

Standard Operating Procedure 2: Training and Safety, version 1.0

Overview:

By late May, the full complement of biological technicians and volunteers will have arrived in the park for the summer field season. Some of these biological technicians and volunteers will have been trained on and be proficient in the use of water chemistry and stream flow meters, having recently completed the field component of the park's annual aquatic macroinvertebrate monitoring program. The entire crew will undergo two to three days of training in CPR/First Aid, the principles, use and safety of electrofishing gear, fish identification, taking fish measurements, recording data, and the collection of habitat data from fish monitoring sites, prior to the start of the annual monitoring schedule. All individuals are further instructed in the use of the Hydrolab® and flow meter equipment.

Each person on the crew will be provided the opportunity to operate an electrofishing unit under close supervision. Individuals will be instructed on the basic techniques and strategies of capturing fish with the units, operating both independently and in a group when more than one electrofishing unit is required to adequately sample a site. During these initial electrofishing exercises, individual crew members will be evaluated for overall aptitude in the operation of the electrofishing units. Typically, the top three to five individuals in terms of demonstrated proficiency and/or potential will be selected at the discretion of the fisheries program manager or the lead biological technician to be the principal operators of the electrofishing units for the duration of the field season. This is necessary to maintain the consistency of effort and results from all of the park wide monitoring sites.

Following this initial phase, actual monitoring begins on a range of small to medium-sized streams. Most of the streams surveyed during the first two to three weeks are small, fairly shallow, and are limited to two or three fish species. Within these small streams, it is easy to effectively sample while the biologist and lead technician provide on-the-job training in protocol sampling procedures. Several mid-sized streams with six to ten fish species and slightly more complex habitats are also included in this extended training period. During this two to three week period, the crew are closely supervised and further instructed in all aspects of the field techniques and data collection. Upon the completion of this period and prior to monitoring medium, large and joint NPS/VDGIF streams, each member of the crew will be proficient at all of the routine tasks and will be expected to anticipate work tasks and follow through with the completion of those tasks with or without specific instruction from the supervisors.

Electrofishing in mountain stream habitats ranks among the most hazardous work activities performed by biological technicians and volunteers at Shenandoah National Park. This is compounded somewhat by the long hikes over rough and steep terrain while transporting pack loads of up to sixty pounds in potentially difficult weather conditions. There are also venomous reptiles present (i.e. northern copperhead and the timber rattlesnake), a number of biting and stinging insects and an abundance of poison ivy. With adequate preparation, training, the use of personal protective gear, and by being ever mindful of potential hazards during the course of the workday, all of the tasks associated with electrofishing can be accomplished in a manner that is safe to all individuals involved.

General Safety Procedures

- 1) Numerous job hazard analyses (JHA) specific to Shenandoah National Park will be reviewed by the crew prior to the start of the field season. These JHAs include, but are not limited to, *working in tick infested areas, light vehicle use, backcountry travel, electrofishing operations, aquatic macroinvertebrate collection, lifting and carrying, and hantavirus*. Certain JHAs may require additional safety training. Park JHAs can be found on the intranet (use Google) at <http://inpshen-circs/SHEN/SAFETY/Job%20Hazard%20Analysis/Forms/AllItems.aspx>
- 2) As part of the initial introduction to safety, emergency contact information will be collected from each crew member and will be stored in the field vehicles. The division secretary, communications center, and resource chief, will also retain copies of emergency contact information. In addition, crew members will have an opportunity to confidentially share known health issues (e.g. allergy to bee stings) with the biologist or lead technician. When permission is granted, these issues may be discussed with the entire crew.
- 3) Each member of the crew will be given a set of Potomac Appalachian Trail Club Maps for Shenandoah National Park. They will be expected to use these and the topo maps on the wall to know where we are going each day and routes to nearest hospitals. A set of PATC maps will be retained in each vehicle. Directions to hospitals in surrounding communities will be in the glove boxes of each vehicle. Routes to hospitals can be found on the intranet (use Google) at <http://inpshen-circs/SHEN/GIS/Medical%20Facilities%20Near%20SNP/Medical%20Facilities%20Near%20Shenandoah%20NP.HTM>.
- 4) The entire crew will be informed on the use, function and procedures of park radios. Each individual on the crew will know how to call for assistance in the case of an emergency and which radio channels will work best in a given location. During the field season, the crew will always have two functional portable radios on hand at all times in addition to the dash mounted vehicle radios.
- 5) Prior to the beginning of the fisheries monitoring field schedule, every attempt will be made to ensure that nearly every crew member has current certification of basic first aid and CPR. A general rule of thumb is at least half the members certified for the large crew and all for the small crew plus the biologist and lead technician.
- 6) An approved first aid kit will be carried at all times when field work is conducted. This kit will be stored in a consistent location and all field personnel will be informed of that location (typically this is in the hood of the red pack). Additional first aid material may be needed under certain circumstances or for certain crew members (e.g. “epipen”). First aid kits will contain Benadryl for allergic reactions in the backcountry. This can assist with any allergic reaction including bee stings or delayed anaphylactic shock (red meat allergies) due to tick bites. Items in the kit must be replaced the day they are used.
- 7) There is no substitute for good personal preparedness at the beginning of the season and at the beginning of each day. Each person on the crew is responsible for packing an adequate supply of food and water for the anticipated conditions of the day. It is particularly important to plan ahead for the longer hikes and to anticipate personal food, water and clothing needs accordingly.

