

**Artificial habitat collector design for young-of-the-year American eel (*Anguilla rostrata*) glass eels and elvers (after Silberschneider et al. 2001, J. Fish Biol. 58:1359-1370)**

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**Abstract:** During the winter / spring of 2005, the Rutgers Marine Field Station initiated a pilot study in the Mullica River–Great Bay estuary to determine the feasibility of using artificial resettlement collectors (originally designed for Australian glass eels, *Anguilla australis*, *A. reinhardtii*; Silberschneider et al. 2001) to study ingress patterns of early stage American eel.

Eel resettlement collectors were constructed out of dense tufts of unraveled polypropylene rope fiber attached to a PVC base with cable ties. Each collector was weighted by attaching a terracotta base and deployed on the bottom. Individual collectors represented a standardized replicate consisting of equal numbers of fiber tufts (15) unfurled from equal lengths of rope (50 cm). Collectors were “seasoned” in seawater for ~1-2 months before deployment to eliminate any artificial odor and foster a preliminary community of bacteria and algae.

Arrays of habitat collectors (3) were deployed at each site (weekly, March-May) from sundown to sunrise in order to sample glass eels using the incoming, nighttime flood tide. At sunrise, collectors were retrieved, shaken out into a plastic tub filled with fresh water/sea water (3 rounds, 20 shakes each), and a sub-sample of 40 eels per collector anesthetized with MS-222 and measured/weighed/staged. Remaining eels were then counted and released at the site of capture the next day.

Overall, 7 sites (3 replicate collectors per site) were sampled in the upper–lower Mullica River–Great Bay system. From these observations, catches in individual resettlement habitats ranged from 0 – 2585 eels per collector. Pigmentation stages varied from unpigmented, newly arrived eels (stage 1) to fully pigmented (stage 7) elvers. The proportion of pigmented/unpigmented individuals increased gradually, and then rapidly, with time until no stage 1 individuals remained by late April.

These traps have several notable advantages over more traditional glass eel/elver sampling devices (i.e. fyke nets, fish ladders, elver traps) in that they are highly portable, can be fished simultaneously over wide spatial scales, and require minimal monitoring. They also have the ability to collect glass eels in complex habitats or situations of increased flow. Additional information on experiments used to test the efficiency of these collectors can be found in Silberschneider et al (2001).

Preliminary field work indicates that this device is useful for quantifying early life stages (leptocephalus and glass eels) of Conger eel (*Conger oceanicus*) as well.

## Materials<sup>1</sup> and Methods

25 ft (750 cm) - 5/8 inch (1.6 cm) diameter twisted brown polypropylene rope

1 – 12 inch (30.5 cm) diameter PVC plant saucer

1 – 11 inch (27.9 cm) terra cotta plant saucer

15 – medium cable ties

1 – green polypropylene rope (cut to desired length)

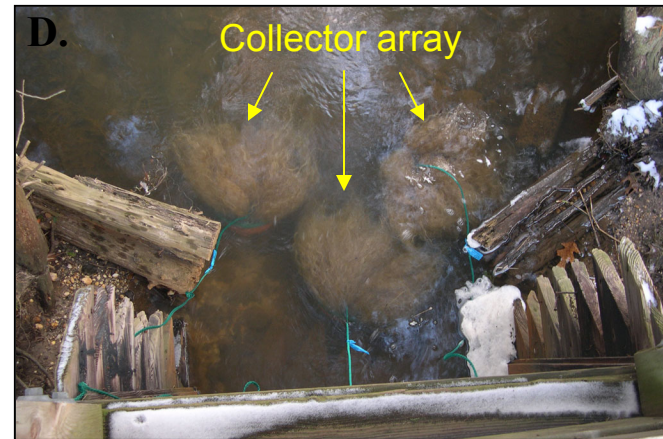
<sup>1</sup>All of the above materials are typically available at Home Depot or local hardware stores.



Tuckerton creek; Tuckerton, New Jersey (A, B)



Atlantis Golf Course; Tuckerton, New Jersey (C, D)





1) Cut the length of brown polypro rope into 15 equal lengths (~50 cm ea.). Completely unfurl each rope segment until individual fibers are worked free.



2) Pinch unfurled bundles of rope in the center forming two ~25 cm tufts.

3) Drill 15 pairs of small (just enough to pass a cable tie through) holes into the bottom of the PVC saucer.

4) Attach rope fibers to the PVC saucer at the center of each bundle using a cable tie (there should be 15 bundles total – 12 attached to the outer ring of the saucer, 3 attached to the inner ring).

5) Drill a hole through the center of the PVC and terra cotta saucer.

6) Invert the terra cotta saucer and pass the length of green polypro rope through both saucers. Form two knots above and below the flush saucers to hold them in place.



7) Deploy with fiber tufts facing upward.

