

the Whirling Disease Initiative Newsletter

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The Whirling Disease Initiative: Program Background and Activities

Background. Over the past decade, the microscopic parasite *Myxobolus cerebralis*, which causes whirling disease in many salmonid fish species, has spread and infected hundreds of river and stream reaches throughout the United States. The impacts of this parasite on susceptible trout can be dramatic: darkening of the tail, skeletal deformities, frenzied tail chasing (thus the name “whirling” disease), and death. The whirling disease parasite is extremely hardy and long-lived. Like the malaria parasite, it infects two very different hosts alternately. The whirling disease life cycle employs two hosts: a fish host and an aquatic worm host (*Tubifex tubifex*). Reaching an understanding of the parasite has required defining the biology of infected fish, infected worms, and the parasite in its dormant and infective life stages.

A Eurasian native, *Myxobolus cerebralis* made its way to North America in the 1950s. It was once believed to be relatively harmless to wild fish, but research in the mid-1990s found that it was decimating rainbow trout populations in some of the Rocky Mountain region’s finest river fisheries. Most salmonids have been found to be susceptible. Whirling disease is therefore a major threat both to biological diversity and to the nation’s multi-million-dollar fishing and tourism economy. The whirling disease parasite has been reported in 24 states—from New York to California—and has generated great concern among anglers, scientists, and fisheries managers.

The Whirling Disease Initiative. The Whirling Disease Initiative was established by an Act of Congress in 1997. Its purpose is to conduct research that develops practical management solutions to maintain viable, self-sustaining wild trout fisheries in the presence of the whirling disease parasite. The Initiative’s ultimate clients are state, tribal, and federal fisheries-management agencies, and the constituencies they serve.

General oversight of the Initiative is provided by the National Partnership for the Management of Wild and Native Coldwater Fisheries. The National Partnership is a consortium of organizations concerned with the status of wild and native fisheries in the United States—federal and state agencies, professional associations, and private advocacy organizations. The overall goal of the Partnership is to move biological research and management trials forward to make practical options for controlling the



Welcome to the New Whirling Disease Initiative Newsletter! The Whirling Disease Initiative Newsletter is a quarterly publication distributed via e-mail and hardcopy. Hardcopies will only be provided to those who have specially requested them. We hope you find this publication informative, interesting, and valuable. We are striving to transmit news on whirling disease topics and meetings to fishery managers, researchers, and anglers. You can also view the newsletter online at the new whirling disease web site: <http://whirlingdisease.montana.edu/>. To subscribe, or unsubscribe to this newsletter, please refer to the back page for more information.

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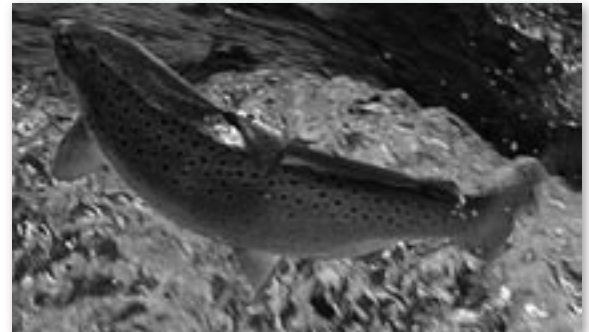
Montana Water Center

disease available to fishery managers. The National Partnership provides long-term direction to the Whirling Disease Initiative. To do this, the Partnership's Board of Representatives convenes annually for a detailed briefing by whirling disease researchers, and participates in discussions concerning fisheries health and research needs.

The Research Process. In-depth scientific direction is given to the Whirling Disease Initiative by its Steering Committee, made up of representatives from state fish and wildlife agencies, federal natural resource agencies, and the Whirling Disease Foundation. Working in collaboration with Montana Water Center staff, the Steering Committee prepares an annual research plan, issues Requests for Proposals based on its research priorities, selects and approves projects for funding following scientific peer review, and distributes the research results within the scientific and fishery management communities and to other stakeholders. The Montana Water Center is the administrative entity that manages the program and coordinates outreach and educational activities.

Each year, federal funding earmarked in the Interior Appropriations Bill comes to the Initiative through the National Fish Hatchery System Division of the U.S. Fish and Wildlife Service. Projects are chosen for funding by the Steering Committee. During the Initiative's seven-year history, the Steering Committee has supported projects, ranging from basic biological research to applied research directly testing potential management solutions. Early projects were aimed at studying the parasite and fish susceptibility. In 2000, the Steering Committee shifted priorities toward possible management strategies. This applied focus has addressed the ecology of whirling disease and the tests of potential methods for controlling its effects or spread.

