

THE GREY PARTRIDGE (PERDIX PERDIX L.) - THE INDICATOR OF THE SUSTAINABLE AGRICULTURE

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INTRODUCTION

Agricultural intensification has played an important role in the decline of biodiversity in farmland ecosystems. Habitat degradation has resulted in reduced edge effects. This has led to species loss, soil degradation, deflation and drying of arable lands. There are a lot of farmland in Europe, which has a significant impact on the continent's climate. How do linear habitats affect the microclimate, biosphere and crops? An endemic farmland bird, the grey partridge (*Perdix perdix*) is an indicator of healthy agroecosystems. Their population has declined drastically in recent decades across Europe.

MATERIAL AND METHODS

We look for correlations between habitat structure and population dynamics. We have used the websites of Google Scholar, Sciencehub, Wiley and Elsevier to find the journals. We googled the following keywords: grey partridge, farmland, arable lands, crop fields, headlands, forest belt, hedgerows ecosystem services, field margins, microclimate, wildflower strip, grass bank, beetle bank, and game conservancy. We think that: 1. Habitat limits the partridge population. 2. A high abundance of partridges means good habitat. 3. Hedgerows and field margins are also beneficial for agriculture.

RESULTS

The edges and margins has played important role in arable fields but intensive agriculture is destroying them. The partridge populations are highly dependent on marginal vegetation, but the characteristics of hedgerows are more important than the length. Researchers have evidence that the quantity of dead grass and other herbaceous plant (for example common nettle (*Urtica dioica*)) are the most determining factors for nesting. According to Church (1980), the pairs after pairing do not move away from the edges. “For instance, Hunt (1974) suggested that 'incomplete' hedges were the best type of nesting cover for grey partridges because of their ground vegetation characteristics. However, no previous studies have attempted to quantify hedgerow quality and relate it to partridge numbers.” The ecological value of hedges can be enhanced with deadwood and herbaceous vegetation. Diverse ecotones provide habitat for multiple species.

