REPORT | SKYLARK PLOTS | 2018

Farmers for Skylarks

Unique cooperation
to reverse the trend for
a threatened species

WWF BirdLife SVERIGE SLU Lantmännen

About the report

This report describes skylark plots, an initiative to promote biological diversity within agriculture and how these affect skylarks (Alauda arvensis) in Sweden. Although skylark plots are used in several countries in Europe, the effect these have on birds has mostly been researched in England. There are differences between an English and a Swedish arable landscape in terms of field size and the crops that are cultivated. As such, research is also needed in Sweden to investigate whether this initiative helps to promote biological diversity.

The results presented in this report are based on field studies and analyses by Sönke Eggers and Jonas Josefsson, researchers at the Department of Ecology at the Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden. The lark plots were observed during three breeding seasons from 2015–2017 in winter wheat fields on farms in the Swedish regions of Skåne, Västergötland, Östergötland and Uppland.

With the financial support from WWF Sweden, bird count expertise from BirdLife Sweden and its members, researchers at SLU and countless of fields with skylark plots through Lantmännen's farmers, results are now available that indicate that skylark plots have a positive effect on the number of skylark territories in Sweden. The findings are presented in this report.

If you have any questions about the contents of this report, please contact Jan Wärnbäck, Nature Conservation and Agriculture Expert at WWF Sweden: jan.warnback@wwf.se

Photo: Kaj Svahn

SUMMARY

Damming the decline of skylarks

Each spring skylarks come to Sweden and sing above fields and meadows. They are a sign of biological diversity and a functioning ecosystem. However, skylarks are a threatened species. Over the past 40 years, skylarks have halved in number throughout Europe. In Sweden, three quarters of the skylark population has disappeared over the same period of time.

In a project that seeks to reverse this trend, BirdLife Sweden, Lantmännen and WWF Sweden are working closely together to create more favourable conditions for skylarks in the Swedish farmland.

Agriculture has developed rapidly in recent decades and become more efficient, fields have become larger and crops grown denser. These developments in agriculture have resulted in changes that have affected the arable landscape, which has led to falling numbers of some species. Swedish farmers around the country have therefore, in consultation with BirdLife Sweden and Lantmännen, started to create skylark plots, undrilled patches in fields where larks can land and find food.

Creating skylark plots is one of the criterias within Lantmännen's sustainable cultivation concept, Climate & Nature. This cultivation concept means consumers can be offered a more sustainable flour, "Friendlier wheat" from Lantmännen's brand Kungsörnen, while at the same time farmers are paid an additional premium to farm in line with the concept.

Skylark plots can now be shown to have a significantly positive effect on the density of skylark territories in winter wheat fields. The results presented in this report are based on research over a three-year period and show that the number of skylarks in fields with established skylark plots has increased by up to 60 percent. There are more breeding larks in fields with lark plots, more young probably survive and it would appear that larks from neighbouring areas are attracted by fields with skylark plots.

The Skylark

Biodiversity is the richness and variety of living organisms of all origins and is important for humans and nature. It enables nature to deliver ecosystem services such as pollination that is vital for the cultivation of many important crops. There is a great deal we do not know about the processes that occur and that are needed for nature to be able to continue to supply these free services that ultimately give us food for the day.

This is why different initiatives to promote biodiversity play a key role in achieving sustainable development. Creating better conditions for a species, such as the skylark, plays an important role in a larger context.

> *"Over the past 40 years, the number of skylarks in Europe has halved."*

With their streaked and dull brown colouring, skylarks make a rather modest impression by appearance. At the same time, they have an unrivalled position as the very voice of spring. Their beautiful song radiates through the air high above the open farmland and can at times be almost deafening during spring and summer. They can fly as high up as 200 metres and sing non-stop for over an hour at a time, although on average birds stay around 100 metres above the ground and sing for four minutes.

However, the landscape has become quieter in recent decades. The number of skylarks in Europe has halved over the past 40 years, and in Sweden annual counts indicate that three quarters of skylarks have disappeared over the same period of time. According to BirdLife Sweden's estimates, there are around 735,000 skylark pairs in Sweden today. The reasons for this decline are largely due to the changes within agriculture during the same time period, which can also be seen in the farming landscape. As fields have become larger and crops sown more densely, less room has been left for other life.

Modern agriculture can combine both a high yield and rational use of land with biodiversity and ecosystem services. However, this requires active measures from committed farmers. One such measure to increase living space in the agricultural landscape can be the creation of undrilled patches in cultivated fields – skylark plots – which have now proved to deliver good results.