The Initiative has sponsored from nine to 20 research projects in each cycle. A research cycle generally runs from May of one year through December of the following year, allowing for two research field seasons. More than 100 research projects have been carried out by university and public-agency scientists, and private firms since 1997. A total of more than \$8 million of federal and matching funds has been expended or committed to these projects. Typically two to four investigators are involved in each project, and they bring to the project cash or in-kind match of 25 to 150 percent of the amount of the Federal grant. Students are involved in most projects, either as technicians or, more often, as graduate research assistants. ☒



The Larger Perspective by Gretchen Rupp

Whirling disease has been called 'the malaria of trout' - with good reason. Like malaria, this disease has a complicated life cycle that exploits both vertebrate and invertebrate hosts. When the Whirling Disease Initiative came into being, only the outlines of this life cycle were understood. Consequently early research focused on basic biology and parasitology. How do the TAMs get into fish? (TAMs, Triactinomyxons, are the transformed spore released by the tubifex worms; this is what attaches to the fish ultimately infecting it.) How do they disable them? How many TAMs does it take to infect a trout? Diagnostic questions were also crucial in the early years. How can you judge the severity of an infection? How can TAMs be identified and quantified in a stream?

Within a few years investigators began to test the many factors that influence whether an infection will reach a particular stream, become established there, and cause harm to the resident trout populations. At this stage the questions targeted environmental factors like water temperature, flow, and stream gradient. They also concerned immunology, for both fish and tubifex worms. The search for rapid, inexpensive, field-portable diagnostic techniques was urgent.

The Initiative is now in the third of its three phases. This phase concentrates on predicting the effects of whirling disease, and testing approaches to controlling those effects. Can an artificial flushing flow ameliorate a severe infection in a stream? Do stream-restoration projects that eradicate worm habitat have measurable effects on infection rate? How vulnerable is the rainbow trout population in a particular stream? As well, this phase concentrates on conveying research and testing results to those who need them most—fishery managers.

Whirling disease is a complex affliction that is readily transported among watersheds and influenced by many factors. We can never hope to eradicate it. We do hope, though, to develop the best control tools possible, and convey them to the professionals who are charged with maintaining our fisheries for environmental integrity and public enjoyment. ☒



A Newcomer Learns About Whirling Disease... by Amy Rose



As the new outreach coordinator for the Whirling Disease Initiative I've formally been in my position since the middle of August 2004. My background is in communications and training. I spent six-and-a-half years in the United States Air Force creating technical publications, managing communications, and developing and implementing training programs. In this new position, one of my first job priorities was to educate myself about whirling disease. I spent a significant amount of time familiarizing myself with the most important items concerning the disease. I've also received an education in the research, oversight, and passions of the people most concerned. Now, six months into it, I feel intimately involved with the people and issues surrounding whirling disease research, control and management, and the challenges faced by fishery managers. With this background, I proceeded to design an outreach program for whirling disease.

In September 2004, I presented my projections for our first outreach year and introduced myself to the Board and Steering Committee members. My projections include developing products such as this newsletter, presenting tools for management of the disease, and most importantly getting out and talking to fishery managers. I want to get the word out about what's going on with whirling disease and pertinent research findings to the folks who need it most. I am coming to understand how overwhelmed fishery managers can be in trying to juggle a multitude of priorities. I hope the information I present to them will help ease some of the burden of trying to keep themselves informed.

The primary target audience for outreach products is technical professionals—fishery managers and administrators, hatchery operators and fish health professionals, researchers and agency land managers. The secondary audience comprises fishery professionals, both within the agencies and in private organizations such as the Whirling Disease Foundation, Trout Unlimited and the Federation of Fly Fishermen. In addition, we also hope to serve and educate anglers and the general public with the information provided by the outreach program.

I have lots of products in the works as well as a full schedule of presentations. I will start traveling and presenting on whirling disease in February 2005. Please keep your eyes open for upcoming program announcements, contact me with any questions or presentation requests, and check the web site frequently for updates on outreach products and pertinent conferences where I will be presenting. ☒

Fishery Manager Profile—

Jim Fredericks



Jim Fredericks has worked for Idaho Fish and Game (IDFG) for over 10 years. Jim's knowledge of his agency and in his area of expertise—fishery management—is one only obtained through years of service and dedication. The IDFG is legally mandated to preserve, protect, perpetuate, and manage all wildlife resources in the state for hunting, fishing, and trapping. To meet that objective, fisheries management policy emphasizes management of wild fish, native fish, self-sustaining populations, habitat, and genetic integrity.

The need to accommodate anglers is also high on the IDFG's list of priorities. Angling opportunities in Idaho includes hatchery-supported and non-native fisheries. As Jim put it, "IDFG attempts to optimize sport fisheries by protecting and maintaining native fish populations, while still meeting the demands for diverse fishing opportunities, all in the face of a dynamic social and natural environment."

