



Lesser White-fronted Goose  
*Anser erythropus*

# The story of Mánnu and Máddu

Backpacks for the geese  
Norway, May

**This is the story about Mánnu and Máddu. A story about life and death.  
And about new love.**

It is late May, and we are at the Valdak Marshes by the Arctic Ocean in northern Norway. The very last individuals of one of the most threatened bird species of Europe are on their way to the breeding areas in the mountains, and make a stop at the coastal meadows to feed. The spring migration has been demanding, the breeding area is still covered by snow and the breeding is exhausting. Depositing fat reserves is crucial. Valdak is the best site in Europe to monitor the Lesser White-fronted Goose, so the researchers are here as well. Every spring they stay for one month to study them.

The sound of explosions shocks three small geese, entirely focused on grazing small tasty plants in the salt marsh. They attempt to escape but fail as six powerful cannons pull a large net over them. The geese are entangled. They are trapped.

The caught birds are being tagged with colour coded leg rings and equipped with a small backpack – a 35 gram satellite transmitter – that hopefully will track their movements for at least a year. The first secret to be revealed is the location of the breeding sites in the mountains. The next step is to identify the migration route including stop-over and wintering sites.

The birds are in good shape and very quick on their wings when released. They make a loop over the marshes before disappearing into the light spring night of the high north. The researchers are satisfied – three new individuals are “on mission” - Imre, Mánnu and Máddu.



## The Lesser White-fronted Goose

The Lesser White-fronted Goose (*Anser erythropus*) is a subarctic goose species that was historically distributed in the forest tundra zone all the way from the Scandinavian mountains to easternmost Russia. Nowadays, the species is globally threatened with a total population of only some 25,000 individuals. The breeding distribution is presently patchy, as a result of the declining population trend that has continued for decades. The Nordic or Fennoscandian Lesser White-fronts form their own sub-population that has unique migration routes and genetics. The Fennoscandian population consists of only some 20 breeding pairs, and is thus critically endangered and at immediate risk of going extinct. The Lesser White-fronts are long distance migrants that leave the Nordic countries already in the beginning of September, and turn back to the north in May. The migration routes have been very poorly known, and this has been a major obstacle in the conservation of the species. The LIFE project for the conservation of the species, that produced this booklet, was a significant international effort to stop the declining trend of the Fennoscandian population and to raise awareness of the alarming situation.



## From breeding grounds to Siberia Norway, summer

**Small body size, high white front patch, a prominent yellow eye-ring. No doubt – it is a Lesser White-front showing up in the telescope far away in the mountains of northern Norway. The bird is warming her eggs – the breeding has started successfully.**

The researchers are at a safe distance, almost one kilometre away from the nest. Still they are able to identify the individuals by the colour coded rings. Red over green on the right leg – that is the male Imre. Later the same day – the couple is being observed in the same area: the male Mánnu is watching while Máddu is sitting on the nest. The researchers feel relaxed. The birds are all in good shape and the hatching has started. The birds are left on their own on the still snowy mountain tundra.

Two weeks later in mid-June, while the researchers follow their daily activity on the computer screen, all three birds leave the area. This year's breeding has failed. There are too many hungry red foxes around, and the eggs were probably eaten by one of them.

However, the breeding failure may also generate new and important knowledge. Imre, Mánnu and Máddu have started an impressive and dangerous flight. The first leg follows the coastline of the Arctic Ocean more than two thousand kilometres east to the Taymyr Peninsula, Siberia. This is a moulting area for non-breeding Lesser White-fronts both from Fennoscandian and Russian breeding populations. In mid-August new flight feathers are fully grown and the birds start the next leg southwards along the Ob river valley.

This new information is critically important for the conservation of the species. If Imre, Mánnu and



the shorter European autumn migration route, a much safer alternative. Now – Imre, Mánnu and Máddu are on their way to northern Kazakhstan and spend a couple of weeks refuelling on the steppes. In late October, with the first spell of cold winter weather from the north, Imre, Mánnu and Máddu are heading westwards, north of the Caspian Sea and the Caucasus.

