

## What happens when a top predator recolonizes a Nordic island like Åland?

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*When a top predator recolonizes an area, it can dramatically change the ecosystem. This is what might be about to happen on the Åland islands. The Eurasian Lynx has walked over the ice from Finland to Åland after being extinct from Åland for about 100 years. What effects will this have on the islands other animals? What effect will it have on the people living there? Does the lynx population on the Åland islands have a future? These are questions I will attempt to answer.*



Figure 1. Picture of a Eurasian Lynx, *Lynx lynx*. Taken from Wikimedia, taken by Przykuta.

### Lynx, a great predator

The lynx is one of the biggest predators in Scandinavia. It stands alongside other great animals including the wolf and the brown bear. It is the only big cat in this part of the world and thus can be described as the lion of the north. The lynx is a very secretive creature and because of this, it is rarely seen. The fur changes from a yellow-brown in the summer to grey-white in the winter. Their bellies are white and the rest of their body is covered with dark spots. Two main characteristics of the lynx are that their ears have tufts on them and their tails are only about 20 cm long. These features give them their great camouflage.

#### **Lynx Facts:**

*Body length: 90-120 cm*

*Weight: 18-26 (male)*

*14-20 (female)*

*Height: 50-70 cm*

*Reproduction age: 2 years old*

*Litter size: 2-4 cubs*

*Favorite prey: Roe Deer*

The lynx feeds on a range of different species. It has been known to kill prey up to four times its own weight. The most common prey for lynx in Scandinavia are the roe deer, the hare and different fowl species. To kill its prey, lynx bite on the throat until the prey suffocates.

### History on Åland

The lynx was part of the Åland fauna from before the 1800s, but during the 1890s the last lynx was shot. They had been heavily persecuted because of their fur, but mostly because of the damage they had caused to the peoples' sheep and also the Kings' high game (deer that only the King, the knightly hood and the nobles were allowed to hunt). In the 1700s the Swedish King assigned special hunters that were in charge of hunting down the lynx on Åland. Then, in the 1800s, the Finnish government partly changed the law on Åland: now



Figure 2. Map of the Åland islands. Taken from Wikimedia, made by Demis.

everyone could hunt lynx (and other big predators). That is how the story seemed to end for the lynx on Åland.

For nearly 100 years the Åland islands had no top predators. Then the lynx made its entrance onto the stage once more. On a few cold winters during 1980-1990 the lynx walked back over the ice, from Finland to Åland. At this time roe deer had been reintroduced and their population had exploded in numbers. Around the time the lynx came back to Åland, the roe deer had almost become a problem. Some say that the situation that had developed with the roe deer made the colonization of lynx a natural event.

### Conflicts arising

Not everyone on Åland feel this way about the lynx however. Hunters and predators have always been in conflict with each other, since they both hunt the same game; Åland is no exception. Reading chat rooms from a few years back show that, at least some, hunters do not have a positive view on this recolonization. Many say that since the lynx arrived they have seen less roe deer around. Others talk about their endangering the sheep that graze pastures in areas where lynx have been tracked. Some compare them with other invasive species that never have been a part of the ecosystem on Åland until humans brought them there. All these opinions have truth in them; therefore I will examine these statements in more detail below.

### Conflicts in game

Because lynx are predators, their main prey will decrease in numbers at first. This has been shown to be the case especially for the roe deer. Simulation studies have shown that a 50 % increase in the lynx population can lead to an 8 % decrease in the roe deer population. But the same studies have also shown that during high roe deer densities, the lynx have a lower effect on them. When looking at data from the hunting of roe deer one can see that the numbers have gone down after the lynx arrived on Åland. This may be because of the lynx hunting roe deer, but it may also be caused by the harsh winters in those years. In the years 2010-2011, the winters were harsh and the number of killed roe deer decreased from about 4000 to 2000, although this could partly be caused by lynx as well. Roe deer have a hard time surviving harsh winters with loads of snow due to their not being adapted to walking on snow. This can lead to their getting stuck and dying. There are multiple reasons why roe deer populations may decrease, not only the recolonization of lynx.

