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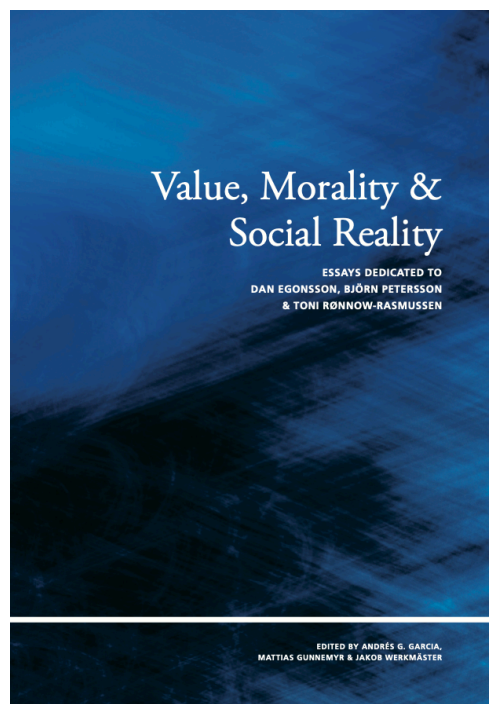
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What Does It Mean for a Species to Be Alien – And Why Is It a Bad Thing?

Erik Persson

Abstract. Invasive alien species are frequently discussed in academic literature, by practitioners, government agencies, and popular media, but what does it mean for a species to be alien and why is this seen as a bad thing? To answer these questions, I have analysed texts about invasive alien species in academic journals and in communication from government agencies. The almost totally unanimous answer to the first question was that a species is alien if and only if it is introduced to an area outside its natural range by humans. I found three primary answers to the second question, namely that (1) alien species are more probable to behave invasively or that it is impossible to know for sure if an alien species will behave invasively, (2) being alien is bad in itself or at least that alien species have a lower value than native species and native environments, and (3) being moved by humans is unnatural and being unnatural has negative value. All three answers probably contribute to why being alien is considered a negative property in species but none of them seem like a satisfying answer to why being alien should be seen as a bad thing in a species.

Introduction

When the word ‘alien’ is used about humans, it usually implies that someone is from somewhere else, usually another country but it could also be another village or (maybe someday) another planet. The word is in that sense, similar to ‘foreigner’,

but it seems to go beyond that. ‘Alien’ can also mean that something or someone is strange in some sense. An idea, for instance, can even be considered alien in a certain context without being foreign. A person can be alienated even if she is not from somewhere else or moving somewhere else physically, if she is in some sense, be it mentally, emotionally, or intellectually, separated from her group or society. When used about humans, both ‘alien’ and ‘foreign’ often also have negative connotations. Throughout most of human history, being alien, in any of the senses mentioned, usually implied a lower value or even a lower moral status. This is in fact still a popular opinion in certain circles though it has no support whatsoever in modern ethical theory.

In astrobiology, ‘alien’ usually means extraterrestrial. That is, coming from somewhere other than Earth. In astrobiology, the value of alien life is clearly positive, and very high. Finding alien life is of course the holy grail of astrobiology. In this case it is a matter of epistemic value, but empirical studies show that many people assign a very high end value to alien life (e.g. Persson et al. 2019). There are also good reasons for assigning a high end value as well as instrumental value to extraterrestrial life (as shown by e.g. Cockell 2011a, b; Persson 2017, 2019).

From an ethical perspective, the discussions about alien life - where alien means extraterrestrial - have just started. If we depart from Hollywood’s depictions of alien life, it is usually (though not always), quite simple. If aliens look more or less like us (e.g., the Navi in the film *Avatar*) then we should sympathize with them. If they look like lizards or giant insects (as in the *Alien* films or the TV series *V*), then they are dangerous, and we should fight them. Among people involved in space exploration, the attitudes differ. Those in favour of human settlements on, for example, Mars, show very little concern for extraterrestrial life (e.g., Smith 2009; Zubrin 1996), while others agree with Carl Sagan’s statement in his famous TV show *Cosmos*, that “[i]f there is life on Mars, I believe we should do nothing with Mars. Mars then belongs to the Martians, even if they are only microbes.” Philosophers discussing the moral status of extraterrestrial life divide more or less along the same lines as those discussing moral status on Earth. That is, we have advocates of a cosmic version of anthropocentrism, sometimes called ratiocentrism (Smith 2009). We have biocentrism (Cockell 2005, 2011), sentientism (Persson 2012) and ecocentrism (Rolston 1986). In addition, we also have cosmocentrism (Lupisella 2020; MacNiven 1995; McKay 1990) that in practice does not seem to differ substantially from biocentrism but where extraterrestrial life is explicitly included.