Máddu had succeeded with their breeding in Norway, they would have stayed in the breeding area with their young and moulted there. Then they would have used

### Complicated migration routes

The migration routes of the Lesser White-fronts were mapped by the LIFE project in order to target conservation measures correctly. In practice, this was done by equipping a couple of adult individuals with a lightweight satellite transmitter. The map is summing up the present knowledge on the routes and stopover sites. In autumn, the Fennoscandian Lesser White-fronts first fly to the Russian Kanin Peninsula and from there they divide, taking two different routes: the European route (dark blue arrows) via Hungary to Greece, or the Central Asian route (red arrows) via Russia, Kazakhstan and Ukraine to Greece. In spring they have a different, straight route (green arrows) from Greece via Hungary, Lithuania, Estonia and Finland back to the breeding areas. One of the major findings of the LIFE project was that the choice of the autumn migration route is determined by the breeding success. The goose families with young are likely to choose the European route, while birds that did not manage to produce offspring can moult in Russia (light blue arrows) and are likely to choose the more dangerous Central Asian route. This has a direct implication for conservation: it's very important to try to 'support' successful breeding in Fennoscandia e.g. by controlling the Red Fox population in the breeding areas. Successful breeding contributes to recruitment of new individuals to the small population and – at the same time – to increased adult survival.





## A gunshot in the dark Russia, October

**In the last days of October, the signals of Imre's transmitter come from exactly the same spot for several days. Is Imre well? Or has the valuable device dropped off?**

The signals from the transmitters of the three birds have been recorded by the satellites several times every day, and there have not been any signs of technical error so far. The birds have been followed all the way from Norway to Taimyr and from there to northern Kazakhstan. Now Mánnu and Máddu seem to be heading back to Europe, but Imre is not.

Imre's latest position is checked on **satellite images**. The image is worrying – the signals come from a garden in a small settlement in Volgograd region in southern Russia. In a couple of days it is confirmed by Russian colleagues that Imre is dead, illegally and probably accidentally shot by a local hunter who doesn't even know, that there are two different species of white-fronted goose. The researchers send out a press release: the critically endangered Nordic population of Lesser White-fronts lost considerable shares of itself because one single thoughtlessly directed gunshot. The sad news is published all over Europe.



Mánnu and Máddu luckily escaped and continue their journey in the western direction. This is really surprising, because the expected direction was southwards to Mesopotamia in Iraq. Instead, the birds are passing by the northern coast of the Black Sea and finally at the end of December, signals point to the Evros Delta in Greece, next to the Turkish border. The autumn migration is complete. The wintering site is reached and identified – in Europe! The researchers are amazed by the loop migration route from Norway via Siberia and Kazakhstan to the wintering sites in Europe. This route has been revealed, now for the first time ever.



On this page and on page 4, a single Lesser White-front in a flock of Greater White-fronts is circled


### The look-alike dilemma

Probably the biggest challenge in the conservation of the species is that during migration, the Lesser White-fronts are mixing with (Greater) White-fronted Geese (Anser albifrons) which is an important quarry species in most countries within the range of the Lessers. Separating the Lesser and the Greater White-fronted Goose – even in the “clearly distinguishable” adult plumage – it is very difficult, even for experienced ornithologists. In a hunting situation, it is practically impossible and therefore the only effective way to protect the Lesser White-fronts from hunting at the few and limited key sites, is to ban hunting of all white-fronted geese in the periods when Lesser White-fronts are present. The Lesser White-fronted Goose LIFE project was seeking for just such a solution in co-operation with national nature conservation authorities and hunters' associations.


The biggest differences between the two species (in adult plumage) are:

- the neck of the Lesser is shorter and darker brown
- the head of the Lesser is more box shaped and a uniform dark brown
- the bill of the Lesser is stubby, almost as long as its height at the base, and intensively pink
- the white front blaze of the Lesser reaches higher up to the crown
- the Lesser always has a bright yellow eye ring; the ring is however not visible at long distances, and the Greater White-front can also, although rarely have a yellow eye ring





## Evros Delta Greece, winter



**The suspicion is confirmed. An empty shotgun cartridge gleams in the sunshine. The bang heard last evening was caused by a gunshot. Somebody was shooting inside the non hunting zone of Evros Delta national park. Has the poacher hit the geese?**

After searching around for a while, the researchers find a small goose wing on the ground. Could it be Mánnu? Or Máddu? The telescopes are focused on the flock of geese that is grazing nearby. Are the satellite birds still around? One Lesser White-front with an antenna is observed and shortly after, so is the other. Neither Mánnu nor Máddu are harmed!

Most Nordic Lesser White-fronts stay here at the border between Greece and Turkey during mid-winter. Here they should be safe as the delta is protected as a strict nature reserve. However, illegal hunting is still a real threat in here.

