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WFRC Research News

(news you can use to thrive and survive)

Editor, Gary A. Wedemeyer *Volume 3(1), February 2004*

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News You Can Use

by Lyman Thorsteinson

The Center's Budget was recently released to managers within the organization. This year's big news is that the $500,000 associated with marine ballast water research was, for the first time, allocated to the WFRC as a base appropriation. This action brings long-term stability to this invasive species research and opportunities for our scientists to become more involved in ballast water studies in Puget Sound, and other Pacific Ocean and coastal sites where marine transportation and potential introductions may affect the Pacific Northwest. Already, WFRC scientists are working with others to investigate ballast water species and habitat relationships in the Columbia River estuary. In Puget sound, we are beginning research necessary to design novel molecular diagnostic systems for species identifications and community characterizations in ballast and coastal waters.

A small planning group comprised of senior scientific and administrative leaders at WRFC will meet in early February to strategically examine and discuss future directions and needs of the Center. The last strategic science plan was completed in 1997 and thus this effort is at once timely and necessary. Our initial objective will be to adopt a planning process that allows WFRC managers to think and act strategically in the face of emerging science needs and organizational change. Our first order of business will be a review of the lessons

learned from ongoing planning at the Columbia River Research Laboratory which relied upon a process involving an external facilitator. I envision the adoption of a planning process where all members of the Center will be engaged and that a final draft strategic plan will be rolled out at a Center-wide meeting in Fall 2004.

Many of you are aware that the WFRC has been actively engaged in USGS Integrated Science Planning for Puget Sound. Puget Sound was the initial geographic focus area in the Pacific Northwest and our involvement in interdisciplinary planning has resulted in a project to investigate nearshore fish use of coastal and estuarine habitats. Our work, in collaboration with NOAA and others, has focused on salmon and forage fish species and concentrated sampling areas in the Skagit River estuary and several other locations along the eastern Sound. In January, as part of a planning effort with the WRD's Washington Water Science Center, Dr. Paul Hershberger and I met with Hood Canal stakeholders to discuss information priorities relative to the fjord's dissolved oxygen problem. The USGS received a Congressional add-on of $350,000 in FY 04 to address this issue and we are hoping to be able to work with WRD as it relates to fish kills, fish health, and ecological problems in Hood Canal.

Most recently, the USGS Western Region announced the Great Basin and Columbia Plateau as new western geographic focus areas. The Western Regional Executives for Biology and Water will serve as the respective leads. The four BRD centers currently involved in Great Basin science – FRESC, WERC, WFRC, and SWBC – met in Seattle last week to discuss ongoing research and research needs. Initial studies emphasis will be sage grouse, habitat, and invasive species and water issues in the basin. A joint proposal is being prepared for funding consideration under the Western Regional Office's Partnership Program and other USGS funding sources. A Columbia Plateau planning group will meet in February.

A Klamath Falls Science Workshop was held the first week in February. The week long meeting in Klamath Falls allowed agency administrators, resource managers, scientists, and other stakeholders to discuss and prioritize their needs in the basin. Rip Shively (WFRC) and Dennis Lynch (WRD) were the USGS meeting leads. The workshop focused on water issues as they relate to its quality, quantity, and availability to multiple users, including endangered fishes, in the basin. The USGS workshop followed the release of a report by the NRC that evaluated existing data and information, and their application to endangered species management for Lost River and short nose suckers and coho salmon. The workshop was meant to aid USGS research planning for FY 05 and beyond in the Klamath Basin. A USGS Research Plan will be prepared following the workshop.

A Center Director's meeting was convened in Seattle on January 23-25. Major issues addressed USGS and Western Regional Office requirements for scientific and policy reviews. The need for updated Center policies and greater attention to policy reviews for all our products was discussed. Also, the USGS Bureau Planning Model requires annual and strategic center reviews and more information about how and when these will be conducted was presented. Other topics included implementation of USGS business practices, the status of competitive sourcing, and congressional and media training. The last day of the meeting

involved strategic planning with the NBII Program which resulted in further excellent efforts to make the WFRC a fuller partner in the Pacific Northwest Information Node.

Looking ahead, this Center recently participated in the identification and description of Western Region science priorities for FY 06. Many ideas were generated for the West and several themes look very promising for the WFRC including salmon declines and ecosystem indicators; enhancing USGS aquatic invasive species capabilities; application of molecular tools in the Western Region; building a new generation of tools for managing water and ecosystems in the West; science to restore Puget Sound nearshore resources; and forecasting landscape changes (the Great Basin as a natural laboratory for addressing sustainable development). These proposed initiatives are currently under consideration by the USGS. ►

Who's Who in Admin.

Dr. David Woodson (Acting Deputy Dave)

Hello, I'm Dave Woodson and Gary's been pestering me to introduce myself. First, I'm from the Regional Office and I'm here to help. Actually, Frank was concerned about WFRC workload and thought I could help Lyman out. I'm hoping to become the Deputy Center Director and become more involved in the management of science at the field level. That's the short story. Below is past detail for the curious.