Let us, however, go back to Earth and the questions that are the focus of this chapter: What does it mean to call a species alien and why is it seen as a bad thing for a species to be alien?

In addition to being philosophically interesting, these questions have gained practical importance in connection with the ongoing campaigns against invasive alien species (IAS) that recently has got quite a lot of attention in conservation biology, law and policy making, as well as in popular media.

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When used about species, the word ‘alien’ is in fact almost always used as a part of the concept of IAS and it will thus be analysed in this context.

The increased attention towards IAS is beneficial to our investigation since it means there is a lot of material to draw from, both in the form of academic literature and in the form of, for example, information texts from government agencies. There is also a downside, however, namely that the close connection between ‘alien’ and ‘invasive’ in these texts makes it difficult to analyse any one of these terms individually. Nevertheless, the fact that ‘invasive’ and ‘alien’ are so closely connected in this discussion is interesting in itself and I will try to make good use of this in my analysis.

Academic texts about IAS most often occur in journals about conservation biology in a broad sense. It is surprisingly rare that these texts attempt to define the whole term or any of the included terms, however. They also seem to take it for granted that being an IAS is something negative (e.g., Cuthbert et al. 2021; Latombe et al. 2017; Mgidi et al. 2007; Sax & Gaines 2003). There are some examples, however, where academic texts do present a definition and a few texts that attempt to defend or contest the assumption that IAS is necessarily something negative. I will make use of these texts and also of official statements about IAS on the websites of Swedish authorities. What makes the latter good sources for this investigation is that they tend to be very thorough and have a pedagogical ambition. They therefore typically both define ‘IAS’ and explain why it is important to fight them, that is, why being an IAS is something negative.

Let us start, however, with what seems to be the most influential definition of ‘Invasive alien species’, formulated by the International Union for Conservation of Nature (IUCN):

“Invasive alien species are animals, plants or other organisms that are introduced by humans, either intentionally or accidentally, into places outside of their natural range, negatively impacting native biodiversity, ecosystem services or human economy and well-being.” (IUCN).

This formulation indicates three distinct answers to the descriptive as well as the normative aspects of what it means to be an invasive alien species:

- Being introduced by humans,
- Being outside its natural range, and
- Negatively impacting native biodiversity, ecosystem services or human economy and well-being.

Can this tell us anything about what it means for a species to be alien as such?

The first two properties listed here seem to focus on the alienness, while the last aspect seems to be about invasiveness, though, if invasive species have these negative impacts independently of them being alien, then why does invasiveness need to be clustered together with alienness?

Alien Species as a Threat

Invasive alien species are usually assigned negative value because they threaten ecosystems (Fantle-Lepczyk et al. 2022; Latombe et al. 2017; Simberloff et al. 2013), ecosystem services (Cuthbert et al. 2021; Latombe et al. 2017) and other natural resources (Simberloff et al. 2013), society (Mgidi et al. 2007), economic values (Cuthbert et al. 2021; Fantle-Lepczyk et al. 2022; Gholizadeh, et al. 2022; Mgidi et al. 2007; Naturvårdsverket 2021), human health (Naturvårdsverket 2021), or wellbeing (Cuthbert et al. 2021; Simberloff et al. 2013), biodiversity (Cuthbert et al. 2021; Gholizadeh, et al. 2022; Latombe et al. 2017; Naturvårdsverket 2021; Simberloff et al. 2013), or native species (Fantle-Lepczyk et al. 2022; Latombe et al. 2017; Sax & Gaines 2003; Simberloff et al. 2013). This seems like a good reason to assign a strong negative instrumental value to invasive species, but what does this have to do with being alien?

