

## The Use Of Leverage To Facilitate The Search For The Hellbender

During September 1991, we searched for hellbenders (*Cryptobranchius alleganiensis alleganiensis*) in the New York portion of the Susquehanna River drainage. The purpose of this survey was to attempt to verify previous records (Bishop 1941; Bothner 1981; Breisch 1990) and to find new localities and potential habitat.

Many methods have been tried to locate hellbenders including visually searching, electroshocking, and rock-lifting (Williams et al. 1981). We tried visually searching both day and night and electroshocking with a Smith-Root model 11-A (Smith-Root Inc., 14014 N.E. Salmon Creek Ave., Vancouver, Washington 98665, USA) with no hellbenders being located using those methods. We tried to trap hellbenders using 0.6 m by 0.6 m by 0.2 m high wire mesh traps baited with chicken livers with the same results. This left us with only the rock lifting method to try.

As hellbenders are normally found under large rocks in riverine situations, a technique was devised to enable two people to quickly lift large rocks with as little back strain as possible and without destroying the habitat. Anyone who has ever looked for hellbenders should be able to appreciate the difficulty of bending over or kneeling to hand lift large rocks in 10-15°C water.

A device available in forestry supply catalogs (e.g., Forestry Suppliers Inc., P.O. Box 8397, Jackson, Mississippi 39284-8397, USA) called a peavey was used to lift the chosen rocks. As the peavey is normally used to roll heavy logs in the 0.3-0.75 m diameter range we thought that this device would be both inexpensive and sturdy enough to safely lift large rocks. One person using a single peavey was able to lift rocks measuring up to 1.25 m by 1.85 m by 0.25 m thick. The hook on the peavey was caught on the underside of the rock or on any irregularity on the side of the rock. The person doing the lifting would then hold the end of the 1.3 m handle, bend at the knees, and then lift with a straight back. The second person would then probe under the rock with a long-handled dipnet to attempt to dislodge any hellbender that might be hiding under the rock. Rocks were lifted upward from the downstream edge just far enough to allow a dipnet to be passed under the rock. No attempt was made to flip the rocks completely over as it was desirable to have as little effect on the habitat as possible. In most cases the upper edge of the rock just barely broke the surface of the water. As this survey was done during the hellbender nesting season we choose to lift the rocks from the downstream edge in order to minimize effects on any nests that might be present. At other times of the year lifting the rocks from the upstream edge will allow the current to quickly clear disturbed sediment and make locating hellbenders easier.

Another advantage of using the peavey is that searching in relatively cold deep water is possible. We were able to lift rocks and verify the presence of hellbenders in water depths of up to 1 m without getting anything more than our chestwaders and hands wet. This method can be used during any season of the year without undue discomfort on the part of the users. One must be cautious during the nesting season to minimize nest disturbance.

The peavey is inexpensive (\$49.95 Forestry Suppliers) and much safer to use than electroshocking. Electroshocking equipment can cost over \$2000 and requires safety gear to be worn. A word of caution is in order. Do not try this method by yourself. It is estimated that many of the rocks we lifted weighed 275-450 kg. We used two people (one netting and one lifting) and found that in some cases that was not enough. In one case a hellbender escaped to the left while the netter was to the right and the lifter attempted to pursue the hellbender while pushing away a rock in the 350-450 kg range. The best way to utilize the peavey is with

a crew of at least three persons. One person lifts the rock and does not pursue anything while the others attempt to capture hellbenders either by dipnet or seine.

This method was successfully used to move many thousands of kg of rocks over six days of searching and resulted in the location of 33 hellbenders and five hellbender nests. Many old sites were verified and almost 50 km of river were added to the known range of *C. alleganiensis* in New York. A big advantage of the peavey was the relative ease in which rocks could be lifted in a controlled manner. This enabled us to put all nests discovered back together (with eggs and attending male). Only one animal discovered using the peavey technique was injured and this injury was a scraped front foot that should heal quickly.

This method was further put to the test during a one-day search for hellbenders on 17 November 1992 during which it snowed almost constantly with an air and water temperature of 2°C. One hellbender was located. This search was hampered by both the weather and high water conditions. Without the peavey it would have been very difficult to locate any hellbenders.

