Current and Historical Drivers of Landscape Genetic Structure Differ in Core and Peripheral Salamander Populations

I. General Information

Citation:

Summary/Abstract:
With predicted decreases in genetic diversity and greater genetic differentiation at range peripheries relative to their cores, it can be difficult to distinguish between the roles of current disturbance versus historic processes in shaping contemporary genetic patterns. To address this problem, we test for differences in historic demography and landscape genetic structure of coastal giant salamanders (Dicamptodon tenebrosus) in two core regions (Washington State, United States) versus the species' northern peripheral region (British Columbia, Canada) where the species is listed as threatened. Coalescent-based demographic simulations were consistent with a pattern of post-glacial range expansion, with both ancestral and current estimates of effective population size being much larger within the core region relative to the periphery. However, contrary to predictions of recent human-induced population decline in the less genetically diverse peripheral region, there was no genetic signature of population size change. Effects of current demographic processes on genetic structure were evident using a resistance-based landscape genetics approach. Among core populations, genetic structure was best explained by length of the growing season and isolation by resistance (i.e. a 'flat' landscape), but at the periphery, topography (slope and elevation) had the greatest influence on genetic structure. Although reduced genetic variation at the range periphery of D. tenebrosus appears to be largely the result of biogeographical history rather than recent impacts, our analyses suggest that inherent landscape features act to alter dispersal pathways uniquely in different parts of the species' geographic range, with implications for habitat management.

Keywords:
Pacific giant salamander, Dicamptodon tenebrosus, disturbance, genetic diversity, central-marginal hypothesis, peripheral populations, landscape genetics

Primary Author:
Rachel Y. Dudaniec

Primary Author's Affiliation:
Department of Forest Sciences, University of British Columbia

Other Authors:
Stephen F. Spear, John S. Richardson, Andrew Storfer

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Not Applicable

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2012

Project Format:
Document

Project Type:
Research

II. Species Relevant to Project
III. Location and Habitat

**Project Location:**
Willapa Hills and South Cascades, Washington, USA and Chilliwack Valley

**Forest District:**
Chilliwack, Other

**Regional District:**
Fraser Valley, Other

**South Coast Municipalities:**
Chilliwack, Other

**Watershed:**
Chilliwack, Other

**BEC Zone:**
Coastal Western Hemlock, Other

**Habitat:**
Forest, Riparian, Stream / River

IV. Additional Information

**Contact:**
r.dudaniec@uq.edu.au

**My websites / Project Websites:**


Links