There is far more to reversing the decline in lark numbers than simply to conserve a species close to our hearts. Skylarks live their entire lives in the arable landscape and can be a good indicator of the state of this type of landscape. With the possible changes that climate change can bring, it is important for the resilience of natural systems that there is a broad base of viable species. This will enable biodiversity that can supply necessary ecosystem services, the free work done by nature that is of such tremendous importance for food production. In other words, making life better for skylarks can also make life better for us humans.

Skylarks seem to thrive better in fields with skylark plots compared to fields without them.

Swedish agriculture

Swedish agriculture has a unique position and is considered one of the most sustainable in the world. Sweden has one of the lowest uses of agrochemicals in Europe, not only because we have sought to control and reduce the use of chemicals in agriculture over many years, but also because we have one of the highest proportions of organic farming. We actively strive to reduce nutrient leakage and to recycle nutrients into the farmland. We have knowledgeable and committed farmers around Sweden who contribute to making agriculture more sustainable.

Despite these solid efforts, farming has always had an impact on the environment, animals and insect life, and parts of today's cultivation systems mean less room for some species to thrive. One of the species most affected is the skylark, a bird that spends its entire life in the farming landscape and which in Sweden has declined by 75 percent over the last 40 years.

Finding a system that can accommodate both efficient food production and biodiversity along with ecosystem services such as water regulation, soil formation and pollination is very important. This is already possible today with the development of more sustainable methods of cultivation.

Lantmännen's cultivation concept Climate & Nature

To help tackle future sustainability challenges, Lantmännen has developed a new cultivation concept for grain which has up to 20 percent less climate impact, less environmental impact and contributes to increased biodiversity. The cultivation concept Climate & Nature was launched in 2015 and has been adopted in grain cultivation all around Sweden.

The concept includes numerous measures and requirements, such as fertilizers with low carbon footprint and avoiding unnecessary tractor usage. It has also been challenging to find measures that benefit biodiversity within the concept and are simple to implement in Swedish agriculture. Skylark plots play an important role in this respect. Farmers who farm in accordance to Climate & Nature commit to creating at least one skylark plot per hectare of cultivated land.

"More biodiversity contributes to a well-functioning ecosystem that reduces pest attacks on crops and delivers a good yield. This is why establishing skylark plots is an important initiative that benefits both animals, insects and agriculture," says Fredrik Andersson, who runs Sävgården in Arboga, a farm that has adopted Lantmännen's Climate & Nature concept.

The concept has enabled Lantmännen and Swedish farmers to bring conventional agriculture one step further in reducing the impact of farming.

Creating skylark plots is a relatively simple measure that benefits both larks and farmers.

Friendlier Wheat

Lantmännen's cultivaton concept Climate & Nature makes it possible to offer consumers a more sustainable flour while at the same time the farmer is paid an additional premium for the crop. All flour from Lantmännen's brand Kungsörnen labelled Friendlier Wheat or Friendlier Rye comes from farmers who grow their crops in accordance with the concept.

More about skylarks

Skylarks live their entire lives in the farming landscapes – during the sumer in the Swedish fields while during the winter they can be found as far south as southern Spain. When spring comes, the birds almost always return to the same place where they were born. In other words, they are loyal to their native soil which means you can say that farmers all have their own skylarks that "belong" to their farm.

Pairs often stay together year after year and help each other feed their young with all kinds of insects, larvae and spiders. Even though their nests are located in the same environment as where they find their food the larks fly at least 50 metres from their nest to forage for food. This is probably a matter of sheer caution in the open landscape where the larks live and helps hide the location of their nest from various nest predators.

By raising or switching off their sowing machine in the field farmers create an undrilled patch - a skylark plot - that enables the larks to easier land in the field and find food.

Skylark plots

A measure with big benefits. A skylark plot is an undrilled patch of about 20 m^2 that is created by the farmer when sowing winter wheat. During spring, winter wheat fields are an almost perfect environment for skylarks. However, during the breeding season the growth in height and density of the crop often makes it hard for the larks to find food. Skylark plots are therefore spread out in the field and enable the birds to forage for food in a larger area.

The larks use the undrilled patches as places to land and the plots mean that they can forage for food on the ground even when the crop is growing higher and higher and more densely in the field. The fallow plot creates an edge zone and forms a variation in the farming landscape.

