

# Redlisting genetics: towards linking genetic data and conservation management

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## Abstract

Genetic diversity is critical for adaptation in response to changing environments and provides a valuable metric for predicting species' extinction risk. The International Union for Conservation of Nature (IUCN) and broader scientific community have acknowledged that genetic diversity is a critical component to biodiversity conservation. However, there remain gaps in the incorporation or application of genetic data to extinction risk assessments and conservation management programs. While contemporary international policy lacks explicit guidelines for the application of genetics to conservation, new working groups are collating expertise to provide resources for research, interpretation, and policy. Here, we contribute to the discussion of how conservation efforts can be enhanced with the use of genetic and genomic data. Specifically, we describe how different genetic and genomic diversity metrics can inform species extinction risk and complement the existing IUCN Red List of Threatened Species reporting criteria. We conclude by advocating for standardized reporting and data sharing to facilitate the use of genomic data by different parties, and recommend changes to the infrastructure of IUCN and the National Center for Biotechnology Information (NCBI) GenBank® so that life history and sequence data are viewed together. We expect our recommendations will complement ongoing work by the IUCN Species Survival Commission's Conservation Genetics Specialist Group to protect genetic diversity and biodiversity globally.

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