USGS science for a changing world

Fisheries and Aquatics Bulletin

Edited by Janet A Cushing

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Inside this issue:

From the Editor's Desk

News Flash! Our new Fisheries: Aquatic and Endangered Resources Program website has undergone an overhaul and is now **LIVE**! With help from the Bioinformatics web development team, we've updated information on the Program website and given it a whole new look. Some of the features you'll see include:

- Highlighted Projects—this is where you'll see breaking news in USGS fisheries and aquatics research;
- Links to Partnerships—information about our partnering involvement, such as the National Fish Habitat Action Plan, Science Support Partnership, and features on great partnering activities;
- Research—this page is broken down into broad topics and associated tasks, with links to the specific USGS Science Centers involved in that research;
- Publications and Products—with links to the USGS publication warehouses, science centers, and journal publications; and
- Links to other BRD Programs and Science Centers.

We hope this website will be useful to our partners, fisheries and aquatic scientists, and our Science Centers and Regions. If you have suggestions for improving the website or would like to see particular features, please let us know!

Given the many links this website has to our Science Centers, let me take this opportunity to encourage the Centers to update their websites if they have not done so already. In this day and age our websites provide a public face to the world as well as a valuable resource for those looking for information on particular topics. Although keeping a website current takes significant resources, doing so is a sound investment in outreach and marketing. This newsletter goes out to approximately 450 people. On the other hand, a website might be seen by thousands. The potential number of people we can inform about the great science being done by USGS scientists through our websites is huge in comparison to other forms of outreach. Most people still don't know that USGS has a Biology Discipline, much less know about our fisheries and aquatics research. Now, when I talk to someone about USGS, and they want to know more about what we do, I can happily say, "Check out our Program, at **http://biology.usgs.gov/faer/** !"

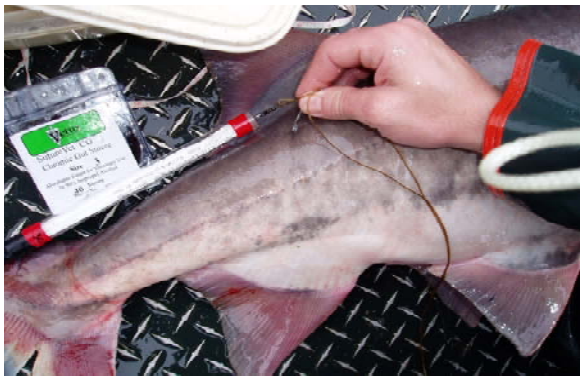
Science Features:

Delayed Mortality and Movements of Paddlefish Released as Bycatch

-Phillip W. Bettoli, USGS Tennessee Cooperative Research Unit, Janice Kerns, Tennessee Technological University, and George D. Scholten, Tennessee Wildlife Resources Agency

Paddlefish (*Polyodon spathula)* in Kentucky Lake, TN-KY, are commercially exploited for their caviar and flesh. Minimum size limits enacted in 2002 (864 mm eye-fork-length [EFL]) and 2005 (914 mm EFL) sought to protect paddlefish from growth and recruitment overfishing. Following the change in the size limit in 2005, the bycatch of sub-legal paddlefish increased from 49% to 75% of the total catch of paddlefish. The minimum size limit is expected to increase to 965 mm EFL in 2008; thus, the bycatch of sublegal fish will likely increase again. Previous research conclusively demonstrated high mortality of paddlefish caught in gillnets (i.e., initial mortality) when water temperatures were warm at the beginning and end of the winter fishery. Forcing fishers to release small (alive) fish will not

reduce fishing mortality unless those fish subsequently survive; therefore, survival of paddlefish released as bycatch was examined. Beginning in January 2004, we externally radio-tagged paddlefish (n = 104) caught and released by commercial fishers and we tracked those fish for several weeks. Each radio tag was equipped with a float, which was designed to detach from the fish after several weeks and float to the



surface, where it and the radio could be recovered and reused. The direction and magnitude of movements (or lack thereof) by tagged paddlefish were usually sufficient to distinguish live fish from fish that died after being released. The survival of some fish was inferred by recovering detached tags upriver of where fish were released. Only four of the 104 tagged paddlefish died after being caught, tagged, and released; 94 fish survived the encounter with commercial gillnets, and six were censored because their fate could not be determined. Water temperature, fish length, net-soak time, and handling time were not significantly related to delayed mortality in logistic regression models. Given the low delayed mortality of caught-and-released paddlefish, raising the minimum size limit (and forcing fishers to release small paddlefish) appears to be a viable management approach to prevent overfishing. Restricting netting to the coldest months of the year (to reduce initial mortality) is another management action available to managers if they wish to further reduce fishing exploitation.

