

WFRC Research News

(Lab news you can use to survive and thrive)

Editor: Gary A. Wedemeyer

Winter Issue: January, 2006

IN THIS ISSUE...

Lab News You Can Use

by Lyman Thorsteinson

The Fish Immunology Group Part 3, Dr. Kerry Laing

by Gary Wedemeyer

Emlen Escapes!

by Gary Wedemeyer

WFRC Fact Sheets

by Debra Becker

If You Display It, They Will Come

by Judy Maule

Metadata News

by Vivian Hutchison

'Ya mon' — Modeling in Jamaica

by Jim Petersen

Alumni News

Kyle Garver

A Little Light Reading

– Selected WFRC Publications

– Bonus Book Review

Lab News You Can Use

by Lyman Thorsteinson

Happy New Year!!

High on my list of recent accomplishments was a first visit to the Reno Field Station and a whirlwind tour of southern Nevada with host and super-star tour guide, Gary Scoppettone. Reno has a geographically-diverse portfolio of research that includes projects addressing threatened and endangered fishes, invasive species, and habitat restoration and population recovery, on a variety of species in a number of habitats. I visited project sites for research on: desert pupfish and Moapa dace in warm water springs near Las Vegas; aquatic community interactions in Pyramid Lake (interagency emphasis on cui-ui and pelicans); and Lahontan cutthroat trout at Independence Lake in the Sierra-Nevada Mountains. We met with Interior and tribal partners and Reno staff provided me with an excellent overview of their science activities. Today, I have a much greater appreciation for the breadth and scope of Reno's science, its relevance to partner needs — and Gary says he's not done with me yet. I definitely have a new found respect for our biologists toiling in desert and arid landscapes.



Since our last issue, the Center hosted a 2-day research planning workshop on the USGS Initiative for Coastal Habitats in Puget Sound. The meeting

was attended by scientists from all USGS disciplines including a strong socioeconomic component from Fort Collins. The Center and Biology was represented by Jim Winton, Rusty Rodriguez, Reg Reisenbichler, Dennis Rondorf, and Jeff Duda. As an outcome of the meeting, proposals were developed for the Skagit River Delta, Elwha River Estuary, and a more generic Coastal Urban Corridor. Each effort reflects a process-oriented study's approach to understanding factors responsible for the creation, maintenance, and biological utilization of coastal habitats. USGS study areas are generally defined as the landscapes encompassing coastal bluffs and wetlands, areas of tidal influence in watersheds, and the photic zone of nearshore waters. The proposals were peer-reviewed and funding transferred from Geology's Coastal and Marine Geology Program. In addition, the USGS is presently collaborating in a broader planning effort with NOAA Fisheries and others to describe the priority science needs for ecosystem-based management in Puget Sound. I have been asked to work on food web and species/habitats working groups.

Our September close-out went smoothly thanks to our hard-working administrative staff. In addition, we had a number of planning assignments with deadlines in September. We completed several Center plans including "Laboratory Safety Plan", "Strategic Plan", and "Peer and Policy Review of Science Products/Project Management SOP". These were forwarding to reviewing officials at the Western Regional Office and distributed to those in attendance at the Center-wide Meeting in Oregon. Your comments on these documents would be appreciated.

A Center-wide Meeting was held at the Inn at Otter Crest, Oregon in early October. A main purpose

was to roll-out our new Strategic Plan, highlight some of our research, and to talk about future science directions. We are a diverse group, with varying interests, but I think we were successful in meeting the mix of objectives outlined above. I opened the meeting with a review of the state-of-the-Center, which was followed by a series of administrative and science presentations. Robin Schrock (formerly CRRL) provided a Headquarters view of FAER and other programmatic activities that will affect our Center. Anne Kinsinger (USGS Acting Western Region Director) provided executive views of current conditions at national and regional levels and how these will affect our future. Together we discussed our priority science areas as they pertain to large rivers, endangered and threatened species, aquatic invasive species, coastal ecosystems, and disease ecology. Even though the WFRC is geographically dispersed and diverse with respect to disciplinary expertise, the strategic planning provides a framework for how our disciplinary questions inter-relate and how our considerable expertise can be tapped to address issues throughout the West.

