

# DECADAL ACTIVITY PATTERNS IN AN ISOLATED URBAN REPTILE ASSEMBLAGE: MONITORING UNDER A CHANGING CLIMATE.

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## Abstract

**Aim** Determine seasonal, annual and decadal patterns of abundance in reptile populations and assemblages occupying an isolated urban bushland remnant **Location** Bold Park (~338 ha), Perth, Southwestern Australia **Time period** 1986-2021 **Major taxa studied:** Squamate reptiles **Methods** Fenced pitfall trapping in four sampling sites representing different habitats and fire history over the primary reptile activity period and 35 consecutive years; trapping regime was modified for the last 28 years. **Results** The location occurs in one of 35 global biodiversity hotspots and has a Mediterranean climate experiencing a 15% decline from the century average rainfall over the last 50 years. Twenty-nine species were recorded, with 16 captured in 32 or more years and accounting for nearly 97% of all captures; the six most common for 81%. Three taxa became locally extinct. Activity predominates in warmer and dryer months (October to April), peaking in November-December. Species richness remained relatively constant between years with around 73% of known taxa captured annually. Assemblage structure didn't change when analysing presence/absence data but shifted through five statistically significant assemblages analysing relative abundance data. Over the last 28 years relative abundance was significantly and positively correlated with annual rainfall residuals for the three years preceding annual sampling, resulting in significant changes in total assemblage structure and significantly similar patterns in four sample sites; presence/absence data indicated minor assemblage structure changes. **Main conclusions** Annual species number remained relatively constant but relative abundance illustrated significant temporal changes in assemblage structure over decades; presence/absence did not. The modeled relationship between relative abundance and annual rainfall residuals for the three years preceding annual sampling is supported by known ecological responses and reptile demographics within this Mediterranean climate. Maintenance of urban biodiversity should consider impacts of a significantly drying climate exacerbating the extinction debt already inherent in isolated bushland populations.

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