Janice Kerns displaying caught paddlefish.

Editor's note: The full article is currently in peer review for a chapter in "Paddlefish Management, Propagation, and Conservation in the 21st Century," a book to be published by the American Fisheries Society in 2008. For more information please contact Phil Bettoli at pbettoli@usgs.gov or pbettoli@tntech.edu. All photo credits: Phil Bettoli.

First New Waterborne Aquaculture Drug in 20 Years Approved

-Randy Hines, USGS Upper Midwest Environmental Science Center, Robin Schrock, USGS Fisheries: Aquatic & Endangered Resources Program, and Catherine Puckett, USGS Office of Communications

Twelve years of rigorous research by USGS scientists helped lead to the approval by the Food and Drug Administration (FDA) of the first waterborne drug for fish diseases in more than 20 years.

The drug, 35% PEROX-AID®, a product of Eka Chemicals, Inc, in Marietta, Georgia, was approved recently for use in three diseases of freshwater fish and their eggs that, left untreated, cause significant losses to the $1 billion (2006) U. S. aquaculture industry. State and federal natural resource agencies responsible for fish hatchery programs benefit from more effective and efficient production, including endangered and threatened species broodstock protection, and the public benefits from healthy fish released into the wild for recreation through restoration programs.

Private aquaculture will also benefit from approval of the new drug. According to industry figures, uncontrolled diseases cause around $100 million in losses in the catfish industry alone. Half of the reported disease cases were attributed to the three diseases this new drug can treat: bacterial gill disease and external columnaris disease of fish, and saprolegniasis on fish eggs.

Researchers at the USGS Upper Midwest Environmental Sciences Center (UMESC) in La Crosse, Wisconsin, developed the data that resulted in the approval for the drug, with financial support through the Federal-State Aquaculture Drug Approval Partnership Project. Dr. Michael Jawson, UMESC center director, said that this approval is a critical step forward in helping control diseases in commercially and publicly raised fishes. He noted that the broad use approval is unique and significant for U.S. aquaculture in that it covers two fish life stages –eggs and fish– of a number of cultured freshwater fish species for three separate diseases. Fish commonly afflicted with these diseases include trout, salmon, steelhead, channel catfish, and tilapia.

Rosalie Schnick, National Coordinator for Aquaculture

New Animal Drug Applications, said, "The scientists at the Upper Midwest Environmental Sciences Center did an excellent job completing the major data requirements for obtaining this most significant approval. The 35% PEROX-AID® approval is a tremendous example of a public research facility cooperating with a private entity to gain results that will benefit the propagation of finfish for public good, including fisheries restoration and enhancement."

USGS scientists completed target animal safety studies on many freshwater fish species, conducted critical laboratory and field efficacy studies, and completed a comprehensive environmental assessment of hydrogen peroxide use in aquaculture. Eka Chemicals, Inc., completed the requirements for drug manufacturing and worked with Schnick to complete the requirements for human food safety. Under the Minor Use Minor Species Animal Health Act as administered by the FDA, Eka Chemicals, Inc. has an exclusive right for 7 years of marketing for the approved indications beginning on the date of approval. This privilege is extended to drug sponsors to encourage the development of drugs with limited economic potential due to their restricted market. The drug is expected to be available to commercial and public aquaculture in late winter or early spring.

