Fish Health Newsletter

American Fisheries Society/Fish Health Section

Volume 31 Number 4 November 2003

In this issue:

President's Report:

Good News/Bad News

Winter has made an early appearance here in northern Utah; and we've had a white Halloween and been under a snowpack for the past 10 days. After the long hot summer and six years of drought it's a welcome change.

First, the good news. According to Aaron Lerner at the AFS Parent Society, sales of the new digital Bluebook are going well. This should provide some needed revenue to the Section, but more importantly, the new Bluebook is filling a long-vacant gap in the area of fish disease diagnostics and fish health inspections. New pathogens, new technology and new techniques have been incorporated into this new edition. At the risk of sounding biased (to which I freely admit), the reviews thus far have been all very positive. Thanks again to all the many volunteers who shared their time and expertise to make this happen!

Already, work is underway on next years Bluebook edition. Expert review teams are scrutinizing comments and suggestions made on the Inspection Section. Chapters on new and emerging pathogens are being written for the Diagnostic Section. So, if you haven't already done so, order your copy now!

The new Bluebook has also received some professional recognition. At the urging of Scott LaPatra, our representative to the U.S. Animal Health Association, this group passed a resolution urging consideration of the inspection procedures in formulating National Aquatic Animal Health Plans. Thanks to Scott for taking the time and effort in successfully presenting this topic before this forum!

Now the bad news; as I mentioned in last newsletters column, our membership has been flat for several years. However, the most recent roster from AFS suggests an even worse picture - we're actually declining! (see accompanying figure) Why this is happening is anybody's guess. I could reiterate all the benefits of membership, i.e., the newsletter, frequent listserv updates of fish health issues, discounts on AFS books, professional contacts and interactions, etc, but that would be preaching to the choir of newsletter readers. I think the bottom line is that we, as members, haven't been "selling" the Fish Health Section and encouraging our associates, colleagues and students to join. So, those of you who work at universities, fish health centers and other laboratories can expect to hear from me in the weeks to come, asking your help in recruiting. Other ideas on how to recruit members and make the Section better are always welcome as well. Let me hear from you!

Chris Wilson
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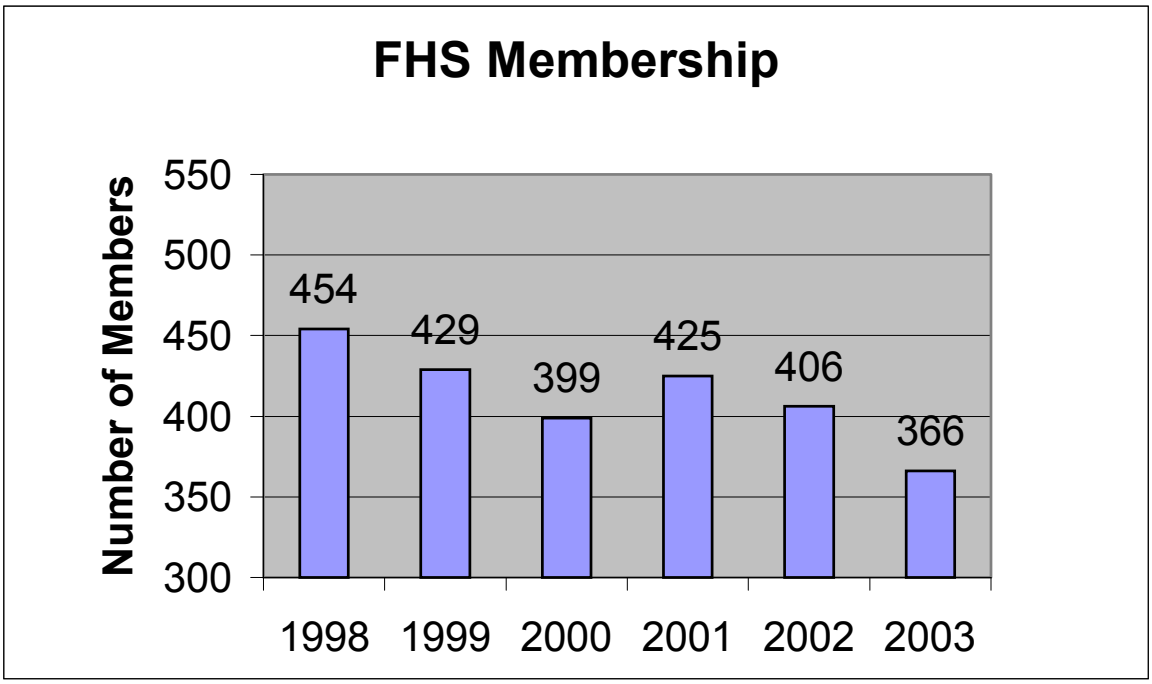

Meetings:

OKLAHOMA CHAPTER AFS, SOUTHERN DIVISION AFS, and B.A.S.S.
LMBV (Largemouth Bass Virus) Workshop.
2ND CALL FOR PAPERS
Southern Division Spring Meeting-2004
The Oklahoma Chapter and Southern Division of the American Fisheries Society invite you to join us in Bricktown, Oklahoma City, OK at the Westin Hotel for the 2004 Southern Division Spring Meeting, 26-29 February 2004.
Please advise that potential attendees of the LMBV Workshop need to contact the Conservation Director of B.A.S.S. (334-272-9530) if they are interested in attending the free workshop.

Hotel and Registration Information:
Room rates are $89 per night for single through quad occupancy.† Rooms must be reserved by 25 January 2004 to receive this rate and guarantee availability. Reservations will be accepted via phone only (405) 235-2780. State you are with the American Fisheries Society. Check the meeting website for more hotel reservation information ([http://members.cox.net/gregsumm/]http://members.cox.net/gregsumm/)

Meeting registration forms can be down loaded at ([http://members.cox.net/gregsumm/registratio]http://members.cox.net/gregsumm/registration). Meeting registration is $65 for students and professionals prior to 1 February 2004 and $75 thereafter. Students seeking free accommodations should download the form off the meeting website. Students applying for reimbursement of registration costs by working at the meeting should contact Dan Dauwalter: [mailto:dauwalt@okstate.edu]dauwalt@okstate.edu.

Schedule of Events:
-Thursday 26 February-Technical Committee Meetings
-Friday 27 February-Southern Division EXCOM Meeting; Southern Division Business Meeting; Continuing Education Workshops, LMBV Workshop, Student Social at "Rocky's" in Bricktown
-Saturday 28 February-Plenary Session, Symposia and Technical Sessions, Poster Session, Social at the "Bricktown Brewery"
-Sunday 29 February (ending at noon)-Symposia and Technical Sessions, Poster Session

Workshops: The 4th Largemouth Bass Virus workshop, sponsored by B.A.S.S. will be held Friday. We also currently have a workshop entitled, "Working with Commissions," scheduled for a full day on Friday. The workshop will be taught by Mike Fraidenburg of Dynamic Solutions Group, LLC. For background information on this workshop see the February 2001 issue of Fisheries. The annual half-day Student workshop is being planned by the Student Affairs Committee. More information on these and other workshops will be available on the meeting website and in the December SDAFS newsletter.

Symposia: Symposia topics currently scheduled include:
-Warmwater Streams: Species Restoration and Recovery Success; Stream Habitat Improvement; Warmwater Streams Fisheries Management
-Ictalurid Biology and Management
-Non-game Fishes

Submission Procedures for Presentations and Posters
Presentations will be scheduled for 20 minutes (15-min presentation and 5 min for questions, which will be strictly enforced. Media for presentations is Microsoft PowerPoint. Abstracts should be a 200-word (or less) statement of objectives, principal results and conclusions.† All abstracts must be submitted on-line at [http://www.sdafs.org/abstracts]http://www.sdafs.org/abstracts . Abstracts for symposia and contributed presentations, as well as posters are due by 1 December 2003. If your presentation is part of a symposium be sure to acknowledge on the abstract submission form. For additional information contact Jeff Boxrucker, Oklahoma Fishery Research Laboratory, 500 E. Constellation, Norman, OK 73072; (405) 325-7288; [mailto:jboxrucker@aol.com]jboxrucker@aol.com

Check out the meeting website at http://members.cox.net/gregsumm/ .This site will be updated as more information becomes available.

