

# FRESHWATER SNORKELING: WHY AND HOW TO GET MORE PEOPLE INTO THE WATER

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## THE BEGINNING

During the 1990s, I had the distinct pleasure of getting to know and work with Pat Rakes and JR Shute, the founders of Conservation Fisheries, Inc. (Figure 1). Their non-profit organization is dedicated to the preservation of aquatic biodiversity in streams and rivers particularly in the southeastern United States. As their webpage (<http://www.conservationfisheries.org/>) tells you, they have worked with over 70 species of fishes; many of these species are federally listed as Threatened or Endangered under the Endangered Species Act. Pat and JR helped me a lot with monitoring and managing the aquatic Threatened and Endangered species found in the Cherokee National Forest.

When I moved to the Cherokee National Forest in Tennessee in 1988, I had a lot of experience monitoring fish populations, especially trout, using the standard technique of a three-pass electrofishing effort. This technique gives a relatively precise estimate of the population size for trout within the stream sampled. However, because the fish being monitored in Tennessee are threatened and endangered and there may be some mortality associated with electrofishing, we could not use that technique to monitor these populations. That was the basis for the Forest Service establishing a snorkeling program in the Cherokee National Forest. I had no idea what a wonderful experience it would prove to be.

The National Outdoors Writers Association's annual meeting was held in Chattanooga in 1999. They requested a field trip to see some of the wildlife work in the Cherokee National Forest. One of the stops was a visit to the Conasauga River to

discuss threatened and endangered fisheries management. I asked Pat and JR to participate by talking about their organization and showing the writers some of our native fishes. We were all surprised when they were able to capture a Conasauga Logperch (Figure 2) under the Jack's River Bridge. This endangered fish had never been found that far upstream and would be very special to show the writers. We carefully put it into a viewing aquarium and showed it the writers. As all 30 of them were taking turns looking at the rare fish and taking pictures, it occurred to me that there were more people looking at these



Figure 1. JR Shute and Pat Rakes talk to reporters about the Spotfin Chubs (*Erimonax monachus*) they are about to reintroduce into the Tellico River.



Figure 2. Endangered Conasauga Logperch (*Percina jenkinsi*) and Threatened Blue Shiner (*Cyprinella caerulea*).

Photos by the author unless otherwise indicated.

Jim Herrig was raised in Brookings, South Dakota. He received his BS Degree in Wildlife and Fisheries Science from South Dakota State University and his MS Degree in Fisheries Science from Colorado State University. He began his career as a wildlife biologist for South Dakota Game, Fish, and Parks. However, he switched to fisheries working for several national forests in Colorado and retired in January, 2017, after 30 years with the Cherokee National Forest in Tennessee.





Figure 3. What are you seeing?

species right now then had ever seen it in all of history! That was not only a staggering insight but also a troublesome fact. Why haven't more people seen these fish? Lots of vacationers spend time fishing, floating, and swimming in our freshwater streams but few poke their heads below the surface to see what is there (Figure 3). They don't realize there is a magnificent freshwater "aquarium" right at their feet. The public needed to be educated about the aquatic resource they were not just overlooking but neglecting. If we could get people to appreciate the incredible diversity in our freshwater streams, they would be more inclined to clean up and protect these waters in the long term.



Figure 4. Conasauga River Alliance.

The Conasauga River Alliance was formed in the late 1990s with over 30 local, state, and federal agencies; universities; and non-governmental agencies (Figure 4). They were united under the common goals of: 1) maintaining and improving the quality of the Conasauga River watershed while respecting landowner rights; 2) raising people's awareness, knowledge, and appreciation for the importance of how the watershed affects the quality of their lives; 3) instilling a sense of responsibility in all people for their role in how they treat the watershed and our environment; and 4) changing the way people affect the watershed to improve the quality and quantity of water. To accomplish these goals, the Conasauga River Alliance organized a two-day field trip in 2000 and held a second event in 2001 highlighting the work that was being done in the watershed. This included: 1) riparian buffer protection; 2) road maintenance



Figure 5. Conasauga River landowners get their first look below the surface of the river



Figure 6. Early snorkeling group at the Conasauga River snorkel hole

nance and design for sediment control; 3) chicken farm waste control; and 4) timber and prescribed burning management for wildlife. Additionally, the folks who attended were introduced to freshwater snorkeling and the amazing aquatic diversity that was theirs to see. Eighty-year old farmers who had lived their entire lives on the shores of the Conasauga River told me they were astounded when they saw what was in their river (Figure 5). Children squealed with excitement when they were handed a large tadpole or a stinkpot turtle. Our goals had been met; the first freshwater watchable wildlife site that featured snorkeling was born.