USGS began this research in 1994 in response to a request by the Association of Fish and Wildlife Agencies that state natural resource agencies needed specific drugs to combat specific fish diseases. Dr. William Gingerich, the lead researcher on the project, agrees with Schnick that the approval for this new aquaculture drug is unique because it is so comprehensive. He credits the Food and Drug Administration reviewers and policy makers for being open to the concept of broad drug approvals for aquaculture drugs. Dr. Gingerich and his team members were recognized for their achievements from Eka Chemicals, Inc. at a ceremony at the Center. The USGS scientists on Dr. Gingerich's research team are Verdel Dawson, Mark Gaikowski, Wendy Larson, Jeffrey Meinertz, Jeffrey Rach, Susan Schleis, Larry Schmidt, and Theresa Schreier.

Photo credit: Randy Hines, USGS

For more information on the Aquaculture Drug Research and Development Program at the USGS Upper Midwest Environmental Sciences Center go to **http://www.umesc.usgs.gov/aquatic/aquaculture_drug.html**.

USGS Researchers Help Conserve Unique Muskellunge Strain In Voyageurs National Park—

Nick Frohnauer, Iowa State University, Clay Pierce, USGS Iowa Cooperative Fish and Wildlife Research Unit, and Larry Kallemeyn, USGS Columbia Environmental Research Center

Researchers from the USGS International Falls Biological Station of the Columbia Environmental Research Center and the Iowa Cooperative Fish and Wildlife Research Unit teamed up to study threats to the long-term viability of the Shoepack Lake muskellunge population in Voyageurs National Park. The

Shoepack Lake muskellunge population (SLMP) in Voyageurs National Park is a unique resource that is potentially at risk for loss of long-term genetic viability. Shoepack Lake and nearby Little Shoepack Lake are the only natural homes of this genetically distinct strain. The adult population in 2001 was roughly 1100 fish. Shoepack Lake muskellunge grow slower and are thinner, but have higher population density and angler catch rate than most other muskellunge populations. Habitat area in Shoepack Lake fluctuates with construction and washout of the beaver dam at the lake outlet. A washout occurred in July 2001 following heavy rain, resulting in a 5-ft. drawdown and 47%

Tagging muskellenge

reduction in lake surface area. Although boat use on Shoepack Lake by visitors has steadily increased in the last decade, fishing pressure and harvest are very low due to the remoteness of the lake and a 30-in. minimum length limit.

Population and angler exploitation data were collected over a two-year period. Researchers used computer simulation to assess the effects of varying levels of fishing and reduced habitat area due to naturally occurring lake drawdown on long-term population changes of the SLMP. They then converted simulated population sizes to genetically effective population size, which is the measure of population size used by conservation biologists to evaluate long-term genetic viability, and is typically less than total adult population size.

Computer simulations assuming an intact outlet beaver dam (large habitat area) and current low levels of fishing resulted in no risk for loss of long-term genetic viability. Simulations assuming increased fishing resulted in significant risk. Simulations assuming lake drawdown (smaller habitat area) resulted in significant risk for loss of long-term genetic viability, regardless of the level of fishing.

Researchers concluded that at present low levels of fishing, the current harvest regulations (one fish per day, 30-in. minimum length limit) are adequate. If fishing increases in the future, no-kill or barb-less hook regulations should be considered to control harvest and minimize damage to released fish. To maintain larger habitat area, re-construction and maintenance of the outlet dam by beavers would be desirable. Minimizing the impact of fishing and maximizing habitat area are keys to maintaining the long-term genetic viability of the SLMP.

Editor's note: This study was published as companion articles in the North American Journal of Fisheries Management*, and can be downloaded at*: **http://www.cfwru.iastate.edu/pierce.htm**. *All photo credits: Clay Pierce.*

Science Centers in the News

USGS Researcher Receives Lifetime Achievement Award

Dick Neves, Leader of the Virginia Cooperative Fish and Wildlife Research Unit, received the Lifetime Achievement Award from the Freshwater Mollusk Conservation Society "for singular accomplishments and long-term contributions that have advanced the conservation and science of freshwater mollusks at a national and international level." The award was presented at their national meeting in Little Rock, AR on March 14, 2007.

