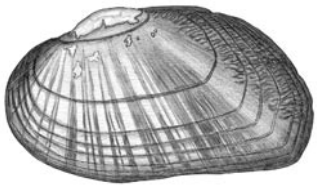
7. Macroinvertebrates

We do not recommend a specific macroinvertebrate method in this Monitoring Guide because of the inherent complexity of conducting statistically valid macroinvertebrate assessments. We recommend that the user consult with professionals in their region who have the expertise necessary to design a macroinvertebrate monitoring plan appropriate for the stream barrier removal project. Appendix D provides an in-depth discussion of planning macroinvertebrate monitoring for stream barrier removal projects. Table 8 provides a summary of macroinvertebrate monitoring protocols used by different Gulf of Maine jurisdictions.



Brook floater

8. Fish Passage Assessment

We do not recommend a specific fish-monitoring method in this Monitoring Guide because fish monitoring should be managed by trained fisheries experts and must be tailored to the project site and target species. We recommend consulting with experts in the region with the necessary jurisdiction to design and implement fish monitoring for barrier removal projects.

Fish ladders sometimes are not effective at enabling fish to move past dams. After a dam is removed, monitoring can reveal if more fish are traveling up and down the river.

Table 7. Fish-monitoring methods that may be recommended by local fisheries experts.

Method	Technique	References
Visual	Human visual identification and counts of fish at specific locations.	Nelson, 2006; Stevenson et al., 1999
Simple presence/absence	Electrofishing is a commonly used and inexpensive technique to assess the presence or absence of fish species above and below a barrier.	Reynolds, 1997
Video	Pre-positioned video camera recording fish at specific locations.	Bowen, 2006
Passive Integrated Transponder (PIT tags)	Fish are captured and are inserted with a Passive Integrated Transponder (PIT tag). Fish injected with this tag can be automatically recognized by strategically located detecting/recording devices.	Bruyndoncx, 2002
Mark and recapture	Fish are captured and are fin clipped and/or have an external fish tag attached; employs nets, traps, or electrofishing.	Nielson, 1992; Parker, 1990
Telemetry	Fish are captured and tagged with electronic transmitters. Transmitters can be applied to fish internally or externally. Fish movements are subsequently determined by locating fish/transmitters using mobile and/or fixed telemetry receivers.	Amlaner and MacDonald, 1980; Baras, and Philipart, 1996; Burnham et al., 1987; Cheeseman and Mitson, 1982; Finkenzeller, 2000; Lucas and Baras, 2001; Moore and Russell, 2000; Pincock, and Voegeli, 1990; Priede and Swift, 1992; Sibert and Neilson, 2001; Spedicato et al., 2005; Winter, 1983; Winter, 1996; Zydlewski et al., 2006