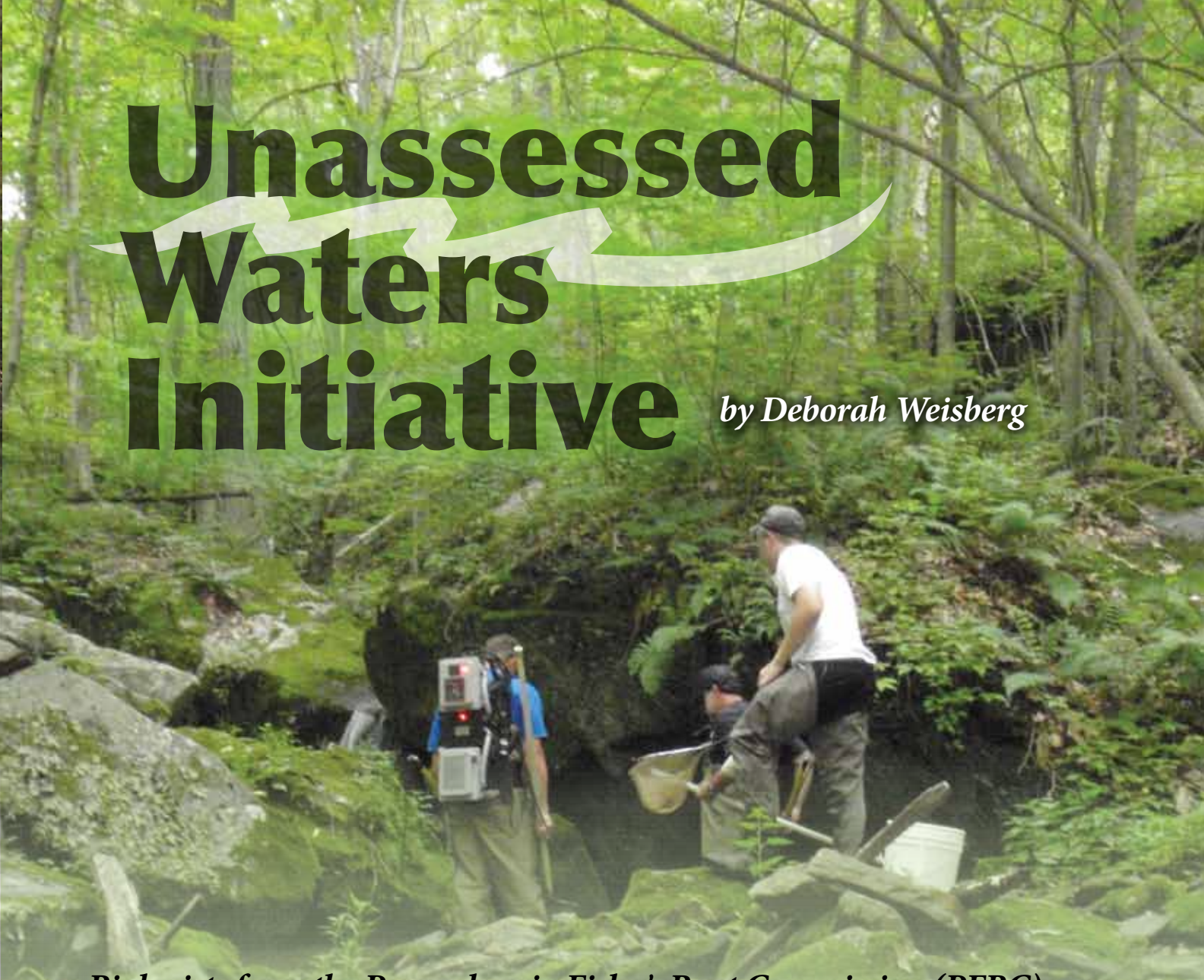
Unassessed Waters Initiative

by Deborah Weisberg



Biologists from the Pennsylvania Fish & Boat Commission (PFBC) will be venturing to remote streams again this year in search of wild trout, one of the Commonwealth's most precious natural resources.

