

## Opportunistic Offshore Sighting of a Tricolored Bat (*Perimyotis subflavus*)

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**Abstract** - During a marine mammal vessel survey, a single *Perimyotis subflavus* (Tricolored Bat) was sighted 103.5 km off the coast of North Carolina. While we cannot determine whether the bat flew unaided from the mainland or stowed away on a ship, this is likely the furthest offshore sighting for the species. The possibility of Tricolored Bats flying offshore could have implications for wind-energy programs or other offshore industries.

The records of offshore bat observations date back to the 1890s (Hatch et al. 2013). Once rare, offshore sightings of bats are becoming more frequent due to increased survey efforts (Solick and Newman 2021). Several bat species have been observed offshore, primarily during monitoring for offshore energy projects (Peterson 2016). However, the movements and migratory patterns of some bat species, including *Perimyotis subflavus* (F. Cuvier) (Tricolored Bat), are poorly understood. The Tricolored Bat, one of the smallest bat species in North America, is typically found in forests of North America through northern Central America (Fujita and Kunz 1984). Herein, we report an offshore sighting of a Tricolored Bat.

We observed a single Tricolored Bat 103.5 km due east of Corolla, NC (36°17'24.8814"N, 74°38'48.663"W; Fig. 1) at 10:36 am on 6 August 2018 while we were conducting a marine mammal survey departing from Rudee Inlet, Virginia Beach, VA. As the vessel traveled slowly, the bat approached and began circling the 16-m charter boat. The bat eventually flew into the covered bridge area of the boat where the marine mammal observers were stationed and landed on the boat captain for about a minute. We took photographs during the encounter to confirm species identification (Fig. 2). Next, the bat flew away, and we saw it circling the vessel a few more times, landing on the back deck at one point. Still, it did not remain with the vessel longer than 10 minutes. The observation location was 18.5 km off the continental shelf. The weather on the day of the observation was clear with calm seas: Beaufort Sea State 2, 0.3 m swell, SE winds, and 15% cloud cover.

Tricolored Bats are thought to migrate relatively short distances (<100 km) between their summer breeding areas and winter hibernacula (Bisson et al. 2009, Fraser et al. 2012, Smith et al. 2022). However, limited data are available on distances traveled during summertime when they forage or engage in other behaviors (Fraser et al. 2012). Many Tricolored Bats travel <100 km between their summer and winter habitats (Smith et al. 2022). Recent evidence suggests that some Tricolored Bats undertake longer latitudinal migrations, especially in the northern part of their range (Fraser et al. 2012). Some Tricolored bats have been found to summer >100 km south of their hibernation sites, with at least one bat traveling >1300 km (Smith et al. 2022). Still, it is unknown whether this species regularly travels offshore, similar to other bat species in the mid-Atlantic (Sjollema et al. 2014). An alternative explanation for our observation is that this individual was diverted offshore due to weather or other external factors. Offshore observations of Tricolored Bats are rare (Solick and Newman 2021). However, they have been acoustically detected and visually observed

