Birds, bugs and bees: how organic farming benefits nature

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The food and farming challenge

"...we'll never grow our way into food security. The more food we produce, the more we'll waste and over consume, the more we'll degrade the environment, and the issues of equity and access to food will remain.

To solve these problems, we need to recognise local and planetary boundaries, grow food sustainably within them, and recognise that they limit our ability to consume. By doing so, we'd end up living healthier lives in a healthier environment, and more equitably."

Tim Benton, ex Global Food Security Champion

The State of Farmland Nature

- Farmland bird populations declined rapidly during the 1970s and 1980s
- By 2000, their numbers were half what they were in 2000
- Specialist birds (heavily dependent on farmland for food and breeding) have declined more severely

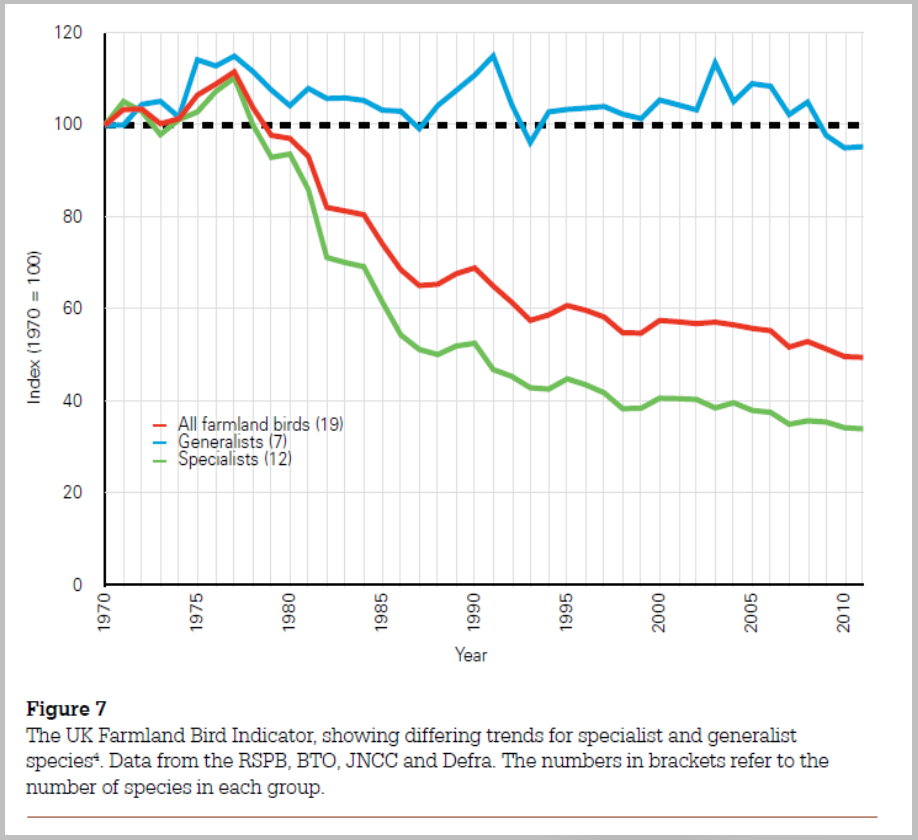

Figure 7
The UK Farmland Bird Indicator, showing differing trends for specialist and generalist species[4]. Data from the RSPB, BTO, JNCC and Defra. The numbers in brackets refer to the number of species in each group.

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The State of Farmland Nature

- Butterfly species of the wider countryside have declined by 41% since 1976
- 64% of farmland moths and 70% of carabid beetles studied are declining
- Arable plants are the fastest declining group of plants in the UK

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Agricultural trends (past and present) linked to biodiversity declines:

- Decline in mixed farming
- Switch from spring sown to autumn sowing, reducing food and habitat for many species
- Intensification of grazing regimes
- Abandonment and reduced grazing, leading to loss of some habitats
- Increased used of pesticides and fertilisers
- Loss of marginal habitats, such as ponds and hedgerows

Species examples

Grey partridge

Decline caused by indirect effect of pesticides on chick survival through reduction of insect population and effects of changing hedgerow management on the availability of nesting habitat

Skylark

Decline caused by loss of nesting and feeding opportunities in dense, autumn-sown cereals and high rate of nest loss in intensive silage fields

Not just biodiversity impacts

- Wide range of other environmental impacts associated with farming:
  - GHG emissions
  - water pollution and over-abstraction,
  - soil erosion and degradation
  - loss of landscape diversity and character

Benefits for nature of organic farming

Number of studies providing evidence of the effects of organic farming on biodiversity:

- Tuck et al (2014) Land-use intensity and the effects of organic farming on biodiversity: a hierarchical meta-analysis
- Lampkin et al (2015) The Role of Agroecology in Sustainable Intensification
- Hardman et al (2016) Delivery of floral resources and pollination services on farmland under three different wildlife-friendly schemes

Tuck et al (2014)

- On average, organic farming increases biodiversity (measured as species richness) by about one third
- The effect of organic farming varied with the organism group and crop type studied
- Larger effects found in cereals, among plants and pollinators and in landscapes with higher land-use intensity

Tuck et al (2014)

- Plants benefited most, probably due to restricted herbicide use
- Arthropods, birds and microbes also benefited with varying degrees of confidence
- Most functional groups – herbivores, pollinators, predators and producers – were more diverse in organic farming
- In cereal fields, organic farming had large effects, significantly higher than in vegetable crops and orchards
- A lower but still significant effect was found in grasslands (pastures and permanent or semi-permanent leys)

