

## Submitted Abstract

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## Abstract

The environmental conditions required for generational replacement, i.e. the regeneration niche, is a key component of species responses to environmental change that remains largely understudied. Species modelling efforts still rely mostly on adult presence or performance to infer population responses to environmental change, and only recently they have started to incorporate information on multiple age classes, including the critically important juvenile phase. If juveniles and adults differ in their fundamental or realized niches, as observational and experimental data seem to suggest, inferences from models based on adult suitability may not accurately reflect future changes in distribution or habitat suitability. However, a systematic and multispecies assessment of ontogenetic niche shifts is not yet available. To address this question, we compared the regeneration and adult niches among 43 forest species in Switzerland using data from the Swiss National Forest Inventory, to quantify the prevalence of ontogenetic niche shifts among major Swiss tree species, and whether niche shifts would generally take the shape of niche contraction or expansion. We found, niche conservatism to be the dominant pattern among all widespread species, indicating a large niche overlap across ages. Less abundant species had less consistent patterns, although detailed modelling will need to be implemented for them. As expected, regeneration niches were significantly slightly less stable than adult niche between inventories. However both adults and regeneration showed generally high temporal niche stability, supporting direct comparisons between them. Overall, our results suggest that niche stability is the most common pattern in widespread species and that ontogenetic niche contraction (niche of regeneration larger than that of adults) is more likely than niche expansion (adult regeneration larger). These represent a better scenario for tree species adaptation to climate change since 1) under ontogenetic niche expansion, adult occurrences represent a more conservative niche assumption and for modelling species distribution, and 2) a buffering of regeneration niche around the adult distribution may facilitate species migration with climate change via pre-established juvenile individuals.