

**APPENDIX H**

**FISH SAMPLING PROTOCOLS FOR TRAPPING**

**OPERATIONS IN THE BONNEVILLE DAM**

**ADULT FISH COLLECTION AND**

**MONITORING FACILITY**

## **Fish Sampling Protocols for Trapping Operations in the Bonneville Dam Adult Fish Collection and Monitoring Facility (AFC&MF)**

1. **General.** The following protocols will be implemented by agencies conducting research in the AFC&MF. Trapping will not occur when fish ladder water temperatures exceed 74°F as measured at the top of the return ladder. These protocols were coordinated and adopted through the Fish Passage Operation and Maintenance (FPOM) Coordination team and the Fish Passage Advisory Committee (FPAC).
2. **General requirements for AFC&MF users.** All personnel conducting research in the AFC&MF will implement the following requirements.
  - a. Users must have appropriate documentation for conducting research at the dam. (See Guide for Researchers at Bonneville Dam).
  - b. Users must have a valid ESA Section 10 Permit that covers all listed species passing the project during the trapping period and users shall comply with all fish handling conditions in the permit. **Note: If Section 10 conditions are more restrictive than the following protocols, users must follow Section 10 conditions.**
  - c. Hard hats are to be worn at all times. A headpiece with magnifying glass for monitoring GBT is also acceptable.
  - d. Long pants or raingear are to be worn at all times. Shorts or sweats will not be permitted in the lab.
  - e. Steel-toed shoes or steel-toed rubber boots are to be worn at all times. No tennis shoes or sandals will be permitted.
  - f. Users will notify project biologists when they arrive on site and when they depart (x3551, x3375, or x3552). If users supply the project biologists with a season schedule, it will not be necessary to notify project biologists upon arrival and departure. If users are on site during non-business hours (1700-0630), Monday through Friday or anytime on the weekends, they are required to contact the control room (x221 or x222) when they arrive and when they depart.
  - g. Users will lower the main ladder picket leads and downstream exit bulkhead when they arrive, if necessary, and raise the picket leads and downstream exit bulkhead when they are completed for the day unless other arrangements are made.
  - h. Users will be permitted to operate valves 9 and 10 to control flow down the flumes at their discretion and the raw water booster pump. It is recommended that valves 9 and 10 remain open 55% and 40%, respectively. Users will not be permitted to operate any other valves or the overhead crane unless permitted to do so through the project biologists.
  - i. Users will record the times picket leads are lowered and raised, which agency they are representing and water temperatures when they arrive, at 1200 and 1500 hours, each day they are using the AFC&MF. Temperatures will be recorded from the temperature probe at the top of the return ladder. A spreadsheet will be provided by project biologists and located by valves 9 and 10.
  - j. Users must use a cotton mesh net, which is large enough to safely handle the largest fish passing the project during the trapping period.