Special Notice: Oklahoma State University is having a reunion at the Westin Hotel on Friday night, February 27th from 5pm to 7pm. We welcome all former Cowboys and Cowgirls. Check the bulletin board at registration for room location.

The 9th Biennial Meeting of the FISH DIAGNOSTICIAN'S WORKSHOP, the 54th Annual Meeting of the ANIMAL DISEASE RESEARCH WORKERS IN THE SOUTHERN STATES (ADRWSS), the 18th Annual Meeting of the SOUTHERN CONFERENCE ON ANIMAL PARASITES (SCAP) and the 5th Annual Meeting of the SOUTHERN CONFERENCE OF RESEARCHERS IN AQUATIC DISEASES (SCRAD).

The meeting will be held February 8-10, 2004 at the Isle of Capris Casino Resort, Biloxi, Mississippi, and will be hosted by the College of Veterinary Medicine, Mississippi State University.

Call for papers/registration forms will be sent by December 1.
Abstracts (for ADRWSS/SCAP/SCRAD) will be due January 8th, 2004.

For more information on:
Fish Diagnostician's Meeting: Al Camus (camus@cvm.msstate.edu)
ADRWSS/SCAP: Linda Pote (lpote@cvm.msstate.edu)
SCRAD: Mark Lawrence (lawrence@cvm.msstate.edu)

The 29th Annual Eastern Fish Health Workshop

The National Fish Health Research Laboratory presents the 29th Annual Eastern Fish Health Workshop at the oceanfront Royal Pavillion Conference Center. Registration begins on Monday, March 22 from 5 until 8 PM, and is followed by three full day sessions (March 23 thru 25). This year, our banquet is scheduled for Thursday evening, March 25, and will be combined with a dance and open bar! A continuing education class on "Tumor Biology in Fish," is offered on Friday, March 26. The workshop encourages participation in aspects of aquatic animal health from individuals working within marine and freshwater environments. We encourage you to contribute oral presentations of case reports and research investigations. There are no poster sessions. In addition to our general sessions, special forum sessions that have already been planned include:

Helminths of fish - Alistair Dove, chair

1. Drew Mitchell: Bolbophorus infections in catfish
2. Janine Caira: The cestodes of elasmobranchs
3. Alistair Dove: Bothriocephalus acheilognathi, the Australian experience
4. Mark Siddall (tentative): The state of science of leech parasites of fish
5. Mark Sokolowski (tentative): Pathogenesis of Anguillicola in eels

Emergent issues associated with the health of tropical fishes - Roy Yanong, chair

1. Michael Mauel: PLOs in Tilapia: not ANOTHER granulomatous disease?
2. Greg Lewbart: Surgical Cases in Ornamental Fish: A chance to heal with cold hard steel
3. Donald Neiffer: Parrotheads and Bonnets: major fungal headaches
4. Roy Yanong: Cryptobiosis in the Cichlidae: fun for the whole family

Largemouth Bass Virus Disease: A review - John Grizzle, chair

1. John M. Grizzle: Introduction to Largemouth Bass Virus
2. Robert S. Bakal: Distribution of Largemouth Bass Virus
3. Tony L. Goldberg: Host, Pathogen and Environmental Factors Influencing Susceptibility
4. Jack Gaskin: Application (and Implication) of Serology in LMBV Infection of Centrarchids
5. Mohamed Faisal: Expansion of Largemouth Bass Virus Range in Michigan's Lower Peninsula

Emergent issues associated with the health of tropical reefs – Laurie Richardson, chair

1. Cheryl Woodley: Shifting the Paradigm for Coral Reef Health Assessment
2. Ginger Garrison: Chemical Contaminants in African Dust and Coral Reef Organisms
3. Dee Mills: Amplicon Length Heterogeneity - a Tool to Investigate Coral Microbial Communities
4. Laurie Richardson: Species Specific Molecular Probe Investigations of "White" Diseases of Corals

5. Garriet Smith: Recent Studies on Yellow Band Disease of Scleractinian Corals
6. Diego Gil: Differential Response of Zooxanthellae to Bacterial Toxins that Bleach Stony Corals
7. Shawn McLaughlin: Case Studies of the International Registry of Coral Pathology

Issues and Trends Associated with Aquatic Animal Diagnostics – Stephen Kaattari

1. Stephen Kaattari: Immunodiagnostics in Theory and Practice
2. Kimberly Reece: Molecular Diagnostics in Theory and Practice
3. Gene Burreson: Issues associated with a Reference Laboratory for Shellfish diseases
4. Janet Warg: USDA/APHIS and veterinary diagnostics

Issues and Trends Associated with Commercial Aquaria - Scott Weber

1. Jill Arnold: Diagnostic microbiology for small laboratories: a practical guide for the identification of bacterial isolates from fish.
2. Lisa A. Murphy: Whole Blood and Plasma Cholinesterase Levels in Normal Koi (Cyprinus carpio)
3. Craig Harms: Apatite concretions in spiral colon of yellow stingray (Urolophus jamaicensis) fetal pups
4. Sue Goodridge and Andrew Routh: Problems With Protozoa - Treatment of Cryptocaryon irritans in a Giant Ocean Tank.
5. Scott Weber and Holly Martell: From Wild to Exhibit: Notes on Caribbean collecting, shipment and quarantine.

Continuing Education Opportunity

Tumor Biology in Fish will be presented by Dr. John Fournie of the US EPA Laboratory, Gulf Breeze. This overview on neoplastic lesions in fish is for individuals who have had little experience in this area of science.
The session will be held on Friday, 26 March 2004 from 8:00 AM until 4:00 PM. Individuals earn 7.0 hours of CE Credit from the Fish Health Section of the American Fisheries Society. Specific questions should be addressed to Vicki Blazer (vicki_blazer@usgs.gov). Class size will be limited and based on a first come, first served basis. There is a $35.00 (U.S.) registration (breakfast and lunch included) and checks should be paid to Rocco Cipriano c/o Eastern Fish Health Workshop before 15 February 2004. .
The Royal Pavilion is an ocean-front facility used in the past. Many of our participants have asked to return to this site. You can check out the resort's website at http://www.rpresort.com/royalpav.
If you have not received announcements for this meeting, you can be placed on the e-mail distribution list for further announcements by contacting Rocco Cipriano at Rocco_Cipriano@usgs.gov.

4th World Fisheries Congress
Vancouver, BC CANADA

May 2 - 6, 2004
The Congress theme, "Reconciling Fisheries with Conservation: The Challenge of Managing Aquatic Ecosystems," will be addressed by a world class list of Keynote speakers, session topics, posters, limited presentations, round table discussions, forums, workshops and debates.

Online Abstract Submittal for the Fourth World Fisheries Congress will open April 2003. Please visit www.worldfisheries2004.org for details

FIRST CALL FOR PAPERS AND REGISTRATION FOR THE 45TH WESTERN FISH DISEASE CONFERENCE, JUNE 22-24, 2004 IN JUNEAU, ALASKA

Meeting Registration and Continuing Education Workshop

The 45th Western Fish Disease Conference will be hosted by the Fish Pathology Section of the Alaska Department of Fish and Game in Juneau, Alaska during Wednesday and Thursday June 23-24th, 2004. A Fish Health Section Continuing Education Workshop will precede the meeting on Tuesday June 22nd. The registration fee for the CE workshop is $30 and the agenda will be announced at a later date. An off site venue planned for the evening of June 23rd is a 3 hr whale watching and buffet dinner cruise (with NO host bar) from a 78 ft catamaran (www.allenmarine.com) that is included in the $140 meeting registration fee along with break refreshments, abstract and agenda booklet. Checks for meeting registration should be made payable to "*Western Fish Disease Conference/FHS*" and mailed to Ted Meyers at the address below. The deadline for registration and hotel room reservation is *May 31, 2004*. Sorry, but we will NOT be able to take credit cards for registration fees.