Another challenge has also caused headaches for the researchers of the Lesser White-fronts. In some years, some birds or even the main flock disappear from Evros in mid-winter. Nobody knows where they go and stray but many theories exist: Turkey? Bulgaria? Another site in Greece? Hopefully Mánnu and Máddu will give the answer by the electronic tracks they produce.

The team is impatient. In order to implement actions to safeguard the wintering sites, they need to know where. Days and weeks are passing and the flock has apparently decided to stay in Evros this winter. One day in early March the flock has disappeared. The signals from the transmitters reveal that Mánnu and Máddu are in a hurry – they have started the spring migration up north.



### At the moment Greece represents the bottleneck country within the EU

Hunting, including poaching and unintentional accidental shooting, is the most important threat for the Lesser White-fronts. If the mortality of the adult Lesser White-fronts could be decreased even a bit by different conservation measures, it would inevitably lead to recovery of the population. As described on the previous spread, this is very much linked with the hunting of the (Greater) White-fronted Goose. Because of this, alone, the legal protection of the species is not enough. Within the European Union, Greece is at present, clearly the most risky country for the Lesser White-fronts. The LIFE project was able to reveal a case where a Norwegian Lesser White-front was shot dead inside the Lake Kerkini national park, where all hunting is prohibited. There is an urgent need for the Greek authorities to increase the effort to safeguard the protected areas, to prevent illegal hunting of Lesser White-fronts even inside the protected areas by effective control of poaching, as well as to increase the level of national law enforcement in order not to jeopardize the international conservation efforts to save the species. The LIFE project stressed this to the Greek authorities and to the European Commission.



## A new safe site to stay Estonia, April



The small islet on the Matsalu Bay looks very different from last year. Highland cattle are grazing on the open coastal meadow. Last year the same islet was covered by extensive reed beds. By a voluntary restoration camp, large parts of the islet were mowed and burned. Now the islet is being grazed by cattle – and hopefully also by the geese. Will the Lesser White-fronts accept the new site that is restored for them?

The researchers have received information that the flock has left Hortobágy in Hungary and are now awaiting them to arrive here at Haeska, a key spring staging site in the Matsalu national park in Estonia.

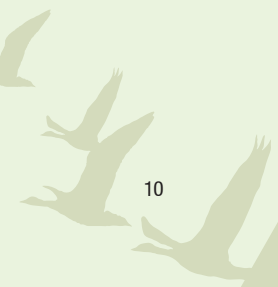
The islet is located very close to the coastal meadows where the geese traditionally make a stopover during the spring migration. A small island converted to an attractive feeding and roosting site is probably safer for the geese than the areas on the mainland.

On the horizon, a small flock of geese appears. They are coming closer and closer, but the direction seems to be wrong. They pass the island. Suddenly, they turn around and land on the islet! The flock consists of Lesser White-fronts, and Mánnu and Máddu are identified in the flock immediately after landing! Everybody is happy to conclude that a new important step towards the improvement of the European migration route has succeeded.



### Habitat management in Estonia

In the planning phase of the LIFE project it was concluded that the Haeska Rahu islets on the Matsalu Bay in Estonia, inside the Matsalu National Park, would be a perfect roosting and feeding place for the Lesser White-fronts that are visiting the area every spring. The islets are situated next to their favourite feeding grounds on the coastal meadows. Until the mid-1900's the islets were regularly used for hay making by the local people, and due to constant management the islets were kept as open, low-growth meadows. Since then, hay making and collecting of reeds on the islets decreased rapidly, and the islets were overgrown by the extensive reed beds. The LIFE project restored large parts of the islets back to an open meadow in the summer of 2006, and grazing on the islets was introduced by a local farmer co-operating with the project. Already in spring 2007, the Lesser White-fronts started to use the newly restored site. The action also benefited other birds. For example, the first ever breeding record of the Marsh Sandpiper (*Tringa stagnatilis*) in the Matsalu National Park was made on the islets in the summer of 2008!





## Heading north Finland, May

**Matsalu and Estonia are left behind and the geese are now over Finland – the land of thousands of lakes – on their way to the breeding areas. However, the last leg home is long and the wind turns north. On the coast of the Bothnian Bay there is a nice coastal meadow area, created by the continuing post-glacial rise of the land from the sea, and is an attractive site for tired geese.**

Also as in Matsalu, the coastal meadows here in Siikajoki provide safe conditions for the geese. This stopover site is protected, but used by the Lesser White-fronts nowadays only during the spring migration. The locals are proud of their rare birds visiting annually, as the species has almost become extinct from other parts of Finland.

