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Avian Radar Systems as a Tool for Assessing Aircraft Bird Strike Risks

Radar systems designed to detect avian activity at airfields are useful in understanding factors that influence the risk of bird-and-aircraft collisions (bird strikes).

USGS and USDA researchers used a radar system to measure avian activity at Beale Air Force Base, in California's Central Valley. They examined relationships among avian activity, bird strikes, and meteorological and time-dependent factors, and published their findings in the journal *Human-Wildlife Interactions*.

Researchers found that avian activity around the airfield was greater at times when bird strikes occurred, versus on average. Researchers then computed an avian activity index (AAI) and compared it against seasonal, temporal and meteorological factors.

Variation in AAI was first explained by seasons, which were based on average migration dates of birds at the study area. In general, avian activity increased with decreased temperature, wind, visibility, precipitation, and increased humidity and cloud cover.

These effects differed by season. For example, during the spring bird migration period, most avian activity occurred before sunrise at twilight hours on clear days with low winds, whereas during fall migration, substantial activity occurred after sunrise, and birds generally were more active at lower temperatures.

The study produced an interactive model that allows safety officers and wildlife managers to predict AAI and the relative risk of bird strike based on time, date and meteorological values. Further investigation and ongoing data collection will refine these inference models and improve our understanding of factors that influence avian activity — which is ultimately necessary to inform management decisions aimed at reducing risk of bird strikes.

Management Implications

- Portable avian radar systems can provide around-the-clock information regarding bird activity, which is useful for assessing the risk of bird of bird strike near airports or other areas of concern.
- Risk of bird-aircraft collision increases with avian activity, which varies by season, time of day, and weather conditions.
- We developed an interactive model for safety officers and wildlife managers to utilize avian activity from radar data and observations, and assess the relative risk of bird strike by entering date, time and meteorological values.

THIS BRIEF REFERS TO:

Coates, PS, ML Casazza, BJ Halstead, JP Fleskes, JA Laughlin. 2011. Using avian radar to examine relationships among avian activity, bird strikes, and meteorological factors. *Human-Wildlife Interactions* 5(2): 249-268.

<http://www.werc.usgs.gov/ProductDetails.aspx?ID=4744>

<http://www.werc.usgs.gov/casazza>



Clockwise from Top: 1) airstrip with radar system; 2) radar image with high avian activity; 3) radar image with low avian activity. Top Image: USDA. Bottom Images: DeTect, Inc. Any use of trade, product, or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. government.