Hotel and Transportation into Juneau

A block of rooms have been reserved at the historic Westmark Baranof Hotel (www.tripadvisor.com/Hotel_Review-g31020-d73086) in downtown Juneau where the meeting will be held. Room rates are $129/night single or double occupancy + 12% sales tax. Reservations can be made by calling Westmark Central Reservations @ 1-800-544-0970. June is the middle of Juneau's busy tourist season, so please make your room reservations early to take advantage of the hotel rate and reduced fares with advanced booking on Alaska Airlines. Block room rates are from June 21-23 but can be extended several days on either end of the meeting for those wishing to spend recreational time in Juneau. Juneau is also a good stopover point for those who might wish to tour Glacier Bay or travel on to Anchorage and Denali Park after the meeting. Transportation from the Juneau airport to the hotel is a 15-minute ride by taxi or rental car (Budget, Avis, Rent-A-Wreck).

Juneau is located in the rainforest of the Southeast panhandle of Alaska and can be reached only by sea or air. For those having time for a cruise, the Alaska Marine Highway Ferry system travels from Bellingham, WA providing a pleasant 2-day voyage on their flagship the Columbia. Reservations may be made online (www.alaska.gov/ferry). Alaska Airlines flies direct to Juneau from SeaTac Airport in Seattle several times daily with a flight time of about 2 hrs. Super Saver fares are available if tickets are booked in advance and during special offers on the airline website (www.alaskaair.com).

Juneau weather is unpredictable and noted for rain almost anytime but late June can be one of the driest periods of the year having an abundance of sunny weather with pleasant daytime temperatures of 65-70^{o}F. **Note for Fisherpersons:** chinook (king) salmon fishing generally peaks in June and can be quite good while pink and chum salmon as well as halibut will also start to show up in the fishery. Fishing charters, glacier and scenic tours, wildlife and whale cruises, gold rush history and special interest attractions are all available in Juneau with detailed planning and reservation information provided by the Juneau Convention and Visitors Bureau website (www.traveljuneau.com).

Instructions for Abstracts and Oral Presentations

This is the first call for abstracts regarding oral and poster presentations addressing all aspects of diseases in wild and cultured aquatic animals. Abstracts must be submitted in camera-ready format. All printed material should fit into a box having margins of 14 X 15 cm. The format should include: 1) title in capitalized letters; 2) superscript numbers to denote affiliations if multiple authors; 3) an (*) following the author's name who will make the presentation; 4) use a high quality printer and font size with at least 12 pitch, preferably Times New Roman. PowerPoint presentations for oral delivery should be emailed or sent on 3.5 floppy disc prior to the conference. Oral presentations should be no longer than 12 minutes leaving 3 minutes for questions.

Abstracts are due no later than *April 15, 2004* and should be submitted by mail or email in Microsoft Word with the registration/abstract form (attached) to Ted Meyers at the indicated address below. No Faxed abstracts please.

Contact Information

Ted Meyers
Alaska Department of Fish and Game
Commercial Fisheries Division
P.O. Box 25526
Juneau, AK 99802-5526

Telephone: (907) 465-3577
FAX: (907) 465-3510
Email: (ted_meyers@fishgame.state.ak.us)

Registration and Abstract Submission Form

Name: _____

Address: _____
_____

Telephone: _____ email: _____

Registration Fee (includes dinner cruise) = $140 _____

Number of guest dinner tickets _____ @$78 each _____

Registration for the Continuing Education Workshop = $30 _____
(Agenda to be announced)

Total Amount enclosed _____

Make Checks Payable to "Western Fish Disease Conference/FHS"

Submitting an abstract for the meeting? Yes_____ No _____

Title: _____
_____

Type of Presentation Oral _____ Poster _____

Equipment Needs: Slide Projector _____ LCD Projector _____ Other _____

Return Registration Form, Abstract and Payment To:

Ted Meyers
Alaska Department of Fish and Game
Commercial Fisheries Division
P.O. Box 25526
Juneau, AK 99802-5526
(907) 465-3577
Email: ted_meyers@fishgame.state.ak.us

2004 AFS FISH HEALTH SECTION MEETING

The 2004 AFS FHS meeting will be hosted by the USGS Fish Health Research Laboratory, Kearneysville, WV. The meeting will be held Sunday July 25 (registration and reception) through Wednesday July 28th at the Fish and Wildlife Service's National Conservation Training Center (NCTC) in historic Shepherdstown, WV. A continuing education course "**Current Topics in Fish Parasitology**" will be held Thursday July 29th. This will be a 7.0 hour session organized by Dr. Alistair Dove of the Marine Disease Pathology and Research Consortium located at the Marine Sciences Research Center, SUNY Stony Brook, NY. The session will provide an overview of contemporary topics associated with parasitology of fishes. The target audience will be those individuals who want an in depth coverage of new diseases and new concepts in fish parasitology. Individuals participating in this program will earn 7.0 CE credit hours from the Fish Health Section of the American Fisheries Society. Contact person A. Dove (add9@cornell.edu). The class size is limited to 40 people, based on time when registration is received.

Onsite rooms (106) are available at NCTC for these dates. Lodging at NCTC includes meals – dinner the day of check-in through lunch the day of check-out. For those of you who have not visited NCTC before, the cafeteria is excellent and provides a variety of choices for all meals. Meals and lodging are $78.00 for FWS employees; $84.00 for BLM/NPS partners and $115.00 per day for all others. NCTC is about an hour's drive from Washington Dulles airport and 1½ hours from Baltimore. There are also two hotels within approximately 4 miles of the meeting site. Those who lodge offsite or commute may elect to pay for meals a la carte or purchase a lunch pass at NCTC.

Registration will be $120.00 and will include a barbeque (weather permitting) Monday night, a banquet Tuesday night and all breaks throughout the day. Optional tours (free of charge if there is enough interest) will include a tour of Harpers Ferry – ghost tales, lore and legend Wednesday evening and Antietam National Battlefield Thursday evening for those staying for the continuing education course.

Important Deadlines: June 1, 2004 - Preliminary submission that includes the following: 1) Intent to attend, 2) title of presentation, 3) whether poster or oral is preferred and 4) if oral, type of presentation – slides or powerpoint. This will allow the organizing committee to prepare a preliminary agenda prior to the meeting. In addition, NCTC requires a Participant List submitted at least 30 days prior to the event so also needed is 5) full name, 6) affiliation, lodging designation (onsite, offsite, commuter), 7) lodging/attendance dates and 8) if staying offsite are there any meals you will be buying at the cafeteria. Please submit this information by email to vicki_blazer@usgs.gov.

June 15, 2004 Formal abstracts and registration fees due.

For any questions feel free to contact Vicki Blazer (P 304 724 4434; email vicki_blazer@usgs.gov) or Rocco Cipriano (P 304 724 4432; email rocco_cipriano@usgs.gov)

2005 Annual Meeting of the Fish Health Section, American Fisheries Society
In 2005 the Annual Meeting of the Fish Health Section will move to the Midwest. An offer to host the meeting by Joe Marcino of the Minnesota DNR has been accepted by the FHS. The meeting will be in the Minneapolis, MN area with the specific date in the summer not yet confirmed.

Announcements:

The Hutton Junior Fisheries Biology Program

The third year of the Hutton Program was a resounding success! Fifty-four high school students throughout the United States and in Puerto Rico spent an exciting summer experiencing the worklife of a fisheries biologist. Although it is a relatively new program for AFS, the Hutton is important to the future of the profession. The ultimate goal of the program is to recruit young people into a career in fisheries, particularly those groups underrepresented in the profession. These students would eventually be able to fill some of the vacancies created by a retiring workforce. The Hutton has enhanced the lives of the students and mentors it served over the past three years, and it has the potential to provide the profession with a new generation of fisheries biologists.

Mentor applicants for the 2004 Hutton Program are encouraged to apply as soon as possible. This is your chance to contribute to the development of the youth in your area and to your profession. For more information on the Hutton Program and to download 2004 mentor and student applications, visit the AFS website at [http://www.fisheries.org/Hutton.shtml]http://www.fisheries.org/Hutton.shtml. If you need additional information, please contact Jan Lubeck at [mailto:jlubeck@fisheries.org]jlubeck@fisheries.org or Christine Fletcher at [mailto:hutton@fisheries.org]hutton@fisheries.org.

