nominating chair/EXCOM. He is a member of the Fisheries Management Section and is a frequent journal referee for Fisheries, NAJFM, and TAFS. In addition, Dan has served on the Editorial Board as an Associate Editor for NAJFM for the past two years.

E. Eric Knudsen**Candidate Statement (*continued*)
WDAFS Vice President**

criticized as perhaps an unnecessary layer of AFS organizational structure. However, as some of my AFS mentors have pointed out, the Divisions serve a vital role, particularly in addressing issues covering a broader geography than represented by individual chapters. WDAFS has tremendous opportunities to serve its membership through professional unity and to provide a professional, scientific voice of reason in regional fisheries turmoil. To be most effective, for both the membership and the public, we need to strive toward the goals of efficient internal and external communication, strong membership, and productive committees. I believe the following improvements will set the stage for meeting those goals.

1. Further implementation of a WDAFS web page.
2. Timely mailing of the "Tributary".
3. Annual meetings with diverse, attractive programs, advertised well in advance.
4. A shift of the annual meeting away from mid-summer.
5. Improved committee participation.

While these goals and actions seem important to me, I will always be listening to WDAFS members for input and ideas.

**Annual Meeting Registration and Information**

<http://www.fisheries.org/wd/meet99.htm>

Visit the Western Division Web Site!

Robert H. Gray
Candidate's Statement
Secretary/Treasurer

Robert H. Gray received a bachelor's degree in biology from Winona State University, Winona, Minnesota (1964); a master's degree in biological sciences from the University of Oregon (1967); and a Ph.D. in zoology/ecology from Illinois State University (1971). He taught at the college (University of Oregon, Illinois State University, University of North Dakota, Lake Erie College) and graduate school (University of North Dakota) levels; was employed by Battelle Memorial Institute for over 25 years where he designed and directed studies to assess effects of electric power generation on water quality, fisheries, and the environment; and has managed multidisciplinary programs dealing with environmental health and engineering aspects of energy technology development. He has served as a consultant to the Italian National Government and Brookhaven National Laboratory on water quality and other environmental issues, and is past Chairman of the Richland, Washington, Ecology Commission. Bob is currently serving as a private consultant to the International Atomic Energy Agency on environmental monitoring, the Pima County, Arizona Wastewater Management Department to establish water quality criteria/standards for the arid and semiarid west, and the Umatilla Chemical Agent Disposal Facility in Oregon on environmental monitoring. He has authored more than 260 journal, symposium, and book articles, over 55 technical reports and has edited 7 books. He has organized numerous international symposia on biofouling, water quality, toxicology, monitoring and other aspects of the environment (several of these were held in conjunction with annual AFS meetings). Bob is a long-time AFS member and has served on the AFS Permanent Home Fund Committee (1984), the Skinner Memorial Fund Committee (1985), the Publication Awards Committee (1987), the Time & Place Committee (1987-1994 [served as Chair] and 1998-2001), the Environmental Concerns Committee (1988- 1989), and the Nominating Committee (1988-1989). He is a charter member of the Water Quality Section and has served as it's Symposium Committee Chair (1986-1991) and President (1992-1993). Bob is a Fellow of the American Institute of Fisheries Research Biologists and was part of it's delegation that visited east Asia in May and June 1985.

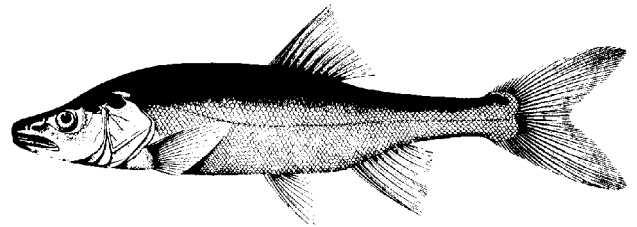
Ed Cheslak
Candidate's Statement
Secretary/Treasurer

Ed Cheslak is a principal aquatic ecologist for LFR Levine-Fricke (a full service environmental consulting firm with corporate headquarters in Emeryville, CA) and is manager of their Ecological Services group. He has more than 26 years of experience in conducting, directing, analyzing, and evaluating applied ecological studies, experiments and assessments in streams, lakes, estuaries, riparian corridors, and wetland ecosystems. This experience includes analysis of the effects of flow modifications, habitat alterations, and nonpoint discharges on stream water quality, fisheries, aquatic invertebrates, and riparian communities. Most recently he has been active in managing wetland restoration projects and ecological risk assessments. Ed has been active in local chapter and Western Division activities for many years and is a life member of the society. He served as the treasurer of the Cal-Neva Chapter in 1993-1995. Presently he is serving as the appointed Secretary-treasurer of the WDAFS to complete the term of the elected individual who moved away from the Division. He is seeking election to this office to continue this valuable and critical service and maintain active participation in the Division and its programs. Ed supports active involvement of fishery professionals in AFS at the local, regional, and national levels. He sees involvement in AFS as a way of sustaining, enhancing, and deepening one's role as a professional in society.

**Western Division Annual
 Business Meeting**

Tuesday July 13, 12:00 NOON

Moscow, Idaho



WESTERN DIVISION BALLOT

Please mark your choice for each office, stamp, and return to Pete Bisson postmarked by July 5, 1999, or bring to the Annual Meeting in Moscow, Idaho

Vice-President

Tom Backman



Eric Knudsen



National Nominating Representative

Dan Schill



Secretary/Treasurer

Ed Cheslak



Bob Gray



Write-In Candidates

Office:

Name:

Tri-fold here first

**STAMP
HERE**

***Peter A. Bisson
USDA Forest Service
Pacific Northwest Research Station
3625 93rd Avenue SW
Olympia, WA 98512-9193***

Tri-fold here second and secure with tape (do not staple)

Vote



Western Division Annual Meeting

Moscow, Idaho

July 11-14, 1999

DRAFT

General Meeting Program

Sunday, July 11

Afternoon Executive Committee meeting; Executive Retreat for Chapter Officers

Monday, July 12

8:15 - 8:30 Welcome and announcements - Ken Hashagen, Program Chair

8:30 - 8:45 Welcome/Introductory Remarks - Bob Bilby, Western Division President and Christine Moffitt, President-Elect, American Fisheries Society

8:45 - 9:30 Gus Rassam, Executive Director, American Fisheries Society

Plenary Session The Pros and Cons of Dam Removal in the Snake River: Four Views

9:30 - 12:00 Session Chair: Ken Hashagen, California Dept. Fish and Game, Sacramento CA

12:00 - 1:00 **Lunch** (included in the registration fee)

1:00 - 5:00 **Concurrent Technical Sessions**

#1 Columbia River Symposium

#2 Techniques and Technology

#3 Contributed Papers

Session #1 Columbia River Symposium

Session Chair: Ted Bjorn, University of Idaho, Moscow, ID

1:00 - 1:20 Assessment of the Benthic Community on Hard Substrate in Three Lower Snake River Reservoirs

T.L. Nightengale, 9520 Rainier Ave S #506, Seattle, WA 98118; 206/721-7936, FAX 413/828-2429; tlnight@accessone.com; **D.H. Bennett**, Dept. of Fish & Wildlife, Univ. of Idaho, Moscow, ID 83844-1136; 208/885-6337, FAX 208/885-9080; dbennett@uidaho.edu

1:20 - 1:40 A Preliminary Survey of Benthic Macroinvertebrates on Artificial Substrata in the Hanford Reach, Columbia River, Washington

E. J. Stark, Department of Fish and Wildlife, College of Forestry, Wildlife, and Range Sciences, University of Idaho, Moscow, ID 83844-1136; 208/885-7742; star8155@novell.uidaho.edu; **D.H. Bennett**, Dept. of Fish & Wildlife, Univ. of Idaho, Moscow, ID 83844-1136; 208/885-6337; FAX 208/885-9080; dbennett@uidaho.edu

1:40 - 2:00 Monitoring the Migrations of Wild Snake River Spring/Summer Chinook Salmon Smolts, 1989-1998.

Stephen Achord*, **M. B. Eppard**, **B. P. Sandford**, and **G. M. Matthews**, Northwest Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 2725 Montlake Blvd. E., Seattle, WA. 98112-2097; 509/547-7518, FAX 509/547-4181; Steve.Achord@noaa.gov

2:00 - 2:20 Effects of Habitat Degradation and Dams on Chinook Salmon in Northeast Oregon: Observations From the Headwaters

Colden Baxter* and **Christian Torgersen**, Oregon Cooperative Fish and Wildlife Research Unit, Department of Fisheries and Wildlife, Oregon State University, Nash Hall 104, Corvallis OR 97331; (541) 737-2463, FAX (541) 737-3590; torgersc@ucs.orst.edu, baxterco@ucs.orst.edu; **Joseph Ebersole**, Department of Fisheries and Wildlife, Oregon State University, Nash Hall 104, Corvallis OR 97331; (541) 737-3503; FAX (541) 737-3590; ebersolj@ucs.orst.edu; **Hiram Li**, Oregon Cooperative Fish and Wildlife Research Unit, Biological Resources Division—U.S.G.S., Department of Fisheries and Wildlife, Oregon State University, Nash Hall 104, Corvallis OR 97331; (541) 737-1963, FAX (541) 737-3590; hiram.li@orst.edu; **Bruce McIntosh**, Department of Forest Science, Oregon State University, Corvallis OR 97331; (541) 750-7313, FAX (541) 750-7329; mcintosb@ccmail.orst.edu

2:20 - 2:40 Predation by Resident Fishes on Juvenile Anadromous Salmonids in Lower Granite Reservoir, Snake River

D.H. Bennett, Dept. of Fish & Wildlife, Univ. of Idaho, Moscow, ID 83844-1136; 208/885-6337; dbennett@uidaho.edu