Jim has responsibility for the upper Snake River drainage, which includes the Henrys Fork, Henrys Lake, Teton River, South Fork Snake River, Falls River, Warm River, and Willow Creek. He also manages the reservoirs of the above-mentioned rivers and the "sinks" drainages: the Big Lost and Little Lost Rivers. (The "sinks" is a local colloquial term used to describe the streams that come out of the Centennial Pioneer, Beaverhead, and Lost River Mountain ranges and "sink" into the desert. They naturally don't reach the Snake River. They include the Big Lost and Little Lost Rivers, and the Birch, Medicine Lodge, Beaver, and Camas Creeks.)

Jim sees the "big picture" issues for Idaho fishery management as similar across the state. Although the species vary from region to region, the native versus non-native fish conflict is felt

across all of Idaho (both socially and biologically). One area of difference is that four of seven Idaho regions have anadromous fish management responsibilities. Therefore, those regions have a different management focus and deal with issues that the resident-fish only regions don't have to address. In recent years, the main concern in the south-central and southeastern regions is drought. Jim explains that, "Three or four years of successive drought greatly changes the management picture in much of this area. Reservoirs that support hugely productive and popular fisheries in normal years have been completely drained annually in recent years, and provide virtually no fishery. In the northern part of the state, the water problem is generally 'too much runoff' with flooding, and rain-on-snow events impacting stream and lake populations of trout. [Here in the southern region], it's quite the opposite. Along those lines, whirling disease is not generally considered an issue in the northern part of the state, whereas in our lower gradient, drought impacted streams, it is much more of a consideration."

Jim's most important fisheries management considerations are flow regimes and water withdrawal. Both the South Fork and Henrys Fork Rivers are regulated systems with substantial irrigation diversions. His other concerns include rainbow trout invasions particularly in the South Fork and the Teton Rivers, habitat degradation, and disconnectivity. Habitat problems and disconnectivity have been exacerbated by the drought. Jim also considers whirling disease to be a problem conditionally: "Wild trout recruitment has been a problem in recent years in some systems and whirling disease may be a factor."

One of Jim's primary successes has been his committed work with Friends of the Teton River a non-profit dedicated to the development of a scientific understanding of the Teton Watershed, implementation of on-the-ground projects to improve conditions in the Teton River, its tributaries and wetlands, and the creation of educational programs about the Teton Watershed.

Stats: Jim's been with Idaho Fish & Game for 10 years. He's held the position of Regional Manager Idaho Falls for the last three-and-a-half years. Prior to his IDFG service he was a research and fishery biologist in the Panhandle Region out of Coeur d'Alene. Jim has a B.A. in Psychology and an M.S. in Fishery Resources from the University of Idaho.



Fish showing typical clinical signs of whirling disease.

In his own words, Jim explains this work best: “It’s hard to say how environmental changes have impacted Yellowstone cutthroat trout. The upper Teton River is very complex from a hydrologic standpoint. In a sense, tributary water withdrawal and flood irrigation have delayed and moderated the natural runoff—so now the river functions more as a spring creek than it historically did. This seems to provide an advantage to rainbow trout over cutthroat trout. Furthermore, the major streams that historically provided the majority of spawning and rearing habitat for cutthroat trout, are largely disconnected now. There are spring creeks adjacent to the river that have restoration potential, but we have been trying to gain a better understanding of the factors limiting trout recruitment before we (collectively) invest a huge amount of resources into what could be a misdirected effort.

I think there is a consensus that the ultimate long-term ‘best fix’ for cutthroat is reconnection of the major tributaries. Unfortunately, from a water management and social standpoint, this is far easier said than done.

As we worked with Friends of the Teton River in laying out direction for programs to improve cutthroat populations, we all recognized that although we can see several successive years with poor cutthroat recruitment, we don’t have a clear understanding of why. Was it a lack of spawning habitat? Rearing habitat? Overwinter survival, or whirling disease? There were several possibilities, but nothing obvious. Whirling disease seemed to be a strong possibility, but it didn’t explain why cutthroat numbers were plummeting while rainbows were steady or increasing. So we worked together to secure funding—funding that came from private donors, an EPA grant and from the U.S. Fish and Wildlife Sport Fish Restoration Program. We are now working with Martin Koenig, a graduate student, and his advisor, Dr. Jeff Kershner at Utah State University to try to identify the bottlenecks in cutthroat survival.”

The Whirling Disease Challenge in Idaho. Jim has been assessing the areas of greatest parasite concentration using sentinel challenge. He’s found the parasite throughout the drainage. There are some streams with consistently higher challenges than others, and he is also seeing some relative abundance trends in trout that may be related to infectivity. The frustration lies in problematic or unenlightening results. Jim says his staff isn’t finding anything conclusive that demonstrates how whirling disease affects trout populations. “One thing that has been a little perplexing is the difference in challenges to sentinel fish

from year to year. The site of our most significant challenge, based on spore counts and histology in 2004, was actually negative in 2003.”

