Introduction

- Passive integrated transponder (PIT) tags are an effective method of uniquely marking individual vertebrates across a wide range of taxa (1, 2).
- Portable antennas have been used recently to monitor fish and salamanders (3, 4, 5, 6).
- The cryptic nature of snakes presents challenges for detection and developing estimates of population parameters (7).

Objective: Assess the efficacy and applicability of PIT tag telemetry for studies of natricine snakes.

Methods

- Preliminary mark-recapture surveys were conducted (May – July 2013) along a 200 m stretch of Little Hickman Creek in Jessamine County, Kentucky.
- 12 mm PIT tags (Biomark) were implanted (using the Biomark MK10 Implanter) into the abdominal cavities of individuals upon initial capture.
- 35 Northern Water Snakes and 33 Queen Snakes PIT tagged before surveys were conducted.
- In August, we conducted 3 surveys using traditional searching methods and 11 surveys (3 morning, 4 afternoon, and 4 night) using the portable PIT tag reader to detect PIT tagged snakes.
- Detections of tagged snakes were recorded with geographic coordinates using the portable reader.
- Single factor ANOVA was used to assess significance of differences in mean numbers of snakes detected (Excel 2010).
- Linear distances between initial detection sites and the furthest subsequent detection sites were calculated (ArcGIS v.10.1).

Results

- 130 total Queen Snake detections (30 morning antenna, 52 afternoon antenna, 39 night antenna, 9 afternoon manual).
- 33 total Northern Water Snake detections (10 morning antenna, 12 afternoon antenna, 9 night antenna, 2 afternoon manual).
- 20 Queen Snakes were detected on at least two separate occasions.

Conclusions

- Surveys conducted with a portable antenna detected significantly more PIT tagged snakes than surveys conducted using traditional searching methods.
- Multiple detections of marked individuals can provide useful spatial data.
- PIT telemetry shows advantages over traditional methods of acquiring ecological and behavioral data and additional applications of this technology should be investigated to maximize utility.

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References