

FRIENDS OF THE SCOTSMAN /

Count on farmers to make sure that Scottish songbirds keep their habitats

At the Oxford Farming Conference 2017 held earlier this month, one highlight was the debate entitled After CAP, what? To survive and thrive what policies does GB agriculture need?

On the platform were George Monbiot, journalist and environmental activist; Dame Helen Ghosh, Director General of the National Trust; Minette Batters, Deputy President of the NFU; and Guy Poskitt, farmer.

This was always going to be an informative and engaging discussion. Monbiot had said, and said again on the day, that "sheep are a fully automated system for environmental destruction". He also said in a recent paper that "our bare hills are an artefact of three principal activities, sheep, deer stalking and grouse shooting".

There is a lot we could take issue with in those statements; also the fact that one approach he advocates towards environmental management is simply to do nothing.

Minette Batters, when challenged as to whether she thought large amounts of money should continue to be paid to landowners under a new regime, responded quite rightly that it all depended on what payments were for. The comment was also made that payments should be seen as investment, not subsidy.

And there is the crux of the discussion. There is no denying that we



Efforts to manage the environment are not always recognised by activists, says Dr Dave Parish

need to farm to provide food and, whatever happens post Brexit, there will need to be some transitional measures so that thousands of farmers do not immediately go to the wall. But there are a whole host of questions still to be answered, not least, should farmers be paid for what they do, including enhancing the environment, rather than be penalised for what they don't do as is the case in New Zealand? Should there be a limit to the subsidy received? Should that subsidy cover food production at all or should it purely be for green measures? And how big should the pot be – it currently stands at around £3 billion per annum.

The Game & Wildlife Conservation Trust (GWCT) in Scotland now has a demonstration farm at Auchnerran, and a 1,200-ewe sheep flock. The Trust is an active farmer. One of our objectives at Auchnerran is to show that it is possible to run a profitable upland sheep enterprise and enhance biodiversity in tandem. We have now just completed our second full year there and it is too early to report how

things are progressing. However, the CAP (Common Agricultural Policy) and its future is very much an issue for us, whether in support of the farming enterprise or the environmental measures supported through the Scottish Rural Development Programme, so we will be watching with interest as plans and policies for what happens next unfold.

Part of what we have been doing at Auchnerran is a baseline assessment of what there is on the farm by way of wildlife, and we appear blessed with significant numbers of waders – lapwing, curlew and woodcock – among many other species.

Farmland birds provide a barometer of how we achieve a balance between farming and food production and the GWCT's annual Big Farmland Bird Count takes place again across the UK between 3 and 12 February. During that time we are asking farmers to record and report what species of birds and how many of them they see on their farms. The results also provide an indication of whether farmland bird numbers

are in decline or if the conservation efforts of farmers are succeeding. Farmers and gamekeepers are responsible for managing the largest songbird habitat in the UK, but often their efforts are unrecorded and the Big Farmland Bird Count gives farmers the chance to show what their conservation efforts are delivering.

Such measures include planting and maintaining hedges, leaving field margins sown with grasses such

as cocksfoot and timothy, tussocky strips providing both cover and food for birds, and mixed woodland and woodland edges.

Farmers have an important part to play in terms of making habitat available, and for those farms with shoots there is huge benefit for them too. There are vital links between all these elements – hedges, field margins and farm woodland, as well as with the crops being grown on the farm.



Pollinators also require encouragement since their decline and a poor wild berry crop can result in an associated decline of farmland birds.

In Scotland last year the count took place on 55 farms covering a total 35,700 ha, with 120 different species reported. The Scotland count featured 23 Red List species, with five of these in the top 20 – house sparrow (11), starling (16), tree sparrow (17), yellowhammer (18) and fieldfare (20).

The top 10 farmland bird species reported overall last year were black-bird (1), woodpigeon (2), robin (3), blue tit (4), chaffinch (5), buzzard (6), pheasant (7), carrion crow (8), great tit (9) and jackdaw (10).

