



## CONSERVATION GRADE – NATURE FRIENDLY FARMING

**TIM NEVARD** and **BRIN HUGHES**  
outline a way of feeding the  
growing world population  
without destroying biodiversity  
and the environment

**W**hether or not you agree with man-made global warming, there is no doubt that the world is heating up. Levels of atmospheric CO<sub>2</sub> are higher than at any time in the last 440,000 years (source: Met Office) and there is now scientific and political consensus that we have entered a period of unprecedented climate change.

The greatest (and perhaps the only) 'buffer' we have to climate change is the maintenance of the biodiversity of our natural ecosystems. Biodiversity – or biological diversity – means the many and varied forms of life on Earth, from tiny, single-celled bacteria to blue whales, from algae to zebras. As well as diversity of species, there is also diversity within a single species ('genetic' diversity) and diversity of ecosystems (like seas, grasslands, wetlands, forests and lakes).

### Biodiversity loss

To many consumers, the concept of biodiversity (and often the word itself) seems remote. But like all our predecessors, we continue to rely on the diversity of organisms in the natural world for our survival. This biodiversity provides us with food, raw materials, medicines, clean water and fertile soils. Mangrove swamps are the tropical world's primary coastal flood defences, peat bogs soak up carbon dioxide and a country walk is good for mind and body.

However, we continue to damage biodiversity. Species become extinct or are forced into unsustainably small and isolated populations, as tropical forests are cleared for palm oil production, wetlands are drained and seas are over-fished.

In short, we rely fundamentally on global biodiversity but we are not managing it sustainably. Several reports (NEAA, MEA and IUCN) confirm that global biodiversity remains under severe threat with species extinctions occurring at 100 to 1,000 times the historic rate. More than a third of species are estimated to be facing extinction; an estimated 60% of the Earth's ecosystems have been degraded in the last 50 years and there is mounting evidence that the status of many ecosystems is reaching or has already reached the point of no return (Nature, 2009). If we continue to lose species and their habitats, we threat-

en the very services on which our prosperity and wellbeing depend.

But we need to feed a growing world, and that presents a conundrum.

### Food security and population growth

A major driver of biodiversity loss has been the post-war obsession with obtaining the most food from a rapidly diminishing per capita arable land area at the cheapest possible cost. In the UK we now realise that such an intensive system of farming is not sustainable. Things have improved recently: pesticide use is better-regulated and 'agri-environment schemes' have enabled some farms to become more 'nature-friendly'. However predicted population increases indicate that global demand for food will increase 50% by 2030 and 100% by 2050.

Providing a sustainable supply of food that is affordable, nutritious and safe is therefore the major global challenge for farmers, agri-business, researchers and government. The regions of greatest population growth over the last 50 years have been Asia and Africa and these trends are predicted to continue (UN, 2006). Greater urbanisation has occurred as populations move into cities and as incomes increase, so eating habits have changed. Meat consumption per capita in China increased from 20 kg in 1980 to 50 kg in 2007 (source FAO). This puts pressure on resources as 1,000-2,000 kg of water is required to produce 1 kg of wheat, whereas 10,000 to 13,000 kg of water is required to produce 1 kg of beef.

Population growth rate is now greater than the index of agricultural production and world grain stock (although at far more comfortable levels than they were two years ago) would provide 77 days of consumption (Brown, 2010). But the area of the earth's surface available to grow food crops for today's 6.1 billion people remains at only approximately 3%. That equates to 0.25 ha of available farmland per capita. With limited arable land and a continually growing world population, the available farmland per capita is expected to further decrease dramatically to 0.16 ha by 2050 (UN, 2006).

### Wheat yields – conventional and organic

Yields of conventionally produced wheat in developed countries continued to increase steadily during the 1970s, 80s and early 90s. These increases were in line with scientific advances in conventional breeding technologies, together with improved efficacy of pesticides and crop nutrition. But those increases have ceased in recent years with many farmers now struggling to increase outputs beyond what appears to be the maximum realisable capacity.

Yields of organic wheat crops are consistently lower than conventional, suggesting an even lower capability of organic crops to feed the growing population. Figures

from Elm Farm Research Centre, the primary organic research institute in the UK, indicate that the average UK organic winter wheat yield (assessed from data on many farms) is c. 4 tonnes/ha but averages are c. 8 tonnes/ha for 'conventional' agriculture; a yield ratio of 0.5 (Goulding and Trewavas, 2009).

Record conventional wheat yields are c.14-15 tonnes/ha. Occasionally organic yields have reached 7 tonnes/ha; again suggesting an organic/conventional yield ratio of 0.5.

### Biofuels

Carbon dioxide emissions from the burning of fossil fuels and their contribution to climate change are well documented. Hence, the development of biofuels from crops is seen by some as a way to mitigate climate change. Brazil leads the world in production and use, making about 16 billion litres per year of ethanol from sugarcane. The European Union had a target for 2010 that 5.75% of transport fuels should come from biological sources (although this target is unlikely to be met). The British government's Renewable Transport Fuel Obligation requires 5% of the fuel sold at the pump by 2010 to be biofuel. And in the US, the Renewable Fuel Standard aims to double the use of biofuels in transport by 2012.