Studies in England have shown that skylark plots have a positive effect on the number of larks in fields. Hence the decision to study the effects of skylark plots in Sweden too. The results presented in this report are based on three years' research of the effects of skylark plots on skylark numbers and reveal a significant positive effect. Lark numbers in fields with skylark plots have increased by up to 60 percent on the farms studied.

Skylark plots in Swedish farmland are an important step towards a more sustainable agriculture. A measure that shows that production and nature conservation go hand in hand in modern agriculture.

Farmers in favour of skylark plots

Establishing skylark plots is a relatively simple thing to do, the sowing machine is raised or switched off once or twice per hectare. No special thought need then be given to the plots during the rest of the growing season. This means skylark plots are practical to implement for many farmers, and at the same time deliver benefits in terms of biodiversity.

Many farmers are in favour of creating skylark plots and have wanted to be part of the study. Having clarified how effective the measure is, the study can help more farmers discover the benefits of adopting the Climate & Nature concept.

"All I have to do to create a skylark plot is to leave a bit of my land fallow – and to pull the hydraulic handle to raise the sowing machine," says Kjell Nilsson, Säby, Uppsala, participant in Birdlife Sweden's Save the Skylarks Project.

Photo: Mikael Arinder, Skånska Bilder

The rise of the skylark plot

2010
Upplands Ornitologiska Förening (UOF), a regional BirdLife Sweden association, starts a project to create the first skylark plots in Sweden.

2012
BirdLife Sweden takes over the project and launches "Save the Skylarks" around the country.

2012–2015
3,000–3,500 skylark plots a year are created by farmers with the aid of donations made by the general public.

2015
Lantmännen launches Climate & Nature to develop more sustainable methods for conventional farming.

2016–2017
Around 13,000 skylark plots are created in Sweden.

2018
The Swedish results are presented showing the positive effects of skylark plots.

Relaunch of "Save the Skylarks", including an initiative enabling private individuals to buy their own skylark plots.

The end result – more skylarks

The study shows that skylark plots have a significant impact on the number of skylarks in the areas studied. There are more breeding larks in fields with skylark plots, more young probably survive and it would appear that larks from neighbouring areas are attracted by fields with skylark plots.

Skylark plots have a positive effect on the number of skylark territories throughout the breeding season in all five arable landscapes studied in south and central Sweden (figure 1). The effect is significant. In fields with skylark plots in Skåne in southern Sweden, the bird territory density increases by 25 percent. In Uppland in central Sweden, the increase is even greater, with 60 percent more larks found in fields with skylark plots.

Field size is of importance for how many lark territories there are in a field. Skylark plots have the greatest impact in large fields where the territory density without plots is low per hectare.

Figure 2 compares fields with one, two and three skylark plots per hectare with a control field without plots. The figure shows that skylark plots are of greater importance in fields larger than 15 hectares and the number of skylark plots per hectare is of major significance for lark numbers in these fields.

About the study

The effects of skylark plots have been examined in a study during three breeding seasons from 2015–2017 in winter wheat fields on farms in Skåne, Västergötland, Östergötland and Uppland. The study observed fields with and without established skylark plots on each farm. In total, 38 farms and 113 fields, of which 64 had and 49 did not have skylark plots, were included in the study.

The height of the crop during the growing season affects the birds' ability to land on the ground and forage for food. It is therefore interesting to see if and how the difference in number of undrilled skylark plots per hectare influences the way the birds use the different fields during the breeding season. The size of a field, that is to say the distance to the edge of the field and the effects of the landscape in terms of how much of the land is not sown in autumn, are other parameters taken into consideration.

The study has been completed with financial support from WWF, bird census expertise from BirdLife Sweden's members, researchers at SLU and the help of the many fields with skylark plots created by farmers within Lantmännen's cultivation concept Climate & Nature and BirdLife Sweden.

Figure 1. The number of skylark territories per hectare (mean value +/– standard error) in fields with and without (control) skylark plots on farms in Halland, Östergötland, Skåne, Uppland and Västergötland.

