

An Eastern Ribbonsnake, *Thamnophis saurita* (Linnaeus, 1766), scavenging on a roadkilled Cuban Treefrog, *Osteopilus septentrionalis* (Duméril & Bibron, 1841), in Everglades National Park, Florida, USA

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The Eastern Ribbonsnake (*Thamnophis saurita*) is a semi-aquatic, typically diurnal species native to the eastern United States and found mostly in aquatic and semi-aquatic habitats (Meshaka and Layne, 2015). The diet of these snakes within their southern distribution is relatively understudied, but they appear to prey almost exclusively on anurans (Langford et al., 2011; Meshaka and Layne, 2015). Populations of this species are declining across their range.

On 27 August 2024 during a night-time road survey for native snakes along Main Park Road in Everglades National Park, an Eastern Ribbonsnake was observed in the middle of the road at 23:02 h. The snake was actively consuming a deceased Cuban Treefrog (*Osteopilus septentrionalis*). The treefrog had been struck by a vehicle, as evidenced by its torn skin, exposed organs, and adherence of multiple body parts to the pavement (Fig. 1). When first observed, the snake had consumed approximately three-fourths of the frog, feet first. In 15 min of observation, the snake readjusted its jaws multiple times, tried dragging the prey away – most likely because of our presence – and ended with only one-fourth of the frog remaining in its mouth after regurgitating the rest. We observed the snake for an

additional 30 min during which it continued to try to consume the prey (Fig. 1). At the end of that time, it fully regurgitated the frog and moved off the road.

Carrion is common on roadways and can provide a source of food for many species that scavenge (Chyn et al., 2024). Observations of scavenging behaviour by snakes has been largely opportunistic, but there is some evidence to suggest that this behaviour may be more common than previously thought. DeVault and Krochmal (2002) summarized reports of scavenging by snakes and found 26% of field observations of scavenging were by semi-aquatic or aquatic snakes, including several species of *Thamnophis*. The same review reported that of 29 observations involving carrion consumption, 17 were obvious road-killed prey, including an analysis of gut contents from six snakes that showed more evidence of scavenging of already dead prey (DeVault and Krochmal 2002).

Osteopilus septentrionalis is an invasive species that was first confirmed in the United States in the 1920s and is now present throughout most of Florida, with additional breeding populations documented in Georgia and Louisiana (Barbour, 1931; Jarboe et al, 2019). When threatened, this frog species secretes a sticky toxin that may be irritating to mucous membranes and other sensitive tissue of predators. While little is known about the effects of this toxin on snakes, it is likely harmful because native snakes did not coevolve with this group of treefrogs (Goetz et al., 2018). A 2018 study found that consumption of *O. septentrionalis* by the Eastern Gartersnake, *T. sirtalis sirtalis* (Linnaeus, 1758), had sub-lethal, long-term negative effects, including weight loss, digestion issues, and regurgitation (Goetz et al., 2018). While this suggests that Cuban Tree Frogs most likely have more harmful levels of toxins than native tree frogs and may cause more damage internally, lethal

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Figure 1. Eastern Ribbonsnake (*Thamnophis saurita*) consuming a recently roadkilled Cuban Treefrog (*Osteopilus septentrionalis*) in Everglades National Park, Florida, USA, in August 2024. Photo by E. Lane.

effects to snakes after consumption of Cuban Tree Frogs have not been documented. Furthermore, during laboratory trials gartersnakes did not appear to have a consumption preference between Cuban Treefrogs and native frog species (Goetz et al., 2018). Love (1995) documented an opportunistic observation of a Peninsular Ribbonsnake, *Thamnophis sauritus sackenii* (Kennicott, 1859), consuming a Cuban Tree Frog with no obvious difficulties during ingestion. We observed the snake regurgitating the Cuban Tree frog, but what triggered regurgitation (e.g., toxicity or disturbance from observer presence) is unknown. Although the snake began consumption after the frog was dead, toxins could have been present on the outer surface of the frog because of the extensive damage to its body.

Our observation adds to the existing literature suggesting that scavenging in native, semi-aquatic snakes may be an under-observed phenomenon. However, consuming invasive anurans, such as this Cuban Tree Frog, may outweigh the benefits of scavenging if the cumulative effects of exposure to toxins on individual fitness are negative. While this observation may not be unexpected, we are unaware of previous accounts of *Thamnophis saurita* scavenging a road-killed *Osteopilus septentrionalis*. Our observation highlights the general lack of information available on the behaviour of native snakes in the presence of potential non-native prey. A better understanding of the frequency of consuming (live or scavenged) non-native prey could inform the extent of this phenomenon.

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