Thankfully, the pitfalls of biofuels are now well known: turning plants into fuel is often more polluting than burning petrol, and using crops for fuel when millions are starving is hard to justify. From the environmental point of view, the big issue again is biodiversity. Rainforests are being destroyed for biofuel crop production in Brazil and for palm oil plantations in Indonesia and Malaysia, at the expense of some of the world's most biodiverse habitats. We share 97% of the DNA of the orang-utan but we have destroyed 80% of its habitat for palm oil production – if we allow one of our closest cousins to go extinct what hope is there for us?

### Global ecosystem services

The economic costs associated with these losses of biodiversity have only recently begun to be investigated. The annual loss of ecosystem services is estimated at 50 billion euros, and by 2050 the cumulated welfare losses are estimated to be equivalent to 7% of GDP (COM, 2009). Proper valuation of ecosystem services is therefore essential and to that end the international study, The Economics of Ecosystems and Biodiversity (TEEB), will release a report in summer 2010 aimed specifically at the business sector. The report will provide guidance for the development of EU policy on prevention of biodiversity loss and will help businesses understand and take advantage of new opportunities to create value within a new and growing green economy.

### Consumer solutions

At present, food production in developed countries is very efficient when measured in strict financial terms, but we are 'in the red' with our debt to nature and increasingly the global economic impacts of biodiversity losses are becoming clearer. To pay back that debt we need to use land in ways that do not reduce biodiversity further. One solution is for consumers to choose only food products that are farmed sustainably – just as they did in the 18th century when they chose to avoid buying sugar grown by the socially unsustainable and morally reprehensible system of slavery.

By making a sustainable choice again, consumers could use their purchasing power to influence the development of social, environmental, health and animal welfare values in the food system and make sustainability a matter of competitive advantage for the those food brands which offer sustainable choices to their customers.

The 'Conservation Grade™' certification system of 'nature friendly farming' provides food brands, producers and consumers with a unique, sustainable solution to efficient food production while enhancing biodiversity and preventing wildlife declines on farmland.

### Conservation Grade: nature friendly farming

Conservation Grade is a unique sustainability protocol implemented by farmers in return for a contracted premium price for their crop.

Independent scientific trials demonstrate the Conservation Grade farming system leads to significant increases in biodiversity compared to conventional agriculture (Figure 1). At the same time food production output is maximised in terms of yield and quality.

<b>BIRDS</b>	Numbers up 41% (and new species introduced)
<b>BUTTERFLIES</b>	8-fold increase over crop (22 species)
<b>BUMBLEBEES</b>	13-fold increase over crop
<b>MAMMALS</b>	30-fold in some habitats (water vole and other increases)
<b>PLANTS</b>	Generally increased, especially rarer annuals
<b>BEETLES AND SPIDERS</b>	Up to 100-fold increase in some habitats

**Figure 1: Increases in wildlife species on Conservation Grade farms.** During a three year experiment, increases in individual species were recorded and summarised (Conservation Grade, 2003).



All Conservation Grade farmers have access to a supply contract for their produce for which there is a guaranteed premium over the market price in return for implementing the protocol standards. Because of this commercial continuity, Conservation Grade creates a model for both profitable farming and practical wildlife conservation.

The processor or brand owner uses the Conservation Grade logo on all products as approved by Conservation Grade Producers Ltd. This provides a significant environmental point of difference to help in the marketing of its products for which brand owners pay a licence fee or royalty on any product carrying the Conservation Grade logo.

Conservation Grade farmers are required to take 10% of their land out of food production to develop a specific range of habitats for wildlife on their farmed land. The habitats must be created and managed in the ratios prescribed to create the optimum conditions to promote biodiversity on the farm. These include:

**4% pollen and nectar;** e.g. wildflowers and clover, normally planted in field margins, to provide insect food and habitat.

**1.5-2% wild bird food;** using plants like quinoa and fodder radish that provide seeds for birds in winter and early spring.

**2% tussocky and fine grasses;** providing shelter for spiders, beetles and small mammals (and food for predators like barn owls).

**Up to 0.5% natural regeneration areas;** for the encouragement of rare arable annual plants and ground nesting birds.

**2% land that is a unique feature of the individual farm** that can be managed to promote wildlife; for example, hedges, ditches, old barns, ponds or woodland.

Conservation Grade farmers are required to exceed the requirements for current government environmental stewardship schemes: for example, in the current UK environmental stewardship scheme, Entry Level (ELS) Option EG3 nectar flower mixture, the maximum area required is 3% (3ha per 100ha of arable land); whereas Conservation Grade farmers are required to provide 4% of farmed area as pollen and nectar habitats. The Conservation Grade protocol also imposes a compulsory structure for habitat placement, instead of a menu of prescribed habitat options. This ensures an appropriate

balance of specific habitats on the farm to provide the best support to local biodiversity.

## Conclusion

2010 is the International Year of Biodiversity and the growing awareness of the implications of biodiversity loss is driving it to the forefront of the economic and environmental agenda in much the same way that climate change has moved centre stage over the past decade.

The analysis on the cost of biodiversity loss and ecosystem degradation already emerging from the TEEB initiative is providing leaders in both business and government with much needed information on which to base key decisions at corporate and national level.

Agricultural production is reliant on biodiversity and ecosystem services and the trend for certified sustainable agricultural products to enhance brand value and differentiate products with consumers will continue and grow. 🌱

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