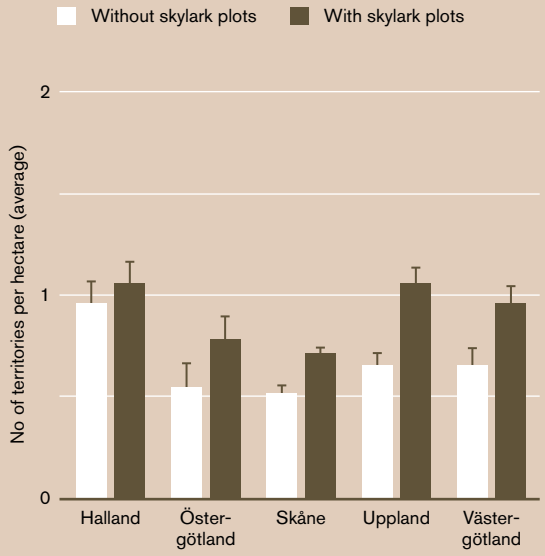
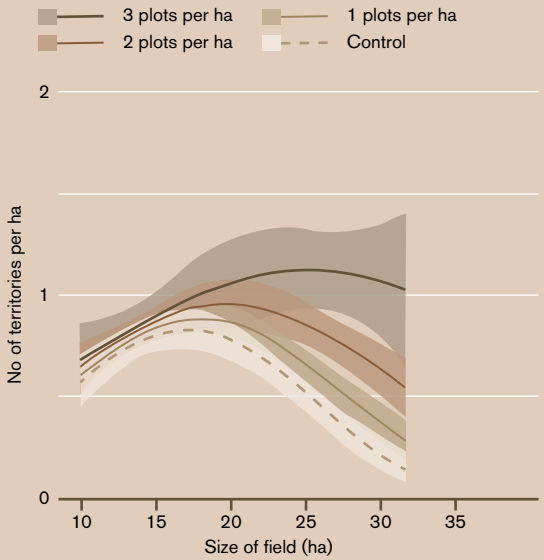


Figure 2. Number of skylark territories (line) per hectare (mean +/– standard error) increases in fields with skylark plots compared to fields without skylark plots (control). The effects dependent on field size (10–30 ha) and number of skylark plots established per hectare (03).



Differences over time in fields with and without skylark plots

For skylarks that both breed and forage on arable land, high and dense vegetation, particularly of winter wheat during the latter part of the breeding period, can limit access to food. Skylark plots are intended to enable the birds to land in fields to forage for food. It is therefore of interest to see if the plots improve their opportunities to breed. If this proves to be the case, one indication would be that the birdsong would diminish slower in fields with skylark plots compared to fields without them.

The results show that when the breeding season progresses from May to July, the number of singing birds in the fields under observation decreased at the same rate in fields with and without plots (figure 3a). This can be interpreted such that skylark plots do not extend the breeding season, that is to say, individuals do not have more broods in fields with skylark plots.

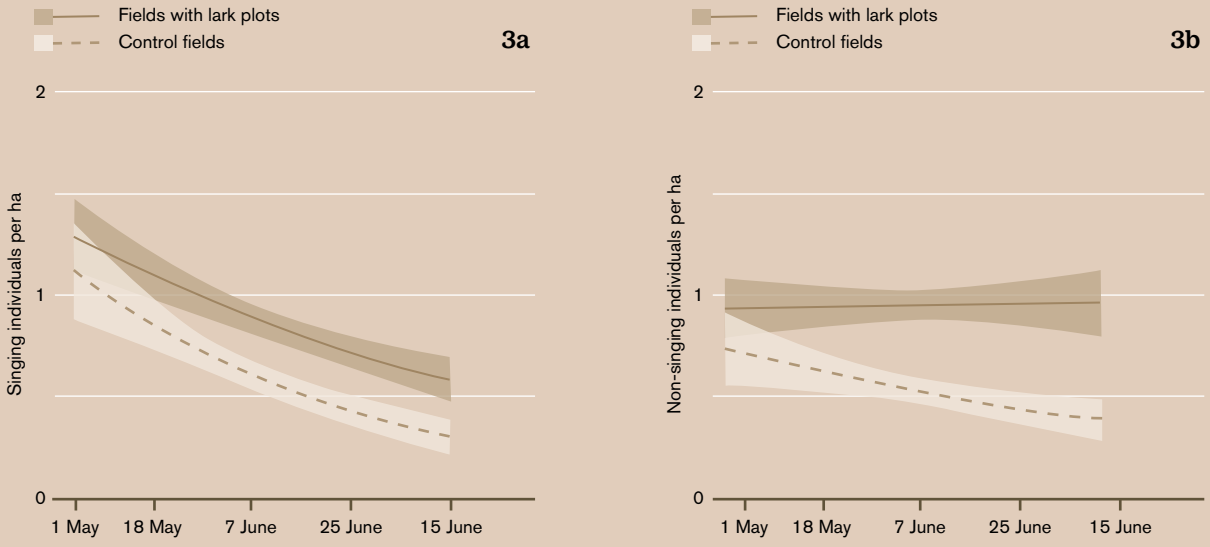
The number of birds that didn't sing has also been observed and a fascinating difference has emerged when comparing fields with and fields without skylark plots. The number of non-singing birds (i.e. not showing signs of territorial behaviour) remains stable – but only in fields with skylark plots (figure 3b).