As a manager he needs a reliable index, whether it is through spore counts or histology, or with sentinel or wild fish, that can tell him that whirling disease is or is not limiting recruitment. He says his agency has some strong indications that whirling disease may be affecting the population in the Teton Valley, but they also have some serious habitat problems that confuse the issue.

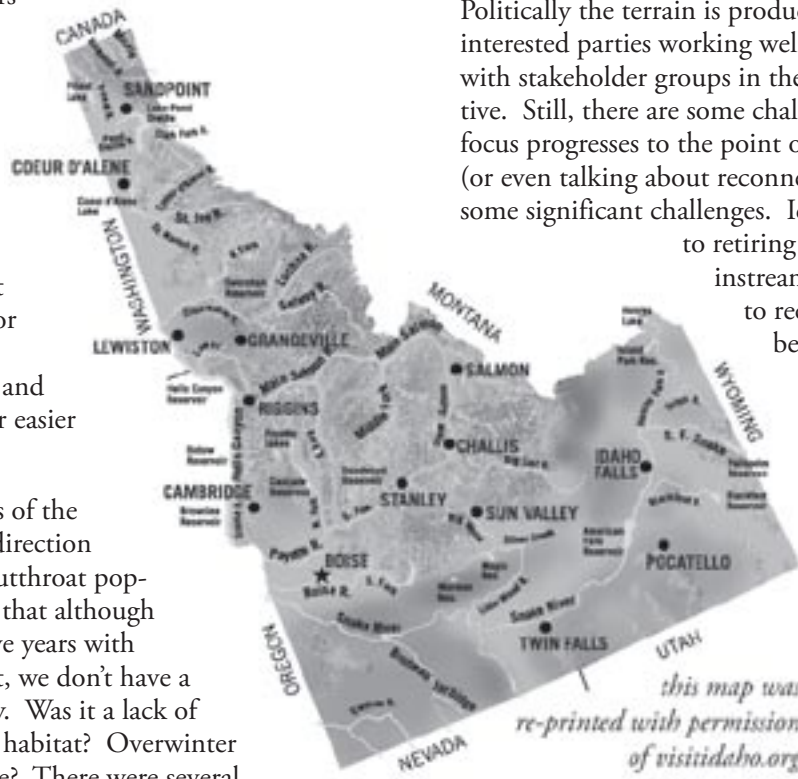
Jim also has to walk a political and scientific balancing act. Politically the terrain is productive and cooperative with all interested parties working well together. Working relationships with stakeholder groups in the Teton Valley are especially positive. Still, there are some challenges. Jim says, “If and when the focus progresses to the point of trying to reconnect tributaries (or even talking about reconnecting tributaries) there will be some significant challenges. Idaho water law is not conducive

to retiring water rights for the benefit of instream flow, so it’s not going to be easy to reconnect tributaries with water being in such short supply.”

The changing resident population also causes some interesting new problems. Jim notes that the Teton Valley is not that much different from its western counterparts. There is a mix of long-time residents with a fairly conservative agricultural focus and newcomers, who place a higher value on the recreational and aesthetic value of the area. Ranches are being sold, which brings a mixed benefit; sometimes the

sale of a ranch allows for improved habitat and riparian conditions, other times subdivisions and development take place at the expense of open space.

final questions for Jim continued on page 6...



For more information on invasive species in Idaho, download Idaho Fish and Game’s full report titled *Invasive Species Management In Idaho* at: http://fishandgame.idaho.gov/wildlife/plans/invasive_species/.

Annual Meeting of the National Partnership for the Management of Wild and Native Coldwater Fisheries:

Bozeman, Montana ~ September 22-24, 2004

The partnership oversees the Whirling Disease Initiative which sponsors research, promotes practical management solutions, and fosters relationships and collaborations with interested groups. The Montana Water Center at Montana State University administers and manages the Whirling Disease Initiative.

The meeting got off to an enthusiastic start with a wonderful dinner followed by an insightful talk given by nationally-renowned fisheries biologist Dr. Robert Behnke. The second day of proceedings focused on presentations and panel discussions covering various whirling disease-related topics, including: risk assessment, establishment of a fisheries database, a state-by-state status report of whirling disease, management strategies, and re-evaluating the goals, processes, and objectives of the Initiative. The final day concluded with a business meeting of the National Partnership.



Dr. Robert J. Behnke Professor Emeritus is widely recognized as one of the world's foremost authorities on the systematics of salmonids. He has written more than 100 articles and papers on fish and fisheries. He writes a regular column "About Trout" in Trout Unlimited's Trout Magazine. Dr. Behnke also published the American Fisheries Society's: "Native Trout of Western North

America" in 1992. He has received numerous prestigious awards including the Ricker Resource Conservation Award from the American Fisheries Society. His latest publication, *Trout and Salmon of North America*, is considered the culmination of Behnke's 50 years studying North American salmonids. An indispensable guide, it is now being called the finest and most complete trout and salmon book ever published. It covers trout from the Sierra Madre of Mexico, all subspecies of cutthroats, char from Maine to the Arctic Circle, many subspecies and races of rainbows and steelhead, and all species of salmon from Alaska and the Pacific Northwest. ❧

Fredericks, continued...