- 3:00 - 3:20** *PIT Tag Survival Estimates for Juvenile Salmonids through Snake and Columbia River Dams and Reservoirs*
William D. Muir*, NMFS, Fish Ecology Division, 5501A Cook Underwood Rd., Cook, WA 98605; 509/538-2626; FAX 509/538-2272; bill.muir@noaa.gov; **Steven G. Smith**, NMFS, Fish Ecology Division, 2725 Montlake Blvd. East, Seattle, WA 98112; 206/860-3352; FAX 206/860-3267; steven.g.smith@noaa.gov; **John G. Williams**, NMFS, Fish Ecology Division, 2725 Montlake Blvd. East, Seattle, WA 98112; 206/860-3277; FAX 206/860-3267; john.g.williams@noaa.gov
- 3:20 - 3:40** *Seals*
- 3:40 - 4:00** *Results from Recent Smolt Transportation Research*
G. M. Matthews*, NMFS, Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097; 206/860-3251, FAX 206/860-3267; gene.matthews@noaa.gov; **Douglas M. Marsh**, NMFS, Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097; 206/860-3235, FAX 206/860-3267; doug.marsh@noaa.gov; **Jerrel R. Harmon**, NMFS, Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097; 509/843-3058, FAX 206/860-3267; jerry.harmon@noaa.gov
- 4:00 - 4:20** *Snake River Chinook Salmon Smolt-to-Adult Return Rate Comparisons by Migration Routes and Their Implications for Recovery*
Russell B. Kiefer, Idaho Department of Fish and Game, 1414 East Locust Lane, Nampa, ID 83686; 208/465-8404, FAX 208/465-8434; rkiefer@rmci.net

Session #2 Techniques and Technology

Session Chair: Tim Cochnauer, Idaho Department of Fish and Game

- 1:00 - 1:20** *Three Dimensional Physical and Bioenergetics Habitat in Large River Systems Using State-of-the-Art Hydroacoustics, GPS, GIS, Photogrammetry, and Computational Fluid Dynamics*
R. Craig Addley, Utah State Univ., Institute for Natural Systems Engineering, Dept. of Civil and Environmental Engineering, Logan UT 84322-4110; craig@aaron.cee.usu.edu
- 1:20 - 1:40** *Response of Free-Ranging Kokanee to Strobe Lights*
Melo A. Maiolie*, Idaho Fish and Game, PO Box 806, Bayview, ID 83801; 208/683-3054, FAX 208/683-3054; mmaiolie@micron.net; **Bill Harryman**, Idaho Fish and Game, PO Box 806, Bayview, ID 83801; 208/683-3054, FAX 208/683-3054; harryman@micron.net; **Bill Ament**, Idaho Fish and Game, PO Box 806, Bayview, ID 83801; 208/683-3054, FAX 208/683-3054; ament@micron.net
- 1:40 - 2:00** *Use of Aerial Photographs and a GIS in Watershed-Scale, Instream-Flow Assessment*
J. Scott Covington*, United States Geological Survey, Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, Wyoming 82071-3166; 307/766-5415; FAX 307/766-5400; jscoving@uwyo.edu; **Wayne A. Hubert**, United States Geological Survey, Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, Wyoming 82071-3166; 307/766-5415; FAX 307/766-5400; whubert@uwyo.edu
- 2:00 - 2:20** *Efficient Use of Data Logger Thermographs to Characterize Spatial and Temporal Gradients in Habitat of Threatened Salmonids in Multiple Stream Reaches*
D.C. Burns, M. Faurot, R. Nelson, and R. Uberuaga, Payette National Forest, P.O. Box 1026, McCall, ID 83638; 208/634-0700; FAX 208/634-0744; Burns_Dave/r4_payette@fs.fed.us
- 2:20 - 2:40** *Application of Sonar to Estimate Trout Numbers in Standing Waters*
Dan Yule, Fisheries Biologist, Wyoming Game and Fish Department, 3030 Energy Lane, Suite 100, Casper, WY 82604; 307/473-3415; dyule@missc.state.wy.us
- 3:00 - 3:20** *Precision of a new method for collecting habitat data at radio telemetry locations in streams*
Matthew R. Dare*, University of Wyoming Cooperative Fisheries and Wildlife Research Unit, P.O. Box 3166 Laramie, WY 82071; 307/766-2091; FAX 307/766-5400; mattdare@hotmail.com; **Wayne A. Hubert**, University of Wyoming Cooperative Fisheries and Wildlife Research Unit, P.O. Box 3166 Laramie, WY 82071; 307/766-5415; FAX 307/766-5400; Whubert@uwyo.edu; **Thomas A. Wesche**, Habitech, Inc. 410 E. Grand Ave. Laramie, WY 82070; 307/742-4902; Twesche@aol.com
- 3:20 - 3:40** *The Use of Two Dimensional Hydrodynamic Modeling to Evaluate Channel Rehabilitation in the Trinity River, California*
Sean P. Gallagher, U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, 1125 16th St., Room 209, Arcata, CA 95521; 707/822-7201, FAX 707/822-8136; Sean_Gallagher@fws.gov; **Jay D. Glase**, U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, 1125 16th St., Room 209, Arcata, CA 95521; 707/822-7201, FAX 707/822-8136; Jay_D_Glase@fws.gov; **Rick. R. Quihillalt**, U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, 1125 16th St., Room 209, Arcata, CA 95521; 707/822-7201, FAX 707/822-8136; Rick_Quihillalt@fws.gov
- 3:40 - 4:00** *Analyzing Uncertainty: Risk Assessment, Sensitivity Analysis, and Model Validation*
Gretchen R. Oosterhout, Decision Matrix, Inc., PO Box 1127, Eagle Point, OR 97524; 541/826-9100, FAX 541/826-5569; dmatrix@teleport.com
- 4:00 - 4:20** *Effects of Coded Wire Tags on the Survival of Spring Chinook Salmon, *Oncorhynchus tshawytscha**

H.L. Blankenship, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia, WA, 98501-1091; 360/902-2748, FAX 360/902-2943; blankhlb@dfw.wa.gov; **D.H. Thompson**, Northwest Marine Technology Inc., 2401 Bristol Court SW, Olympia, WA, 98502; 360/754-2500, FAX 360/754-4240; dthompson@nmt-inc.com; **E.C. Volk**, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia, WA, 98501-1091; 360/902-2759, FAX 360/902-2943; volkecv@dfw.wa.gov; **G.E. Vander Haegen***, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia, WA, 98501-1091; 360/902-2793, FAX 360/902-2943; vandegev@dfw.wa.gov

Session #3 Contributed Papers

Session Chair: Jody Brostrom, Idaho Department of Fish and Game

- 1:00 - 1:20** *Estimating Winter Salmonid Abundance in Small Western Washington Streams: A Comparison of Three Techniques*
Philip Roni and Andrew Fayram, National Marine Fisheries Service, Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112; 206/860-3307; FAX 206/860-3267; phil.roni@noaa.gov
- 1:20 - 1:40** *Preliminary Evaluation of the Effectiveness of a Deflection Louver Combined with Discharge Variations in Reducing Entrainment of Sockeye Salmon Smolts into the BC Hydro Seton Generating Facility, Lillooet, B.C., CANADA*
D.C. Schmidt and R.E. Vanderbos*, RL&L Environmental Services, 201 Columbia Avenue, Castlegar, BC V1N 1A2; 250/365-0344, FAX 250/365-0988; dschmidt@rll.ca; rvandenbos@rll.ca; **B. Stables**, Biosonics, Inc., P.O. Box 485, Sumas WA 98295; 360/988-5411, FAX 360/988-5411; biosumas@compuserve.com; **B.W. Hebden**, BC Hydro, 1155 McGill Road, Kamloops, B.C., V2C 5L1; 250/371-6927, FAX 250/371-6946; bryan.hebden@bchydro.bc.ca
- 1:40 - 2:00** *Geomorphic Influences on Temperature Attributes of Small Mountain Streams*
Daniel J. Isaak* and Wayne A. Hubert, U.S. Geological Survey, Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, WY 82071; 307/766-5415, dano@uwyo.edu, whubert@uwyo.edu
- 2:00 - 2:20** *Use of Fluctuating Asymmetry in a Genetic Monitoring Program for Salmon in the Snake River Basin*
Orlay W. Johnson, National Marine Fisheries Service, Conservation Biology Division, 2725 Montlake Blvd. East, Seattle, Washington, 98112; 206/860-3253, FAX 206/860-3267; orlay.johnson@noaa.gov
- 2:20 - 2:40** *Monitoring Performance of River Restoration Projects*
S. B. Bauer*, Pocket Water Inc., 8560 Atwater Drive, Boise, ID 83714; 208/376-3263; sbauer@micron.net; **S. R. Clayton, P. Goodwin, G.S. Beattie, and A.W. Minns**, Ecohydraulics Research Group, College of Engineering, University of Idaho, 800 Park Boulevard, Suite 200, Boise, ID 83712; 208/364-4081, pgoodwin@uidaho.edu
- 3:00 - 3:20** *Amphibian Malformations: Real or Perceived?*
Robert H. Gray, RH Gray & Associates, 2867 Troon Ct., Richland, WA 99352; 509/372-0804, FAX 509/372-3515; rhgray@ix.netcom.com
- 3:20 - 3:40** *Variations in Movement Patterns of Rainbow Trout in Several Southwest Alaska Watersheds*
E. Eric Knudsen*, USGS, Alaska Biological Science Center, 1011 East Tudor Rd., Anchorage, AK 99503; 907/786-3842, FAX 907/786-3636; eric_knudsen@usgs.gov; **F. Jeffrey Adams**, U.S. Fish and Wildlife Service, King Salmon Fishery Resource Office, P.O. Box 277, King Salmon, AK 99613, 907/246-3442, FAX 907/246-4237; jeff_adams@mail.fws.gov; **Mark J. Lisac**, U.S. Fish and Wildlife Service, Togiak National Wildlife Refuge, P.O. Box 270, Dillingham, AK 99576, 907/842-1966, FAX 907/842-5402; mark_lisac@mail.fws.gov; **Douglas Palmer**, U.S. Fish and Wildlife Service, Kenai Fishery Resource Office, P.O. Box 1670, Kenai, AK 99611, 907/262-8963, FAX 907/262-7145; douglas_palmer@mail.fws.gov
- 3:40 - 4:00** *Providing Spawning and Nursery Flows for the Endangered June Sucker, *Chasmistes liorus*, in a Manipulated System: An Evolving Process*
Christopher J. Keleher*, Central Utah Water Conservancy District, 355 West University Parkway, Orem, UT 84058; 801/226-7147, FAX 801/226-7150; ckeleher@cuwcd.com; **Daryl Devy**, Central Utah Water Conservancy District, 355 West University Parkway, Orem, UT 84058; 801/226-7117, FAX 801/226-7150
- 4:00 - 4:20** *Consideration of Evolutionary Life History Strategies and Adaptation in the Decline and Recovery of Salmonid Stocks: An Old Idea for a New Crisis*
Michael Hurley, M&M Environmental Enterprises, 1201 N 16th St, Boise, ID 83702; (208) 388-1139; mhurley@rmci.net

