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FRESHWATER SNORKELING PROGRAM

A Manual for Practitioners



Forest Service

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This manual is designed for use by anyone wanting to design and implement a freshwater snorkeling program, and is intended to be a living document. As new authorities, policies, and procedures are developed and implemented, this document will be changed and improved. Please send any suggested changes to Kimberly Winter at the Forest Service NatureWatch Program via email (kimberly.winter@usda.gov) or standard mail at 201 14th Street SW, Yates—3rd Floor, Washington, DC 20250-1160.

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Southern Research Station, Center for Aquatic Technology Transfer—Pages: I, 3-4, 5, 8, 13-14, 16, 17, 18 (center left), 21 (upper left), 22, 25, 29, 30, 32 (upper left), 37, 39, 40

NatureWatch Program—Pages: III, 15, 24, 26, 32 (lower right), 33 (lower left), 35, 38

Monongahela National Forest, West Virginia—Pages: 1, 20

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DEDICATION

This second edition of the Freshwater Snorkeling Program Manual (formerly the “Tool Kit”) recognizes the evolution of decades-old local snorkeling programs from the Cherokee National Forest of Tennessee to the NorthBay campus in Maryland, each kept alive by the passion and energy of their lead educators: Retired Forest Service Fish Biologist, Jim Herring; and former Executive Director of NorthBay and current CEO of Freshwater Journeys, Keith Williams.

It includes updates and unique approaches to freshwater snorkeling by recent programs run by Craig Roghair of the Center for Aquatic Technology Transfer, Chad Landress of the Monongahela National Forest in West Virginia, and others in Vermont, Washington, and Virginia; plus ongoing contributions to snorkel guiding by Casper Cox of Tennessee.

This manual is dedicated to the growing, national community of freshwater snorkelers and all they do to advocate for clean water.

Look below the surface...

From the contributors and authors of the Freshwater Snorkeling Program Manual



Some founding members of the national freshwater snorkeling program team: Craig Roghair, Chad Landress, Kim Winter, Jim Herring, and Keith Williams

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INTRODUCTION

For many people, snorkeling conjures images of coral reefs and tropical locations. However, snorkeling can be enjoyed throughout your local freshwater streams and rivers as well. Fish, turtles, tadpoles, salamanders, crayfish, eels, insects, snails, mussels, and many other animals thrive in clear, clean freshwater rivers, streams, lakes, and ponds. Engaging face-to-face with them in their own underwater world is a captivating way to gain a greater appreciation for diverse and fragile aquatic ecosystems, and our shared role in protecting them.

When you take on the challenge of leading a guided snorkeling program in freshwaters, you provide a fascinating recreational and educational activity and demonstrate your commitment to land and water stewardship. People of all ages are looking for opportunities to get outside, unplug, and immerse themselves in new experiences, and watching nature is one of the fastest growing areas of outdoor recreation. People want to learn about the natural world around them, connect with fish and other wildlife in a safe and non-intrusive way, and share their experiences with others. Freshwater snorkeling programs offer an unique way to connect people to the outdoors, share stories of our waters and the animals that call them home, and engage partners and educators in creative conservation programs.

Snorkeling is an activity that people of most ages and abilities can enjoy. With responsible oversight and quality equipment, you can safely and comfortably immerse visitors in the wonderful world found just below the surface of clean rivers and streams. A well-designed and managed snorkeling program is safe, fun, beneficial to the public, and of minimal impact on the environment.



PURPOSE OF THIS MANUAL

This manual is intended to bring into focus some key considerations for developing and implementing your own freshwater snorkeling program. It shares the collective knowledge of a community of freshwater snorkeling enthusiasts that originally came together to provide snorkeling programs on our national forests. Our goal is to present general information that can be applied by anyone with an interest in starting a freshwater snorkeling program, whether on a national forest or not, with sidebars specific to the U.S. Forest Service experience.

Our growing community includes people from a wide range of backgrounds with a variety of professional expertise, all with a passion for connecting people to the underwater world. Our community seeks to sustain existing programs and build new programs with a focus on safety and quality of experience. Join our community of practice!

A BRIEF HISTORY

Efforts to share freshwater snorkeling experiences have gained significant momentum in recent years, but their roots extend back two decades. Some key milestones include:

2000: Jim Herrig, U.S. Forest Service Fish Biologist on the Cherokee National Forest in Tennessee, recognizes the unique potential for connecting people to the outdoors through river snorkeling, and establishes a freshwater snorkeling program.

2006: Keith Williams, Executive Director of the NorthBay Education Foundation in Maryland, begins using river snorkeling as part of his outdoor education programs.

2014: Jim Herrig, Kim Winter and Nat Gillespie of the NatureWatch and Fisheries Programs and a Forest Service Enterprise Team produce a first draft of the Freshwater Snorkeling Tool Kit. The Forest Service partners with Freshwaters Illustrated to produce the short film, “A Deeper Creek - The Watchable Waters of Appalachia”, featuring the Cherokee National Forest snorkeling program.

2015: Chad Landress, Fish Biologist on the Monongahela National Forest in West Virginia, establishes an innovative snorkeling program that leverages Americorp interns for administration and staffing, demonstrating a new business model for snorkeling programs.

2016: Keith Williams and Kathy Chambliss of NorthBay develop a Freshwater Snorkeling

Curriculum and publish it and the Tool Kit under a new U.S. Forest Service and NorthBay partnership. The release of these documents provides momentum for the establishment of new snorkeling programs throughout the National Forest System and fosters a strong public-private partnership between NorthBay and the Forest Service.

2017 – 2018: Craig Roghair of the Forest Service Southern Research Station Center for Aquatic Technology Transfer (CATT) develops pilot snorkeling programs on national forests in Vermont, Virginia, Alabama, and Florida and implements them with CATT and NorthBay staff. The pilots show that snorkeling can be used in a wide range of locations to reach diverse audiences. A third-party assessment of the pilot programs confirms they are a powerful tool for connecting students to the outdoors.

2019-present: The list of new partners and freshwater snorkeling programs continue to grow and diversify across the United States, engaging broad demographic groups in learning the importance of clean, fresh water and the roles humans play in conserving aquatic biodiversity. With freshwater snorkeling programs gaining momentum and expanding across the country, the need for an updated snorkeling manual arises.

PLANNING YOUR PROGRAM

Purposeful and thoughtful planning will lay a strong foundation for your freshwater snorkeling program and will ensure that safety is a priority for all participants. Take the time to carefully consider these key planning topics.

IDENTIFY YOUR AUDIENCE

Many aspects of your snorkeling program, including location, timing, and staffing levels, will be determined by your target audience. Will you focus on groups or individuals, children or adults, schools or youth groups, in a rural or urban setting? Will you offer programs on weekdays or weekends? Or, perhaps you are considering a specialized program that offers events for persons with disabilities, non-English speakers, or veterans. Additional demographic considerations follow.



Age of Participants

The age range of participants is particularly important, as it determines the number of staff required at your events and the sizes of snorkeling gear required. While there is no minimum age for snorkeling, we have found that participants below the age of ten (4th grade) generally require more help with getting into and out of wetsuits, need more time to learn how to snorkel, and may have more issues with attention span in a group setting. As the number of younger children in the group increases, the ratio of adults in the water should increase in order to ensure the safety of young participants, increase supervision, and provide interpretation or guidance to what they are experiencing in the water.