Food and Drug Administration Awards USGS Scientist Special Citation Award

BIll Gingerich, Research Physiologist and Chief of the Chemistry and Physiology Branch at the Upper Mississippi Environmental Science Center, was a recipient of the Food and Drug Administration Commissioner's Special Citation Award. The award was given for exceptional leadership, outstanding coordination of resources, and sustained efforts in the development of data for the approval of new animal drugs for aquaculture.

Detection of Viral Hemorrhagic Septicemia Virus in Fish

A new fact sheet by scientists from the USGS Western Fisheries Research Center describes the best methods for resource managers and others to detect and confirm a new and virulent strain of viral hemorrhagic septicemia virus (VHS) in fish, including popular game fish and bait fish. The new USGS fact sheet reviews important factors in how to isolate VHSV Genotype IVb using cell culture assays and its identification by the polymerase chain reaction (PCR) assay**. The fact sheet can be downloaded at http://biology.usgs.gov/faer/.**

New Publications

Early Development of Four Cyprinids Native to the Yangtze River, China

http://pubs.usgs.gov/ds/2006/239/

Chapter 1 -- Notes on the Translation and Use of "A Study of the Early Development of Grass Carp, Black Carp, Silver Carp, and Bighead Carp in the Yangtze River, China" By Duane C. Chapman and

Ning Wang.
Chapter 1 provides important instructions on the use of the translation, including a description of the Chinese morphometric conventions, which differ from those used by North American scientists. Chapter 1 also provides the historical context in which Chapter 2 was developed, and information on how the larvae of the subject fishes, which have invaded the Mississippi River basin, may be distinguished from other fishes present in the basin.
Chapter 2 -- A Study of the Early Development of Grass Carp, Black Carp, Silver Carp, and Bighead Carp in the Yangtze River, China By Bolu Yi, Zhishen Liang, Zhitang Yu, Randuan Lin, and Mingjue He. Translated by Duane C. Chapman and Ning Wang .
This chapter was translated from the Chinese with the approval and assistance of the living authors of that study. It contains the most detailed description available, and approximately 200 drawings, of the early development of the subject fishes.

Freshwater Bivalve Ecotoxicology

Newton, T. and G. Cope. 2007. Biomarker responses of unionid mussels to environmental contaminants. Chapter 10 (pp. 257-284) in Freshwater Bivalve Ecotoxicology, J.L. Farris and J.H. Van Hassel (eds.), CRC Press, Boca Raton, FL.
This chapter reviews the literature on biomarker responses of unionid mussels to environmental contaminants. The review focuses on studies that (1) reported measured contaminant concentrations; (2) had robust experimental designs; and (3) were published in peer-reviewed literature.

Valenti, T. W., D. S. Cherry, R. J. Neves, B. A. Locke, and J. J. Schmerfeld. 2007. Case study: Sensitivity of mussel glochidia and regulatory test organisms to mercury and a reference toxicant. Chapter 14 (pp.351-367) in Freshwater Bivalve Ecotoxicology, J. L. Farris and J. H. Van Hassel (eds.). CRC Press, Boca Raton, FL.

This study compares the sensitivity of several species of freshwater mussel glochidia to inorganic and organic mercury and their sensitivities relative to those of standard regulatory bioassay organisms.

Other mussel papers

Citation: Liberty, A. J., B. J. Ostby, and R. J. Neves. 2007. Determining a suitable substrate size and sampling frequency for rearing juveniles rainbow mussels *Villosa iris*. North American Journal of Aquaculture 69:44-52.

This study investigated the effects of sampling frequency and substrate size on the overall size and survival of juvenile rainbow mussels (*Villosa iris)*. The experiment results show that frequent disturbance of juveniles by sampling may impede physiological functions, resulting in stress and a decrease in overall survival and shell length.

Citation: Kesler, D., T. Newton and L. Green. Long-term monitoring of growth in the Eastern Elliptio (*Elliptio complanata*) in southern New England: a transplant experiment. Journal of the North American Benthol. Soc. 26:123-133, 2007.
This study reports on a series of reciprocal transplants of *E. complanata* among 3 lakes in Rhode Island that followed the survival and growth of transplanted and resident individuals for 5 to 14 y. The objectives were to determine whether the growth cessation seen in *E. complanata* in Worden Pond continued when individuals were moved to other lakes and to determine whether mussels transplanted from other lakes into Worden Pond stopped growing after the transplant.

