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978-1-107-67323-6 - A Less Green and Pleasant Land: Our Threatened Wildlife

Norman Maclean

Excerpt

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INTRODUCTION

In 2010 I edited a multi-author book entitled *Silent Summer*, which set out to provide an in-depth audit of wildlife in Britain and Ireland over the last 50 years, with predictions of what the future may hold. That previous book was well received, but was a somewhat weighty reference volume with 36 chapters

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and over 60 authors. This present book aims to carry the same message but to present the information more concisely and in a more accessible format.

HOW *SILENT SUMMER* CAME TO BE WRITTEN

At the outset I should like to explain how the original book came to be written. Over the last 60 years, I have lived to see dramatic reductions in the numbers of many common insects and birds within the UK. As a school-boy in Edinburgh in the 1940s I roamed the countryside on the outskirts of the city, and remember fields and waste ground with a huge abundance of butterflies such as small tortoiseshell and meadow brown, innumerable bumblebees and large populations of now scarce birds such as corn buntings and grey partridge. When I acquired a car in the 1950s, it was fitted, as were almost all other cars, with a must-have accessory, a small plastic device attached to the front of the bonnet to help deflect insects from splattering the windscreen. When one stopped at a petrol station to refuel, staff regularly provided a windscreen washing service to remove the dead insects that had clouded the glass, despite the efficacy of the deflector. These gadgets have disappeared because the need for them has gone, a stark indicator of the dramatic decline of so many common insects.

As a postgraduate student at Edinburgh University, I experienced an interesting juxtaposition of images shared by most biologists at the time. Neil Armstrong and Buzz Aldrin's successful landing on the Moon's surface in July 1969 on board Apollo 11 did much more than score a first Moon landing. The spaceship cameras also sent back amazing images of Planet Earth viewed from space, images we all shared and which altered our mindset of the planet on which we live. We saw for the first time how intensely green and blue our planet is, green from its living plants and blue from its abundant ocean (Plate 1). It remains uncertain to this day whether any other object in the universe has evolved a similar biodiversity. We may be unique.

But another image of Planet Earth had been provided by the earlier publication in 1962 of Rachel Carson's prophetic book *Silent Spring*,¹ which carried a warning of the possible widespread damage to world ecosystems resulting from the extensive use of human-engineered pesticides. Rachel Carson was born in 1907 on a small farm in Pennsylvania, USA, and became a marine biologist with the US Bureau of Fisheries as well as a writer on nature and ecology.² Although not all her forecasts were correct (she erroneously predicted that DDT would prove to be carcinogenic), she was much more right than wrong, and was posthumously honoured in 1980 with the award of the Presidential Medal of Freedom.

Those of us who were young biologists in the 1960s tended to superimpose the world of Rachel Carson onto the world of Armstrong and Aldrin. We

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were thrilled to see Planet Earth from space, and we eagerly accepted responsibility for the future management of its wildlife communities and ecosystems, but we also saw it as a somewhat sick planet with serious ecological problems. Viewed from space, all looked well, but viewed in close-up with binoculars or microscopes as we students were taught to do, we knew that the space vision was to an extent a false image of world health and prosperity.

This book is therefore an attempt to look at our own wildlife 50 years on from Rachel Carson, to take an audit of what has happened since, what is likely to happen in the immediate future and what we should be doing about it. The large volume of *Silent Summer* was referred to by one reviewer as a ‘Domesday Book of Wildlife’ – and that is indeed what it set out to be. This present volume is a shorter single-author version of the original.

CONSEQUENCES OF INSECT DECLINE

It is clear, even to a relatively uninformed observer, that many insect populations have declined in Britain and Ireland, but our concern should not stop here. Since insects are fundamental to the food chains of many higher animals, especially of birds such as flycatchers, swallows and swifts, and also many mammals such as bats, shrews and hedgehogs, it is obvious that reductions in populations of prey species such as insects are likely to have longer-term impacts on the other species which prey on them. In our own ecosystems this may indeed be beginning, with marked declines in common bird species such as house sparrows and starlings which, although omnivorous as adults, feed their young primarily on insects (although declines of both species probably result from an interplay of several factors).

Of course, changes in wildlife composition are nothing new. After all, the dinosaurs have long since gone, their demise now thought to be chiefly the result of a huge meteorite crashing into our planet in the vicinity of the Mexican Yucatan Peninsula and bringing substantial world climate change as a result.³ Yes, there have been previous great extinctions, and that at the end of the Permian period some 250 million years ago was even more catastrophic than the extinction of the dinosaurs 65 million years ago.⁴ But what is unique about the present wildlife declines here and in the rest of the world is that they are mainly the result of human activity, especially the effects of the Industrial Revolution from 1800 onwards. There are seven billion of us humans competing for space and resources on Planet Earth, probably rising to about nine billion by 2050, and our appetite for energy, water and food is having huge impacts on the planet. This is both bad and good. It is bad in that it is hard to stop, good in that it is not impossible to stop, and even now there are optimistic signs of wildlife recovery as a result of positive conservation

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measures. So this book attempts to say what the present state of play is and what are the grounds for hope in the future.

