

RED-BELLIED SNAKE (*STORERIA OCCIPITOMACULATA*) COPULATION IN SOUTH DAKOTA

— *Storeria occipitomaculata* is a small, terrestrial species of snake that occurs across much of eastern North America (Ernst and Barbour 1989, Ernst 2002, Ernst and Ernst 2003). Due to this widespread distribution, *S. occipitomaculata* faces varied climates that likely result in regional differences in reproductive phenology. Much of what is known about the reproductive ecology of *S. occipitomaculata* has been documented from the southeastern portion of its range in North America (South Carolina: Semlitsch and Moran 1984, North Carolina: Willson and Dorcas 2004), though Blanchard (1937) studied a population from northern Michigan. The exact reproductive timing in this species has been difficult to determine due to the longevity of sperm in female oviducts (Trapido 1940), but reproduction is suspected to occur throughout the spring, summer, and fall (Wright and Wright 1957, Fitch 1970). In eastern North America, multiple sources report reproduction in this species as occurring in the spring and fall (e.g., DeGraaf and Rudis 1983, Mitchell 1994, Beane et al. 2010), with direct observations of copulation reported in May (North Carolina: Palmer and Braswell 1995), July (New York: Bishop 1927), and September (Kentucky: Cupp et al. 2012, New York: Trapido 1940, Pennsylvania: Meshaka 2010). Fewer details are available on when this species reproduces in the northern Great Plains along the western boundary of its distribution, with a single published observation of a road-killed female found in August in Manitoba, Canada, with a copulatory plug, suggesting recent copulation (Gregory 1977).

Storeria occipitomaculata has a patchy distribution in eastern South Dakota, with an isolated, disjunct population in the Black Hills (Smith 1963, Ballinger et al. 2000). Though knowledge of the distribution of *S. occipitomaculata* in South Dakota has increased in recent years (Davis et al. 2016, 2017, Davis 2018), this species remains infrequently observed in South Dakota, which has resulted in a paucity of information on its natural history. Both Cahoe and Troelstrup (2004) and Dieter and Ronningen (2017) studied populations of *S. occipitomaculata* in South Dakota, but neither report observations of copulating individuals. Here, I report an observation of spring copulation for *S. occipitomaculata* in southeastern South Dakota.

On 28 April 2018 at 1508 h, I discovered a copulating pair of *S. occipitomaculata* (TNHC 111513 [DRD 4728]: male, 3.1 g, 188 mm SVL, 61 mm tail length; TNHC 111514 [DRD 4729]: female, 3.6 g, 205 mm SVL, 60 mm tail length) under a wooden board (ca. 1 m²), adjacent to an abandoned grain elevator, east of Milltown, Hutchinson County, South Dakota, USA (43.42681°N, 97.79309°W; WGS 84). As I was collecting the copulating pair, I found another adult male (TNHC 111424 [DRD 4730]: 3.3 g, 207 mm SVL, 54 mm tail length) immediately adjacent to them. Numerous *S. occipitomaculata* were observed under cover objects and

crossing roads in this region during snake surveys from 28 April–3 May 2018, corresponding with the first series of warm days for the year (ambient high temperatures: 16.7–30° C).

This observation provides the first published account of *S. occipitomaculata* copulation in South Dakota and is likely one of the earliest observed copulation events for this species. Other authors such as Kiesow (2006), Collins et al. (2010), LeClere (2013), and Moriarty and Hall (2014) have suggested spring and/or fall copulation for *S. occipitomaculata*, but none provide details on copulation from the region. Temperature has been shown to trigger activity in *S. occipitomaculata* (Semlitsch and Moran 1984) and likely influences emergence from winter dormancy and reproductive behaviors like many other North American snakes (Duvall et al. 1982, Gregory 1982). Further, the ability for female *S. occipitomaculata* to store sperm (Trapido 1940) makes determining the exact reproductive timing for this species difficult, which highlights the importance of direct observations.

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