Some final questions for Jim:

What are the current whirling disease issues for your state, region, or agency?

"As I mentioned previously, our biggest issue is trying to accurately determine whether and where whirling disease is a real issue with population level impacts, versus where it is more of a reflection of other bigger picture problems."

What do you think the burning whirling disease issues will be in five years?

"The issue of impacts assessment is certainly one of them. The other issue, to me, is trying to get a better understanding of how the whole whirling disease infection plays out in a particular system. In other words, we seem to be learning that some systems experience population level declines that are/were attributed to whirling disease, and then there is a period of recovery. I don't know if we'll ever really understand whether it's an immunity thing, an environmental conditions thing, or what. But it sure would be nice to know. Some systems seem to recover quickly, some don't, some don't seem affected at all. It's a complex relationship between environmental conditions, fish species, and life history, and the presence of the parasite that we don't fully understand. As a manager, it's part of the job to try to reliably predict what the future holds and with whirling disease, we still have a whole lot of uncertainty."

What kind of outreach actions concerning whirling disease do you feel would be helpful to fishery managers?

"I would like to see a 'status report' of whirling disease developments around the west. I hear anecdotally that the Madison has rebounded very well, and then I hear accounts of other rivers where it's thought to be taking a toll—but I haven't really seen an annual interstate 'what's new with whirling disease' newsletter or report. I get most of my whirling disease info from our state fish pathologist, Keith Johnson, which is invaluable; but it would be nice to see some periodic management oriented updates from time to time." ❧

Thank you Jim for your time and participation!

Find more information about fisheries and fisheries research in Idaho at Idaho's Fish and Game web site:

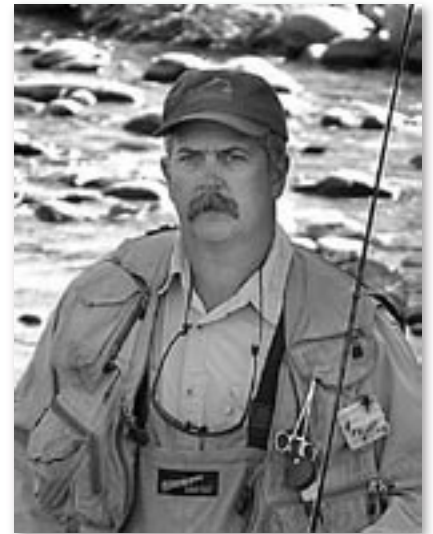
<http://fishandgame.idaho.gov/>

The Power of Teamwork by Dave Kumlien

In December of 1994, newspaper headlines announced that whirling disease was believed to be responsible for a drastic decline in Montana's Madison River rainbow trout population. Even though the whirling disease parasite had been established in the Continental United States for some time, the problems with the Madison's wild rainbow trout population focused national attention on whirling disease. As Dr. Karl Johnson, one of the founding directors of the Whirling Disease Foundation, said, "The vandals have entered the cathedral."

Partnerships are powerful. The famous British statesman Winston Churchill once said, "If we are together, nothing is impossible. If we are divided, all will fail." While the progress made in whirling disease research over the past decade is quite remarkable, it would not have happened without the alliance between the federal government, the states, educational institutions and the private sector. One of the most significant products of this collaboration is the Whirling Disease Symposium (WDS). The WDS has become a determining event in the research process bringing together whirling disease researchers from the U.S. and around the world to present the latest research findings, identify critical needs, and develop research plans. With the support of the Fish and Wildlife Service, the Montana University system Water Center, numerous state fish and game agencies, conservation organizations like Trout Unlimited, and many private sector businesses, the Whirling Disease Foundation has organized and co-hosted this important science meeting. At the first science meeting in May of 1995, 40 scientists and researchers were invited to Bozeman, Montana for the purpose of discussing the problem and developing a basic research plan. Each year, the meeting has grown, and as many as 200 scientists and researchers have attended the meeting and heard upwards of 60 research presentations. The 2005 meeting, the 11th such event, will be held at Denver's Brown Palace Hotel on February 3rd and 4th.

