

USING DNA BARCODES TO IDENTIFY BIRDS INVOLVED IN BIRD/AIRCRAFT COLLISIONS. Carla J. Dove*, Marcy Heacker and Nancy Rotzel, Feather Identification Lab, National Museum of Natural History, Smithsonian Institution, Washington DC. Since the early 1960s, feather remains from bird/aircraft collisions (birdstrikes) have been identified at the Smithsonian Institution by using whole-feather morphology, and suites of microscopic characters found in plumulaceous barbs. In 2003, the U.S. Air Force and the Federal Aviation Association funded a project to investigate the use of molecular techniques for birdstrike identifications. In this study, we determine the effectiveness of using mtDNA barcodes (Cytochrome C subunit oxidase 1, CO1) to identify birdstrike cases that lack sufficient evidence for morphological analysis. From September through December 2006, 978 samples were submitted for DNA analysis. Of these, 33% did not contain viable DNA and were identified mainly to the Order or Family level using microscopic analysis. Of the 67% that yielded viable DNA, 12 cases were bats; 23 cases were inconclusive, false positives, had overlapping barcodes that prevented species identification, or did not meet our 98% acceptance criteria when compared to the Barcode of Life Database (BoLD). Using DNA barcoding as a method to identify unknown birdstrike samples consisting of only blood and tissue resulted in a 66% increase in bird identifications to species level. Because the morphological methods are still used in more than half the 3,000+ birdstrike cases submitted on annual basis for identification, we recommend using a combination of morphological and molecular methods such as barcoding as the most economical and accurate way to identify birdstrikes.

Contact: Carla J. Dove dovec@si.edu
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