HOW I GOT WHERE I AM

By Don Orth

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I believe that I got where I am through sheer dumb luck! Every day and every opportunity is another chance to become a professor of fish conservation—dream job that I never dreamed of. I organized my thoughts around growing up urban, dreams and motivation, success in academia, time on the dark side, and the dark side of knowledge. As Joseph Campbell wrote, "the privilege of a lifetime is being who you are."

GROWING UP URBAN

I was born and raised on the south side of Chicago, in a neighborhood known as West Englewood. Fish was what we ate on Fridays, not a potential career aspiration. At age 10 I got my first paper route, delivering the *Chicago American* in the Marquette Park and West Englewood neighborhoods. On weekends, my buddy Michael D. and I would lash our fishing poles to our bikes and ride to Marquette Park, where we fished in the park lagoon (catch and release before it was fashionable). Only later would I learn that this site was a former mesic prairie and the lagoon was created to surround and drain the golf course.

In the summers we took the CTA bus to Rainbow Beach to cool off and pretend to swim in Lake Michigan. In 1967, we were surprised when our beach visits meant we had to endure smells from huge windrows of dead Alewives (*Alosa pseudoharengus*) that now dominated the beach. The lake now had miles of dead Alewives floating in massive windrows. No one knew why these fish were dying. I was curious and that curiosity about what is happening underwater has driven me ever since. Many years later I read a report written by Edward Brown, U.S. Bureau of Commercial Fisheries; he described the massive fish kills that occurred throughout the lake in 1967 and summarized observations without confirming a cause (Brown, 1968. Great Lakes Fishery Commission Technical Report 13). Later I learned just how much we had altered the Chicago River and Lake Michigan

I enjoyed fishing and used my weekly paper-route earnings to buy *Outdoor Life*. One day I read an ad that referred to people called Ichthyologists who studied fishes. This was my Archimedes "Eureka moment." "Eureka! I have found it!" It was an early discovery that there were people who made their living by studying fish. Imagine that! I have been becoming one ever since.

Photos by the author unless otherwise indicated.

DREAMS AND MOTIVATION

Fishing is based on three simple motivators: being outdoors, relaxation, and thrill of the catch. However, can you really find meaningful outdoor work that is relaxing and thrilling? Probably not. College provided me many opportunities to learn about the scientific foundations behind fish work. I attended Eastern Illinois University, interned at the Illinois Natural History Survey, and completed two graduate degrees at Oklahoma State University, earning degrees in Environmental Biology, Zoology, Environmental Science, and Statistics. Oklahoma may seem an odd choice, but in an experiment in water supply, Oklahoma built many artificial reservoirs to stem the

I attended Oklahoma State University for graduate studies.

At Oklahoma State University I examined population dynamics of the Largemouth Bass in Lake Carl Blackwell.

Fish faculty at Virginia Tech circa 1981. From left to right: Lou Helfrich, Dick Neves, Garland Pardue, Don Orth, John Ney, and Larry Nielsen. None of these faculty were Assholes.

fear of Texas' growth and water needs. Here I studied reservoir fishes and learned more about environmental systems theory, mathematics, statistics, computer programming, and environmental problem analysis. My dissertation research was integrative problem solving to address the pressing questions of instream flow. How much water do we leave in stream channels to maintain some benefits? What is habitat? How do we measure or even manage it?

Science can sometimes take the joy out of fish. At the time, most reservoir fish assemblages were monitored with a combination of shoreline electrofishing, gillnetting, and cove rotenone sampling. How many Gizzard Shad (*Dorosoma cepeidanum*) and White Crappie (*Pomoxis annularis)* can you count and weigh before this becomes dirty, ugly work? The daily work of translating field sample results into large databases is still the heart of quantitative fisheries work. However, the work easily creates disconnects between the fish, the data collection, and analysis and interpretation.

A lot of people have gone further than they thought they could because someone thought they could. That was my story. When my professors asked me "Do you want to be a professor?" My answer was always "No." I did not apply for the Fisheries Science Assistant Professor position when first advertised. I only did after the search process stalled and influential mentors convinced me to apply.

