Fish Health Newsletter

Fish Health Section/American Fisheries Society

October 1998 **Volume 26, Issue**

PRESIDENT'S REPORT: THE USE OF ADVANCED TECHNOLOGIES IN AQUATIC ANIMAL HEALTH MANAGEMENT

A special session was organized by the Fish Health Section (FHS) to encourage dialogue on this issue as part of the 3rd International Symposium on Aquatic Animal Health. Advanced technologies for the detection of nucleic acids or other components of aquatic animal pathogens are being developed and utilized in diagnostic and inspection procedures. These tests have the potential to provide valuable scientific information but could also have serious regulatory implications. Recent applications of these advanced technologies have raised concerns about the use and interpretation of the results of nonvalidated / nonstandardized techniques. Additionally, the use of nonvalidated methods could cause inappropriate devaluation or condemnation of aquatic animal stocks that could have serious legal and political ramifications. Topics that were addressed included:

1) The use of nonvalidated techniques in the diagnosis, inspection and certification of aquatic animals.

" . .the use of nonvalidated methods could cause inappropriate devaluation or condemnation of aquatic animal stocks that could have serious legal and political ramifications."

2) Development of a process to validate and standardize diagnostic methods.

3) Consistent use of diagnostic methods and requirements for confirmation.

4) The use of results obtained by nonvalidated techniques and the potential legal and political ramifications.

5) Management implications of detecting nucleic acids or other components of aquatic animal pathogens.

Representatives from different sectors were invited to speak and included:

1) Research / Larry A. Hanson, College of Veterinary Medicine, Mississippi State University, Mississippi, MS

2) Industry / Scott E. LaPatra, Clear Springs Foods, Inc., Research Division, Buhl, ID

3) Veterinary Services / Thomas J. Baldwin, Washington Animal Disease Diagnostic

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Laboratory, College of Veterinary Medicine, Washington State University, Pullman, WA

4) OIE Fish Diseases Commission / James R. Winton, Western Fisheries Research Center, Seattle, WA

5) Fish Health Section / Joseph W. Marcino, Minnesota Department of Natural Resources, St. Paul, MN

Larry emphasized that highly sensitive nucleic acid based diagnostic tests such as diagnostic tests using the polymerase chain reaction must be evaluated for their worth and not for the novelty:

Any application of a new diagnostic test must be evaluated for practicality, value, reliability and reproducibility. Practicality refers to utility in the laboratory: simplicity, speed, cost, and changes required of current SOPs or technical abilities of laboratory personnel. Value includes the importance of the disease, the utility of the test in determining management options (i.e. antibiotic sensitivity or pathogenic potential), the specificity and range of the test (can it detect or distinguish more than one pathogen), and archival potential (can we go back to the isolate to study its biological properties). Reliability and reproducibility refer to frequency of false positives, false negatives, assay failure, and laboratory to laboratory variation.

The development and evaluation of a disease diagnostic test and a test for inspection/ certification purposes are very different. A PCR assay for inspection purposes requires much more stringent quality control measures than would be needed for a disease diagnostic test. In order to claim a level of sensitivity, each sample must be run with sensitivity standards, either in parallel reactions or within the test reaction using specifically designed internal standards. The lack of amplification of the standard indicates assay failure and the need to re-run that sample. False positives are due to contamination with target containing DNA. The primary source of contaminating DNA is PCR product. One microliter the product of a positive assay is enough to contaminate 100,000 samples. Therefore, adherence to stringent product containment measures must be followed and risk of false positives increases each time an assay is run. Other sources of contamination are diseased fish and clone product from research. Generally, problematic false positive occurrence is determined by specific product generation in negative controls. Negative controls must be run frequently and should be included in the entire assay from sample processing on.

One final concern about the use of PCR in diagnostic assays is the biological significance of the results. PCR can be optimized to generate a reliable positive signal from 10 to 50 copies of target in 1 microgram of total DNA. When this is extrapolated to the amount of tissue sampled and compared to virus culture and the amount of infectious units per genome copy, PCR is about 20-50 fold more sensitive than culture methods for persistent virus infections. Also, PCR detects a DNA sequence not a pathogen, so residual nucleic acid from killed pathogen or a DNA fragment that came from a related organism could be recognized as a positive result when in fact the fish are not carrying an infectious agent. So, in summary the use of PCR for inspection purposes has distinctive advantages in sensitivity but requires stringent quality control and each application should be critically evaluated before the results are used to determine the types of important decisions that can occur in inspections.

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Scott detailed a case study that illustrated that there is a need for more sensitive diagnostic tests for some pathogens, however, we may not understand how or be prepared to interpret the results:

As part of a diagnostic evaluation to determine the cause of a fin erosion condition in a trout broodstock, evidence of a parasite (*Loma* sp.) was found in histological sections. Using PCR, "genomic" evidence of the presence of another parasite was also obtained. Neither parasite had been associated with fin erosion problems previously. No mortality or clinical signs of disease had been observed and growth rates were normal. Additionally, routine inspection for pathogens listed in state importation regulations continued to show negative results.