Tuesday, July 13

- 8:00 - 12:00 **Concurrent Technical Sessions 4, 5, and 6**
- #4 Beyond Hankin and Reeves Symposium**
 - #5 White Sturgeon Symposium**
 - #6 Columbia River Symposium (continued from Monday)**
- 12:00 - 1:20 **Lunch/Business Meeting** (cost of lunch included in the registration fee)

1:20 - 5:00 **Concurrent Technical Sessions 4, 5, and 6 (continued)**

Session #4 **Beyond Hankin and Reeves Symposium**

Session Chairs: Bruce Hansen, USFS, Corvallis OR and Dr. Glenn Chen, USFS, Logan UT

Plenary Session

- 8:00 - 8:30** *Small Stream Survey Designs: How and Why They Work and Where to Use Them*
David G. Hankin, Department of Fisheries, Humboldt State Univ., Arcata CA 95521; 707/826-3683, FAX 707/826-3682; dgh1@axe.humboldt.edu
- 8:30 - 9:00** *Basinwide Visual Estimation of Habitat and Fish Populations in the Southern Appalachians*
C. A. Dolloff, Southern Research Station, Department of Fisheries and Wildlife, Virginia Tech, Blacksburg, VA 24061-0321; 540/231-4864; adoll@vt.edu
- 9:00 - 9:30** *A Retrospective on the Design and Application of Basin Surveys Over the Past Ten Years: Success or Failure?*
J.L. Kershner, Fish Ecology Unit, USDA Forest Service-Washington Office, Fisheries and Wildlife Department, Utah State University, Logan, UT 84322-5210; 435/797-2500, FAX 435/797-1871; kershner@cc.usu.edu
- 10:00 - 10:30** *Interpreting the Results from the Hankin and Reeves Methodology: Consideration of Multiple Watersheds*
G. H. Reeves, Pacific Northwest Research Station, 3200 SW Jefferson Way, Corvallis, OR 97331; 541/750-7314, FAX 541/750-7329; greeves/r6pnw_corvallis@fs.fed.us

Contributed Papers

- 10:30 - 10:50** *The Use of Two-phase Sampling with Universal Estimates of Bias: Salmonid Abundance in the Oregon Coast Range, and Spotlight Counts of the Nocturnal Banded Kokopu in New Zealand*
Brendan J. Hicks*, **C. D. McCullough**, and **James D. Hall**, Department of Biological Sciences, University of Waikato, Hamilton, New Zealand.
- 10:50 - 11:10** *Influence of Multi-scale Spatial/Temporal Variability on Selection of Sampling Designs and Statistical Estimators for Estimating Status and Trend of Juvenile Salmonid Abundance and Habitat*
George W. Weaver, Research Mathematician, USFS, 3200 Jefferson Way, Corvallis, OR 97331; (541) 758-7779; weaver@stat.orst.edu
- 11:10 - 11:30** *Increasing Efficiency and Quality of Calibration at the Sampling Unit Scale*
P.J. Connolly, US Geological Survey, Columbia River Research Laboratory, 5501-A Cook-Underwood Rd., Cook, WA 98605; 509/538-2299 ext.269, FAX 509/538-2843; patrick_connolly@usgs.gov
- 10:50 - 11:10** *Application and Extension of the Hankin and Reeves Methodology: Making Sense of the Data from the Micro to the Macro, Minimizing Sampling Intensity of At-risk Species, and Neat Things You Can Do With GIS*
Jeffrey M. Dambacher* and **Kim K. Jones**, Oregon Department of Fish and Wildlife, 28655 Highway. 34, Corvallis, OR 97333; dambachj@ucs.orst.edu; joneski@fsl.orst.edu; **James D. Hall**, Department of Fisheries and Wildlife, Oregon State Univ., Corvallis, OR 97331; james.hall@orst.edu
- 11:10 - 11:30** *Using Geography and Remote Sensing to Put the Continua Back in the “River Continuum”*
C.E. Torgersen* and **C.V. Baxter**, Oregon Cooperative Fish and Wildlife Research Unit, Department of Fisheries and Wildlife, Oregon State University, Nash Hall 104, Corvallis OR 97331; 541/737-2463, FAX 541/737-3590; torgersc@ucs.orst.edu, baxterco@ucs.orst.edu; **B.A. McIntosh**, Department of Forest Science, Oregon State University, Corvallis OR 97331; 541/750-7313, FAX 541/750-7329; mcintosh@ccmail.orst.edu; **H.W. Li**, Oregon Cooperative Fish and Wildlife Research Unit, Biological Resources Division—U.S.G.S., Department of Fisheries and Wildlife, Oregon State University, Nash Hall 104, Corvallis OR 97331; 541/737-1963, FAX 541/737-3590; hiram.li@orst.edu; **K. Wright**, Department of Fisheries and Wildlife, Oregon State University, Nash Hall 104, Corvallis OR 97331; 541/737-2463, FAX 541/737-3590; wrightk@ucs.orst.edu
- 11:30 - 12:00** *Use of Hankin and Reeves Methodology in Basin Surveys and Statistical Sample Surveys to Characterize Patterns and Processes of Stream Habitat at Multiple Scales in Oregon*
Kim K. Jones*, **Jeffrey M. Dambacher**, **Barry Thom**, and **Charles Stein**, Oregon Department of Fish and Wildlife, 28655 Highway 34, Corvallis, OR 97333; joneski@fsl.orst.edu
- 1:20 - 1:40** *Assessing Stream Habitat: Scale Dependency, Controlling Factors and Habitat Dynamics*
Michael Hurley, M&M Environmental Enterprises, 1201 N 16th St., Boise, ID 83702; (208) 388-1139; mhurley@rmci.net
- 1:40 - 2:00** *Stream Surveys: If They Are the Answer, What is the Question?*
B.B. Roper, Idaho Panhandle National Forest, 3815 Schreiber Way, Coeur d'Alene, ID 83815; 208/765-7488; FAX 208/765-7307; broper/r1_ipnf@fs.fed.us
- 2:00 - 2:20** *Regional Estimation of Juvenile Coho Abundance in Streams*
Scott W. Overton, Department of Statistics (Emeritus), Oregon State University, Kidder Hall #44, Corvallis, OR 97331; **Trent L. McDonald***, Western EcoSystems Technology, Inc., 2003 Central Ave, Cheyenne, WY 82001; tmcdonald@west-inc.com

- 2:20 - 2:40** *Field Implementation of a Modified Hankin & Reeves Stream Survey Design*
C.D. Moyer, USDA Forest Service, Pacific Northwest Research Station, Forestry Sciences Laboratory, 3200 S.W. Jefferson Way, Corvallis, OR 97331; 541/758-7790, FAX 541/758-7760; cmoyer/r6pnw_corvallis@fs.fed.us
- 3:00 - 3:20** *Application of the Modified Hankin and Reeves Protocol to Estimate the Distribution and Abundance of Juvenile Salmonids in Coastal California Streams*
T. H. Williams*, **P. Adams**, **M. S. Mohr**, **M. Bowers**, NMFS Southwest Fisheries Science Center, Santa Cruz/Tiburon Laboratory, 3150 Paradise Drive, Tiburon, CA 94920; 415/435-3149, FAX 415/435-3675; Thomas.Williams@noaa.gov; Pete.Adams@noaa.gov; Michael.Mohr@noaa.gov; Michael.Bowers@noaa.gov
- 3:20 - 3:50** *Panel Discussion and Wrap-Up*
Hankin, Reeves, Kershner, and Dolloff

Session #5 White Sturgeon Symposium

Session Chair: Paul Anders, University of Idaho, Center for Salmonid and Freshwater Species at Risk, Moscow, ID

- 8:00-8:20** **Welcome and Introduction, Paul Anders and Madison Powell**

Artificial Production

- 8:20-8:40** *Restoring Productivity of Reproductively-Challenged Reservoir Populations of White Sturgeon Using Supportive Breeding Techniques*
B.L. Parker* and **A.J. Talbot**, Columbia River Inter-Tribal Fish Commission, 729 NE Oregon Street, Suite 200, Portland, OR 97232; 503/238-0667, FAX 503/235-4228; parb@critfc.org, tala@critfc.org)
- 8:40-9:00** *Conservation Aquaculture and Endangered Species: Theory Behind the Practice*
P.J. Anders, University of Idaho, Center for Salmonid and Freshwater Species at Risk, Moscow, ID 83844-2260; 208/885-2823, FAX 208/885-5968; ande9662@uidaho.edu
- 9:00-9:20** *Fecundity and Egg Size in Iteroparous White Sturgeon*
Joel Van Eenennaam and **Serge Doroshov***, Univ. of California, Davis CA 95616-8125; 530/752-2058, FAX 530/752-0175; sidoroshov@ucdavis.edu