The **Information Resources on Fish Welfare** is now up on the AWIC website.
Erickson, HS (2003) ***Information Resources on Fish Welfare: 1970-2003***. AWIC Resource Series No. 20. U.S. Dept. of Agriculture, National
Agricultural Library, Animal Welfare Information Center. Beltsville, MD. 436 pp.
http://www.nal.usda.gov/awic/pubs/Fishwelfare/fishwelfare.htm
NAL Call No. aHV4701.A94 no.20
Abstract: The Information Resources on Fish Welfare has been designed to provide the most current worldwide data available regarding fish welfare for use by both those who have knowledge in one of the various fish related fields or may even be professionals in a fish related field, as well as for individuals who are interested in learning more about fish welfare issues. This publication does not present an opinion on the subject but is rather a comprehensive review of the available information resources regarding fish welfare and its related issues. In this timely publication, AWIC, in cooperation with various authors and publishing houses, provides twelve national and international current review articles and guidelines, which cover the topics of general fish welfare, pain and awareness related to fish, and fish welfare related to aquaculture, laboratory and field research, and fisheries. In addition to the review articles, a thorough review of the literature (including citations with abstracts and web sites) is presented, including the following topics: 1) general fish welfare related topics: alternatives; anesthesia and euthanasia; awareness, cognitive ability, and fear; pain and distress; and health and welfare; 2) culture, fisheries, and research related topics: angling; aquaculture; fisheries; laboratory; aquarium fishes (including general topics, ornamentals, dealers, and pet shops); and selected husbandry topics (including animal domestication, harvest and slaughter, holding and transport, and tagging); and 3) regulatory issues (including a table of national and international animal welfare acts related to fish). As an additional resource for institutional animal care and use committees (IACUC), a section on fish related IACUC web resources is provided. Educational training materials and courses are presented for those wishing to delve further into educating themselves and their facility employees about fish welfare. AWIC presents this material to provide the various fish communities and regulatory agencies worldwide a comprehensive resource on fish welfare. As this publication does not present an opinion regarding fish welfare, we at USDA hope that the national and international readers (producers, researchers, IACUC members, government representatives, aquarists, and general public) will use the scientifically based guidelines and information to answer the questions regarding the impact of human activities on fish welfare in his or her field, for his or her species, and to act accordingly to prepare and follow humane procedures for the care and husbandry of aquatic animals. This publication is also presented as a resource for United States Federal Government grant applicants and awardees that will use fish in their proposed research.

To request copies please use the AWIC email address (awic@nal.usda.gov) or contact the Editor (Heidi S. Erickson, Ph.D.) at the contact information listed below.

Heidi S. Erickson, Ph.D. Tel: 301-504-5170
Technical Information Specialist FAX: 301-504-7125
USDA, ARS, NAL, AWIC herickson@nal.usda.gov
10301 Baltimore Ave. http://www.nal.usda.gov/awic/
Beltsville, MD 20705

NEW RELEASES FROM AFS

Biology, Management, and Protection of Catadromous Eels
Douglas A. Dixon, editor

Effective management and protection of eels are an increasing challenge to resource agency managers and operators of water resource projects, such as hydroelectric operations. The rapid evolution of technical information requires opportunities for information exchange and dialog such that management methods, protection needs, and protection measures can be effectively determined.

This book will be the principal source for scientific information on catadromous eels. There is no other single source for such information; in fact, not since 1977 has a book or edited volume of technical papers including eel biology been produced.

AFS Symposium 33
388 pp., hardcover, August 2003
Stock Number: 540.33
List Price: $75
AFS Member Price: $53
ISBN 1-888569-42-5

To order:
Online: [http://www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi]www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi
Phone: (678) 366-1411, or Fax: (770) 442-9742
Email: afspubs@pbd.com

Biodiversity, Status, and Conservation of the World's Shads
Karin E. Limburg and John R. Waldman, editors

As the seminal volume to address shad status, biology, and conservation, the proceedings of "SHAD 2001: A Conference on the Status and Conservation of Shads Worldwide," provides a comprehensive review of the world's shads. Shads are an entire subfamily of herrings, the Alosinae, which is composed of more than 30 species across six continents. Most shads are anadromous and face anthropogenic pressures in both the freshwater and marine environments. These include the multiple, compounding stresses of overharvesting, pollution, and habitat loss.

This title provides the most current, fundamental biological information on the group; describes the status of individual species; synthesizes global trends in shad populations; and develops conservation strategies to broaden the understanding of shads for fishery managers, researchers, and students alike.

AFS Symposium 35

370 pp., paper, August 2003
Stock Number: 540.35
List Price: $75
AFS Member Price: $53
ISBN 1-888569-51-4

To order:
Online: [http://www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi]www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi
Phone: (678) 366-1411, or Fax: (770) 442-9742
Email: [mailto:afspubs@pbd.com]afspubs@pbd.com

Fisheries, Reefs, and Offshore Development
David Stanley and Ann Scarborough-Bull, editors

This volume is the proceedings of the Gulf of Mexico Fish and Fisheries meeting, focusing on the impact and effects of oil and gas development on fish and fisheries in the Gulf of Mexico. The book covers (1) an evaluation of natural and artificial reef productivity, (2) fisheries management in the Gulf of Mexico, (3) a compilation of offshore petroleum platform assemblage research, (4) the impact of outer continental shelf (OCS) development on the marine community, (5) OCS and deepwater marine ecology, and (6) artificial reefs and fisheries management. The volume provides new information and research and updates the 1991 AFS symposium “Fisheries and Oil Development on the Continental Shelf."

AFS Symposium 36
238 pp., paper, August 2003
Stock Number: 540.36
List Price: $60
AFS Member Price: $42

ISBN 1-888569-54-9

To order:
Online: [http://www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi]www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi
Phone: (678) 366-1411, or Fax: (770) 442-9742
Email: afspubs@pbd.com

Investigation and Monetary Values of Fish and Freshwater Mussel Kills
Robert I. Southwick and Andrew J. Loftus, editors

This book is an update and expansion of the widely accepted monetary values of fish that have been published by AFS since 1975 (last updated in 1992 as Special Publication 24). This publication has been adopted as the legal basis for restitution or fines in more than half the states and has been upheld in numerous legal challenges.

In this current version, freshwater mussels are included for the first time. The publication contains comprehensive methods for assessing fish kills and freshwater mussel kill events and for assessing restitution based on replacement cost for organisms lost in the kill. Tables containing updated replacement cost values for most major fish species that are cultured and for all freshwater mussel species in the U.S. are included.

This book is a must for anyone involved with fish or freshwater mussel kills, propagation, and water pollution policy.

BOOK AND CD
AFS Special Publication 30
179 pp., paper, August 2003
Stock Number: 510.30
List Price: $45
AFS Member Price: $32

ISBN 1-888569-48-4

CD ONLY
Stock Number: 703.13
List Price: $39
AFS Member Price: $27
ISBN 1-888569-49-2

To order:
Online: [http://www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi]www.fisheries.org/cgi-bin/hazel-cgi/hazel.cgi
Phone: (678) 366-1411, or Fax: (770) 442-9742
Email: afspubs@pbd.com

BKD ELISA: Correlation Between "New" Kirkegaard and Perry Antibody Lots and Those of Mother Batch 1

Roberta Scott and Keith Johnson, Eagle Fish Health Laboratory,
Idaho Department of Fish and Game, Eagle, Idaho.