In addition to the coastal research I have described for Puget Sound, I am working hard, with the help of senior staff, for program growth in several other areas. These include Center participation in a USGS initiative entitled "Water Availability for Ecosystems" (Jim Petersen, lead), basin-wide research and monitoring in the Klamath Basin (Rip Shively and Jim Winton, leads), and aquatic invasive species/ballast water research (David Woodson and me, leads). David Woodson, Kyle Sato, and Mike Parsley are coordinating the conduct of a feasibility study for a new CRRL facility with USGS Menlo Park and the GSA (final report due in February 2006). There is progress on many fronts.

The Center received its FY 06 allocation and, with the exception of a 2.5% rescission by Headquarters, our base funding is similar to FY 05. The distribution of these funds within the Center will be in accordance with our FY 06 BASIS+ proposal submissions and Common Services requirements. At present, our projected reimbursable program is slightly less than FY 05. The good news is that our Center overhead rate has been stabilized in FY 06 and this should make us that much more competitive in the reimbursable world throughout the fiscal year.

A final note – Dr. John Emlen retired on December 3, 2005 after many productive years of service to the WFRC. He will be greatly missed and I know that I speak for all in wishing John and family all the best in the years ahead.

The Fish Immunology Group Part 3, Dr. Kerry Laing

by Gary Wedemeyer

This is the last of our 3-part series introducing WFRC's new Fish Immunology Group -- Dr. John D. Hansen, his research team: Eric Landis, a Ph.D. candidate from the University of Maryland, Dr. Kerry Laing, a post-doctoral fellow, and WFRC staff biologist Dorothy Chase.

In parts 1 and 2, we reported that the group is utilizing a functional genomic approach funded largely through the USDA to define the MHC haplotypic architecture within clonal lines of trout. In addition, they are actively involved in the design and usage of microarray technology that can be used for the identification of molecular pathways and candidate genes that are relevant to fish health and the production of effective vaccine technologies. The Fish Immunology Group is also funded through the National Science Foundation to

look at the processes governing T-cell development and function in trout.



Dr. Kerry Laing's project is primarily concerned with identifying and isolating genes for two major components of the T cell signaling pathway in

rainbow trout. One of these is CD4, a T cell co-receptor that recognizes antigenic peptides presented by MHC class II and the other is p56LCK, a kinase that is involved in the signaling cascade following T cell engagement with MHC.

So far things are progressing well. She has the full length p56LCK molecule cloned, and has gone on to generate recombinant proteins and monoclonal antibodies that are now being characterized. Kerry also has identified two distinct CD4 molecules in trout and will develop monoclonal antibodies to these soon. Currently with these CD4 molecules Kerry is assessing the structural characteristics and phylogenetic relationships with mammalian CD4 related molecules. She is also investigating the ability of the trout CD4 molecules to interact with p56LCK using various methods to determine protein-protein interactions.

Kerry's research is designed to complement the work that John Hansen has been doing with the CD8 α molecule that specifically recognizes MHC class I, and thus provide a means to study helper (CD4+) and cytotoxic (CD8+) T cells separately in fish. Under the assumption that they possess the same lymphocyte subclasses that are observed in mammals. Thus, the most important aim of the project at this stage is to develop and characterize the monoclonal antibodies for these two CD4 molecules. This will provide useful reagents for

future use in T cell function and maturation studies in salmonids that are currently not possible.

Emlen Escapes!

by Gary Wedemeyer



WFRC's internationally recognized ecologist and mathematical modeler Dr. John Merit Emlen has escaped the daily grind! He retired the 1st

of December, 2205.

John received his Ph.D. from the University of Washington in 1966 and conducted pioneering research at the University of Colorado, State University New York, Stony Brook, Indiana University and the Environmental Protection Agency (Corvallis Laboratory) before joining the WFRC staff in 1987.