In 1980, after four years in the Air Force as a paramedic in England, I pretty much knew what I didn't want to do for a living. My wife and I decided going to college was the smart thing to do so like my father and grandfather before me, I went to Texas A&M. I decided to formally study entomology because it had been a field of my interest since I was five. While there, I earned a Bachelor and Master's Degree in Entomology. My dream job was to be a county entomologist in some rural west Texas town; you know one of those little towns with only one Dairy Queen and you can see cotton fields from Main Street.

My Master's project was working out the life history and a way to control a carrot weevil that was (literally) eating up the carrot industry in the Lower Rio Grande Valley of Texas. An area between Brownsville and McAllen Texas — snowbird country, the land of blue-haired elderly ladies, walkers and Winnebago's. After 18 months and a lot of Shiner Bock (the grad student beer of Texas A&M), I had saved the carrots for Gerber, Del Monte and Campbell's Soup. Unfortunately, I had changed my attitude about working in Extension Service Agriculture by then, and that "Don't mess with Texas" littering ad was the last straw. So I decided to leave Texas. Besides, as my advisor told me, getting three degrees from the same university was like kissing your cousin. Feeling a bit dejected, I set off for Okalahoma State University (OSU) to pursue a Ph.D.

There I joined a project that allowed me to pursue my interest in population dynamics and develop my modeling skills. My dissertation involved developing a model of the interactions between squash bugs and squash plants. The completed model was very complex and although valid, was never applied to resource management. At OSU, I earned a minor in statistics in addition to my third entomological degree. The high point was at graduation — George Bush (41st President), was our commencement speaker. It was fun watching

the secret service guys try to blend in with the students as they were the muscular guys without tassels and with necks thicker than their heads.

From OSU I landed a job as a research entomologist with the ARS in Brookings, South Dakota. Cold place, but it was a hard money job and by then I had two children that required constant feeding. In South Dakota, I worked on Eastern, Western, and Mexican corn rootworms that, as you might have guessed, ate corn roots — to the detriment of the corn plant. My research focused on biology and ecology, first on developmental rate models to predict life stage events for biocide applications, and second on population dynamics at larger than field scales. These efforts led me into GIS, geostatistics, and trying to develop landscape-level models. I collaborated with several other scientists who wanted to be able to predict pest and disease events with crop yields for all the various corn varieties, cropping systems, and soil types from the Rockies to the Atlantic Ocean. Although we never got there, we had fun trying and I learned a thing or two about working with others.

After about eight years in South Dakota, ARS reassigned me to the Southern Regional Research Center in New Orleans to work on the Formosan Subterranean Termite (FST) Program. This is a program to develop strategies for controlling these termites, both at the level of individual houses and at larger scales of control. I was the Ecology Project Chief charged with developing area-wide management programs. My research involved developing termite suppression strategies in a 15-block area in the Vieux Carre, or French Quarter of New Orleans. On the brighter side, this meant that my field crews had to meet once a month in the morning at the Café DuMond for begnets and coffee and then for lunch at the Acme Oyster House for a shrimp and oyster po'boy. I think I put on about 50 pounds while I was there.

In addition to that work, I had collaborative projects with university folks at Texas A&M, Louisiana State, Mississippi State, Auburn, University of Florida, University of Georgia, University of Hawaii, and the University of North Carolina. My part of the FST program had about $2.5 million in base money and another $750K in contracts with private industry. I supervised three research grade scientists and 10-20 GS-3 to GS-9 technicians, depending on the time of year. The other scientists in our group worked on developing new and improved toxins, baits, and DNA analyses. After three years in the French Quarter and having proved we could suppress termites over relatively large areas I wanted to increase suppression and monitoring to the state and regional scale. Although this approach was not followed, I had already joined the USGS Western Regional Office in Seattle (April 2001) and escaped the heat of New Orleans.

My job in the Regional Office involved technical oversight and management of the QRP, NRPP and State Partnership Program. Additionally, I oversaw RGE in the region and performed other duties as assigned.

I am looking forward to working with everyone here at the WFRC. If I haven't met you yet, I apologize. Please stop by and say Hello. ►

Welcome Back Kotter
(*Liz Turpin, actually*)

by Lyman Thorsteinson

I am pleased to welcome a new Administrative Officer to the Western Fisheries Research Center. With the help of an excellent Search Committee, I selected Liz Turpin to fill the vacancy left by Joyce Jones. Ms. Turpin has been a federal employee for over 26 years in a variety of administrative positions. She began her federal career with the Department of the Interior's U.S. Fish and Wildlife Service in the 1980s serving as an Administrative Support Assistant/Accounting Technician in their Albuquerque Regional Office. In 1991, she transferred to Las Vegas, Nevada, to be employed as the Administrative Support Assistant at the Desert National Wildlife Refuge Complex. In 1994, she accepted the Budget Analyst position at WFRC (then, the National Biological Survey's Northwest Biological Science Center). In 1997, Liz transferred to NOAA's Northwest Fisheries Science Center (a.k.a the Montlake lab.) where she served as a Program Analyst/Budget Analyst. Thus, Liz has years of successful experience working with both fish biologists and aquatic resource issues. She is especially well-versed in budgeting and has a strong administrative background in reviewing, processing, monitoring, and tracking interagency/reimbursable agreements.