Schools

Snorkeling connects students psychologically and intellectually to the river in ways that can help teachers reach required academic outcomes and make lasting impacts on students. School-based programs offer an opportunity to interact with students in the classroom before or after field programs, while developing relationships and trust with teachers over academic years. Schools are most likely to participate if you can demonstrate how the snorkel program helps to meet educational standards, you can provide them with adequate lead time for planning and logistics with their school, and you can ensure the safety of their students.



Fourth-grade students and their families may be incentivized to participate in future excursions outdoors through a free access pass to public lands available under the Every Kid Outdoors (formerly Every Kid in a Park) Initiative. These passes are valid for one year during the child's 4th Grade academic year, and can be obtained through the everykidoutdoors.gov website.

Groups

Scouts, camps, daycares, community recreation programs, veterans groups, and outdoor organizations are just a few of the many groups that may be interested in a snorkeling program. Scheduling groups allows the snorkel program lead to have one main point of contact for each snorkeling session, which streamlines communications and logistics with the rest of the group. For schools and other youth programs, transportation to and from the site can be a limiting factor, so it is helpful to look into grants, sponsorships, donated bus rides, and other ways to provide for logistical needs.

Individuals

You will engage a wide variety of participants if you open your snorkeling program to individual registrations. This type of program requires that you establish a system (or website) that can handle multiple registrations and has a clear communications plan to supply each registrant with necessary forms and logistical information.

Aquatic Enthusiasts

Swimming holes, canoe launches, and other recreation areas near streams and lakes attract people that are already interested in the aquatic world. Come-as-you-are snorkeling events at these locations provide the opportunity to engage a variety of people in a new activity that can expand their appreciation and understanding of their favorite waterbody. Aquatic enthusiasts are wonderfully receptive to the stewardship messages of the freshwater snorkeling program, and could potentially advocate for and help to clean up the water bodies and aquatic communities they visit.



ESTABLISH KEY MESSAGES & LEARNING GOALS

When a snorkeler spots a colorful school of fish, watches a crayfish excavate a burrow, or notices the way grains of sand move in the current, they connect to the underwater world in a strong, personal way. Inspired snorkelers seek to learn more and identify with what they just observed. Informed snorkelers will want to share what they have learned with others and take actions to protect the new world they have discovered. Think carefully about what you would like participants to learn and how they might share and apply this newfound knowledge with their friends, family, and community, including social media networks.

What are the big-picture items of importance for this location and for the group attending? Are teachers attending who would like to reinforce certain lessons from their class about water quality, watershed stewardship, or aquatic organisms? Establishing your learning goals in collaboration with lead participants can help you determine how to frame the experience of freshwater snorkeling by adapting your key messages to the particular interests of the group participating and the characteristics of this unique site.

Your time with participants is short, so try to limit your discussion to one or two key messages. Be prepared to provide information about the animals and habitats observed, how they are related to water quality and land management, and what we do as a community to care for our watersheds. Having a waterproof fish guide on hand can help, but you don't need to be a trained biologist to help snorkelers explore and connect to what they are seeing. In fact, learning together can be even more powerful. For example, if snorkelers ask you to identify a fish they see, encourage them to watch its behavior and micro-habitat and find its name or genus by consulting a fish guide together.

All snorkeling programs rely on clean water, so you can focus on messages related to that theme. An example of questions to ask your group could include:

How can we snorkel here today?

Answer: Clean water through good watershed stewardship.

Why are we seeing so many fish, crayfish, bugs, etc. here today?

Answer: Animals thrive in clean, clear water in a healthy aquatic ecosystem.

Why is the water so clean here?

Answer: People are working together to care for the land around the water (healthy watershed management).

What are some things you can do to take care of your watershed?

Answer: [Have a discussion focusing on individual and community actions to help protect the watershed, such as litter removal, active management and the Clean Water Act.]

CHOOSE A SNORKELING SITE

A good snorkeling site is safe, easily accessible to your audience, and has features that allow you to highlight key messages and reach learning goals. Be sure to select one or two back-up sites nearby to use in case the originally selected site has high flows or water quality issues on the day of the event.

Consider sites that meet as many of these criteria as possible:

Physical Characteristics

- Clean, clear water and conditions during the time period you intend to offer snorkeling
- Water temperatures that are conducive to extended periods of time in the water (or additional thermal protection for participants such as wetsuits, hoods, gloves)
- Safe, easy entry and exit from water without causing damage to stream banks
- A diversity of aquatic organisms
- Different types of aquatic microhabitats such as slow, deep pools, and flat, shallow riffles
- Free of non-native invasive species or waterborne diseases. *If your snorkeling gear will be used in multiple waterbodies, decontamination may be required to prevent spread of non-native species and diseases. Know what is present and how to decontaminate equipment.*

Logistical Concerns

- Location in close proximity to your target audience (typically within 2 hours drive or less) that allows snorkel program staff to participate without overnight stays
- Adequate parking for participant group size and transportation type (e.g., multiple cars vs. a bus); including space for vehicles to discharge passengers and wait
- Private changing facilities (permanent structures are ideal, but tents can be used to ensure privacy while changing from clothes to swimsuits or wetsuits)
- Adequate restrooms (permanent, on-site facilities are ideal, but portable toilets or nearby facilities can provide added flexibility in site selection); participants should never be asked to use the woods as facilities, as that creates uncomfortable situations and pollution
- Easy water access points for wheelchairs, sight-impaired, elderly, or other people who may need assistance getting into and out of the water
- Access to emergency responders

Scout proposed sites during high, moderate, and low flows and at different times of year to find the flows and water temperatures that provide the safest and most comfortable snorkeling conditions. Visit your proposed sites after rain events to see if waters become too clouded for snorkeling, and how long the cloudy conditions persist.

Safety Considerations

Carefully consider the following safety factors when scouting sites:

Water depth—Ideally, snorkelers are able to float with their chest, belly and legs off the bottom while using their hands as anchors and for locomotion without clouding the water. Average water depth of 1 to 2 feet is ideal for freshwater snorkeling. Deeper water requires swimming instead of floating, which creates noise, stirs up sediment, and could present safety risks. Establish safe boundaries with buoys or flagging.

Water velocity—Snorkeling sites with a mix of water velocities will have the largest diversity of fish. Ideally, snorkelers will still be able to easily anchor themselves with hands or feet and can pull themselves upstream through faster water areas. Areas with strong currents or whirlpools should not be made accessible to snorkelers because they could force them to have to swim to maintain their location, and would increase drowning risk. Establish safe snorkeling boundaries with buoys or flagging, and post staff or lifeguards at locations of greater risk.

Water quality—Water pollution can create unsafe conditions for snorkeling. A review of state water quality reports is a good first step to determine if there are water quality issues in your area. Excessive levels of coliform bacteria or giardia are of particular concern for snorkeling programs. Supplemental water quality testing at your snorkel site can provide additional peace of mind. State labs or local watershed organizations can often provide reasonably-priced, certified water testing for your snorkel program.

Temperature—Body heat is quickly lost in water, even on warm days. Know the water temperature at your site and outfit participants with appropriate equipment to prevent excessive loss of body heat. If air temperature is also low, be sure to have access to a heated shelter or bus. Know the signs and symptoms of hypothermia and proper first aid, and encourage participants to use wetsuits as an overall safety precaution for temperature and other hazards.

Entrapment hazards—Undercut banks, logs and large wood accumulations, bedrock ledges, and spaces between large boulders provide important cover for fish, but can present hazards to snorkelers. Identify areas where snorkelers could potentially become trapped beneath stream features. Brief your participants on the dangers associated with snorkeling in these areas, instruct them to never intentionally dive or put their heads into these areas,. Encourage your groups to always snorkel using the buddy system, like certified divers.





