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Unusually Large Prothonotary Warbler Clutch at Tishomingo National Wildlife Refuge.—Prothonotary Warblers (*Protonotaria citrea*) typically lay 3–7 eggs per clutch throughout their range (Petit 1999). Mean clutch size ranges from 4.31 eggs/nest in Wisconsin (Flaspohler 1996) to 4.98 eggs/nest in Michigan (Walkinshaw 1941). I observed a mean clutch size of 4.6 eggs/nest with a range of 1–6 eggs/nest for Prothonotary Warblers at Tishomingo National Wildlife Refuge (NWR) from 2003 to 2006.

On 19 June 2006, my field technician, Stormy Shoopman, found an unusually large number of Prothonotary Warbler eggs in a nest box at the Tishomingo NWR. She found 8 Prothonotary Warbler eggs in Box

46, located approximately 2 km west of the Refuge Headquarters. The box was previously checked on 12 June and had a nest with a cup, but no eggs. On 26 June, I captured the incubating female from Box 46 and discovered she was already banded (Band No. 1680-50873) and this was her second nest attempt of 2006.

I originally banded her as a second-year (SY) female on 27 May 2003 at Box 33, about 537 m from Box 46. In 2003, this female had 2 successful nests and fledged 8 young. She also was recaptured once in 2004 and twice in 2005, but did not have successful nests in either year. On 22 May 2006, I caught her when she was incubating 5 eggs in Box 45, about 17 m from Box 46. She successfully fledged 5 young on 7 June 2006. After her first nest of 2006 in Box 45, female 1680-50873 moved to Box 46 that was previously occupied by a different female.

As to the outcome of the 8-egg clutch, there were 3 hatchlings and 3 unhatched eggs in the nest on 3 July 2006. It appeared that 2 eggs hatched, but the chicks died soon after hatching and the parents had removed the eggshells. This is fairly common in Prothonotary Warbler nests when brood reduction occurs at hatching. Jona Reasor, the Tishomingo NWR biologist, and I returned on 7 July to band the nestlings. We found 2 unhatched eggs and 2 nestlings which we banded. The nestlings were almost 2 g lighter than typical Prothonotary Warbler nestlings at that stage of development. Of the unhatched eggs, we discovered that 1 was cracked and had no embryo development and a bad odor. The other egg had a well-developed embryo that died just before hatching. This incomplete incubation may have been a result of the large clutch size because the female's brood patch can provide adequate heat distribution only to a smaller clutch. The 2 nestlings successfully fledged on 14 July.

An 8-egg clutch is a rarity (Petit 1999) for this species and the first I have documented during 4 years of research at Tishomingo NWR. The largest clutch I previously documented was 6 eggs. However, 6-egg clutches are routinely found in Prothonotary Warbler nests at Tishomingo NWR. Although there are references to 7–8 egg clutches in the literature (Petit 1999), I was unable to find documentation on the outcome of large Prothonotary Warbler clutches. Charles Blem (pers. comm.) studied Prothonotary Warblers extensively in Virginia, and he documented only 3 8-egg clutches among 2,828 Prothonotary Warbler nests. Those nests had low nestling survival, and some eggs were buried. He suggested that 8-egg clutches were the result of 2 females competing for the box with 1 female ultimately gaining control. He further suggested that the female who gained control of the nest buried her competitor's eggs and only incubated her eggs; however, no eggs were buried in my observation.

There are 2 possible explanations for this unusually large clutch size. The female may have obtained sufficient nutritional resources to lay a large number of eggs in a short period of time. I think this explanation is unlikely for 2 reasons. First, she had recently fledged a 5-egg clutch and it would be difficult for a female to obtain enough calcium and other nutrients to lay 3 more eggs than in her first clutch in such a short period of time. Second,

eggs are typically laid once per day and she would have begun laying the first of 8 eggs just 4 days after fledging her first clutch. This is unlikely to have occurred.

The second, and more likely, explanation is that this clutch was laid by 2 different female warblers and female 1680-50873 usurped the nest from the previous female. Only one female was incubating this nest, so it is possible that she laid the majority of the eggs in the clutch; although I do not have data to support that conclusion. However, it is not unreasonable to speculate that the previous resident of Box 46 or a female from an adjacent territory could have contributed ≥ 1 egg to the clutch. This is known as egg dumping and occurs fairly frequently among avian taxa; however, it has not been documented for Prothonotary Warblers (Petit 1999). Genetic testing of parents and offspring would provide a better understanding of Prothonotary Warbler clutch parentage.

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