Citation: Steingraeber, M.T., M.R. Bartsch, J.E. Kalas, and T.J. Newton. 2006. Thermal Criteria for Early Life Stage Development of the Winged Mapleleaf Mussel (*Quadrula fragosa*). Am. Midl. Nat. 157:297–311.

This manuscript is one of many examples of the excellent collaboration between USGS and the FWS. This work was conceived, carried out and written up jointly by both staff. This study confirms the host fish for the federally endangered winged mapleleaf mussel (*Quadrula fragosa*). The researchers were able to incorporate flexibility into the design for the host suitability trials in order to compare the time required for encysted mussel larvae to metamorphose into juveniles under different thermal regimes and to develop a quantitative model that describes this thermal-temporal relation. The FWS now has an active propagation program for this species. The additional data on the thermal cues required to trigger peak excystment of juvenile winged mapleleaf is also being used to guide juvenile winged mapleleaf restoration efforts in the St. Croix National Scenic Riverway.

Sea Urchin Toxicology

Citation: Carr, R.S., J.M. Biedenbach, and M. Nipper. 2006. Influence of Potentially Confounding Factors on Sea Urchin Porewater Toxicity Tests. Arch. Environ. Contam. Toxicol. 51: 573–579.

In this study, assessment surveys of the early life stages of the sea urchin (*Arbacia punctulata*) and lab experiments were conducted to determine acceptable ranges of natural variables such as pH, ammonia, and dissolved organic carbon on the fertilization and embryological development endpoints. The researchers examined the influence of several potentially confounding factors on the test results. The results of the database analyses and these additional experiments are presented here to aid in the interpretation of porewater toxicity test results from past and for future studies.

NFHAP News

10 Waters to Watch

The National Fish Habitat Board has unveiled its list of *10 Waters to Watch*. The waters featured on this list demonstrate the results of conservation efforts under the National Fish Habitat Action Plan. The waters highlighted on the list range from Maine to Alaska and from Idaho to Mississippi. To see a map and more information about these *Waters*, go to **http://www.fishhabitat.org/**.

Projects in the *10 Waters to Watch* are being coordinated through five Pilot Fish Habitat Partnerships (Southeast Aquatic Resources Partnership, Eastern Brook Trout Joint Venture, the Western Native Trout Initiative, the Midwest Driftless Area Restoration Effort, and the Matanuska-Susitna Basin Salmon Conservation Partnership). The National Fish Habitat Action Plan calls for the creation of 12 or more Fish Habitat Partnerships by 2010.

National Fish Habitat Board

The National Fish Habitat Board met on June 6-7 at the Department of Commerce headquarters in Washington, D.C. The primary agenda item was Fish Habitat Partnerships (FHPs). All five pilot FHPs gave presentations to the Board describing how their partnership developed, how they are governed, their strategic planning process, how they measure progress, and how they communicate with stakeholders. Following the presentations, the Board approved an application process for partnerships seeking official recognition as FHPs.

In other business, the Board approved four priority strategies for fish habitat conservation over the next few years: 1) identify and protect intact and healthy waters; 2) rehabilitate river and stream flows and lake and reservoir water surface elevations; 3) reconnect fragmented habitat; and 4) reduce excess sedimentation, phosphorus and nitrogen runoff. The Board intends for these four strategies to help set priorities for Fish Habitat Partnerships and other Action Plan partners engaged in fish habitat projects.

Dr. Susan Haseltine, Associate Director of Biology, USGS, addressed the Board concerning USGS support for the Action Plan, and offered to sponsor a workshop to address research needs. Dr. Mamie Parker of the U.S. Fish and Wildlife Service (FWS) announced that FWS would be making $125,000 of FY 2008 FWS NFHAP funds available to the Board for their priority funding needs. The Board also considered options for funding a Communications staff person. A subcommittee of the Board will put together a funding strategy.

The next Board meeting will be on October 2-3, 2007 in Washington D.C. However, a working group of Board members will be attending the meeting of the Sport Fishing and Boating Partnership Council in Homer, Alaska in early August, to discuss with the Council their shared interests in the Action Plan.