Trash—Snorkeling sites may be popular for other forms of recreation as well. Do a pre-snorkel safety inspection of the area to remove broken glass, fish hooks, cans, and other hazardous trash. Brief participants on what to do if they encounter hazardous items in the water, and encourage a safe, snorkel site clean-up as part of your water stewardship learning objectives.

Wildlife—Hopefully participants will have the opportunity to view abundant wildlife, but some animals present hazards. Crayfish can pinch, bees and ants can sting, turtles and snakes can bite, and in some areas venomous snakes or alligators may be present. Inspect the banks and shoreline vegetation around the snorkel area for hazardous wildlife, and brief participants on hazards presented by various types of animals they may encounter.

Plants—Contact with stinging or poisonous plants can put a damper on an otherwise exciting day. Inspect the banks, shoreline vegetation, and trails around the snorkel area for hazardous plants, and brief participants on hazards presented by various types of plants they may encounter at your site.

Flash flooding—Rivers downstream of hydropower dams and some types of watersheds are prone to flash flooding. If snorkeling downstream of a dam, be sure to know the hydropower peaking schedule and signals for unscheduled dam releases. If snorkeling in a watershed that is prone to flash flooding, be sure to closely monitor weather conditions and emergency alert networks.

Other activities—Recreational activities such as fishing or boating can present hazards to snorkelers. Consider scheduling snorkeling programs for days or times that will minimize the potential for conflicts with or interruptions by other aquatic recreationists.



CONSIDER EVENT TIMING

Timing is an important consideration for your snorkeling program and is largely determined by your local climate, the audience you want to reach, and the availability of staff or volunteers to run the program. In temperate climates, you will experience the warmest water temperatures in late summer or early fall. Programs that want to engage with local schools will be limited to the school year, whereas those targeting youth groups or general audiences may have a larger window of opportunity. You may attract more people or groups if you are open to holding your events on both weekdays and weekends, or even holidays. While scheduling a preferred day and time for your participants, it is wise to consider an alternative date as well, in case weather or water conditions are unsuitable for snorkeling on the preferred date.

Carefully consider the time of day you choose to hold your program. Often the schedule is dictated by the availability of your participants, but underwater viewing is ideal when the sun is directly overhead around midday. Early and late hours have less direct sunlight and more shadows that disrupt your visitors' ability to fully appreciate the experience, although some fish and other aquatic animals may be more active during these times. Air temperature typically peaks in mid-afternoon, allowing snorkelers to warm up more quickly following a chilly dive. Plan to have participants on site early enough to get oriented and listen to a safety briefing, allow them to suit up, and provide an overview of what they will see when they get in the water before peak viewing time.



Mark Twain National Forest, MO

Special Authorizations

All U.S. Forest Service staff, volunteers, contractors, and partners must obtain authorization to snorkel from the **Forest Service Dive Control Board**. Contact your Unit or Regional Dive Safety Officer to obtain a list of the latest authorization requirements, as well as the Forest Service Diving and Snorkeling Application form.

Authorization requirements include demonstration of snorkeling skills, a knowledge review, and current certification in First Aid and CPR. Applicants must receive confirmation of their acceptance into the Forest Service Diving and snorkeling program from the Regional Dive Safety Officer **BEFORE** they can snorkel or enter the water with participants.

To maintain snorkeling authorization, Forest Service staff and snorkel partners must snorkel at least one time per year and report their snorkeling activities to their Unit Dive Safety Officer on an annual basis.

IDENTIFY STAFFING NEEDS

Even small or temporary snorkeling programs can require considerable effort to administer and implement, particularly in the initial stages of their development. Be sure that the personnel you select have adequate time and training to participate. Staff can be drawn from any combination of sources, including federal or state agency personnel, non-profit organizations, conservation programs, or local volunteers.

Public Engagement Skills - For a successful snorkeling program, you need a team that is patient, passionate, enthusiastic, and good at encouraging others to explore and connect with the outdoors. Staff can be drawn from a wide range of professions, but consider additional training for those that lack public education or environmental interpretation experience. There is a big difference between knowing about fish and aquatic ecosystems and being able to effectively convey information about those resources in a way that engages a target audience. Consider enlisting interpretive program staff or educators with experience working with your target audience, and have them share ideas with or train your team. A well-trained staff will be more comfortable and confident and will effectively deliver your key messages to participants, ensuring a successful program for all.

Staff Roles - The number and type of staff required depends on the size and frequency of your freshwater snorkeling programs. At a minimum, your program will need an *administrator* and *guides*, which can be overlapping duties. The *administrator* coordinates with participants and schedules events, and *guides* provide instruction and oversight during the events. Your organization, as well as some participant groups, may also require certified *lifeguards* at events. For smaller programs, an administrator may also serve as a guide or lifeguard. As your program grows, you may find that a *program manager*, a full-time *administrator*, and *equipment manager* are helpful.



Calapooia River, Willamette National Forest, OR

Addressing Younger Audiences - Programs serving younger ages (e.g. 4th – 5th grade) will require a higher ratio of guides and lifeguards to participants than programs for older age groups. Generally, at least one staff to every 3-5 students will allow for ideal interaction and guidance. Consider having 4-5 chaperones (volunteers, parents, teachers, or additional staff) on shore to observe and monitor any larger (12+) groups of children to address any horseplay, misconduct, or safety concerns without disrupting the experience for the other participants.

Specialty Programs - Specialty programs may require additional staff and expertise. For example, if your participants include speakers of languages other than English, or who speak English as a second language, consider enlisting the skills of a translator or bilingual educator, teacher, or parent of students who would be willing to assist in interpreting, to convey important safety messages and ensure a welcoming environment. Programs serving participants with special needs, disabilities, or the elderly may require special equipment to provide adequate access to the water, or specialized assistance while snorkeling.

Certifications - Your organization may require your staff to have specialized training, such as Dive Safety, First Aid and/or CPR certification. Know your organization's requirements and keep your staff's training and certification requirements up to date and documented in a known location.

DEVELOP A BUDGET

Operational costs of freshwater snorkeling programs will vary widely, depending on the regularity and intensity of the snorkeling program, staff available, the number of partners involved who can assist with logistics and in-kind contributions, and the equipment you are able to buy, rent or have donated.

Sources of Funding - An ongoing freshwater snorkeling program requires funding to support staff and to purchase and maintain equipment. How you fund your staff positions will depend on how your program is structured and whether your staff are permanent, seasonal, or volunteers. Fee-based snorkel programs may be able to fully or partially support their staffs from collected funds. Consider your target audience and the effect that collecting fees may have on their ability to participate. Programs that do not charge a fee rely on a combination of grants, donations, sponsorships, and in-kind support from partners, and often leverage in-house staff, seasonal employees, interns, and volunteers. Program planning and implementation requires significant effort, so close coordination with your organization's leadership is critical, particularly when you are drawing your staff from in-house personnel. The authors of this manual have identified a growing community of snorkeling programs that utilize a variety of staffing models. Reach out to us for introduction to the freshwater snorkeling community of practice if you are struggling to develop a viable approach.



Calapooia River, Willamette National Forest, OR

There are many potential funding sources to help sustain your freshwater snorkeling efforts. Here are some suggestions:

Program – Ideally, your organization can supply dedicated program funding to purchase equipment and ensure consist staffing and service. When full program support is unavailable, you will need to leverage other sources of funding or in-kind contributions.

