Are pioneering coyotes, jackals and foxes alien species? Canid colonists in the changing conservation landscape of the Anthropocene

HAN SOMSEN and ARIE TROUWBORST

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Abstract

The pervasive influence of human agency on biodiversity in the Anthropocene gives rise to several fundamentally new challenges for national and international law in the field of conservation, including questions regarding what is 'natural' and what is 'alien'. Ultimately, a new vision and new rules are called for, but in the meantime wildlife lawyers and other conservation professionals must work with conventional legal frameworks. Striking instances where vexing issues arise are the recent range expansions of certain canids. Coyotes (*Canis latrans*) and crab-eating foxes (*Cerdocyon thous*) in the Americas and golden jackals (*Canis aureus*) in Europe are progressively colonizing areas and countries where they did not occur before. A key question is whether to consider this as acceptable extensions of natural range, or whether the pioneering carnivores should be viewed as (invasive) alien species, potentially triggering legal obligations of prevention, control and eradication. In addressing this question we draw on guidance provided under the Convention on Biological Diversity and other international legal frameworks, where governments are forced to grapple with the application of long-standing concepts to new phenomena in an era of global change. Our analysis suggests that coyotes in Costa Rica, crab-eating foxes in Panama, and golden jackals in the Netherlands – to name some examples – are *not* to be considered as alien species, whether invasive or not. Thus, even if action to address adverse impacts by the advancing canids on (other) native biodiversity may sometimes be desirable, they are *not* subject to legal requirements to combat invasive alien species.

Keywords

Anthropocene, carnivores, coyote, crab-eating fox, golden jackal, international law, invasive alien species, range expansion

Against a tide of unprecedented human persecution, coyotes (*Canis latrans*) have dramatically expanded their range during the last century, reaching all corners of North America and venturing far into Central America (Hody & Kays, 2018; Flores, 2016). Having followed the Pan-American Highway and its adjacent cattle farms, and crossed the Panama Canal in 2010, the adaptable canids are now on the verge of South America (Méndez-Carvajal & Moreno, 2014; Hody & Kays, 2018). In Panama, coyotes coincide with crab-eating foxes (*Cerdocyon thous*), a South American species undergoing a northward range expansion – like the coyote, without prior record in Panama – producing a historic continental carnivore swap (Hody, 2016). In Europe, meanwhile, golden jackals (*Canis aureus*) are displaying a similarly unprecedented range expansion (Arnold et al., 2012; Trouwborst et al., 2015; Rutkowski et al., 2015). The situation of these three canids, which are progressively colonizing places and countries where they did not historically occur, is different from the recent wolf (*Canis lupus*) range expansions in North America and Europe, as the latter represent actual comebacks. Moreover, the suspected drivers of the three smaller canids' expansions are anthropogenic, with the species benefiting from, e.g., deforestation, other land-use changes and the decimation of larger predators like wolves (Arnold et al., 2012; Flores, 2016; Hody & Kays, 2018).

The recent records of these expanding canids contrast with the growing number of species that are negatively impacted by human activities, with large-scale displacement increasingly common. As the Anthropocene proceeds and the global biodiversity crisis unfolds, the discipline of wildlife law is becoming more like refugee law, and conceptual footholds harder to find. A clear example is this question by researcher Roland Kays regarding the coyote's advance: "Is this something we should view as a natural expansion, that's a good thing, or that we should view as an invasive species, that's a bad thing?" (Klein, 2018).

To a significant degree, this is a legal question. Our paper intends to answer the latter, by looking at currently applicable law, using standard legal research methodology. In addition, we highlight that this type of questions is likely to challenge conventional legal frameworks increasingly often.

The central insight regarding the Anthropocene is that human agency has infused and colonized nature. Galileo's solitary observation that *the Earth moves* was similarly startling and unpopular at his time, but he could privately take comfort from the notion that the planet had probably always moved along its predictable trajectory, and indeed apparently was meant to be moving. The take-home message from the global network of scientists in our new epoch, however, is that through human agency, as Serres (1990) put it, '*the Earth is moved*', as it were, to a place where it was never destined to be, and from which there is no returning. In that sense, coyotes, golden jackals and crab-eating foxes have been moved to new places, and other species to the brink of extinction, or across it, as part of something structural. Wildlife lawyers and other conservation professionals must decide what to make of all this. We can of course review the phenomena before us against the standards of current wildlife law, but must also accept that conventional legal texts are becoming increasingly unfit to inform a meaningful assessment.

One thing to note in our uneasy new role of wildlife refugee lawyers is that, with all respect due, cognitively and morally, it is obvious that reliance on whatever is deemed 'natural' as a yardstick to decide a species' fate in any given habitat is progressively becoming inappropriate. In the Anthropocene 'the natural' is being substituted by human

agency. There hence appears to be no escaping the overwhelming responsibility of having to exercise human discretion to decide where, and thereby quite possibly also if, a given species shall persist or disappear. Thus, a new vision, and new rules are needed, which transcend the nature/human dichotomy.

In the meantime it befalls upon legal scholars and courts, through interpretative methods used by them for centuries, to reconnect the normative realm implicit in existing wildlife law with an empirical reality that is becoming disengaged from it. That exercise, exemplified below, should not distract us from the legislative tasks ahead.