Additional testing of matched specimens in two different laboratories produced contrasting results. Additionally, both parasites that were detected were not listed, their distributions were unknown but likely widespread, and although horizontal or fish-to-fish transmission of the parasites was generally accepted, there was no scientific information to support vertical transmission.

The reaction by various entities to the report of genomic evidence of a particular non-listed parasite ranged from the destruction of fish that had been received as eggs to the printing of speculative press releases by the media. The broodstock strain was subsequently destroyed and the fin erosion problem has persisted. This case study illustrated what can potentially happen in the absence of a process to validate and standardize new diagnostic techniques. It also raises the concern of potential legal and political ramifications of using nonvalidated techniques.

Tom spoke about the practical use of advanced molecular diagnostics in a diagnostic laboratory setting. He began with an explanation on why such tests would be developed and implemented that included:

1) Alternative testing modalities are unavailable for inordinately difficult.
2) Alternative assays are not timely.
3) Alternative assays are not sensitive or specific (ambiguous).
4) The agent targeted by the assay is foreign to the US, creating difficulties with the use of assays that result in viable pathogen amplification.

He then went into how such an assay is put on line. Ideas presented included:

1) Use published sequences that have reasonable support that they are unique.
2) Test the assay with known agents, including the specific pathogen, and close relatives.
3) Standardize test protocols.
4) Determine appropriate controls.
5) Determine the reproducibility of the assay.
6) Develop QA/QC protocols.

Tom concluded by emphasizing that most of these assays are confirmatory assays only, not intended for primary screening.

Jim spoke on the role of the OIE in validation of assays:

With the rapid development of novel techniques for the detection of fish pathogens, the

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issue of validation of assays and the benchmarking of new assays against known "Gold Standards" has become increasingly important. In fact, this issue may be more critical in fish disease certification and diagnosis than for other animals where serological assays have been traditionally (and continue to be) used as well-established reference tests. While the fish health community needs to address this issue, we are not alone in that the Office International des Epizooties (OIE) has formed a working group to consider this problem in veterinary medicine.

We can begin by examination of the 1996 edition of the OIE Manual of Standards for Diagnostic Tests and Vaccines for Mammals, Birds and Bees. In the introductory section, the OIE has developed chapters on sampling methods, good laboratory practices, principles of validation of assays, tests for sterility, human safety, principles of vaccine production, and biotechnology in the diagnosis of diseases and vaccine development. While not all these sections apply equally to fish, many of the concepts can be adopted with little modifications. A diagram of the flow chart for validation of assays showed five stages that the OIE working group has identified in the process of validation. Reference standards can be used for determining sensitivity and specificity of an assay. In addition, reproducibility and replicability are important criteria. Fish health organizations from throughout the world might begin to develop similar guidelines using this model.

Following the presentations, several questions and comments were raised during a discussion period. In general, these involved:

1. Presentation of data in scientific papers needs to be standardized.
2. Epidemiology and maximum likelihood methods can assist.
3. Difficult to get funding for validation work.
4. Need for banks of reference samples to send to investigators.
5. Need to coordinate statistical methods used.
6. Need regulatory input - how do you apply techniques fairly.
7. Aquatic toxicology has addressed similar problems.
8. Separate performance of an assay from the risk of false result.

At the end of this well-attended session, there seemed to be general agreement that the topics presented were both informative and timely.

It was also agreed that various fish health organizations (e.g. FHS, EAFP, JSFP) and the OIE should work together to harmonize international standards for validation of diagnostic and certification assays for fish. In addition, there should be different standards for the application of diagnostic or confirmatory assays as opposed to inspection or certification assays. The later have the greatest problem and should receive the most attention in terms of validation.

The FHS has established technical procedures for the inspection of aquatic animals that serve as standard methods. A new ad-hoc committee has been formed that will be working with other national and international aquatic animal health organizations to establish formal guidelines by which new methods must be compared with established benchmarks before they can become accepted as standards.

Scott Lapatra, President

A Thank You to the FHS Membership

This is just a short note to say some things that I failed to mention in my rather short acceptance speech for the S.F. Snieszko Distinguished Service Award in Baltimore. I was so surprised and overwhelmed that I forgot to say how fortunate I have been to be a member of an outstanding group of fish health professionals, many of which are more deserving of this award than I. It was my good luck that so many of you were kind enough to help me through my career. Any achievements that I may count can all be traced to the many talented individuals I have worked with through the years, whether they be students, postdocs, visiting scholars, colleagues in state and federal agencies, residents, biologists, managers and section and society officials, private organizations and concerned citizens. I certainly appreciate being recognized, particularly in front of so many of my colleagues and friends at the meeting in Baltimore. Thank you all. Sincerely, Ron

AWARD RECIPIENTS AT THE BALTIMORE INTERNATIONAL SYMPOSIUM

S.F. Sniezsko Student Travel Award
The S.F. Sniezsko Student Award recipient for 1998 was Rachel F. Ramirez, a graduate student in the Department of Biological Sciences, California State University, Hayward. She is conducting her master's thesis research under the direction of Dr. Beverly Dixon. Rachel was awarded travel funds to present her research entitled " Bioencapsulation of Antibacterial Drugs in Adult Brine Shrimp, Artemia franciscana. Rachel is currently conducting her thesis research on the normal intestinal anaerobic microflora of selected ornamental fishes, a project funded by the Pet Care Trust.