More information on the Board meeting, including briefing materials, can be found at **http://www.fishhabitat.org/nationalboard.htm**.

Science and Data Partners Workshop

Save the date: September 2, 2007, 8 am—12 pm.

Where: American Fisheries Society Annual Meeting, San Francisco, CA.

Open and **free** to all! **PARTICIPANTS MUST PRE-REGISTER** as soon as possible on the AFS Annual Meeting Registration Form; this activity can be found on the "Other Activities" webpage, and is listed as "National Fish Habitat Science." The AFS Annual Meeting Registration is at the following website: **http://web.fisheries.org/sf/index.php?option=com_content&task=view&id=16&Itemid=31**. Registration is required for planning purposes and to receive background materials prior to the meeting.

Description: Partnerships established under the National Fish Habitat Action Plan (NFHAP) are expected to adopt the science assessment framework established by the NFHAP Science and Data Committee for resource assessment and project evaluation. The 2004 NFHI workshop and 2006 Fisheries Data Summit were initial steps toward establishing national criteria for measuring aquatic health, addressing scaling issues, and identifying mechanisms to integrate regional joint partnership information systems. **This workshop will build upon the outcomes of the earlier workshops** and aid in developing a detailed strategy of how the Partnerships will engage in this

work with the Board's Science & Data Committee. Topics to be addressed include:

- How to link national and regional scale assessments of aquatic habitat condition
- The roles of the Science and Data Committee and Partnerships in evaluating success of the NFHAP
- Development of the NFHAP Database Network

This will be an *intensive* and *interactive* forum where participants will be asked to share their expertise in regional and national habitat assessment, and perspective of working with regional and national partnerships. This workshop will provide an intellectually stimulating prelude to the AFS Meeting and great networking opportunity with conversation that one will want to continue into the afternoon and evening as you sample California's great wines!

Fisheries professionals of all types will benefit from participating in the workshop, but it is a "must" for anyone engaged in, or contemplating, a partnership under the NFHAP!

This workshop is sponsored by: American Fisheries Society Computer User Section, American Fisheries Society Fisheries Administrators Section, National Oceanic and Atmospheric Administration, The Nature Conservancy, U.S. Fish and Wildlife Service, and U.S. Geological Survey.

Contact Janet Cushing at jcushing@usgs.gov or (703) 648-4093 for more information.

Atlantic Coastal Fish Habitat Partnership

The Atlantic Coastal Fish Habitat Partnership (ACFHP) held their initial workshop on May 16-17, in Baltimore, with the purpose of engaging partners in developing and implementing an ACFHP.

Following an overview presentation session, the first breakout group session worked on defining focal species and habitats. This resulted in a list of the following general targets: structurally complex habitats, diadromous fish, macrocrustaceans, tidal river systems, non-tidal river systems, marshes, estuarine-dependent fish, SAV, water (quality and quantity), and nearshore coastal habitats.

The second breakout group session focused on the appropriate regional design for the ACFHP to facilitate/foster/focus fish habitat restoration/protection efforts at a meaningful scale. The full group agreed that there should be an overarching coast-wide partnership that should break into regional sub-partnerships.

The full group decided to break into four working groups (Steering Committee WG, Communications WG, Science WG, and Joint Southeast WG). Each working group was asked to develop a work plan for relevant next steps. The full group determined that an ACFHP Interim Steering Committee should meet in conjunction with the Atlantic States Marine Fish Commission Habitat Committee meetings in August and October 2007 to create an action plan for further progress of the ACFHP. For more information about this candidate FHP, contact Jessie Thomas at jthomas@asmfc.org.

Tribal Liaison News

USGS Native American Internships Awarded

Many worthy proposals were received for the 2007 Student Interns in Support of Native American Relations (SISNAR) grant, managed by the USGS Native American Liaison program. The team of USGS American Indian/Alaska Native Liaisons awarded grants ranging from $6500 to $10,000 to seven USGS scientists (**among them, two fisheries biologists!**) based on their proposals of how the project would advance the USGS scientific mission while successfully building relations between the USGS and Native American governments.