While there has been no discovery of a silver bullet to end the whirling disease threat, several promising management options are being studied and developed. It is quite likely that any solution to whirling disease will be similar to an artist creating a painting. Like an oil painter, fisheries managers will likely use a palate of tools to address each individual river and stream, and unfortunately, not every "picture" will be a classic work of art. The Whirling Disease Foundation recognizes the importance of the annual symposium in creating this management tool palate and wishes to thank all symposium supporters for their generous assistance. We look forward to seeing you in Denver! ☒



**“If we are together,
nothing is impossible!”**

- Winston Churchill

Launching of the New Whirling Disease Initiative Web Site—January 11, 2005

The Whirling Disease Initiative, managed by the Montana State University Montana Water Center in Bozeman, Montana, announces a new informational web site on whirling disease. The web site is a central online repository for information on research, contacts, maps, graphics, application tools, outreach tools, meetings, conferences, and the National Partnership for the Management of Wild and Native Coldwater Fisheries which oversees the Whirling Disease Initiative. It is designed to serve fisheries and hatcheries managers, researchers, and agency land managers, as well as educators, anglers and the general public.

The web site is just one educational component of a larger outreach program planned by the Whirling Disease Research Initiative which began in 1997. Other proposed outreach activities and products include formal presentations to interested parties; field visits to fishery managers; annual whirling disease updates; risk assessment methodology and other fishery management tools; status-and-trend information; state-by-state information on policies and regulations; a quarterly newsletter; and maintaining communications among researchers, managers and the public.

Visit the site at <http://whirlingdisease.montana.edu/>.

Keep your eyes open for upcoming whirling disease outreach products;
this is just the beginning!

Showcase Student—Leyla Arsan

Leyla Arsan was born and raised in Southeast Asia, spending most of that time in Hong Kong. She came to the United States at the age of 14 for secondary studies and she has been here ever since. Leyla did her undergraduate studies at Prescott College in Arizona, where she double majored in environmental studies and adventure education. She was able to take advantage of a rare opportunity and complete her field research at the college's field research station in Bahia Kino, Sonora, Mexico. Her focus was inter-tidal ecology. After completing her undergraduate degree, Leyla spent several years as a raft guide, Outward Bound instructor, and natural history guide in Alaska. Last year she decided to return to school and further her education in fisheries science.



Leyla looking at tubifex.

Leyla is completing a Master of Science degree at Oregon State University in Corvallis, Oregon. Her concentration is fish health with a specific research focus on analyzing risk parameters for the introduction of whirling disease. Within that focus, Leyla is looking at two different anadromous systems: the Willamette River in Oregon and the state of Alaska.

When asked to describe the goals of risk analysis Leyla said, “This risk analysis will help managers identify means to prevent the introduction of whirling disease into non-endemic areas and to reduce its effects in areas where the parasite already exists. It will also draw attention to areas of special risk or importance. My grand hopes are that this will help to stop the spread of whirling disease and in turn preserve and bolster our wild trout populations.

Risk analysis lays out a way of thinking about disease introduction and pathogen tracking. It sets a framework that allows managers and researchers to more easily explore avenues in disease introduction and establishment. It clearly identifies areas with data gaps and hence, areas of potential research. It brings to focus topics that perhaps have had very little attention in the past or inconclusive evidence from prior research.”

Right now Leyla is focusing on release assessment and exposure assessment. Release assessment studies the risk of introduction of *Myxobolus cerebralis* into a particular environment. Exposure

assessment determines the potential of the pathogen life cycle becoming established. Her assessment results should vary between her two study areas (Oregon and Alaska). She explains the two different focuses in this way, “Overall, the release assessment will focus on the potential for introduction as a result of a variety of factors: movements of fish by human activities, natural fish migration and straying, and potential effects of angler activity. The exposure assessment will focus on the likelihood that the parasite could become established by evaluating tubifex populations (numbers and susceptibility), extent of worm habitat, and temperature ranges.”

Although she is excited and her research has been productive thus far, Leyla does face some challenges, mostly in the form of data gaps. Due to Alaska's massive size and remoteness in comparison to Oregon, accessibility to data has been difficult. Information that is readily available for rivers in Oregon is often not available for Alaskan rivers. However, the Willamette River poses its own obstacles in determining where stray anadromous salmon originate.

Details of Leyla's Research and Methodology. The parasite has not been found in Alaska and routes of introduction are suspected to be limited. Additionally, information is limited regarding the potential for parasite establishment if it were introduced. One method being used to determine Alaskan-area factors is sorting through Alaskan sediment to identify oligochaete worms, the intermediate host of whirling disease. Despite the challenges faced in Alaska, Leyla and her co-researchers are excited about the fact that this is the first study to look at *Tubifex tubifex* lineages in this region.

In contrast, there are numerous potential introduction routes throughout the Columbia River Basin in Oregon and Washington (straying and migration of anadromous fish from endemic areas, angler activity, and transfers of infected fish between private ponds), although environmental conditions and the absence of tubificid hosts may limit the parasite's establishment in certain tributaries.



Collecting samples.

Research Concentration. There are many factors that are analyzed in a risk assessment. Some research requires information gathering from databases. Other research is gleaned from studies done by other scientists. Here are a few examples of Leyla's current research concentrations.