Emlen's research accomplishments here at the WFRC are well known to all of us but, in brief, his primary interests have been the application of ecological theory to the solution of natural resource problems — with a special emphasis on population and community dynamics, and fish and wildlife management.

John started off his retirement by traveling to Vera Cruz, Mexico where he took part in an ecological modeling workshop on developmental instability and gave seminars on INTASS and the ecological impacts of grazing practices. His post-retirement plans include continuing his present work on San Francisco Bay striped bass, invasive weed research in Montana and Utah, modeling IHN viral evolution with Gael Kurath, and continued work on WFRC's Trinity River project with Jeff Duda. John is also looking forward to finally having the time to

analyze and write up the extensive dataset he has collected for INTASS.

John is especially looking forward to having more time for his twin avocations of music and writing. As you may know, John plays the piano beautifully and also sings tenor in the Federal Way Chorale. He has 3 novels and 1 non-fiction book in various stages of preparation and will undoubtedly be looking for a publisher in the not-to-distant future.

In concluding my interview I remarked "I know I speak for all of WFRC when I say "Good luck to you John. We will miss your intellectual contributions, and also your upbeat attitude" In reply, John merely pointed to the philosophical quotation which has long been posted in his office: "If life is worth taking seriously, then the last thing one should do is be too serious." Not surprisingly, the author of that quotation is J. Emlen.

WFRC Fact Sheets

by Debra Becker

In an effort to increase the Center's visibility to persons outside the scientific community and prepare for Congressional visits a publications plan was developed in March of 2005. Scientific staff contributed narratives and Dena Gadomski from the Columbia River Research Laboratory, and I were tasked with completing several outreach publications for the Center. This list consisted of two Center brochures, and 12 factsheets. As of August Dena and I have completed 6 Center factsheets.

The following factsheets can be found on the WFRC website at:

http://wfrc.usgs.gov/pubs/fact_sheet.htm

- Fish Can Get Diseases Too
- Arid Lands of the Southwest
- Aquatic Invasive Species
- Biological Science in Oregon
- Managing Water in the West — Developing New Tools for a Critical Resource

- Western Fisheries Research Center Studies — Threatened and Endangered Fishes

In 2006, we plan on completing 6 more factsheets and 2 Center brochures.

- Biological Science in California and Nevada
- Biological Science in Washington
- WFRC Partners: Our Extended Family
- USGS Integrated Science (To include: Upper Klamath Basin Integrated Science, Hood Canal: Effects of hypoxia on marine fishes)
- Columbia River Basin – Large Rivers
- Geographic Focus Areas (To include: Puget Sound Nearshore Ecosystem Studies and the Great Basin)

Watch the newsletter for further developments.

If You Display It, They Will Come!

by Judy Maule

CRRL Open House Draws Unexpected Crowds

On Saturday, August 27, the Columbia River Research Laboratory hosted its first Open House since the lab was established in 1982. Exhibits included boats and sampling equipment, live fish, fish bones and scales, and posters and computer displays with staff available to talk with visitors about the wide range of work done by CRRL scientists. The Open House provided a unique opportunity for the public to learn more about research techniques and the information being gained from the studies

Nearly 200 visitors of all ages stopped by the lab between noon and 4:00 p.m. Many of the local people said they had driven by the lab for years and always wondered what went on there. A surprisingly high number of people came from Portland, Vancouver and even as far as Battle Ground thanks to articles in the metro newspapers. All agreed that it was worth their trip up river to

learn more about the research being conducted by USGS scientists.

A number of other USGS employees, such as Lyman Thorsteinson, David Woodson, Brian Cole and Alan Mikuni, and employees from federal partners such as US Fish and Wildlife Service and Bureau of Reclamation, toured the facility and talked with staff.