Fisheries agencies throughout the Pacific Northwest have relied on commercially available antibody reagents for detecting *Renibacterium salmoninarum* antigen by enzyme-linked immunosorbent assay (ELISA). The successful culture of chinook salmon *Oncorhynchus tshawytscha* has relied on ELISA test results to help manage bacterial kidney disease (BKD) (Pascho et al. 1991, Meyers et al. 1993). The culling and/or segregation-culture of progeny utilizing ELISA results, along with intraperitoneal injection of erythromycin (20mg/kg) (Haukenes and Moffitt 1999) in all adult brood fish and oral feeding of erythromycin to progeny (Moffitt and Haukenes 1995 University of Idaho INAD #6013) has eliminated or dramatically reduced clinical BKD episodes at five Idaho Department of Fish and Game (IDFG) facilities that rear spring/summer chinook (VanderKooi and Maule 1999, Pascho et al. 1993). The ELISA-based management of BKD in cultured salmonids has been dependent upon the quality and reproducibility of commercially available antibody reagents.

Polyclonal antibodies used in the BKD ELISA programs in the Pacific Northwest have been commercially available through Kirkegaard and Perry Inc (KPL), Gaithersburg, MD, since the late 1980s. The reproducibility of these affinity purified antibodies of mother batch 1 lots (Scott and Johnson 2001) led to consistent results, reflected by fewer outbreaks of BKD in hatchery chinook production groups. In 1996, the batch 1 antibody stocks at KPL were depleted and a second series of goats was immunized. In laboratory tests, the mother batch 2 antibodies were not consistent with the first batch in ELISA optical density (OD) values and required the application of linear regression analysis to adjust "cut-off" values (Scott and Johnson 2001).

In July of 2003, KPL provided our laboratory the opportunity to evaluate new lots of coating (Lot # 030518) and horseradish peroxidase-labeled (HRP) conjugated (Lot # 030746) antibodies processed with a new affinity purification column. Initial tests with these new KPL antibodies were made with diluted KPL controls (Lot KC 30). The antibodies from the new column resulted in optical densities of controls that correlated well with the original mother batch 1 lot numbers (Figure 1). The new KPL coating and HRP conjugated antibodies were tested by checkerboard titration against an array of dilutions to optimize the assay results in an effort to reproduce values of the batch 1 KPL antibodies. Coating antibodies were tested with dilutions from 1:1000 to 1:3000 and the HRP conjugate from 1:1000 to 1:6000 against blanks and KPL positive control (Lot KC30) dilutions of 1:100, 1:500, 1:1000 and 1:5000. These results were compared to the optical densities using batch 1 antibodies. Dilutions of new coating antibodies at 1:1500 and conjugated antibodies at 1:4000 were selected for further testing (Figure 1).

Composite samples of chinook salmon kidney tissue supernatants were assembled from frozen individual samples to attain sufficient sample volume for detailed examination by four laboratories of the Pacific Northwest Fish Health Protection Committee (PNFHPC)

cooperators. The composite samples were assembled based on prior ELISA OD values to encompass a range from negative (<0.10) to positive (0.10 through 1.00); these were then retested by ELISA with the former KPL batch 1 antibodies (coating lot UB065 at 1:1000 dilution and conjugate lot TA025 at 1:2000 dilution) at the Eagle Fish Health Laboratory, IDFG. Figure 2 demonstrates the consistency obtained between the two batches of antibodies as evaluated by the ELISA microplate reader (BIO-TEK Model EL800, Winooski, VT).

The three other PNFHPC laboratories (Western Fisheries Research Center in Seattle, WA, Oregon Department of Fish and Wildlife in Corvalis, OR and National Marine Fisheries Service in Seattle, WA) then tested the same sample set with the new lots of KPL antibodies (coating lot 030518 at 1:1500 dilution and conjugate lot 030746 at 1:4000 dilution). ELISA was run on 123 samples, along with blanks, conjugate controls, and KPL positive controls (Lot KC30) at dilutions of 1:100, 1:500, 1:1000 and 1:5000.

These results are displayed in Figure 3 and indicate good correlation between laboratories when testing the same composite kidney samples. However, the difference between the KPL batch 1 and KPL New antibodies is less when run on the same equipment at a particular laboratory (as in Figure 2). The discrepancies between laboratories testing the same samples demonstrates the need for standardization to compensate for the differences in equipment and especially the variance between plate readers. The need for standardization of ELISA results becomes important when management decisions on egg movements are made using results from different laboratories.

The new KPL antibodies were implemented in the IDFG facilities 2003 spawning season. We would like to express our appreciation to KPL and Mr. Les Kirkegaard for addressing the problem of antibody quality and specificity, and to the cooperating laboratories that participated in this comparison.

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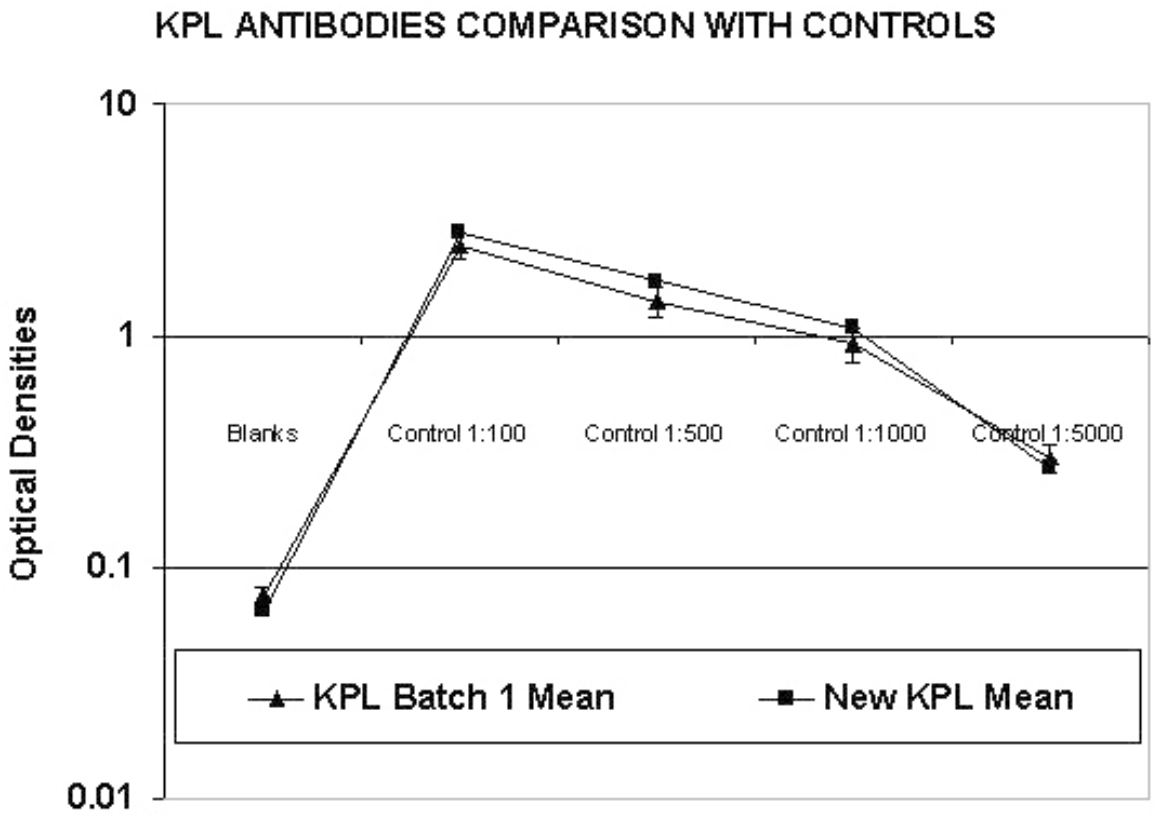

Figure 1: Comparison of blanks and control dilutions between KPL batch 1 antibodies (coating lot UB065 1:1000; conjugate lot TA025 1:2000) and New KPL antibodies (coating lot 030518 1:1500; conjugate lot 030746 1:4000) as tested at the Eagle Fish Health Laboratory, IDFG. (The correlation of optical densities of Figure 1 is a P-value of 0.0003)