I know I speak for all of us when I say that I am excited to have someone with Liz Turpin's qualifications and comprehensive administrative work experience re-join the WFRC staff. If you don't already know Liz, please stop by and welcome her back. ►

WFRC-Russian Research: *Part 2: Carl's Excellent Adventure*

by Gary Wedemeyer

In Part 1, *Frank's Excellent Adventure,* Frank Shipley had just returned from Russia where he initiated a charr genetics research project with Dr. Serge Pavlov and collaborators at Moscow State University. This past August, Carl Ostberg (WFRC-Seattle) traveled back to Russia to collect fish samples for later laboratory analyses when Serge returns to WFRC this coming spring.

As you may recall, this research project is part of the Western Region's "Genetic Tools" project *Genetic Analyses of Pacific Salmonids in the Russian Far East and the U.S. Pacific Northwest*. Specifically, WFRC is cooperating with the Russian Academy of Sciences addressing resource conservation goals for Area V (the Russian Far East) and the U.S. Pacific Northwest. In 2003, the research objective was to learn more about the genetic diversity of charr morphotypes (*Salvelinus malma*) in Kamchatka. In support of this work, Carl spent much of last August and September collecting tissue samples for genetic analysis from isolated populations of Dolly Varden inhabiting Kronotsky Lake in the Kronotsky Biosphere State Reserve.

The Dolly Varden in Kronotsky are isolated from other charr populations by an upstream migration barrier in the river that flows out of the lake (Kronotsky river). However, biologists are not sure if the three morphotypes are actually reproductively isolated from one another — one of the reasons for this study.

The species within the genus *Salvelinus* are ideal for genetic studies because the majority of

populations occur in recently deglaciated, Holarctic areas, and are often the first colonizers of newly formed habitat. As such, most populations have colonized specific habitats since the last ice-age 15,000 years ago, allowing for recent morphological and genetic divergence to be studied. Furthermore, the Dolly Varden in Kronotsky Lake are believed to have been landlocked by a migration barrier due to volcanic and geologic processes as recently as the mid 1700's.

WFRC participation provides first hand experience with charr ecology for the USGS and facilitates a continuing collaboration between USGS and Russian fisheries scientists regarding the evolution and biology of culturally important species.

Lake Kronotsky is near the eastern shore of the Kamchatka peninsula about 20 miles from the Pacific ocean. Travel was from Anchorage Alaska to Petropavlosk and then by Army helicopter to the lake. About a 90 min. flight. The field crew included Dr. Serge Pavlov (fish geneticist from Moscow State University) and his graduate student Zhenya Pivovarov. Fortunately for Carl, the Russians also provided a camp cook.

Kronotsky lake supports large populations of Dolly Varden (three morphotypes), sticklebacks, and kokanee. This year's research targeted the Dolly Varden which were caught by hook and line. Carl found that Pacific Northwest steelhead fly fishing gear was most effective and used (winter steelhead) flies he tied himself. The work was fun but arduous, and a good day of fishing by the group would yield perhaps 18 - 20 fish. The Russian scientists took meristic and morphometric measurements, and eye, liver, and heart tissue for allozyme analyses. Carl took liver tissue and preserved it for later *mt*DNA sequence analyses to be conducted here at the WFRC.

While the three morphotypes being studied are all within the Dolly Varden species complex, they are chromosomally divergent and quite different in physical appearance. This research project will help determine what evolutionary path these populations are on. One morphotype (*Schmidti,* the smallest fish) exists only in Lake Kronotsky. The second morphotype (termed *Longhead*) is found in both the lake and the Kamchatka River basin, while the third charr morphotype (*White*) is widely distributed.

Russian cooperator Dr. Serge Pavlov will return to the WFRC in April to work with Carl, Rusty Rodriguez, and Lyman Thorsteinson. Frank Shipley expects to participate as well. In the meantime, Carl is working up samples and reports a new fondness for cabbage, potatoes and Borsch. ►

Visiting Scientist: *Dr. Sascha Hallett*

by Gary Wedemeyer

Australians Dr. Sascha Hallett and her husband Stephen Atkinson were at WFRC recently working with Dr. Charlotte Rasmussen to learn molecular techniques for genotyping freshwater Tubifex worms involved in the transmission of the whirling disease parasite (*Myxobolus cerebralis*). Stephen is a computer graphics expert and is assisting Sascha in the laboratory as well as working on the preparation of publications and presentations for seminars and scientific meetings.