Genetics/Molecular Ecology

- 9:20-9:40** *Genetic Diversity in White Sturgeon, *Acipenser transmontanus*, of British Columbia*
S. McKay, Agriculture and Agri-Food Canada, Molecular Genetics Section, Saskatoon Research Centre, 107 Science Place, Saskatoon S7N 0X2; 306/956-2843; SASKRES.mckaysh@EM.AGR.CA; **C. Smith**, Centre for Environmental Health, Biology, University of Victoria, P.O. Box 3020 STN CSC, Victoria, B.C.V8W 3N5; 250/472-4072 FAX 250/472-4075; ctsmith@uvic.ca; **S. Pollard***, Ministry of Fisheries, P.O. Box 9359 Station Provincial Government, Victoria, B.C. V8W 9M2; 250/356-7005 FAX 250/387-9750; sue.pollard@gems5.gov.bc.ca; **B. Koop**, Centre for Environmental Health, Biology, University of Victoria, PO Box 3020 STN CSC, Victoria, B.C.V8W 3N5; 250/472-4072; 250/472-4075; bkoop@uvic.ca
- 10:00-10:20** *Sire and Dam Effects on Growth Rate in White Sturgeon*
Jeff Rodzen* and **Bernie May**, Dept of Animal Science, Meyer Hall, Univ. of California, Davis CA 95616; 530/752-6351; jarodzen@ucdavis.edu
- 10:20-10:40** *Phylogeographic Distribution of White Sturgeon mtDNA Haplotypes in the Columbia River Basin: Preliminary Results*
P.J. Anders, University of Idaho, Center for Salmonid and Freshwater Species at Risk, Moscow, ID 83844-2260; 208/885-2823, FAX 208/885-5968; ande9662@uidaho.edu; **M.S. Powell ***, University of Idaho, Center for Salmonid and Freshwater Species at Risk, HFCES, Hagerman, ID 83332; 208/837-9096, FAX 208/837-6047; fishdna@micron.net

Growth/Physiology/Pathology

- 10:40-11:00** *Cortisol Stress Response of White Sturgeon to Capture and Handling*
J.A. North, Oregon Department of Fish and Wildlife, 17330 SE Evelyn Street, Clackamas, OR 97015; 503/657-2000 ext. 410, FAX 503/657-6823; john.a.north@state.or.us
- 11:00-11:20** *Increased Growth Rate of White Sturgeon with the Administration of Growth*
G.T. Schelling*, **M.T. Casten**, and **R.W. Hardy**, Department of Animal and Veterinary Science, Aquaculture Research Institute, University of Idaho, Moscow, ID 83844; 208-885-7310, FAX 208-885-6420, gschelling@uidaho.edu
- 11:20-11:40** *Viral Infections in Wild White Sturgeon from the Columbia River Basin*
Scott E. LaPatra*, Clear Springs Foods, Inc., Research Division, P.O. Box 712, Buhl, ID 83316; 208/543-3456; FAX 208/543-4146; scottl@clearsprings.com; **B.L. Parker**, Columbia River Inter-Tribal Fish Commission, Portland, OR; **J.M.**

Groff, School of Veterinary Medicine, Univ. of California, Davis CA; **H.M. Engelking and J. Kaufman**; Oregon Department of Fish and Wildlife, Department of Microbiology, Oregon State University, Corvallis, OR

11:40-12:00 *Environmental Contaminants in the Kootenai River System: Potential Effects on Reproduction in White Sturgeon*

Gretchen O. Kruse, University of Idaho, and Sr. Fisheries Technician, Idaho Dept. of Fish and Game, 2750 W. Kathleen Ave., Coeur d Alene ID 83815; 208/769-1414, FAX 208/769-1418; gkruse@idfg.state.id.us

Conservation Management

1:20-1:40 *Status of White Sturgeon in Reaches from Lower Salmon Falls to the Salmon River, ID*

Ken Lepla* and **Jim Chandler**, Idaho Power Company, Boise, Idaho

1:40-2:00 *White Sturgeon Resource Conservation Area: Is it Time?*

T. Cochnauer, Idaho Department of Fish and Game, 1540 Warner, Lewiston, ID 83501; 208-799-5010; FAX 208-799-5012; tcochnau@IDFG.STATE.ID.US

2:00-2:20 *Spawning Behavior of Kootenai River White Sturgeon and a Predictive Model*

Vaughn L. Paragamian and Gretchen Kruse, Idaho Department of Fish and Game, 2750 Kathleen Ave., Coeur d' Alene, ID 83814

2:20-2:40 *Trawl and Haul: A Free Ride for Columbia River White Sturgeon*

T. A. Rien* and **J. A. North**, Oregon Department of Fish and Wildlife, 17330 SE Evelyn Street, Clackamas, OR 97015; 503/657-2000 ext. 404, FAX 503/657-6823, tom.a.rien@state.or.us

3:00-3:20 *Factors Affecting Spawning and Recruitment of White Sturgeon*

M.J. Parsley, U.S. Geological Survey, Western Fisheries Research Center, Columbia River Research Laboratory, 5501A Cook-Underwood Road, Cook, WA 98605; 509/538-2299, FAX 509/538-2843; michael_parsley@usgs.gov

3:20-3:40 *The Effect of Impoundment on the Productivity of White Sturgeon in the Columbia River*

John DeVore, 2108 Grand Boulevard, Vancouver, WA 98661; 360/906-6710; DEVORJJD@dfw.wa.gov

3:40-4:00 *White Sturgeon in the Columbia River Basin of British Columbia*

Jay Hammond, BC Ministry of Environment, Lands and Parks, Suite 401 - 333 Victoria Street, Nelson, BC V0G 2G0; 250/354-6343; FAX 250-354-6332; jhammond@nelson.env.gov.bc.ca

4:00-4:20 *Concluding Remarks*

Paul Anders and Madison Powell

Sponsors:

University of Idaho, Aquaculture Research Institute

University of Idaho, Center for Salmonid and Freshwater Species at Risk

University of Idaho, Hagerman Fish Culture Experiment Station

Session #6 Columbia River Symposium (continued from Monday)

8:00-8:20 *Snake River Salmon Recovery: Separating "D" Chaff from "D" Wheat*

Edward C. Bowles*, **Charles E. Petrosky**, and **Russell B. Kiefer**, Idaho Department of Fish and Game, P.O. Box 25, Boise, ID 83707; ebowles@idfg.state.id.us

8:20-8:40 *Status and Expected Time to Extinction for Snake River Spring Chinook Stocks*

Phillip R. Mundy, Fisheries and Aquatic Sciences, Lake Oswego, OR 97034-1744; 503-699-9856; mundy@teleport.com

8:40-9:00 *An Assessment of Lower Snake River Hydrosystem. Alternatives on Survival and Recovery of Snake River Salmonids*

John G. Williams*, NMFS, Northwest Fisheries Science Center, 2725 Montlake Blvd. East, Seattle, WA 98112; 206/860-3277; FAX 206/860-3267; john.g.williams@noaa.gov; **Peter Kareiva**, NMFS, Northwest Fisheries Science Center, 2725 Montlake Blvd. East, Seattle, WA 98112; 206/860-3403; FAX 206/860-3267; peter.kareiva@noaa.gov

9:00-9:20 *Why it Sucks to be a Pacific Lamprey in the Columbia River Basin*

Doug Hatch*, **John Netto**, **Rian Hooff**, **Blaine Parker**, **Mark Wishnie**, **Chris Beasley**, **Mike Wakeland**, and **André Talbot**, Columbia River Inter-Tribal Fish Commission, 729 NE Oregon Street, Suite 200, Portland, OR 97232; 503/238-0667

9:20-9:40 *Migration Passage Patterns of Pacific Lamprey at Bonneville Dam, 1996-1998*

A.L. Matter*, **J.J. Vella**, and **L.C. Stuehrenberg**, Fish Ecology Division, Northwest Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, 2725 Montlake Boulevard East, Seattle, WA 98112; 206/860-3367, FAX 206/860-3267; alicia.matter@noaa.gov

10:00-10:20 *Laboratory Evaluation of Adult Pacific Lamprey Swimming Performance*

Christopher Peery*, **Ted C. Bjornn**, **Richard Piaskowski**, and **Rudy Ringe**, Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho, Moscow, ID 83844; 208/885-7617, FAX 208/885-9080; bjornn@uidaho.edu