Immediately following the second year of field trips, groups began requesting guided tours in the Conasauga River (Figure 6). The Cherokee National Forest organized snorkeling programs to meet this demand and was able to accommodate the requests at no charge until 2010 when demand sharply increased. In 2010 the number of snorkeling programs increased significantly with weather and stream flows being our only limiting factors. Guides and safety people were hired to lead the programs with a modest fee charged to the snorkelers to cover these costs. The fees did not discourage people from





Figure 7. Trend in the number of snorkelers coming to the Cherokee National Forest

coming to the snorkeling programs. The World Wildlife Fund, Southeast Tennessee Resource Conservation and Development Council, and Tennessee Valley Authority have stepped forward to ensure that underserved kids are able to attend snorkeling events by underwriting their fees. Almost 7,000 people have experienced our freshwater snorkeling events in the 17 years it has existed; in the past three years, the average is over 900 per year (Figure 7). There is a great demand for freshwater snorkeling and I encourage those of you with the enthusiasm for this developing sport to establish your own programs. The benefits go far beyond the recreational aspects. People will have a greater understanding of watersheds; they will be better informed on clean water issues; they will develop an intense desire to clean up waterways and protect them from damage; and they will discover a new and fun experience they can have when they visit the outdoors.

#### WHAT MAKES FOR A GOOD SNORKELING SITE FOR FIRST-TIME FRESHWATER SNORKELERS?

Clean water. The body of water that you choose for your snorkeling programs needs to be clean. That is to say it should be reasonably clear and not heavily impacted with harmful chemicals and/or bacteria (Figure 8). If the stream you want to take people snorkeling in is impacted, you need to go elsewhere and get your snorkelers to help you clean up the impacted stream.

Freshwater snorkeling can be done in ponds, lakes, and reservoirs but these waters often have lots of floating algae that limits visibility. Also, these open bodies of water do not have reliable concentrations of fishes for snorkelers to see. Nesting sunfish and game species associated with manmade structures such as docks are some of the exceptions.

Tailwaters below dams often have exceptional clarity and good concentrations of fishes, but water conditions may be quite variable on a daily or even hourly basis; volume of flow

and water temperatures can change suddenly to the point of being extremely dangerous. US Geological Survey gaging stations are a good reference for anticipating stream flows on both regulated and free-flowing streams.

Free-flowing streams whose watersheds encompass generally undisturbed uplands are likely to provide the most consistent clean water conditions. Other considerations for selecting a site for first-time snorkelers with wetsuits on should include: 1) fairly warm water ( $>65^{\circ}\text{F}$ ); 2) slow-flowing water without cascades; 3) a diversity of habitats—pools, runs/glides, and riffles; and 4) good numbers and variety of fishes, other vertebrates, and invertebrates. There should be a restroom, picnic tables, and a place to change clothes at the site. The best time of day to maximize sunlight on the water is between the hours of 10 am and 2 pm.

#### FIRST-TIME SNORKELERS: MAKE THEM AS COMFORTABLE AS POSSIBLE

I have found from my personal experience and from assisting hundreds of first-time snorkelers that the most difficult part of the trip is putting your face into the water and breathing through the snorkel. It is well worth the time to spend a few extra minutes with anyone who shows the least bit of anxiety. My approach to this challenge is to get into the water and kneel down in about a foot of water facing the shore. I tell the new snorkelers to get on their knees in the water facing away from shore. Together we practice breathing in and out of the snorkel emphasizing that no air should go through the nose (Figure 9). When they are comfortable being mouth breathers, I have them bend over, put their hands on the stream bottom, and slowly put their faces into the water continuing to breath. This step may take several attempts. Once they can breathe in the water, I tell them to stretch their feet out behind them and let their bodies float with only their hands touching the bottom. Using their hands, they can crawl out to where the fishes are. If the water is too deep to reach the bottom, they should breast stroke



Figure 8. Conasauga River near the snorkel hole





Figure 9. Author instructs first-time snorkelers

or dog paddle to move around. No splashing or kicking the feet is tolerated as this always scares the fishes. For non-swimmers who want the experience, I will get them to the floating stage, then holding on to one of their arms, I will walk them out to deep water. The wetsuit allows everyone to float motionless as they look down on the large fishes in the deeper pools. In more shallow waters where the smaller fishes are more abundant, the wetsuit provides knee and elbow protection.

The scariest situation I have seen is when a person gets vertical in the water and cannot touch the bottom with their feet. The person (especially a non-swimmer) starts to panic and splash. Water will get into their mouth increasing their panic. They don't know that the wetsuit will keep their head above the water level. Talk to the person and reach out with a lifeguard float or a stick and pull them to shallower water. The person will usually be embarrassed but will often be ready to try snorkeling again in a few minutes—in shallower water.