A possible answer could be that only alien species behave invasively. We know that this is not true, however. Another answer, that also makes more sense, is that they behave invasively more often than they contribute positively to their new environment. Another answer that has been suggested is that it is a matter of precaution (Simberloff et al. 2013). If a species is moved from one environment to another it is very difficult to say for certain that it will not have any negative effects in the new environment. That is why it is often recommended to always avoid moving species even if they are not shown to be invasive.

In these cases, the negative attitude towards alien species is purely instrumental. Alien species are not despised because they are alien as such but because of the risk they pose to other species (Simberloff et al. 2013).

This seems like a plausible answer to why alienness and invasiveness is connected in the expression 'invasive alien species' and also to why alien species are sometimes persecuted even though they are not shown to be a threat.

If this is the only reason for mentioning alienness in the context of IAS maybe discussions about IAS does not tell us a lot about what it means for species to be alien, but it does tell us something about the negative connotations of alienness in species.

Things are not as crystal clear as they may seem, however. Conservation biologists seem to have different opinions on which is most common, that new species become a threat to their new environment or that they provide a valuable addition to it (see Peretti 1998; Sagoff 2009; Sax & Gaines 2003; Simberloff et al. 2013 for different opinions in this matter). This takes away some of the credibility of the precautionary approach. If alien species overall contribute more value than they take away in their new environments, precaution may not be the best approach.

On the other hand, even if it is not correct that alien species overall do more harm than good, it is still possible that the influence of this view is the main or the only explanation to why alienness is connected with invasiveness.

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There are other problems, however. If alien species should be stopped or exterminated because they are merely a risk to other values, then why are not native species that behave invasively treated in the same way?

There are well-documented cases where human encroachments (other than importing new species) cause certain indigenous species to start behaving in an invasive way in environments where they are already established and have been established for a long time. Examples of such human induced changes are eutrophication and climate change. Why are not these invasive non-alien species persecuted in the same way as invasive alien species?

We should also ask ourselves, if the relevance of being alien is merely instrumental, why include it in the name ‘invasive alien species’? Would it not make more sense to just call it ‘invasive species’ and motivate the campaigns against alien species with the risk that they will become invasive if we move them?

Finally, we also need to account for the first two aspects of what it means to be an IAS in the IUCN definition. That is, being introduced by humans and being outside of its natural range. How come the definition of ‘alien’ focuses on human involvement and naturalness? Why not on, for instance, how different its place of origin was from its new environment, how far or how fast the species has travelled or how long ago it came to its new environment?

Aliens vs. Natives

In many places, alien species are not just seen as problematic when they threaten other values, including other species that are, for example, economically valuable or keystone species in the ecosystem, or when they directly or indirectly threaten a larger number of species and thus cause a decrease in biodiversity. Sometimes, one alien species threatens one indigenous species and there will be no other consequences. In these cases, one species is substituting another species without any further effects on, for example, the economy or biodiversity. Why is that a problem? Here it seems that being alien is seen as bad in itself.

This is even more pronounced in cases where introduced species are being exterminated even if they are not invasive and do not threaten any other species. These cases seem to be less common, but they do occur. Simberloff et al. (2013) deny that invasion scientists see alienness as being bad in itself. Several other authors disagree, however. Young & Larson (2011) claim that “invasion biology places a value on existing biodiversity”, and Cidrás & González-Hidalgo (2022) states: “This dichotomy, [i.e. between “natives and aliens”] which is essentially a geographical categorization hinging on questions of placement and displacement, has been strongly supported in the last few decades in invasion science.”

Especially Peretti and Sagoff are very clear about their views:

“Nativist trends in Conservation Biology have made environmentalists biased against alien species. This bias is scientifically questionable, and may have roots in xenophobic and racist attitudes.” (Peretti 1998).

“...the purism of biological nativism has historically been associated with fascist and apartheid cultures and governments” (Peretti 1998).