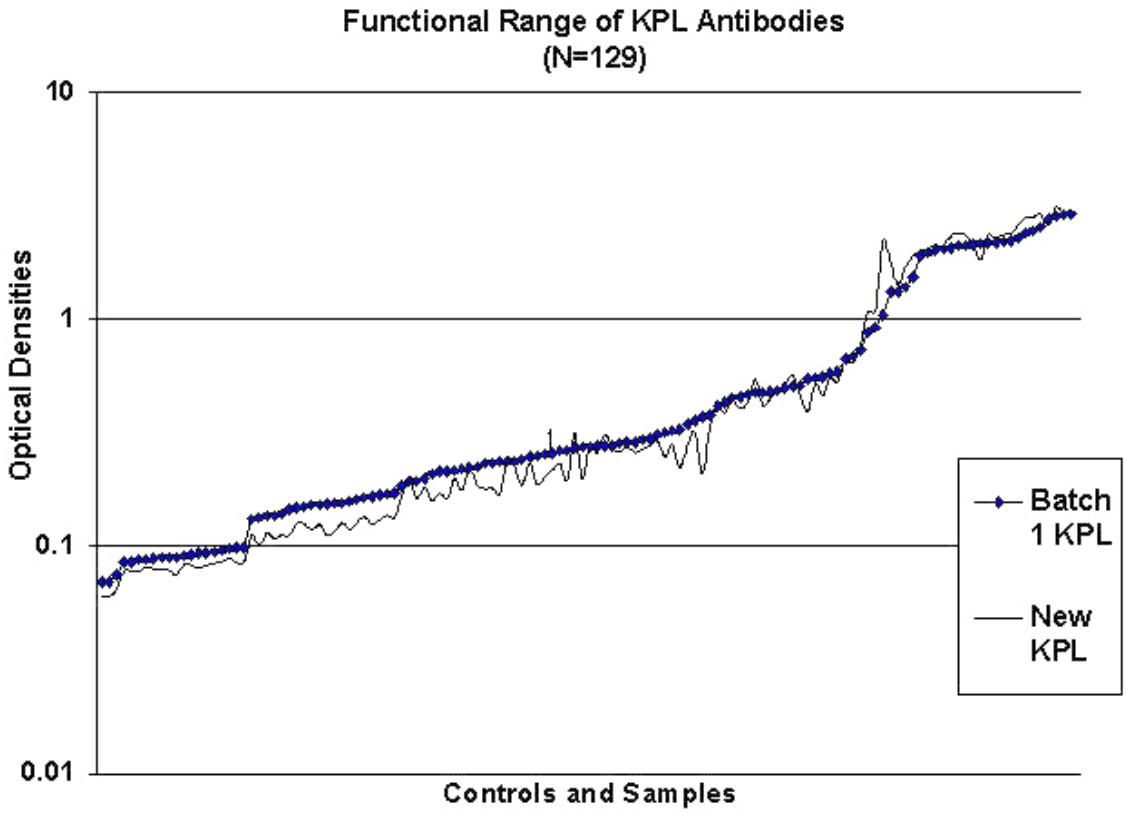

Figure 2: Comparison of optical densities of 123 samples, blank and controls between KPL batch 1 and the new lots of KPL antibodies.

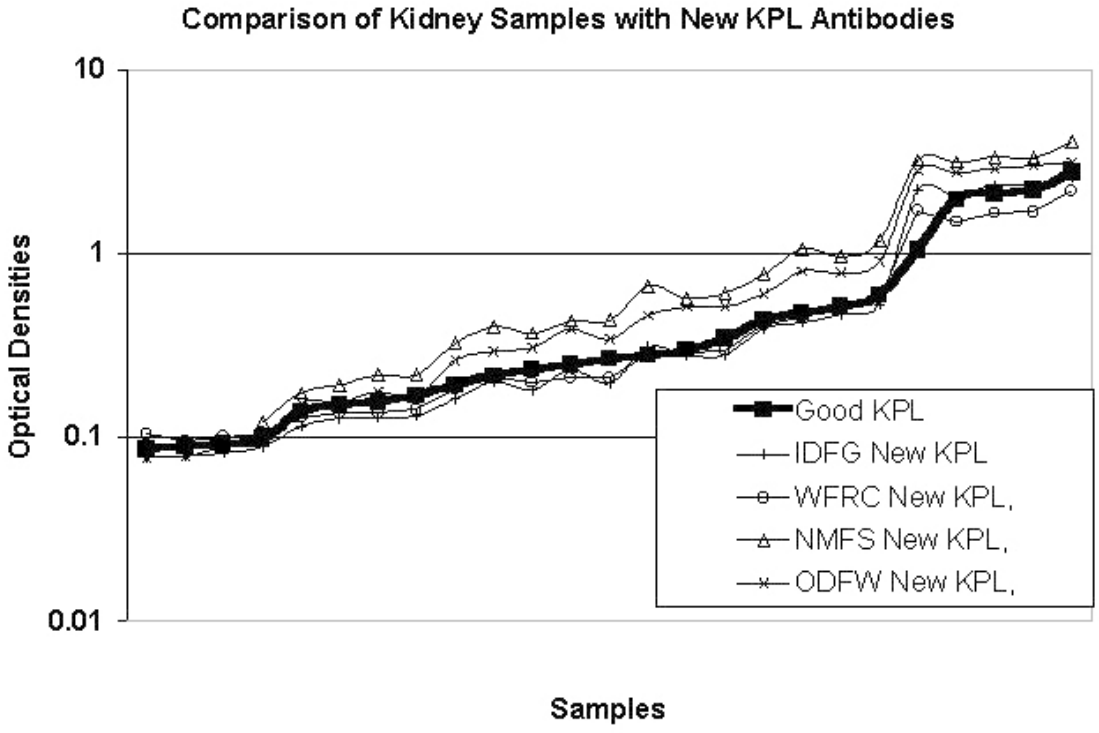

Figure 3: Comparing optical densities of 123 samples tested at four laboratories using the New KPL antibodies with batch 1 (Good) KPL antibodies.

Isolation of marine birnaviruses from new species of wild fishes

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Birnaviruses were first isolated from salmonids in the 60s (Wolf, 1988) but nowadays are known as parasites of several Classes of aquatic animals world-wide: *Teleostei, Agnatha, Mollusca* and *Crustacea* The wide spreading of this virus can be explained by its high stability, and is also due to fish migrations and the relationships predator-prey. The number of species known as host for these viruses is around 80 (Reno, 1999) but is continuously increasing due to the isolations from new hosts. However, due to the economic importance of aquaculture, most of the studies regarding new isolations are referred to cultured fishes.

In the present study, we report the isolation of marine birnaviruses from seemingly healthy fishes caught in the Flemish Cap (FC), a Newfoundland fishery located at international waters along the American coastal platforms, and where fishing is regulated by NAFO (*Northwest Atlantic Fisheries Organisation*). Since 1994, our Ictiopathology group has collaborated in 2 research campaigns in that fishing ground organised by the Instituto de Investigacións Mariñas (CSIC) and the Instituto Español de Oceanografía (IEO), Vigo, Spain, together with the Instituto de Investigação das Pescas e do Mar (IPIMAR), Portugal. During the campaigns, fish from different species (a total of 80 fish during the FC 94´s, and 538 in FC 99´s campaign) were caught at depths between 162 and 668 meters, and several organs and tissues aseptically extracted and immediately frozen at -40ºC until further processing for viral analysis in the laboratory. Fish species sampled were: Atlantic cod (*Gadus morhua*), Greenland halibut (*Reinhardtius hippoglossoides*), witch flounder (*Glyptocephalus cynoglossus*), and American plaice (*Hippoglossoides platessoides*), at the FC 94´, and the same 4 species and 4 new species including deepwater redfish (*Sebastes mentella*), onion-eye grenadier (*Macrourus berglax*), blue antimora (*Antimora rostrata*), and Atlantic wolf-fish (*Anarhichas lupus*), at the FC 99´.