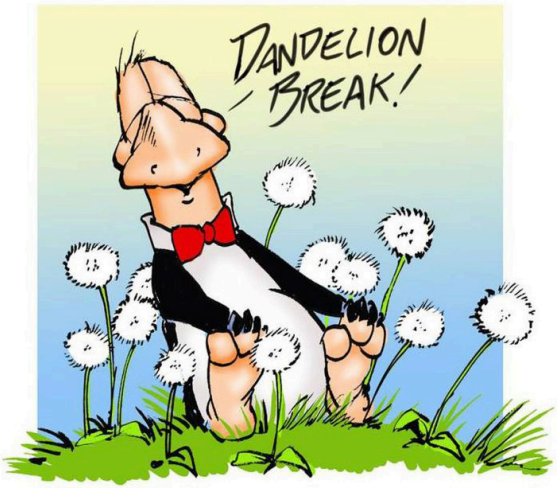
SUCCESS IN ACADEMIA

Academia is filled with insecure people and many are assholes. In *The No Assholes Rule*, Robert Sutton confirmed that negative or unkind people (aka Assholes) were seen as less likeable but intelligent, competent, and expert. I do not work well with Assholes. Academia is the only place where you can do your science 24/7 and "publish or perish" is the only rule that applies. However, there is still no good answer to "How much money is enough?" Few fish papers carry the prestige of high-impact journals. Monitoring your citations and h-index are not good fits for a fish nerd. Our science moves slowly and steadily. My dissertation research paper has been cited only 7.5 times per year since it appeared in 1982! Budgets are increasingly set by "butts and bucks" criteria. Butts in the classroom are hard to come by when you classroom smells like dying fish.

My research and teaching emphasize practical solutions to keep, maintain, and enhance opportunities for fish-related pursuits. Applied research with a focus on stream and river issues never has garnered enough money for research. I built a C.V from a wide variety of studies, including recreational fishing regulations, trophic basis of fish production, harvest and environmental disturbances, reproduction and early mortality in nest spawning centrarchids, biotic integrity monitoring, habitat selection and suitability modeling, instream flows, fluctuating flows, individual-based population models, and environmental flows. My advice for millennial fish nerds includes: (1) do something meaningful; (2)

In what other job could you legitimately be paid for fish watching? Orth and students used SCUBA to assess fish and crayfish populations in the 1980s.

do not chase money; (3) develop and guide talent; and (4) maintain a long-term perspective and strategy. Write about the research questions you find relevant and develop a broad oeuvre (body of work). Since the world is not built to my specifications, I try to cope with delayed gratification and a heavy dose of selfcontrol. I deal with these realities by escaping in an Opus-inspired dandelion break or a Calvin and Hobbes world of denial.



Opus reminds us to take frequent dandelion breaks.

I taught Fisheries Management and Fish Population Dynamics and Modeling for 20 years. Fish Die! Fish can only die once? If your parents had no offspring, odds are good that you won't either! Therefore, the math is very important, but so are people and fish. Too frequently those who understand the simple beauty of integral calculus, and the meaning of the instantaneous fishing mortality rate do not relate to people. When the states had to create stock assessment teams for managed fisheries I taught fish stock assessment for fish biologists. There were too many exploited fish to manage, too much data to collect, and too few fish biologists to handle the work load. Everyone wanted an easy-to-run model solution, which would inevitably prove to be "clear, simple, and wrong," in the words of H.L. Mencken. In managing stream and stream habitats, similar agency needs for simple, clear solution to a complex problem would prove troubling. Simple notions of a habitat-based, trophic support for fish and nutrient processing have been ignored by otherwise intelligent managers.

In Stream Habitat Management, I emphasize the importance of interdisciplinary problem solving to deal with questions of flow regulation, hydroelectric power, dams, diversions, habitat degradation, and the urban stream syndrome. I took a sabbatical leave at Oak Ridge National Laboratory and focused my attention on environmental impact assessment of hydroelectric projects and individual-based population models. Decades of research were encapsulated within simple FORTRAN subroutines depicting processes that influence the individual fish.