The SISNAR activity was created to meet multiple goals, including preparing American Indian students for careers in science, making them and their governments and communities, aware of the value and relevance of USGS science, and developing a relationship between the USGS and Tribal governments.

Congratulations to the following scientists receiving SISNAR grants:

Jim Johnson (Biology) -Great Lakes Science Center: Lake Trout, Atlantic Salmon, and American Eel Restoration

Scott Wright (Biology) -National Wildlife Health Center: Wildlife Disease Monitoring on Tribal Lands

Charles Culbertson (Water) -Maine Water Science Center: Water Quality Sampling of the Medux-nekeag River

Gene Napier (Geography) -Earth Resources Observation and Science Center: Sicangu Oyate Landscape Monitoring

Perry Jones (Water) -Minnesota Water Science Center: Fond du Lac Groundwater/Surface Water Interaction—Impacts of Lake Levels on Wild Rice Production

Paul Hersherberger (Biology) -Western Fisheries Research Center: Patterns of Viral Disease in Puget Sound Herring

Margaret Hiza Redsteer (Geology) -Flagstaff Field Center: Road and Land Use Impacts on Surface Erosion and Run-Off in the Southwestern Navajo Nation

Northwest – Tribal Resource Management Plan Submitted for Puget Sound Chinook and Hood Canal Summer-Run Salmon

The Northwest Indian Fisheries Commission has submitted a Tribal Resource Management Plan for NOAA Fisheries to evaluate. It was presented by the Bureau of Indian Affairs on behalf of the Northwest Indian Tribes; the submission fulfills the Tribes' obligations under Endangered Species Act (ESA) regulations for Puget Sound Chinook salmon and Hood Canal summer-run chum salmon. The Tribal Plan describes research and assessment activities that may affect listed Puget Sound Chinook salmon and Hood Canal summer-run chum salmon in Washington State. It also includes implementation, monitoring, and evaluation procedures designed to ensure that the research is consistent with the objectives of the ESA. The research activities described in the Tribal Plan would take place over a ten-year period starting in 2007.

Job Announcement

Fisheries/Aquatic Plant Biologist

Agency: Florida LAKEWATCH, Department of Fisheries and Aquatic Sciences, University of Florida

Responsibilities: Florida LAKEWATCH is seeking a Fisheries/Aquatic Plant Biologist with primary responsibilities of collecting and managing Florida LAKEWATCH's long-term fish and aquatic plant monitoring data. The incumbent must have thorough knowledge of Florida's freshwater fish and aquatic plant assemblages and be able to identify individual fish and aquatic plant species. This position will also require good writing and computer skills.

Qualifications: B.S. required, M.S. preferred in some type of aquatic sciences program. Must have experience working with fish and aquatic plant communities. Experience with data management and analysis required.

Salary: Approximately $30,000/year plus benefits.

Contact: Interested candidates should send/e-mail a cover letter, curriculum vitae, names of three references and list of course work in aquatic sciences to:

Mark V. Hoyer

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University of Florida/IFAS
7922 NW 71st Street
Gainesville, FL 32653
mvhoyer@ufl.edu

Upcoming Meetings

137th American Fisheries Society Annual Meeting

The AFS annual meeting is coming up quickly! This conference is an outstanding venue to think about managing whole ecosystems, advance your professional networking, and to keep current on emerging ideas in fisheries science and management. There will be 61 symposia and more than 1,800 presentations during the week of **September 2-6, 2007**. The website for registering is: **http://www.fisheries.org/sf/**. If you are an oral presenter, please pay special attention to the instructions on this website about transferring your electronic presentation at the meeting.

10th International River Symposium and Environmental Flows Conference

For those not going to the AFS Annual Meeting—This conference will take place in Brisbane, Australia, during **September 3-6, 2007**, and will focus on exploring environmental flows from a science, policy, management, and community perspective. For more information, go to **http://www.riversymposium.org**.