Samples were processed and inoculated in CHSE-214, EPC, TV-1 and BB cells. Analysis of isolated viruses by electron microscopy (EM) (Fig. 1) revealed the presence of birnavirus-resembling icosahedral particles of 55 to 65 nm of diameter in around 35% of the sampled fish in the first campaign, and over 40% in the second one. Identification of the isolates was confirmed by RT-PCR. Among the 8 fish species analysed, only Atlantic wolf fish showed to be free of birnaviruses. Regarding the remaining species, percentages of fish infected with this virus ranged from 5 to 20%. It is interesting to point out that in some samples tubular structures were visualised together with birnavirus-like particles by EM (Fig. 2), which reacted with IPNV antisera by immunogold EM. These particles are being further studied.

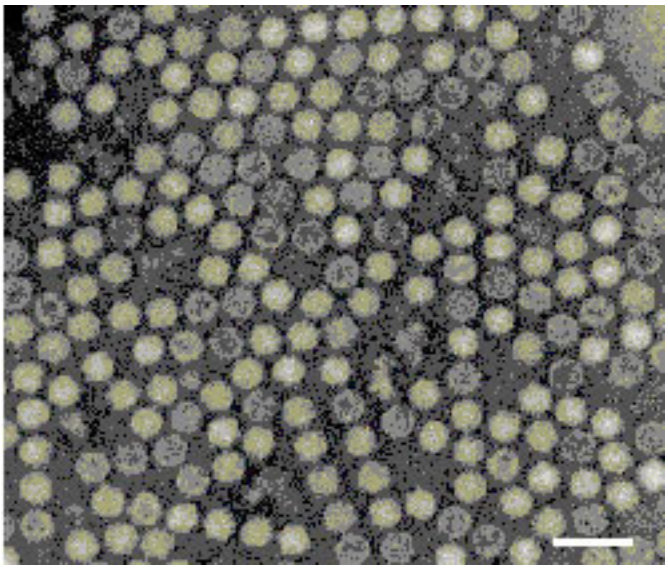

Figure 1

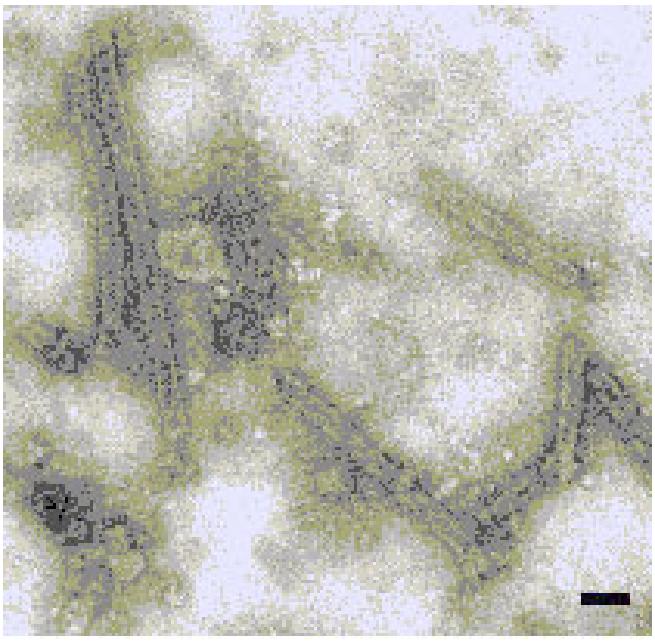

Figure 2

Among the wild fish species under study, 3 were never reported previously as host species of birnaviruses: deepwater redfish, onion-eye grenadier and blue antimora. The remaining host species Atlantic cod, Greenland halibut, witch flounder and American plaice were reported to be carriers of aquatic birnaviruses in a previous communication by members of our team, as a previous result of the first campaign (Bandín et al., 1997).

These findings support the world-wide distribution of aquatic birnaviruses and add 3 new species of fishes to the list of the great host range of these viruses. We consider that

is important to know as much as possible about the epidemiology of birnaviruses, including their reservoirs, since they can parasite many species of aquatic organisms susceptible of being cultured in the near future.

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NCCLS Guideline: Methods for Dilution Susceptibility Testing of Bacteria Isolated from Aquatic Organisms

NCCLS is considering the development of a new guideline related to the methods for dilution susceptibility testing of bacteria isolated from aquatic sources. We would like to know if such a document is needed, and thus worth the effort to develop. Please take a few minutes to the read the following brief project description, and reply by email at **exassess@nccls.org** with your opinion on:

- the utility of the document
- the level of urgency that exists in developing the document
- the appeal to industry, professions, and government
- the application of the document internationally

Thank you for your assistance. Also, if you would like to participate on this project, please reply to exassess@nccls.org letting us know your interest in this project. A current Curriculum Vitae or resume is required to be submitted along with your contact information.

NCCLS Guideline: Methods for Dilution Susceptibility Testing of Bacteria Isolated from Aquatic Organisms

There are currently no well-defined standardized methods for dilution susceptibility testing of bacteria isolated from aquatic organisms or their environment, of which typically prefer or require temperatures less than 35 ºC. Such standards are necessary to assure the integrity of the data generated and to facilitate inter-laboratory comparisons. Although the most commonly used susceptibility testing method in aquatic disease diagnostic laboratories is the disk diffusion, there are more and more recent publications using dilution susceptibility testing. Many of these publications comprised of studies testing at 15 ºC, 22 ºC and 28 ºC are however, based on non-NCCLS testing methods, and many of those that are based on NCCLS testing methods are based on those at 35 ºC. These studies were incapable of performing sufficient quality control testing. Thus it is important to the advancement of drug testing of aquatic pathogens, that a standardized method and accompanying QC ranges for dilution susceptibility testing exist, and be available for use by the aquatic animal disease diagnostician.

Develop AST method for dilution tests for use with organisms isolated from aquatic sources, needing alternate culture conditions (e.g. lower temperatures) than those currently used in NCCLS standards or guidelines. The scope will be similar to that of the recently published NCCLS Report M42-R, *Performance Standards for Antimicrobial Disk Susceptibility Tests for Bacteria Isolated from Aquatic Animals*.

FHS PARTICIPATION IN THE AAVLD / USAHA ANNUAL MEETINGS

Scott LaPatra

As you know, the Fish Health Section (FHS) has committed to becoming more involved on issues of importance to the membership. For the last seven years I attended and participated in the United States Animal Health Association (USAHA) and the American Association of Veterinary Laboratory Diagnosticians (AAVLD) annual meeting. Last year the meeting was held in St. Louis, Missouri and this year it was held in San Diego, California. For background information, the USAHA is the most well established animal health organization that has approximately 1,400 members and works with a variety animal health entities both nationally, including the United States Department of Agriculture Animal Plant Health Inspection Service (USDA/APHIS), and internationally. The purpose of the AAVLD, which works closely with the USAHA, is the dissemination of information relating to the diagnosis of animal disease, the coordination of the diagnostic activities of regulatory, research and service laboratories, the establishment of accepted guides for the improvement of diagnostic laboratory organizations relative to facilities, equipment and personal qualifications.

The FHS objectives, interests and goals regarding animal health are very similar to the USAHA. One of the reasons we were in attendance was to offer our expertise and established programs in aquatic animal health and maintain visibility with other groups also interested in aquatic animal medicine. This year the AAVLD and the USAHA Aquaculture Committees met jointly and were chaired by Dr. Tom Bladwin representing the AAVLD and myself representing USAHA. As in past years, I updated the committee about the Sections activities. Additionally, the committee has been very successful at passing resolutions which are then forwarded to the Executive Committee of the USAHA. This year two resolutions were supported by the Committee. The minutes from the meeting along with the two resolutions that were forwarded to the USAHA Executive Committee are included below. If you have any questions or need for additional information, please don't hesitate to contact me or one of the FHS Executive Committee members.

Aquaculture Committee, Joint USAHA and AAVLD

Co-chairs: Drs. Scott LaPatra (USAHA) and Tom Baldwin (AAVLD)
The Aquaculture Committee met on October 12, 2003 from 1-5 PM.

A. Dr. Scott LaPatra – Welcome and introductions

B. Invited speakers

1. Dr. John Clifford, Assistant Deputy Administrator, USDA, spoke on the National Aquatic Animal Health Plan, including sections on mission, rational, challenges, objectives, task force members, process, anticipated results, and progress.

