SDG 15, life on land: Invasive alien species – problem or solution?

Introduction

Sometimes even the best-intended actions bring bad and unexpected results. When we interfere with natural processes, this happens more often than usual. This is also the case with invasive alien species (IAS), also called non-natives or aliens. These are species introduced intentionally or unintentionally into a natural habitat. The quality that makes IAS dangerous is their ability to spread and become abundant in the new region (Caro, Sherman 2011). 'In contrast, policy papers, legislation, and some ecologists tend to append an additional component to this definition: invasive species are not just invasive, but they also cause some form of ecological or economic harm' (ibid.) In a few cases, IAS have become so successful in the new area that they pose a threat to native species, in some cases even putting native animals and plants at risk of extinction.

How do these species arrive in new regions? This often happens by accident; some organisms come to new regions attached to ships or other means of transportation. Insects or seeds are sometimes hidden in pallets or agriculture products. Sometimes, the introduction of new species is intentional, as it serves some human purpose; for example, Arctic lupin was introduced into Iceland to prevent soil erosion, and Sosnowsky's hogweed was introduced to serve as a very efficient cattle food. Owners of gardens often bring home some plants from their travels or buy some plants that are atypical for their region at the shop, inadvertently contributing to the spread of the species in this new ecosystem. Moreover, pet owners buy exotic animals, and when they get bored or become unable to take care of the animal, they set it free and leave it in nature. This problem mainly applies to amphibians and reptiles. There have already been a few instances where some careless snake owners have decided to set them free, irrespective of possible future consequences of this action. One important factor that facilitates the introduction of new species is climate change, where the rising temperature is already making species move northward or southward in the southern hemisphere. (cf Pélissié et al. 2022). This warmer climate also makes it possible to introduce species that are not specific to a certain region.

History of introduction of Sosnowsky's hogweed

Many IAS were introduced with the best intentions to change or improve some processes. One of these is Sosnowsky's hogweed; the plant that was chosen as a result of a search for the most effective and nutritious plant for cattle. In the 1950s, the Union of Soviet Socialist Republics (USSR) was looking for the best food for livestock. 'Scientists conducted experiments on 300 varieties (of plants) taken from the wild, and 50 were selected for further research. It was found that hogweed, named after a Russian researcher of Caucasian flora (Prof. I.D. Sosnowski), is the richest in desirable ingredients. It was tested in the Polar Plant Garden on the Kola Peninsula in the 1950s. Ten years later, it was already being cultivated in collective farms throughout the USSR. It arrived in Poland in the early 1970s as a gift from the Vavilov Institute of Plant Cultivation in Leningrad' (Dziatkiewicz 2003). At that time, many plants were tested as a possible food for cattle, and many were sent to Poland for further trials and testing. The advantage of Sosnowsky's hogweed was its richness in nutrients, especially protein and carbohydrates. According to Professor Regina Lutyńska from the Department of Forage Crops, Institute of Plant Breeding and Acclimatisation, the milk and meat of cows fed with this plant are rich in fat.

As the results were promising, Sosnowsky's hogweed was planted, and it seemed to be a big success in the beginning; it produced excellent yields and was not prone to weeds. Soon, the side effects of this miraculous plant were discovered. First of all, it was difficult to keep up with the harvest: the plant grows so fast that it needed to be harvested very often. If not cut in time, it grows so strong that agricultural machines like combine harvesters cannot cut it. Second, the plant should be cultivated with utmost caution and protective clothing due to the possibility of severe burns. Finally, as a gift from Russia to communist Poland, it was subject to propaganda and could not be criticised openly. Thus, the researchers decided not to introduce it. Even so, the plant was very successful and tough to eradicate, and it has spread.

Sosnowsky's hogweed today

Today, Sosnowsky's hogweed can be found in many places, mainly in meadows, on farmland, along roadsides, along the banks of rivers, lakes and streams, in gardens, parks and forests (Powiatowa Stacja Sanitarno-Epidemiologiczna we Wrześni n.d.). The plant's stem and leaves have hairs that 'produce a toxic substance which, when exposed to UVA and UVB rays, binds to the skin causing second- and third-degree burns' (ibid.). It leads to skin redness and

blisters filled with fluid; the infected areas are sensitive to sunlight for several years. The plant can also cause irritation of the respiratory tract, nausea, vomiting, headaches, and conjunctivitis.

The plant grows naturally in 'the central and eastern parts of the Greater Caucasus, in the central, eastern and south-western Transcaucasia, as well as in north-eastern Turkey (it is native to Armenia, Azerbaijan, Georgia, Turkey and southern Russia)' (GDOŚ, n.d.). In Poland, the species is an invasive plant that spreads very quickly due to its fast rate of growth and the large number of seeds produced.

Summary

Sosnowsky's hogweed is an example of how good intentions can create a problem more serious than those for which the actions were taken. In addition, in this case, the fact that Sosnowski's hogweed was a gift from Russia to communist Poland added spice to the situation, as it was difficult to diplomatically reject such an awkward gift. Unfortunately, many cases of introducing invasive species result from attempts to solve a problem, and this was no different in the case of Arctic lupin, which was brought to Iceland as an attempt to solve the problem of soil erosion. However, the plant proved to be so efficient at spreading that it now covers 4% of the island. There are many such cases of changing ecosystems for human needs. Perhaps they should serve as a warning against human intervention in ecosystems?

Questions

1. Do you know any other invasive species of plants and animals?
2. What are the main characteristics of invasive species?
3. Can aesthetic reason justify careless implementation of non-native species?
4. What could be done to avoid future situations like those described in the case study?

List of references

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