The Fish Health Section **Special Achievement Award** was given to the Pacific Northwest Fish Health Protection Committee (PNFHPC) for their contribution to public education by organizing the symposium "Pathogens and Diseases of Fish in Aquatic Ecosystems: Implications in Fisheries Management ." Ray Brunson, Executive Secretary of the PNFHPC,

The Journal of Aquatic Animal Health **Best Paper Award** was was presented to R. Kocan, M. Bradley, N. Elder, T. Meyers, W. Batts, and J. Winton. Jim Winton accepted the award for the group.

AMERICAN FISHERIES SOCIETY FISH HEALTH SECTION
EXECUTIVE COMMITTEE MINUTES
Aug 30 - Sept 4, 1998
Baltimore, Maryland

1. The meeting was called to order by President, Scott LaPatra. Present for the executive committee meetings were: Beverly Dixon - Pres.-elect, Mike Kent - Vice-Pres., Jo-Ann Leong - past-Pres., Jerri Bartholomew - Sec.-Treas, Ray Brunson - Professional Stds, Paul Reno - Technical Stds, John Plumb - Nominating, Chris Wilson - Newsletter, Ron Hedrick and Margaret Ewing- Journal, Larry Hansen - Awards, Jim Winton - Publications Advisory, Pete Taylor - Promotions, Ted Meyers - Procedures, Joe Marcino - QA/QC Program Development, and Ron Goede, Chris Moffitt and Vickie Blazer.

2. President's Report - Scott reported on the status and needs of the section. Needs to be addressed are promotion of the affiliate membership status, tying in our continuing education program with recertification and updating the 4th edition of the Blue Book. There was some discussion about the direction of the NAAH strategy.

3. Committee Reports

Awards - Larry Hanson announced the winner of the student travel award. He suggested the FHS sponsor a student presentation award for presentation at the annual and honorary lifetime membership to the recipient of the Snieszko Distinguished Service Award. The excom approved both proposals by unanimous vote. Honorary membership is achieved by petition with 100 signatures by the membership. Winners of the Snieszko Award should also be listed in the AFS directory and their picture submitted to Fisheries. There were suggestions from the excom for streamlining the award process, nominating past award winners for AFS awards and for stimulating interest by listing past award winners in the newsletter.

Nominating - John Plumb reported the election of the following: Mike Kent - Vice-President, John Grizzle - Prof. Stds. (3 yr term), Patricia Barbash - Prof. Stds. (2 yr term), Richard Cooper - Tech. Stds. (3 yr term), Martin Chen - Tech. Stds. (2 yr term), Vickie Blazer - Nominations.

Professional Standards - Ray Brunson reported that there are currently 61 active Fish Heath Inspectors and 49 Fish Pathologists. There was discussion of ways to document continuing education and of a home study program. Certification requirements were discussed, with the suggestion that an additional certification status be drafted.

Program - Beverly Dixon has begun coordination with the parent society meeting in Charlotte, N.C. We will have 1 1/2 d for our technical session and a 2 hr session in the general fisheries arena.

Publications Advisory - Jim Winton discussed the issues that the committee has targeted - quality, timeliness and page charges. The issue of page charges is being addressed by AFS and a two-tiered reduction is planned. AFS has also addressed the issue of citations and starting this year all journals will be cited in major citation indexes. These moves should help encourage submission of manuscripts from outside north America. Increase in submissions could result in increased numbers of issues which would help with the timeliness of publication. This committee will solicit suggestions at the business meeting and make recommendations to the excom.

Technical Standards - Paul Reno presented his plan for revision of the Blue Book which led to discussion of the inclusion of "novel" technologies and how they would be benchmarked. Scott LaPatra presented his proposal for the special session at this meeting and Jim shared the validation procedures required by the OIE. There is a need to set standards for the addition of new methods and the committee will need to prioritize the chapters to be updated. Validation issues need to be addressed and an ad hoc committee was established with members to include Bill Keleher, Laura Brown, Ron Goede and Marios Georgiadis.

Journal - Ron Hedrick announced that Margaret Ewing will be leaving the journal and will be replaced as co-editor by Steve Kaattari. Several associate editors have come to the end of their term and new editors have been added to the board.

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QA/QC - Joe Marcino announced that a set of standard operating procedures is nearly complete and is patterned after Blue Book/APHIS protocols. It will include procedures for testing and may serve as an appendix for the revised Blue Book.

Finance - Jerri Bartholomew reported the section financial status. At this time, $40,665, 68 is held in the general account, the Continuing Education Committee holds $3,811.17 and the AFS holds $522 in a Blue Book account and $35,208.39 in the Snieszko Endowment Fund. Total FHS assets - $80,207.24.

