

**STANDARD OPERATING PROCEDURE
FOR MACRO INVERTEBRATE
KICK NET SAMPLING**

The Office of Environmental Measurement and Evaluation
EPA New England - Region 1
11 Technology Dr
North Chelmsford, MA 01863

Prepared by: _____
Hilary Snook, Env. Scientist Date

Reviewed by: _____
Peter Nolan, Unit Lead/QAO Date

Reviewed by: _____
Katrina Kipp, Unit Manager Date

Purpose: To establish a procedure for the collection of macro invertebrate samples from wadeable streams in new England.

Scope: This Standard Operating Procedure is applicable to the collection of macro invertebrate samples from wadeable streams and rivers.

Method Summary: A sampling frame is placed on the stream bottom and a kick net immediately downstream. The substrate is “scrubbed” for a designated time period and collected in the net. This is repeated until the desired unit area of stream bottom has been covered.

Contents	Section A	Definitions
	Section B	Health and Safety Considerations
	Section C	Personnel Qualifications
	Section D	Equipment and Supplies
	Section E	Sample Collection
	Section F	References

SECTION A. Definitions

Quadrat/Sampling Frame:	A metal rectangular frame with a unit area measuring one fifth of a square meter, used to quantify the area of stream bottom to be sampled.
Kick Net:	A box shaped net comprised of canvas bottom and/or sides and 504 μ nylon mesh back.
Wash Bucket:	A standard heavy duty nylon bucket with the bottom comprised of 504 μ stainless steel screen. Used for sieving bottom samples prior to preservation.
Proportionate Habitat Sampling:	Sampling of the macro-habitat in order to reflect the abundance of particular habitats found within the sampling reach (i.e. If you are taking 20 replicates at a site and your habitat shows that 50% of your reach is pools and the other 50% riffles, then ten kicks each would be taken from each of the two different habitats).
Riffle Habitat Sampling:	Sampling in riffle areas; those areas of the stream comprised of cobble gravel substrate with a water flow over their surface which is shallow (usually less than eight inches in depth) and non-laminar.

SECTION B. Health and Safety Considerations

1. When working with potentially hazardous materials or situations, follow EPA, OSHA, and specific health or safety procedures.



2. All proper personal protection clothing and equipment is to be worn. This should include waders with felt soles to minimize slips and falls, and gloves for handling substrates.
3. Some samples may contain biological and chemical hazards. These samples should be handled with suitable protection to skin, eyes, etc.

SECTION C. Personnel Qualifications

1. All field samplers working at Superfund sites are required to take a 40 hour health and safety training course and a refresher course prior to engaging in any field activities.
2. The field sampler should be trained by an experienced sampler before initiating the procedure.
3. All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function.

SECTION D. Equipment and Supplies:

1. Waders & gloves
2. Square frame kick net with 504 μ mesh nylon netting
3. Wash bucket with 504 μ stainless screen bottom
4. Ethanol
5. Watch with second hand
6. One fifth square meter sampling frame
7. Half gallon plastic wide mouth jar



SECTION E. Sample Collection

1. Determine the location of the first habitat to be sampled along the sampling reach.
2. Randomly toss sampling frame in the desired habitat area to be sampled. If sampling is to be restricted to riffle habitats only, then the sampling frame should be started at one side of the stream and move in an upstream and diagonal/cross stream direction in order to have complete coverage across the riffle area with the desired number of replicates.
3. Square the sampling frame so that the flow of water runs parallel to two of the frames edges.
4. Place the kick net against the downstream edge of the sampling frame and make sure kick net is in an upright position and held by one sampler.
5. The individual holding the net times the other sampling individual for a period of one minute. During the timed sample, the second individual, with gloved hands, “scrubs” the substrate, brushing off large cobbles and disturbing the bottommost substrate to a depth of approximately one inch. Material and organisms will drift with the stream current into the net. The entire area within the sampling frame should be scrubbed within the one minute time frame.
6. Steps one through five should be repeated for the next habitat and thereafter, until all desired replicates are completed along the sampling reach. The kick samples may be transferred to the wash bucket at anytime that the net becomes full or cumbersome.
7. Place wash bucket close to or in the stream in a shallow (4-6" deep) quiescent area. To transfer organisms from the net to the wash bucket, dip the bottom portion of the net into the water and sweep the net to one side, consolidating the sample material. Lift the net out of the water and grab the sample by grasping the net from behind and closing it around the sample. Invert the net over the wash bucket and push the contents of the net into the bucket. Splash water into the inverted net from the stream to wash the remaining



contents into the bucket.

8. To transfer organisms from the wash bucket to the plastic sample jar, remove the large detritus and organisms by hand and place directly into the sample jar. The remaining sample material should be consolidated to one side of the bucket in a similar manner as the kick net; dipping the bucket into the water and sweeping to one side. Pick up the remaining material by hand if possible and place into the sample container. Any remaining material can be rinsed into the sample jar by holding the mouth of the bucket over the jar and splashing water against the bottom portion of the bucket.
9. Add ethanol to the sample jar in a volume proportion to make up approximately 70% ethanol and 30% water. Close the cap tightly and label the top of the jar with the following information: *Stream name, site number, and sampling date*

SECTION F. References

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

<http://www.epa.gov/OWOW/monitoring/techmon.html>