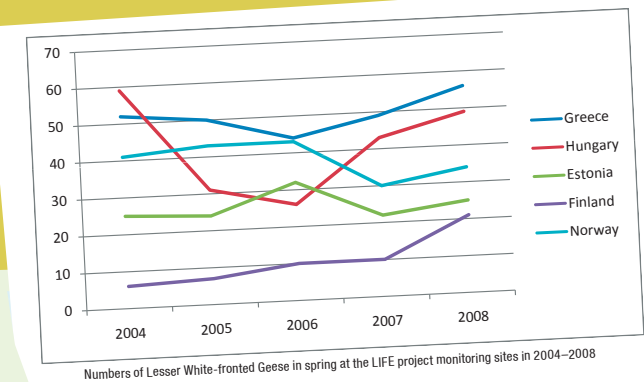
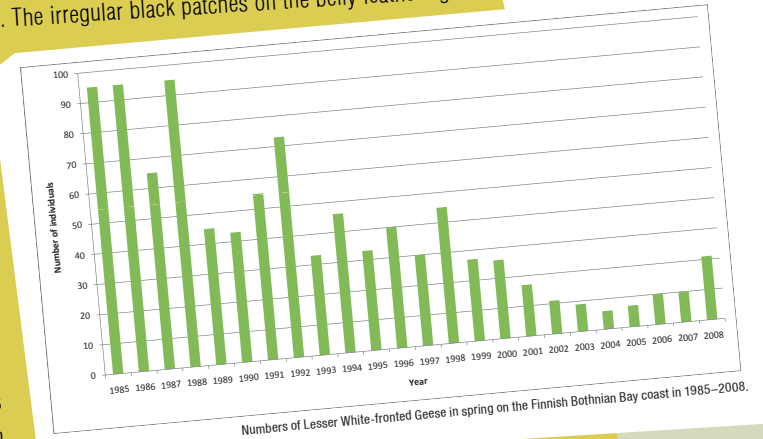
The spring migration continues, and the satellite signals tell that the course is set for the Valdak Marshes. The geese spend many more hours on the wing. In mid-May, the flock arrives at the snow covered Valdak Marshes. Snow or not – it is springtime and the arctic salt grass have reached the optimal stage of fresh growth as high quality food for the geese before egg-laying. The birds know exactly where to look and start grazing immediately.

One year has passed since Mánnu and Máddu were captured here together with Imre. Now, only the two of them are left. The spring monitoring at Valdak shows that the flock is smaller this year. Probably, not only Imre has passed away. The researchers know that adult survival and new recruitment to the population are of vital importance to halt the trend towards extinction.

## Is the 100 years decline of the Fennoscandian population stopped at the last minute?

Constant monitoring of the number of the Lesser White-fronts as well as of the share of young birds is the basis for assessing the conservation status of the population and for assessing the effect of conservation measures. The irregular black patches on the belly feathering of adult Lesser White-fronts form an individual "fingerprint". Based on this individual belly patch pattern, the LIFE project was able to follow the spring migration of tens of individuals, and a lot of new valuable information was acquired.

The traditional spring staging area on the Finnish Bothnian Bay coast is the site where Lesser White-fronts have been monitored for longer than at any other site in the world. The annual monitoring started already in 1985, and as shown in the graph, the decline has been dramatic. For this area, the first published counts of Lesser White-fronts date back to the beginning of 1900's, when some 10,000 individuals were passing the area every spring. Thus, in the latest century there has been a thousand fold decrease of the population! The LIFE project monitored the Lesser White-fronts virtually continuously, always where the main flock was present. The graph shows the trend of the numbers in all LIFE project countries in the years 2004–2008. It seems that the population did not decrease in this period.





## One happy family Norway, June

**What a perfect setting for a nest: a light green willow thicket a few meters from a small lake where the yellow midnight sun is blinking on the water surface. A small yellow and brown head is showing up from the flank feathers of the female. Then two more heads are visible in the telescope. Mánnu and Máddu have become parents. The breeding this summer is a success.**



The researchers who located this happy family based on the satellite transmitters are also happy. But there are also reasons to be worried. Several species of mammal and bird predators pose a threat to the small goslings, and especially in combination with disturbing human activity such as off-road traffic, the predation may have severe effects.

These areas where one of Europe's most rare and threatened bird species is reproducing are so far not legally protected. The fragile idyll may therefore easily be disturbed by humans in one way or another. The successful breeding is so important, and the researchers are still worried also about the risk posed by the high number of Red Foxes in the mountains this year. They have to wait – but as the days are passing, the tracking data tells that the birds continue to stay in the same area. That is a good sign.