Dr Dave Parish, Senior Scientist, Scottish Lowland Research, Game & Wildlife Conservation Trust. For more information about the 2017 Big Farmland Bird Count see www.gwct.org.uk/farming/big-farmland-bird-count

↑ The chaffinch featured in 5th place in the Big Farmland Bird Count in Scotland last year



Don't mistreat your machine, it may just get its own back

In 1950 Alan Turing, in his article "Computing Machinery and Intelligence" proposed the question: "Can a machine think?" This question has fascinated computer scientists and influenced Artificial Intelligence (AI) research over the last decades.

AI could be described as machine intelligence, or a computer system that exhibits similar behaviour to a human being. AI has recently enjoyed a lot of attention in the media. According to Gartner Inc., AI is the top technology trend for 2017.

AI technology is becoming increasingly part of our daily life. There are numerous examples such as Google search, Amazon recommendations, Apple Siri, and self-driving cars. Governments and industry across the world are investing in AI

research and applications to secure competitive advantage and economic progress.

Recent research breakthroughs in machine learning algorithms, the abundance of data and computing power have accelerated the development of AI even more. Machine learning algorithms are part of AI, providing the ability to learn from data and experience without the need to be programmed.

Major tech companies, such as Microsoft, IBM, Salesforce, Facebook, Google and Baidu, have bought start-ups and hired top researchers and software engineers. Google, for example, acquired the AI start-up DeepMind in 2014 for £400 million, while Salesforce has recently acquired the AI company MetaMind. DeepMind is the company that devel-

oped the AlphaGo software, which defeated the world champion at Go – Lee Se-dol. Go is considered much more complex than chess and a real challenge for AI in games. The reason for this success to be considered so important is that AlphaGo employs a machine learning algorithm that can be applied to any task regardless of the specific domain. MetaMind applied the state-of-the-art machine learning algorithm called "deep learning" for "Natural Language Processing", which is now embedded into the AI Salesforce Einstein platform. Deep learning techniques have fundamentally changed how computer-based systems recognise faces, objects and speech. Nowadays systems utilising deep learning work as well as humans and are continuously improving their performance.

The ultimate goal of AI research is to create so-called Artificial General Intelligence (AGI) that can act as human and learn just like a human can learn any task. The recent progress in machine learning and neuroscience make the prospect of achieving human-like AI a real possibility.

According to a Microsoft Academic Search conducted in 2013, the top 100 authors in artificial intelligence predict that there is a 90 per cent probability of achieving AGI by 2070. This suggests that the top experts in the AI field do not doubt that there will be human-like AI by the end of this century. What does that entail? Will that type of AI result in improving the life on our planet and solve the world's problems?

Demis Hassabis, CEO of Google

Deepmind, in recent media interviews has said that having AI able to solve problems in general would enable us to do all sorts of things and "make the world a better place".

However, there are scientists and entrepreneurs that raise concerns about the risks of AGI.

For example, Stephen Hawkins and Elon Musk have talked in the media about the negative consequences that human-like AI could bring. These include loss of jobs, unpredictable behaviour of robots, loss of privacy and even harming humans.

If an AI system is more intelligent than a human being, then this system can take control and behave in an unpredictable way.

Could researchers and AI creators guarantee that the intelligent

machines they are building will behave in a way beneficial to humanity?

Several research centres have recently been set in the UK by top universities and technology companies to address the social, ethical and legal concerns arising from AI technologies.

The Future of Humanity Institute in Oxford has AI safety as one of its main programme areas. The Cambridge Centre for the Study of Existential Risk and the Leverhulme Centre for the Future of Intelligence at Cambridge University investigate the risks that rapid AI developments pose. Google, Facebook, Amazon, IBM and Microsoft have created a new AI partnership to set up standards for AI systems and ensure best practices are adopted worldwide.

AI systems are now with us and will continue to expand their use in the future. Governments, industry and universities have the responsibility to drive the strategies in AI research and development as well as the education and training that is needed to provide people with the right skills to adjust to the new AI technological challenges.

Professor Chrisina Jayne, Robert Gordon University, Head of School of Computing Science and Digital Media



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Should we be wary of AI to come, wonders Prof Chrisina Jayne