- 10:20-10:40** *Effect of Water Temperature in Adult Fishways and Forebays at Ice Harbor and Lower Granite Dams on Salmon and Steelhead Passage*
P. J. Keniry* and **T. C. Bjornn**, Idaho Cooperative Fish and Wildlife Research Unit, Rm. 103, College of FWR, University of Idaho, Moscow ID 83844-1141; 208/885-4526, FAX 208/885-9080; pkeniry@uidaho.edu
- 10:40-11:00** *Perspective on the Temperature Issue in the Columbia River: Is There a Problem?*
Gerald R. Bouck (Retired), 9691 SW Alsea Dr., Tualatin OR 97062; 503/692-4907; grbouck@aol.com
- 11:00-11:20** *Fallback by Adult Salmon and Steelhead at Columbia and Snake River Dams, and its Impact on Upriver Passage, Final Distribution and Survival*
M.L. Keefer* and **T.C. Bjornn**, Idaho Cooperative Fish and Wildlife Research Unit, College of Forestry, Wildlife and Range Science, University of Idaho, Moscow, ID 83844-1141; 208-885-7614, FAX 208-885-9080
- 11:20-11:40** *Passage of Adult Steelhead at Dams and into Tributaries in the Columbia River Drainage as Assessed with Radio Telemetry*
M.A. Jepson*, **M.L. Keefer**, and **T.C. Bjornn**, Idaho Cooperative Fish and Wildlife Research Unit, U.S. Geological Survey, Biological Resources Division, University of Idaho, Moscow, ID 83844-1141
- 11:40-12:00** *Passage of Adult Chinook Salmon at Dams and into Tributaries in the Columbia River Drainage as Assessed with Radio Telemetry*
T.C. Bjornn* and **M.L. Keefer**, Idaho Cooperative Fish and Wildlife Research Unit, U.S. Geological Survey, Biological Resources Division, University of Idaho, Moscow, ID 83844-1141; bjornn@uidaho.edu; **L.C. Stuehrenburg**, Northwest Fisheries Science Center, National Marine Fisheries Service, Seattle, WA 98112
- 1:20-1:40** *Subyearling Chinook Salmon Early Life History Timing and Survival in the Snake River*
W. P. Connor and **T. C. Bjornn**, Idaho Cooperative Fish and Wildlife Unit, University of Idaho, Moscow ID 83843
- 1:40-2:00** *Natural Production of Fall Chinook Salmon from Adult Outplants in the Umatilla River, Oregon*
S.M. Knapp, Oregon Department of Fish and Wildlife, 80866 Hwy 395 No., Hermiston, OR 97838; 541/567-5318; FAX 541/567-0293; odfwhrd@orednet.org
- 2:00-2:20** **Carmichael**
- 2:20-2:40** *Putting Our Management Where Our Mouth Is: Supportive Breeding Within the South Fork Salmon River Metapopulation*
Chris Beasley*, **André Talbot**, and **Doug Hatch**, Columbia River Inter-Tribal Fish Commission, 729 NE Oregon St., Suite 200, Portland, OR 97232
- 3:00-3:20** *Tests of Supplementation for Fish Conservation and Recovery*
André J. Talbot*, **Jennifer Phillips**, **Doug R. Hatch**, and **Chris Beasley**, Columbia River Inter-Tribal Fish Commission, 729 NE Oregon St., Suite 200, Portland, OR 97232
- 3:20-3:40** *Wrap-up and Discussion*
Bjornn

Wednesday, July 14

8:00 -11:40 **Concurrent Technical Sessions**

Session #7 Fisheries Management

Session #8 Fish Health and Nutrition

Session #7 Fisheries Management

Session Chair: Pete Bisson, USFS, Olympia WA

- 8:00-8:20** *Managing for Basic Yield Trout Fisheries in the Presence of Walleye Populations in Three Wyoming Reservoirs*
Paul Mavrakis and **Dan Yule**, Fisheries Biologists, Wyoming Game and Fish Department, 3030 Energy Lane, Suite 100, Casper, WY 82604; 307/473-3413; pmavra@missc.state.wy.us
- 8:20-8:40** *An Update on the Redfish Lake Sockeye Salmon, *Oncorhynchus nerka*, Recovery Program: Hatchery Supplementation and Lake Fertilization*
Bert Lewis*, Shoshone Bannock Tribe, P.O. Box 306, Ft. Hall, ID. 83203; 208/238-3759; salmon1@cyberhighway.net; **Jay Pravecek**, Idaho Department of Fish and Game, 1414 Locus Ln., Nampa, ID 208/465-8404; jpravece@idfg.state.id.us
- 8:40-9:00** *Spawning Ecology of Fluvial Westslope Cutthroat Trout in the Blackfoot River Drainage, Montana*
D. A. Schmetterling, Montana Fish, Wildlife and Parks, 3201 Spurgin Road, Missoula, MT 59804; 406/542-5514, FAX 406/542-5529; dschmett@bigsky.net
- 9:00-9:20** *Native Fishery Management in Yellowstone Park; Westslope Cutthroat Trout Restoration*
Jeff Lutch, National Park Service, Center for Aquatic Resources, P.O. Box 168, Yellowstone National Park, WY 82190; 307/344-2285, FAX 307/344-2323; Jeff_Lutch@nps.gov
- 9:20-9:40** *Predatory Influence of Selected Predator Fishes on Kokanee, Lake Pend Oreille, Idaho*

D.T. Vidergar and D.H. Bennett, University of Idaho, Department of Fish & Wildlife Resources, CFWR, Rm. 105, Moscow, ID 83844-1136; 208/885-6434, FAX 208/885-9080; vide0231@novell.uidaho.edu

- 10:00-10:20** *Changing Trends in Management of Aquatic Species Systems in Utah - An Overview*
M. Jane Perkins, Neotenic Enterprises, 675 East 200 South, Provo, UT 84606 and University of Phoenix, Utah Campus, General Studies Program; 801/374-9737, NEO10IC@AOL.COM
- 10:20-10:40** *Winter Microhabitat Fidelity, Growth, and Survival of Juvenile Coho Salmon in Prairie Creek, California*
Ethan Bell*, **Terry Roelofs** and **David Hankin**, Fisheries Department, Humboldt State University, Arcata, CA 95521; 707/840-9722; bell@humboldt1.com tdr1@axe.humboldt.edu; **Walter Duffy**, California Cooperative Fisheries Research Unit, Humboldt State University, Arcata, CA 95521; wgd7001@axe.humboldt.edu
- 10:40-11:00** *Bull Trout Distribution, Status, and Conservation in the Clearwater basin*
G. Servheen*, Idaho Department of Fish and Game, 1540 Warner Ave, Lewiston, ID 83501; 208-799-5010; 208-799-5012; faxgservhee@idfg.state.id.us; **T. Cochnauer**, Idaho Department of Fish and Game, 1540 Warner Ave, Lewiston, ID 83501; 208-799-5010; FAX 208-799-5012; tcochnauer@idfg.state.id.us; **S. Russell**, Nez Perce National Forest, Rt. 2, Box 475, Grangeville, ID 83530; 208-983-1950, FAX 208-983-4099; srussell/r1_nezperce@fs.fed.us; **C. Johnson**, Bureau of Land Management, Rt. 3, Box 181, Cottonwood, ID 83522; 208-962-3245; FAX 208-9623275; c40johns@id.blm.gov; **J. Capurso**, Clearwater National Forest, Powell Ranger District, Lolo, MT 59847; 208-942-3113; FAX 208-942-3311; Capurso@montana.com; **J. Dupont**, Idaho Department of Lands, P.O. Box 670, 701 River Ave, Coeur d'Alene, ID 83816; 208-769-1525; FAX 208-769-1524; dlands@nidlink.com; **D.Stewart**, Idaho Dept. Of Environmental Quality, 300 W. Main, Grangeville, ID 83530; 208-983-0808; FAX 208-983-2873; dstewart@camasnet.com; **D.Weigal**, Nez Perce Tribe, P.O. Box 1701, Orofino, ID 83544; 208-476-7269; FAX 208-476-0719; weigeld@clearwater.net; **T. Cundy**, Potlatch Corporation, 805 Mill Rd. Lewiston, ID 83501; 208-799-4135; FAX 208-799-1707; twcundy@potlatchcorp.com; **R. Roseberg**, U.S. Fish and Wildlife Service, P.O. Box 18, Ahsahka, ID 83520; 208-476-7242; FAX 208-476-3252; ralph_roseberg@fws.gov; **M. Faler**, U.S. Fish and Wildlife Service, P.O. Box 18, Ahsahka, ID 83520; 208-476-7242; FAX 208-476-3252; mike_faler@fws.gov
- 11:00-11:20** *Temperature Requirements for Threatened Bull Trout from the Pacific Northwest*
Jason Selong*, Thomas E. McMahon, Biology Department, Fish and Wildlife Program, Montana State University, Bozeman, MT 59717; 406/994-2492; ubitm@montana.edu; **Frederic T. Barrows**, U.S. Fish and Wildlife Service, Bozeman Fish Technology Center, Bozeman, MT 59715; 406/587-9265; rbarrows@montana.campus.mci.net; **Alexander V. Zale**, Montana Cooperative Fishery Research Unit, Montana State University, Bozeman, MT 59717; 406/994-2380; zale@montana.edu
- 11:20-11:40** *Can "Resident" Bull Trout Populations Reestablish a Migratory Life History Form?*
M. Lee Nelson and **Thomas E. McMahon**, Biology Department/Fish and Wildlife Program, Montana State University, Bozeman, MT 59717; 406/994-2492; FAX 406/994-7479; ubitm@montana.edu; **Russell F. Thurow**, U.S. Forest Service, Rocky Mountain Research Station, Boise, ID 83840; rthurow/rmrs_boise@fs.fed.us
- 11:40-12:00** *Community Structure of Westslope Cutthroat Trout and Brook Trout Populations in Small Tributary Streams in the Clark Fork River Basin*
Don J. Conklin, Jr., **Paul L. Winkle***, and **James W. Chadwick**, Chadwick Ecological Consultants, Inc., 5575 South Sycamore St. #101, Littleton, CO 80120; 303/794-5530, FAX 303/794-5041; chadeco@aol.com