Promotions - Pete Taylor is working on a folding display which can be sent to meetings. He is interested in recruiting other interested members with artistic talents to assist him.

4. Old Business

Directory Update (Chris Wilson) - a final solicitation for directory information will be made at the business meeting, then the directory will be compiled. It will include the by-laws, lists of award recipients, officers and committee members. Also discussed were the new look of the newsletter, a FHS brochure, letterhead and a web page.

NADA Coordinator donation - a move was made to donate $1,000 and approved by the excom.

USAHA/AVLD Meetings - Scott LaPatra will represent the FHS at the upcoming meeting in Minneapolis, MN, in October..

By-laws - Concern was expressed over the loss of continuity with rotating the chairs of the Professional Standards and Technical Standards committees. A proposal that Ray Brunson and Paul Reno be retained as coordinators was accepted by the excom.

Procedural Manual (Ted Meyers) - the draft of the new manual was distributed for review by current committee chairs. Additions will include procedures for student paper awards and coordinator roles in the Technical Standards and Professional Standards committees.

5. New Business

AFS Governing Board Meeting - A summary of the meeting was presented by Vickie Blazer and Christine Moffitt. The AFS Strategic Plan is being sent to the chapters for review and Scott LaPatra, Bev Dixon and Mike Kent will review the document for the FHS. The resignation of Paul Brouha as executive director was announced, interim leadership will be by Bob Kendall. The AFS web page is now on a commercial site and sections are encouraged to link on that site.

General Business Meeting

1. Scott LaPatra opened with introductions of the current excom, discussion of transitional changes required by the new by-laws, affiliate member status and revisions proposed for the Blue Book and in continuing education and certification.
2. **Committee Reports** were presented as above, with some discussion of the proposed tiered inspector status.
3. **New Business**

Journal - further discussion of the status of the journal by Ron Hedrick. There is currently a backlog of manuscripts. Total subscribership is 800 library and 434 personal. Jim Winton followed with discussion of how to improve the journal, including international associate or subject editors and a move to increase the speed of publication.

AFS - Christine Moffitt, Pres.-Elect of AFS talked about the direction the parent society is heading, the strategic plan, and how the FHS might participate and benefit more from what the parent society offers.

1999 meeting - Discussion on where to hold the next meeting was initiated by Bev Dixon. A motion to hold the next two meetings in conjunction with the parent society was defeated. A second motion, to hold the 1999 meeting with the parent society in Charlotte passed. At that time a decision will be made on whether to hold consecutive meetings with AFS.

Advanced Technologies - A draft resolution on the responsible use of new technologies for diagnosis was presented by Scott LaPatra. This topic would be addressed during the special session of the Baltimore meeting. There was some concern expressed by the membership about the wording of the resolution and changes were suggested. A final resolution will be reviewed by the excom.

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Report to the Fish Health Section from the Professional Standards Committee

During the Business Meeting of the Annual AFS-FHC meeting in Baltimore, the Professional Standards Committee gave an update on activities of last year. Ray Brunson praised the past members of the committee for their work and dedication in reviewing applications submitted to the PSC for certifications and re-certifications. Deborah Buchard, Scott Foott, Dorothee Kieser, and Dr. Richard Wolke served on the PSC voluntarily through the transition from the old Board of Certification to the new PSC. With the recent election results, John Grizzle and Patricia Barbash will be working with Ray to tackle the continuing issues and activities essential to maintain professional standards and standing within the AFS.

During the past year the PSC has received numerous requests from within and outside the Section to explore new certification standards and even to explore the possibility of a new category of certification status.

In the next Newsletter, the PSC will present a draft description and standards for a "Fish Disease Inspector" which would be a level of inspector status that would be certified by the Section to have the skills, knowledge and capabilities of performing collections and sampling for certain aquatic animal populations. These individuals would NOT be responsible for nor be required to have the skills and knowledge to perform laboratory testing. They would be responsible for recognizing gross morbidity and pathology and be equipped to properly dissect, prepare, and transport samples to properly recognized laboratories/testing facilities or Certified Fish Health Inspectors/Pathologists for further analysis. This category of Inspector would be scientifically prepared and ethically responsible to enter a facility and determine the most effective and sensitive way to collect samples for regulatory purposes or for the purposes of determining presence and prevalence of pathogens.