“... many environmental scientists are committed to the idea of pure, ‘native’ nature.” (Peretti 1998).

“No matter how species-rich, beautiful, and complex an ecosystem may appear to the average city dweller, the biologist will see it as degraded insofar as alien species invade it.” (Sagoff 2009).

It is also easy to find examples of authors in the field who clearly describe the issue of IAS as a conflict between native and alien species or biotas (e.g., Chaffin et al. 2016; Gholizadeh, et al.; Mgidi et al. 2007).

In a questionnaire study aimed at conservation biologists, 37% answered that they agree and 34% that they do not agree with the statement “Exotics are an unnatural, undesirable component of the biota and environment”. (Young & Larson 2011).

There has been some speculation about why native species are seen as inherently more valuable than introduced species. As we saw above, Peretti (1998) associates it with xenophobia. He mentions also that seeing alienness in species as a sufficient reason for extermination campaigns has historically been associated with racist regimes. He mentions World War II Germany and South Africa as examples.

Simberloff et al. (2013) contest the claim of xenophobia. They write: “The wish to maintain the global diversity of native communities and ecosystems has nothing to do with xenophobia. On the contrary, it stems from principles similar to those that defend the right for every human society to retain its cultural distinctiveness, as proclaimed by the Council of Europe and UNESCO.”

I am not sure this is a good reply. The right to retain one’s cultural distinctiveness may be granted by the Council of Europe and UNESCO, but it is not obvious that it stays totally clear of xenophobia.

Nevertheless, it seems implausible that a large majority (as it is) of the world’s conservation biology researchers and practitioners are motivated by xenophobia. It is clearly possible to prefer what one has over what one might get and to have a special relation to existing species that results in valuing them as ends in themselves. A complicating factor for the xenophobia explanation is also that campaigns against IAS are prevalent in most countries around the world, not only in countries whose governments have a xenophobic ideology. This is also true for countries where protection of native species against alien species is an explicit part of the motivation for the fight against IAS. This includes South Africa of today, post-apartheid.

The fact that not just South Africa but also USA, another former colony has protection of native species and keeping native environments clean from alien

species as an explicit motivation for its fights against IAS (Chase 1987; Peretti 1998; Sagoff 2009; Wilson 1992), could indicate another possible explanation, namely that alien species are consciously or unconsciously associated with colonialism (Crosby 1986; Heywood 1989; Peretti 1998). New species can thus in themselves be seen as colonisers or are strongly associated with human colonisers. This cannot be the whole truth either, however, since just as alien species are prosecuted just for being alien in countries that are not led by xenophobic governments, it is also true that this happens in countries that do not have a colonial past.

Unnaturalness

The IUCN definition of IAS mentions two properties that do not seem to have anything to do with invasiveness but that seem to be clearly meant as criteria for alienness: Being introduced by humans and being outside of the species' natural range.

These criteria are echoed in many other definitions. Fantle-Lepczyk et al. (2022) define 'Non-native invasive species' as "organisms introduced beyond their natural range by human activity." Antonsich (2021) distinguishes between native and alien species thus: "natives are species occurring within their natural range and whose dispersal is independent of human action, whereas aliens are species which have crossed a biogeographic barrier thanks to human action". Gholizadeh, et al. (2022) use a less categorical characterisation by stating that "IAS are often introduced by humans to habitats outside of their natural range".

In Sweden, the game plan for the campaign against invasive alien species is set up by the Environmental Protection Agency (EPA) together with the Agency for Marine and Water Management (AMWM). On their website, EPA tells us that "Invasive alien species are plants, animals, fungi and microorganisms that have been intentionally or unintentionally moved to a new environment where they spread rapidly and cause damage to biodiversity, the economy and potentially human health." (Naturvårdsverket 2021).

The Agency for Marine and Water Management (AMWM) explains on their website that "Invasive Alien Species, IAS, are animals, plants and organisms that are introduced accidentally or deliberately by humans into an environment where they are not normally found." (Havs- och Vattenmyndigheten 2021).