Partnerships – Working with partners is a great way to share the workload and leverage funding for your snorkel program. When contacting potential partners, share that your aim is to get people outdoors, unplugged, and learning about clean water. Many organizations offer grants to programs that get people outdoors, including transportation grants to rent buses for school groups. Work with your partnerships coordinator or grants and agreements staff to look for funding opportunities through partners having interests in water-based recreation, youth programs, fishing, or water education.

Volunteers – Talk to your organization’s volunteer coordinator to identify sources of volunteers for your program, and enlist partners to help.

Sponsors – Snorkeling programs are highly visible and marketable, so they may also attract environmental and outdoor recreation organizations and outfitters. Local businesses are often looking for opportunities to showcase their products or help youth enjoy an educational or recreational opportunity that may lead to deeper engagement in the community. Consider speaking with area businesses or larger companies to gauge their interest in sponsoring equipment purchases, transportation, or other costs associated with the program.

Fee – If you have the ability to charge a fee, consider a price that is equitable to participants, motivates them to feel invested in the event, and helps recover some costs of program implementation.



*Fees for interpretive services provided by Federal agencies are authorized under the **Federal Lands Recreation Enhancement Act [FLREA]**. Federal employees must follow FLREA and internal agency direction for implementing new fees, which includes a Federal Register notice, regional and national review, public involvement, and regional forester approval.*

For more information on setting up a recreation fee, visit the REA toolbox at <https://www.fs.fed.us/eng/toolbox/fda/fdau.htm> (accessible only to U.S. Forest Service and Bureau of Land Management personnel).



One piece snorkel-mask sets, or uni-snorkels, have become popular in recent years, and offer the user a way to breathe through mouth and nose, keeping the field of vision clear. They have been shown in some cases to produce higher levels of carbon dioxide inside the mask, which has caused some users to become disoriented; and they can be more difficult to remove in the event of an emergency. At this time, we do not recommend their use for freshwater snorkeling.



Equipment and Maintenance - Initial equipment costs for 20 participants ranges from \$3,000 to \$8,000 depending on your climate, site conditions, target audience, and group size. The most expensive items (wetsuits, masks, snorkels) will last for many years if cared for properly, so equipment costs will decrease significantly after the initial purchases. You may be able to secure discounts for bulk purchasing from some vendors. We encourage all programs, regardless of climate or water temperature, to provide wetsuits to participants. Body heat in aquatic environments is lost rapidly, even in relatively warm waters. Wetsuits provide the added benefits of body coverage, sun protection, buoyancy in deeper water, and abrasion protection while exploring shallow, rocky areas. Some common snorkeling program startup items are listed below.

Snorkels – for minimal maintenance and ease of use get a basic model, without purge valve; some snorkels come with replaceable mouth pieces for the bite pads that go between the teeth (and tend to get bitten off), so purchase extra mouth pieces.

Masks – adult size will fit most people, but have a few youth sizes on hand as well; and more of them, if students are the focus audience for your programs.

Wetsuits – 5 mm thick, one-piece, unisex suits with zippered cuffs work well for most programs and are easier to store and transport. Two-piece suits give more flexibility for finding correct size fits for all participants, and allow options when working with varying water temperatures. Typically, you will need one and a half times as many wetsuits as participants to ensure that you have enough to fit everyone in your group.

Buckets – for cleaning masks and snorkels, wash them in buckets with a dilute bleach mix after every use and store in a clean, dry area until the next outing.

Storage tubs – wheeled mobile chests (50 gallon or larger) with extendable handles for transporting gear and rinsing wetsuits after use.

Tarps – A 10' x 12' tarp is needed for laying out the wetsuits at the snorkeling site. It keeps them cleaner than putting them on the ground.

Tents – if changing facilities are absent or inadequate for number of participants; canopies with sides, changing tents, and large camping tents work well. Tents need to be tall enough so people can stand up and comfortably change in privacy. Zippers and poles tend to wear out, so try to keep a set of replacements. Consider developing a button, snap, or clip closure system to mitigate issues with tent zippers.

Wetsuit cleaning solution – use between programs to keep suits fresh.

Mask defogger solution – snorkeling is more enjoyable when masks are clear. It is a good idea for your guides to carry a bottle of defogger in their wetsuits so they can assist people with fogged up lenses during the session.

Underwater viewing scopes or buckets (“Snoods”) – an alternative for participants who cannot snorkel; they are good for people who do not want to be fully submerged or who cannot use a mask or wetsuit. They do not provide nearly as good of an experience as a mask and snorkel or being underwater; but they are available commercially. Do-It-Yourself Snood instructions are available for constructing your own.

Certifications – First Aid, CPR, lifeguard training certification costs, as needed.

Vehicle - if snorkeling events become popular, a dedicated vehicle may be needed to transport staff and equipment.



Other Miscellaneous Items

First Aid Kit

Thermometer (for water)

Rescue throw rope

Portable radio – can be essential when out of cell phone coverage

Educational enrichment materials - to enhance learning value of event

Fish identification sheets - tailored to the snorkel location

Interpretive poster - showing the characteristics of each fish family found in the stream and their microhabitats for feeding and breeding



Aquatic organisms sheets - to help participants identify other animals in the water, such as macroinvertebrates, crayfish, etc.

Scavenger hunt - for school groups [a test to see if they can find all items in the water]

Fish Watching in Progress sign - can be displayed on a vehicle while the event is going on to let other people know what's happening and to help answer questions from non-participants, who may be wondering what is happening in the water

Selecting from the many brands and styles of snorkeling equipment can be overwhelming for new program administrators. We have a growing community of snorkeling practitioners ready to help, so please reach out to a program contact for assistance in selecting equipment.

You will need a place to dry and store equipment, and a way to transport equipment to and from your event. Wetsuits are quite bulky and take up considerable space. Storing and transporting equipment will become greater considerations as your program grows in size.



Staffing and Additional Programming Costs

Regular expected costs include the staff needed to start the snorkeling program, such as the program manager, guides, lifeguards, equipment manager, and administrative assistant; and expenses related to gear replacement and transportation. Seasonal employees can reduce ongoing costs for some staff positions, but a successful snorkeling program will sustain several dedicated staff who can build relationships, manage the program logistics, and expand its audience reach during peak season; and then resume full time alternative tasks during the off season.

Depending on the group size you are serving, you may also want to provide shore-based activities, such as macroinvertebrate stations or a nature walk, and rotate groups of participants between shore-based activities and snorkeling during your snorkel event day. Consider how many participants you can safely manage in the water at once, and plan for shore-based activities, as desired. Additional costs related to staffing and materials should be estimated based on how many supplementary, shore-based activities you would like to offer.



West Branch White River, Green Mountains National Forest, VT

All participants of U.S. Forest Service snorkeling programs are required to have a signed liability waiver on file. If a participant is unable to supply a signed waiver by the time of the event, they will not be allowed to snorkel. Contact the U.S. Forest Service Regional Dive Safety Officer or Washington Office NatureWatch Program Leader to obtain the latest version of the Office of Government Council approved snorkeling liability waiver form. Do not prepare your own liability waiver.



U.S. Forest Service policy requires a signed photo/video release form for all minors participating in programs for which photographic images or film could potentially be used on agency websites, or otherwise placed into media considered 'public domain' .