One day, the satellites inform about the relocation of the birds. The new positions point to an island in the fjord outside the Valdak Marshes. The researchers take a boat to reach the place and at a distance Mánnu and Máddu are observed - with five goslings!

This is very good news. Five new birds! If they grow up, they represent nearly 10% of the total population. Furthermore, as the successful reproduction makes the adults moult in the breeding area, they will also use the safer European route in for the autumn migration. Ten more days of berry feeding, and the family is on their way south again.



### National action plans for the Lesser White-fronted Goose

National Action Plans for endangered species are official documents defining the necessary conservation actions in order to protect the species. Within the European Union, the target is to reach in the long term a favourable conservation status, which means that the species can survive as a viable population in its natural habitat. The LIFE project prepared National Action Plans for the Lesser White-front in Norway, Finland and Estonia, and now the plans are “in force”, adopted by the national authorities. Of the five LIFE project countries, Hungary and Greece still lack a ratified national action plan for the species, and preparing these plans is an urgent task for the authorities. The actions plans include e.g. habitat management actions, regulations for hunting, control of natural predators like the Red Fox in the mountains, and continuous monitoring of the population. Some of the actions were even started already during the LIFE project period. In Norway, effective control of the Red Fox population on the breeding ground was started, and in the autumn staging area, in the inner parts of the Porsangen Fjord hunting of all goose species was banned for the period when the Lesser White-fronts are likely to be present. Because the Lesser White-front is a migratory species, international co-operation also in the conservation actions is urgently needed, and such actions are also included in the national plans.





## On the Puszta Hungary, late September

**The fresh green growth of grasses and herbs after the hot and dry summer at the Puszta is tempting the geese. The colleagues in the Hortobágy national park have irrigated this site especially to provide a safe feeding site for the Lesser White-fronts. The geese are walking around grazing. Also the fish pond that they use for roosting is regulated to optimal water level for the geese, just in time before they arrive. The conditions here are perfect, and Mánnu and Máddu stay with their goslings as long as possible. But the winter is also cold in Hortobágy, and Greece is better for wintering.**

The Hortobágy national park in Hungary is a traditional stopover on the European migration route – both in autumn and spring. In the old days this was a dangerous area because of extensive goose hunting, but now the national park is well managed and controlled.



### Habitat management in Hungary

As in Estonia, also here in the famous Hortobágy National Park, habitats of the Lesser White-fronts were effectively managed by the LIFE project. In Hortobágy the management actions were more extensive and diverse than in Estonia. The aim was to provide the geese with good feeding and roosting sites within the borders of the national park, where the risk of being shot is practically nonexistent, thanks to effective and continuous safeguarding by the national park rangers. Hopefully the Greek authorities will follow the excellent Hungarian example in the near future!

Three types of management actions were conducted:

1. Providing safe feeding areas on arable lands. Crops (e.g corn) were mowed on agricultural fields within the national part and left in place for geese. Additional crops grown elsewhere where also transported to these sites.
2. Improving natural grasslands by grazing and irrigation. Large areas of the puszta were fenced and grazed to induce fresh growth of the plant species preferred by the Lesser White-front by the time of their arrival in September. If the summer was too dry, the sites were also irrigated.
3. Improvement and maintenance of the roosting sites on the Hortobágy fish ponds by regulating the water level. The project purchased water to keep the fish ponds preferred by the Lesser White-fronts at optimal level for geese. As a result, the geese could not only roost, but also feed on the fish ponds.

The actions were very successful: towards the end of the LIFE project, the Lesser White-fronts used practically only the safe and favourable feeding and roosting sites within the national park managed by the project. The actions were also favourable for other birds, like the Cranes. After the project, the management actions will be continued by the national park administration, just as in Estonia.





## Lake Kerkini. A Greek Tragedy Greece, December

**During dinner time, the peaceful life in the wildlife paradise is disturbed by a hollow gun-shot. With the Evros Delta still fresh in mind, the researchers look at each other. It is not possible – nothing was supposed to harm the geese here in Lake Kerkini – the area is strictly protected and considered to be the only safe wintering site in Greece. They continue their evening meal feeling a bit uneasy.**

Lake Kerkini is a strictly protected national park and a well known wildlife sanctuary in northernmost Greece. Ecotourism is popular and also economically important to the local community. The Lesser White-fronts are one of the “jewels” that the visitors come to see. They want to experience wildlife that is not too scared and shy because of hunting. Use of guns is therefore not allowed in the reserve. The researchers are restless and worried, and already before sunrise they are on the way to check the flock.

