## A Tank Full of Middle Fork Willamette River Natives

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uring the winter of 2006 in Eugene, Oregon, Dr. Joseph Dunn approached me about installing an aquarium in the waiting room of the building he was constructing to hold his medical practice. Joe kept some fancy goldfish in a large aquarium at his home and had long wanted to get an aquarium in his office. With the new construction going on, and some willing partners, the time to strike was at hand. The partners were avid fly fisherman and the deal was for a trout tank. I had kept some trout in a backyard pond for a while, and I knew that they were large fish with messy eating habits. So we set about to build as large a tank as possible. In the store I had a 210 gallon tank, six feet long, but there was room for something bigger, and it was decided to build a plexiglas tank 6-feet long by 29 inches wide by 40 inches tall, to hold a total of about 360 gallons.

Trout need to be kept cool, and a chiller was in order. To prevent condensation on the outside of the tank from ruining the view, the acrylic was 1<sup>1</sup>/<sub>4</sub>" thick, which provided enough insulation. Since the tank was freestanding, water lines and electricity for the lights were run through 2 overflow towers constructed of black acrylic in the center of the tank. Initially the contractor ran two 1" PVC pipes under the slab to supply water and drains for the tank. This was deemed insufficient for the flow needed to keep a coldwater trout tank clean, and the slab was cut open and two more 2" PVC pipes were buried in the foundation before the room was finished.

The filtration was in a separate closet sized room. Water from the tank flowed underground and then through two,  $200\mu$ M nylon filter bags into a 100-gallon Rubbermaid<sup>®</sup> stock tank. From this sump, a large pump drew water and fed it into a bubble-washed bead filter. Next came a water-cooled chiller, which used water to send the heat from the chiller down the drain. This was necessary to keep the closet from overheating. After cooling down, the water flowed through an 80-watt high-output T5 UV sterilizer before returning to the tank. The returning water went under the floor, up through the overflow towers, and into a manifold of PVC and valves that directed the returning water into the tank. Lighting consisted of six, 39-watt, 6000K high-output T5 bulbs.

About 400 pounds of river gravel was added to the tank, along with some river rocks and the largest driftwood that could be found, and still fit into the tank. After cycling the tank with some goldfish, 24 four-inch Rainbow Trout (Fig. 1) were obtained from a local hatchery.

This is how the aquarium was set up for about two years. The trout lived up to their reputation as heavy, messy feeders. In order to increase flow to the tank, and try to avoid the weekly build up of mulm on the bottom, both 1" pipes were used as feed lines, and both 2" pipes were utilized as drains. Weekly maintenance involved algae scrubbing, cleaning the nylon filter bags, and back-washing the bead filter, with a 20% water change. As time went by the number of trout dwindled to one, a fine male approximately 18 inches total length.

Something new was needed, and the idea arose to stock the tank with the lesser known native fish of the region. The Oregon Department of Fish and Wildlife (ODFW) prohibits the taking of non-game fish without a permit, and this includes catching them in a net to look at them, much less keeping them in a tank. The general public is unaware that there are other fish in the rivers besides trout, salmon, and introduced game species like Smallmouth Bass and Bluegill. The plan was to display non-game fish in a public setting to



Fig. 1. Rainbow Trout (Oncorhynchus mykiss).

help educate people about native fish. Compared to other areas of the country, Oregon is not species-rich when it comes to non-game fish, but there are some interesting critters out there.

In addition to belonging to NANFA, I had been attending Desert Fish Council meetings, and had met several ODFW employees, university professors and other parties interested in the non-game fishes of Oregon. With their help I was able to assemble a list of target fishes and find a contact in ODFW who could steer the permit application through the process. At first the reaction to the plan was not positive. Fortunately the City of Eugene was sponsoring public hearings to gather opinions on a redevelopment plan for the Willamette River greenway. At the hearing, I was able to speak with Jeff Ziller, ODFW District Biologist for the South Willamette Valley. He was enthusiastic about the plan and helped me complete the application. This involved filling-out a web-based application that was found on the National Oceanographic and Atmospheric Administration (NOAA) website. Though none of the species to be collected were threatened, the federally-listed Oregon Chub (Oregonichthys crameri) was found in the area. Collecting locations were planned to avoid this species.

