Conservation physiology can inform threat assessment and recovery planning processes for threatened species

Conservation physiology has emerged as a discipline with many success stories. Yet, it is unclear how conservation physiology is currently integrated into the activities of bodies such as the IUCN and other agencies/organizations/bodies which undertake international, national, or regional species threat assessments and work with partners to develop recovery plans. Here we argue that conservation physiology has much to offer for the threat assessment process and outline the ways in which this can be operationalized. For instance, conservation physiology is effective at revealing causal relationships and mechanisms that explain observed patterns (e.g., population declines). Identifying the causes of population declines is a necessary precursor to reverse or mitigate such threats. Conservation physiology can also identify complex interactions and support modeling activities that consider emerging threats. When a population or species is deemed “threatened” and recovery plans are needed, physiology can be used to predict how organisms will respond to the conservation intervention and future threats. For example, if a recovery plan was focused on translocation, understanding how to safely translocate organisms would be necessary, as would ensuring that the recipient habitat provides the necessary environmental characteristics to meet the fundamental physiological needs/tolerances of that organism. Our hope is that this paper will clarify ways in which physiological data can play an important role in the conservation activities of bodies like the IUCN that are engaged in threat assessment and recovery of endangered organisms. Although we focus on activities at the international scale, these same concepts are relevant and applicable to national and regional bodies.