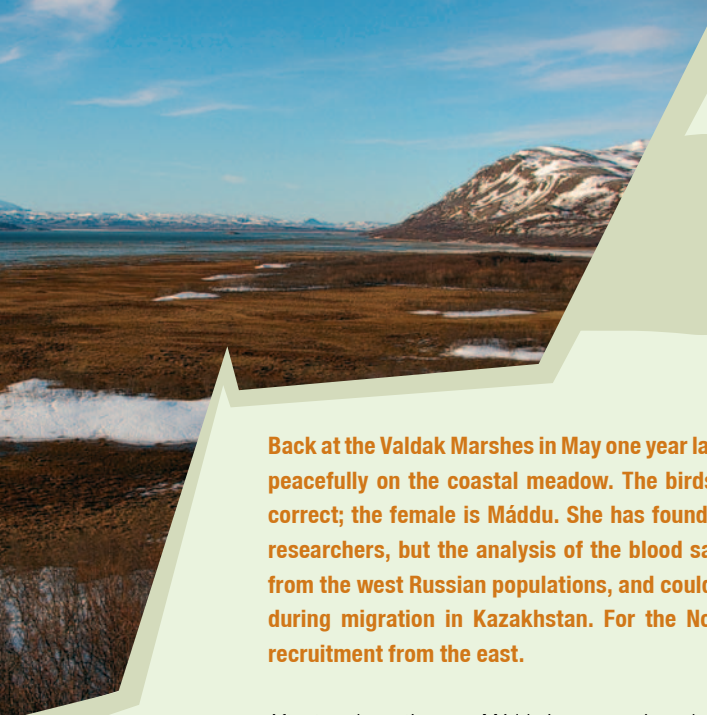
The Lesser White-fronts are grazing on the vast mudflats in a mixed flock with their bigger cousins, the Greater White-fronted Geese. The flock is easily located, and while scanning the flock with spotting scopes they hear a local fisherman shouting. He has found a dead goose, and he is picking it up from the mud. The goose has a backpack and the colour coded ring tells that it is Mánnu.

Mánnu is dead. He is another victim of human thoughtlessness. For Mánnu it doesn't matter if this is defined by humans as “accidental shooting”, “poaching” or “illegal hunting”. Further thorough investigations reveal that Mánnu died because of internal bleeding caused by a shotgun pellet that penetrated the whole body cavity. In the X-ray picture the pellet is still visible in the leg where it ended. Only one bird out of the three equipped with satellite transmitters are left. And Máddu has lost her mate.



### Public awareness campaigns

Because hunting is the main threat for the Lesser White-fronts, raising awareness amongst hunters about the species and the threats it is facing is an essential part of the conservation work. First of all, there's a need to inform every hunter in key areas to be aware of the fact that there are two different species of white-fronted goose, and that the smaller one is critically endangered most of all because of hunting. Identification skills of the hunters must improve, even though in the real hunting situation separating reliably the two white-fronted species is practically impossible anyway. Therefore the responsible hunter needs to know, where and when goose hunting should be entirely avoided. The LIFE project arranged information campaigns in Estonia, Hungary and Greece. A concrete proposal from the LIFE project for the local hunting clubs at the key areas was to establish a voluntary “red light” system for all goose hunting for the period when the main flock of Lesser White-fronts is present. The sad case of Mánnu was widely communicated by the LIFE project, and the project appealed to the Greek authorities to take necessary measures to ensure the Lesser White-fronts are effectively protected from hunting, at least in the strict nature reserves and Natura 2000 sites. In Greece, the campaign was also directed towards the farmers in the Evros Delta area. In this part of the campaign, the main aim was to provide guidance on how to implement agri-environment measures favourable for the Lesser White-fronts.



## Future generations Norway, May

**Back at the Valdak Marshes in May one year later. A pair of Lesser White-fronts is grazing peacefully on the coastal meadow. The birds are being carefully checked and – quite correct; the female is Máddu. She has found a new mate! The male is unknown to the researchers, but the analysis of the blood samples confirm later on that he originates from the west Russian populations, and could well have joined the Fennoscandian flock during migration in Kazakhstan. For the Nordic population, he is now an important recruitment from the east.**

After two dramatic years Máddu is once again on her way to the breeding grounds in the mountains. Her new mate represents an important addition of new genes to the small Fennoscandian population. Together they may contribute to the survival of a species that is on the verge of extinction in Europe.