Leyla in the field.

Alaska. Factors considered in a release assessment:

- Potentials for Alaskan fish straying into endemic areas on their migration are low. Straying of a Columbia River Basin salmon into the Copper River in southcentral Alaska has been recorded (Ron Josephson, Alaska Department of Fish and Game, personal communication), but the frequency of long-distance straying is unknown. This is studied through database research, and personal communication with professionals in the field. If data is inconclusive this indicates an information gap and an area for future research concentration.
- Columbia River Basin fish are commonly harvested commercially in salt-water commercial harvests in southeastern Alaska. Disposal of carcasses and effluent from these harvests is being investigated to ascertain if this offers a pathway for introduction. This is done through database research, and personal communication with professionals in the field.

Factors considered in an exposure assessment:

- Significant tubifex populations were found in hatchery sediments from the Cook Inlet Basin. It is not yet known where tubifex and susceptible fish hosts overlap in the wild in Alaska. This is studied by collecting and holding worm samples from Alaska for morphological identification and determination of species abundance.
- Initial worm lineage studies show existence of lineage IV, never before described in North America. Leyla is examining the susceptibility of this tubifex lineage to

Myxobolus cerebralis. Lineages are determined by a PCR-based technique (polymerase chain reaction) developed by Beauchamp et al. (2002). The sample site with the highest percentage of lineage IV is used for a laboratory exposure experiment to see if this lineage of worm is susceptible to *Myxobolus cerebralis* and would propagate the parasite.

- Data is being analyzed to establish if temperatures are seasonally permissive for parasite growth and survival. Hydrological data from the past 10 to 20 years is being examined.

Willamette River, Oregon. Migration and straying considered in a release assessment:

- Significant numbers of stray salmon were found in the Willamette River during 2004. Stray rates are far higher than would be predicted from database queries, leading to the conclusion that handlers at fish traps are not recognizing stray fish. Data being gathered from these fishes include their system, hatchery of origin, and possible infection with *Myxobolus cerebralis*.
- Fish trap handlers are told exactly what markings to look for and to set aside any fish with unusual markings. These fin clip markings are ideally paired with a hatchery of origin through database research. These fish are also assayed for *Myxobolus cerebralis* by pepsin-trypsin digest and then re-tested by PCR.



Collecting samples with fellow student.

Look for Leyla Arsan at the upcoming Whirling Disease Symposium in Denver, February 3 and 4, 2005. She will be presenting a poster on whirling disease risk analysis. ☒

Improving Whirling Disease Communications

What Can We Do Better? by Bob Wiltshire

Communicating - we all do it, all day, every day. Communicating is fundamental to our existence, yet most of us rarely think about how to improve it. This is unfortunate because, like any other endeavor, we can easily improve our ability to communicate by applying proven techniques to achieve better results.

Communications are integral to our economy. Marketing and advertising campaigns, the media and entertainment industries, and our education system are all based on communication. As such a critical part of our lives, it should be no surprise that the process of communicating has been researched for many years. Through the use of experimentation, observation, and evaluation, social scientists have identified the elements of a successful communications effort.

How can we use this information to help us do a better job of communicating about whirling disease? Identifying and understanding the audience and crafting the message are concepts that the whirling disease community must address to be successful. Until we can very simply describe what the message is, who the message is for, and why the audience will care, we cannot succeed.

When whirling disease first appeared there was a simple message, “This disease has the potential to severely impact the populations of wild salmonids.” This was easy to communicate, and we found a receptive audience. Resource managers, the public, and politicians all responded. Human and financial resources were quickly marshaled, and there was tremendous interest in the efforts of researchers. Unfortunately, attention waned, and the relevant message was lost. As a result, few people have the intense interest that was so evident just a few years ago.

Due to the current decline in interest, the whirling disease community (specifically the Whirling Disease Initiative and the Whirling Disease Foundation) has come together and asked for more, and for better communication on the topic. While I agree that we need more communication, it is far more important that we have better communication. Before developing a communication plan for whirling disease, I believe the following questions should be answered: Who needs to know more about whirling disease? What should they know? Why should they know it? Until there are precise answers to these questions, we cannot hope to craft an effective communications strategy.

Who? What? Why?—These are the keys. Each is important and each will be shaped by the other. Unfortunately, I believe these critical elements have not been given serious attention. We cannot hope that our communications will reach an interested audience until we address these basic questions.

As I watched the presidential debates this past fall, I was impressed by how easily a candidate was able to turn a pointed question on one topic into a detailed answer about a totally different subject. We often hear political pundits talk about the need for candidates to stay “on message” and this was a perfect example of how they did so. They knew exactly who they were trying to reach and exactly what they wanted to tell them. Working from this base of certainty, they had no difficulty in conveying their message.