The 1992 Convention on Biological Diversity (CBD) requires its 196 parties – virtually all states except the US – to "[p]revent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species" (Article 8(h)). Similar requirements feature in other international legal instruments, for instance:

- 1979 Convention on the Conservation of Migratory Species of Wild Animals (CMS), Articles III(4)(c) and V(5)(e);
- 2003 (revised) African Convention on the Conservation of Nature and Natural Resources, Article IX(2)(h);
- 1992 Convention for the Conservation of the Biodiversity and the Protection of Wilderness Areas in Central America, Article 24;
- 1979 Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), Article 11(2)(b);
- 1992 EU Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, Article 22(b);
- 2014 EU Regulation 1143/2014 on the Prevention and Management of the Introduction and Spread of Invasive Alien Species (IAS Regulation).

Many national laws likewise aim to prevent introductions of invasive alien species, and when this fails to control or eradicate them when feasible.

The above question by Kays signals uncertainty whether coyotes qualify as (invasive) alien species in places like Panama and Cape Breton Island. Confusion is apparent even within the IUCN Red List. The coyote assessment by Gese et al. (2008) considers the species "native" in all ten countries where it occurs – United States, Canada, Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, Costa Rica and Panama. However, the assessment of Dice's cottontail (*Sylvilagus dicei*) asserts that coyotes are a "non-native carnivore" in Costa Rica – where it poses a threat to the endemic rabbit – while simultaneously conceding that coyotes arrived in Costa Rica through a "natural range expansion south following cattle" (Mora et al., 2016).

Useful guidance has been forthcoming from the CBD Conference of the Parties, which has defined an "alien species" as a species "introduced outside its natural past or present distribution" (CBD COP Decision VI/23, 2002). "Introduction" is understood as the "movement by human agency, indirect or direct," of a species "outside of its natural range (past or present)". The element of introduction by man also features in the definition of "alien species" employed in the EU's state-of-the-art IAS Regulation: "any live specimen of a species, subspecies or lower taxon of animals … introduced outside its natural range" (Article 3(1)). Under both instruments, an alien species is considered "invasive" when it threatens native biodiversity.

A canine example of such an "invasive alien species" is the red fox (*Vulpes vulpes*) in Australia, where it was introduced for sport hunting purposes, to the detriment of

numerous native species (Global Invasive Species Database, 2018). A European example of an "invasive alien" canid is the raccoon dog (*Nyctereutes procyonoides*), introduced into the western part of the former Soviet Union and spreading across Europe since (Kauhala & Saeki, 2016). The latter example also illustrates how species, once introduced by man, continue to carry their "alien species" status also when subsequently expanding 'naturally' into neighbouring countries.

By contrast, canids colonizing areas beyond their former ranges entirely *on their own* would not seem to qualify as "alien species," and therefore neither as "invasive alien species" – quite regardless of their impact on local biodiversity. Put another way, the mere fact that a species cannot be shown to have historically occurred somewhere does not make it an "alien species" there (see also Trouwborst et al., 2015).

Yet, how liberally should the concept of "movement by human agency, indirect or direct" from the aforementioned CBD definition be interpreted? Clearly, it encompasses organisms intentionally or accidentally trucked, shipped, flown or otherwise *physically transported by people*. But can the definition also encompass cases where a "natural" range extension is somehow provoked or facilitated by humans?

The tentative answer would seem to be no. For instance, the EU's IAS Regulation "applies to all invasive alien species" and therefore does *not* apply to "species changing their natural range without human intervention, in response to changing ecological conditions and climate change" (Article 2(1)-(2)). Another pointer is a Recommendation by the Bern Convention's parties concerning range shifts driven by (human-induced) climate change. Concerned that "native species moving to neighbouring areas may be considered as alien due to the fact that climate change is the result of human action and that such species may be unnecessarily controlled," the parties expressly interpreted the term "alien species" as "not including native species naturally extending their range in response to climate change" (Recommendation No. 142, 2009). The CMS's parties have also adopted treaty interpretations welcoming rather than deterring species driven upwards or polewards by climate change (e.g., CMS COP Resolution 12.21, 2017).

In sum, current international wildlife law clearly suggests that coyotes in Costa Rica, crab-eating foxes in Panama, and golden jackals in the Netherlands are *not* to be considered as "alien" species, whether invasive or not. Thus, they are also *not* subject to the aforementioned legal requirements to combat invasive alien species.

It may be that measures to prevent damage inflicted by canids on (other) native species in newly colonized territories – e.g., coyotes eating Dice's cottontails – are appropriate in certain situations, and this could conceivably include lethal control. Again, an evident role is reserved in this regard for (inter)national wildlife law, under which colonizing canids may be designated as, e.g., protected, game, or pest species. However, to regard pioneering coyotes, golden jackals and crab-eating foxes as *alien* species to be discouraged or eradicated would be missing the mark.

Whereas the current analysis is limited to clarifying the legal status of colonizing versus introduced species, we draw attention to the existence of various related issues. For instance, further complications arise where range expansions into non-historic areas result from a mixture of natural expansion and anthropogenic introductions. An apt illustration is the red fox in large lowland areas of North America, where the species' establishment largely seems to have been a natural expansion, but was influenced also by introductions of foxes from Europe (Statham et al., 2012). Likewise, coyotes and golden jackals can hybridize

with wolves and dogs, raising vexing questions regarding the legal status of hybrid offspring (Trouwborst, 2014). These issues line up with de-extinction (Somsen, 2016) and assisted colonization (Trouwborst, 2015) in a growing queue of conundrums that wildlife law must come to grips with in the Anthropocene.

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