

derable, and even if all countries introduced a two-children-per-family policy, the global population would continue to increase by several thousand million people before it could stabilize. Furthermore, this is a problem which is only indirectly relevant to the industrialized countries in general, and which therefore will be relatively difficult to make heard in those countries, although most of the developing countries are working with the problem.

A number of the already-known problems — 'greenhouse' effect, stratospheric ozone shield problem, energy consumption, and chemicals in local surroundings — are estimated to present considerable problems also in the 25 years' perspective. Thus, today's problems cannot be solved right away.

#### *Room for Bad Surprises*

There is reason to call attention to some of the surprises in the above list. If a general conclusion is to be drawn about the long-term environmental problems, it is that we are still so ignorant about Nature's relations that there is plenty of room for unpleasant surprises. Much in the same way as asbestos problems, CFC-gas influence on the stra-

tospheric ozone shield and the carbon dioxide emission's consequences for the climate, came earlier as unpleasant surprises.

In the above list two possible surprises should be pointed out. First, the problem of contagious diseases, which with increased travelling ease and activity will be able to spread much faster than before. The lung plague in India — which turned out to be more of a media event than anything else — is perhaps an omen of new contagious diseases in the future. Second, the destruction of the oceans. Our knowledge about the oceans and their life is very limited. We know very little about how we affect the oceans today. Will we see the Gulf Stream turn in 25 years? Neither of the two surprises have been properly realized. But alertness towards surprises, which inevitably are going to turn up, should not be reduced.

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## Conserving Farmland Wildlife\*

### *Introduction*

Farming is Europe's dominant land-use, so we would expect farmland to be the home of a large part of our natural heritage of plants, animals, and their chosen or at least adequate habitats. For some 8,000 years it was. The hugely diverse flora and fauna that are native to the eastern European steppes and forests soon spread into the new environment created by the earliest farmers. There the biota thrived in a diverse landscape of crops, pastures, and fallows, often divided by sheltering hedgerows and fertilized and nurtured by human hands.

Europe's cereal fields alone are estimated to have been the home of some 700 species of higher plants, about 3,600 species of insects, and up to 400 species of spiders — constituting the basis of a food-chain for many birds and small mammals, and in turn of larger carnivores. To these figures we can add the almost innumerable species to be found in other farmed habitats: pastures, hill grazings, managed woodlands, and wetlands. In all its varied forms, Europe's farmland harboured a rich if bewildering diversity of life-forms.

Much of this has now gone. In the incredibly short time of 50 years since the intensification of farming began, larger fields, crop and farm specialization, faster machinery, and devastating pesticides, have destroyed more farmland plants and animals than scientists have been able to estimate. No country in Europe has been spared. There is none that has not witnessed the extinction of many species at least nationally, and catastrophic declines in the populations of most of those remaining. Only in a few favoured 'protected areas' have governments and Nature conservation bodies preserved a little of the best. In the rest of the countryside there has been wildlife destruction on an unprecedented scale.

All this was driven, of course, by the need to feed an expanding and increasingly demanding human population, which was largely made possible by improvements in agricultural technology. The final twist, in the European

Union at any rate, is that for the last 20 critical years the change was fuelled by a system of farm subsidies which rewarded food production above all else — with no room, at least on farmland, for any thought of Nature conservation. The recent reform of the Common Agricultural Policy has begun to address this particular problem, but with uncertain effect so far. The current fear is that the high productivity-high-intensity approach to farming that has been so damaging to Nature in western Europe, is now being adopted by the less developed countries of the east, where less-intensive farming has continued until very recently and valuable farmland wildlife could still be saved.

### *Still Time to Save Much?*

The urgent need in all this is to find out how we can continue to produce the food which we need while recognizing the unique wildlife value of farmland and managing it with Nature conservation in mind. For effective action, clear practical guidance will be needed by both politicians and farmers throughout Europe. Here we think of the Allerton Research and Educational Trust (ARET). This UK organization owns and manages a 300-ha farm in the East Midlands of England. There is nothing particularly special about the farmland; the soil is of moderate quality and the climate broadly typical of northern Europe. ARET's farm is a mixed enterprise, being 70% arable and 30% grazing — a blend which will be familiar to many of Europe's farmers. What is unique about this farm is the *care with which it is being managed*.

The aim of ARET is to research the compatibility of profitable agriculture and practical Nature conservation. Since 1992, farming has been carried out with the aim of maximizing all possible benefits for wildlife, while not compromising the efficiency of food production. This attempt to solve an apparent conflict has been possible because the cropping pattern, the use of pesticides, the management of the set-aside areas, and the conservation of the field boundaries, woods, ponds, and streams, have all been based on more than 50 years of research by another UK body, The Game Conservancy Trust.

\* Adapted from *Naturopa Environment Features* 94-4, pp. 1-4.

