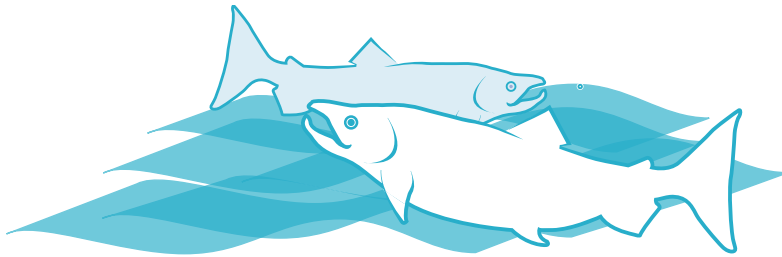




Like a fish to water

By Amanda Meyer



• Rachel DeWilde thinks of her time at Bishop Mountain, her
• family's fish camp on the Yukon River, as "before" and "now."
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• "Before" means catching, cleaning and putting away about 50
• salmon a day. "Now" means a mere 20 – 30 a day.
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• "Now" also means DeWilde is at UAF learning about fish
• genetics so someday she can go back to Bishop Mountain and
• find out the reasons for salmon declines.
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• "Bishop Mountain is fundamental to who I am," she says.
• "There's a freedom, wildness and culture about fish camp. It
• would be devastating to think what will happen if subsistence
• fishing goes away. I wonder, what will happen to rural culture?"
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• DeWilde was 14 when she first heard about the salmon run
• decrease. It took a while for stories to travel from the older
• people to the younger. Watching the salmon get smaller and
• less abundant made her worry for the future of her generation
• of Native people, but she didn't have the tools to help. She didn't
• even know there were tools she could use.
•

To find the right answers, you have to ask the right questions

She found her toolbox — maybe her tackle box — at UAF, where she is in her second year. It was RAHI II and her interest in fish that brought her here. She works in Andres Lopez's fish genetics lab, and is contemplating a graduate degree so she can go back to Bishop Mountain to look for answers to the salmon decline.

At 14, DeWilde had volunteered at Tanana Chiefs Conference, an Interior Alaska Native nonprofit corporation, to collect salmon samples at Bishop Mountain. She later worked for the Alaska Department of Fish and Game, clipping scales and taking measurements before the salmon were gutted and cut.

"I saw scientific changes for the first time," the 19-year old Athabascan says. "My interest snowballed from there."

During summer 2009, after her junior year in high school, DeWilde took a RAHI II course in genetics and molecular biology through the Rural Alaska Honors Institute. Hosted by UAF, regular RAHI helps rural and Alaska Native students prepare for college through six-week courses in language and math. RAHI II students, like DeWilde, focus on science, and study molecular biology in research labs.

DeWilde saw Lopez's fish lab for the first time during her RAHI II summer. Lopez is an assistant professor at the School of Fisheries and Ocean Sciences and curator of fishes for the UAF Museum of the North. He and graduate student Mac Campbell are investigating the genetics of the Alaska blackfish, an understudied fish species.

Under Campbell's guidance, DeWilde became familiar with the lab techniques related to fish genetics. She learned to use a micropipettor (micro-PIE-petter), a laboratory tool that can transfer very small amounts of liquid samples, such as blackfish DNA, to other containers. She then uses these blackfish DNA samples in a polymerase chain reaction and subsequent gel electrophoresis. Translation: DeWilde creates millions of copies of DNA, puts those samples on a gel and uses electricity to separate the different fragment sizes for further study. [See sidebar].

When DeWilde returned to UAF as a college freshman, a year after RAHI, Lopez hired her to work in the lab under an Alaska INBRE work internship, an opportunity open to RAHI II alumni to get more lab experience during their first or second year in college. "It was great, fantastic. I couldn't have gotten my job in the lab without it," DeWilde says, referring to RAHI II.



Blackfish as surrogate salmon

Under Campbell's watchful eye and patient tutelage, DeWilde has grown to love researching Alaska blackfish genetics. Though she spends her time on blackfish rather than the salmon that first got her interested in science, DeWilde sees only benefits.

"I have an amazing opportunity to develop myself as a geneticist," she says, "and I'm blessed to be studying a great species with a great mentor."

DeWilde would rather be in a lab than a class. Seeing a picture of pipetting won't help you understand until you pick one up. DeWilde handles the purple micropipettor with ease, deftly dropping her samples into the wells of the polyacrylamide gel she's running for Alaska blackfish DNA.

"You should throw someone in a lab, even if it's over their heads," DeWilde says. "They'll learn faster and gain invaluable information."

She began applying for, and receiving, her own research grants, capitalizing on the funding to work on microsatellites and genetics.

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She has also taken advantage of opportunities to see another side of science. In 2009, she went to Washington, D.C., to present her RAHI II research at the National Institute of Diabetes and Digestive and Kidney Diseases. In March 2011 she returned to D.C. and impressed attendees of a National Institutes of Health meeting with her professionalism, personality and knowledge. According to Arthur Hussey, program administrator for Alaska INBRE, “She wowed them.”

“It was really cool to see the other side of science,” DeWilde says. “There are lots of people fighting for funding so we can do what we love. Seeing this side of things was really important to understanding my career, and makes me appreciate the opportunities for research even more. It’s nice to make connections and know who’s funding me.”

She hopes to translate her undergraduate experience working with blackfish to studying the population genetics of Alaska salmon, either through graduate work or in a job right after her bachelor’s degree. Then maybe she can go back to Bishop Mountain to figure out what’s happening to the Yukon’s salmon, and help preserve the rural culture she loves.



Amanda Meyer is program coordinator for Alaska BioPREP at UAF. She is a transplant from Florida and has found more fun outside in the Alaska Interior than she ever had in the clubs of Miami. Meyer hopes to start an interdisciplinary doctoral degree program at UAF in 2011.

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And now a word from our sponsors

Science research takes a lot of work from a lot of people in a lot of disciplines. It also costs a lot of money. Here are some of the programs that make Rachel DeWilde’s work possible:

Alaska BioPREP, a research lab training program, which funds RAHI II

Alaska EPSCoR, a National Science Foundation-funded program to improve Alaska’s research capacity

Alaska INBRE, a National Institute of Health-funded infrastructure-building and research support program

National Institutes of Health: Science Education Partnership Award, which funds Alaska BioPREP

UAF Center for Research Services



DeWilde’s research

Microsatellites refer to repeating base pairs in the noncoding region of DNA. They are used as molecular markers in genetics, and can help determine relatedness in population studies. They may also be used to study gene duplication or deletion. DeWilde is developing microsatellites using 454 sequencing, a new technology wherein DNA is cut into small fragments. A machine identifies microsatellites on the genome and the area around it, and sends the researcher a file. From this smaller-scale analysis of genetic variation, DeWilde developed 40 primers she will be comparing to the larger population.

As DeWilde puts it, “I’m using a tetranucleotide microsatellite I developed, which is a four base pair repeat. It’s really cool because most are only two base pairs.”

Right.

Still, it’s pretty impressive language from someone who admits she could barely get through a research paper when she started in RAHI II.