This new category will satisfy a current void in some areas that do not have FHS-Inspectors or Pathologists readily available, but could be served by individuals that have training to send samples to qualified labs. This proposal would also fit well into the Section's newly developed Affiliate Membership that may attract other aquatic health professionals into the Section. The Section would benefit from a fresh influx of professionals, which will promote inter-disciplinary communication and cooperation within the aquatic animal health field. Ray Brunson

INEFFECTIVE CONTROL OF BACTERIAL COLDWATER DISEASE AFTER PRE-SPAWNING ERYTHROMYCIN INJECTIONS

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Introduction:

Bacterial coldwater disease (BCWD), also known as rainbow trout fry syndrome (Evensen, O & E. Lorenzen, 1996) caused by *Flavobacterium psychrophilum* is an annual problem at a number of Washington Department of Fish and Wildlife hatcheries. Evidence of the bacterium in the egg and the possibility of control with pre-spawning injection of oxytetracycline or erythromycin was recently documented (Brown et al. 1997, Izumi & Wakabayshi, 1997). The objective of this study was to test the effectiveness of a pre-spawning erythromycin injection of rainbow trout broodstock to control BCWD in the resulting progeny.

Methods:

Two weeks before spawning, 275 three year old and 500 four year old female rainbow broodstock at the Spokane Hatchery were injected with 20 mg/kg erythromycin. The remaining broodstock were un-injected controls. Eggs from injected and control females were collected, fertilized, and incubated separately.

Lyons Ferry Hatchery received 175,000 eyed eggs each from injected and un-injected four year old females. Tucannon Hatchery received 110,000 eyed eggs each from injected and un-injected three year old females.

Treated and control fish were reared separately at both sites. Fish at Lyons Ferry Hatchery were started in hatchery tanks (5.9 m^3) and then transferred to outside raceways (81.6 m^3). Fish at Tucannon Hatchery were started in hatchery trough (0.14 m^3) and then transferred to outside round ponds (75.3 m^3). Replicate containers were utilized for injected and control fish at both sites. Fish were reared in well water at Lyons Ferry Hatchery and in fish free spring water at Tucannon Hatchery.

Results:

BCWD was not observed at Lyons Ferry Hatchery during the first six months of rearing (Table 1). BCWD outbreaks have occurred in prior years during this period. The lack of BCWD at Lyons Ferry Hatchery may be explained by lower

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Table 1. Results of pre-spawning erythromycin to control BCWD.

Hatchery	Treatment	No. of	No. Fish/	BCWD	Total %
Lyons Ferry					
Tucannon					

raceway rearing densities.

1) Cumulative mortality for the first 6 months of rearing

BCWD was observed in rainbow fingerling in all round ponds at Tucannon Hatchery, during the first six months of rearing (Table 1). Mortality occurred despite lower rearing densities than in previous years. Likely, the results at Tucannon Hatchery differ from Brown et al., 1997 because more female broodstock were tested and the control fish were from the same stock.

Overall, a reduction in total mortality was noted at both sites in progeny of injected broodstock (Table 1). The mortality differences occurred during the yolk sac and early feeding stages and were not associated with the BCWD outbreak at Tucannon Hatchery. Further studies are needed to determine if the lower mortality was a result of the pre-spawning erythromycin injection.

References:

Brown, L.L., W.T. Cox and R.P. Levine. 1997. Evidence that the causal agent of bacterial coldwater disease *Flavobacterium psychrophilum* is transmitted within salmonid eggs. Diseases of Aquatic Organisms. 29: 213-218.

Evensen, O and E. Lorenzen. 1996. An immunohistochemical study of *Flexibacter psychrophilus* infection in experimentally and naturally infected rainbow trout (*Oncorhynchus mykiss*) fry. Diseases of Aquatic Organisms. 25: 53-61.

Izumi, S. and H. Wakabayashi. 1997. Use of PCR to detect *Cytophaga psychrophila* from apparently healthy juvenile ayu and coho salmon eggs. Fish Pathology. 32: 169-173.

1999 Fish Health Section Meeting – Important Notice

The 1999 annual meeting of the Fish Health Section will be held in conjunction with the annual meeting of the American Fisheries Society from August 30- September 2, in Charlotte, North Carolina. For this reason the format for submitting abstracts will differ from our usual format. The FHS program (within the annual AFS meeting) will consist of a day and a half of contributed papers from our FHS members. The afternoon of the second day will consist of our business meeting followed by a 2-hour panel discussion of invited participants from both the FSH and AFS. This 2 day session will be listed as a special symposium within the AFS meeting. FHS members may also submit papers which will be included in other AFS sessions. The following guidelines are for abstract submissions. The guidelines are also described on page 33 of the September issue of *Fisheries* or at the AFS Web site at www.fisheries.org..

Please be aware the **DEADLINE** for submitted abstracts is **January 8, 1999.** Send abstracts to Andy Dolloff, Department of Fisheries and Wildlife, Virginia Tech, Blacksburg, VA 24061-0321. Please specify that you are contributing an abstract to the FHS, and whether you wish to present a poster or oral presentation.

The social event for the meeting will be a trip to the Charlotte Speedway!!!