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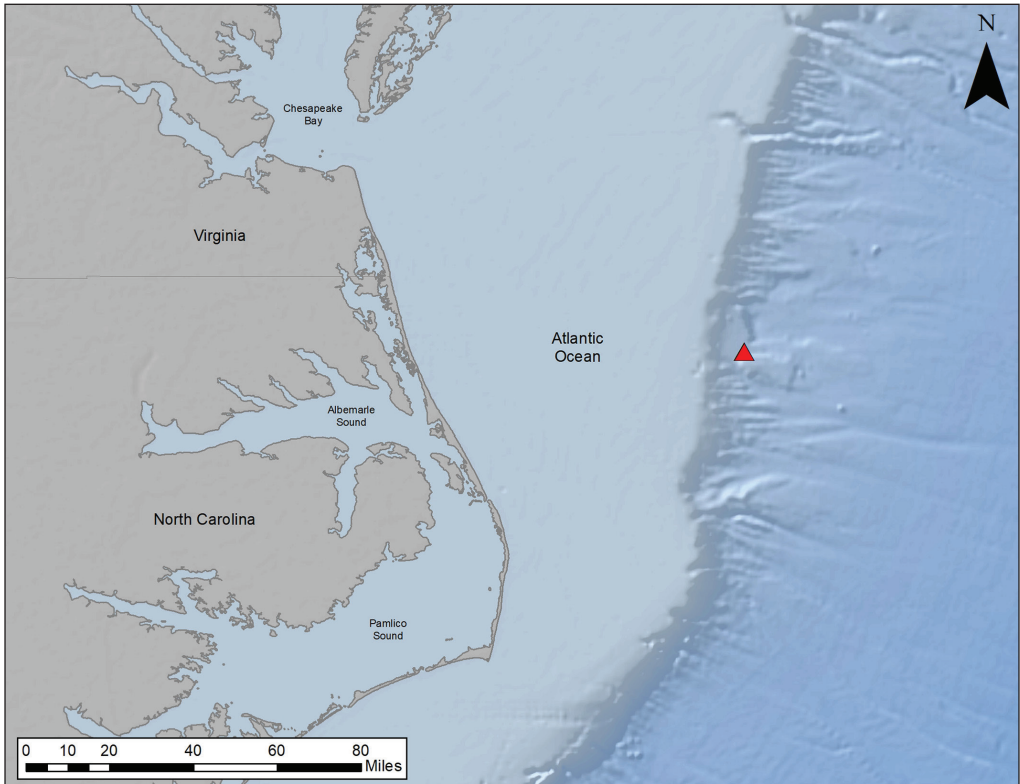


Figure 1. Sighting location of an individual Tricolored Bat off the coast of North Carolina (103.5 km due east of Corolla, NC; 36°17'24.8814"N, 74°38'48.663"W) on 6 August 2018 (red triangle).



Figure 2. Tricolored Bat after landing on the boat captain 103.5 km off the coast of North Carolina.

on islands or coastal habitats such as Nova Scotia (Broders et al. 2003), the Gulf of Maine (Peterson 2016), Martha's Vineyard (Buresch 1999), Assateague Island (Johnson and Gates 2008), and Bermuda (Grady and Olsen 2006). It is feasible that, at least in some of these cases, the bats were aided by human transport.

The Port of Norfolk, VA, is the third largest port on the US eastern seaboard, with ships traveling in and out of the mouth of the Chesapeake Bay. Possibly, the bat we observed roosted in a commercial shipping vessel that left port and transited offshore. We do not believe the bat was on the survey vessel when it departed port. Several bat species have been known to roost in ships. There are records of bats found dead in shipping containers or surviving transatlantic crossings (Daniel and Yoshiyuki 1982, Grady and Olsen 2006, Sjollem et al. 2014, Voute 1982). While Tricolored Bats commonly roost in culverts, bridges, or foliage depending on the time of year (Fujita and Kunz 1984, Loeb and Winters 2021, Smith et al. 2022), they have not been documented roosting in mobile platforms such as vessels.

Our observation likely represents the furthest known offshore sighting of a Tricolored Bat. The species was recently proposed for listing as endangered under the Endangered Species Act (USFWS 2022) mainly due to the harmful effects of white-nose syndrome caused by the fungus *Pseudogymnoascus destructans* (Blehert & Gargas) Minnis & D.L. Lindner that infects hibernating bats. This observation occurred within the vicinity of a planned offshore wind farm (Dominion Energy 2023). The impacts of offshore wind development on bat populations remain uncertain, as most offshore wind-energy projects in the United States are still in the early stages of development. However, the patterns of bat activity observed in offshore environments suggest a potential risk of collision with wind turbines (Sollick and Newman 2021). Consequently, continued research to determine the extent to which Tricolored Bats and other bat species use the offshore environment is warranted, particularly given the high projected growth in offshore wind-energy development.

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J.E. Bort Thornton, M.E. Richlen, T.B. McDonald, and J.T. Bell

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