Session #8 Fish Health and Nutrition

Session Chair: Ken Hashagen, California Department of Fish and Game

- 8:00-8:20** *Myxobolus Cerebralis Infection in Rainbow Trout, Oncorhynchus mykiss, and Brown Trout, Salmo trutta, Exposed Under Natural Stream Conditions*
Thomas J. Baldwin*, Washington Animal Disease Diagnostic Laboratory, Washington State University, Pullman, WA 99164, tjb@vetmed.wsu.edu; **E. Richard Vincent**, Department of Veterinary Microbiology and Pathology, Washington State University, Pullman, WA 99164; **Ronald M. Silflow**, Montana Fish, Wildlife and Parks, Bozeman, MT 59715; **Danielle R. Stanek**, Department of Veterinary Microbiology and Pathology, Washington State University, Pullman, WA 99164
- 8:20-8:40** *Fish Nutrition for Sustainable Aquaculture*
J.A. Green* and **R.W. Hardy**, University of Idaho, Hagerman Center for Sustainable Aquaculture, 3059F National Fish Hatchery Rd., Hagerman, ID 83332; 208/837-9096, FAX 208/837-6047; gree9524@uidaho.edu
- 8:40-9:00** *Gill Structural Changes as a Potential Indicator of Eutrophic Stress*
Hilary M. Lease*, **James A. Hansen**, **Harold L. Bergman**, and **Joseph S. Meyer**, University of Wyoming, Department of Zoology and Physiology, Laramie, WY 82071-3166; 307/766-4837, FAX 307/766-5625; hlease@uwyo.edu)
- 9:00-9:20** *Variation in Body Condition (Wr) of Juvenile Rainbow Trout in Relation to Physiological Measures of Starvation and Activity*
Darin G. Simpkins*, Wyoming Cooperative Fish and Wildlife Research Unit, Department of Zoology and Physiology, University of Wyoming; Laramie, WY 8207; 307/766-2091; FAX 307/766-5400; simpkins@uwyo.edu; **Wayne A. Hubert**, Wyoming Cooperative Fish and Wildlife Research Unit, Department of Zoology and Physiology, University of Wyoming,

Laramie, WY 82071; 307/766-5415; FAX 307/766-5400; whubert@uwyo.edu; **Carlos Martinez del Rio**, Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ. 85721; 520/626-3329; cdelrio@u.arizona.edu

Miscellaneous

- 9:20-9:40** *And After The River Ran Through It, What Then?*
N. Allen Binns, Wyoming Game and Fish Department, 260 Buena Vista, Lander, WY 82520; 307/332-2688; FAX 307/332-6669; abinns@misc.state.wy.us
- 10:00-10:20** *Responses of Sculpins, Salmonids, and Macroinvertebrates to Stream Habitat Conditions, Sediment, and Metals*
C. A. Mebane, Idaho Division of Environmental Quality, 1410 N. Hilton, Boise, Idaho 83706; 208/373-0502; FAX 208 373 0576; cmebane@deq.state.id.us
- 10:20-10:40** *Density and Growth of Tailed Frog Tadpoles, *Ascaphus truei*, in Two Idaho Streams*
Kirk Lohman, Department of Fish and Wildlife, University of Idaho, Moscow, ID 83844
- 10:40-11:00** *CLAWS 2---Invasion of the Chinese Mitten Crab, Effects on a Fish Protection Facility*
Lloyd Hess, Brent Bridges, Scott Siegfried, and Sarah Wynn, U.S. Bureau of Reclamation, RR#1 Box 35, Byron, CA 94514-9614; 209/833-0340, FAX 209/833-0387; lhess@mp.usbr.gov
- 11:00-11:20** *Summer Habitat Use by Inland Redband Trout in the Kootenai River Drainage, Montana*
Clint C. Muhlfeld; Flathead River Native Species Biologist, Montana Department of Fish, Wildlife, and Parks, 490 N. Meridian Rd., Kalispell MT 59901; clintamy@bigsky.net; **David H. Bennett**, Department of Fish and Wildlife, University of Idaho, Moscow ID 83844; **Brian Marotz**, Montana Department of Fish, Wildlife, and Parks, 490 N. Meridian Rd., Kalispell, MT 59901
- 11:20-11:40** *The Use of Environmental Variables as Predictors for Habitats with Increased Risk of *Myxobolus cerebralis* infections*
Monica Hiner and Christine Moffitt, Department of Fish and Wildlife Resources, Univ. of Idaho, Moscow, ID 83844-1136); **Douglas Burton and Steven Elle**, Idaho Department of Fish and Game, Eagle Fish Health Laboratory, 1800 Trout Road, Eagle, ID 82616
- 11:40-12:00** *Declivity in Steelhead Trout Recruitment at the Keogh River Over the Past Decade*
B. R. Ward, Ministry of Fisheries, Fisheries Research and Development Section; 2204 Main Mall, University of British Columbia, Vancouver, B.C., Canada, V6T 1Z4; Bruce.Ward@gems8.gov.bc.ca

Today's Technology for Tomorrow's Resources

1999 Annual Meeting - Second Call for Papers

The annual meeting of the AFS Alaska Chapter is your major opportunity to network with a wide diversity of aquatic resource professionals working in Alaska. The 1999 meeting has been scheduled for November 9-11 in Kodiak. The meeting theme of "Today's Technology for Tomorrow's Resources" is intended to foster discussion among meeting participants on research and management techniques to guide long-term, sustainable use of our aquatic resources. Proposals are being solicited for meeting sessions, workshops, and luncheons. Sessions and session chairs/co-chairs (in parenthesis) identified to date include: Improvements to Shellfish Assessment and Management (Gordon Kruse and Dan Urban); Groundfish (Tory O'Connell and Jon Heifetz); Telemetry (Doug Palmer); Contributed Papers (no chair yet); and Posters (no chair yet). Potential sessions or workgroup topics also include riparian management, the use of reserves, essential habitat, herring management, aging techniques, acoustic assessment, and multi-species modeling. If you are willing to coordinate or participate in a session or workgroup, please submit proposals or abstracts, to the session chair or to Bill Bechtol, ADF&G, 3298 Douglas Place, Homer, AK 99603-8027 (email: billb@fishgame.state.ak.us).

Proceedings from the October 27-28, 1998 workshop Management Implication of co-Occurring native and Introduced Fishes are

available. Individual papers or the entire proceedings (in PDF format) can be downloaded from <http://www.nwr.noaa.gov/nnative>. Information on obtaining printed copies are available at the web site.

Third World Fisheries Congress to Be Held in Beijing

Close to 1,000 fisheries professionals from around the world are expected to attend the Third World Fisheries Congress, scheduled for October 31-November 3, 2000, at the International Convention Center in Beijing, China. Attendees will explore the theme, "Feeding the World with Fish in the Next Millennium: The Balance between Production and Environment." The event is cosponsored by the American Fisheries Society, Asian Fisheries Society, World Aquaculture Society and Australian Society for Fish Biology.

Potential presenters are invited to visit the meeting web site (www.fisheries.moa.gov.cn) for details about abstract and paper submissions. Papers on the following three topics are especially sought: "Fish Farming: Past, Present, and Future;" "Aquafood: Advances in Seafood Technology;" and "Contributions of Information Technology to Fisheries Sustainability."

Predicting Species Occurrences: Issues of Scale and Accuracy

This symposium is scheduled for October 18-22, 1999 in Snowbird, Utah. The species covered will include terrestrial vertebrates, invertebrates, fish, plants, and fungi. Symposium topics include:

- Theory and design of habitat models

- Gradients in modeling world
- Major issues in mapping and scale
- Accuracy assessment
- Model development & Linking species and landscapes in time and space

A pre-symposium workshop, "Experimental Design and Model Development," will be held October 18, with the full symposium beginning October 19. Visit the web site at:

http://www.ets.uidaho.edu/coop/1999_symposium.htm

Abstracts of best student and professional papers and posters from 1999 Annual Chapter Meetings.

ALASKA Chapter

Best Student Paper: (TIE)

Relationship Between Kelt and Spawner Abundance in Steelhead Trout (*Oncorhynchus mykiss*) of the Karluk River, Alaska

*Robert N. Begich**, Alaska Department of Fish and Game and *George LaBar*, University of Idaho, Department of Fish and Wildlife Resources

From 1992 through 1997 a mark-recapture experiment conducted at the Karluk River, Alaska utilizing a prespawn marking event in conjunction with a post-spawn weir census of emigrating steelhead kelts as the recapture event was used to estimate spawning population size and spawning survival. The estimated abundance of spawning steelhead ranged from 4,107 (SE =134) fish to 10,803 (SE=347) fish. The number of emigrating kelts counted through the weir ranged from 2,613 to 6,826 fish. Spawning survival was estimated by sex and spawning history, from pre-spawn capture to post-spawn weir emigration. From recaptures of marked fish mean spawning survival was 61% (SE =2.7%) for all steelhead, 59% (SE =4.2%) for females, and 56% (SE=3.2%) for males. Mean spawning survival of initial and repeat spawning females was 62% (SE =4.4%) and 45% (SE 5.4%), respectively. Among males mean spawning survival for initial spawners was 56% (SE =2.3%) and 48% (SE=7.7%) for repeat spawners. Logistic regression modeling of mark-recapture data was used to identify biotic factors significantly related to steel-head spawning survival and to estimate the probability of surviving spawning. Model probabilities of spawning survival were applied to kelt data collected at the weir during each emigration to estimate spawning population size for each year. Comparison between spawning population estimates derived from mark-recapture methods and logistic regression modeling revealed that annual spawning survival and kelt emigrations are population processes which can be used to assess spawning stock status. Biennial survival of adult repeat spawning steelhead was estimated from tagged marked recaptures at the Karluk River weir. For the 1992 through 1995 populations of emigrating steel-head kelts, mean biennial survival from time of emigration (marking at the weir) to a second successful emigration (recapture at the weir) was 23.8% for all steelhead, 27.8% for females, and 18% for males.

Best Student Paper: (TIE)

Effects of Nutrient Additions to Kootenay Lake, British Columbia on Kokanee Salmon: Density, Distribution, and Diet

Lisa C. Thompson, University of British Columbia, Fisheries Centre

Nutrients were added to the North Arm of Kootenay Lake, BC, from 1992 to 1996, in an effort to restore the lake community to its status prior to the building of hydroelectric dams upstream. Two upstream impoundments (Duncan Dam, BC, 1967; Libby Dam, Montana, 1973) cause the phosphorus load to be only one-third of historical levels. Phosphorus concentrations in the lake declined during the 1970's. Kokanee abundance was erratic from 1978 to 1984, then began a steady decline in 1985, which prompted the fertilization program. Phytoplankton biomass appears to have responded positively to the nutrient additions, and a gradient of algal concentration has formed from north to south along the lake. Macrozooplankton the main food of kokanee, have also increased in biomass during the fertilization period, although the standing stock of zooplankton is sometimes higher in the South Arm (unfertilized) of the lake. The average proportion of cladoceran zooplankton, such as *Daphnia*, has increased from less than 5% to about 10%, Kokanee numbers have increased lake-wide. Egg-to-spawner survival rates have increased in the main body of Kootenay Lake. The increase in kokanee abundance has coincided with changes in kokanee fry diet and distribution. Kokanee fry now consume a greater amount of zooplankton biomass, per unit fish biomass, than prior to fertilization, Also, fry consume more per fish in the South Arm (unfertilized) than in the North Arm, during summer. However, fry densities are much higher in the North Arm until fall. It appears that kokanee fry are staying in the fertilized arm, despite their high density, in order to take advantage of higher zooplankton productivity there.