Sascha earned a Ph.D. in marine parasitology in 1998 from the University of Queensland in Brisbane, Australia, and was subsequently awarded an Alexander von Humboldt Fellowship at the

University of Munich (Germany). There, she conducted research to improve the understanding of myxozoa life cycles in the marine environment. Unlike the situation in freshwater, marine life cycles of myxozaoan parasites are only poorly understood.

After leaving WFRC, Sascha will continue working on whirling disease as a new postdoctoral fellow at Oregon State University in Dr. Jerri Bartholomew's lab. As most of you know, WFRC has long been an OSU collaborator and Jerri is a WFRC alum (Class of 1993). ►

Who's Who in Research

Dr. George Sanders

Howdy ya'll, I 'm George Sanders. Since Gary has been pestering me (but in a loving "grandfather-ish" way) about composing an article for our local paper for quite some time, I have determined that "resistance is futile," so here it goes. I am the Veterinary Medical Officer (VMO) here at WFRC; however this title really does not explain well what I do. In addition to taking care of fish or other research animals (human primates not included) that are housed at the center when they are sick, I assist in their experimental protocol development and insure that they are maintained in accordance with the federal regulations and common sense ethics that govern the use of vertebrate animal for research.

I also dabble a bit in a few research projects. My original research project, that Dr. Jim Winton and I developed during my NIH-funded Laboratory Animal Training Program in the Department of Comparative Medicine at University of Washington (UW), was the development of a piscine disease model utilizing zebrafish and a fish pathogen, Spring Viremia of Carp Virus (SVCV) in our very own Aquatic Animal Biohazard Level-3 lab (ABL-3). This was my first foray into fisheries research utilizing a viral pathogen. Good training and persistence has lead the recent publication of this work:

Sanders, G.E., W.H. Batts, and J.R. Winton. 2003. The susceptibility of zebrafish (Daniorerio) to a model pathogen, spring viremia of carp virus. Comparative Medicine. 53 (5):502-509.

Serendipitously, my work with SVCV in zebrafish has, with the discovery in 2001 of this OIE reportable exotic pathogen in the United States, lead to my collaboration with both the USDA-APHIS and U.S. Fish and Wildlife Service to develop and perform research projects here at WFRC that will help answer some of our concerns about SVCV in the USA. Specifically, but not exclusively, this includes determining what further research is needed to determine which of our local cyprinid fish species are susceptible or resistant to this virus, and what will be the potential spread of this virus among wild populations of fish in the USA.

The other major project that I'm currently involved in is with Drs. Dick Kocan, Jim Winton, and Paul Hershberger (our new researcher at the Marrowstone Marine Field Station). This project deals with the evaluation of the pathological effects of *Ichthyophonus* on the survival and reproductive success of Yukon River Chinook salmon. My role in this project was the development and implementation of a scoring system and method to histopathologically evaluate tissue samples to determine the severity of infection and to quantify tissue host reaction. This project continues to be

very interesting and the ramifications of what we are finding are quite significant and controversial.

As I'm only a 50% FTE here at WFRC, the other half of my time is spent at the UW in the Department of Comparative Medicine (C-Med.) where I am an Acting Assistant Professor. Once again my title is confusing in that my duties primarily include being the veterinary clinician and pathologist for fish and amphibians, an *ad hoc* member of the UW Institutional Care and Use Committee for fish and amphibians (and other "non-typical" research animals), and the veterinarian in charge of the UW's approved decentralized facilities (which actually includes both WFRC Seattle and its Marrowstone Field Station facilities). I addition, I do teach our postdoctoral residents a thing or two about aquatic animals and other lab animal critters during their stay in our department.

My diverse veterinary and pathology interests stem from growing up in Miami, Florida where I originally wanted to become a Marine Biologist. After consultation with individuals from that discipline and local veterinarians my decision was swayed to the latter due to the greater job opportunities! I attended Morehouse College in Atlanta, GA (a historical African-American Liberal Arts College) and earned a BS in Biology.

After graduation, I attended Louisiana State University School of Veterinary Medicine (LSU-SVM) in Baton Rouge, LA were I was exposed to a healthy dose of exotic-animals. During that time, in addition to having school days off for Mardi Gras, I was fortunate enough to become a Merck Veterinary Scholar at Colorado State University one summer where I learned about veterinary medical research. Upon my return to LSU-SVM, I was able to work in Dr. Ronald Thune's laboratory, where my interest in aquatic animal research, diagnostics, pathology, clinical evaluation, and treatment flourished.

