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Terrestrial movements and foraging behavior of the gray treefrog during the breeding Season

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Currently, conservation techniques aim to preserve metapopulation dynamics in order to prevent species' extinction. A metapopulation is composed of multiple populations that interact by the exchange of individuals. This movement of individuals among populations helps prevent extinction by maintaining population sizes and genetic diversity via gene flow. Defining the amount of core habitat required for a single population is one step toward preserving the larger metapopulations and thus the species. The gray treefrog (*Hyla versicolor*) spends much of its life history away from breeding ponds; however, little data exists on the amount of terrestrial habitat needed for its survival. We conducted a mark and recapture study to determine the core habitat used by the gray treefrog during the breeding season for non-breeding purposes. Experimental arboreal pipe refugia—constructed of acrylonitril butadiene styrene (ABS) conduit—were hung in trees along seven paired, staggered transects radiating from three breeding ponds. Treefrogs utilize the ABS pipe refugia as daytime retreat sites in between periods of nocturnal activity. Frogs captured in the pipes, as well as at each breeding pond, were individually marked, weighed, and stomach flushed to infer their terrestrial activities in the habitat adjacent to the breeding ponds. Within five meters of the pond, we found that there were significantly more males than females in the pipes. Additionally, males were lighter and had fewer prey items in their stomach contents at the breeding ponds than in the ABS pipe refugia. This results from the fact that males return to the pond many times per breeding season and spend multiple nights in a row calling. Thus, they remain closer and presumably decrease foraging activity. Females may travel farther to reach better foraging grounds in order to satisfy their higher caloric needs for oogenesis, only returning to ponds once or twice per breeding season to lay eggs. Our data indicates that treefrogs use the terrestrial habitat to forage between intervals spent at the breeding pond. Using these results, we can infer that the core habitat used by the gray treefrog during the breeding season is at least 200 meters. This helps to quantify populations within a metapopulation context. Additionally, our results will help generate conservation and management strategies aimed toward curtailing the steady decline of amphibian populations.