

**Institutional Animal Care & Use Committee**

**I. PURPOSE**

The purpose of this policy is to minimize injury and mortality to fishes and other animals while electrofishing. Electrofishing is a standard technique used in research, and it is often the only method to effectively collect fish in areas unable to be sampled by other standard techniques (e.g., seines).

Electrofishing introduces an electric current into the water to momentarily stun fish to aid in collection. Electrofishing units may be housed in a backpack (to sample small streams), held on a barge that is towed through water (to sample larger rivers), or mounted to a boat (to sample large rivers and lakes).

Electrofishing units have a generator that produces an electric current, a power control device that modifies the electric current to maximize efficiency and reduce potential injuries to the fish, and one or more electrodes (anodes and cathodes).

Fish respond to electricity in a predictable manner. If the electric field is detected from a distance, fish will evade the field. If the fish are within the electric field, the fish will swim toward the anode (taxis). As the fish approaches the anode, the fish may undergo narcosis (immobility in which the muscles are relaxed) and loss of equilibrium. Fish are immobilized (or “stunned”) briefly and are captured by a dip net. The fish are then removed from the electrical field, placed in a bucket or livewell, and then processed according to animal care protocols.

## II. PERSONAL SAFETY AND OTHER CONSIDERATIONS

- A. Safety should be the primary concern of all personnel.
- B. Individuals with a pacemaker or other cardiac issues should not assist with electrofishing.
- C. At least 2 people should be CPR certified. All personnel should know the location of the nearest hospital.
- D. Personnel wading in streams and rivers during electrofishing must have nonbreathable waders with rubber soles. Personnel working on electrofishing boats must wear rubber soled boots.

Insulated rubber gloves should be worn by all personnel while electrofishing. Waders, boots, and gloves must be inspected regularly to ensure that there are no leaks. Personnel should also have polarized sunglasses (if sampling during the day), brimmed hats, and a wading belt (if sampling in streams or rivers).

- E. All electrofishing units should have maintenance and safety inspections once a year.
- F. An electrofishing safety “pre-check” should be conducted before each use to make sure the equipment is working and that all personnel understand safety instructions. Personnel should review commands (e.g., “Power on”, “Power off”) before electrofishing.
- G. The power supply should only be connected immediately before sampling and disconnected immediately after sampling.
- H. Personnel must have proper state and/or federal permits to use electrofishing equipment.
- I. All individuals on the electrofishing crew should bring with them all the items they need for a full day of fieldwork, including but not limited to:
  - Snacks/lunch
  - Water
  - A change of dry clothes
  - Towels
  - Sunscreen
  - Insect repellent
  - Any medications/medical equipment needed

- J. The electrofishing crew should bring a first aid kit with them into the field.
- K. Life jackets should be present for all individuals in a boat.
- L. All members of the crew must inform the PI or crew leader of any medical conditions they have that may hinder or limit their participation in electrofishing activities.
- M. Any injuries or accidents must be immediately reported to the PI or crew leader. The PI/crew leader will make any decisions regarding medical care or the suspension of electrofishing activities in order to seek medical treatment for the affected individual.

### **III. PROCEDURES**

- A. Electrofishing can be conducted using direct current (DC), pulsed DC, and alternating current (AC). However, DC or pulsed DC is to be used whenever possible to reduce injuries and mortality.
- B. Electrofishing settings should be set at the lowest voltage and frequencies possible. These settings should be based on the water conductivity, temperature, and target species and size.
- C. Because fish are more vulnerable to electricity at high water temperatures, electrofishing should not be used for coldwater species if water temperature  $>20.0^{\circ}\text{C}$  or for cool or warmwater species if water temperature  $>30.0^{\circ}\text{C}$ .
- D. Fish should be removed immediately from the electrical field when shocked with an insulated net and placed in a bucket or livewell.
- E. The bucket or livewell should contain well oxygenated water at a temperature similar to the water the fish were obtained.
- F. The condition of the fish in the bucket or livewell should be monitored. Fish should be processed according to animal care protocols as soon as possible.
- G. Only trained individuals may operate the electrofishing equipment while abiding by the CST field safety protocols. Inexperienced personnel must be accompanied by trained individuals to learn how to use the gear.

- H. Personnel for backpack electrofishing typically include one person wearing the backpack electrofishing unit, two individuals with dip nets (i.e., “netters”) located on either side of the unit and slightly downstream, and one individual holding a transfer bucket filled with fresh water. Sampling is performed by moving upstream shocking habitats of targeted fish species. Netters will collect the fish and transfer them to the bucket. The individual holding the transfer bucket will monitor the fish as sampling progresses.
- I. Electrofishing with a towed barge unit is similar except an individual must push the unit through the water rather than wearing a backpack electrofisher.
- J. Personnel for boat electrofishing typically includes one person driving the boat, two individuals with dip nets (i.e., “netters”) located at the front of the boat, and one individual monitoring fish in the livewell. Sampling is performed by moving the boat into habitats of targeted fish species.

## **V. REFERENCES**

A. Reynolds, J. B. 1996. Electrofishing in Murphy, B. R., and D. W. Willis, eds. Fisheries Techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

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