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COMMENTARY

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Neonatives and translocated species: different terms are needed for different species categories in conservation policies

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Pervasive human-induced environmental changes are increasingly causing species to move, with profound implications for their conservation and survival (e.g. Chen et al. 2011; Dawson et al. 2011). In a recently published piece on "Global policy for assisted colonization of species", Brodie et al. (2021) call for assisted colonisation (also called managed relocation) to be embraced as a viable management option in post-2020 global conservation policies. They suggest that species, deliberately introduced beyond their historic native range and species that expand their ranges on their own in response to climate changes, should be treated identically for the purposes of policy. They also suggest expanding the use of the term "neonative" – which we previously proposed for range-expanding species that track environmental changes without human assistance (Essl et al. 2019) – so that this term also applies to species targeted for assisted colonisation.

Table 1. Ten key features and associated differences between range-expanding species tracking environmental changes (= neonatives) and species moved purposefully to regions outside their native range in response to (anticipated) environmental changes (= assisted colonisation or managed relocation). The main conservation and challenges associated with the features are shown.

No	Key features	Neonatives	Conservation challenges and implications	Assisted colonisation	Conservation challenges and implications
1	Number of individuals typically involved	(Very) large	No specific conservation challenges	(Very) small	Ensuring that founder populations do not go through genetic bottlenecks
2	Number of species involved	Often large to very large	Monitoring the effects of range-expanding species on resident biota	One or few	Selection of priority species (incl. the potential that translocated species might become invasive), monitoring the effects of translocated species on resident biota
3	Characteristics of species involved	Wide range of species, particularly mobile species and generalists	Applying management measures to ensure survival of less mobile species and of specialists	Charismatic, large, conspicuous species	Identification of alternative conservation options for the vast majority of biota that cannot be realistically translocated
4	Range expansion is reactive or proactive to environmental changes	Always reactive, i.e. species are responding to environmental change that has already occurred	No specific conservation challenges	Reactive or proactive (in anticipation of expected environmental change)	Taking uncertainty of future environmental changes into account
5	Source regions of individuals involved in range expansion	Leading range edge	No specific conservation challenges	Anywhere, often current centres of occurrence	Ensuring that suitable ecotypes of the translocated species are chosen
6	Form and distance of range expansion	Wave-like range expansion from current leading edge to adjacent regions that have become suitable	Improving landscape permeability	Jump dispersal, places of translocations are often distant and disjunct to the native range	Identifying suitable places of release with high likelihood of establishment and low risks of negative impacts
7	Velocity of range expansion	Variable, depending on characteristics of the species, the landscape (e.g. permeability) and the velocity of environmental change	Improving landscape permeability	Abrupt, depending on human activity (i.e. introduction of individuals or propagules to the site of release)	Apply an exhaustive ex ante risk-assessment prior to species translocation
8	Degree of ecological novelty associated with the range-expanding species	Typically low, but with exceptions (e.g. if range-expanding species have novel traits)	Monitoring the impacts on resident biota and potentially managing if negative impacts are observed	Variable, but often high as distances to native range are often large	Monitoring the impacts on resident biota, potentially managing if negative impacts are observed
9	Direct resources involved	Low to non-existing	Typically no resources are directly needed, but potentially for monitoring, or management (e.g. increasing landscape permeability)	Medium to high	The planning, execution and monitoring of translocations requires (substantial) resources
10	Connectivity of native range and newly colonised region	High, newly colonised regions are usually adjacent to (leading edge of) native range	No specific conservation challenge	Low, places of translocations are usually distant from the native range and separated by unsuitable regions in between	Identifying suitable places of release with a high likelihood of establishment and low risks of negative impacts

We recognise the need to proactively consider the opportunities and risks of species translocations as a key tool in policies and management in the Anthropocene. However, we agree with Ricciardi and Simberloff (2021) and consider it crucial to treat distinct phenomena and different categories of species of conservation concern differently in policies. Very careful attention must be given to the precise definition of core concepts and terminology. Human-induced translocations differ from range-expanding species (i.e. 'neonatives' as we defined them in Essl et al. 2019) in key aspects (Table 1), which makes lumping these two categories of species highly problematical with regard to fundamental features that relate to policy. These aspects include dispersal potential, the rate and direction of range expansions, the number and characteristics of species involved and the associated risks and uncertainties. Whereas species targeted for assisted colonisation are currently a limited number of charismatic taxa (Hällfors et al. 2017), range-expansions by "neonatives" (as in our definition) involve a wide range of biota (Essl et al. 2019), some of them with a great potential to spread. Additionally, the risks and benefits associated with the two phenomena differ (IUCN 2013; Ricciardi and Simberloff 2014). Finally, although human decisions on whether or not to move species are pivotal in assisted colonisation (Richardson et al. 2009), this is not the case for species undergoing range expansions independently of direct human action. For the latter, measures to preserve or restore connectivity are most relevant (e.g. Wessely et al. 2017). Consequently, these profoundly different key characteristics of range-expanding species tracking environmental change vs. those subject to assisted colonisation result in very different conservation challenges (Table 1).

We call upon conservation bodies, such as the IUCN and the Convention of Biological Diversity (CBD), to evaluate the full range of conservation opportunities and risks created by species on the move. These efforts should recognise the profoundly different nature of translocated species and those undergoing range changes due to global change, but without direct human assistance. We are convinced that only such a nuanced approach will lead to appropriate conservation action to ensure species survival in the Anthropocene. We argue that species selected for assisted colonisation are a distinct category that should be subject to exactly the same classification as all other species. As they are introduced purposefully outside their natural range, they should be considered as aliens. The protocols for evaluating associated risks are well established (Richardson et al. 2009; Karasov-Olson et al. 2021). However, given that translocated species also differ in some important characteristics from other alien species, it may be warranted to classify these species in a distinct (sub)category.

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