Since then, I've been hooked. I accepted a residency position in the Lab Animal Training Program of the UW's College of Medicine partially because of the large fisheries program at the UW. I figured this would provide me with exposure to fish and other aquatic animal species that I had not yet encountered. To make a long story shorter, in 1998 I did one of my residency's research rotations in the laboratory of Dr. Mike Kent at the Pacific Biological Research Station in Nanaimo, BC and the second one with Jim here at WFRC. The rest, as they say, is history! ►

Dr. Kyle Garver

Hi everyone, well Gary hasn't really found the newest kid on the block this time but probably did find the most gullible. He promised a little cash award for my article although I haven't seen any of that money yet.*(Ed's. note: Kyle, the check is in the mail!)*

I'm Kyle Garver and I'm a postdoctoral fellow in Gael Kurath's laboratory otherwise known as the Free Love side (*Ed's note: that's not what you think! It's a little fish virology humor*). Like former "meet the staff" autobiographer Paul Hershberger, I too am originally from Pennsylvania, although my hometown (Allentown) was not made famous by Harley Davidson, but rather by Billy Joel. Despite all the factories closing down, it was a good place to grow up. It was here that I was introduced to Pennsylvania Dutch specialties such as scrapple. It is also the place that first sparked my interest in fish

through catching trout in the many limestone streams and spring fed creeks.

In 1993 I received a Bachelor of Science degree in Biology at Penn State, home of the Nittany Lions and Joe Paterno. Not to be confused with the State Pen (short for penitentiary) located a few miles down the road and home to a couple thousand inmates. Upon graduation I felt the need to broaden my horizons and experience a more diverse culture, so I moved to the heart of the Midwest where I went to graduate school at Purdue University in West Lafayette, Indiana. While at Purdue I did research on viral assembly. By mixing specific proteins together with DNA and RNA molecules we could create infectious particles in a tube. By studying these *in vitro* interactions we gained a better understanding of how viruses, such as herpes, are put together *in vivo* and therefore how best to design strategies to block this assembly.

After earning a Ph.D. in 2000, I sought to combine my research interest in viruses with my interest in fish. This led me to the field of fish virology and the WFRC, where I've been studying the epidemiology of infectious hematopoietic necrosis virus (IHNV) throughout the Columbia River Basin. I've also been involved in studies investigating a DNA vaccine against IHNV. Being able to work at this state-of-the-art facility with such a magnificent research staff has made my post-doctoral experience here nothing short of spectacular. A special thanks to Gael for providing me with this opportunity. ►

WFRC in the NEWS

by Gary Wedemeyer

Does military action stress plants? "Probably" said WFRC ecologists Jeff Duda and John Emlen in a recent Top Story interview posted on BioMedNet, "but the choice of species is crucial if plants are to be used as indicators of environmental stress."

"US Department of Defense (DOD) installations probably harbor more endangered species than any other US department" said Duda. "This gives the DOD the tricky task of balancing the need for military training with efforts to conserve vast tracts of ecologically important land," he said.
Duda and several colleagues are looking for ecological indicators that can be used to guide the DOD in this balancing act. But their latest study of the stress responses of a deciduous shrub called winged sumac (*Rhus copallinum*) is going to require more research he admits.

Nine sites were established for study at Fort Benning, an infantry training facility in Georgia. *R. copallinum* was chosen as a possible indicator of environmental stress because it was present in both disturbed and relatively undisturbed habitats at all of the sites.

As reported in the journal *Ecological Indicators*, Duda and his coauthors found that measures of stress in this species revealed significant differences between the sites. However, "mean values of developmental instability, water potential, and variable fluorescence... did not consistently differentiate sites relative to the disturbance gradient," the authors note.

Dr. Tim Flowers, professor of plant physiology at the Plant Stress Unit of the University of Sussex in the UK, says that all plants should respond to these sorts of stresses. But, he adds, "some are more

sensitive than others, and then it becomes a matter of degree."

And this may have been the caveat with this latest study. "Perhaps *R copallinum* was just too robust," says Duda. "It is possible that species utilizing those strategies to persist across a range of disturbance conditions might be the least sensitive in terms of physiological or developmental signals," he and his colleagues note.

This shows the difficulty of selecting an appropriate species to act as an ecological indicator, they conclude. "Research is continuing to find a species or suite of species that the US military can use to quantify the impact of training on the environment" says Duda.

The complete text of the interview and news story item (by Henry Nichols) can be obtained from Jeff, John Emlen, or found on the BioMedNet website http//gateways.bmm.com. Their paper in the journal *Ecological Indicators*, is currently *in press*. ►

Alumni News

Bill Nelson (Class of 1994)

Dr. Wedemeyer, world-renowned scientist, newsletter editor, and all around good guy, asked me to write an article briefly describing what I have been up to since I retired in 1994. For those of you who don't know me, I was head of the WFRC's Columbia River Research Lab (CRRL) — employed by the FWS for 34 fun-filled years and about 10 minutes by the National Biological Survey. I started in 1962 conducting research for the FWS on the Missouri River Reservoir system. When that program was terminated in 1978 I was transferred to the WFRC, stationed in Vancouver, Washington, and charged with initiating a research program on the Columbia River Basin reservoir system. Starting with one other biologist, the legendary Lance Beckman, and enough funds to cover our salaries, I began identifying research topics and submitting proposals to fund the work. By the time I retired these efforts had resulted in the creation of your present Columbia River Research Laboratory in Cook.

