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## **Territorial Common Ravens (*Corvus corax*) commute to distant anthropogenic foods in the Greater Yellowstone Ecosystem**

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**Background:** Territorial birds typically restrict ordinary movements to remain near their defended foraging, nesting, and roosting sites. Breeding Common Ravens (*Corvus corax*) are highly territorial, but often travel long distances to reliable food sources. Their surprising travels prompted us to investigate the resources obtained and energetic costs and benefits of such flights.

**Methods:** We trapped 77 breeding and nonbreeding ravens from 2019-2024 and tagged each with GPS-equipped transmitters. The tags recorded the birds' locations every 30 min, when fully charged. Solar panels on the tags recharged batteries and allowed us to track the birds through the present or until death (n=17) or transmitter failure (n=9).

**Results/Conclusions:** Territorial Common Ravens restricted movements to within ~8 km of the nest and roost during the breeding season. Throughout the year, they rarely traveled more than 10 km to natural foods (insects, small mammals, wolf kills). However, territorial ravens regularly commuted 30-50 km from their traditional roost sites on territory to anthropogenic foods. Such long-distance flights were non-stop and directly to areas where hunters regularly killed elk, bison, and deer or to sites where garbage and grease floating on wastewater were processed. During flights, ravens typically traveled 45 km/hr. In contrast, non-territorial ravens regularly traveled 20-30 km daily regardless of the season and type of food exploited. We suggest that the certainty of obtaining food of high caloric content repaid the energetic costs of commuting. A raven expends up to 1200 Kcal / day, which would be repaid with approximately 300 g of protein or 130g of fat. A dominant raven can obtain this quantity of food throughout the year, especially during the hunting seasons outside Yellowstone National Park. However, exploitation of anthropogenic foods in the Greater Yellowstone Ecosystem exposes ravens to risks (lead and other chemical contaminants). The apparent ease with which ravens travel to distant foods emphasizes the need to manage anthropogenic sources near rare species that are incidental prey of ravens.