Attempting an audit of British and Irish wildlife is more important than simply providing an accurate picture to satisfy our intellectual curiosity. After all, although we live in a very small area of land in world terms, we are an advanced country with a great heritage of interest in wildlife provided by figures such as John Ray (born 1627), Gilbert White (born 1720), Richard Jefferies (born 1848) and more recently David Attenborough. If we, the citizens of Britain and Ireland, cannot make wildlife conservation work here, what hope is there for other less-favoured countries and ecosystems? But if in this small island crucible of Britain and Ireland we can achieve success in halting wildlife decline, we will then be in a good position to help counter more widespread declines elsewhere. Of course, Britain and Ireland are now largely managed environments, whereas in areas of Australia, Africa and elsewhere there are wide swathes of country in which humans have still only a small impact on wildlife (although even here native Africans and Australian aboriginals hunt game, gather firewood and destroy some forest).

STRUCTURE OF THE BOOK

Let me now briefly outline the structure of this book. In Chapter 1 I discuss how the world's wildlife has coped with change over the billions of years of Earth history, and then go on to discuss present change and how wildlife can be expected to cope with it. I then consider the factors that drive the change, especially climate change, agricultural intensification, the effects of intentional and accidental introductions of new wildlife species, human population increase and all that goes with it, water pollution, and interactions between field sports and wildlife conservation. Then there is a chapter on wildlife conservation, how it is managed and the role of Britain and Ireland in wildlife conservation at home and overseas. Most of the remaining chapters are devoted to a careful consideration of changes in wildlife populations, which species are declining and which are prospering. To help balance the negative message in much of the book, I include a chapter on top wildlife sites. There is a concluding chapter on where we are now, what can be done to ensure that the worst declines are halted and what may be the best hopes for the future. It may well be that some readers of this book will want to skip the early chapters on Earth history, biological evolution and the drivers of wildlife changes, and go straight to the chapters which provide details of our present wildlife and its likely future. In this way, the book could easily be read back to front, beginning with the wildlife details, and then later considering the factors which have led to the existence of life on Earth and are leading to present changes in the ecology of these organisms. After all, that's how most of us

came to our present understanding of wildlife ecology. In our youth we were curious about the creatures we saw and increasingly learned to identify them, and only later did we understand the mechanisms which have made them the way they are.

An acronym which will appear from time to time in this book is BAP. This stands for Biodiversity Action Plan and indicates species known to be threatened or endangered. At the end of the book a systematic listing of prospering and declining species will be found.

There are two aspects of the following chapters that need to be made clear. The first is about species names. Wherever possible, I use English names. Some insect species are too obscure to have attracted an English name, and scientific (Latin) names are used for these. For many plants the Latin names are as well known as the English names, and for these both are provided.

The other aspect is about repetition. I hope that you the reader will forgive the fact that the structure of the book involves inevitable repetition. Thus the story about ‘industrial melanism’ in the peppered moth is told in Chapter 1 to illustrate how species evolve, and is mentioned again in Chapter 14 in the context of British moth species. Again, the evolution of cord-grass (*Spartina anglica*) is mentioned in Chapter 1 but referred to again in Chapter 17 in the discussion of British grasses.

I should like to emphasise that there is no way in which I could write this volume without utilising the expertise which the authors of chapters in the previous book invested in their chapters. It is a mark of their concern for the wildlife conservation cause that they have generously agreed to my basing much of this present book on the detailed accounts which they provided in their respective authoritative contributions.

WHY WE SHOULD VALUE AND CHERISH WILDLIFE

This is a book about wildlife biodiversity, that is, the richness of wildlife variety, and how it is faring in Britain and Ireland. It is therefore important that I set down why I think wildlife matters, and why we should value biodiversity. The reasons are as follows:

- (1) **The moral imperative.** Most people accept that they have some moral responsibility to help those other people who are less advantaged than themselves, especially in situations of food shortage or disease threat, and in conditions of cruel exploitation. We accept that people have rights. However, there is also a growing awareness that animals too have rights, rights to be free from cruelty and undue exploitation, rights to exist and experience a lifestyle which is a natural part of their existence. Humans increasingly accept that other species with which we share the planet

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should share in our prosperity, or at least not become the victims of it. Just as the best and most enlightened societies can be identified by their concern for the poor and defenceless humans in their midst, so too can they be recognised by their respect for other living species, and a concern for the rights of other species to exist and prosper. Thus the Hindu and Buddhist respect for all animals makes countries like India and Bhutan much more pleasing to visit than countries where animal rights are flagrantly disregarded. Our links with nature and the natural world seem to me to be important contributors to our sanity, and undoubtedly many people find a deep spiritual quality in the countryside and its species richness. We evolved as part of the natural world and, in my view, that is still where we find the roots of our identity and sense of belonging.