After spending 16-years laundering funds and FTE's I thought I might get an offer from the Mafia when I retired. However, an offer did not materialize so I have ended up fishing and hunting, volunteering, and traveling. Hanging out at the local senior center eating cheap lunches and listening to the other old fogies discussing their latest operation, aches, pains, and drug costs has definitely not been a component.

Upon retirement, my wife Sarah and I bought a home on Jessie Lake in the Chippewa National Forest of northern Minnesota. During the summer I fish for walleyes in our 1,800-acre lake with numerous side trips to smaller nearby lakes for largemouth bass. Fishing (and catching!) has been so good this past year that I am presently suffering from tennis elbow. Come fall, I spend my mornings hiking in the woods in search of ruffed grouse. Occasionally I even manage to flush a bird, and on very rare occasions hit one! I must admit my reflexes have slowed and my shooting ability has declined to the point that these sojourns are not about filling the freezer but about enjoying the gorgeous scenery, observing a variety of wildlife, and burning up a few calories in a loosing battle to reduce the size of my fat rolls. When the weather deteriorates I switch to duck hunting, again with minimal material rewards, except for the enjoyment

of solving the worlds problems with a hunting partner over a cup of coffee while watching the sunrise over the wild rice beds.

Shortly after moving to Minnesota, I became involved with a couple of neighbors organizing a watershed association. Our watershed covers about 21,000 acres and includes four lakes. There are only 35 permanent residences on the lakes and about 95 summer cabins; about 80 of these property owners join the association each year. After we got the association up and running, we prepared funding proposals for a variety of projects. (Between preparing proposals and attending numerous meetings with various county, state, and federal agencies coordinating these projects I would occasionally get the shakes thinking I was back in the Columbia River Basin!)

We actually have scored on almost all of our proposals, probably because our watershed is located at the "top" of the Hudson Bay drainage system in Minnesota. So I have ended up doing extensive field work collecting water samples, core samples for a paleolimnology study, cleaning downed timber out of tributary streams, removing beaver dams by hand or with explosives, building walleye spawning beds and monitoring their spawning populations, etc. One of the more interesting projects has been working on a National Science Foundation Grant with a professor and his graduate students from the University of Minnesota studying the exchange of phosphorus at the mud-water interface under anaerobic conditions in a polymictic lake.

I have also conducted a variety of bird surveys for the Minnesota Department of Natural Resources (DNR) and the U. S. Forest Service. For the DNR, I have surveyed common loon and owl populations, normally for fun but occasionally they even pay mileage. For the USFS, I have bid on various contracts to survey goshawks and a variety of warbler, flycatcher, and woodpecker species they classify as "sensitive species". It has been sheer joy actually out-bidding some environmental consulting firms and landing these contracts. Sometimes, I have barely managed to earn minimum wage but some contracts have been very lucrative. However, after working on "one more contract" this past summer I told Sarah that if I ever considered submitting another bid she should have me committed. This old duffer finally figured out it is no longer enjoyable to crash cross-country through the thick brush, climb over, under, and through deadfalls and blow downs, and wade through icy alder swamps at the crack of dawn. The chances of breaking a leg or having a heart attack while searching for black-throated blue warblers no longer seems like a good way to spend my "golden years."

When we first retired our kids (Karen and Pete) and their spouses commonly traveled here for visits. One year we rented a sailboat and spent a week sailing throughout the British Virgin Islands. Another year we all spent our Christmas vacation at a rented beachfront villa on Ambergris Caye in Belize fishing and snorkeling. However, our kids have now presented us with granddaughters so it is more difficult for them to travel. Therefore, we make at least a couple of trips annually to Boston to see Karen, Greg, and Grace, and to Washington to see Pete, Lori, and Lilly. In fact we will be spending this Thanksgiving with Pete, and Christmas with Karen. Since Sarah is into spoiling grandkids much more than I am, she makes the most frequent trips.

Upon retirement, international travel was not in our the plans but I have become hooked on seeing

the world. We normally go on one trip a year overseas, but in one wild and crazy year we made four trips. I especially enjoy traveling to countries where you cannot drink the water, need to pop pills for malaria, and obtain shots to ward off weird diseases. I figure I can do the developed countries such as those in Europe when I am 90 and need a walker. For now, we are concentrating on the trips that require butt-busting plane trips. This winter it is going to be a 22-hour flight to Thailand. However, our record is 53-hours home from our tent on the rim of the Ngorongoro crater in Tanzania. Although I have not as yet been to all that many countries I have managed to visit all seven continents. The last of which was Antarctica which, along with South Georgia and the Falkland Islands, I visited last February. Sarah refused to go with me figuring she gets enough winter here but it turned out to be 60 degrees warmer in the Antarctic than in northern Minnesota, 30 above versus 30 below. For me, one of the many high points of this trip was toasting Sir Ernest Shackleton with a shot of rum at dear old Ernie's gravesite on South Georgia Island in a snowstorm! The low point was the three days of 45-65 mile per hour winds that created mountainous waves. When we reached the Falkland Islands after the storm it was very disconcerting to see the crew welding cracks that had opened up in the bow of our small cruise ship! At least none of our passengers were washed overboard as happened on another trip. I am a firm believer that retirement is not for everyone but for me it has been a delight. Actually, the best part is that I am still above the sod! ►