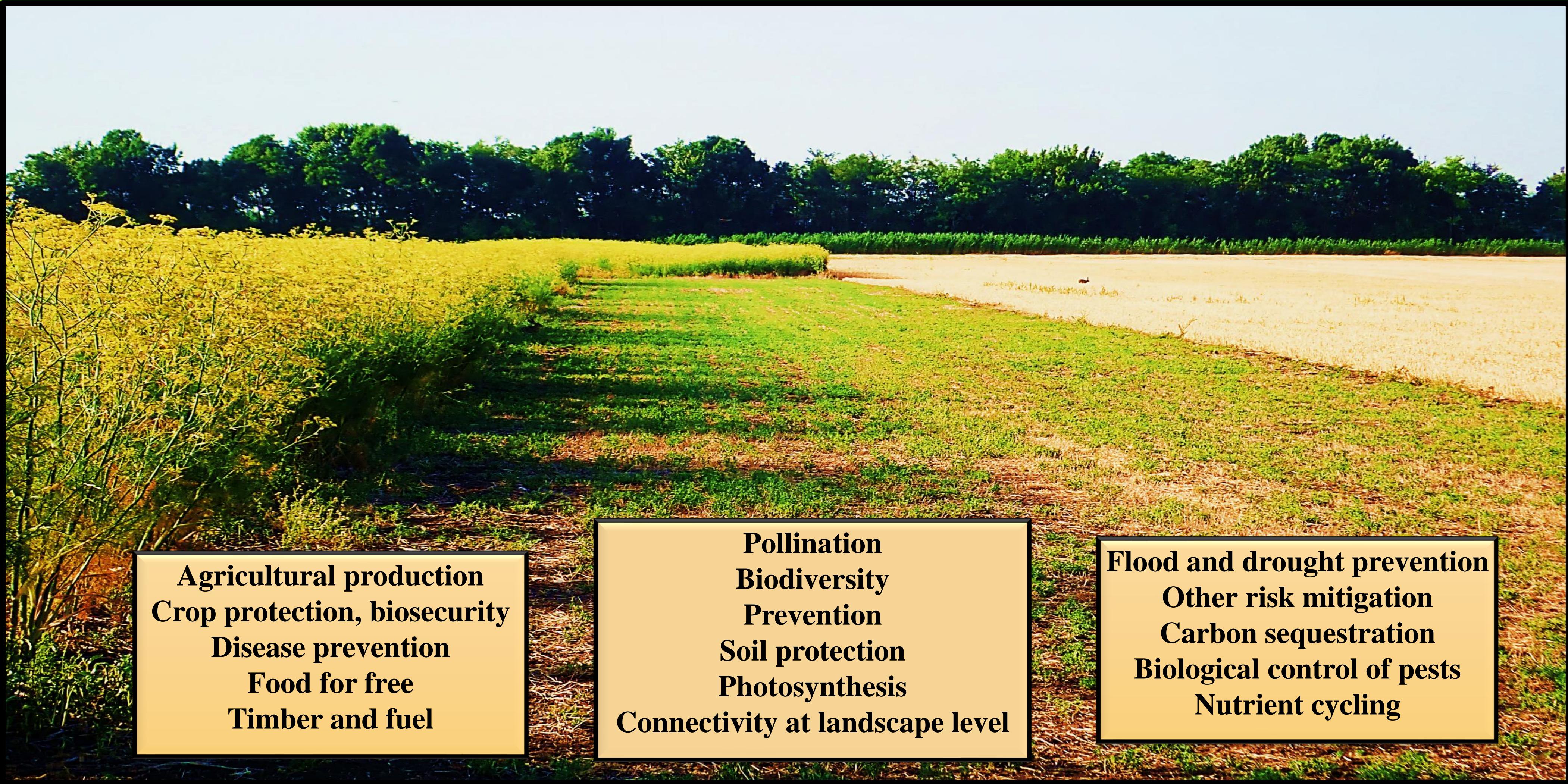


Figure 1: Ecological services of edges and hedgerows

Does habitat limit the partridge population?

Habitat is the most important factor in the dynamics of a population, but it is not enough to study it on its own. More accurate results can be obtained by analysing immigration and emigration, reproduction and mortality rates, and predation. However, it can be said: In the right habitat, these factors are in balance and density fluctuates less. For grey partridges, habitat is important, but not the only factor determining density. Another problem is the lack of food and the critical density. The grey partridges are monogamous, which further complicates the survival of the species. In general, the removal of the margins reduces the density, but there are also other components.

Does a high abundance of partridges equal with good habitat?

High density means generally good habitat. This is particularly true for the partridge, which is an extremely vulnerable species. However, other factors like food, climate, reproduction, mortality and human impact are also relevant. The partridge is sensitive to change, so we can assume that high density means good habitat. These birds need grassy edges and field margins, beetle banks, low use of pesticides and increased control of predators. Hedgerows and forest belts with lots of dead grass and herbaceous plants are also suitable, but these microhabitats are also at higher predation risk. We can say that where the abundance of them are high for long periods, the habitat is good and they are like indicators or “barometers of the countryside”.

Are hedgerows and edges also beneficial for agriculture?

The benefits of hedgerows and field margins for wildlife and agriculture are clear (*Figure 1*). Agroecosystems have been severely damaged by the removal of linear habitats. These micro-habitats protect crops and soils and increase crop production. They also act as buffer zones. They support pollination and biodiversity. They mitigate climate change, wind erosion and other effects, as we saw see before. Perhaps agriculture needs marginal vegetation more than the grey partridge. Conserving edges is the cornerstone of sustainable agriculture. Nowadays we spend lots of money on soil conservation when we could do much more with some simple techniques. It is impossible to recreate the past, but protecting existing hedgerows and restore new ones is essential for sustainable farming.