Lab Director Jim Petersen reported overhearing a visitor remark to his wife that what folks at CRRL do is “way cool!” Another visitor hurried home to bring back her husband because she thought the exhibits were so interesting. Connections were forged with teachers from local high schools, Mount Hood Community College and the Vancouver campus of Washington State University for future collaboration and educational exchanges.

The Cook facility includes three analytical laboratories dedicated to enzymology, general physiology, and immunology and cell culture. The wet lab used to conduct research on fish development and behavior was also open to visitors during the Open House. Computer demonstrations provided information about modeling, distribution of fish and plant species, and other work being conducted in the region.

Children climbed aboard research vessels and learned about boat safety as well as getting a close-up look at the specialized equipment used to track fish. Visitors were fascinated to learn more about the tagging and tracking of fish as they migrate through the rivers. People also were impressed by the broad spatial extent of the projects the lab is involved with.

One of the most popular stations was Conrad Frost’s bone display that included fish and other skeletons, and fish scales under microscopes. Conrad developed an expansive display that

included excellent drawings and written materials along with the specimens. Nathan Zorich enthusiastically staffed the exhibit throughout the day, providing information and answering questions to a never-ending crowd.

The live fish display was another popular stopping point with salmon, sturgeon and lamprey in tanks, and fish in the swim tube in the wet lab. A question and answer activity engaged children and parents alike and stimulated discussions with staff.

U.S. Fish and Wildlife Service, Columbia River Information and Education Office's Outreach Coordinator Cheri Anderson provided a display and handouts related to FWS hatcheries and the Fish Health Center in the Gorge. She also provided a fishing pond where anglers from two to sixty-two could catch a laminated salmon or steelhead and identify the species by matching caudal fin and coloration to samples. This display engaged the youngsters and gave parents a chance to share a few fishing tales of their own.

At the conclusion, Jim Petersen thanked CRRL staff for their enthusiasm, friendliness and professionalism. It was clear that people who work for CRRL are proud of the work they do and they enjoyed talking about it. It was gratifying to see how many people drove to the remote site, spent an hour or more touring the facility and talking with staff, and went home favorably impressed by the work USGS-CRRL is doing in the Northwest.

When is the next Open House? While this may not become an annual event, Jim Petersen guarantees that we won't have to wait another 23 years for a repeat performance!

(Eds. note — those not familiar with CRRL might be interested in a little background material)

Research at the lab began in 1982 when WFRC fish biologists Bill Nelson and Lance Beckman were

tasked to create a research program in the Columbia River Basin. As Nelson and Beckman developed projects, funding opportunities grew quickly, and increasing numbers of employees were soon needed to support the ever-broadening scope of research. In 1996, the lab became part of the U.S. Geological Survey, and is now one of the largest employers in the mid-Columbia Gorge, with over 90 Federal employees and 100 seasonal contract employees.

Today, lab funding comes primarily from partners including the U.S. Army Corps of Engineers, Bonneville Power Administration, state fish and wildlife agencies, other state and local agencies, and the Tribes. CRRL staff expertise encompasses a wide range of skills related to fish biology, large river ecology, environmental physiology, behavior of fish, spatial analysis and modeling. Staff scientists actively collaborate with researchers throughout the country and internationally, and serve on a variety of regional committees, teams, councils and review panels.

I Never Metadata I Didn't Like

by Vivian Hutchison, NBII liaison to WFRC



Making Metadata Happen

Think for a moment about a new project in your organization that involves collaboration with two different partners. Both partners are contributing data sets to the project, and you are tasked with merging the information, analyzing it, and creating a new informational mapping tool. You receive a data set from one partner, and you are relieved to see a Federal Geographic Data Committee (FGDC) compliant metadata record accompanying it. Why? Because you are now able to read about when the data set was created, why, who developed it, what scientific methods were used, the content and structure of the data, how the data were produced, the level of accuracy, and its geospatial domain.

