

The Agri-Environment

The application of ecological theory and conservation biology to agricultural ecosystems has become an important and growing research field and undergraduate course component in recent years. This book is both an academic textbook and a practical guide to farm conservation, and has evolved from the authors' extensive teaching experience. It covers the ecology of farmed land, how agricultural practices influence the environment, how agriculture has changed over time and how the species that inhabit the agri-environment have adapted. It also covers the history of agricultural policy and subsidies and the development of agri-environment schemes. A number of different farming systems are discussed, as are the difficulties in determining their relative merits. Guidance is offered on how to produce a workable farm conservation plan, and the final chapters look to the future and the development of new greener farming systems.

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John Warren, Clare Lawson and Kenneth Belcher
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Preface and Acknowledgements

Historically agriculture has been considered purely as the method by which humans produced most of their food, fibres and other natural products. This activity has dramatically altered the farmed environment, favouring some species and habitats and degrading or destroying others. Over time as the human population has grown and agricultural activity has intensified the magnitude of this effect has increased, resulting in recent rapid declines in the abundance of many species and in the conversion of semi-natural habitats to monocultures. Population crashes in many of the species associated with farmed land and reductions in the quality and quantity of ecological services delivered by farmed land have resulted in an awareness that agriculture produces much more than just food. This realisation combined with other pressures such as reducing and decoupling economic subsidies from food production and changes in consumer demands for ecological goods and services are driving a second truly green revolution within the agricultural industry. New understanding of the ecology of the impacts of agriculture at a range of levels is enabling multifunctional production systems to be designed that deliver quality food products while supporting biodiversity and maintaining ecological services. Everyone involved in the agricultural industry during the twenty-first century will need an understanding of how to balance these conflicting demands.

This book has been written for agricultural and conservation students and researchers and for those actively involved in balancing food production with on-farm conservation. Its aims are to provide an understanding of the underpinning ecological science that regulates the plant and animal populations and communities that inhabit the agri-environment. Through these ecological processes the human activity of food production changes the environment in which we co-inhabit with the other species on the planet. It is therefore essential that we understand these mechanisms if we are to better manage them in future. But

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agriculture is not purely an ecological science, it also has social and economic elements and this book covers the history of agricultural policy and subsidies and the development of agri-environment schemes. A number of different production systems (some more scientific than others) are available which, at least in part, attempt to balance agricultural production with sustainable environmental management. These alternative production systems are explored, as are the difficulties in determining their relative merits. For the moment the main policy mechanism used by western governments to encourage more ecological sustainable farming is the agri-environment scheme. The principles behind such agri-environment schemes are discussed and a guide is provided for how to produce a workable farm conservation plan. The final chapters cover recent developments in our understanding of the importance of scale and landscape complexity within the agri-environment. These concepts are becoming increasingly important in managing farmed landscapes, for example in locating habitat restoration projects and increasing habitat connectivity. Such factors will be important from the level of farm planning to designing national policy. It is always dangerous to predict the future, but balancing the partitioning of sunlight energy as food between an increasing human population and the other species that share our planet is a difficult problem and one that requires a great deal of scientific understanding.

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