

Use of Automated Radio Telemetry to Detect Nesting Activity in Ornate Box Turtles, *Terrapene Ornata*

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ABSTRACT.—Researchers often employ radio telemetry to locate study animals efficiently, but the time required to locate individuals can make monitoring large populations difficult and costly. In 2010–2011 we located nesting ornate box turtles (*Terrapene ornata*) in a large group of radio-tagged animals. To minimize search efforts, we investigated whether automated radio telemetry and the signal change method could be used to identify nesting activity before locating animals. The signal change method relies on the principle that any movement of a radio transmitter, including minor changes in orientation, can strongly affect the intensity of the transmitter's signal at a stationary receiving station. Using video recordings of free-ranging radio-tagged turtles, we confirmed that transmitter signal strength values can be analyzed to identify periods of box turtle activity. Early in the 2010 nesting season, automated telemetry observations indicated that some females engaged in nocturnal activity. Previous reports indicate that ornate box turtles often nest at night but are otherwise inactive after dark. Based upon this information and relatively little indication of nocturnal activity by males, we hypothesized that nocturnal activity corresponded to nesting. We subsequently monitored female nighttime activity in near real time, hand-tracked four night-active individuals, and found three of these turtles nesting. In 2011 we again selectively hand-tracked night-active females and located nests for 12 of 18 study animals, which approximates the expected annual reproductive rate for our population. We demonstrate that the signal change method can be used to identify nesting activity in ornate box turtles and suggest this method may be of use in other species that nest outside of their normal activity periods.

INTRODUCTION

Behavioral data may be collected in the field by a variety of methods. Focal observations allow researchers to make detailed observations (Ruby and Niblick, 1994) but require significant time investment to collect and may influence the behavior of study animals (Baker and McGuffin, 2007). Video recordings of animal behavior may reduce the impacts

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