You are very encouraged by your experience, so you move on to the second data set...but sadly, there is no metadata record with the data. As you stare at columns of data, you are faced with a myriad of questions. What units of measure were used in this data set? What do all these abbreviations in the column headers mean? Who is responsible for maintaining the data set? Why was the data originally collected? You wonder if you will be able to gather all this information and still meet your deadlines. You sigh as you pick up the phone to make what will surely be a lengthy call – if you can figure out who to call in the first place... How can the latter scenario be remedied? Here are a few helpful starting points:

1) Sell the idea to upper management by emphasizing the importance of standardized records that document the important work of your scientists and researchers. Highlight that metadata is an efficient method of tracking the accomplishments of your department. Robust metadata records can be used to capture institutional knowledge – a useful tool when experienced scientists retire, for example.

2) Assign a metadata expert in your organization. The role of that individual would be to conduct information gathering interviews with your scientists by asking 15 simple questions about their data set. (For a list of questions, contact Viv Hutchison: vhutchison@usgs.gov) Information collected would be used to create a metadata record to be reviewed later with the scientist. Metadata templates could be created for further similar or related research efforts.

3) Engage the resources of the NBII. We have built an infrastructure for you to use that includes metadata training, quality control, record creation assistance, and a growing Clearinghouse.

First, find out about workshops offered throughout the year by visiting the NBII training calendar: <http://www.nbii.gov/datainfo/metadata/training/calendar.html>. Start by sending one person to the training, then decide if your agency would benefit by a workshop in your location. Limited travel funding is offered for most of the workshops.

Second, ask about NBII metadata creation assistance to begin immediately documenting your top priority data sets. It is a free service.

Third, investigate the best metadata creation tool for your needs – there are several to choose from, depending on your organizational needs. Examples can be found at: <http://www.nbii.gov/datainfo/metadata/tools/>.

Finally, consider joining the NBII Clearinghouse. Once you have started documenting data sets, the NBII will quality control your record and submit it to the Clearinghouse for you. You can become a Clearinghouse node, and we will harvest your records weekly into the NBII Clearinghouse under your organizational name.

The data your organization collects is important and valuable. Data sharing, collaboration and resource leveraging is a reality in today's science environment. Metadata records will make it all possible, and will preserve research conducted today, for tomorrow's generation. Many resources are available to you – let the NBII know how we can help!

Hutchison Elected President

by Gary Wedemeyer

Vivian Hutchison, NBII's metadata liaison with the WFRC, was recently named president-elect for the Organization of Fish and Wildlife Information Managers (OFWIM).

OFWIM is an international non-profit association dedicated to the management and conservation of natural resources through technology and information exchange.

'Ya mon' - Modeling in Jamaica

by Jim Petersen

Ahh -- as I write this there is a warm Caribbean breeze blowing and it's about 82° F. I arrived in



Jamaica on November 20 and will be here until December 10 on a Fulbright Senior Fellowship at

the Discovery Bay Marine Laboratory (DBML). The weather wasn't always as nice as this – during the first week the wind blew steadily and it rained about every other day. Tropical weather this time of year can be a little fickle, but I'm not complaining. I planned the trip to avoid the main part of the hurricane season (August-October), and was successful in that sense! Dena came down for a week of Annual Leave, but she hit the bad weather and had to tolerate a giant jackhammer doing road construction outside our room – not her best “vacation.” My accommodation was at the lab, and was a bit Spartan compared to what we are used to (no phone, no internet, no TV), but I had some interesting vertebrates as house guests.

Fulbright Fellowships are meant to be both a scientific and cultural exchange between countries and institutions, and mine seemed to work out well that way. One of the main activities was conducting a 2-day workshop on “Fish Bioenergetics Modeling”, which was held on November 29-30. The DBML Director, Norm Quinn, and I organized the workshop over the last several months. We had 8 students from 4 different countries (Jamaica, USA, St. Lucia, and the U.S. Virgin Islands), including university lecturers, several graduate students, a Peace Corps volunteer, and some NGO staff. I introduced the class to the principles of this type of modeling and ran them through exercises with software that is available for building and applying energetics models. For the “final exam”, they conducted an exercise with tilapia to see if they could estimate growth and production in a hypothetical tilapia farm.

