

Using environmental DNA as a sampling method for occupancy modeling in the Eastern Hellbender (*Cryptobranchus alleganiensis alleganiensis*)

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Chopsticks for Salamanders Grant Update

From May to August, we conducted 75 hellbender, habitat, and eDNA surveys throughout the New and Watauga River Drainages in Western North Carolina. It was certainly a long and exhaustive summer, but it was also extremely productive. In total, we captured 89 hellbenders with a total of 29 recaptures between the three rounds of surveys. A couple of the highlights from this summer include catching the largest hellbender recorded in NC (60cm, 1655g) as well as catching a hellbender with just a humerus bone sticking out for a leg (see pictures). Our repeated surveys helped us find hellbenders at sites where we had not found them during a previous survey round (for example: no hellbender round 1, no hellbender round 2, captured hellbender round 3). This supports the efficacy and necessity of using occupancy modeling designs for traditional hellbender surveys. Further, we will be looking to the eDNA results to see if in fact hellbenders were present during all three survey rounds while we failed to detect them with our traditional survey methods.

With all of our field work completed, I am awaiting the results from the eDNA samples to finish running the occupancy models. With the outputs of our models for both traditional and eDNA surveys, I will compare the two survey methods' estimates of occupancy and detection. Moreover, the covariates we collected for stream parameters will be included to account for our ability to detect hellbenders and determine why these hellbenders are occupying the streams that we find them in. Additionally, I will be able to use the two survey methods to estimate false-negative rates in our eDNA samples. We are all looking forward to the results of our hard work.

Pictures:



NC record hellbender shown in a cm measuring board



Tommy Franklin PIT tagging a hellbender



eDNA filtration field set up