DEVELOP WAIVERS AND RELEASES

Liability Waivers

Most organizations should require participants, or a parent or guardian for participants under the age of 18, to sign a liability waiver before they participate in a snorkeling program. Consult with your organization's legal team BEFORE initiating a snorkeling program to see if there are any issues that would preclude you from doing public snorkeling events. If it is determined that a liability waiver is needed, they will not be optional - ALL participants in your snorkeling event will be required to sign a waiver, or they should not be allowed to enter the water.

Photo and Video Releases

If you anticipate taking photographs or filming while the participants are at the site, your organization may require you to obtain a signed photo or video release for each person. This is particularly important at events including minors or people that may be legally or culturally sensitive to sharing images of themselves (such as Tribal members, elderly, foster children, and others). You must have a protocol in place, such as wrist banding, to identify individuals that have not provided a photo/video release so that they can be eliminated from accidental inclusion in public-facing imagery.



Mark Twain National Forest, MO

IMPLEMENTING YOUR PROGRAM

Now that your program is set up, you are ready to guide people outside, underwater, and immersed in the aquatic environment. Organization is the key to a well-run program.

FIND PARTICIPANTS

There are currently very few organizations, private or public, who provide snorkeling opportunities in freshwater streams and rivers. It is conceivable that your program could evolve into a very popular outdoor experience for your community.

Your approach for outreach and advertising will depend largely on your target audience. To attract individual participants, share information with your local chamber of commerce, visitor centers, hotels, campgrounds, and businesses. If you are more interested in organized groups, contact schools, universities, youth organizations, environmental groups, watershed councils, summer camps, or civic clubs for participants.

School schedules are often set well in advance, and administrators are increasingly hesitant to approve field trips that are not directly related to education standards. Make your first contact with schools months in advance of your event date to provide adequate time for administrators to review and approve the field trip and for you to potentially visit with and provide supplementary information to participating classes.

Sample Letter for Schools

We have developed a fun watershed learning program that we want to pilot at [Waterbody Name] in the [Location Name] this [season]. The program is a day trip where students will explore the effect land use has on water quality and will investigate the research question: To what extent is [Waterbody Name] healthy? They will predict the quality of the river based on basic observations, then they will conduct biological assessments to generate data related to water quality. Students will analyze the data to answer the research question. A central part of the program is snorkeling. Students will snorkel a section of [Waterbody Name] to explore the life of the river from beneath the surface, to ask authentic research questions related to the life in the river, and to compare how different aquatic organisms are adapted to live in different habitats. This is an inquiry based learning experience that engages students in authentic scientific exploration and fully aligns with Science, Language Arts and Math standards. We have optional pre-trip curriculum available that introduces students to key concepts, explores watershed conservation, water quality, fish habitat and behavior, and helps prepare students for the trip. Please let me know if I can answer any questions.



Contact information is considered 'personally identifiable information' (PII) and is subject to the rules and policies of your organization for collecting and protecting that information.

For Federal agencies, forms collecting PII must first be approved by the Office of Management and Budget. You may already have approved forms.

REGISTER PARTICIPANTS

Once you have identified participants, you will need to register them for your freshwater snorkeling program. If you work exclusively with groups, you only need one point of contact per group who will be the designated person to gather registration information from event participants. If your event is open to individual registration, you will have to gather the appropriate information for each participant.

Collect the following information:

- Name
- Contact information (address, phone, e-mail)
- Number of participants over age 18
- Number and ages of participants under 18 years
- Allergy and pertinent medical information
- Liability waiver, as required by your organization
- Photo release, if required by your organization
- Invoice, if running a fee-based program
- Number and ages of participants will give you an idea of the specific sizes of wetsuits needed for each group and will allow you to tailor the program

If practical, a pre-trip visit to the group can be used to outfit participants. However, having a wetsuit that fits each and every participant can prove difficult. A disclaimer such as the following may help, "Wetsuits fit tightly, and may not be wearable by all participants. Please let us know if any of your snorkelers have a condition that may affect the wearing of a wetsuit, or if they need a size or style not currently available. We will try to accommodate certain needs, but may not be to do so in all cases."

DEVELOP AN EMERGENCY ACTION PLAN

You must develop an emergency plan specific to each of your snorkeling events. A quality safety plan will include:

- Snorkeling event date(s)
- Event location (including map/GPS coordinates)
- Designated first aid providers
- Contacts for emergency services (ambulance, hospital, police)
- Directions and map to nearest hospital
- Communications plan for emergencies (confirm cell reception by all available carriers; have alternatives for communicating, such as two-way radios)
- Point of contact information for snorkeling program representative and participant representative who will be on site the day of snorkeling

Your organization may have additional requirements for safety and evacuation plans.

It is particularly important to know what forms of communication will work at your snorkel site. Cellular phones and certain carriers may not have reception at remote sites. Where cell phones are ineffective, have alternative forms of communication and test them on site prior to the snorkeling event.

You must also have a plan for what to do in case of sudden bad weather, such as an unexpected thunderstorm or flood. You must provide options for sheltering in place and for evacuation.



In addition to a site-specific Emergency Action Plan, U.S. Forest Service personnel must also develop a Job Hazard Analysis and Tailgate Safety Form specific to the snorkeling program.

Contact a U.S. Forest Service unit or snorkeling program representative to obtain examples of the required safety documents.





PREPARE TO TELL A STORY

Freshwater snorkeling programs are unique events with dramatic imagery, providing great storytelling opportunities. Prepare for your event by planning to document first-person impressions and stories from participants. This provides an opportunity to share what they have learned in their own words, and broadens the impact of your program beyond the people that actually participated in snorkeling. Encourage participants to come to the event ready to express themselves creatively, such as through photographs, film, and artworks. Allow them to share their experiences through social media networks to expand the water stewardship message to more people in their spheres of influence.



West Branch White River, Green Mountains National Forest, VT

COMMUNICATE EARLY AND OFTEN

Clear and consistent communication with registered participants is important. Plan to send an event confirmation to participants, with directions to the site and instructions on what the snorkelers should bring and wear.

If your event includes a fee, the confirmation should not be sent until the after receiving full payment for the session. If possible, wait to cash a check or run a credit card for payment until after the scheduled snorkeling event has taken place so it is easier to process refunds if an event is cancelled.

Send a confirmation letter at least two weeks prior to the snorkeling event to give participants enough time to plan for their trip. Confirmation letters should include:

- Scheduled date of reservation (with start/end times)
- Detailed directions with a map and expected travel times to the site
- Parking instructions
- Contacts for pre-event information
- Emergency Action Plan
- Reminder to bring signed liability and photo waiver forms, if required
- Packing list – suggested items include:
 - swim suit*
 - lunch and drinking water*
 - reef-friendly sunscreen*
 - water shoes (old tennis shoes, or closed-toe, strap-on sandals for walking in water)*
 - towel*
 - plastic bag for wet clothes*
 - change of clothes*

You may need to move or cancel events due to inclement weather or poor water conditions. If possible, have an alternative snorkeling site available in a different watershed, or higher up in your watershed where you may find better snorkeling conditions during high water. If you must cancel an event, doing so at least a day before the event is scheduled is preferred, but last-minute cancellations are sometimes unavoidable. Know the factors that are most likely to lead to cancellation and monitor them closely in the days leading up to the event. Develop a cancellation plan, which should include:

- Who is monitoring conditions
- Who is contacting participants and how/when participants will be contacted
- Who makes a determination to cancel
- Potential re-schedule dates for snorkeling

Share the cancellation plan and contact information with the group lead or with individual participants, as appropriate, so they know how to get information about changing plans. Knowing who to call and how to reach them is particularly important for last-minute cancellations.