After the permit was obtained, initially two locations were visited. One suggested by Jeff was in the Delta Ponds area

near Valley River shopping mall north of downtown and east of the Willamette River. Here, under a bridge on Goodpasture Island Road, we found a Prickly Sculpin (Cottus asper) (Fig. 2), and some Largemouth Bass (Micropterus salmoides), and Western Mosquitofish (Gambusia affinis). This was not a great location, as the water was low and the substrate soft. We tried another location a little to the south, and had a little more luck, catching some Bluegill (Lepomis macrochirus), small Yellow Bullhead (Ameiurus natalis), Prickly Sculpin, Largemouth Bass, and Mosquitofish. Still not too excited, we drove over into Springfield and took a look at a creek that flowed alongside the freeway behind Hamlin Middle School. There were lots of Redside Shiners (Richardsonius balteatus) (Fig. 3) and gambusia in the creek, which had low overhanging vegetation and a nice sand bottom. We tried chasing some of the shiners into a barrier net set across the narrow creek, without much luck. I stalked a school of the Redside Shiners a little lower down, where they had gathered in a pool, and one lucky cast of the net later I had about 50 shiners in the bucket.

We dashed the few miles to the waiting aquarium and acclimated our fish. Things generally went well, but the temperature of the tank was lower than the water the fish were captured in by about 10 degrees, so the chiller needed adjusting. Somehow turning the chiller down got confused with increasing the temperature, and instead of the temperature



Fig. 2. Prickly Sculpin (Cottus asper).

being turned up, it was turned down. This extreme 24 hour cold spell is the only real reason I could think of as to why we lost some of the smaller shiners, about 15, while the larger ones survived. After another day the temperature was set around  $65^{\circ}$ F and all was well.

A few weeks later, we met up with Jeff Ziller one morning in Coburg, Oregon. He had arranged access to Green Island for us. This property was near the confluence of the McKenzie and Willamette rivers. The land was owned by the McKenzie River Trust and had some populations of the Oregon Chub. He took us to two locations. The first was an old river channel that used to be where a ferry crossed the river. The location was shallow and weedy, but not too muddy. Here we caught lots of Threespine Sticklebacks (Gasterosteus aculeatus), and the almost ubiquitous Mosquitofish. Not too far away flowed a side channel of the Willamette River. Here in a small spur there were Northern Pikeminnow (Ptychocheilus oregonensis) (Fig. 4), Speckled Dace (Rhinichthys osculus), Longnose Dace (Rhinichthys cataractae), Largescale Suckers (Catostomus macrocheilus), Redside Shiners, Largemouth Bass, and some crayfish. Kicking up rocks in the riffles yielded Torrent Sculpin (Cottus rhotheus) (Fig. 5) and Prickly Sculpin. It was a really beautiful and productive site, and just what we had all been hoping for since the project was conceived.

Select numbers of the fish, except for the Mosquitofish and Largemouth Bass, were transported to the waiting aquarium and easily acclimated to the tank. The fish adapted to a regular diet of frozen mysis shrimp and frozen bloodworms, supplemented by occasional live adult brine shrimp. The crayfish was a big hit with the office staff, but after one or two fish disappeared, it was removed. The next fish to disappear were the Largescale Suckers, not sure what happened to them. Apparently some of the smaller sticklebacks were consumed by the larger fish, which included a fairly large Prickly Sculpin, which had to be moved to separate quarters.

The aquarium, being 40 inches tall, had always suffered from a buildup of mulm. While especially evident in its trout pond phase, it was also a problem with the smaller natives. One solution was to reduce the number of returning water jets, increasing the strength of the flow from the remaining jets, and aiming them so that the water assumed a circular current around the overflow towers. Finally a large high pressure air pump was used to power flexible bubble wands wrapped around the bases of the towers. These curtains of air helped move the waste to the overflow towers, aerated the water, and were aesthetically pleasing, both since the wall of bubbles hid the towers to some degree, and in



Fig. 3. Redside Shiner (Richardsonius balteatus).

## their own right.

After settling in, the Redside Shiners were the stars of the show, but the dace, sticklebacks, pikeminnows, and sculpins all contributed to the enjoyment of the display. Most of the patients in the waiting room were surprised and pleased to learn that the fish were native to the Southern Willamette Valley. In this sense, the project's goal of educating the public about Oregon's lesser known freshwater fish, was a huge success.

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Fig. 4. Northern Pikeminnow (Ptychocheilus oregonensis).



Fig. 5. Torrent Sculpin (Cottus rhotheus).