# Raptor Research Foundation
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an average minimum sink speed of 0.886 m/s. The proportion of modeled thermal updraft estimates that were greater than that minimum sink speed was very high in August (94%), but low in January (<1%). In contrast, the proportion of modeled orographic updraft above that minimum sink speed was relatively consistent throughout the year, for example at 7% in August and 9% in January. Month-specific resource selection functions based on updraft were effective at predicting movements of condors. These preliminary results suggest that although thermals are stronger forms of updraft, condor range expansion may be instead limited by the availability of weaker but more seasonally consistent orographic updraft. Extrapolating to presently uncolonized areas, updraft models predicted that the <40% of California and Oregon with the greatest topographical diversity is likely to be preferentially used by California Condors as they expand their distribution. This effort illustrates the effectiveness of using aeroecological principles to predict movements of some types of terrestrial birds.

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## Movement Ecology of Aplomado Falcons in the Chihuahuan Desert of Mexico as Revealed by Satellite Telemetry

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The Chihuahuan Desert population of the Northern Aplomado Falcon (*Falco femoralis septentrionalis*) is currently threatened by the extensive conversion of breeding habitat from open desert grasslands to irrigated farmland. However, why the species has not been able to occupy apparently available breeding habitat in the Chihuahuan Desert of northern Mexico and the southwestern United Staates remains a mystery. In this regard, the study of natal dispersal in Aplomado Falcons may potentially reveal mechanisms of habitat selection and help identify critical habitat suitable for protection. We tracked the movements two wild Aplomado Falcons (female and male) in Chihuahua (Mexico) since fledgling using Argos 5 g PTT-100 satellite transmitters deployed in May 2015. Falcons dispersed from their natal territory about 100 ds after fledgling. These falcons moved throughout historic breeding territories (delineated by a previous long-term demographic study), including intact or converted to recently converted farmland. These tagged falcons occasionally explored areas outside the core breeding areas with pulse-like, long-distance movements, into potential breeding habitat being converted to farmland. After moving around for two yrs in an area of 8,000 km2, the male falcon occupied in a vacant historic breeding territory and unsuccessfully nested with an unbanded female 15 km away from its natal territory; its second nesting attempt in 2018 breeding season yielded two fledglings. Upon becoming a breeding bird, the male falcon had a home range of 77 km2. The female falcon moved around for two yrs in an area of 7,500 km2 before its transmitter failed without documentation of breeding. Our telemetry data suggest that suitable falcon breeding habitat, in spite of its apparent availability, is actually limited to central Chihuahua and its current loss rate seriously questions the potential recovery of the species in the Chihuahuan Desert.

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## Year-round Satellite Tracking of Amur Falcon (*Falco amurensis*) Reveals the Longest Migration of any Raptor Species Across the Open Sea

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The title for undertaking the most arduous of all raptor migrations belongs certainly to the Amur Falcon, which is a complete transcontinental, trans-equatorial, long-distance flocking migrant. The principal breeding (mainly NE China) and wintering (mainly S. Africa) ranges are separated by both 70° of latitude and longitude. Details of the species' spring migration route have been almost completely unknown. It was assumed that Amur Falcons follow an elliptical course, and that spring migration takes the birds northwest of their southbound (autumn) route, journeying overland from southern Africa, north to the Horn of Africa and from there northwest into the Arabian Peninsula en route to Iran, Afghanistan, and Pakistan. Since 2010 we have tracked 10 adult falcons fitted with 5 g solar-powered satellite transmitters. Contrary to previous assumptions, the spring migration is not predominantly overland, but is a non-stop flight across the Indian Ocean from Somalia to India, covering 2500-3100 km of open water. From India, falcons fly around the Himalayas, and on to the breeding grounds. The assumption of an ocean crossing in autumn is confirmed by our data. Eight ocean crossings by one female were recorded during 2010-2014, establishing that the migration of Amur Falcon regularly includes the longest (2400-3150 km) open-sea crossing of any bird of prey species. In total, both southbound and northbound migrations lasted about two mos, and the distance as measured by the paths used by the birds between the breeding grounds and the wintering areas was about 14600 km. The annual cycle of Amur Falcon takes advantage of existing ecological