Don Orth angling male Smallmouth Bass from a nest in a study of reproductive dynamics. Circa 1992.

TIME ON THE DARK SIDE

I learned many lessons during my 7-year turn as Department Head, the "dark side," during an era characterized by the loss of public support for higher education, rescission plans, and layoffs. Say no nicely. Communication is key. Walk around. Integrity is when what you think, say, and do are in sync. Say thank you. Learn how to volun-tell faculty. Development = money grubbing. Assholes are people too! Controlled apathy = faked enthusiasm. The Department Head is responsible for making connections between the talents of the faculty and the needs of the majors, the campus, and the constituents. Heads must manage the budget, personnel, legal, and political issues. Oh, yea, and always make the Dean look good in the process. Students and faculty should drive what we do at universities. The Virginia Tech tragedy of April 16, 2007, was a painful reminder of how a major university fell short of caring for an individual student, which had tragic consequences.

ARROGANCE IS THE DARK SIDE OF KNOWLEDGE

I returned to teaching, which provided my first chance to teach ichthyology. I was reminded that the work that many of us have been doing for decades can be tremendously difficult for those who are just starting out. "We learn not for school but for life" *Non scholae sed vitae discimus* (from the Roman Stoic philosopher, Seneca the Younger's Moral Letters to Lucilius AD 65). All learning begins with a dream and students arrive with a dream whether ill-formed or fantastical. Students fear the arrogant professor, who can help students reach that dream. I remind them that "life is a comprehensive exam." Becoming an ichthyologist may not be the career goal of each and every student, but learning to become a better student of the fishes develops numerous skills transferable in their future endeavors.

Teaching has changed dramatically since I began. Circa 1970s.

In math and the sciences, students first encounter the fear that they are stupid. When I work on important, unstructured problems, "feeling stupid" is normal. I muddle through as best I can. Most of the time I just don't seem to know what I am doing. In order to protect our integrity, scientists rely on the structured scientific paper written in a fraudulent style (IMRaD, i.e., Introduction, Methods, Results, and Discussion) that sanitizes the real process of discovery (See "Is the Scientific Paper a Fraud?" by Sir Peter Medawar). Yet we don't tell that story. The IMRD scientific paper is a delusion that misleads the beginner. It doesn't describe all the struggles and frustrations to learn how to invent a suitable method to test an important hypothesis. "Feeling stupid" is perfectly fine as long as we learn something along the way. When a student is becoming a scientist, he or she must tell stories. Hence, I advocate for storytelling with a mentor or in a small community of practice. A digital story of critical events in my early life illuminated the values of an 18-year-old Don; see "Not Everyone Truly Lives" (https://vimeo.com/101666604).

Today, I am engaged in research on the non-native Blue Catfish (*Ictalurus furcatus)* in Virginia's tidal rivers and the as-yet-undescribed Clinch Dace (*Chrosomus* sp. cf. *saylori*). I am money grubbing for a long-overdue assessment of coolwater endemic fishes in the upper New River. I have learned to incorporate social media (@donaldorth on Twitter, Virginia Tech Ichthyology on Facebook), blogs (http://vtichthyology.blogspot.com/), digital storytelling, ePortfolios, and Flickr (https://www.flickr.com/groups/1596382@N24/), in my teaching. Here, I interact with many NANFA members. NANFA is a great example of a specialized community that facilitates learning and appreciating native fishes. No matter how you get started in becoming a better student of the fishes, NANFA can help.

Fish conservation is a difficult and complex arena. Actions needed take persistence and patience and an open mind. Alewife are now managed in the Great Lakes by stocking non-native salmonids, while Lake Trout (*Salvelinus naymaycush)* and whitefish recovery languishes. The Chicago River finally has a riverside walk. This was a dream of Daniel Burnham, Chicago's visionary architect, who proposed a riverside walk as far back as 1909. Asian Carp wait for an open window to invade Lake Michigan. And some young Chicagoans dream of studying fish.

Photo with Mahi Mahi (*Coryphaenus hippurus).* (Photo by Valerie Orth)