Reg Morgan (Class of 1974)

I began my career with the U. S. Fish and Wildlife Service at the Winthrop National Fish Hatchery in September of 1955. Shortly after my arrival, I met Dr. Rucker who, as you know, founded the WFRC. He and other biologists from out of town would sack out on the floor of my government quarters at the hatchery, saving as much money as they could out of their "ample" $6 a day per-diem. In 1957, I transferred to the Seattle Montlake Lab (then the FWS) in what was then known as the Bureau of Commercial Fisheries (BCF). Duties included field work assignments in Washington, Idaho and California. In 1960 the BCF Shea Creek Research Station was opened on a small tributary stream of the Yakima River, about five miles downstream from the town of Ellensburg. A weir was needed and we stood on stepladders in the river for days at a time driving individual "H" beams down into bedrock with a jack hammer. Four years later we watched a local contractor pull them all out in a few hours with his D-8 "Cat" when the project was terminated.

With a wife and three kids, the youngest two weeks of age, I was RIFed and joined the staff of the WFRC (then the Western Fish Disease Laboratory) in March of 1964. The next ten years were spent at Sand Point in Bldg. 204 (your old former laboratory).

Many fond memories come to mind. Wrapping water and steam pipes under the building with asbestos insulation. No protective devices, no breathing apparatus, only lab coats! Bill Klontz dropping Harriet Rucker's glass punch bowl before one of our annual lab Christmas parties. Fortunately, it was not a family heirloom. The Christmas parties (do you still have them?)

consisted of a gift exchange accompanied by a poem. Names were drawn a month in advance to go with the gift. Some lab staff members would "kill" to make sure they got the name of the person they wished to target with a poem.

Until 1970, Sand Point remained an active Navy Base. There was a rifle range just south of Bldg. 204 which was used infrequently on weekends by reservisits. At one time there was a trap range with free clay pigeons where we could go target shooting during the lunch hour. The Navy did all the building maintenance for us and provided 24-hour security as well. The guards had a practice of driving by and checking the laboratory doors every evening. If a door was found unlocked, they would come in the building and take one of the lab's typewriters down to HQ. Then Dr. Rucker would have to retrieve the item the next morning. One night Dr. Rucker was working late and noticed car headlights shining on the front of the building. He investigated and caught some sailors stealing our landscaping decorations — some Japanese glass fishing floats. (This was during the Johnson administration and Lady Bird had ordered that Federal buildings were to be "spruced-up"). Rucker confronted the sailors (they turned out to be the guards) and we never had to worry again about typewriters leaving the building. If we accidently left a door unlocked, the guards locked it for us and left a polite note under the door.

Another fond memory of mine is the lab's government car. We called it the old "Green Hornet." It was a 1955 Ford panel truck that Dr. Rucker drove back and forth to Winthrop in 1955. The vehicle had only the basics: manual transmission, four tires, heater and windshield wipers. No radio, not even a cigarette lighter. But the lab owned it and it was cheap transportation. In those days, you did not have to rent cars from GSA.

Once a year the Rucker's would entertain the WFDL staff at their home. You never, ever, sat with your spouse, significant other, etc. I guess this is how you entertain in polite society. Looking back, I guess I left polite society when I left the WFDL. But it started a trend, at least for Linda and me. To this day, when we go out in polite society we feel very uncomfortable if we have to sit together.

In 1974, RIF #2 came along and I was transferred to the FWS Fish Genetics Laboratory at Ranch "A," five miles down a dirt road from Beulah, Wyoming. Coming from the Seattle area to the wilds of the Black Hills was a shock for the kids. Where we lived in Lynnwood, school was across the street and shopping and professional services were a mile or two away. The kids rode two school buses to Sundance, Wyoming, a 50-mile daily round-trip commute. Shopping and professional services were in Spearfish, South Dakota, about the same distance in the opposite direction. We were at the FGL for six years when the lab. was closed and the grim reaper arrived again. RIF #3. After some job searching, I was offered a position at the Lake Roosevelt Fishery Research Station in 1980, a small branch of your present day CRRL. In 1983 we were told that the station would close early in 1984 and another RIF was in the offing. We still had unopened boxes from RIF #3. Linda had a good job with the National Park Service just two blocks away. The kids were all in school. I decided to retire when the project closed. On February 4, 1980, I turned off the lights, walked out the front door, closed it behind me and walked down the hall. I felt like Alan Ladd riding

off into the sunset in that 1950's epic movie "Shane."