1999 FIRST CALL FOR PAPERS

"Integrating Fishery Principles from Mountain to Marine Habitats"
Is Theme of 1999 Annual AFS Meeting

Deadlines
Abstracts for Contributed Papers and Posters: 8 January 1999

The American Fisheries Society (AFS) announces the first call for its 129th Annual Meeting, to be held at the Adams Mark Hotel and Conference Center in Charlotte, North Carolina. The meeting theme is "Integrating Fishery Principles from Mountain to Marine Habitats." In the last quarter of the twentieth century, public awareness of environmental issues has grown exponentially and increased the demand for healthy aquatic ecosystems. Fisheries scientists and managers have responded by broadening both the disciplinary and geographic scope of their work. The fisheries professional of today may have training in human dimensions, engineering, or veterinary medicine as well as in traditional fisheries subjects. Fisheries professionals frequently work in teams to address complex, large-scale issues involving entire ecosystems.

Organizers of the 1999 Annual Meeting encourage all fisheries professionals to share their particular experience and expertise. We also encourage participation by junior scientists and students representing the diversity of our profession.

Contributed Papers and Posters

The scientific program will include two types of sessions: contributed paper/poster sessions and symposia (including workshops or panel discussions). The FHS will be a

(Continued from page 12)
special symposium including technical papers and a panel discussion. Oral presentations will be limited to 20 minutes; the recommended format is a 15-minute presentation using 2"x 2" slides followed by a 5-minute question-and-answer period. The Program Committee for the 1999 AFS Annual Meeting invites abstracts for contributed papers and posters.

Abstracts
Must follow the required format and must be received by 8 January 1999. Submissions by e-mail or 3.5" diskette (MAC or DOS format) are highly encouraged.

Format for Abstracts

All abstracts for contributed papers, symposia, and posters must be submitted electronically using the format depicted in the accompanying example. Please keep titles brief but descriptive; list all authors, their addresses, phone and FAX numbers, and e-mail addresses, and indicate the presenter with an asterisk. The body of the abstract is restricted to 200 words. If you are submitting a contributed paper or poster, indicate your preference for Oral Presentation, Poster Presentation, or Oral Presentation Preferred/Poster Presentation Acceptable. Poster submissions are highly encouraged due to limited space available in the program. A poster session will be scheduled to permit discussions between poster authors and attendees. Also, please indicate which of the categories best fits the concept of your abstract in the "Topic" line of the abstract. This will aid the Program Committee in organizing contributed sessions and will prevent conflicts with concurrent talks.

Abstracts are used by the Program Committee to evaluate and select papers for inclusion in the scientific and technical sessions of the 1999 AFS Annual Meeting. An informative abstract contains a statement of the problem and its significance, study objectives, principal findings, and key conclusions. Abstracts should be 200 words or less and conform to the prescribed format.

General Topics for Contributed Papers and Posters

Fisheries Management, Aquatic Communities and Ecosystems, Human Dimensions of Fisheries, Policy, Education, Fish Health, Genetics, Physiology, Fish Culture, Habitat and Water Quality, Population Dynamics, Statistics and Modeling, Marine Fish Ecology, Freshwater Fish Ecology, Bioengineering, Other (please specify).

Who to Contact

Submit all materials (contributed paper abstracts, and poster abstracts) via e-mail to bdixon @csuhayward.edu. Format all submissions in WordPerfect (version 8.0 or earlier), Word (version 6.0 or earlier), or ASCII; use a standard 12-point font and left justification only. If you do not have access to e-mail, submit a 3.5" floppy disk.

The American Fisheries Society does not waive registration fees for symposia, workshop, or contributed session participants.

The 5th Annual Whirling Disease Symposium

RESEARCH AND MANAGEMENT PERSPECTIVES

February 18-20, 1999

Holiday Inn-Parkside, University of Montana, Missoula, Montana

Please share your expertise and latest findings at the annual symposium on whirling disease. This year, the symposium will include five sessions:

Session I: Parasite Morphology

Session II: Ecology and Epidemiology

Session III: Fish Host Studies

Session IV: Oligochaete Host Studies

Session V: Management

A Thursday evening poster session is planned to encourage further communication among research groups. Suggested topics:

A. Proposed Research Projects

B. Preliminary Research Findings

C. Diagnostic and Field Research Techniques

Please submit your paper or poster TITLE by **October 30, 1998** to:

The Whirling Disease Foundation

P.O. Box 327, Bozeman, Montana 59771-0327

(406)585-0860 phone

(406)585-0863 fax

whirling@mcn.net e-mail

Include author's name(s), affiliation(s), address(es), phone, fax, and e-mail addresses. Make sure to indicate the person who will present the paper or poster. Conference chair, Dr. Jerri Bartholomew, and the session chairs (to be announced) will review all titles. Notification of acceptance will be made by November 9, 1998. You will then be asked to submit an extended abstract (2-10 pages), specifications forthcoming, by January 11, 1999. These abstracts will be published before the conference in a Proceedings. Please call the Whirling Disease Foundation with your comments or questions at (406)585-0860. You will receive a conference registration packet, including a preliminary agenda, by mail in early December.

Travel Information: Call Kristin at the Travel Station (800-522-8747) for information on reduced airfares. You can receive a 10 % discount off Delta's lowest published fare if you book 60 days in advance. Special hotel rates for this conference are available from the Holiday Inn-Parkside (800-399-0408). Other hotel listings will appear in the December registration packet.

