

OC24 - Montenegrin ponds and lakes under threat: multiple stressors caused large-scale amphibian decline

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Most of Montenegrin landscapes are characterized by wild hilly and mountainous environments and by traditional agriculture. Most small ponds and lakes were primarily used for watering cattle and providing water to local communities. They have attracted the attention of biologists for decades because they hosted emblematic species, including endemic subspecies and alternative rare phenotypes of newts. However, as amphibian declines have been reported worldwide, we aimed to determine their status in such apparently favourable areas and by the same occasion to identify the possible threats affecting local waterbodies. To this end, we surveyed those historically known to be inhabited by both metamorphic and paedomorphic newts in both the early 2000 and in 2016. In contrast to metamorphs, paedomorphs cannot escape water as they keep gills at the adult stage. This sampling was representative as this covers all parts of Montenegro and included ponds, wells and lakes. High population losses of the two phenotypes were found, particularly in ponds and lakes. The decline concerned both phenotypes, which became progressively extirpated, site after site. The situation is particularly catastrophic with almost all populations of paedomorphic newts now extinct. This includes lake populations and endemic taxa. Metamorphs declined less, but suffered strong recent losses during the last decade in the places where they managed to subsist. Several stressors acted on this decline, with corteges of alien aquatic species having the most global effects. This involved fish and crayfish, alone or together. Additional factors such as habitat destruction, urbanisation and eutrophication additionally impacted ponds and lakes. The status of biodiversity in Montenegrin ponds and lakes is thus alarming with few sites remaining undisturbed. Despite their location in apparently pristine places, they follow the trends found in other parts of Europe. There is therefore an urgent need for preserving such freshwater habitats before their biodiversity at both intra and inter-specific levels belong to the past.