Some of the students talked about using the modeling approach



to study tilapia in Jamaica, juvenile billfish growth off of Florida, and Nassau grouper growth in the Bahamas. Hopefully, some of the training will help with these ideas and studies. The hardest part of the workshop was gathering together 8 disparate computers from various people and labs at DBML – we are definitely spoiled by our abundant computers and IT support here at WFRC.

Besides the workshop, I got the opportunity to do a variety of other things. Dr. Quinn and I traveled into the mountains to visit the Sturge Town School and give a couple of talks to the 3-6th graders. I'm not sure these kids had ever seen a PowerPoint presentation, and we had to use a sheet over a

partition for our screen, but it went well. The kids asked lots of good questions (e.g., “What is the most important thing you’ve ever learned?”) and we might have recruited a couple budding scientists. DBML does a lot outreach, trying to educate school children, fishermen, and others about marine conservation.

We attended a charity ball sponsored by the Jamaica Hotel and Trade Association that was lots of fun. Aside from some outstanding local food, Red Stripe beer, and island martinis, they had a live band and a fashion show where I met some other “modelers.”



We traveled across the island to Kingston to visit the University of the West Indies, which is the parent institution for DBML. This trip was along the backroads, and it took us about 6 hours to go roughly 60 linear miles. Traveling by road is a little scary in Jamaica since they drive on the left, drive fast, pass on any stretch, and there are continual kids, adults, goats, and potholes on the road. Nonetheless, the scenery was often spectacular and the people that we constantly asked directions were always very polite and helpful. A highlight of the trip was a stop at one of the city markets to “bargain” for fruit and vegetables. The University of the West Indies is large, has a beautiful campus, and is similar to U.S. universities in many ways.

Finally, I also got to spend quite a bit of time talking with the Director of the marine lab (Dr. Quinn) and the head of the Department of Fish and Wildlife in the U.S. Virgin Islands (Dr. Barbara

Kojis) about the similarities and differences from my work as CRRL Director. There are probably more differences than similarities between DBML and CRRL. DBML has only a couple of scientists on staff and they spend more time with administration than research. Most research is conducted by visiting scientists, mostly academics, who come for 1-4 weeks to do lab or field experiments. They have on-site housing for about 50, something I’m glad we don’t have to deal with at CRRL! The lab is right on the bay and has about 5 aluminum boats and scuba tanks for scientists to use. The staff includes a diving officer, maintenance, housekeeping (nicknamed “Precious”), and administration. One unique aspect of the lab is that they have the only functional decompression chamber in Jamaica, which got used once while I was there by an unfortunate (or careless) diver!

Of course there was a little fun time thrown in. We had a turkey dinner for Thanksgiving overlooking the beach at Rio Bueno (named by Columbus during his second voyage), Dena and I toured around Montego Bay a bit, I tried to go snorkeling as often as possible, and I got to know a few of the local workers at DBML. Dena and I visited Jamaica a couple years ago as tourists, so I didn’t feel the need to rush around too frantically and see the sights.

All-in-all, the experience was very good and I think there was a positive exchange between someone from Washington state and the Jamaicans that I encountered. Tourists occasionally come away from Jamaica remembering the hustlers or the ganja pushers. That certainly occurs and you have to be ready for it, but once you venture outside the main tourist hangouts it’s rarely a problem.

Let me know if you’d like more information about the Fulbright Fellowship process.

WFRC Alumni

News from Canada

by Kyle Garner

Hi Everyone,

Be warned! Nothing stops the tenacious Gary (the editor) Wedemeyer! I tried to escape Gary's radar by moving to another country but somehow he tracked me down and convinced me to give an update on my life as an expatriate in Canada.

