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URBAN LANDSCAPE GENETICS OF A PROTECTED SONGBIRD

Abstract

Extensive urban development and wildfire have substantially reduced available habitat for the Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*; CACW) in San Diego and Orange Counties. Remaining populations are small and fragmented, raising concerns about genetic connectivity in the protected, resident songbird. We sampled all of the major known aggregations of CACWs in San Diego and Orange Counties, and genotyped 168 individuals across a panel of 20 microsatellites we developed for the species. We characterized patterns of genetic diversity and differentiation across the sample area, and identified the potential effects of fragmentation and other landscape barriers to dispersal and gene flow. Clustering analyses indicate low gene flow among aggregations of CACWs around the southern, more urbanized half of San Diego County relative to those in the northern area of the county and adjacent groups in southern Orange County. This pattern is further evident in the varying signatures of isolation-by-distance (IBD), with strong IBD in the northern half of the sampling area indicating sites are well connected via localized dispersal and stepping stone gene flow. Conversely, a lack of IBD among groups in the southern half of the sampling area indicates movement is more restricted. Genetic diversity is even among all sample sites despite these contrasting signatures of differentiation, indicating that the reduction in gene flow among southern sites is recent. These results underscore the value of understanding connectivity among reserve systems, and will provide guidance for future habitat protection and restoration efforts.