Metapopulation management of a critically endangered marsupial in the age of genomics

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Incorporating genomic insights into threatened species management is gaining traction amongst conservation managers. Over the last decade, technological advancements in genomics have dramatically increased the questions we can answer for wildlife management, as well as the precision and accuracy of our estimates. Continually evolving technology presents an interesting challenge for long running conservation programs that aim to assess population genetic changes over time. It is well established that molecular markers commonly used to assess population genetic health, microsatellites and single nucleotide polymorphisms, do not correlate and are not interchangeable. So, what are conservation managers meant to do? They have limited choices, either they continue using older techniques for consistency and risk potential loss of genetic information, or change to contemporary techniques, discard historical data, and risk the loss of a significant investment and the capacity for temporal comparisons. While population genetic estimates may not be comparable, it should be considered whether conservation recommendations are broadly similar between interpretations from different data types. We will present our case study of the critically endangered woylie (*Bettongia penicillata*) metapopulation. Where we generated 13,194 genome-wide SNPs for the to provide conservation recommendations for 13 populations and guidance as to how these recommendations align to those previously made using 12 cross-linked microsatellite markers. Observed heterozygosity was significantly lower than expected across all populations, suggesting a historical bottleneck in this species. Significant inbreeding was observed in four populations, with effective population sizes ranging from 9.9 to 268.9 across all populations. Trends in observed heterozygosity and population differentiation were broadly similar between our contemporary SNP and the historical microsatellite dataset providing a degree of comfort for managers as previous actions are supported by contemporary data.