



Introduced species overlooked in biodiversity reporting

A UNIGE researcher demonstrates that the biodiversity indicators used in reports on the evolving state of nature are incomplete: they only include indigenous species, deliberately excluding introduced species.

Nature is intimately connected with human well-being of current and future generations – which is why an array of reports track the state of biodiversity and predict the impact of our way of life on its evolution. These reports are based on several indicators that only take indigenous – i.e. “original” – species into account for each region. Yet today modern environments are made up of indigenous and introduced species. The introductions are either deliberate – as is the case, for example, with agricultural crops – or accidental, as was the case with the Asian hornet or the box tree moth. Although these introduced species play important roles, they are ignored by specialists, a fact that partly distorts the international nature reports. The study by the University of Geneva (UNIGE), published in the journal *PLOS Biology*, recommends that the positive and negative contributions made by these species should be included so that the public has an accurate view over the surrounding nature and its evolution.

Biodiversity protection at present is intimately linked to protecting the indigenous species and environments that are specific to each region worldwide, the aim being to safeguard the “authenticity” of landscapes and their ecosystems. The indicators used by biologists are based exclusively on species of origin; in other words, they overlook the presence of introduced species. These indicators inform international reports on biodiversity, introducing a bias at the source, argues Martin Schlaepfer, a researcher at UNIGE’s Institute of Environmental Sciences (ISE). In short, a section of nature is deliberately ignored. Why?

Fear of the invader

Biologists generally favour the protection of native species. By contrast, introduced species are viewed as undesirable by the conservation community because a subset can generate undesirable effects. “But around 88% of species introduced to Europe are not problematic,” explains Schlaepfer. “And among those that do create a problem, we generally only look at their flaws, without factoring in the positive features they can also generate.” For example, the giant goldenrod (*Solidago gigantea*) is a species of plant introduced from North America. It is considered invasive in Switzerland because it can dominate environments bordering agricultural land. However, in addition to boasting medicinal properties, the giant goldenrod also facilitates favourable biological interactions with pollinators. In a similar manner, American crayfish – which are invasive in European lakes – provide the catering industry with an important source of food.



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The giant goldenrod (*Solidago gigantea*) is a species introduced from North America. It is considered invasive in Switzerland because it can dominate environments bordering agricultural fields. But favourable biological interactions with pollinators take place and the plant has medicinal properties. Current biodiversity and sustainability indicators ignore these positive contributions.

High definition pictures

As a follow-up to his research, Martin Schlaepfer offers the possibility to take an **online survey** on the perception of introduced species.

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Reports that are relevant for politicians and the public

By deliberately omitting introduced species, biodiversity reports do not accurately reflect nature as it really is. “If you focus on trees in the Canton of Geneva, there are 88 indigenous species. But there are 597 introduced tree species in the canton!” points out Schlaepfer. A large part of the natural world surrounding the people of Switzerland is knowingly excluded from the indexes. “If we want to remain relevant for political institutions, we now need to consider nature in its entirety,” insists the UNIGE biologist. But what would the impact be on the results of the reports?

Planetary boundaries

In 2012, the High-Level Group on Global Sustainability produced a UN-validated report that identified 12 indicators for measuring planetary boundaries, i.e. the limits that humankind must not exceed in order to enable life to continue on Earth. One of these indicators is biodiversity. Biologists observe the average abundance of species originally present in a region; if the average abundance drops by more than 10%, experts consider that nature has been altered too extensively and that the health of future generations is in danger.

“But these reports do not include the potentially useful functions brought about by species that were not originally present, even though they are constantly interacting with the indigenous biodiversity,” says Schlaepfer. “If they included these factors, then the percentage of the land area deemed to be in poor condition would decrease from 58% to 48%, reducing the severity of humankind’s impact on nature.”

Looking at all of nature’s species in order to follow their evolution

In his study, Schlaepfer challenges the indicators used in international reports on biodiversity. “Understanding nature and its links to human well-being means assessing every species at its fair value, because they all interact with humans and form part of the reality of the evolution of biodiversity”, points out Schlaepfer. Furthermore, introduced species may also be in the majority, mainly in urban areas. “Trees that are culturally important for the public are often introduced species, and they illustrate why we must include the positive aspects of these species that contribute to the well-being of humans, even if they contradict the values of some biologists.”

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