CONSIDER PRE-EVENT ENGAGEMENT

Visit From Snorkel Team Representative

Planning a pre-snorkel visit to a classroom or other group of future participants provides a great opportunity to familiarize your snorkelers and your team with important information about their unique needs, interests, and concerns; and to check on wetsuit sizes. It also offers a safe and familiar environment in which to build rapport with your group. Use this opportunity to instill passion and excitement about snorkeling, and to share information that will spark interest in the activity and what they will experience.

Sometimes, the pre-trip visit is not feasible and discussion items will need to be covered at the snorkeling site prior to entering the water. Even if you have visited the group before their arrival, take some time for an abbreviated review of your pre-snorkel preparations to cover the information for anyone who was not present during your initial visit and to recap and repeat for those who might benefit from the repetition.

Curriculum, Lessons, Videos, and Presentations

The Educator's Guide to Freshwater Snorkeling is available to share with teachers or group leaders during an initial visit to the classroom or meeting place. Give them an opportunity to schedule activities, do their own research about freshwater ecosystems and animals, and build knowledge and interest for where they will be snorkeling at a future date. Having a curriculum helps guide the process using science standards for education, while a brief presentation with videos and photos can give them a quick virtual experience to reduce fears and familiarize them with the logistics of snorkeling day.



History and Management of Land Surrounding Snorkeling Site

An initial discussion of the snorkel site in relation to the watershed, the history of land use in the area, how it affected and may continue to affect aquatic conditions, and the effects of current management both on and off public lands, provides a backdrop from which to discuss the snorkel adventure, water quality, and how aquatic organisms respond to land use. It is important to be tactful about discussing land use to avoid labeling specific activities (e.g., agriculture, logging, cattle farming) as inherently impairing or negative. Rather, frame land use within the context of best management practices, buffer zones, and other scientifically-based methods for being wise stewards of our watersheds. This discussion should be tailored to the age group you are engaging, and can be presented to almost all but the youngest participants. A key element is to present the context of, “where does the water come from” and “where does the water go?” These two questions allow the participant to examine the human behaviors that may allow their enjoyable snorkeling experience at the site, but may preclude such an experience downstream where the effects are cumulative.

Aquatic Organisms’ Habitats and Life Histories

Each snorkel site will have its own unique assemblage of aquatic organisms to introduce to participants. Discussion in the classroom or in a pre-event meeting allows ample time to present interesting life history facts about the amazing critters the snorkelers may encounter, and gives time to introduce videos, photographs, and multi-media to the presentation. During the discussion, make note that there is no guarantee of observing any one particular species, due to the dynamics of a natural environment. That is what makes the adventure of snorkeling so much fun - you never know what you might or might not see. The same site may have certain species on one day and different species another, or different sizes, colors, and life stages of organisms in varying seasons or breeding times. When species’ life histories are considered in relation to the conditions of the aquatic habitat and watershed health, they allow the participant to not only learn to love the world beneath the surface, but also to better understand the uniqueness and interdependency of each ecosystem.



Liability and Photo Release Forms

Visiting a group before they arrive at the snorkel site allows you or the group leader to distribute liability waivers and photo/video consent or release forms that may be taken home for signatures by parents or legal guardians of minors. Plan ahead to have copies of these forms available for everyone and confirm a date and process by which you will be able to receive the signed, dated forms prior to or upon arrival at the snorkel site. No participant will be allowed in the water without a signed liability waiver, including chaperones, teachers, or volunteers.

Photo/video consent or release forms are optional, but if you are taking photos or video and some participants have declined their consent, you must ensure that their images are not taken or used publicly. It can be helpful to have a sticker or colored band on those individuals so that they are easily distinguishable from other participants if accidentally included in a photo of others.

Get to Know Your Audience

One of the most important aspects of providing an educational and enjoyable experience for snorkeling participants is gaining a deeper understanding of the audience. The age range, social demographics, group size, physical and mental comfort, and participants' expectations all play a major role in how they interact with the snorkeling experience. For example, a group from a rural area, which may be familiar with the site from angling experience, will interact with the aquatic environment in a different manner than a group that has traveled to the same site from an urban area and has limited experience in a natural river setting. As a guide or leader, the more the conversation can be tailored to the background of the audience in attendance, the more likely they will walk away with a positive experience and new appreciation for the aquatic resources they observed.

Safety and Health Concerns

Briefly review some general safety and health topics that participants should be aware of before arriving at the snorkel site, including the list of items to bring. Remind participants with special needs or health concerns, such as allergies, to alert their group leader and the snorkeling host of these items, so that reasonable accommodations can be made and the snorkeling team can brief their staff before the group's arrival at the site.



RUN YOUR SNORKELING EVENT

After all of the planning and preparations, it is finally time for your snorkeling event! The run-of-show and other considerations will typically be as follows:

Contact - Participants must have the ability to contact your event administrator up to the very last minute. Buses break down, drivers get lost, and weather can change quickly, all necessitating reliable and quick communications. Have a plan to touch base with participants or group point of contact that morning to confirm their arrival time and address any event day logistical concerns.

Setup - Staff should arrive early, prepare snorkeling gear, set up changing tents, do a safety sweep of shore areas, set up boundary markers/buoys, pick up trash, and check bathrooms – even clean and stock them with toilet paper, if needed.

Staff Briefing - Before participants arrive, gather staff and volunteers together to review the emergency action plan for the site, determine alternate forms of communication if primary ones fail, and locate first aid materials. Review learning goals and key messages you will share throughout the day. Guides should assess if the program can be held safely from start to finish, both in and out of the water, and devise contingency plans if conditions change.

Arrival - Greetings and introductions will set the tone for the day, and are particularly important for younger participants. Participants that feel connected to the guides are more likely to ask questions and interact. A bathroom break is appropriate at this point.



Lesson Plan - Prepared lesson plans, or at least an outline of what special features you would like your audience to learn about, can be used to help structure the learning components of freshwater snorkeling. A lesson plan should be tailored to the overall demographics (age, urban/rural, etc.) of the group participating in a way that is respectful, empathetic of any special needs or concerns, and sensitive to cultural nuances.

Your lesson plan should include:

1. Introducing each member of the snorkeling team and the program goals
2. Time for the audience to introduce themselves, their experiences and background in water topics and outdoor learning
3. A quick review of the pre-event snorkeling lessons and activities that they and their teachers will be provided before the trip to the snorkeling site
4. Defining a watershed and a describing features and geographic boundaries of the watershed in which the stream or water body is located
5. Discussing human-influenced or geomorphic activities occurring on the land and in the water upstream and downstream (locally-specific information)
6. Any actions your organization or others are doing to protect and sustain the integrity of the watershed
7. Identifying animals that participants may encounter and what microhabitats they may be found in while feeding, spawning, schooling, and hiding
8. Describing the physical characteristics of the fish and other aquatic organisms that will aid in identifying species to the appropriate taxonomic (genus or family) level. *If possible, provide an identification sheet (photos, scientific and common names, and descriptions) of the animals they may see*
9. Answering questions about the pre-event materials and addressing any apprehensions or concerns about the water, safety, and/or the animals they may encounter



Orientation - Introduce participants to the unique features of your snorkeling site and present the key messages that your staff will reinforce throughout day. Share an engaging overview of what they will be looking for under the surface of the water and how conservation plays a role in ensuring the future of those resources, and familiarize them with safe and ethical viewing practices.