Partnering with colleges and conservation groups, PFBC personnel will visit headwater tributaries they have never before assessed to determine which merit the greatest protection against Marcellus shale natural gas drilling and other impacts. It's a labor-intensive challenge, given there are 45,000 waterways in Pennsylvania, a state second only to Alaska in sheer number of stream miles. PFBC has scientific data on only 3,000 streams; the rest are unnamed lines on a map known only, perhaps, to a handful of local anglers.

The unassessed waters initiative was officially launched in 2010 as part of the PFBC's five-year strategic trout management plan, but the groundwork was laid in 2006. Initially, the goal was to document streams in wild trout watersheds with increasing human encroachment. However, the boon in natural gas extraction has given the task new urgency, according to PFBC fisheries biologist Bob Weber, who is coordinating the project. "We used Geographic Information System technology to map wild streams we currently know about. Then, we layered those with human population data from the United States Census, because that tells us where development is occurring," he said. "We later layered in where Marcellus drilling operations have been permitted or where they are likely to be."

Since 2005, the Pennsylvania Department of Environmental Protection (DEP) has permitted the drilling of 21,075 gas wells. In just the past 22 months, DEP has cited 43 drilling companies for more than 1,435 violations.

PFBC began boots-on-the-ground surveys a year ago with encouraging results. "We've visited about 300 streams so far and found wild trout in more than half of them," said Dave Miko, PFBC Division of Fisheries Management Chief, who helped develop the project. "That's going to mean 150 'new' wild trout streams that we've not documented in the past."

"Although our ability to survey streams is being outpaced by development, we're making good progress. As long as we can get funding, the project will continue until the work is done."

Given the number of prospects, the PFBC has enlisted support from the private sector. Students from Lycoming and Kings colleges assisted with assessments last year as part of an internship program jointly funded with the PFBC. The project generated so much buzz that other groups, including the Western Pennsylvania Conservancy and Duquesne University, now want to join the effort.

Partnerships are the only practical way to accomplish an undertaking of this magnitude, said PFBC Commissioner William Worobec, of Williamsport, who called the study one of the agency's most significant studies in 30 years. "It's a direct result of our Resource First policy," he said, referring to the PFBC's renewed commitment to conservation. "I've been to so many Marcellus drilling sites up in the northcentral region where I live that it prompted a broader concern for streams all over the Commonwealth."

Other threats to streams include nutrient overload from farmlands and runoff from urban sprawl.

"The survey's preventive approach is pioneering," Worobec said. "There are very few opportunities for us to be proactive, and this is one of them. Once a trout stream is impaired, it's difficult, if not impossible, to fix it. Preventing impacts is so much easier and in the long run much less costly."

Although there were concerns at first about using non-agency personnel to electrofish remote streams, with proper training and supervision, student surveyors exceeded expectations, visiting even more streams than originally planned. They were taught to use a probe to put an electrical current into the stream to immobilize fish, so they could be netted, examined and released unharmed.

"It's safe as long as your waders have no leaks," said Lori Smith, one of the Lycoming College students who surveyed in the Loyalsock, Pine and Lycoming creek basins. "We worked in groups of four, with one person shocking and three people netting. Netting was probably the trickiest part."

Accompanied by biology professor Mel Zimmerman, Smith and five of her classmates visited 30 waterways—ten more than their goal. Fisheries included Mill Creek and Beauty's Run on Lycoming Creek and Bovier, Short and Long runs on Pleasant Stream, all in the Lycoming watershed. Others were King, Wolf, Miller and Trout runs in the Loyalsock Creek basin and Ross, Furnace, Sulphur, Tombs, North Branch of Tombs and Nichols runs in the Pine Creek basin.

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Confirmation of wild trout on Tombs Run and the North Branch of Tombs Run on Pine Creek led DEP to place restrictions on a pipeline project in the area until after the November trout spawn, Weber said. "It's one example of how the surveys are supposed to work."

