

## When invasive exotic populations are threatened with extinction

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**Abstract** An important question that arises is what to do when an invasive exotic is a species threatened with extinction within its original distribution and there are few cases in the world illustrating this situation. These species potentially compete with local species for resources and may displace native species or, may in some cases, weaken the gene pool of the native species. The simple eradication of the invasive population could reduce the species' gene pool, and the eradication process might affect local sympatric species. We recommend a program including identification of areas within the natural range where the species is extinct, removal of the causes of extinction in those areas, then gradual removal of the species from its introduced range and release in the relocation areas following proper guidelines for reintroduction of species.

**Keywords** Invasive species · Exotic species · Invasive endangered · Conservation of endangered species

### Comments

Together with habitat destruction, pollution and global climate changes, invasion by exotic species is generally considered one of the main causes of erosion of biological diversity (Olden et al. 2004), although there has been some controversy (Gurevich and Padilla 2004). As a result, many countries have started monitoring, evaluating impacts and eradicating invasive species. An important question that arises is what to do when the invasive exotic is a species threatened with extinction within its original distribution. There are few cases in the world (e.g. *Bos javanicus*, *Camelus dromedarius*) (Bradshaw et al. 2006; Wilson and Reeder 2005), and two cases in Brazil illustrate this situation. The liolaemid lizard *Liolaemus lutzae*, a species locally “critically endangered” (Machado et al. 2008) and “vulnerable” globally (IUCN 2011), was introduced in a natural area

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outside its range in Southeastern Brazil and a local population had successfully established there 18 years later (Soares and Araújo 2008). The golden-headed lion tamarin *Leontopithecus chrysomelas*, a primate species “endangered” in Brazil (Machado et al. 2008) and globally (IUCN 2011), is illegally traded as a pet, and was introduced in Niterói city forests (Rocha et al. 2011). These species potentially compete with local species for resources and may displace native species or, as in the case of *L. chrysomelas*, which hybridizes with the congeneric native species, *L. rosalia*, weaken the gene pool of the native species (Rocha et al. 2011). In this case, the simple eradication of the invasive population could reduce the species’ gene pool, and the eradication process might affect local sympatric species (Veitch and Clout 2002). For such populations of threatened species in areas outside their original distribution, we recommend a program that includes identification of areas within the natural range where the species is extinct, removal of the causes of extinction in those areas, then gradual removal of the species from its introduced range and release in the relocation areas following the IUCN guidelines for reintroduction of species (IUCN 1998).

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