There are several possible explanations for this. One possibility is that birds from surrounding fields gather in fields that have skylark plots. This is probably due to it being easier to land and forage there thanks to the undrilled patches available.

Skylark plots have a positive effect on the number of larks throughout the entire breeding season.

Another possible explanation is that birds that breed in fields with skylark plots manage to raise more offspring. This interpretation is supported by British studies that show almost 50 percent more fledglings in fields with skylark plots.

Figure 3. Figure 3a illustrates how the number of singing skylarks per hectare (mean +/– standard error) changes during the breeding season (1 May–15 July) in fields with and without skylark plots (control).
Figure 3b shows how the number of non-singing birds per hectare changes. These values are standardized, correcting for differences relating to field size and number of skylark plots.



Conclusion

Photo: Mikael Arinder, Skånska Bilder

The results presented in this report show that skylark plots create better conditions for skylarks and that they have a greater effect if established in large fields. Skylark plots are an effective way for Swedish farmers to promote biodiversity and contribute to a more sustainable agriculture. The nature conservation benefits that skylark plots bring and that are documented in this report, can also help both decision-makers and farmers in steering actions to regions, farms and fields where they can provide the most benefit.

This report is the result of a unique partnership between WWF Sweden, BirdLife Sweden, SLU and Lantmännen and provides powerful evidence of how organisations with vastly different missions can join forces on an important issue and contribute with knowledge to create a positive change.

The partner organisations

WWF
wwf.se

The World Wildlife Fund, WWF, is the world's leading conservation organisation and is active in over 100 countries. WWF was established in Sweden in 1971, with the aim of contributing to the financing of international work and to grant funding to Swedish research, education and practical nature conservation activities. Today, WWF is active within the areas of forestry, oceans, water, species, climate and energy and food. Its main role is to protect biodiversity and support the use of natural resources in a sustainable way – both in Sweden and globally.

BirdLife Sweden
birdlife.se

BirdLife Sweden is the Swedish Ornithological Society, established in 1945. Members support the three main activities of the society – bird protection, bird research and bird watching. The BirdLife Sweden programme for active protection of birds as well as the member's bird counts that provide data on bird populations, has contributed to BirdLife Sweden's expert role in bird protection issues. BirdLife Sweden is the Swedish partner of the global organisation BirdLife International.

SLU
slu.se

SLU, the Swedish University of Agricultural Sciences engages in research and teaching related to biological natural resources both on land and sea. The university works with the sustainable development of urban and rural environments and promotes the quality of life, health and welfare of both humans and animals. SLU produces world class research within several areas. Its education programmes lead to relevant careers and the university's know-how is in great demand, both in the private sector and in society. SLU promotes sustainable living and a better world locally and globally.

Lantmännen
lantmannen.com

Lantmännen is an agricultural cooperative and Northern Europe's leader in agriculture, machinery, bioenergy and food products. Lantmännen is owned by 25,000 Swedish farmers, has 10,000 employees, operations in over 20 countries and an annual turnover of EUR 4 billion (SEK 40 billion). With grain at the heart of the operations, Lantmännen refine arable land resources to make farming thrive. Some of the company's best-known food brands are AXA, Bonjour, Kungsörnen, GoGreen, Gooh, FINN CRISP, Schulstad and Vaasan. Lantmännen is founded on the knowledge and values acquired through generations of farmers. With research, development and operations throughout the value chain, together Lantmännen take responsibility from field to fork.

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This is a unique partnership between WWF Sweden, BirdLife Sweden, SLU and Lantmännen and provides powerful evidence of how organisations with vastly different tasks can join forces on an important issue.

To a Skylark

Hail to thee, blithe Spirit!
Bird thou never wert,
That from heaven, or near it,
Pourest thy full heart
In profuse strains of unpremeditated art.

