

Effects of Non-native Predators on the Gopher Tortoise

Gopher tortoise (*Gopherus polyphemus*) populations are in decline and understanding sources of mortality of early life-stages (e.g., eggs and hatchlings) may play a pivotal role in successful restoration and management of populations. Mammals are the primary predators of tortoise eggs and hatchlings, and they use visual and/or scent cues to locate them. Gopher tortoises often nest in the apron of sand outside their burrow, which may serve as a visual cue for predators, though tortoises also lay eggs in other natural openings when available. Limited research has investigated survival of nests at burrows versus those at other locations, yet this information has important implications for habitat management. Moreover, there are concerns about impacts of an invasive species, the red imported fire ant (*Solenopsis invicta*), which may be attracted to disturbance associated with tortoise burrowing and may act as an additional source of predation on hatchlings. To address these concerns, we monitored artificial and natural nests at burrow aprons and open sandy sites away from burrows to determine whether nest location affects predation; other factors considered included distance from roads and time since prescribed burn. We also compared fire ant abundance at burrows and other sites and studied direct (mortality) and indirect (burrow use and movement) effects of fire ants on hatchlings.



Nests in burrow aprons experienced greater depredation than those at open sandy sites, and the non-native nine-banded armadillo (*Dasyurus novemcinctus*) was the primary predator. Additionally, nests at locations that were burned the year of the study had lower survival than nests at locations burned the previous year. Hence, a balanced management regimen that creates alternative open sandy nest sites may increase nest survival. We also found that fire ants were more abundant near tortoise burrows and nests, and a fire ant control component of the study showed that hatchlings with more exposure to fire ants had lower survival. Nest and hatchling predation



is a significant source of mortality in tortoises, and predation rates are likely inflated by the introduction of non-native predators.

MORE INFORMATION

Dziadzio, M. C., R. B. Chandler, L. L. Smith, and S. B. Castleberry. 2016. Impacts of red imported fire ants (*Solenopsis invicta*) on nestling and hatchling gopher tortoises (*Gopherus polyphemus*) in Southwest Georgia, USA. *Herpetological Conservation and Biology* 11:527-538.

Dziadzio, M. C., L. L. Smith, R. B. Chandler, and S. B. Castleberry. 2016. Effect of nest location on gopher tortoise nest survival. *The Journal of Wildlife Management* 80:1314-1322.

Dziadzio, M. C., A. K. Long, L. L. Smith, R. D. Chandler, and S. B. Castleberry. 2016. Presence of the red imported fire ant at gopher tortoise nests. *Wildlife Society Bulletin* 40:202-206.

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KEY POINTS

Nests within burrow aprons are more susceptible to predation than nests away from burrow

Fire intervals of >1 year that are implemented frequently enough to maintain open sandy areas would be beneficial to nesting tortoises

Gopher tortoise nests and hatchlings exhibit reduced survival when exposed to fire ants