Kings College's five student surveyors also surpassed their target. "We were given quite a list in the upper Wallenpaupack and Tuscarora watersheds," said Kings College environmental science and ecology professor Brian Mangan. "We were told we could also shock streams not on our list if they looked promising."

PFBC crews visited dozens of tributaries in the upper Allegheny River and Kettle Creek watersheds. "Our goal was to visit 200 streams in five years," Weber said. "We've surpassed our five year goal in just this past year."

Surveyors followed an established protocol that included taking water temperatures as well as dissolved oxygen and pH levels. Electrofishing enabled them to determine trout numbers and year classes.

"A wild trout fishery means there's natural reproduction, so we're looking for five young-of-year fish or two separate age classes," said Miko. "Where we find a lot of trout, we then figure out the biomass."

Wild trout waters receive Class A, B, C, D or E designations, with A having the most fish and E having no wild trout. Streams in-between, especially Class B, support wild trout and some are also stocked. Class A streams contain at least 27 pounds of wild brook trout per acre, 36 pounds of wild brown trout per acre or 2 pounds per acre of rainbow trout. Brook trout are the Commonwealth's only native trout while the other species have been introduced in the late 1800s.

PFBC shares its findings with DEP, who uses the data to classify stream habitat, including water quality, to make decisions about permitting gas drilling and other activities. "It doesn't mean DEP won't issue permits in a wild trout watershed, but there would be certain restrictions about how close developers can go to a stream, and the time of year they can create disturbances," said Weber. "For instance, there can't be encroachment during the spawn."

While PFBC has jurisdiction over aquatic wildlife, DEP has broader regulatory and enforcement authority over waterways to ensure developers comply with clean water standards.

Until individual streams are classified, they carry the designation of the receiving water. Once they are surveyed, even marginal wild trout waters—Class Cs, for example—receive DEP's Coldwater Fishes classification, which is more restrictive towards development than Warmwater Fishes. It also ensures that the adjacent wetlands automatically receive Exceptional Value status through the DEP's Chapter 105 Water Quality Standards. "The wetlands of any stream have to be protected first, because they determine the quality of a fishery," Weber said. "If wetlands are degraded, the stream gets degraded, too."

If they meet certain habitat criteria, the waterways themselves can be given High Quality (HQ) or Exceptional Value (EV) status. While not based on density of wild trout, HQ and EV habitat is typically pristine and has features conducive to natural reproduction of coldwater species, such as the variety of macroinvertebrates living in the stream bottom or whether the stream provides public drinking water. "Our Class A wild streams often make a strong case for High Quality status from DEP," said Miko. "Exceptional Value is an even higher designation, but sometimes has more to do with a waterway's historical significance or location—maybe it's off the beaten path and has a certain wilderness aesthetic—which merits the ultimate protection." While there are 500 stream sections of Class A Wild Trout Waters, there are just 30 Exceptional Value waterways in Pennsylvania including Lick Run, a tributary to the West Branch of the Susquehanna River in Clinton County, Long Run on Babb Creek in Tioga County and Valley Creek, in historic Valley Forge National Park in Bedford County. All PFBC documented wild trout waters are listed at **www.fishandboat.com**.

"Some of the 'new' waters visited last year—as well as those slated for future visits—may qualify for EV or HQ status, as well as Class A or B designations," said Weber, who began processing survey data this past winter.

"You can tell almost just by walking up on them, by the coolness and clarity of the water, the undercut banks and other habitat, that there'll be trout."

From an anecdotal perspective, Zimmerman—who also heads the Lycoming College Clean Water Institute—observed robust trout populations on a number of streams, despite last summer's adverse conditions. Prolonged lack of rainfall left some feeder streams on his survey list dry. They included Buck Run, Doe Run and Yellow Dog Run on Rock Run and Short Run, Warm Run and the Bartoff Hollow tributary to Grays Run.

