



Photograph by Matthew Kirby

## Eastern Tiger Salamander

### *Ambystoma tigrinum*

The Eastern Tiger Salamander is the largest terrestrial salamander in eastern North America. The common name “tiger” refers to the irregular vertical blotches or bars of yellow to olive gray on a dark brown to black background that cover its robust back and sides. In juveniles and young adults, these can appear more as spots, which extend further down the sides than on Spotted Salamanders (Petranka 1998; White and White 2007; Mitchell and Gibbons 2010). Tiger Salamanders have a large, round, dorsally flattened head with relatively small eyes and have stout limbs and a long, knife-edged tail. Adult Eastern Tiger Salamanders typically measure 18–21 cm in total length and reach a maximum total length of 33 cm. Adult females are the same size or slightly larger than males, although the male’s tail is proportionally longer and taller. Males also can be distinguished by a swollen cloaca during the breeding season (Stine 1984; Petranka 1998).

The Eastern Tiger Salamander is patchily distributed across the eastern United States, from Long Island, New York, west through Minnesota and south to northern Florida and eastern Texas. It is mostly absent from the Appalachian Highlands and occurs in scattered, disjunct populations on the Atlantic Coastal Plain and lower Mississippi Delta. In Maryland, Eastern Tiger Salamanders have been reported only from the Atlantic Coastal Plain. They were first discovered in Maryland in 1933 in Dorchester County (Netting 1938; Stine et al. 1954) and were subsequently found in Caroline County in 1937, Kent and Queen Anne’s counties in 1952 (Stine et al. 1954; Stine 1984), and Charles County in 1953 (Stine 1984). Unverified reports include two

from the 1950s for Somerset County (Reed 1957c; Stine 1984) and one from 1964 for Worcester County (Stine 1984). The only known Western Shore population, located in Charles County, was extirpated in 1963 when construction of a golf course near La Plata destroyed the breeding pond (H. S. Harris 1975; Stine 1984). A single adult Eastern Tiger Salamander was found in Anne Arundel County in 1962, but this was believed to have been an introduction, possibly transported in the root ball of horticultural plantings from Kent County (Stine 1984).

This salamander is primarily fossorial and is rarely encountered except during the breeding season. Its habitat is highly variable range-wide, but optimal habitats include sandy or otherwise friable soils associated with suitable breeding ponds (Petranka 1998). Tiger Salamander habitats on the Delmarva Peninsula include moist, often sandy deciduous, coniferous, or mixed woodlands associated with breeding pools, such as Delmarva bays, fishless human-made ponds, and borrow pits (Arndt 1989; White and White 2007). Simpson (2009) reported that hydroperiods in six Maryland breeding ponds were moderate to long, with some drying as early as mid-June and others still inundated in August. Longer hydroperiods are critical for successful development because larval periods can be long and are highly variable, depending on site conditions, timing of egg laying, and availability of food resources (Petranka 1998). In years with low rainfall, most or all breeding ponds have no successful metamorphosis (Petranka 1998; S. A. Smith, unpubl. data).

Breeding in Maryland can occur from late November to early April (Stine 1984; S. A. Smith, unpubl. data) and is triggered by warm, heavy rains with a few nights above freezing. Breeding often occurs during the so-called winter thaw in late January or early February. Males enter breeding ponds a few days to weeks before females arrive. After a nuptial dance by the male that includes snout-rubbing the female’s body and grasping her side, the male deposits 8–37 pyramidal-shaped, gelatinous spermatophores on the pond bottom (Petranka 1998). If the female is receptive, she will collect a spermatophore with her cloaca, thus fertilizing her eggs (Petranka 1998). Tiger Salamanders exhibit the greatest variation in clutch size of any salamander, attaching several gelatinous egg masses containing 5–165 embryos onto live and dead vegetation or other support structures in the pond, often near the bottom (Stine 1984; Petranka 1998). Stine (1984) reported a range of 17–144 embryos per egg mass with an average of 45 embryos for a Maryland pond. Individual females lay 5–8 egg masses (J. D. Anderson et al. 1971). The egg masses of Eastern Tiger Salamanders can be distinguished from those of Spotted Salamanders as they are flimsy and tear apart when lifted out of water, while Spotted Salamander egg masses are solid and hold their form out of water. The larval period lasts 2.5–5 months. Sexual maturity

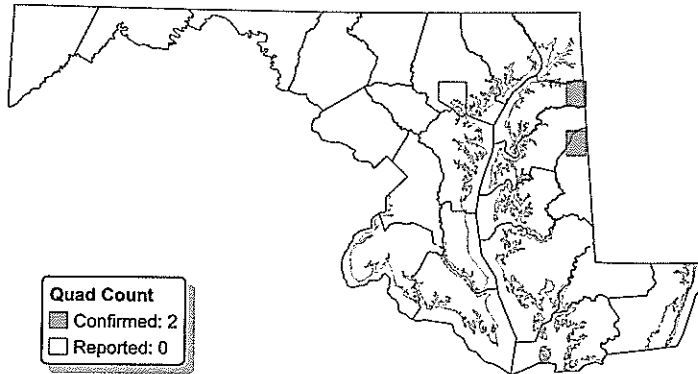
is reached in as little as 2 years (Petranka 1998), though it can take up to 8 years (Kathy Clark, pers. comm.). Tiger Salamander longevity is 16-25 years (Petranka 1998).

During the atlas project, Eastern Tiger Salamanders were confirmed in only two quads and four blocks in two counties, Caroline and Kent. The MARA results show considerably fewer occurrences than were shown by H. S. Harris (1975), who considered the entire Atlantic Coastal Plain of Maryland as the species' probable range. Localities on Harris's map covered eight counties, including historical records and unverified reports. The MARA results are more similar to the map published by Stine (1984), which showed only seven extant breeding ponds in Caroline and Kent counties. Surveys from 1997 to 2015 by Bryan DuBois, Nathan Nazdrovicz and Jim White, and S. A. Smith (all unpubl. data) and by Otto (2006) and Simpson (2009) reported breeding at 21

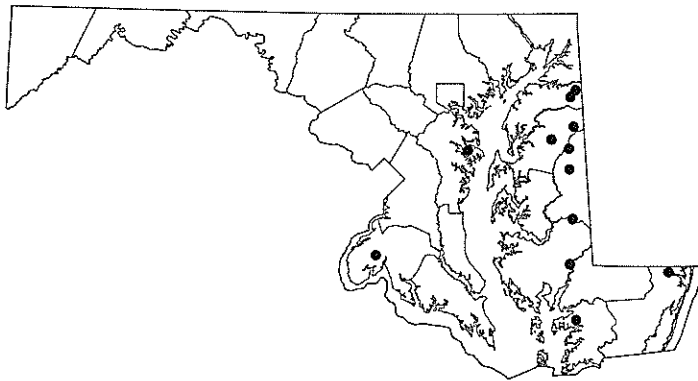
total ponds in Caroline and Kent counties. An adult was also found in Dorchester County adjacent to a breeding pond located in Sussex County, Delaware. Not all of these documented sites were surveyed specifically for Eastern Tiger Salamanders during the atlas project, but if included would have increased the totals to three quads and seven blocks.

The Eastern Tiger Salamander is listed as a state-endangered species in Maryland (MDNR 2016b), but many of the known breeding ponds are clustered on public and private conservation lands, so the potential for successful management efforts is high. Protection of Delmarva bays, vernal pools, and other breeding ponds and the forested matrix that surrounds and connects them is critical to long-term population viability for this salamander species.

SCOTT A. SMITH



Distribution by quad



Historical locations. Adapted from H. S. Harris (1975)