

Blanding's Turtle, *Emydoidea blandingii*, Habitat Use During Hibernation in Eastern Ontario

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Seven Blanding's Turtles (*Emydoidea blandingii*) were followed using radiotelemetry to determine their habitat use during hibernation near Ottawa, Ontario. During May to August, five of the seven turtles occupied wetlands in which they would eventually hibernate. The turtles hibernated in five different wetlands: three in Organic Shallow Marsh Ecosites and two in Organic Thicket Swamp Ecosites. One Blanding's Turtle over-wintered in a temporary marsh that did not form until October. Blanding's Turtles do not appear to be limited in their choice of suitable hibernation sites even near the northern range limit of the species.

Key Words: Blanding's Turtle, *Emydoidea blandingii*, habitat, hibernation, Ontario.

The Blanding's Turtle (*Emydoidea blandingii*) is commonly found in association with shallow wetlands with an organic bottom and abundant aquatic vegetation (Ernst and Lovich 2009). It generally uses a variety of wetland types (Piepgras and Lang 2000, Joyal et al. 2001), with individuals occupying up to 20 wetlands per year (Beaudry et al. 2009). The Blanding's Turtle is a species of conservation concern across much of its range and in Canada populations in Ontario and Quebec are designated threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2005*). To protect Blanding's Turtle habitat effectively it is important to identify all habitats used throughout the year. While Blanding's Turtles move from summer wetlands to different wetlands for hibernation in some populations (e.g., Piepgras and Lang 2000), in other populations most individuals hibernate within their summer wetlands (e.g., Joyal et al. 2001). The purpose of the current research, part of a larger study on habitat use on federal land, was to determine habitat use during hibernation at the northern edge of the range.

Study Area and Method

The study was undertaken at the Shirleys Bay Crown Game Preserve located along the Ottawa River (45.38°N, 75.92°W) west of Ottawa, Ontario. The preserve consists of a variety of wetlands and upland forest and is over 1000 ha in size. It is part of the Connaught Ranges and Primary Training Centre, an active military site of the Department of National Defence.

Blanding's Turtles were caught by hand and sexed using plastron shape and vent position (Ernst and Lovich 2009). All turtles less than 18 cm plastron length were deemed to be juveniles (e.g. Graham and Doyle 1977). As size at maturity varies, this may have resulted in some mature females being deemed juveniles. Turtles were outfitted with Holohil SI-2F radio transmitters. Each 12 g transmitter accounted for less than 5% of the turtle's weight. Transmitters were at-

tached to the rear edge of the carapace using 5-Minute Epoxy (Lepage 12). Waterproof epoxy (PC-7) was then molded to the transmitter to "streamline" its shape, hide its brass casing, and seal any edges which might otherwise get entangled on plant material. Turtles were released at their capture site and subsequent tracking occurred on foot using a TRX-2000S radio receiver and a three-element Yagi antenna. In general, tracking occurred once or twice per week, from time of first capture until late October and then one final time after first snowfall (11 December). Turtles were re-located the following spring to confirm their hibernation location, their survival and to remove transmitters. Tracking in some or all areas was prevented at times because of military exercises. All wetlands used by Blanding's Turtles were classified according to the land classification guide for the province of Ontario (Lee et al. 1998).

Results

Blanding's Turtles were captured from 7 May to 3 June 2007. Six of the turtles were captured in 4 different wetlands, separated by up to 2 km. The remaining turtle was captured on land. Radio transmitters were attached to 4 females (mean = 21 cm plastron length, PL), 2 males (mean = 20 cm PL) and 1 large juvenile (17 cm PL).

Only 1 of the 6 turtles originally caught in a wetland hibernated in the wetland where it was first caught. During May to August, 5 of the 7 turtles occupied wetlands they would eventually hibernate in. Two of the turtles left these wetlands only to return later in the season: one by the end of August, and the other after 10 October. No turtle changed wetlands after 26 October.

The 7 turtles hibernated in 5 different wetlands. Three of the 5 wetlands used for hibernating were Organic Shallow Marsh Ecosites (dominated by Cattails, *Typha latifolia*). The remaining 2 wetlands were both Organic Thicket Swamp Ecosites (dominated by Speckled Alder, *Alnus incana*, and willow, *Salix* spp.).

Although Blanding's Turtles occupied a number of other wetlands, the only other wetland type used was Maple Organic Deciduous Swamp Ecosite. This type of wetland dried up during June, prompting the movement of turtles.

The 2 largest hibernation sites (> 2 ha) each had 2 radio-tracked turtles hibernating within them. Radio-tracked turtles in the same wetland were not hibernating communally, but were less than 20 m apart. It is noteworthy that one adult female left a large permanent marsh to hibernate in a temporary marsh adjacent to it. This site did not fill with rain until October, but the turtle was first tracked there on 28 September, on dry land. On 1, 5 and 10 October she was tracked to a third wetland, returning to the temporary wetland between 10 and 26 October.

Discussion

Blanding's Turtles hibernated in marshes and shrub swamps in the current study. Other studies have found Blanding's Turtles to hibernate in a wide variety of locations, including "permanent pools" (Joyal et al. 2001), ponds (Ross and Anderson 1990), marshes (Edge et al. 2009), shrub swamps (Sajwaj and Lang 2000; Kiviat et al. 2004), Red Maple (*Acer rubrum*) swamps (Joyal et al. 2001, Kiviat et al. 2004), bogs and fens (Edge et al. 2009; Newton and Herman 2009), spring fed ponds (Kiviat et al. 2004), and streams (Newton and Herman 2009). The choice of one of the turtles in this study to hibernate in a small temporary marsh is in contrast to the other more permanent wetlands used by individuals in this study or other studies previously cited. The fact that the turtle moved to the wetland before it filled with water suggests that the turtle was familiar with the wetland and had probably hibernated there previously. To the best of my knowledge, this represents the first documented use by Blanding's Turtles of such an ephemeral wetland for hibernation, although Conant (1951) reported two individuals hibernating on land under wet leaves at the Toledo Zoo.

The fact that Blanding's Turtles hibernated in a range of wetland types and sizes suggests that hibernation sites were not limiting at this location. In their review of turtle winter ecology, Ultsch and Reese (2008) concluded that suitable hibernacula are likely not a limiting factor for turtle species that are anoxia tolerant. Although quantitative studies on anoxia tolerance of Blanding's Turtles have not been undertaken, field studies suggest it is anoxia tolerant (e.g., Sajwaj and Lang 2000, Edge et al. 2009, Newton and Herman 2009).

In this study, five of seven Blanding's Turtles hibernated within wetlands they used during the spring or summer. Similarly, 10 of 14 Blanding's Turtles in Maine hibernated within their summer range (Joyal et al. 2001). Nonetheless, identification of wetlands used by Blanding's Turtles based strictly on observations of basking individuals will likely underestimate

the total habitat used and may exclude some hibernation sites. Given the fidelity Blanding's Turtles demonstrate to hibernation sites (e.g., Kiviat et al. 2004; Edge et al. 2009; Newton and Herman 2009) such an oversight could result in a lack of protection for important habitats.

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