Carolyn Thomas

SHEPHERDSTOWN, W.VA.

Favorite Fly:

The flies in my dad's fly box. Growing up I thought they were so neat—and beautiful. I also loved the little boxes that contained them.

Favorite Place to Fish:

Any place beautiful and wade-able.

Most Memorable Fish:

My first brook trout caught in June 2012 on the Au Sable River in Michigan.

Were it not for a 2010 blizzard referred to now as "Snowmageddon" Carolyn Thomas might still be teaching her regular 7th grade science curriculum at Wildwood Middle School in Ranson, W.Va. As it turns out, being cooped up for several days during the storm provided unexpected time for laying the groundwork to execute a Trout in the Classroom program like no other.

That is when she applied for a Toyota Tapestry grant, a pot of money dedicated towards recognizing educators demonstrating excellence and creativity in science teaching.

"I was building on momentum gained after securing a small Ecolab Foundation grant to set up a TIC aquarium in my classroom," says Thomas. "I began thinking about what else might be possible."

Thinking bigger paid off and Thomas received $10,000 from Toyota to develop a year-long project aimed at challenging students to determine whether the brook trout being raised in their classroom might be re-introduced into a nearby creek. Brook trout, West Virginia's only native trout, have been extirpated from the state's eastern Panhandle as a result of degraded habitat and poor water quality.

"It was serendipitous to receive the grant at that time because the city had just begun transforming former pastureland donated by a local developer into a 30-acre park dedicated to conserving natural resources, educating students and providing residents with a place to enjoy the outdoors," adds Thomas.

The park—which is surrounded by big box stores, a four-lane highway, a sewage treatment plant and two approved high-density residential subdivisions—includes the headwaters for Flowing Springs, a tributary of the Shenandoah River. Carolyn Thomas knew that the stream historically supported brook trout before becoming a dumping ground for tires and trash and a recreational area for ATVs. It quickly became a living laboratory for Thomas and her students.

Over the course of the year, Thomas and her students spent time in the classroom researching the life cycles and water quality needs of brook trout with respect to the surrounding landscape and broader ecosystem. They also paid several visits to take samples and conduct testing at the stream.

"The year-end, multi-media presentations by student teams were fantastic—far beyond what you'd typically see at a middle school level—more like high school or even college," says Mark Zimmerman from TU's Winchester, Virginia, chapter, the closest in proximity to Thomas. "Each team came up with compelling conclusions about

Stream Champion

whether Flowing Springs could adequately support trout."

While they ultimately determined that the stream currently cannot support brook trout, Wildwood Middle School students haven't given up on the possibility of welcoming them back to the area someday in the future. That's what this year is all about. Thanks to another grant from Dominion Electric, they are digging back in to determine how Flowing Springs might be restored to receive the species.

"This year there is more focus on engineering and hydrology, with students using a stream table to study flow, velocity, gradient, discharge, channeling, erosion and runoff in order to make recommendations for re-engineering and restoring Flowing Springs," says Thomas. "They are comparing findings and theories with a restored stream located down the road in Maryland and will ultimately submit their data to inform the management plan for the park."

Throughout both phases, Thomas and her students have benefited from living in an epicenter of professional expertise in science and conservation—with the National Conservation Training Center, the USGS Biological Resources Division, Potomac Valley Audubon Society, Trout Unlimited, Shepherd University and even a local fly fishing school engaged in their work and at their disposal.

"Carolyn stimulates a sense of wonder in the kids," says Joe Hankins, director at The Freshwater Institute where Thomas's students have visited. "She engages all of us through classroom visits, field trips to our facilities and even a level of career counseling. There are teachers we remember as children—Carolyn will be such a teacher for those kids."

At the rate she is moving, it will be quite a few kids. This year she expands her operation to include an additional middle school teacher and a 5th grade elementary teacher with TIC setups, and plans to build a broader network of classrooms and teachers who have similar interests and energy. Participating classrooms will share research and knowledge with students around the state through videoconferencing and other electronic media.

"I want to spend the rest of my life doing this," says Thomas, who embarked on her very first fly fishing excursion just last year. "Having fish in the classroom led to questions about what they need and how it connects with people. Then it led the students outdoors—where more and more kids around the country need to be. None of it would have been possible without that first TIC aquarium."

STEM Education

Carolyn Thomas's work with middle school students in West Virginia not only benefits children and wildlife in her home state. It also reflects a national movement to increase student engagement in science, technology, engineering and math. STEM represents an education trend steering states to teach science and math in the classroom in ways that better connect them with the real world and foster interest for future schooling and careers in a world projected to have increasing demand for scientists and mathematicians with an ability to tackle issues that include energy demands, water quality and changing climates.

Can Brook Trout Return Home to Jefferson County?

While Carolyn Thomas and 7th graders from Wildwood Middle School pondered this question, they delved into many academic disciplines—all in the name of studying brook trout.

Employed earth science, biology and chemistry to study water quality and learn about the life cycle and habitat requirements

Studied physics and engineering principles such as study flow, velocity, gradient, discharge, channeling, erosion and runoff to inform stream restoration strategies

Engaged in fly tying and fly fishing, which connects anglers with the outdoors and its natural cycles

Studied literature describing a "sense of place" and the art and activity of fly fishing

Documented and communicated work through various media including films, online postings and presentations for classwork and for to promote their efforts and share information with the community [Note: Carolyn MAY want to add something here once she sees this.]

"So often in environmental studies, middle school students feel that the problem is so big they can't make a difference. Planting trees, restoring riffles and removing invasive plants connects them with the effort to find 'a place to call home' for brook trout while strengthening their own connections with the community park," Carolyn Thomas said in her application for the 2011 Toyota Tapestry grant.