Higher still and higher
From the earth thou springest
Like a cloud of fire;
The blue deep thou wingest,
And singing still dost soar, and soaring ever singest

Better than all measures
Of delightful sound,
Better than all treasures
That in books are found,
Thy skill to poet were, thou scorner of the ground!

Teach me half the gladness
That thy brain must know,
Such harmonious madness
From my lips would flow
The world should listen then, as I am listening now!

Percy Bysshe Shelley
(abridged)

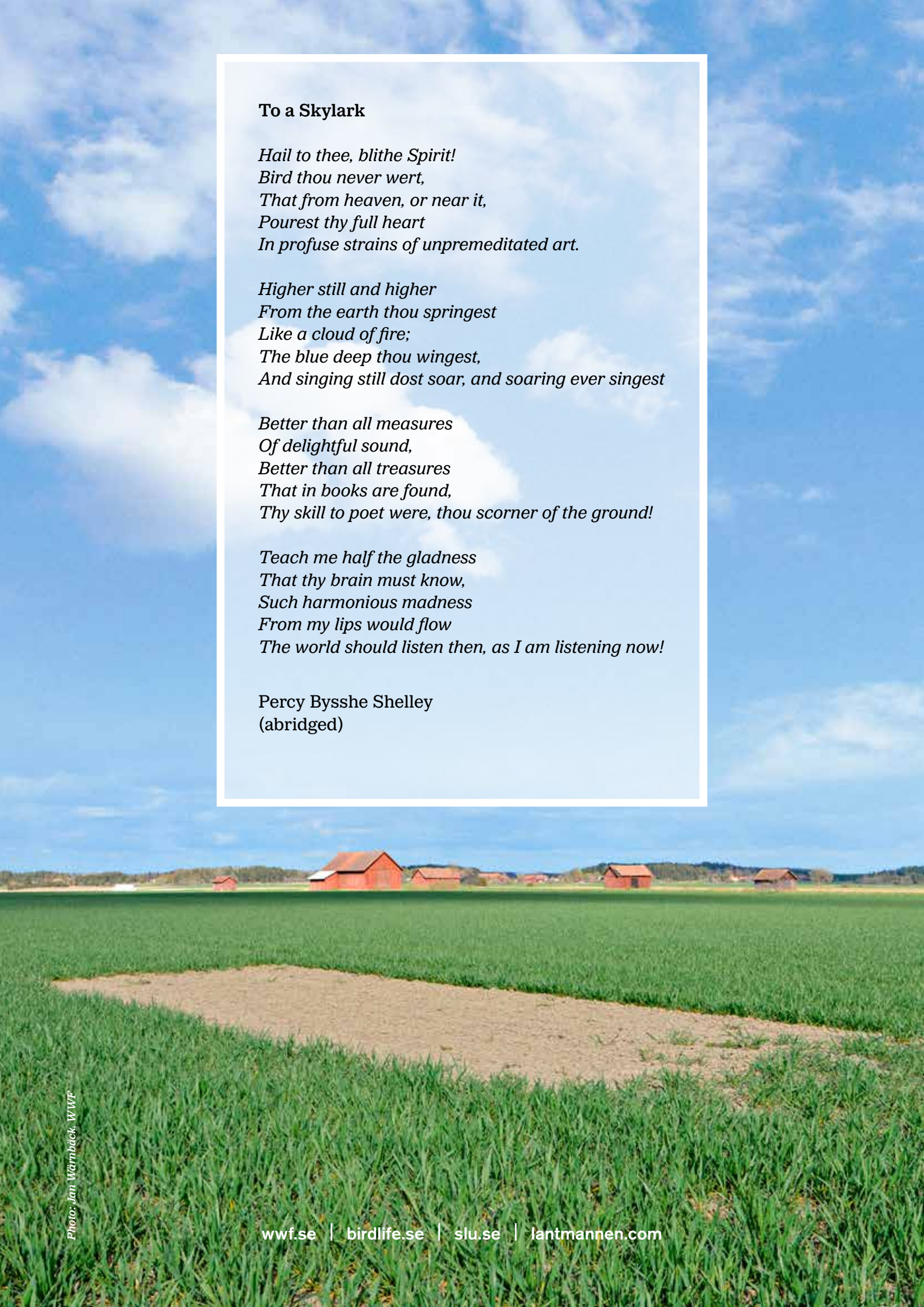

Photo: Jan Wärnbäck, WWF