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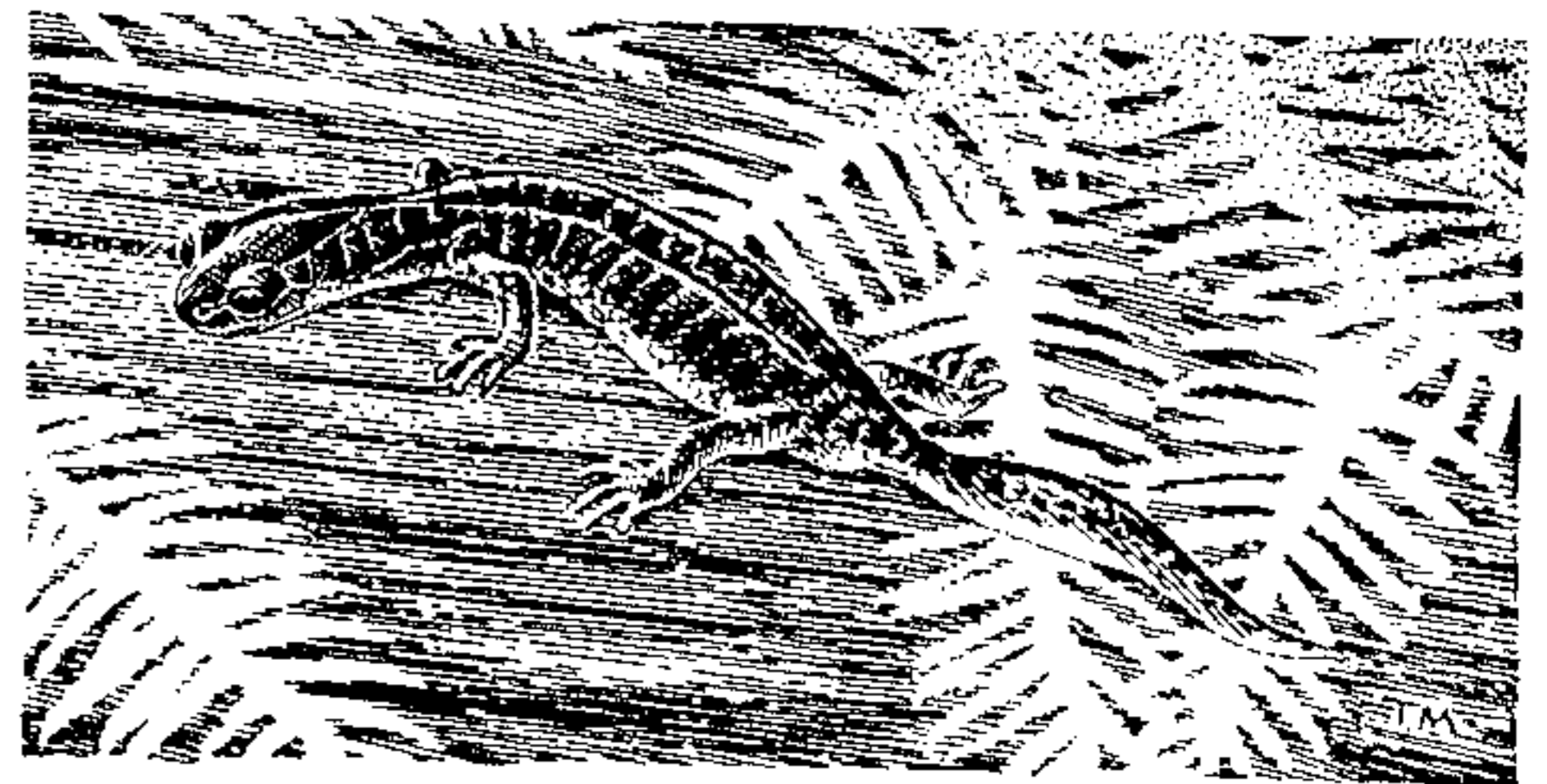
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*Ensatina eschscholtzii*. USA: California: Del Norte Co., Ruby Van Deventer County Park, Smith River. Illustration by Tim Manolis.