

California Central Valley Ducks Move Shorter Distances and Use Smaller Areas Than Expected

In a new publication, U.S. Geological Survey biologists report the results of real-time GPS tracking of three species of dabbling ducks in California's Central Valley to examine the ducks' fine-scale 24-hour movement patterns. By attaching small, light transmitters to the ducks, the scientists were able to determine how far the ducks moved, how much space they used when not flying (e.g. when foraging or roosting), and how their time was allocated across the day. Results showed that the ducks moved shorter distances and used smaller areas than previously thought, indicating that these ducks benefit from small, resource-rich habitat patches.

The researchers captured 109 ducks in Suisun Marsh, fitted them with small harnesses with solar-powered GSM-GPS transmitters attached. The species tracked included gadwall (*Mareca strepera*), mallard (*Anas platyrhynchos*), and pintail (*Anas acuta*). During the study period of 2015 to 2017, the transmitters attached to the ducks recorded their locations every 30 minutes. For each 24-hour period, each duck's movement pathways were analyzed to estimate distances moved, space used, and associated behaviors, resulting in 118,829 recorded locations for the 109 birds.

Movements distances and space-use were smaller than expected based on previous tracking studies. A third of tracked movements were categorized as short duration. Distance moved and space used varied by species, sex and season. Gadwall tended to move less than the other species, with foraging flight distances of 0.5–0.7 km, spending their time in a small number of larger habitat patches. Pintails were the “flightiest” ducks, with foraging flight distances of 0.8–1.1 km. Pintails were most likely to conduct flights > 300 m, had more flight segments than other species, and used more habitat patches per day, resulting in the longest daily total movements. Females and males differed only for pintails during the post-hunt season, when females moved greater distances and used more habitat patches than males, which may reflect females switching ponds to elude male pursuit.

The shorter distances traveled and lower area used relative to other studies may be due to methodological disparities or regional differences in behavior, habitat, and resource availability. Combined, our results indicate that resources are currently not a limiting factor for ducks in California's Central Valley, reducing their need to travel far to acquire enough food.

This Spotlight Refers To:

McDuie, F, Casazza, ML, Overton, CT, Herzog, MP, Hartman, CA, Peterson, SH, Feldheim, CL and Ackerman, JT. 2019. **GPS tracking data reveals daily spatio-temporal movement patterns of waterfowl.** *Movement Ecology*, 7(1), p.6.
<https://doi.org/10.1186/s40462-019-0146-8>



A USGS researcher holds a mallard with a GPS transmitter (Credit: USGS)

MANAGEMENT IMPLICATIONS

- Movement patterns influence how much energy a bird uses, and energy use and space use are important metrics for models used in waterfowl management. Until now, appropriate data on California ducks was lacking, reducing the utility of these models in California. Details from the new study can now be used to improve these models and better calculate the habitat and food requirements of ducks in California's Central Valley.
- Since ducks are able to satisfy their daily energy needs in relatively small foraging and resting areas, management efforts may be better focused on developing “off-season” habitats and non-food resources, such as upland nesting habitat and brood ponds. Additionally, limited movements indicate that, for these duck species, the distribution and configuration of essential habitat may be enhanced by providing more, smaller foraging or refuge areas in closer proximity across the landscape.

RESEARCH CONTACTS

Fiona McDuie
Dixon Field Station
fmcdue@usgs.gov

Mike Casazza
Dixon Field Station
mike_casazza@usgs.gov