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An Odonate Emergence Trap for Use in Marshes

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SYNOPSIS: A trap used in estimating emergence rates of Odonata over water in emergent vegetation is described. It consists of a wooden frame lined with plastic screen and protected from muskrat damage by a covering of steel hardware cloth.

INDEX DESCRIPTORS: Emergence Trap, Odonate Trap.

Recently, Cook and Horn (1968) reviewed the problems of estimating emergence rates of Odonata and then described a sturdy trap which worked well in shallow water. Basically, their trap consisted of a welded-wire framework covered with plastic screen. Traps were placed along the edge of the water and insects entered through the open lower end. During a study in northwestern Iowa marshes where I recorded odonate emergence in deep water and dense vegetation, it was necessary to redesign this trap. Important characteristics of emergence traps used over water in emergent vegetation include: 1) that captured insects can be removed easily, 2) that muskrat (*Ondatra zibethicus*) damage is minimized, and 3) that the trap is large enough to allow some growth of emergent vegetation.

CONSTRUCTION

Traps were large, open-bottomed boxes with a sloped top designed to concentrate insects in the upper corner near a swinging door and make removal convenient (Fig. 1). The protective framework was constructed in two sections: a wood and wire base and a wedge-shaped wire top. Both were lined with plastic screen to retain the insects.

In constructing the base of the trap, 1 x 2-inch boards were cut and nailed to form two frames with inside dimensions of 18 x 36 inches. Next, an 18-inch wide strip of plastic screen was stapled inside the frames to form the vertical walls of the trap. Finally, panels of 1/4-inch mesh steel hardware cloth were fastened to the outside of the wooden frames to protect the plastic screen from muskrat damage (Fig. 1).

To make the wedge-shaped wire top, first a regular trapezoid was cut from a 36-inch wide roll of hardware cloth. It had a base width of 36 inches, top width of 18 inches, and height of 35 inches. Next, a 1 x 2-inch board 18 inches long was fastened along the central portion of the trapezoid base for support. The hardware cloth then was folded at each end of the board, as shown in Figure 1, to form the wedge-shaped upper part of the trap. Finally a 9 x 18-inch piece of hardware cloth was fastened across the open end with hog rings to make a swinging door. Bent nails were used as latches to hold the door tightly closed. After this protective framework was completed, a cut piece of plastic screening was folded and fastened to the inside with staples and pliable copper wire (No. 22).

Figure 1. Emergent insect trap in position in about 2 feet of water. (Water just covers the lower wooden frame. The arrow points to the door.)

After both sections were completed, the top part was fitted inside the base and stapled to the top wooden frame. Legs long enough to reach the marsh floor then were nailed to the outside of the frames. The legs also helped support the walls of the trap. Floating traps anchored by ropes (e.g. Southwood, 1966) were not used because they are more easily damaged by muskrats and are harder to use without disturbing the vegetation.

Completed traps were placed in various vegetation zones of marshes to monitor emergence of odonates. Last instar naiads climbing emergent stems before metamorphosing into adults would enter traps through the open bottom. After transformation, adults were confined to the trap.

ADVANTAGES OF THE TRAP

Insects were removed easily by reaching in through the small door. An aquarium net aided in removal of insects. In

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most instances, the trap was emptied in less than five minutes. Although these traps were used primarily to measure emergence of several kinds of odonates, they also trapped emerging crane flies (Tipulidae), soldier flies (Stratiomyidae), mayflies (Baetidae), and large midges (Chironomidae).

Although traps were tall enough to allow for some vegetation growth, occasionally it was necessary to trim rapidly growing emergent vegetation by reaching through the door.

Traps successfully withstood muskrat activities such as gnawing, use as a feeding platform, and use as a substrate for building a lodge. Minor damage was done infrequently by grazing cattle, and a few traps not firmly implanted into the marsh bottom were tipped over by strong winds.

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