Once your snorkelers are all comfortable in the water and are starting to see critters, assist them in identifying what they



Figure 11. Smallmouth Bass (*Micropterus dolomieu*) and Bluegill (*Lepomis macrochirus*) associated with large woody debris.

are seeing. It is not important that they be able to identify down to species level—telling a darter from a minnow or a bass from a trout is good enough (Figures 10). Teach them to associate different fishes with different microhabitats. Bass, drum, gar, and redhorse suckers are large fishes found in big deep pools; darters are found in shallow, fast riffles. Eddies with rooted vegetation harbor different species than eddies with large woody debris (Figure 11). After about an hour, or sooner if water temperatures are cooler than 65°F, everyone should get out of the water, use the restroom, and eat something. It is always amazing to me how tired I am after snorkeling. You burn up a lot of calories in the water no matter how relaxed you are.

### SAFETY, SAFETY, SAFETY

Freshwater snorkeling is a sport with many potential hazards. When people put their trust in your leadership or their children's wellbeing into your hands, nothing is more important than safety. Don't ever encourage or allow new snorkelers to be more than a few swimming strokes from the lifeguard. The "buddy system" is a great way to increase your comfort level with younger kids. Wetsuits provide a limited amount of flotation but they are not life preservers (Figure 12).



Figure 12. Casper Cox (Guide) and Alison Lang (Lifeguard) give their Aquatic Ecology and Safety briefings to a group of eager snorkelers



Figure 10. Greenbreast Darters (*Etheostoma jordani*)





Figure 13 Relaxed snorkelers



Figure 14. Snorkelers happy with a cooperative River Cooter (*Chrysemys floridana*)

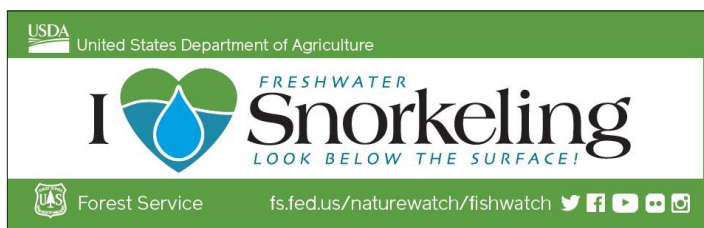


Figure 15. Bumper Sticker.

Snorkelers who have spent a considerable amount of time in streams under differing conditions tend to forget how intimidating it can be to enter a stream for the first time. Floating nearly motionless over a deep pool filled with large drum or buffalo is both relaxing and exhilarating—if you are comfortable in the water. It takes time for first time snorkelers to relax and get comfortable (Figure 13). Be patient and don't push new snorkelers too fast.

Hypothermia, characterized by intense shivering, confusion and loss of coordination, may occur even with a wetsuit; but a poorly fitting wetsuit and low air or water temperatures accelerate its onset. I follow these guidelines for new snorkelers with wetsuits (Table 1):

Table 1. Snorkeling with wetsuit guidelines.

Water Temperature	Time in the Water
Below 55° F	No snorkeling
55° to 65° F	20 to 30 minutes
65° to 70° F	1 hour
Over 70° F	More than 1 hour

Anyone observed shivering uncontrollably should leave the water and get warmed up.

Lightning is always a cause for getting everyone out of the water. Keep an eye on cloud movements and listen for thunder.

Sudden increases in stream flows may be hazardous. They occur frequently below dams but may happen in any stream. Telltale signs of flow increases may include sudden, strong downstream breeze; more debris on the water surface; and a change in turbidity.

A great variety of animals are associated with aquatic systems and many of them are dangerous. Sighting a bear or other predator should be cause enough to get everyone out of the water and into vehicles. Wasps, bees, horseflies, and a host of other insects abound near streams. Look for nests and point them out so people may avoid them. Snakes are common in streams and along stream sides. Whether poisonous or not, most will try to bite if agitated. Look at and admire them but do not handle or harm them. The same advice is given for snapping turtles; other turtles tend to be more docile and people will get a real thrill out of seeing and touching them, but they all bite (Figure 14).

Tadpoles, salamanders, crayfish, and other aquatic invertebrates are fairly harmless. I am surprised by the number of kids that have never held a tadpole and are afraid of it. Kids need to hold tadpoles.

Finally, polluted water is not a place to take first-time snorkelers. Streams with industrial chemicals or high bacteria loads should be avoided. Know what is going on in the watershed above your snorkeling site. Snorkeling in clean streams may encourage people to seek environmental solutions for polluted streams.

### THE NEXT LEVEL

First-time freshwater snorkelers are usually overwhelmed by the incredible sights they see once they put their faces below the water surface. Excited squeals, shouts of “Did you see that fish?” and other “snorkel speak” tell you that they are getting it. When they overcome their initial amazement, be prepared to explain all the interactions going on in the giant aquarium they have entered. Feeding strategies, escape mechanisms, and spawning rituals that the various aquatic critters engage in are happening right before their eyes.

Freshwater stream snorkeling should become the new family activity associated with camping, picnicking, and swimming (Figure 15).