Field Techniques Training and Electrofishing Safety

- 1) Principles of electrofishing and fish identification will be conducted prior to field season as well as during sampling of smaller streams at the start of the field season.
- 2) Office tasks, CPR/First Aid, and reviewing JHAs typically takes two days. After that, the entire crew will have a half day of field training using all of the equipment associated with fisheries work at Shenandoah. At this time, there will be some fish identification training which will also occur on the job at individual sites during the following two weeks. Likewise, training in the use of discharge meters, water quality equipment, and habitat sampling procedures will occur on-the-job during initial monitoring efforts. Because of sample site conditions, during the initial two weeks of work, the pace is generally much slower than it will be from mid-June to the end of the summer. This allows the crew to become used to working in unison and allows individuals to gain a better grasp of the physical and mental demands of the job.
- 3) Each person participating or assisting the electrofishing crew will be required to wear appropriate Personal Protective Equipment as identified in the JHAs (e.g. rubber gloves, non-slip waders, polarized glasses, etc).
- 4) The person or persons operating the backpack electrofishing units will direct the activity of all associated netters and bucket carriers. This can be complicated by the ambient stream noise, the noise from the electrofishing units themselves, and from the combined vocal chatter of the crew.
 - a.) As the crew works upstream against the stream flow and up, over or around rocks or other obstacles, it is the responsibility of the primary netters to assist the person who is wearing the backpack electrofisher in negotiating obstacles and to generally help them to maintain their balance during sampling.
 - b.) When stunned fish are lodged in rock crevices or other substrates, it is imperative that the electrofisher operator(s) raise the probes out of the water before attempting to dislodge the fish by hand. The operator(s) must remain alert to the fall of a crewmember or themselves and be prepared to immediately stop electrofishing. Shenandoah's wording is "Probes Up" this can be used by anyone on the crew for a falling member **BUT** only by the electrofisher operator(s) for a netter using a hand to retrieve a stunned and lodged fish. This ensures that there is adequate preparation before the line of electricity is turned off.
 - c.) When the probes come out of the water, your thumbs should be off of the switches and the probe ends should be pushed together. This ensures an electrical short so no current can reach a bystander. This is required for walking with the efisher unless it is turned off.
- 5) All crew members are responsible for maintaining situational awareness, which largely includes identifying and communicating potential safety hazards. This also includes providing a personal safety zone about oneself and generally avoiding direct body contact with a fellow crewmember. Additional notes are as follows:
 - a) Getting too close to a team of netters can result in being struck by a net handle.
 - b) When carrying buckets full of water and/or fish, it is important to take the time necessary to ensure adequate footing to prevent a fall which could result in personal injury and/or the loss of a number of fish and associated data.
 - c) Always take the time to help each other over/around obstacles.
 - d) Situational awareness reduces with fatigue. Be especially aware of this towards the end of the work day.

SOP Revision History

All protocols, regardless of how sound they are originally, require modification as new and different information becomes available. SOP version numbers increase incrementally by tenths (e.g. version 1.1, version 1.2...etc.) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0 ...). All edits require review for clarity and technical soundness. Small changes or additions to existing methods will be reviewed in-house by Shenandoah or Mid-Atlantic Network staff. However, if a complete change in methods is sought, an outside review is required.

Revision History Log:

Prev. Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #