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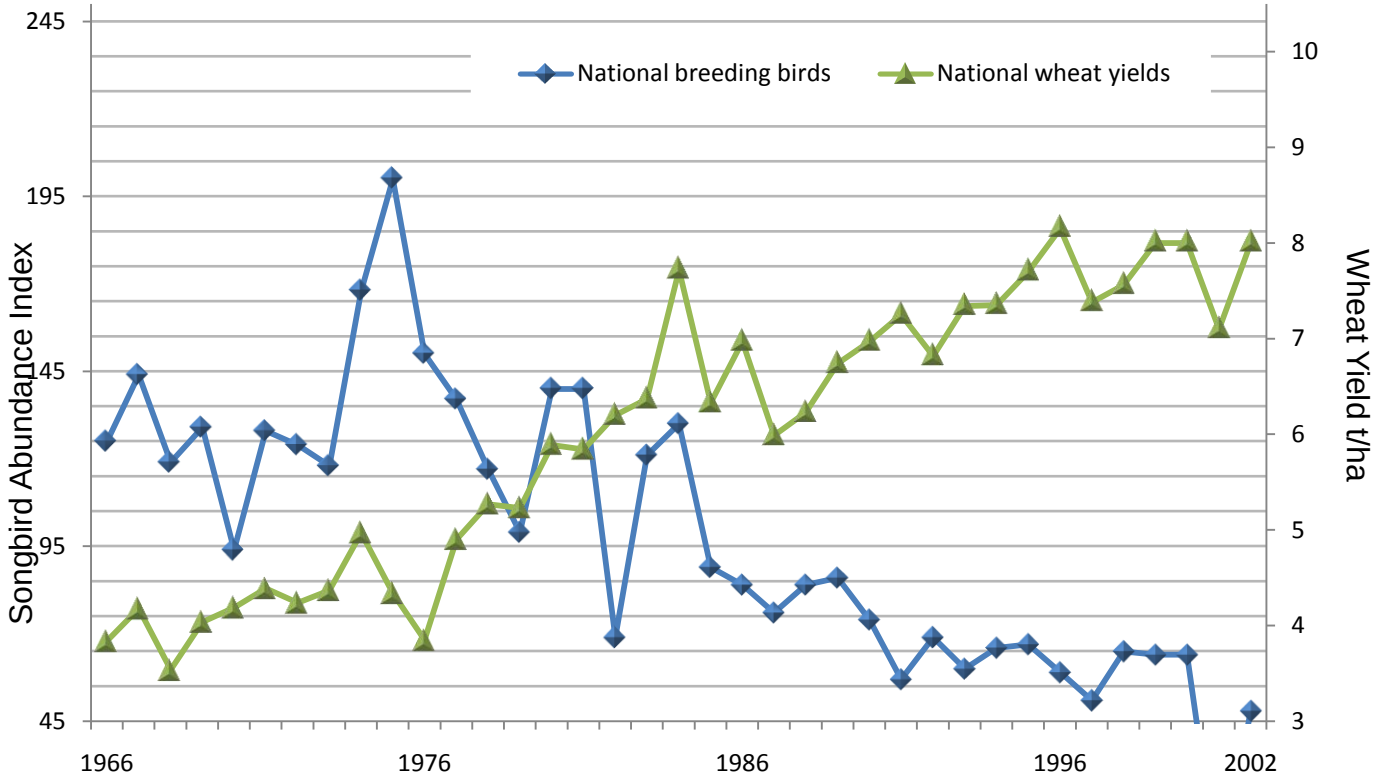
Game & Wildlife
CONSERVATION TRUST

Securing a healthy natural environment; How can farming help?

The price of food has increased steeply in recent months. This is a response to record global demand and record low stocks. Shortages stimulate price increases, price increases stimulate agricultural intensification.

Agricultural intensification within Europe over the past half century has been driven by farm subsidies, but the resulting grain mountains and milk lakes took a heavy toll on wildlife (Fig 1).

Fig 1. UK Wheat Production Vs Songbird Abundance



With farm support payments now disconnected from production it is reasonable to expect that farmers will respond to demand and intensify production. The cushioning effects of set-aside are gone and in a market place demanding food the Environmental Stewardship payments available to farmers now look meager.

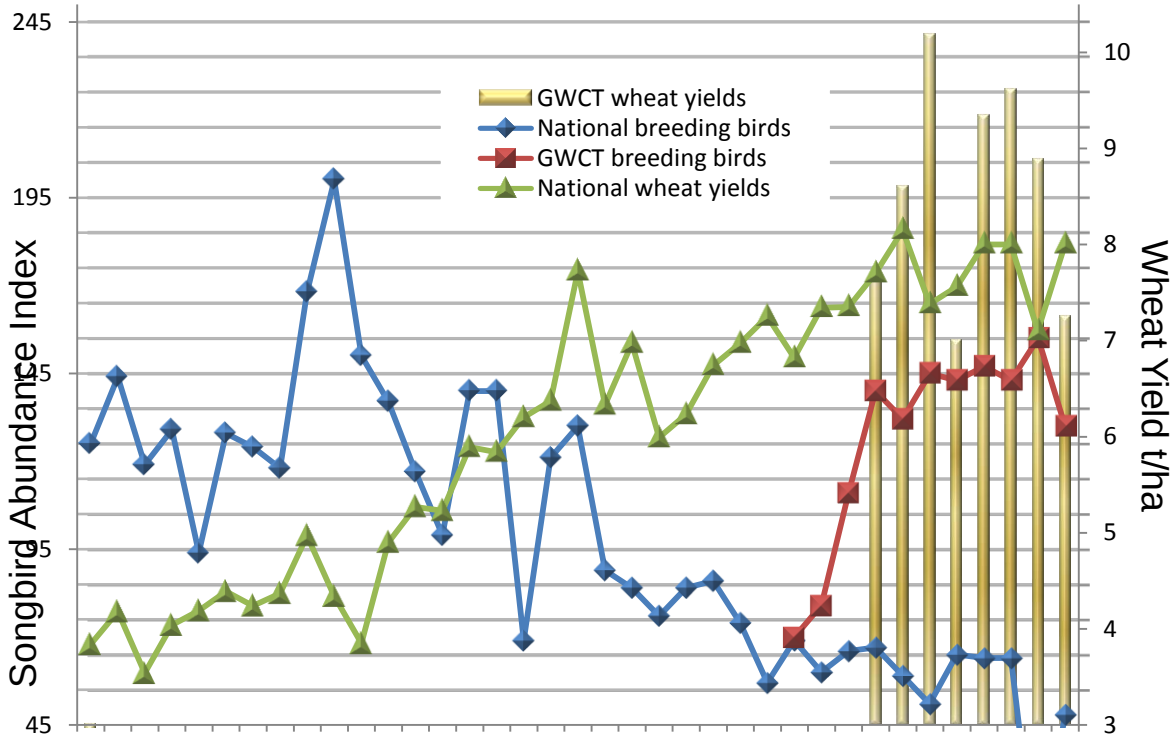
In light of this, can we have conservation and high food production? One approach, currently being advocated by Defra is to consider agriculture and conservation, not as separate goals, but

as derivatives from a single ecosystem. This means understanding the ecology of crops as well as the ecology of the flora and fauna.

Since 1992, at our Allerton Project farm in the East Midlands, we have been exploring this. On 800 acres we have tried to improve biodiversity alongside modern farming. This has involved not just providing habitats for birds but also looking at how crop production affects things like water quality and soil condition as well.

Fig 2 shows that our high yielding wheat crops do not have to come at the expense of songbird populations - indeed using traditional game management techniques one can have both (Fig 2).

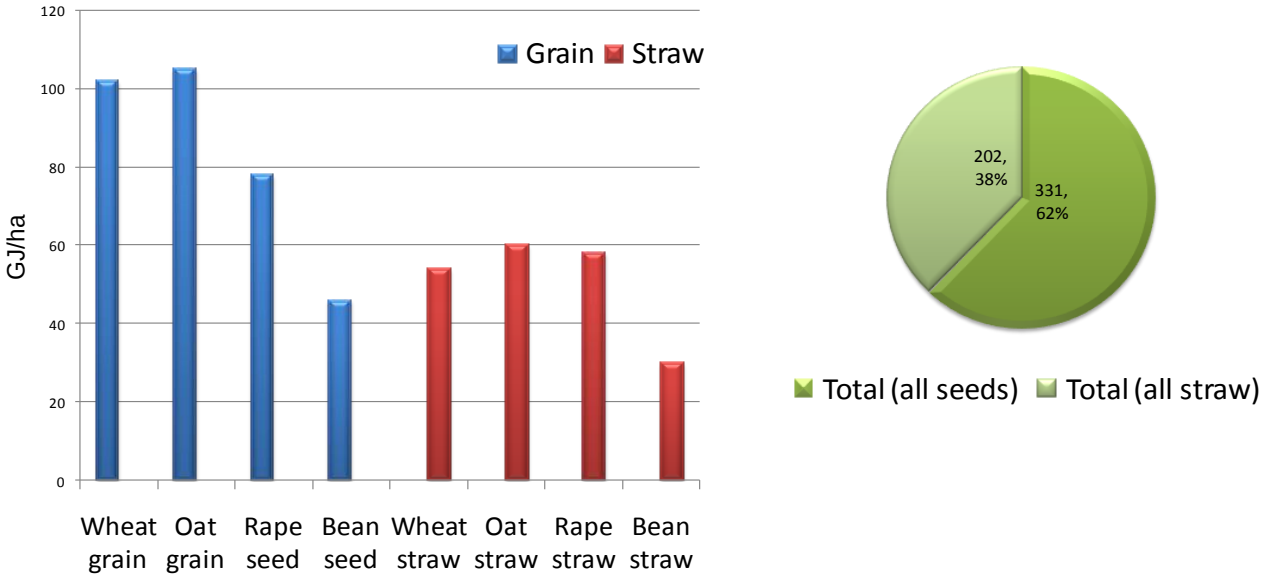
Fig 2. UK Wheat Production Vs Songbird Abundance