Present the following safety information during orientation:

- Snorkeling boundaries within the water body
- Unacceptable behavior (rock throwing, excessive splashing, etc.) and consequences
- Potential risk areas for slips, trips and falls in and out of the water
- Awareness of moving vehicles (in parking area or road crossings)
- Please note to participants that while wetsuits can help them float, they are not flotation devices; they only offer a slight increase in buoyancy
- A snorkeler in distress should try to lay on his or her back to help prevent breathing in water
- Hypothermia can occur in cooler water temperatures and each person experiences temperatures differently – wetsuits are needed for most snorkeling, even if the water feels fine at first
- Participants may only use program-provided equipment, no personal snorkeling gear (particularly no full-face or uni-snorkels)
- How to avoid any entrainment hazards
- Pair snorkelers using the buddy system for safety
- Emphasize that if someone feels uncomfortable and might be in trouble they should immediately inform their buddy of the situation; the buddy should call for assistance and remain with the distressed snorkeler until help arrives
- Review emergency procedures and escape plan
- Identify the designated Safety Officer or First Aid Provider for the day
- Environmental threats (dangerous animals or insects, poison ivy, ticks, biting flies, and mosquitoes)
- Reducing potential for damaging the stream (moving rocks, trampling banks, trash)
- Moving in the water without disturbing sediments or rocks
- What to do if they encounter sharp objects (glass, cans, fish hooks, rocks); including during water stewardship efforts and shoreline clean-up before or after the event

Snorkeling Gear - Familiarize participants with wetsuits, masks, and snorkels. Apply mask defogger to lenses. Recommend a bathroom break prior to putting on wetsuits. Younger participants (and some older ones) may require lots of help getting into the wetsuits, so allow ample time for gearing up and privacy concerns.

Special considerations include:

- Water may leak into the mask while in the water; encourage snorkelers not to panic if this happens, and to find a good spot in the water to either stand or sit without moving and clear it
- Hair from head, beard or mustache may allow masks to leak
- Explain that it is alright to feel weird or have balance thrown off while in the wetsuit and encourage them to move around slowly until they feel comfortable
- Be aware that some snorkelers may require a considerable amount of time to get comfortable with the snorkels, so have them practice breathing exclusively through their mouths with snorkel and mask on
- Understand the potential for panicky feelings and anticipate spending a little extra time working on calming techniques such as deep breathing and distractions; please do not tease or embarrass participants who feel uneasy



North Fork Shenandoah River, George Washington & Jefferson National Forests, VA

Demonstration - Clearly describe and demonstrate the process of going from a standing position to a snorkeling position: put on mask, insert snorkel in mouth, move into push-up position (legs straight back, hands on stream bed), then immerse face and body in water to begin observing! Proper form for shallow water snorkeling is with legs floating motionless behind the body and hands on stream bottom, to move stealthily about the stream as a climber would and without disrupting rocks and sediment. Also, demonstrate snorkel and mask clearing and mask defogging techniques. If water should enter the mask, instruct participants to calmly tilt the mask, opening at the bottom portion of the lens to release the water once his or her face is above surface, or return to shore for adjustment.



In the Water - Help each snorkeler get safely to the water and into a snorkeling position. Invite them to explore different habitats within the designated snorkeling area. Some participants will require considerable time to get comfortable with snorkeling. Have staff available to help hesitant snorkelers. Remind snorkelers that noise and splashing will scare away the fish and stir up the bottom, making it difficult to see. A guide can provide tips on where to see fish and point out interesting observations, such as how different fish are found in fast, shallow water versus deep, slow water; where and what they eat; and where their nests are made.

- Smaller groups of 4-6 in each snorkel section of the water help ensure safety and give each participant the opportunity to view fish and other organisms easily
- No more than 12 participants should be snorkeling at a time to minimize disruptions to aquatic organisms and keep water clarity high
- The lifeguard will be watching participants and making sure everyone remains accounted for at all times
- Participants will decide where they feel comfortable snorkeling. If any members feel uncomfortable with the water depth or current at any time during the activity, the group can move to a shallower or safer area
- Encourage awareness of self and environment – what is happening around them? Where is the water current? Where are potential hazards or areas of interest?



Repeat Key Messages - After several minutes of snorkeling, consider a streamside session to discuss the interesting things you've just seen, tie what they've seen to your key messages and learning goals, and then return to the water for another round of snorkeling.

Be a Scientist - Consider having your guides and participants keep a record of the fish and other animals encountered at the site. Enter observations into an appropriate form, database, or smart phone application to monitor the site for changes in species observations between seasons or years as a crowd-sourced, citizen science contribution to research and management efforts. Also encourage participants to observe and report the conditions of the waterway and impacts to it from human-caused influences, such as pollution. Everyone has a stake in maintaining clean water, and observing as a scientist opens up a new way of actively experiencing this recreational, learning activity.

Create a list of the animals seen during the snorkeling event and record it into an internal (Forest Service NICE or WIT) or external database (such as the iNaturalist app) for monitoring purposes and comparison to other snorkeling events. Record significant water-related observations using the Water Reporter and other related apps.



Mark Twain National Forest, MO





Gear Cleaning - Have everyone get out of the water and carefully remove gear. Place snorkels and masks in buckets containing a mixture of 1 cup of bleach per gallon of water. Allow gear to soak for 10 minutes, then rinse it thoroughly in clean water and allow it to dry on tarps provided. Please dispose of the cleaning solution in areas that do not harm wildlife or vegetation. Do not dump cleaning solutions into the stream. Consider bringing a closed container so that you can dump cleaning solution in your waste water system later.

Wetsuit Cleaning - Wetsuits can be rinsed in the stream to remove any mud or debris, but a more thorough cleaning is more easily done at your storage facility. Wetsuits need to be cleaned on a regular basis to remain fresh and in good condition. Typically this is easiest to accomplish at your office or storage facility. Do not use bleach to clean wetsuits as it will damage the neoprene. There are many commercially available, non-toxic, biodegradable cleaners that remove odors and keep neoprene soft. Follow the manufacturer's instructions for use and disposal.

The Aquatic Nuisance Species Task Force Recreational Guidelines (ANSTF) (https://www.anstaskforce.gov/Documents/AIS_Recreation_Guidelines_Final_8-29-13.pdf) are a good resource for decontaminating gear from plants and animals and some pathogens.

ANSTF Recreational Guidelines for scuba and snorkeling were taken from Stop Aquatic Hitchhikers TM (<http://stopaquatichitchhikers.org/prevention/#scuba-divers-and-snorkelers>), which is supported by the ANSTF and may be reproduced.



Gear Decontamination - You need to decontaminate gear after your event to prevent the spread of non-native invasive species and waterborne diseases. Carefully research non-native invasive species and waterborne diseases potentially present in your area and follow appropriate decontamination procedures. Decontamination is particularly important if your snorkeling equipment is used in multiple waterbodies or across different watersheds. Equipment should be cleaned, dried, and stored for the next event.

Closeout - Thank the group for participating in your snorkeling program. Give them an opportunity to talk about what they saw in the water and share experiences. Consider quizzing them on what they learned and have a fun, interactive way of rewarding correct answers, such as stickers or other water-related items. Repeat the key messages related to your learning goals one last time. Include a take home message about keeping our waters clean and sharing what they learned with others at home or through social media networks. Provide tips on what participants can do to make a difference in their schools, offices, or communities. One thing every participant can do is to share the story of the things they saw during their time snorkeling.