Much conservation effort has been done but still there is an urgent need to further improve and safeguard the key sites, as we have learned by the story of Imre, Mánnu and Máddu.



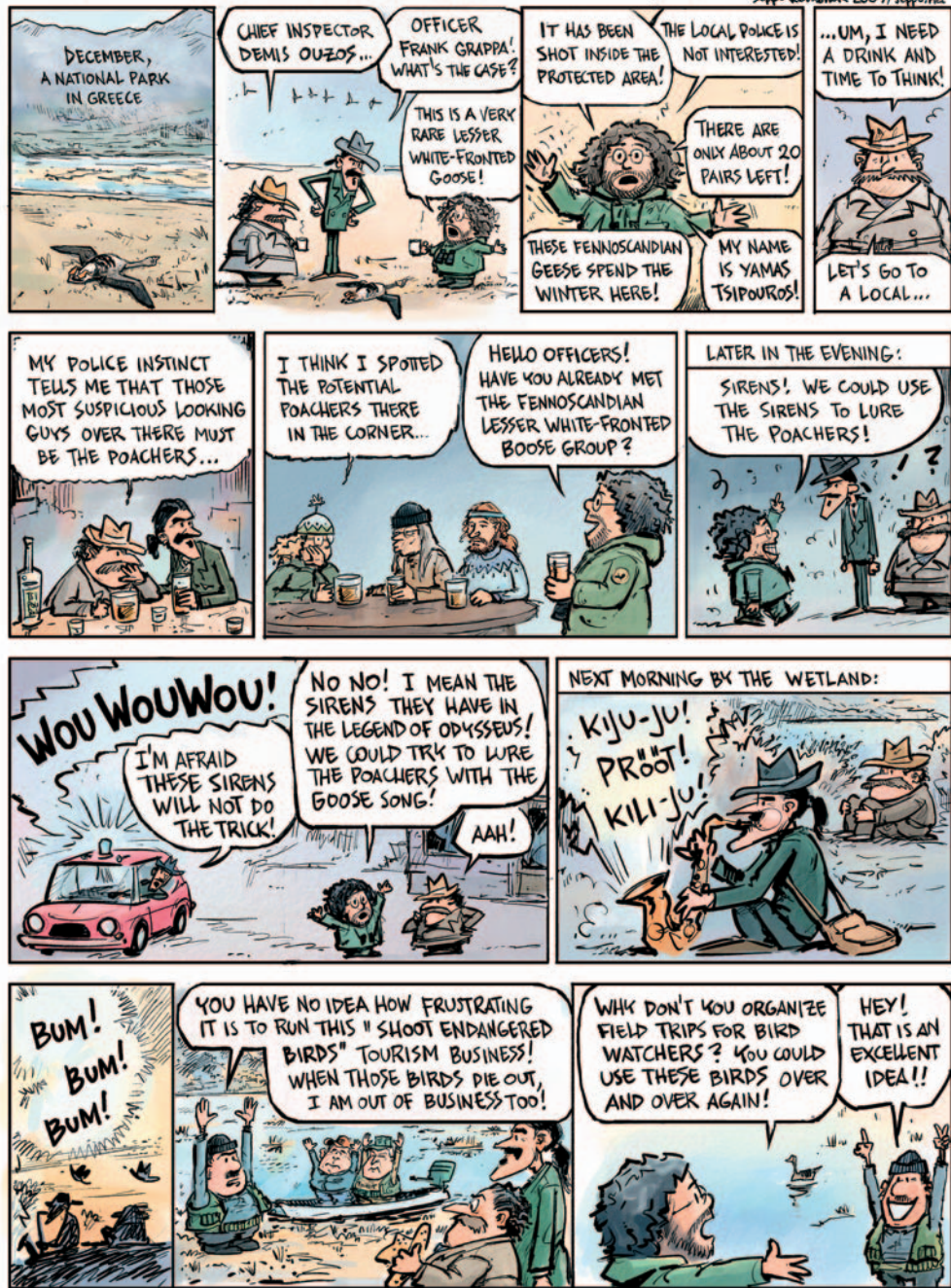
## The Lesser White-fronted Goose LIFE project 2005–2009

The Lesser White-fronted Goose LIFE project (LIFE05 NAT/FIN/000105) was a timely boost for the conservation work of the species at a critical phase. The project was funded by the EU LIFE-Nature fund and by the partners and co-financiers listed on the back cover. The project demonstrates that an international flyway approach is essential for effective protection of such a critically endangered migratory species. However, the Fennoscandian population is at immediate risk of being wiped out, if effective and prompt conservation measures along the whole flyway are not being implemented. The new International Single Species Action Plan for the conservation of the Western Palearctic Population of the Lesser White-fronted Goose, which was adopted by the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) in 2008 provides a useful framework for co-ordinated international action. Many central countries like Hungary, Greece, Russia, Kazakhstan and Ukraine still lack their national action plans. However, the action plans are however just “a piece of paper” if they are not implemented, and if adequate resources are not allocated for the implementation.