High School Special Recognition:

Return of a Lost Legacy: Takotna River Salmon

Gene Avey, Takotna Community School and Training Center, Larry DuBois, Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division, David Fox, Takotna Community School and Training Center, Douglas B. Molyneaux, Alaska Department of Fish and Game, Commercial Fisheries Management and Development Division.

Students of Takotna Community School have teamed up with the Alaska Department of Fish and Game and Bering Sea Fishermen's Association to establish a salmon counting tower on the Takotna River in the upper Kuskokwim River basin. For much of the past century salmon have been absent from the Takotna River. In prior centuries native Athabaskans harvested salmon from the river, but in the early 1900's gold was discovered the Innoko mining district and the Takotna river was transformed into a major access route to the gold fields. The community of Takotna developed as a supply point and staging area for the miners. Salmon caught in the river were fed to growing numbers of dog teams which were used as the primary means of winter transportation. In the early 1920's small temporary dams were built on the river to facilitate steamboat passage to the town of Takotna. Salmon populations became depleted. Biologists found the river to be void of salmon during the 1960s and 1970s, but local residence began to see a few adult fish appear by the 1980s and ADF&G biologists found chum and chinook salmon in the river during a survey in 1994. This prompted the school and ADF&G to begin monitoring salmon passage in 1995 by establishing a counting tower on the river. Annual escapement estimates have ranged from 500 to 1,000 chinook salmon and 1,500 to 3,000 chum salmon. The project is scheduled to operate through the coho season beginning in 1999 pending funding needed to construct a counting weir. The re-establishment of salmon in the river after decades of absence provides a valuable opportunity. The school hopes to attract researchers to help us study and learn about the process of recolonization and some of the factors that may limit or accelerate the rate of salmon recovery.

Best Poster:

Genetic Relationships among Walleye pollock (*Theragia chalcogramma*) in the eastern Bering Sea and Gulf of Alaska

Eric Kretschmer, S.E. Merkouris, and Jim Seeb, Alaska Department of Fish and Game

Walleye pollock (*Theragia chalcogramma*) is the most productive single-species fishery in the world with annual landings exceeding 1.5 billion pounds valued at \$650 million. A major portion of the commercial catch is taken from the Bering Sea. We are looking at three different types of genetic markers that may help differentiate among stocks in the Bering Sea and Gulf of Alaska. We collected walleye pollock from Prince William Sound, Shelikof Strait and off of Bogoslof Island in the Bering Sea, and assayed them for genetic variation at microsatellite, mtDNA and allozyme loci. We chose seven microsatellite loci developed in Atlantic cod *Gadus morhua*, of which four amplified in walleye pollock. Mendelian inheritance of the microsatellite loci was confirmed using three single-pair matings. The four microsatellite loci had a frequency for the most common allele <0.95. Five regions of walleye pollock mtDNA were amplified and digested with 33 restriction enzymes. Ten enzymes produced polymorphisms. Finally, 31 allozyme loci were screened, and seven allozyme loci had a frequency for the most common allele <0.95. The results indicate that these three types of genetic markers may be useful for future studies of walleye pollock populations.

Best Professional Paper:

Principles and Criteria of Sustainable Salmon Management: The Salmon Fishery Evaluation Framework

Phillip R. Mundy, Fisheries and Aquatic Sciences, Lake Oswego, OR

The State of Alaska (ADF&G) commissioned the framework to obtain an independent assessment of principles and criteria for evaluating the status of sustainable salmon fisheries management. It is intended to be a scientific reference against which the many professionals who harvest, process, market and regulate salmon in Alaska and elsewhere may test their own concepts and practices of sustainable salmon management. Development of the framework started with a survey and synthesis of the scientific literature to discover published principles and criteria for sustainable management of natural resources. The synthesis document was further developed and focused on salmon by two scientific peer reviews, a public review, and an expert consultation with ADF&G scientists. The five principles of sustainable salmon management identified are: (1) protect wild salmon and its habitat in order to maintain resource productivity, (2) maintain escapements within ranges necessary to conserve and protect potential salmon production and to maintain normal ecosystem functioning, (3) establish and apply an effective management system to control human activities that affect salmon, (4) maintain public support and involvement for sustained use and protection of salmon resources, and (5) harvest salmon in a manner consistent with the degree of uncertainty regarding the status and biology of the resource. In addition to relatively well known management tools, such as escapement goal ranges, the framework process identified a number of established but underutilized scientific methods that can be applied to improve management, including use of freshwater levels of marine nutrients and habitat capacities to inform harvest decisions. The framework offers advice on the scientific

disciplines and transboundary management programs that it will be necessary to coordinate and integrate in order to achieve sustainable management of salmon resources.

ARIZONA/NEW MEXICO Chapter

Best Student Paper:

Predation and competition observed in a laboratory setting between an introduced crayfish (*Orconectes virilis*) and two native fishes of Arizona

Jeanette Carpenter and Carole McIvor, Arizona Cooperative Fish and Wildlife Research Unit, University of Arizona*

We conducted laboratory experiments to examine the level of predation and competition for shelter between the non-native crayfish (*Orconectes virilis*) and two native Arizona fish, Gila chub (*Gila intermedia*) and desert sucker (*Catostomus clarkii*). For the competition experiments, we used a crayfish that was of equal or smaller size than the Gila chub, Green sunfish (*Lepomis cyanellus*) was used as a predator of both crayfish and Gila chub to elicit a stronger response from the prey species in seeking shelter- Crayfish displaced Gila chub from the shelter and attacked them several times, Gila chub never displaced or attacked crayfish. Although Gila chub sought cover during the control and when green sunfish attacked through a clear partition, they did not seek cover when the partition was removed. We used larger crayfish (>3.5 cm carapace length) in the predation experiments, Crayfish preyed upon both fish species; however crayfish preyed more heavily upon desert suckers than on Gila chub. It is likely that desert suckers were more vulnerable because they used the lower portion of the water column, whereas Gila chub used the entire water column. Gila chub and desert sucker did not alter their use of the water column in the presence of crayfish.

BONNEVILLE Chapter

Best Student Paper:

Laura Kuehn, Utah State University

Utah chubs are re-invading Strawberry Reservoir following the most recent rotenone treatment of the system in 1990. Salmonid gamefish are not expected to be effective predators, therefore, alternative control measures are being sought. Fluctuating water levels can affect aquatic resources and water quality by altering the thermal structure, food supply, and availability of critical habitat for fish and invertebrates. Vulnerable periods in the life history, areas of critical habitat, and evidence of habitat preference of non-game species were identified and utilized to construct a GIS database. The change in critical habitat over a variety of reservoir elevations was quantified using a GIS and an existing bathymetry map of the reservoir. This database will be capable of assessing the effects of different reservoir elevation management strategies on the productivity of non-game fish and gamefish in Strawberry Reservoir, Utah.

Best Professional Paper:

Three dimensional physical and bioenergetics habitat in large river systems using state-of-the-art hydroacoustics, GPS, GIS, photogrammetry, and computational fluid dynamics.

R. Craig Addley, Institute of Natural Systems Engineering, Utah State University

Physical habitat in riverine ecosystems provides a template that biological processes are constrained to operate within. Characterization of the physical template and potential changes to the physical template in both space and time are essential for understanding many biological processes. Unfortunately, physical habitat in riverine systems is both spatially and temporally variable. This makes accurate characterization of the physical habitat difficult. We show how the existing technologies of acoustic doppler current profiling, GPS, GIS, photogrammetry and computational fluid dynamics can be combined to accurately characterize large river systems in space and time. We also show how this characterization can be used to assess the bioenergetics, growth, and survival potential of riverine fishes as a function of the flow regime.

COLORADO/WYOMING Chapter

Best Student Paper:

Douglas C. Novinger and Frank J. Rahel, Department of Zoology and Physiology, University of Wyoming*

Lab and field experiments suggest that interference competition and predation could explain the downstream replacement of native Colorado River cutthroat trout by introduced brook trout. Young brook trout with a naturally occurring size advantage were consistently more aggressive than cutthroat, a disparity exaggerated as temperatures increased from 1-18°C. Cutthroat rarely initiated aggression toward brook trout. Brook trout also captured more food during feeding trials and demonstrated superior sprint swimming performance (5-22EC).

In a field experiment where total fish densities were held constant, growth rates of cutthroat sympatric with brook trout were significantly lower than growth rates of allopatric cutthroat, and sympatric cutthroat showed a significant decline in condition factor. Direct predation by young brook trout on cutthroat may also be important. In a field experiment, 26 of 32 cutthroat mortalities (81.3%) occurred in sympatry, with brook trout predation responsible for as many as 9 (34.6%). Lab and field experiments suggest that vulnerability of cutthroat to predation decreases with both actual cutthroat size and with size as a percentage of the brook trout predator's size. The threat of predation was highest for small cutthroat (< 40 mm) up to 55% of the size of a brook trout predator. Larger cutthroat (60 mm) were vulnerable to predation only up to 45% of the size of the brook trout. Our results indicate several mechanisms that would allow brook trout to replace cutthroat but do not explain the persistence of cutthroat in some high elevation stream reaches. In particular, cutthroat do not appear to have a physiological advantage at cold temperatures.