- 3. Trapping protocols during the fish passage season (from 15 March through 30 November) when fish ladder water temperatures are <70°F.** Personnel conducting research during this time are required to be present in the AFC&MF to divert desired fish into the anesthetic tank using the flume swing gates. Undesired fish will be bypassed to the return pool. No diversion into or holding of fish in the braille pool will be allowed. The purpose of these protocols is to provide precautionary measures to limit delayed mortality resulting from stress when handling fish.
- a. There will be no time restriction for trapping operations.
  - b. There will be no more than 4 chinook, or 6 steelhead, or 6 sockeye, or a combination of 6 adult salmonids allowed in the anesthetic tank at any one time. This assumes that users can effectively track the length of time fish stay in the anesthetic tank.
  - c. There will be no more than 6 adult salmonids allowed in the recovery tank at any one time.
  - d. Water in the anesthetic tank will be replaced at least two times per day. Water temperatures in the anesthetic tank will be maintained within 1°C of the fish ladder water temperature. **Note: If anesthetic tank water temperature exceeds 70°F, criteria in section 4 will go into effect.**
  - e. Water in the recovery tank will be running continuously allowing a constant exchange of water through the tank.
  - f. Personnel shall ensure fish are sampled as quickly as possible. It is recommended that it takes no longer than 25 minutes to transition the fish from entry into the anesthetic tank to release back into the return ladder or transportation tank.
  - g. Personnel shall ensure that fish are fully recovered from anesthetization prior to release into the return ladder.
  - h. When trapping is completed for the day, users will raise the main ladder picket leads and the downstream exit bulkhead.
- 4. Trapping protocols during the fish passage season (from 15 March through 30 November) when fish ladder water temperatures are between 70 and 74°F.** Personnel conducting research during this time period are required to be present in the AFC&MF to divert desired fish into the anesthetic tank using the flume swing gates. Undesired fish will be bypassed to the return pool. No diversion of fish into or holding of fish in the braille pool will be allowed. The purpose of these protocols are to provide precautionary measures to limit delayed mortality resulting from stress when handling fish during warm water conditions. If ladder water temperatures exceed 74°F during any time of the day when the AFC&MF is operating, trapping will be suspended immediately. The Corps reserves the right to terminate trapping operations at any time.
- a. Trapping will only be allowed between 0600-1200 hours each day. The morning operations are to take advantage of the water-cooling that occurs overnight.
  - b. There will be no more than 3 adult salmonids allowed in the anesthetic tank at any one time. This assumes that users can effectively track the length of time fish stay in the anesthetic tank.
  - c. There will be no more than 3 adult salmonids allowed in the recovery tank at any one time.
  - d. Assure oxygen levels are maintained at saturation in the anesthetic and recovery tanks. Provide aeration as necessary to maintain oxygen levels the same as in the fish ladder water. In other words, there will be no depression in oxygen levels in the anesthetic or recovery tanks regardless of numbers of fish in and through the tank. To assure this, water in the anesthetic tank will be replaced at least every three hours.

- e. Water in the recovery tank will be running continuously allowing a constant exchange of water through the tank.
  - f. Maintain the anesthetic and recovery tank water temperatures 1-2°F lower than the ladder water temperature. If ice is used to cool the anesthetic or recovery tank water, the ice should be from river water or, at least, from an un-chlorinated water source. Do not exceed a 3°F difference between the anesthetic or recovery tank water and fish ladder water.
  - g. Personnel shall ensure fish are sampled as quickly as possible. It is recommended that it takes no longer than 25 minutes to transition the fish from entry into the anesthetic tank to release back into the return ladder or transportation tank.
  - h. Personnel shall ensure fish are fully recovered from anesthetization prior to release into the return ladder.
  - i. When trapping is completed for the day, users will raise the main ladder picket leads and the downstream exit bulkhead.
5. **Winter trapping protocols, from 1 December through 14 March.** Personnel conducting research during this time are not required to be present in the AFC&MF. Users are allowed to activate the flume swing gates to divert all fish into the braille pool. The purpose of these protocols is to provide precautionary measures to limit passage delay, and stress from overcrowding in the braille pool.
- a. Sampling will occur on a daily basis.
  - b. Fish will not be permitted to remain in the braille pool longer than 24 hours. It is recommended that handling of fish occurs daily by 1800 hours. This assures that if fish are sampled at the end of the day, most of the fish captured are only held from the morning until afternoon since passage at night is minimal, reducing delay.
  - c. During sampling, the braille pool should be raised and one adult salmonid netted via a sanctuary net and placed into the anesthetic tank at a time. After removing fish from the braille pool into the anesthetic tank, the braille pool will be lowered back to its full depth.
  - d. There will be no more than 3 adult salmonids allowed in the anesthetic tank at any one time. This assumes that users can effectively track the length of time fish stay in the anesthetic tank.
  - e. There will be no more than 3 adult salmonids allowed in the recovery tank at any one time.
  - f. Water in the recovery tank will be running continuously allowing a constant exchange of water through the tank.
  - g. Personnel shall ensure fish are sampled as quickly as possible. It is recommended that it takes no longer than 25 minutes to transition the fish from entry into the anesthetic tank to release back into the return ladder or transportation tank.
  - h. Personnel shall ensure fish are fully recovered from anesthetization prior to release into the ladder.
  - i. If daily sampling can not occur on weekends, the main ladder picket leads and downstream exit gate will be raised following completion of sampling on Friday. The flume swing gates are to be deactivated to allow fish to pass freely into the return pool.