# The Lesser White-fronted Boose Group & The Call of Sirens

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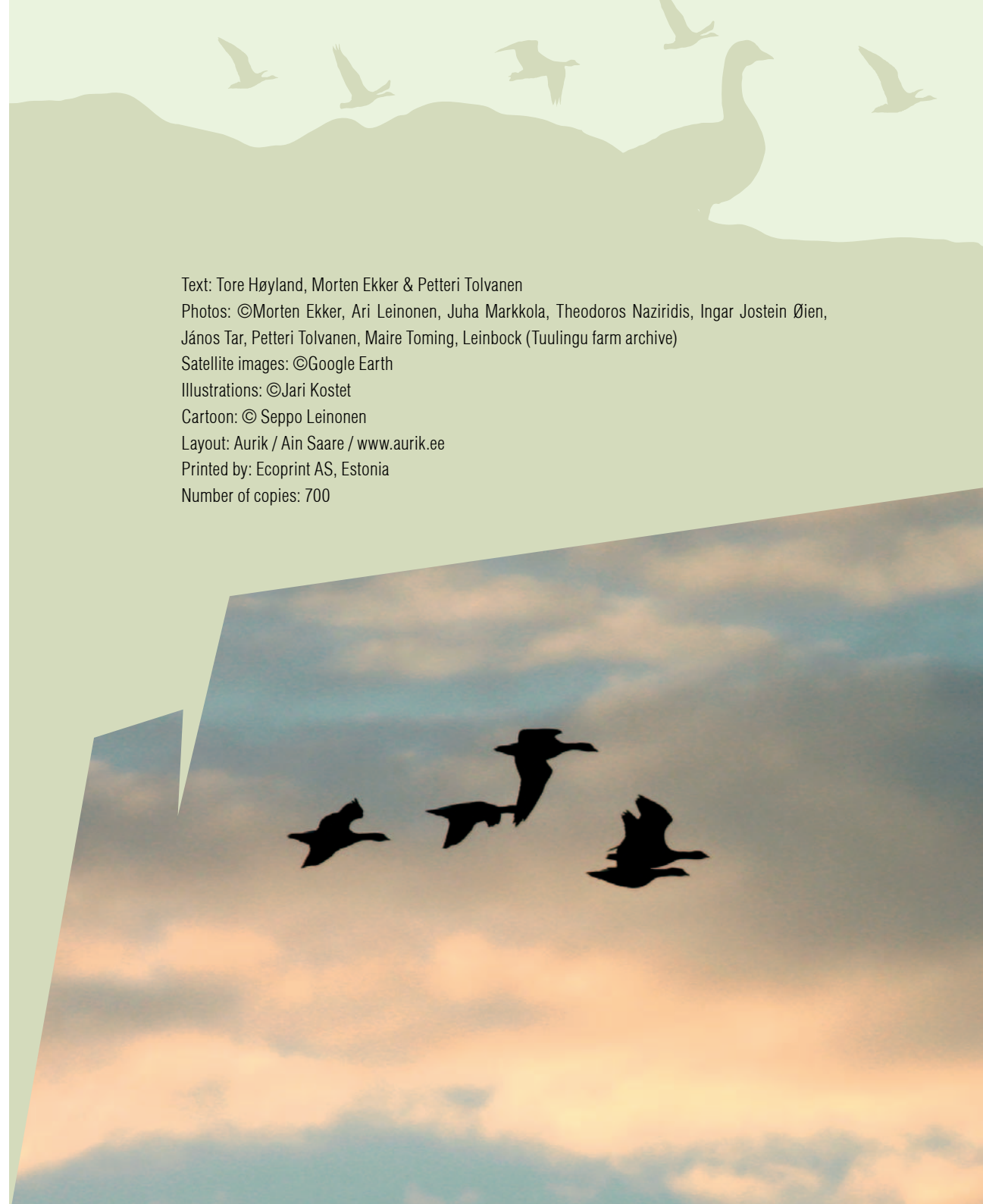
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