The second area we have begun to examine is the amount of fossil fuel required to grow a crop and relate this to the amount of bio-energy the crop is able to produce. Part of the reason that food prices have increased so dramatically is that crops are being used to make bio-fuels. By 2010 it is estimated that 30% of all US corn will be used in ethanol manufacture.

Fig 3 is based on an average crop yielding year for the Allerton Project farm. It shows that just over half the energy captured by the crop is harvested as grain. However to make this

Fig 3. Calorific capture GJ/ha of the arable cropped at the Allerton Project 2002



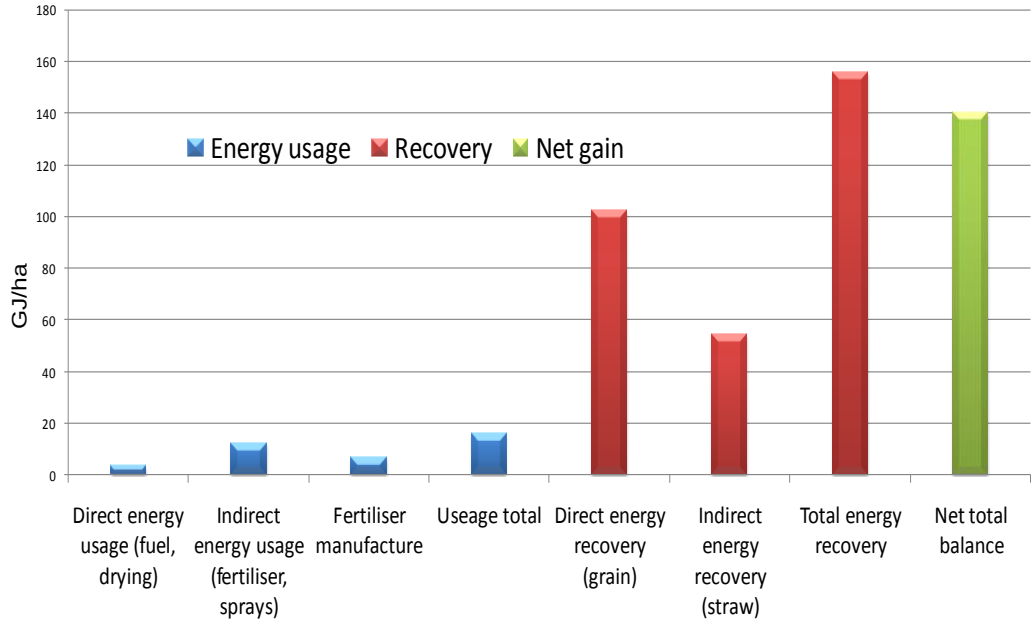
meaningful we need to relate this to the amount of energy put into the crop through fuel and fertilizer (Fig 4).

While beans appear poor energy catchers they do not require inputs of nitrogen, an energy input, which accounts for over 40% of the input required to grow a crop of wheat.

The graph shows that conventional wheat crops show a very positive net balance. While nitrogen fertiliser manufacture is an energy intensive operation the resultant increase in leaf surface area and leaf chlorophyll density enables the plants to recapture around 6 times the amount of both the direct and indirect energy used to grow the crop.

While fuel prices were low there was little incentive to harvest straw and most is simply directly or, through a livestock enterprise, indirectly returned to the soil, where it performs an important function. By raising soil organic matter straw increases water infiltration, soil microbial activity, root penetration and permeability, nutrient recycling and crop yields, whilst

Fig 4. Energy recovery by wheat



reducing erosion, slumping and compaction.

Put simply ‘waste’ straw makes a valuable contribution to the yield of grain and its perpetual removal could destroy soil resilience in turn jeopardizing food production. These are challenges that need to be thought through with an Ecosystems Approach.