In September 2005, after spending five great years at the Western Fisheries Research Center in Gael Kurath's laboratory, I moved to Nanaimo, B.C., to begin work at the Pacific Biological Station (PBS). The move to Canada went fairly smoothly, but was not without adversity: Active labour disputes in Canada's largest telecommunications company delayed access to new service, while differences in the banking culture hindered the establishment of a standard banking account. However, through it all, the people of Canada were quite helpful and extremely nice and I'm happy to say that I now have a phone and a banking account. So to those of you in the US whom I owe money to, I can now pay you back in Canadian dollars.

Now that I'm settled in, I've been familiarizing myself with my new workplace and its local surroundings. The Pacific Biological Station is operated by the department of Fisheries & Oceans Canada and is located on Departure Bay in Nanaimo on Vancouver Island. The station is Canada's principal center for fisheries research on the West Coast and is home to more than 200 staff members. The majority of the research conducted at PBS is devoted to stock assessment and management however there are also active programs in the fields of fish health, aquaculture, and environmental and ocean science.

My research interests, of course, lie within fish health. At PBS, I continue to investigate fish

viruses with my studies focusing on viral hemorrhagic septicaemia virus (VHSV). This virus is mostly found in marine fishes and has been the cause of significant mortality in Pacific herring in British Columbia, Alaska, and (as your very own Paul Hershberger has discovered) in the Puget Sound. The goal of my research is to determine the genetic types of VHSV throughout Canada and to better understand the virulence of this pathogen, in order to assess the potential risk of VHSV to Pacific and Atlantic salmon stocks.

Of course, my research also involves dabbling with my first true love...infectious hematopoietic necrosis virus (IHNV). With British Columbia having the world's largest run of sockeye salmon there are plenty of susceptible hosts and many IHNV isolates to investigate.

Vancouver Island also offers many options for the outdoor enthusiast. I've managed to sample some, such as hiking, fishing, and kayaking. However, much more exploring needs to be done, so if you are planning a trip to the Island please look me up and I'll be more than happy to share what I know with you or we can explore the area together. Hope you are all doing great and have a great Holiday season!

Kyle Garver

Pacific Biological Station

3190 Hammond Bay Road

Nanaimo, British Columbia, Canada V9T 6N7

Phone: (250)756-7340

Email: garverk@pac.dfo-mpo.gc.ca

Oh yea, if any of you are wondering if I still commute by bike...well unfortunately no but I am able to walk and even kayak. Although due to high winds and rough seas during the winter, I'll probably be forced to limit my paddling to the summer months.

A Little Light Reading

Bonus Book Review

by Gary Wedemeyer

The Behavior and Ecology of Pacific Salmon & Trout by Thomas P. Quinn. University of Washington Press, 2005. 378 pp.

Simply put, this new book by Dr. Tom Quinn is the best modern reference extant on the ecology of West coast salmon and steelhead. It certainly offers the most detailed explanation of Pacific salmon/steelhead life history and behavior yet to appear in print.

Quinn writes in an engaging and informative manner and makes good use of the advances of the last decade to document the topics he discusses, so the book seems certain to become a milestone in the Pacific salmon literature.

Virtually every known aspect of the behavior and ecology of the six species of Pacific salmon, plus steelhead and sea-run cutthroat, are documented. Quinn's discussion of the importance of post-spawning salmon carcasses for the health of freshwater ecosystems is particularly well done. "The entire ecosystem — from insects to bears and trees, including the salmon themselves — benefits in complex direct and indirect ways from decomposing salmon."

Although Quinn presents data showing that Puget Sound's salmon runs have declined to only about 8 percent of their estimated historic levels, he remains optimistic about possibilities for recovery. He writes "Salmon are important to so many of us, in so many ways. They are our food, our recreation, our symbol and inspiration, and a critical component in the ecosystems that we value and depend on. If we dedicate ourselves to ensuring that

they continue to play all these roles, I believe the salmon will do the rest."

Quinn's book is not necessarily meant solely for professional biologists, but the information presented is technical and will require most lay reader's full attention.

