



Designation: D4131 – 84 (Reapproved 2014)

Standard Practice for Sampling Fish with Rotenone¹

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1. Scope

1.1 This practice covers determination of the quantitative and qualitative species composition of fish in a specified area. The successful use of this technique is dependent on: (1) preventing fish from escaping the sample area and (2) retrieving all affected fish, which may take up to three days.

1.2 Advantages:

- 1.2.1 Easily detoxified.
- 1.2.2 All native freshwater fish are susceptible, but it has low toxicity to mammals and birds.
- 1.2.3 At low concentrations fish toxicity depends on species, age, and size.
- 1.2.4 The suffocating action is reversible.

1.3 Limitations:

- 1.3.1 It is less effective in cold (below 20°C) and highly alkaline water.
- 1.3.2 Smaller fish and those without air bladders usually do not float.
- 1.3.3 Completely random selection of sample areas is not possible.
- 1.3.4 Overkill beyond sample area can sometimes occur.
- 1.3.5 Food web organisms may be eliminated.

1.4 *Applications*—this practice is useful in both short- and long-term studies for management and impact assessment purposes. It is adaptable to both lotic and lentic situations in littoral and limnetic areas.

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazards, see Section 6.

¹ This practice is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.24 on Water Microbiology.

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2. Referenced Document

- 2.1 *ASTM Standards*:²
D1193 Specification for Reagent Water

3. Summary of Practice

3.1 The sample area is blocked off with a small mesh net(s) and the volume of water to be treated is calculated. The required quantity of rotenone is diluted and distributed throughout the water column in the sample area. All fish should be affected and they should be collected for processing (1).³

4. Apparatus

- 4.1 *Vessels*, for measuring and mixing rotenone and for collecting fish.
- 4.2 *Chemical Applicator*, for boat use.
 - 4.2.1 *Venturi Siphon or Automatic Boat Bailer* that attaches to outboard motor's cavitation plate.
 - 4.2.2 *Gasoline-Powered Pump and Weighted Perforated Hose*.
- 4.3 *Block-Off Net(s)* ¼-in. (6.4-mm) bar mesh for lake-reservoir and small stream use or ¾ to 1-in. (19 to 25-mm) bar mesh for larger streams).
- 4.4 *Dip nets*, for collecting fish.
- 4.5 *Flat-Bottom Boats*, 12 to 14-ft or larger.

5. Reagents

5.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society where such specifications are available.⁴ Other grades may be used,

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The boldface numbers in parentheses refer to a list of references at the end of this standard.

⁴ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.