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FIRST ANNOUNCEMENT:
OFFICE INTERNATIONAL DES ÉPIZOOTIES
World Organization for Animal Health
International Conference on Risk Analysis in Aquatic Animal Health
Paris, 8-10 February 2000

The OIE has the pleasure to announce that a conference is to be organized on risk analysis in aquatic animals. It will be held at the headquarters of the Office International des Epizooties (OIE) in Paris from 8-10 February 2000 and will represent the first opportunity to bring together experts in this increasingly important field. Keynote presentations will be made by invited speakers from international agencies, national government departments, academic institutions and the aquatic animal trade. The poorly understood aspects of the life-cycles and survival parameters of fish and shellfish pathogens make the application of risk assessment to even the most studied models difficult. In fact there are certain critical areas, such as diagnostic techniques and the environmental impact of pharmaceuticals, in which research is lacking and risk assessment can be a useful approach in highlighting research priorities for these topics. Consequently, since risk analysis is a tool to help decision makers, there is a current need for a supportive forum in order to help solve the problems reported to have been encountered in carrying out existing risk analysis methods. The OIE facilities will allow for plenary sessions and a series of discussion groups.

The main conference languages will be English and French, with simultaneous translation facilities being provided. The formal sessions will be concerned with: The need for risk analysis, risk analysis methodology, areas of application to aquatic animals (including problems, research needs and environmental concerns) case histories and field studies, recommendations and future prospects. Each session will be introduced by one or more keynote speakers, followed by offered papers. The discussion groups are designed for both experts and non specialists to have the opportunity to share knowledge and exchange points of view on specific problems. Topics for discussion will include diagnostic methods, detection, pathogen survival and infectivity parameters, with the possibility of including other more practical areas, such as the use of 'survival' data, dose-infectivity data and technical aspects which create problems during risk analysis. In addition, there will be an experimental "think tank" that will involve experts in a chosen field assigning probability distributions to pre-determined risk factors. Proceedings of the conference will be compiled in order to reflect the content and purpose of the conference by selecting certain presentations for later publication.

It is also envisaged that a course on Risk Analysis for Aquatic Animals will be held immediately before the main conference. This would be a completely independent fee-paying course in a central Paris location for a limited number of participants which will be designed to deal with more practical aspects of risk analysis appropriate to fish and shellfish. The content of the conference will be particularly relevant to national and regional authorities concerned with movements of aquatic animals or their processed products. In addition, specialists in aquatic animal health, aquaculture associations and individuals involved in risk analysis will benefit from the varied conference content. A registration fee of 2000 French Francs will include the abstracts book and a copy of the published proceedings. The second conference announcement and call for papers will be in November 1998. In the meantime, further details can be obtained from: Dr. K. Sugiura, OIE Secretariat, 12 Rue de Prony, 75017, Paris, France. Tel: +331 44 151888; fax: +33 1 42 670987; email: k.sugiura@oie.int.

PASSAGES: OBITUARIES

LOUIS LEIBOVITZ, 1921-1989

It is with great sadness that we must announce the passing of our colleague Dr. Louis Leibovitz, Professor Emeritus of Avian and Aquatic Animal Medicine. Dr. Leibovitz died on 22 August 1998 in Falmouth, MA, after a long battle with cancer. Dr. Leibovitz joined the faculty of theCollege of Veterinary Medicine at Cornell University in 1973 after serving as a field veterinarian at the Cornell University Duck Research Laboratory in Eastport, Long Island, N.Y. for 10 years. It was during his service at the Duck Lab that Dr. Leibovitz first identified and described Duck Viral Enteritis as a disease that was causing serious losses to the Long Island, N. Y. duck industry.

Upon moving to Cornell, Lou established a program of research, teaching and service in aquatic animal health. The primary focus of his research was on diseases impacting the clam and oyster industry of Long Island. His practical diagnostic approach to the disease problems faced by the shellfish industry provided immediate help to an industry faced with serious health-related losses. In 1981 Lou moved to the Marine Biological Laboratory, Woods Hole, MA to serve as Director of the Laboratory for Marine Animal Health. This facility was funded by an NIH grant jointly administered by the College of Veterinary Medicine at Cornell University and the School of Veterinary Medicine at the University of Pennsylvania. While at Woods Hole, Lou performed ground breaking research on the diseases of a number of marine invertebrates and fish used by the Woods Hole scientific community as biomedical research models. Dr. Leibovitz provided the original descriptions for many of the diseases he encountered. He also served as one of the original faculty members of the AQUAVET Program, an instructional program in aquatic veterinary medicine co-sponsored by Cornell and Penn. He served in these roles until his retirement in 1988.

Dr. Leibovitz attended Pennsylvania State University until 1942, then served four years in the Army Veterinary Service and won a Battle Star in the European theater. He earned a V.M.D. from the University of Pennsylvania in 1950. He was in private veterinary practice for six years then on the faculty of Delaware Valley College, Doylestown, PA, as a Professor of Avian Pathology and Director of Poultry Diagnotics. In 1963 he joined the Cornell University Duck Research Laboratory.

