
Behavioural and ecophysiological responses of Hermann's tortoise (*Testudo hermanni hermanni*) to translocation

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Abstract

Translocations are important tools to mitigate anthropogenic impacts on threatened populations. However they generally suffer from a lack of feed-back; the success of translocations and methodological improvements cannot be evaluated. In 2013, we translocated 24 Hermann's tortoises (*Testudo hermanni hermanni*) into a host population impacted by fire but characterized by favorable habitats. Translocated individuals originating from rescue operations were hard-released in spring (N=12) and in autumn (N=12) and radio-tracked. We also radio-tracked individuals from the host population (N=20) and from another control population (N=11). All tortoises were intensively monitored during three years; more than 11,000 fixes enabled us to precisely describe and compare movement patterns. Translocated tortoises first dispersed from the release sites into apparently random directions, sometimes crossing unfavorable surrounding habitats, and then settled into remote favorable places. This process usually required several weeks/months, but most individuals settled during the first year after release. Annual survival rate was lower (80%) for tortoises released in autumn compared to those release in spring (87%) or to resident and control tortoises (94%, 100%); these differences were not statistically significant. Mortality was essentially caused by predation. Body condition and corticosterone levels varied between sex and across seasons without effect of translocation. This close monitoring reveals that translocated individuals adapt well to their novel environment without impacting the host population. The strong initial dispersal phase should be considered for translocation: releasing sites should be large enough and/or surrounded by secondary host areas to limit mortality associated with dispersal in hazardous environments (e.g. road-mortality).

Keywords: translocation success, movement, ecophysiology, habitat quality, tortoise, population management

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