In a presentation for the members of the research project *The Human Aspect of Invasive Alien Plants*, at the Pufendorf Institute for Advanced Studies (<https://portal.research.lu.se/en/projects/the-human-aspect-of-invasive-alien-plants-the-paradox-of-plants-p>), an EPA representative defined 'alien species' (in translation from Swedish) as "a species that has been introduced outside of its

natural habitat after the year 1800 and that can survive and reproduce [in its new habitat]” (Persson 2021).

Here, we get an additional clue in the form of a year - 1800. The fact that this answer was not in terms of a time range (for example 200 years) but in terms of a particular year indicates that it does not matter as such how long a species has been in its new environment. A species cannot be “unalienated” just by being a long-time resident in an area. Instead, there is something special with the year 1800. What is that?

On a direct question about what is special with the year 1800 accompanied by the suggestion that the EPA saw the nature in Sweden at this particular year as an ideal state, the presenter emphatically denied the “ideal state” suggestion and explained that the reason for the choice of the year 1800 was that before that year we do not have enough information about how species were introduced. So, the real answer seems to be that it is not the year or the time range as such that is important. Instead, the answer emphasises that it is a matter of how. In combination with the use of the word ‘introduced’, this answer fits well with the definition on the EPA website that states that a species needs to be moved to its new habitat to be branded as alien. Both the phrase, ‘be moved’ (rather than ‘move by itself’) and the word ‘introduced’ indicate that only species that have been moved by someone or something else - not species that have moved or spread by their own power - are considered alien by EPA.

The Swedish version of the same web page says: “Invasiva främmande är arter som med människans hjälp flyttats från sin ursprungliga miljö och i sin nya omgivning börjar sprida sig snabbt och orsakar allvarlig skada för ekosystem, infrastruktur eller människors hälsa vilket medför stora kostnader för samhälle och enskilda.”

In English translation, the first part of the definition says: “Invasive alien [species] are species that by human help has been moved from its original environment ...”.

It is not clear why humans are mentioned in the Swedish version but not in the English version. Maybe it is meant to be implied in the English version. Nevertheless, this definition clearly follows the trend: A species needs to be moved by humans to be alien.

This answer is somewhat informative but still quite unsatisfying. It differs quite substantially from the way ‘alien’ is used in other contexts as we saw in the introduction to this chapter. It is also a bit puzzling why the ‘how’ – or rather, the ‘who’ – is so important, and why the answer to the ‘who’ question seems to be humans.

Let us return for a moment to the second criterion of alienness mentioned in the IUCN definition. This criterion mentioned the natural range of the species. The terms ‘natural’ and ‘unnatural’ are notoriously illusive. There are almost as many definitions of the terms as there are authors trying to define them (e.g., Soulé and Lease 1995, Bennett and Chaloupka 1993, Cronon 1995). It is even questioned

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whether the distinction is meaningful considering the high degree of human influence on nature everywhere on Earth. (e.g., Peretti 1998).

On top of this, the normative content of the words is debated. Is natural necessarily good? Is unnatural necessarily bad?

One thing that phenomena described as unnatural usually have in common is that they are somehow connected with humans. Sometimes categorically so - anything having a certain type of connection with humans is unnatural. Sometimes it seems to be a matter of degree. The more human involvement, the less natural a phenomenon is. If we assume that naturalness is a matter of low or no human interference, the two criteria for alienness mentioned by the IUCN definition – being introduced by humans and being outside their natural range – seem to converge towards an idea that being alien for a species is to be moved by humans outside of the areas where the species occur without human interference and that this is unnatural and therefore bad.

One might imagine that species that have come about due to breeding or synthetic biology can qualify as unnatural, and probably also alien in any environment outside the lab or the farm. Being unnatural, and therefore alien, for an IAS is not a matter of how the species came about, however, but a matter of how it came to turn up in its new location. If it is moved by humans, its occurrence in its new location is unnatural and thus unwanted, and this is what is meant by the word ‘alien’ in this context.