2nd Annual Driftless Area Symposium: Science in the Driftless Area

This second year symposium will be held in Decorah, Iowa on **October 5-6, 2007**. The program committee is soliciting platform and poster papers for presentation. Invited papers should focus on riparian corridor restoration and management, and in-stream ecology and management. The deadline for abstract submission is **August 5**. For more information, contact Mark Ebbers at Mark.Ebbers@dnr.state.mn.us.

3rd International Sustainable Marine Fish Culture Conference

This international conference will be held at Harbor Branch Oceanographic Institution, Fort Pierce, FL on **October 15-17, 2007**. The goal is to bring together

researchers, industry and other stakeholders to identify opportunities that can be developed into commercial reality and to define infrastructure and research needs. Social activities and tours will conducted throughout Harbor Branch's Aquaculture Development Park. The deadline for abstracts is **August 24**. Please visit the conference website at www.sustainableaquaculture.org for more information.

2nd International Tagging and Marking Symposium

This symposium, hosted by the American Fisheries Society, Australian Society for Fish Biology, and New Zealand Marine Sciences Society, will take place in Auckland, New Zealand, during **February 24-28, 2008**. This meeting offers a unique opportunity for the sharing of information on satellite and data logging tags, acoustic and radio telemetry, new methods using traditional internal and external tags, chemical and genetic marks, and innovative data analysis techniques. The deadline for abstract submission is **October 31, 2007**. For more information, go to the following website:

http://www.fisheries.org/units/tag2008/abstract.html.

Resilience 2008 - Resilience, Adaptation and Transformation in Turbulent Times

This international science and policy conference will take place in Stockholm, Sweden, during **April 14-17 2008**. The conference will bring together scientists who work on the complex dynamics of social-ecological systems, to present, discuss, and summarize the current understanding of resilience, adaptability and pathways of transformation in systems of humans and nature. Representatives from government, business and other major organizations will be invited to the policy forum to discuss the challenges facing societal development, and together with scientists propose directions to go and pathways to avoid. Submission of abstracts for oral and poster presentations will be open from **August 15 to November 16, 2007**. Further information about the submission will be provided at the conference website (**www.resilience2008.org**).

Go to Great Links http://www.usgs.gov

The Microbe Project

The interagency web page **www.MicrobeProject.gov** has updated the DOI USGS page to include the USGS microbiology links. For more information about microbiology research in USGS, contact Kay Briggs at kmbriggs@usgs.gov.

Mid-Atlantic - Report Card Issued on Chesapeake Bay Habitat Health

EcoCheck, a partnership between the NOAA Chesapeake Bay Office and the University of Maryland Center for Environmental Science, has just released the 2006 Chesapeake Bay Report Card (http://www.eco-check.org/reportcard/chesapeake). This report card is designed to provide a transparent, timely, and geographically detailed assessment of Chesapeake Bay habitat health. It defines habitat health as the progress of three water quality indicators (chlorophyll a, dissolved oxygen, and water clarity) and three biotic indicators (bay grasses, benthic community and phytoplankton community) towards scientifically derived thresholds and goals. The six indicators are combined into a single overarching index, or report card scores, for 15 regions of the Chesapeake Bay.

New Chesapeake Bay Water Temperature Map Available Online

The NOAA Chesapeake Bay Office has released a new web-based product through the Coastal Prediction Center, using NOAA CoastWatch satellite data. This interactive Chesapeake Bay water temperature map provides the most recent sea surface temperature data from NOAA's Polar Operational Environmental Satellites as 1-day, 3-day or 7-day composites. Users can query several points to get an average, or click a single point to get the temperature at that latitude/longitude. This new product is accessible at **http://coastalpredictioncenter.chesapeakebay.net/**.

Share Your Expertise through the Fisheries and Aquatics Bulletin

Thank you to all those who have contributed material to this issue of the FAB: our Science Features authors, Robin Schrock, Marcia Nelson, Randy Hines, Mike Jawson, Jim Fleming, Dick Neves, Teresa Newton, Kay Briggs, and Jessie Thomas.

Communicate your fisheries and aquatic resources items of interest to gain national exposure. Send articles and photographs with credits and captions to:

Janet Cushing—jcushing@usgs.gov OR
Robin Schrock—robin_schrock@usgs.gov