# Conserving evolutionary processes for three amphibian species in the Iberian Peninsula

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**Objectives**

To maximize the long-term persistence of biodiversity, protected areas need to maintain evolutionary processes. However, assessments of existing protected areas and prioritizations for establishing new reserves rarely account for such processes explicitly. Here we evaluate if protected areas in Portugal and Spain are adequately representing various evolutionary components that underpin the survival of three endemic amphibian species (*Hyla molleri*, *Rana iberica*, and *Pelobates cultripes*).

**Methods**

We used environmental, genetic, and occurrence data to map patterns of (i) individual-level genetic diversity (using homozygosity by locus scores), (ii) broad-scale neutral genetic variation, (iii) broad-scale adaptive genetic variation, (iv) variation in contemporary selection pressures using climate data, and (v) intensity of future selection pressures using future climate projections. We then assessed if existing protected areas are adequately representing these evolutionary components for each species, and identified priority areas for protected area establishment.

**Results**

We found that existing protected areas cover a broad range of contemporary climatic conditions across the distributions of these species. However, they are failing to represent many dimensions of genetic diversity. With two of these species listed internationally as Near Threatened, further erosion of genetic diversity could compromise their long-term persistence. To address these shortfalls, we also identified priority areas for conservation.

**Conclusions**

Strategic establishment of new protected areas could rapidly enhance the long-term persistence of these species. By applying this framework to other taxa, conservation assessments and prioritizations can explicitly account for evolutionary processes and, ultimately, enhance the long-term persistence of biodiversity.

**Key words**: Conservation decisions, Gap analysis, spatial prioritization, protected areas, optimization.