We have lost a unique and valued colleague and a true friend. Our deepest sympathies go out to the Leibovitz family.

Submitted by:Paul R. Bowser, PhD
Aquatic Animal Health Program
Department of Microbiology and Immunology
College of Veterinary Medicine, Cornell University

PASSAGES: OBITUARIES

ROBERT R. RUCKER, 1912-1998

Dr. Robert R. Rucker, internationally known fishery biologist and former Center Director (1950-1973) of the U.S. Geological Survey, Biological Resources Division, Western Fisheries Research Center in Seattle, Wa., died on July 16, 1998, at the age of 86.

Dr. Rucker was born January 23, 1912, in Goodhue, Minnesota and received a doctorate in fisheries biology from the University of Washington in 1944. Due to war-time necessity, he initially conducted microbiological research at the Technological Laboratory, U.S. Fish and Wildlife Service, College Park, Maryland. In 1945, Rucker transferred to the Montlake Laboratory of the U.S. Bureau of Fisheries in Seattle. Here, he developed a pioneering fish disease research program to provide the scientific information needed to improve the survival of Pacific salmon released from federal and state hatcheries then being built to mitigate the loss of salmon runs caused by dams on the Columbia, Willamette, and other Pacific Northwest rivers.

In 1950, Dr. Rucker established the Western Fish Disease Laboratory at the College of Fisheries, University of Washington where he was an adjunct professor. He and his staff continued their pioneering research, developing several new and improved diagnostic and control methods for the infectious and non-infectious diseases limiting the success of the federal and state hatchery system. In 1957, Rucker moved the laboratory to the Sand Point Naval Air Station. The improved scientific capabilities of the new facility allowed the development of advanced research information in fisheries biology that is still in use today, and international recognition of both Rucker and his staff by the scientific community.

Although he retired from active research in 1973, Rucker was well known to the current staff of the USGS Western Fisheries Research Center, because he often stopped by the laboratory to see how the place was holding up without him. As stated by Dr. Frank Shipley, present Center Director, "Dr. Rucker was a pioneer in the field of fish disease research. Under his direction the laboratory grew into an internationally known fish health research organization. He was a friend to us all and foremost among the Center's emeritus scientists. His memoirs appear on the Center's home page at http://biology.usgs.gov/wfrc/."

In addition to his scientific work, Rucker was an accomplished musician and played first flute in the Emeritus Symphony for many years after his retirement. He and his wife were regular supporters of both the Seattle Symphony and Seattle Opera.

Dr. Rucker is survived by his wife, Harriet Ruth; children, Richard, Frederic, and Martha; six grandchildren, and one great granddaughter.

PASSAGES: CHANGE OF ADDRESS

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POSITIONS

The Oregon Department of Fish and Wildlife is seeking a professional fish pathologist or fish health specialist with responsibilities in the prevention and control of fish diseases in Oregon's fish resources. Located at Clackamas near Portland, Oregon, this position provides fish health services at assigned fish hatcheries including preventative monitoring, diagnostics and applied research. This position requires three years of experience as a professional fish pathologist or fish health specialist with knowledge of chemical, microbiological, virological and parasitology principles, microbiological laboratory techniques, methods of fish disease prevention and control; AND a Bachelors degree in biological sciences. A Masters degree specializing in fish pathology or fish health management will substitute for up to one year of the required experience and a Doctorate degree specializing in fish pathology or fish health management or a Doctor of Veterinary Medicine will substitute for up to two years of the required experience.

Current salary range is $2,684-3,753 monthly with a 3% increase on 12/1/98. Starting salary negotiable commensurate with qualifications and experience. In addition, benefits include a retirement program and contribution toward health, dental and life/disability insurance, paid holidays, vacation and sick leave. For application materials call (503) 872-5305, 24 hours a day, 7 days a week or visit the Department's web site at www.dfw.state.or.us. Closes November 30, 1998.

Fish Health Section Newsletter
American Fisheries Society
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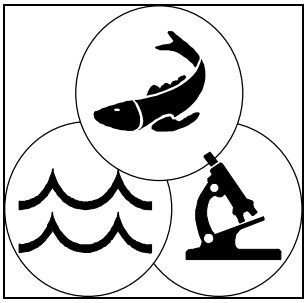

Deadline for next issue:
December 1998

Fish Health Newsletter - Editorial Policy

The *Fish Health Newsletter* is a quarterly publication of the Fish Health Section of the American Fisheries Society. Submissions on any topic of interest to fish health specialists and preliminary case reports are encouraged with the understanding that material is not peer reviewed. Abstracts submitted to the *Journal of Aquatic Animal Health* are also encouraged. Articles should not exceed two newsletter pages and should not have more than five references. Submissions *must* be formatted in WordPerfect 6.x (preferred) or other major Windows word processors, and can be sent by electronic mail or via 3.5" floppy disk to the content editor's address below:

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