Two New WFRC Publications

Gadomski, Dena M., and Michael J. Parsley. Vulnerability of young white sturgeon, *Acipenser transmontanus*, to predation in the presence of alternative prey. Environmental Biology of Fishes. (in press).

Abstract.

We conducted laboratory trials to test the vulnerability of young white sturgeon, *Acipenser transmontanus* (34-100 mm total length), to predation when an alternative prey was available.

In trials with two species of predators, we observed two feeding patterns. When equal numbers of white sturgeon and goldfish, *Carassius auratus*, were available, prickly sculpins, *Cottus asper*, ingested more white sturgeon—for all trials, a mean of 88% of the prey ingested were white sturgeon. Conversely, northern pikeminnow, *Ptychocheilus oregonensis*, ate more juvenile coho salmon, *Oncorhynchus kisutch*, than white sturgeon in three out of four sets of trials (a mean of 15% of the prey eaten were white sturgeon), but ate more white sturgeon (82%) in one set of trials.

White sturgeon size and the availability of cover did not affect the proportions of prey species ingested. Our results indicate that predation may be affecting survival of white sturgeon larvae and juveniles in the wild and could be one factor limiting recruitment of young-of-the-year white sturgeon in some locations.

Hayes, M.C., Rubin, S.P., Hensleigh, J.E., Reisenbichler, R.R. and L.A. Wetzel. 2005. Performance of juvenile steelhead trout (*Oncorhynchus mykiss*) produced from untreated and cryopreserved milt. *Aquaculture*, 249(1-4):291-302.

Abstract

Despite the expanding use of milt cryopreservation in aquaculture, the performance of fish produced from this technique has not been fully explored beyond initial rearing stages. We compared the performance of juvenile steelhead *Oncorhynchus mykiss* produced from untreated (UM) and cryopreserved milt (CM) and reared for 4-9 months. For the 1996 brood, CM alevins were heavier (~1.7%, $P < 0.01$) than UM alevins and length was influenced by a significant milt-by-family interaction ($P < 0.03$) suggesting a greater treatment effect for some families.

No significant differences were found in length or weight ($P > 0.05$) for 1997 brood alevins and percent yolk was similar for both broods ($P > 0.34$). In Growth and Survival Experiment I (GSE-I, 1996) UM and CM juveniles reared in separate tanks and fed to satiation (130 d) showed no significant differences in survival, length, or weight ($P > 0.05$) between milt groups.

In contrast, for UM and CM siblings reared in the same tank for 210 d on a low food ration (GSE-II), survival was similar ($P > 0.05$), but length (UM 4% >CM, $P < 0.05$) and possibly weight (UM 15% >CM, $P = 0.08$), were influenced by cryopreservation. Fish from the 1997 brood (GSE-III) were reared for 313 d in a repeat of GSE-II and no differences were found in survival ($P = 0.47$), length ($P = 0.75$), or weight ($P = 0.76$) suggesting considerable heterogeneity between broods. Performance of the

1996 brood was also tested for response to stress and a disease challenge. Cortisol responses of juveniles exposed to acute stress were not significantly different ($P = 0.19$), but mean cortisol was consistently and significantly greater ($P < 0.01$) for CM than UM fish exposed to a 48-h stress (increased density).

After exposure to three dosages of the bacteria, *Listonella anguillarum*, we found similar mortality proportions ($P = 0.72$) for UM and CM fish. Variable juvenile performance for the parameters tested indicated significant differences among broods and families and suggests a cautionary approach to the widespread use of cryopreservation for steelhead.

Eds. Note: Because cryopreservation is a widely used and successful technique for the conservation of birds and mammals, there is strong interest in it on the part of fishery resource managers as a conservation method for threatened and endangered fishes. However, the authors of this paper urge a cautionary approach, not only for steelhead but for anadromous salmonids in general. Additional fish performance measures such as juvenile migration success, seawater competence and susceptibility to infectious diseases must be evaluated to ensure there are no unsuspected deleterious effects before cryopreservation can be recommended to resource managers as an everyday fisheries conservation strategy.