2. Dr. Mark Engle, National Animal Identification Task Force, outlined how national animal identification efforts in swine and poultry might apply to fish. He emphasized that group identification under dynamic conditions might be most appropriate.

3. Dr. Otis Miller, National Aquaculture Coordinator, USDA-APHIS, reviewed USDA-APHIS efforts in aquaculture disease control, emphasizing successful control programs for infectious salmon anemia virus and spring viremia of carp.

4. Dr. David Scarfe, AVMA, outlined the past years efforts of the AVMA Seafood Advisory Committee.

5. Dr. Scott LaPatra, Clear Springs Foods, reviewed opportunities provided to members by the Fish Health Section of the American Fisheries Society, emphasizing affiliate membership, the Journal of Aquatic Animal Health, national and regional meetings, and a recently released combined publication "*Standard Procedures for Aquatic Animal Health Inspections* and *Procedures for the Detection and Identification of Certain Fish Pathogens*".

6. Dr. Scott LaPatra, Clear Springs Foods, reviewed interactions with members of the Environmental Protection Agency, which have expressed interest in regulating drug, chemical, waste effluent and pathogens released from fish farms.

7. Dr. Tom Baldwin, Utah Veterinary Diagnostic Laboratory, presented a reminder of Robert's Rules of Order, which are the foundation of procedures for doing business in a parliamentary body.

C. Old business

The resolution passed last year, encouraging USDA-APHIS to work with other agencies, organizations and entities to develop a uniform process for aquatic animal diagnostics and pathogen identification, along with the USDA-APHIS response, was discussed.

D. New business

1. A motion to replace the existing mission statement with a new one was made, seconded and passed. The new mission statement reads:

> The Aquaculture Committee provides a forum for discussion and cooperation between members of the diverse aquaculture industries, regulatory and tribal agencies, and the research community, as they address problems and opportunities related to aquatic animal health and well-being, seafood safety, and public health. The committee also develops and recommends policies and actions for the USAHA that will facilitate harmonization of aquatic animal health regulations and the activities of stakeholder federal, state, tribal, and local agencies, and in so doing, ensure the economic stability of the aquaculture industries.

2. A motion to have the committee chairs prepare and submit a letter requesting USAHA issue a letter of support to NCCLS for their efforts in standardizing procedures in aquatic animal laboratory diagnostics was made, seconded and passed.

3. A motion to accept a resolution drafted by Dr. Robert Ehlenfoldt was made, seconded and discussed. A modified version, included as Appendix 1 (see http://www.usaha.org/resolutions/reso03/res-0903.html), was motioned, seconded, and passed.

4. A motion to accept a resolution drafted by Dr. Scott LaPatra was made, seconded and discussed. A modified version, included as Appendix 2 (see http://www.usaha.org/resolutions/reso03/res-0803.html), was motioned, seconded, and passed.

E. A motion to adjourn was made, seconded, and passed.

Appendix 1

UNITED STATES ANIMAL HEALTH ASSOCIATION – 2003

RESOLUTION NUMBER: 1

SOURCE: COMMITTEE ON AQUACULTURE

SUBJECT MATTER: National Veterinary Accreditation Program, Aquaculture Specialist Programs

DATES: 10/12/2003

BACKGROUND INFORMATION:
For more than 30 years, global aquaculture production has increased approximately 11% per year with the US a little behind this average; a trend that is assumed will continue. Recent FAO information indicates global aquaculture (farmed aquatic animals) production rivals or exceeds that of lamb, beef, pork, poultry, and other combined animal commodities, but not pork. Currently the US ranks about ninth in total aquaculture production. The US is a net importer of seafood, with seafood being the largest contributor to the agricultural-product trade deficit.

Disease in cultured aquatic animals is now recognized as a major limiting factor of the industry. Risks of disease outbreaks are exacerbated by wild animal reservoirs and disease in animals and products imported from major producing countries that have few, if any, disease protection measures in place. Sub-optimal US aquaculture veterinary surveillance and response, in turn, may result in the spread of disease to wild animals further compounding problems.

The US has recently experienced two national Emergency Declarations involving aquatic animal diseases, Infectious Salmon Anemia and Spring Viremia of Carp. In the early 1990's Taura Disease decimated the multimillion-dollar US shrimp aquaculture. Numerous other OIE notifiable diseases are currently endemic in the US. Other emerging diseases potentially may affect the aquaculture industry.

The US National Veterinary Accreditation Program (NVAP) is globally recognized as an optimal mechanism to address responses to animal diseases of national significance. Currently, the NVAP is being revised, and an aquaculture specialization category has been proposed. The need for more, well-trained, accredited, private, veterinary practitioners for prevention, control and eradication of aquatic animal diseases is well recognized and supported by the aquaculture industry.

Continuing education (CE) programs for federal, state and private veterinarians suitable for NVAP aquaculture accreditation are desperately needed to ensure sufficient numbers of well-trained, qualified personnel. Several veterinary entities have increased the number of CE programs in aquatic animal medicine that meet the qualities of NVAP CE.

RESOLUTION:
The USAHA encourages USDA-APHIS to:

1. Implement the proposed changes to NVAP, which include an aquaculture specialization category.
    a. Identify necessary aquaculture educational components
    b. Structure CE programs suitable for NVAP accreditation and provide necessary logistic and financial support.
    c. Implement the developed CE programs to ensure sufficient numbers of well-trained private, state and federal veterinarians accredited aquatic animal medicine of farm-raised species.

UNITED STATES ANIMAL HEALTH ASSOCIATION – 2003

RESOLUTION NUMBER: 2

SOURCE: COMMITTEE ON AQUACULTURE

SUBJECT MATTER: Standard procedures for aquatic animal health inspections

DATES: 10/12/2003

BACKGROUND INFORMATION:

In June of 2001, members of the Fish Health Section (FHS) of the American Fisheries Society and the United States Fish and Wildlife Service (USFWS) initiated a process to update the portion of the FHS Bluebook that covers procedures for aquatic animal health inspections. Three committees were assembled made up of both FHS members and USFWS employees, which included DVM and non-DVM aquatic animal health professionals, to review and revise the bacteriology, virology and parasitology sections. Criteria that were used in the selection of appropriate assays included, 1) the sensitivity of the assay, 2) the specificity of the assay, 3) the cost of the assay, 4) availability of reagents, 5) availability of technology, 6) manpower requirements, and 7) scientific defensibility (they must be referenced). Additional sections were added to detail sampling methods, PCR, and methods for revision of this document. The inspection manual was presented and accepted by the FHS and USFWS on September 4, 2002 at the 4th International Symposium of Aquatic Animal Health that was held in New Orleans, Louisiana. The title of the manual is *Standard Procedures for Aquatic Animal Health Inspections.*

These inspection techniques represent a minimal acceptable standard. The techniques are inspection techniques used to detect the presence of certain selected fish pathogens; they are NOT diagnostic techniques. The *Standard Procedures for Aquatic Animal Health Inspections* is a protocols manual and not a policy manual. State and federal governments will stipulate which pathogens should be inspected for, what aquatic animal species are to be examined, and may well wish to define their own conditions for sample sizes and inspection frequency. This manual is meant only to provide appropriate methods for fish inspection, not to specify when and where and to which animals they should be applied.

RESOLUTION:

The USAHA encourages USDA-APHIS, as a member of the Aquatic Animal Health Task Force on Aquaculture, to consider the protocols contained in the *Standard Procedures for Aquatic Animal Health Inspections* when formulating the National Aquatic Animal Health Plan.

Fish Health Newsletter – Editorial Policy

The *Fish Health Newsletter* is a quarterly electronic publication of the Fish Health Section of the American Fisheries Society and is available for downloading in Adobe pdf file format. Submissions on any topic of interest to fish health specialists and preliminary case reports are encouraged with the understanding the material is not peer- reviewed. Abstracts submitted to the *Journal of Aquatic Animal Health* are also encouraged. Submissions must be formatted in Microsoft Word, WordPerfect, or Rich Text Format, and can be sent by electronic mail or via 3.5" floppy disk to the editor's address below. **Graphics files should be sent separately in jpeg format.**

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