

Starker Rückgang einer Grasfrosch-Metapopulation (*Rana temporaria*) in der Nordwestschweiz

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Severe decline in a metapopulation of the common frog (*Rana temporaria*) in northwestern Switzerland

In a 500 ha isolated study area south of the city of Basel (Switzerland), the egg clumps of a Common frog metapopulation (*Rana temporaria*) were counted annually at 9 pond sites from 1988 to 2025. The number of ponds increased over this period from 21 in 1988 to 53 in 2025. Over the same period, the total surface of all ponds increased from 3900 m² to 6150 m². The number of egg clumps fluctuated considerably at each site, but also over the entire study area. The number of egg clumps decreased significantly over the entire study period. Between 1988 and 1993, an average of 8,573 egg clumps were counted; between 2021 and 2025 only an average of 2,052 egg clumps. There was therefore a severe decline in the metapopulation between 1988 and 2025. Between 1997 and 2025, the number of egg clumps decreased significantly in ponds created before 1988, while it increased significantly in ponds newly created since 1996. The decline was temporarily stopped by the increased availability of ponds. The increase and decrease in the number of egg clumps occurred in the ponds created before 1988 and in the newly created ponds in the same years. The number of egg clumps in a pond can be influenced by restoration measures. But factors affecting the entire system of spawning sites must be responsible for the severe decline in the number of egg clumps over several decades. The only explanation for this is climate change. Various possible influences of climate change were examined for plausibility in relation to the decline. Increased mortality of juveniles in particularly dry years and increased mortality due to higher temperatures during the development of the spawn are possible explanations. There is a risk that this isolated metapopulation of the common frog will disappear. The only frog species in Switzerland that is not yet endangered is at risk of severe population decline at low altitudes. Increasing the number of spawning sites, for example with areas newly dammed by beavers, could reduce this risk.

Key words: Amphibia, *Rana temporaria*, long term study, population development, metapopulation, climate change.

Zusammenfassung

In einem 500 ha großen, isolierten Untersuchungsgebiet südlich der Stadt Basel (Schweiz) wurden von 1988–2025 an 9 Gewässerstandorten jährlich die Laichballen einer Grasfrosch-Metapopulation (*Rana temporaria*) gezählt. Die Anzahl Gewässer nahm von 21 Gewässern 1988 auf 53 Gewässer 2025 zu. Die Gewässerfläche vergrößerte sich im gleichen Zeitraum von 3900 m² auf 6150 m². Die Anzahl Laichballen schwankten an jedem Standort, aber auch im gesamten Untersuchungsgebiet beträchtlich. Über die gesamte Untersuchungsperiode hinweg nahm die Laichballenzahl signifikant ab. In der Periode 1988–1993 wurden durchschnittlich 8573 Laichbal-