
Twenty years of the invasion of the California kingsnake (*Lampropeltis californiae*) in Gran Canaria island

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Abstract

The ecological and socioeconomic effects of invasive snakes are known to have been devastating on several islands worldwide. Although some cases are very well-documented (e.g. the brown tree snake on Guam), some others are relatively unknown. With this contribution we aim to update the current state-of-the-art regarding the invasion by the California kingsnake (*Lampropeltis californiae*, Colubridae) on the island of Gran Canaria (Canary Islands, Spain). We provide data on the past and current distribution, trophic ecology, and impacts of this species, which have been collected during the accomplishment of several projects in the last 10 years. The distribution of the species has been assessed with the participation of citizens, diet was studied by analysing the stomach and gut content of 1129 specimens. Impacts upon the endemic giant lizard have been quantified by censusing lizards through different methodologies in invaded and non-invaded areas. The California kingsnake was first detected in 1998 on the island. In 2007, when it was considered naturalized, there was only one population

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nucleus located in the east of the island. In 2010 a second genetically different population was found in the northwest of the island. Currently, four invasion foci have been found, with dozens of isolated individuals throughout the rest of the island. A total of 5383 snakes have been captured on the island since 2011. Diet analyses show that these snakes mainly prey upon endemic herpetofauna, the Gran Canaria giant lizard being the main prey in the first stages of the invasion, followed by the Gran Canaria skink and Boettger's wall gecko. However, invasive rats and mice become more consumed in later stages of the snake invasion, as snakes are causing local extinction of endemic lizards. In the light of what has been described on other islands worldwide and what is happening on Gran Canaria, we urge that islands suffering from invasive snakes should establish closer research collaborations. This will allow joint investigation into new innovative measures and techniques to combat highly invasive species that are disturbing and ruining island ecosystems.

Keywords: California kingsnake, Gran Canaria, impacts, *Lampropeltis californiae*, trophic ecology