The whirling disease community must take this approach. We must know exactly what we want to communicate, and it must be relevant. Our message has to contain more than scientific research findings and information on research in progress. Specifics on whirling disease research often fails to engage and keep the interest of the target audiences. A quick look at the different audiences will tell us why.

Fishery managers, for the most part, often do not have a keen interest unless the research is giving them specific information that allows them to manage better. If the only thing we can tell them is that we are doing research that might someday yield management solutions, they will tell us to come back when we have those solutions.

Anglers have disengaged from the topic because we have failed to make it personal to them. What anglers want to know most is how it impacts them. The things anglers want to know are: how to stop transmission, how this is protecting fish from infection, and how this changes their angling experience. Unless we can show a direct connection to anglers and their activities, they will not be interested.

Additionally, folks at the administrative and policy-making level need to know how they can respond to improve the situation. Often the gap between scientists and decision makers is cause for inadequate and faulty policies. Unless our message to the policy



makers contains relevant information about decisions that need to be made, it is of little interest to them. A purely research-based message is often too cumbersome and complex for administrators. Instead, they need concise and understandable points on the topic of whirling disease in order to maintain interest and give them something useful that can be used in the decision-making process.

Let me offer this formula for developing a more effective message. Start from what you want to achieve. Then, identify the audience that needs to be reached. Finally, determine why they will want to know about your message. If you start this way and have definite targets for each of these points, they will naturally lead to your message. A message that is developed in this fashion will be very easy to communicate and will be much more likely to capture the interest of the target audience.

Effective communication about whirling disease can be achieved. However, this will not happen unless we give communications the same degree of planning, development, and implementation that our research projects receive. We must know what we want to achieve, who our audience is, and why the audience will care. Once we have this information, we can craft communication strategies that achieve positive results. ☒

Meetings and Conferences:

- » Great Plains Fishery Workers Association, Sterling, Colorado; February 1-2, 2005; contact: Ken Kehmeier, 970-472-4350
- » 38th Joint Meeting Arizona/New Mexico Chapter of American Fisheries Society and Arizona/New Mexico Chapters of the Wildlife Society, Gallup, New Mexico; February 3-5, 2005; contact: Pam Sponholtz, 928-226-1289
- » 11th Annual Whirling Disease Symposium - "Recipes for Recovery," Denver, Colorado; February 3-4, 2005; contact: Wanda McCarthy, 406-585-0860
- » Montana Chapter, American Fisheries Society Annual Meeting, Missoula, Montana; February 8-11, 2005; contact: Kate Walker, 406-329-3287
- » Idaho American Fisheries Society Chapter Annual Meeting, Boise, Idaho; February 24-26, 2005; contact: Russ Kiefer, 208-334-3791
- » Colorado and Wyoming, American Fisheries Society Annual Meeting, Fort Collins, Colorado; March 7-10, 2005; contact: Mark Smith, 307-527-7125
- » Symposium of Fishery Sciences in Mexico, La Paz, Baja California Sur, Mexico; May 2-4, 2005; contact: Mauricio Ramírez-Rodríguez, (52) 612-123-4658
- » 30th Annual Eastern Fish Health Workshop, Shepherdstown, West Virginia; June 13-17, 2005; contact: Rocco Cipriano, rcipriano@usgs.gov
- » Outdoor Writers Association of America, Middleton, Wisconsin; June 18-22, 2005; contact: Eileen King, 814-364-9557
- » American Fisheries Society Annual Fish Health Section Meeting, Minneapolis, Minnesota; July 27-29, 2005; contact: Joe Marcino, 651-296-3043
- » American Fisheries Society 135th Annual Meeting, Anchorage, Alaska; September 11-15, 2005; contact: Bill Wilson, 907-271-2809
- » Midwest Fish & Wildlife Conference, Grand Rapids, Michigan; December 11-14, 2005; contact: Gary Whelan, 517-373-6948

Contributors

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Gretchen has been the director of the Montana Water Center for four years. She has served the Whirling Disease Initiative in that time offering her knowledge and professional expertise in the oversight of whirling disease research and program administration.

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Amy is a newcomer to whirling disease—she started working for the Whirling Disease Initiative in August 2004. She is the outreach coordinator for the new Outreach Program.

Dave Kumlien

Dave Kumlien is the Executive Director of the Whirling Disease Foundation located in Bozeman, Montana. He's been the director for three-and-a-half-years now. Dave was also the recipient of the Outdoor Life Conservationist of the Year award in October 2001. He was honored for his work and the work of the Whirling Disease Foundation.

Bob Wiltshire

Bob has been intimately involved with the welfare and recreational enjoyment aspect of salmonids in Montana for many years. In addition to his ten year executive directorship of the Fly Fishers Federation located in Livingston, Montana, he was also a member of the Montana Governor's Whirling Disease Task Force.

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