Best Professional Paper:

N. Allen Binns, Wyoming Game and Fish Department

Many habitat improvement devices have been placed in streams throughout North America to increase trout abundance and fishing opportunity. Some fishery workers have questioned the effectiveness of such work. Proponents contend habitat improvement does help salmonids, while critics argue that such work often fails and is a waste of money. Stream habitat improvement projects done in Wyoming since 1953 were recently reviewed to determine if such work was or was not beneficial trout. Of 71 projects that the Wyoming Game and Fish Department has been involved with, fish response was monitored at 46 projects. Trout responded positively to the better posttreatment habitat provided at these projects. Posttreatment, mean wild trout abundance increased 116% and biomass doubled. Numbers of catchable wild trout, 6 inches or longer, were 88% higher and their biomass was up 95%. In mixed trout populations, where both wild and stocked fish were present, abundance increased 121% and biomass 137%. Catchables more than doubled in both numbers and biomass. Habitat improvement techniques used in Wyoming have proved durable and effective over time, and have benefitted trout fisheries statewide.

IDAHO Chapter

Best Student Paper:

Predatory Influence of Bull Trout on Kokanee, Lake Pend Oreille, Idaho

Dmitri Vidergar and David H. Bennett, Department of Fish and Wildlife Resources, University of Idaho*

Lake Pend Oreille, Idaho has produced the world record rainbow trout (kamloops) *Oncorhynchus mykiss* and bull trout (*Salvelinus confluentus*), and supported a commercial harvest of kokanee salmon *O. nerka* and opossum shrimp *Mysis relicta*. In the last 40 years, the sport fishery for kokanee, rainbow, and bull trout have declined, while the sports fishery for lake trout *S. namaycush* has increased. To identify possible reasons contributing to the decline of kokanee we are examining the impacts of selected predatory fishes on kokanee abundance and survival in Lake Pend Oreille. We trained volunteers through an extensive public education effort to correctly tag and document recaptures of bull trout. Between April 1997 September 1998 348 bull trout >348 mm were caught, tagged, and released in Lake Pend Oreille. Population abundance for bull trout seems to be similar to that of kamloops. Dietary analysis from Lake Pend Oreille shows that bull trout over 406 mm rely heavily on kokanee as a prey item (67%) and on other fishes (18%). Bioenergetic modeling indicates that a significant number of kokanee are consumed per year by bull trout over 406 mm.

Best Professional Paper:

The Ability of Idaho Anglers to Identify Five Different Species of Trout

Dan Schill, and Tony Lamansky, Idaho Department of Fish and Game

The ability of anglers to identify fish they catch is fundamental to the success of fishery management that relies on differential harvest by species. We assessed the ability of anglers to identify five different trout species by conducting interviews on two Idaho waters using replica mounts, full color pictures, and inspecting actual fish in the creel. The species we, used were rainbow trout *Oncorhynchus mykiss*, cutthroat trout *Oncorhynchus clarki*, brown trout *Salmo trutta*, brook trout *Salvelinus fontinalis*, and bull trout *Salvelinus confluentus*. Four of the five species may be encountered in the drainages surveyed; brown trout do not reside in the study area, but are found lower in the system. Of the 671 anglers contacted, 93.3% correctly identified rainbow trout, 49.1% cutthroat trout, 47.4% brown trout 38.0% brook trout, and 32.8% bull trout. Only 13.9% of anglers identified all five species correctly while 7.5% could not correctly identify any of the species. In addition, only 65.1% of anglers were able to correctly recite the statewide regulation for bull trout. We tested identification success against gear type, age, sex, residence, angling experience, regulation knowledge, and years of education. We found a significant difference in identification success between fly anglers and lure and bait fishermen. Anglers that could recite the regulations had higher identification rates than those that did not. Angler age and years of education also influenced fish identification rates. The ability of anglers to identify different trout species is poor; however the proportion of anglers interviewed with a bull trout in the creel was low (1.5%). To increase angler regulation awareness and fish identification ability, a vigorous educational effort, including increased signing, personal contacts, and other multimedia options is being planned.

MONTANA Chapter

Best Student Paper:

Summer habitat use by inland redband trout *Oncorhynchus mykiss gairdneri* in the Kootenai River drainage, Montana

Clint Muhlfeld and David H. Bennett, Department of Fish and Wildlife, University of Idaho, and Brian Marotz, Montana Department of Fish, Wildlife and Parks*

The reported decline in the distribution, abundance and genetic diversity of Columbia River inland redband trout *Oncorhynchus mykiss gairdneri* has prompted fisheries managers to better understand the habitat requirements of redband trout to preserve their genetic integrity and individual population persistence. A more thorough knowledge of the relationships between the available physical habitat and the habitat used by redband trout is needed to identify critical habitat and develop effective conservation strategies. We used microhabitat, mesohabitat and macrohabitat analyses to examine summer habitat use and distribution of redband trout in two watersheds in the Kootenai River drainage, Montana. Microhabitat analyses revealed that juvenile (36-125 mm) and adult (> 126 mm) redband trout preferred deep microhabitats (> 0.4 m) with low to moderate velocities (< 0.5 m/s). Conversely, young-of-year (<35mm) redband trout selected slow water (< 0.1 m/s) and shallow depths (<0.2 m) located in lateral areas of the channel. Results of a discriminant functional analysis using five microhabitat variables indicated that total depth, followed by mean water column velocity, were the primary variables that differentiated habitat use among size-classes of redband trout. Size-specific trends in microhabitat use appeared to be ontogenetic. Mesohabitat analyses demonstrated that young-of-year, juvenile and adult trout strongly selected pool habitats and avoided riffles; runs were generally used as expected by juveniles and adults and more than expected by young-of-year. Pools were significantly slower, deeper and contained more total cover than riffles and runs. Macrohabitat analysis indicated that redband trout density was positively related to the abundance of pools and negatively related to stream gradient. Pool-to-riffle ratio, gradient and stream size combined accounted for 73.7% of the variation in the density of redband trout among 23 stream reaches in five streams.

OREGON Chapter

Best Student Paper:

Utility of Otolith Microchemistry in Ecological Studies of Resident And Anadromous Rainbow Trout

Christian Zimmerman, Department of Fisheries and Wildlife, Oregon State University and Gordon Reeves, U.S. Forest Service, Pacific Northwest Research Station*

The ecological relationship of sympatric anadromous (steelhead) and resident rainbow trout (*Oncorhynchus mykiss*) is poorly understood and has been difficult to study given the identical appearance of juveniles. We are conducting a range-wide study to confirm the expected relationship of Sr/Ca ratios in the primordia of anadromous morphs. Identification of maternal origin is essential in ecological studies of multiple life history morphs. We are using Sr/Ca ratios in the primordia and freshwater growth region of the otolith to identify maternal origin (anadromous vs. resident) of juvenile *O. mykiss* collected from rearing habitats in the Deschutes River, Oregon. Using this method of identification, we can monitor the relative abundance of anadromous and resident progeny over time. We can also test for differences in growth and morphology of the two populations. Finally, we have used otolith microchemistry in the analysis of barriers to migration and the occurrence of anadromous morphs in stream basins. Otolith microchemistry was instrumental in confirming that log jams in the Sixes River, Oregon were not migration barriers to adult steelhead as was previously assumed. Otolith microchemical examination of Sr/Ca ratios provides an important and much needed method of identification and will significantly aid in ecological studies of sympatric anadromous and resident morphs of *O. mykiss*.

Best Student Poster:

Salmon in the Classroom: a Survey of Teacher's Perceptions

Jennifer Smith, Southern Oregon University

In 1981, the Oregon Legislature established the Salmon-Trout Enhancement Program (STEP) to restore native stocks of salmon and trout and their habitats. A popular component of STEP has been the "salmon in the classroom" program in which schools obtain eggs from regional hatcheries and students rear them to fry stage before releasing them into local streams and rivers. During 1997 – 98, 50 schools participated, releasing approximately 15,000 coho, 3,500 chinook, and 42,000 steelhead into the upper Rogue district. From 1994 - 97, fry releases in upper Rogue River tributaries (Bear Creek and Little Butte Creek) averaged 113,500 fry per year. To evaluate the value of this education program as perceived by participating teachers, I conducted a survey to (1) determine teacher knowledge of salmon ecology and genetics, (2) identify which aspects of the program (i.e., in class activities vs. field activities) are most important, (3) explore the information transfer from STEP biologists to teachers and from teachers to students. I obtained a 55% response (29 of 50 teachers) to the survey. Results showed that 65% of teachers viewed learning the salmon life cycle as the most important aspect of the experience and 32% responded that release of student-raised fish was not key to understanding the life cycle. Most respondents

(77%) recognized that maintaining genetic diversity is important to salmon conservation and 68% acknowledged that introducing fish of hatchery origin could affect wild populations. Thirty two percent however, responded that classroom-raised fish contribute to the maintenance and restoration of wild salmon and that survival of their fish in the wild is critical to the success of the program. Thus although most respondents showed a general knowledge of salmon biology and recognized the potential harm of hatchery fish introductions, fully one third felt they were contributing to salmon restoration.

Editors Note: No recognition was accorded papers at the California-Nevada, Greater Portland, or North Pacific International Chapter annual meetings. David Manning of the California-Nevada Chapter received a national best paper award!

Information from the Hawaii or Humboldt Chapters was not available for this issue.

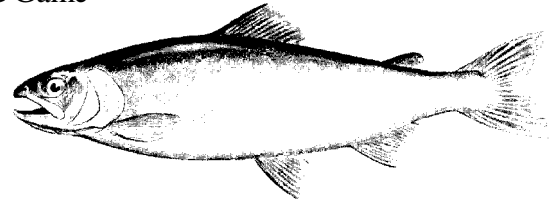


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