During its first year, ARET determined to lay down a baseline of information from which to measure the results of the special management in years to come. Accordingly, surveys were carried out of the soils, hedgerows, woodlands, wetlands, flora, gamebirds, songbirds, mammals, and insects. At the same time, plans were drawn up for the new management regimes. Most have already been put in hand; the others will start soon. Among the special features of the farming are:

**Set-aside Areas:**— A mixture of rotational and non-rotational set-aside areas is used. The Game Conservancy Trust recommends this option as the best for game and wildlife conservation. A network of strips and blocks of non-rotational set-aside areas is established along field margins and across large fields. Three blocks (whole or half fields) of rotational set-asides make up the statutory area requirement.

**Hedgerows:**— An extensive programme of hedgerow restoration and management has been instituted. In the UK, government grants are available to subsidize the costs, but good hedgerows are in any case wise agricultural practice, sheltering fields and reducing soil erosion.

**Conservation Headlands:**— Conservation headlands are being used around most cereal fields. Six-metres-wide strips are selectively sprayed, to control only the most damaging weeds; the less harmful species remain as hosts for butterflies and other insects which form the diet of songbird and gamebird chicks.

**Beetle Banks:**— These have been created across the middle of large fields, to provide overwintering habitat for aphid predators — thus protecting the crop and reducing the need for insecticides. One special feature is the gap at each end, which allows modern farm machinery to work the field without disruption.

**Woodlands:**— Neglected woodlands are being thinned and new woods have been planted with long edges of shrubby cover to help wild gamebirds.

**Wetlands:**— The farm has two large ponds, both of which were overgrown, silted up, and polluted. The restoration

programme began by felling trees to let light in, dredging the ponds, and stopping the pollution at source. In time it is hoped that there will be a sustainable trout fishery which will help to pay for this work.

**Gamekeeping:**— ARET's gamekeeper undertakes habitat management and the control of common predators to preserve game and other wildlife. The game shooting will bring in important income to pay for some of the conservation work.

#### *Monitoring of Results and Conclusion*

The effects of these management projects on the fauna and flora of the ARET farm are being monitored, recorded, and published. All the conservation management is fully assessed in terms of materials and labour costs. This attention to the financial picture will eventually show us the extent to which farmers can manage their land sustainably with conservation in mind, whilst still making a realistic living.

Although the ARET project is still in its infancy, the early results are highly encouraging. In the first growing-season since the 'new farming' began, yields and profit have been consistent with the average for farms of this size. No serious agricultural problems have arisen from the conservation measures implemented. Gamebirds and songbirds have bred much more successfully than latterly, and the number of Hares (*Lepus europaeus*) has increased. Equally important, large numbers of visiting farmers, journalists, politicians, and officials, have seen a really practical demonstration of the way farming and Nature conservation can go hand-in-hand. In 1994 ARET added the Duke of Edinburgh, with a representative of his own estate staff, to its list of interested visitors wishing to see this special farming in action.

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### Biodiversity Leadership Awards

#### ANNOUNCEMENT

The Bay Foundation and the Josephine Bay Paul & C. Michael Paul Foundation announce a collaborative programme for three Biodiversity Leadership Awards of US \$180,000 each to individuals whose work demonstrates leadership in science or policy related to the global loss of biological diversity. Ten distinguished educational and research institutions having active programmes in conservation science, policy, or environmental studies, will conduct a world-wide search for candidates. Each of these institutions has appointed an advisory panel representative to help set the programme guidelines, to submit three nominations from the institution, and to serve on the selection panel to recommend to the Foundation the finalists for each category.

The Foundations have targeted three broadly-defined categories — conservation biology, environmental studies, and conservation science advocacy — where they believe such grants could inspire efforts and bring attention to the related issues of biological extinction, habitat preservation, and 'sustainable development'.

**For Conservation Biology:**—To an individual whose work in conservation biology is distinguished by its pioneering

nature, creative excellence, and potential for mitigating the species extinction crisis.

**For Environmental Studies:**— To an individual whose work in environmental science or related studies is making a significant contribution to the understanding and stewardship to the Earth's resources.

**For Conservation Science Advocacy:**— To an individual whose work in education, policy, or advocacy, brings scientific conclusions to bear on the problems of 'sustainable development' and the conservation of biological diversity.

The ten participating institutions are The American Museum of Natural History, The Wildlife Conservation Society, The Missouri Botanical Garden, The Natural History Museum of Los Angeles County, The Zoological Society of San Diego, the Marine Biological Laboratory, the Salk Institute for Biological Studies, The Santa Fe Institute, and Harvard and Yale Universities. Each institution will submit three nominations. Only one of an institution's nominations can be of a person employed by, or principally situated at, the nominating institution, and one of the persons nominated must be working in a developing country. Nominations will only be accepted from the participating institutions.