"In fact, we ran across timber rattlesnakes looking for water, so we had to watch for those," Zimmerman said. "Other streams were very low, yet we found surprisingly large numbers of trout in the pool areas. Interestingly, we also found sculpins and dace as well as good insect life."

Some looked promising enough that Zimmerman and his students made notes to return with their fishing rods this spring.

Zimmerman also hopes to perform more surveys. "It gives our students real world experience that looks good on a resume and helps them find employment when they graduate," he said. "Students were excited about taking part. Once they started the project, they realized what an important job they were being asked to do and how much their data will matter."

The pristine beauty of the waterways she visited struck Smith. "You can tell almost just by walking up on them, by the coolness and clarity of the water, the undercut banks and other habitat, that there'll be trout," she said. "I'm passionate about protecting them."

The presence of gas drilling rigs underscored the value of her work, she said. "I felt like I was making a contribution with the surveys. It's important for the Pennsylvania Fish & Boat Commission to have good baseline and historical data, in case drilling companies damage streams."

Marcellus activity concerned the Kings College crews as well. "We saw a lot of truck traffic, and there were streams we couldn't even get to, because the drilling companies were paving roads for their equipment," said Mangan, who pointed out that runoff from paved surfaces, erosion and sedimentation can impact coldwater habitat.

Many of the streams that were visited by Mangan's crew were near farmland, which poses a different set of threats to stream habitat and water chemistry. "We saw the effects of agricultural runoff and nutrients in the streams," Mangan said. "We saw algae in some places."

The surveys began in July and continued until mid-fall, when brown and brook trout begin to spawn. The process involved significant preparation such as reaching out to landowners for permission to access waterways since even remote streams are typically on private property. In Pennsylvania, only navigable waterways are open to the public. Non-navigable streams, while subject to PFBC and DEP regulations, belong to the owners of the land they flow through. Riparian access always requires landowner permission. "A lot of these headwater streams belong to rod and gun clubs, and some of them own thousands of acres," said Zimmerman. "Most of them were fine with granting us access, and a number of them wanted to accompany us in our work. I think they were curious more than anything, and interested in knowing what we'd find."

Surveyors used handheld GPS units to locate streams and collected water samples to take back to the lab. Where they electrofished to estimate trout populations, they also measured stream width and noted the quality of habitat. Weber and his colleagues spent this past winter collating data, so waterways can be classified both by PFBC and DEP. Eventually, the new streams will be posted online.

"Those who oppose publicizing wild streams have little to worry about, since the benefits of documentation outweigh any slight increase in angling pressure," Miko said. "The people who fish for wild trout constitute a small minority of our license buyers—those who target wild trout exclusively are less than one percent—and most practice catch and release."

"Putting more conservation-oriented anglers on a stream creates another advantage. The more eyes on a waterway the better," he said. Miko also points out that while PFBC has made resource protection a priority, it also is in the business of expanding recreational opportunities to anglers. "We hope that people will explore some of these wild trout streams once they are fully protected," he said.

"Individual anglers may even be recruited to help in the survey work," said Miko. "We expect this program to keep growing, and we may ask people who visit these streams to take water temperatures for us and report back. Conserving wild trout is in everyone's interest."

PFBC has budgeted up to $100,000 for the surveys this year and is looking for additional funding sources. Work by Lycoming and Kings colleges was financed with $5,000 in matching funds to cover the purchase of GPS units, students' wages and other expenses.

New partners have stepped forward in recent months including French Creek Valley Conservancy project manager Tim Hecei who is eager to visit feeder streams on Little Conneauttee Creek, a French Creek tributary. "The Little Conneauttee is a very high-producing brown trout fishery, just northwest of Cambridge Springs," he said. "The insect life is good enough that the stream maintains brown trout year-round."

Hecei's interest in the unassessed waters survey is that it will open the door to other conservation efforts as well. "If there's focus on game species, like trout, you can eventually generate interest in non-game species, like mussels, and insect life. When you involve people in protecting fish they like to catch, it becomes easier to educate them about what makes a healthy watershed," he said.