Cleanup- Model a simple way participants can help keep our waterways healthy by engaging them in a quick trash pickup at the end of the day. Ensure that participants can safely engage in filling bags to take out of the area to an appropriate waste pickup location, providing additional assistance for any hazardous, sharp, or heavy items. Ask participants to consider the myriad ways that trash may have arrived at the site (direct source, from upstream, local businesses or agriculture, residents, visitors, flooding, etc.) and how upstream actions influence downstream environments. Ask them how this small ecosystem might model global aquatic ecosystems. Guides should check the area for lost items before leaving, ensuring the site is cleaned up and Leave No Trace principles are followed.

Debrief - Allow time after cleanup for the staff to debrief on the experience and address any issues or concerns. Make sure any safety incidents or injuries are reviewed and documented appropriately. Ask each person on the staff to describe something that went well and something to improve for the next program. The team leader should record these ideas and follow up with the team when planning for the next event. Determine when and how to follow-up with the participants, given the feedback provided during the event and the staff reflections on their experience.



Conasauga River, Cherokee National Forest, TN

LAST MINUTE CHANGES AND FLEXIBILITY

Weather

Conditions can change just prior to or during the event, so build flexibility into your snorkel day plans. You may need to cancel a snorkeling event due to inclement weather or poor water conditions, or other logistical challenges. If you must cancel an event, doing so at least a day before the event is scheduled is preferred.

Should a rain event occur or the water quality be too poor to enter with snorkels and you have a group arriving, have a contingency plan in place for on-site learning and activities, such as a macroinvertebrate station, viewing scopes that do not require full immersion into the water, and/or games under a covered shelter.

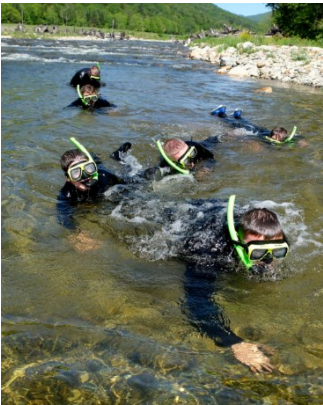
Have a cancellation plan ahead of time. Conditions under which you may want to cancel or move snorkeling to a different location include:

Water Quality Concerns

- *Coliform* bacteria such as *Escherichia coli* (*E. coli*) levels exceed the threshold for human health due to a sudden rain, flooding, or polluting activity; do not put your participants at risk of infection.
- Calm, stagnant pools on the edges of the snorkeling zone may be harboring *Giardia* parasite cysts and *Cryptosporidium* protozoa, which can be resistant to chlorine and persist for longer periods in the environment. Snorkeling participants who are afraid of swimming might seek areas without water current, putting them at higher risk for ingesting pathogens and parasites.
- Testing 48 hours or less before snorkeling is important to ensure that conditions have not changed.
- Check the latest Center for Disease Control and other research publications, including *Recreational Waterborne Illnesses* (Perkins and Trimmier, 2017) to help assess the risks and preventative measures for your snorkeling participants.



The U.S. Geological Service (USGS) provides water monitoring in rivers across the United States. You can refer to <http://waterdata.usgs.gov/usa/nwis/rt> or water.weather.gov/ahps to find a river sensor near your snorkel site



Find the stream flow gages closest to your snorkel site. If there is a stream flow gage located within your larger watershed, it can help you determine the water flow level at your site.

If there is not a gage in your river, there may be a stream flow gage in a nearby watershed that can serve as a proxy.

Water or Air Temperature

Monitor weather conditions in your area to ensure that the temperatures of the water and the air are, and will remain, high enough that participants will be safe and comfortable for the duration of the snorkeling event.

It is advisable to require that all participants wear wetsuits, even if the water temperature is initially comfortable. Prolonged periods of snorkeling can sap the heat from one's body quickly, and participants will have a much more enjoyable experience if they are all comfortable for the duration. Wetsuits also provide protection from scratches and can help with buoyancy.

Pre-set the minimum and maximum air and water conditions that will be tolerable and make sense to your area, trying to stay at water temperatures above 72 degrees Fahrenheit, if possible.

Lightning and Extreme Weather

Lightning, high winds, heavy rain, flash flooding, tornados and snorkeling do not mix. Extreme weather events prompt a situation in which you may have to cancel a program at the site without prior notice.

High Water or Unacceptable Clarity

Know the water flow parameters required to provide a safe program. Familiarize yourself with the long-term relationships between water flow, stage and clarity conditions at your snorkel site and the data from the nearest stream flow gage(s). Regularly checking stream flow gage conditions can help you make the right call about whether conditions are favorable for snorkeling.



FOLLOW UP AFTER A SUCCESSFUL SNORKELING EVENT

Reach out to participants following the event to thank them for participating and get feedback on how to improve the program. Take comments to heart but not personally. Be adaptable and responsive to concerns. You may consider obtaining feedback through comment cards or surveys distributed on-site, through a post-event phone call or email, or provide an option for anonymous feedback, such as an online survey. Feedback will help you to adapt your approach, staffing, and logistics to provide a better program in the future.

Consider developing supplementary materials you can send to participants after the event to enhance or continue the learning process. For example, you might share a list of the animals observed during the snorkeling event with links to additional information, instructions on how to construct your own viewing scope (or Snood), information on other opportunities to connect to nature in your area, or smart phone applications available for engaging with nature. A post-event visit may also be welcomed by schools or other groups, and provides one last opportunity to reinforce key messages.



All snorkeling events staffed, hosted, managed, or sponsored by the U.S. Forest Service in and partners should be entered into the **NatureWatch, Interpretation, and Conservation Education (NICE)** database application. NICE helps the U.S. Forest Service track and coordinate nationwide interest in freshwater snorkeling, gauge areas in need of funding, and improve communications to ensure the very best customer service to our participants, regional staff, and partners. It's easy!

The NICE Database can be accessed at: <https://apps.fs.usda.gov/nice>. A current edition of the NICE User's Manual is available at a button available on every page of the application, and a recorded tutorial is located here <https://usfs.adobeconnect.com/p1tzi7f1z1>



MEASURE AND REPORT SUCCESS

At a minimum, track and report the number of programs and participants per program. While these numbers are important, you are more likely to attract long term support if you can provide additional details on your program's impact and outcomes. Information on participant demographics is easy to gather and can provide important context for program reports and grant applications. If you have the resources, consider partnering with social science researchers to develop a post-event survey that measures participant enjoyment, connection to place, learning outcomes, environmental attitudes, or other metrics important to your snorkeling program.



Alexander Springs, Ocala National Forest, FL

PUBLICIZE AND SHARE YOUR PROGRAM

Many of the photos and videos you take during your event can provide excellent content for newsletters, blogs, and social media posts about freshwater snorkeling. Be certain you obtain permission to share the images, and create a story about your event to build support for your program, attract new partners, and celebrate the amazing biodiversity found under the surface of clean, fresh water. Getting local media involved before, during, or after your snorkel events can help promote watershed management efforts in the community and build advocates for water stewardship.

JOIN THE FRESHWATER SNORKELING COMMUNITY OF PRACTICE

Freshwater snorkeling programs are gaining momentum across the country, and are a fantastic way to incorporate watershed stewardship principles into a low-impact, recreational activity. Every waterbody, snorkeling team, and participant come together to create an unique experience in snorkeling. Sharing these experiences can help programs adapt and improve. Contact the authors for more information about how you can join our growing community of practice to share insights, address any issues, and build your full-immersion, outdoor education program to its greatest potential.

Happy Snorkeling!



Cheaha Creek, Talladega National Forest, AL