Retirement has treated me well. I literally fell into free-lance writing while bending elbows at a local watering hole shortly after I retired. I have been writing for the WENATCHEE WORLD for 14 years. A "hook and bullet" column ("On Target") appears every Thursday and has been published for 13 years. The column covers North Central Washington (Okanogan, Grant, Douglas and Chelan counties). For 14 of the last 16 years I have written a weekly general interest column in the STAR, a weekly newspaper of the Grand Coulee Dam area. Both columns have been very well received.

Linda and I have lived in the coulee almost 24 years now. Life in a small town is great (mostly). If you've never lived in one you won't know what I'm talking about. As someone told me when I moved here, "There's not much to see in a small town but what you hear makes up for it." Amen to that.

Linda retired in January of 2002 and we both wear retirement very comfortably. We keep track of the days of the week, not with a calendar but with a "S-M-T-W-T-F-S" pill dispenser. Our spare time is involved in community or church projects with occasional fishing trips (both of us), goose hunting (very often during the season), watching nightly "Seinfeld" reruns, or wiping up carpets where In-and-Out-and In-and…(the cat) has puked. Other than a little "barf," life has been great. ►

In Memoriam

Ronald D. Wilson (Class of 1994)

Ronald D. Wilson, 57, former facility manager of WFRC passed away on November 15, 2003 in Guam. Ron supervised the initial construction of WFRC and subsequently became our first facility manager when the laboratory was completed in 1994. After serving WFRC for a number of years Ron left to work for the NPS, first as facility manager of the *American Memorial Park* in Sipan and then the *War in the Pacific National Historical Park* in Guam where he unexpectedly passed away.

Before coming to WFRC, Ron had retired from the Navy where he served our country during Vietnam. Ron loved building things; working with his hands, working on cars and golfing. He is survived by his wife of 30 years, Colleen Wilson of Marysville, son, Joshua (Tennille) Wilson of Marysville, daughter, Tama (Jim) Carson of Juneau, AK, mother, Jean Wilson, brother Richard Wilson, sister Krys Eaton and grandchildren; Sebastian Wilson and Kendyl Carson. Ron was preceded in death by his father, Helmut Wilson. ►

Dr. Marsha L. Landolt

Dr. Robert A. Busch

by Diane Elliott and David Powell

As many of you know, two longtime collaborators and friends of WFRC, Dr. Marsha Landolt and her husband Dr. Robert Busch, were tragically killed last month when an avalanche slammed into their vacation cabin in the Sawtooth Mountains of Idaho.

Dr Marsha Landolt earned a Ph.D. in Pathology from George Washington University and began her research career at our sister laboratory, the BRD Leetown Science Center (then the FWS

Eastern Fish Disease Laboratory). However, most of her ties to WFRC developed after she came to Seattle in 1971 as a new faculty member in the College of Fisheries, University of Washington. Staff scientists from WFRC collaborated in many of her research projects, gave numerous guest lectures in the fish pathology/toxicology classes she taught over the years, and served on the thesis committees of many of her graduate students. Dr. Landolt's research was well respected both nationally internationally and she quickly rose through the ranks, becoming Associate Dean of the College of Ocean and Fishery Sciences in 1983, and Director of the School of Fisheries in 1991. From 1996 until her death, Marsha served as Dean of the UW Graduate School, and as Vice Provost, taking on administrative assignments that helped solidify the University's position as one of the premier research universities in the nation.

Despite her success in University administration, Dr. Landolt continued to publish scientific manuscripts throughout her career, authoring over 70 journal articles and invited chapters for books, including several co-authored with her WFRC colleagues and her husband Dr. Robert Busch.

Dr. Robert Busch earned a Ph.D. degree in immunology and bacteriology from the University of Idaho in 1976 and developed his first ties with WFRC (then the FWS Western Fish Disease Laboratory) while he was the FWS Coop Unit Leader at Humboldt State University in California.

After several years at Humboldt, Bob was recruited by Rangen Inc. (the aquaculture feed manufacturer) to serve as Director of their corporate research laboratory in Hagerman, Idaho. Bob later became Research Director of Clear Springs Foods, Inc. in nearby Buhl, where he designed a new laboratory and conducted genetic and fish pathology research, much of it in consultation with WFRC.

In 1989, Bob became Vice President and General Manager of Biomed Inc., a division of the Norwegian aquaculture company Alpharma. Here, he continued his collaboration with WFRC and eventually expanded the fish vaccine business from a tiny enterprise to a major aquaculture industry.

After Alpharma moved its fish vaccine operations to Norway in 1999, Dr. Busch devoted his considerable talents and knowledge of fish vaccines and pharmaceuticals to work as a private consultant to the aquaculture industry, both nationally and internationally. Bob also maintained his collaboration with WFRC and was a frequent visitor and participant in our research program. ►