



CONSERVATION RESEARCH REPORT

Climate Change and the Extinction of Mediterranean Reptiles

The loss of biodiversity is of great concern for biologists and nature enthusiasts alike. FOUFOPOULOS ET AL. (2011. *The American Naturalist* 177:119–129) indicated that climate change could be particularly detrimental for reptilian species in the Aegean Sea, located between Greece and Turkey. The authors examined the effects of climate change on islands during the Holocene period and determined extinction rates of 35 species of reptiles from Greek islands. The Holocene began at the end of the last ice age (16,000 years ago) and was characterized by a shift from warm and

wet conditions to an increasingly arid climate. The authors compared extinction rates between species with northern (latitudinal midpoint of range over 37.6°N) and southern (LM below 37.6°N) ranges to determine if northern species are more likely to become extinct. Factors investigated include maximum population density, habitat fragmentation, available suitable habitat, island size, and anthropogenic activities.

Extinction rates for the species studied ranged from 0.01 to 0.5 populations per 1,000 years. As anticipated, researchers found that species with more northerly distributions, charac-



Erhard's Wall Lizard (*Podarcis erhardii*) is a polymorphic species (more than 25 insular subspecies have been described) that demonstrated a lack of an isolation-by-distance effect, suggesting that populations are genetically isolated and that lizards cannot (or will not) cross even narrow straits. This provides strong evidence that individuals are unlikely to colonize islands on which local populations have been extirpated. Photograph by Jaroslav Koleczek.

terized by less suitable habitat than species in more southern regions, had higher extinction rates — implying that climate change is more likely to affect extant species with more northerly distributions. Interestingly, anthropogenic factors such as fragmentation were not found to significantly affect extinction rates. However, as human activity on Aegean islands increases, habitat fragmentation also increases, escalating extinction rates. A major concern identified in the study is the low dispersal rates of reptiles from one island to another. Cold water and a lack of rafting material make it very unlikely for an individual

to move between islands and successfully colonize and affect other populations. The lack of gene flow, combined with the effects of climate change, pose serious conservation issues for these species. Knowing the rates of extinctions for species in different areas, like those presented in this study, can help prioritize conservation efforts. Special consideration might need to be given to species with more northerly distributions for which less time is likely to be available.

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