If naturalness is the key criterion for alienness, it would also explain why only invasive alien species, and not invasive non-alien species need to be exterminated. Behaving in an invasive way in a species “home” environment may have negative consequences but it is not unnatural.

As we noted above, the basis for seeing ‘natural’ as positive and ‘unnatural’ as negative, is shaky, but is naturalness a good basis for branding a species as alien?

Peretti (1998) points out that “The words ‘native’ and ‘natural’ are closely linked. The Latin ‘nascor’ is the original root for several English words including native, natural, nation, and natality.” So, there might be an etymological basis for associating ‘native’ and ‘natural’ and therefore ‘alien’ and ‘unnatural’. We should not rely too heavily on this connection, however. Stating that alien species are unnatural because of the etymological connection would be to commit the genetic fallacy.

There is also a biologically based problem with the connection between ‘native’ and ‘natural’, namely the fact that nature is not static, and it is only “natural” that species come and go. It is well-established that nature types have a certain succession order. Some species pave way for other species that in turn supplant the first species.

A practical problem with defining ‘alien’ in terms of active human interference is that it might cause problems for assisted migration as an answer to climate change (see e.g., Hoegh-Guldberg et al. 2008; McLachlan et al. 2007; Minter & Collins 2010; Richardson et al. 2009 for information about assisted migration).

Nevertheless, the connection between alienness and naturalness may well be an important explanation for why human introduction is mentioned in so many definitions of IAS and it may well be a prominent explanation for why being alien is considered a negative property for species, both in connection with invasiveness and in its own right.

Conclusions

The aim of this chapter was to identify what it means for a species to be alien, and why this is considered a bad thing. Since being alien when it comes to species is almost only discussed as part of the concept ‘invasive alien species’, this is the context in which the questions are discussed. The questions were therefore investigated by using academic texts and communication from Swedish government agencies about invasive alien species.

The sources were almost totally unanimous regarding the question of what it means for a species to be alien in the chosen context, namely, to be moved from its natural range by humans.

I identified three primary answers to the question of why being alien is considered a negative property for a species:

1. Invasive species threaten important environmental, economic, and other values. We can never know for sure which species will start behaving invasively but we do know that when species are moved to a new environment, there is a higher probability they will behave invasively and cause problems than that they will be positive additions to the new environment. Therefore, all alien species need to be treated as potentially invasive and be banned from entering and exterminated if they have already been introduced.
2. Native species and native environments are valuable in their own right. Alien species have a negative value in their own right because they are non-native, or at least they have a much lower value than native species. Alien species sometimes threaten native species and even when they do not, they degrade native environments just by being introduced to these environments. I also identified two possible explanations for why being native was considered valuable in itself and why being alien was being seen as negative in itself. One was xenophobia, the other was that alien species are associated with colonialism. None of them can completely explain this answer, however. It is very implausible that everyone who promote or take part in the fight against IAS have xenophobic motives and the fact that native species and environments have been preferred by xenophobic governments does not explain all other cases where non-xenophobic governments outlaw alien species. It is also not the case that only former colonies outlaw alien species.

3. Being moved by humans is unnatural and being unnatural is bad. This answer is philosophically weak. The distinction between ‘natural’ and ‘unnatural’ is questionable. ‘Alien’ is not defined in terms of ‘unnatural’ in most other contexts, which is not a problem per se since the discussion in this chapter is explicitly set in this particular context, but it does lower the usefulness of the answer. Finally, and maybe most importantly, the connection between being unnatural and negative value is unexplained. Nonetheless, the opinion that being unnatural implies a negative value is very common in all kinds of contexts and references to unnaturalness are common in the literature about IAS. This answer is also closely connected to the overwhelmingly most common answer in the literature as well as among the government agencies to the question of what it means for a species to be alien. It is therefore plausible that this answer is a very common reason for considering alienness a bad thing in a species.

All three answers have some plausibility as answers to why being alien *is considered* to be a bad thing in a species. None of the answers seem to provide a really solid reason for why being alien *should be* considered a negative property for a species, however, and it has in fact been argued that the term ‘invasive alien species’ should be discarded and substituted with the term ‘invasive species’.

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