

## **RAINBOW SMELT SPRING FYKE NET SURVEY SAMPLING PLAN 2013**

This Sampling Plan broadly outlines the procedures to be followed for the Species of Concern (SOC) Smelt Survey. Please refer to the Quality Assurance Project Plan (QAPP) written by project partners in the Massachusetts Department of Marine Fisheries (MA DMF) for procedure details. All relevant procedures, safety protocols, and design considerations described in the QAPP must be followed.

### ***DEPLOYMENT***

In order to sample the entire time period and accurately characterize the peak of the run, the sampling team should plan to set the net from the last week of March until the last week in May for southern sites, and from mid-April until late June for Penobscot and Downeast sites. If no smelt are captured after the peak of the run for more than one week, sampling may be ended with the agreement of the project manager.

### ***FYKE NET PLACEMENT AND METHODS***

The net has six hoops with 2.5ft diameter attached to a box frame (4x4ft). Throats are attached to the second hoop inside the mouth and fourth hoop. Box frame wings (4x4ft) are attached to both sides of the box frame mouth. Optional 16ft soft wings with leads and floats may be added to the box wings. The net should cover about 75% of the channel width. All meshes are ¼ inch. Wing poles will be set 2.5m apart. Signs will be provided to place on the shore close to the net to describe the project and to warn the public not to disrupt the project.

***Placement*** – The fyke net should be placed a narrow width in the river, where the net extends to cover about 50-75% of the river width. The net should be placed where the mean high tide line is approximately 4-5ft to increase the efficiency of the net. The net should be placed with the mouth facing downstream with the hoops extending upstream to catch all movement upstream. The net may be secured with four pieces of 8ft (length) 5/8” to 1/2” (width) rebar, two will secure the frame, and two will secure the box wings. Shorter pieces of rebar may be more appropriate in rock substrates.

***Procedure*** – The dates that the net will be placed will not be random, but will coincide with the tide, moon phase, and team availability. The net will be placed 3 nights a week (for at least 8 weeks), at the evening low tide or up to 3 hours before or after low tide if the water level and flow are low enough that the team can work safely. The net will be left in position until the next low tide cycle. At the morning low tide, teams of three people (or at a minimum two people) will haul the net and perform the following procedure:

Empty the cod end and other compartments of the net into buckets or large coolers with aerators. All smelt should be randomly distributed in 5-gal buckets or large coolers. 100 males and 100 females will be measured to the nearest millimeter, and the length and sex of each fish recorded. All remaining smelt will be counted and sexed.

***Scale Samples*** – Approximately 400 scale samples will be taken over the course of the run at each site. Scales will be taken on the side of the fish directly below the dorsal fin after first wiping the area to avoid loose scales from other fish. The scalpel used to take the sample should be wiped clean before each new sample is collected. At least 20 samples will be taken for each centimeter size class per sex (10cm to 23cm), and samples taken from size classes above 23cm as they occur. For centimeter classes with high frequency (16-19cm), do not take all 20 scale samples in the same week – rather, take 5 samples each week. The record of scale samples and fish lengths must be submitted to the project manager each week to ensure that all size classes are represented over the sampling period. Scale samples will be taken at all sites.

After smelt have been processed, count and release all decapods. Measure eels to nearest cm. For large catches of non-target species, measure a random sample of up to 30 fish, and record the total number caught.

### ***WATER QUALITY SAMPLING***

One YSI 6600 or 6920 V2 sonde will be used to collect individual grab samples at the spawning grounds above the fyke net. Samples will be taken in fresh water, above the salt wedge. All procedures for calibration, deployment, and storage described in the MA DMF QAPP must be followed. The following water chemistry measurements will be taken: temperature, specific conductivity, dissolved oxygen (percent saturation and mg/L), pH, and turbidity. Three samples will be taken 10-30cm from the bottom at two minute intervals. The sonde **must** be allowed to calibrate for 10 minutes placed in the water before any samples are taken. If the pH continues to decrease after 10 minutes, let the sonde rest longer until the pH stabilizes (this will especially happen when the sonde is placed in cold water after sitting in a warm building or car).

Water velocity will be taken daily or weekly depending on access to a Gurley velocity meter. Velocity measurements should be taken in accordance with the MA DMF QAPP.

A staff gage will be placed at each site in a location where the gage can always be read at low tide. A piece of rebar can be hammered into the substrate in the channel, or another fixed point can be used (ex. a bolt or mark on a rock). Each sampling day, measure from the top of the rebar (or mark) down to the water level. Record in centimeters.