### *Sheep killings*

The other problem that was mentioned was the risk that lynx kill sheep. This is a common problem in many countries that the lynx inhabit. Even though lynx do kill sheep it has been shown that many lynx prefer other prey (such as roe deer) to sheep, even when sheep are more abundant than roe deer. Some studies even show that lynx will choose their home ranges depending on the amount of roe deer, not the amount of sheep, in the area. These studies give us a hint that lynx do not see sheep as their main prey, even though they seem to “settle” for them if they cannot find anything else. Something else that speaks for this is the phenomenon known as “search image”. This is something that many animals acquire in their first months or years when learning to hunt with their mother. When lynx cubs, for example, learn to hunt with their mother and see that she hunts for roe deer and hares, they, in turn, will chose these prey animals when they grow older and hunt for themselves. This leads to their not seeing sheep as their prey. It also could mean that they do not fully know how to hunt them.

*There are many methods for protecting animals, such as sheep, from predators. To learn more I recommend these reviews by Smith et al. 2000. (see last page)*

In the event that lynx do kill sheep, the government on Åland has decided to compensate the owners. They have money in their budget for such events where not only sheep but also other domestic animals get killed or injured by lynx. They are also working on training inspectors to assess the damage done by lynx. So far, three different compensations for sheep have been made. And they are working on better ways to ensure this compensation.

### *Invasive species?*

The third argument that can be seen is that the lynx was an invasive species and should be killed. Knowing that lynx would have been a part of the ecosystem if we hadn't killed them in the 1800s, this is a poor argument. Since they had wandered across the ice from Finland and not been planted here by humans, their presence is a very natural event, whereas the occurrence of an invasive species at many times can be connected to human interference. Also, an invasive species is usually defined as a species that is not native to the area that it has started to occur in and is outrivaling the native species.

### **Lynx on Åland today**

Today there have been two different inventories of how many lynx there are on the island. So far they have been counted, through tracking and spotting, to about seven individuals, one living on the main island and the others in the archipelago. A female with her yearling has also been spotted on the latest inventory, which is a sign that they are breeding successfully. If this stays successful, the population of lynx on Åland has a chance of surviving. The government on Åland has also decided to draw up a management plan for the lynx on Åland. This is a great step toward ensuring the survival of the species, but also toward ensuring the other wildlife populations' survival as well as the sheep's safety. In a management plan there will be guidelines to how a hunting of the lynx will be carried out in the event the population grows too large. Also, strategies to maintaining a healthy lynx population will be included in such a plan.

### **An interesting example**

Most research on the Eurasian lynx is done in countries and not on islands. One example though, from another lynx species (the bobcat), is that of an island in the USA, Cumberland Island. On this island the bobcat was reintroduced and had an interesting impact on the islands ecology. The main prey for the bobcat was white deer and these in turn ate sprouts of oak trees that grew on the island. After looking at data that stretched over many years, scientists could see that the lynx not only influenced the white deer population, but also the oak trees. The oak trees on the island had increased from before the lynx had been reintroduced, this as a result of the white deer population (the ones that ate oak tree sprouts) decreasing when the lynx started hunting them. This is a plausible outcome on the Åland islands as well. The roe deer largely impact the forest plantations on these islands and a decrease in roe deer numbers could therefore result in less damage on sprouts.

### **Looking ahead**

It seems that the population of lynx has a chance of surviving on these islands, especially now that a cub has been found. Even so, that is no guarantee that there will be no problems for the species in the future, or that they will not cause problems. Their impact on the roe deer populations and on the sheep owners are probably the most apparent. How great this impact will be largely depends on how big the lynx population becomes. The more the lynx population grows, the bigger impact it will have on the roe deer. Either way, the roe deer probably will decrease in numbers at first and then stabilize as the lynx population does the same. We have seen that lynx prefer roe deer over sheep, but sheep are still at risk. This is why compensation and techniques for protecting the sheep are necessary. So a management plan is very important, not only for the safety of the potential prey and the sheep but also for the lynx population itself. Further studies on what animals live on the Åland islands, how they are affected by the lynx etc., are important to further understanding the lynx population. This is not only important for the management of the species but it is also important to seeing the effect of a top predator on an island environment.

In closing, the lynx population will impact both the ecology and the society of the Åland islands. How great and to what extent, only time will tell.

#### **Literature:**

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