Lampkin et al (2015)

- Assessed three different approaches compared to intensive, conventional systems:
  - integrated crop/farm management
  - organic farming
  - agro-forestry

- Assessed contribution to a range of outcomes including biodiversity and related ecosystem services

- Concluded that agroecology approaches can:

  ‘maintain or increase biodiversity and the output of related ecosystem services – with appropriately designed and managed agroforestry and organic systems offering potentially greater benefits than integrated systems’

Lampkin et al (2015)

Table 4-8: Factors affecting biodiversity and related ecosystem service impacts of agroecological compared with intensive conventional systems

Output parameter	*Integrated*	*Organic*	*Agroforestry*	*Key factors*
Soil micro organisms	+	++	++	Cultivations, supply of organic matter as energy source for soil ecosystem, distribution of nutrients within soil profile
Invertebrates	++	++	+++	Cultivations, supply of organic matter, storage and application of slurries/ manures, soil pH, provision of undisturbed field features (e.g. beetle banks), restricted use of pesticides
Plants	+	++	+++	Specific habitats (beetle banks, field margins), non-use of herbicides, crop species and variety choices, rotations and polycultures
Pollinators	+	++	++	Provision of food sources throughout season, either as pollen/nectar mixes, flowering strips, or diverse legume mixtures; restricted use of pesticides
Mammals	+	+	++	Availability of non-cropped habitats, corridors e.g. hedges, farm woodland, tree lines, as well as permanent grassland
Farmland birds	+	+	+/-	Alternation of winter and spring crops, provision of nesting sites for ground-nesting birds, restricted use of pesticides, feed availability in hungry gap

- = less than conventional, 0 = similar to conventional, + = higher than conventional

Hardman et al (2016)

- Assessed floral resources and pollination services under three schemes:
  - Organic farming
  - Conservation Grade (CG)
  - Entry Level Stewardship (ELS)
- Looked at:
  - Flower density and diversity
  - Pollinator density and diversity
  - Pollination services

Hardman et al (2016)

- Organic crop habitats supported higher density of flowers, insect-wildflower visits and fruit set, than CG or ELS crop habitats
- Non-crop habitats supported higher density of flowers and insect flower visits than crop habitats on CG and ELS farms
- Pollination services were higher on organic farms overall compared to CG and ELS

Why support organic farming?

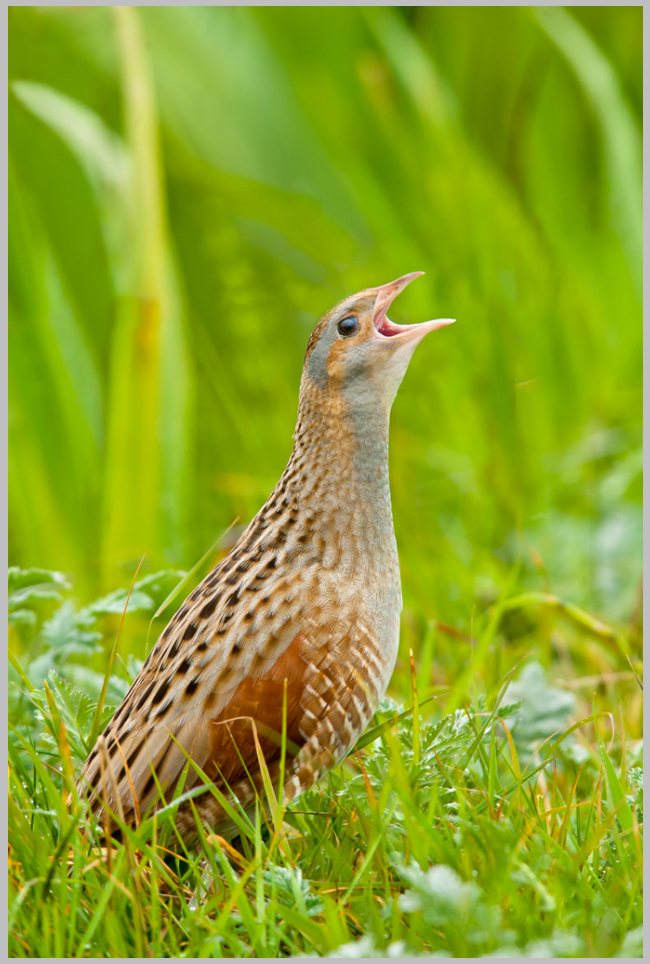
- Growing body of evidence of the biodiversity and other environmental benefits of organic farming, alongside other agroecological approaches

- Organic farming benefits from being:
  - underpinned by regulation
  - codified in standards, independently inspected and verified
  - food clearly labelled for, and recognised by, consumers

- Important that regulation and standards continue to develop and evolve, to maintain and enhance biodiversity benefits

Not just organic farming

- Agri-environment schemes remain vitally important in helping nature
- Other schemes e.g. Fair to Nature can help
- High Nature Value farming systems must be supported



Where next?

- Continue research into organic and other agroecological farming approaches
- Invest in knowledge transfer, training and advice for farmers
- Continue support for organic conversion and maintenance
- Aid organic expansion and market growth e.g. through public procurement and targets, as in Denmark
- Enshrine principles of agroecology in law e.g. as in France

Good Food Nation Bill Scotland

- Scottish Government due to consult on a Good Food Nation Bill in Autumn 2017
- Scottish Food Coalition calling for a socially and environmentally just food system in ‘Plenty’
- Opportunity to promote organic and agroecological farming approaches