- (2) **The wildlife contribution to agriculture.** Our wildlife is crucial for successful agriculture in a variety of ways. Pollination of many crops ranging from orchard trees to oilseed rape and field beans (although the last two seem to be partly wind-pollinated) requires the activity of hive bees, bumblebees and other insects. Insect pests, such as aphids in field crops, are predated by birds and other predatory insects, while the disposal of dung is helped by the activity of dung flies and a great variety of beetles and other insects. An aspect of agriculture and farm field management which we rarely consider is the disposal of dead wild animals both on the land and on the roads. This is largely accomplished by burying beetles and other insects such as greenbottle flies on the land, but the remains are also partly cleared by a great variety of predatory birds such as carrion crows, magpies, buzzards and red kites, and also by foxes.
- (3) **The wildlife contribution to medicine.** This is a small but significant aspect of the importance of wildlife, especially plants. Many drugs are derived from wild plants, such as digitalis from foxglove and salicylic acid (the basis of aspirin) from willows (more accurately, they were discovered in wild plants but are now sometimes synthetically produced). A drug called galantamine, extracted from snowdrops and some related plants, has recently been approved for the treatment of Alzheimer's disease, and no doubt many new drugs are contained in plants yet to be researched. Enjoyment of the scents, sounds and sights of wild species is also increasingly recognised as a contributor to mental health, and especially as a therapy in the treatment of depressive illness.⁵
- (4) **The wildlife contribution to tourism.** Most people value the green countryside as a place to walk and to picnic, while the pursuit of field sports is entirely dependent on a vibrant countryside. Imagine taking our children to the seaside if there were only sterile rock pools, or going on holiday in

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Britain and Ireland if the land was shorn of its forests, or had lost hills purple with heather, flowery meadows and bright rivers running over luxuriant green weed beds. And increasingly so-called ecotourism is important at home as well as abroad, with many people making special trips to see white-tailed eagles, ospreys or nesting seabirds on coastal cliffs.

- (5) **Wild species as art objects.** It is somewhat unconventional to refer to wild species as examples of living art. After all, the word *art* is normally reserved for objects resulting from human skill and imagination. But it is hard to find an alternative word to apply, and indeed not only do many artists include natural wood, mineral, or pieces of insects in their compositions, but people frequently ornament their houses with cases of pinned butterflies, shells, or attractive pieces of natural wood. Admittedly, these are all dead, but I want to argue here that many, or even most, wild species should be regarded as wondrous works of art worthy of careful conservation. After all, the evolution of any wild species, a shore crab, a blackbird, or a lesser celandine, could we but trace it, is a long adaptation over millions of years to many factors, rather akin to the forging and hammering of a rare silver flagon in the hands of the silversmith. Then again, looking closely, especially with a hand lens, at any animal or plant reveals an intricate beauty and delicate form that far outstrips that of any man-made jewel. I challenge you to dig out a hand lens and peer closely at any small beetle or daisy flower. Are you not carried away with wonder at the precision, beauty and originality of the structure so revealed? Just compare, say, a Fabergé egg, that astonishing product of the Russian goldsmith's imagination and skill, with a robin's egg. The latter is whitish, stippled delicately with brown and red, only about 1 cm long, a tiny jewel in itself (while the nest in which it is laid is itself a miracle of artistic construction). But what lies within a Fabergé egg? If we were fortunate enough to handle one, we would find within either empty space, or perhaps, originally, a few sweetmeats. But inside a robin's egg lies a developing embryo, exquisitely formed, with a tiny beating heart and an astonishing complexity of embryonic structure and function, itself the result of a long period of evolution. What is more, even if we could assemble all the amazing works of the jeweller's and goldsmith's art, it could never rival the bewildering variety of different forms found in nature. Many of these wild species also make music with their songs and calls, whilst some delight us with their graceful flight or astonishing swimming skills.

To lose one wild species is to lose a precious and irreplaceable commodity, yet present trends of wildlife decline and extinction mean many such losses.

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Taken together, although it is possible for humans to live and prosper without much concern for wildlife, and for human society to function as if we did not share the planet with other life forms, our individual lives and our social communities are greatly diminished by such neglect. Our countryside and its wildlife species not only provide us with nourishment, they hugely enrich our lives. We should all give a thought to the fact that, as we continue to sing of our ‘green and pleasant land’, it is steadily becoming less green and less pleasant, as we pollute it with our waste products and erode it with the demands of our increasing population.

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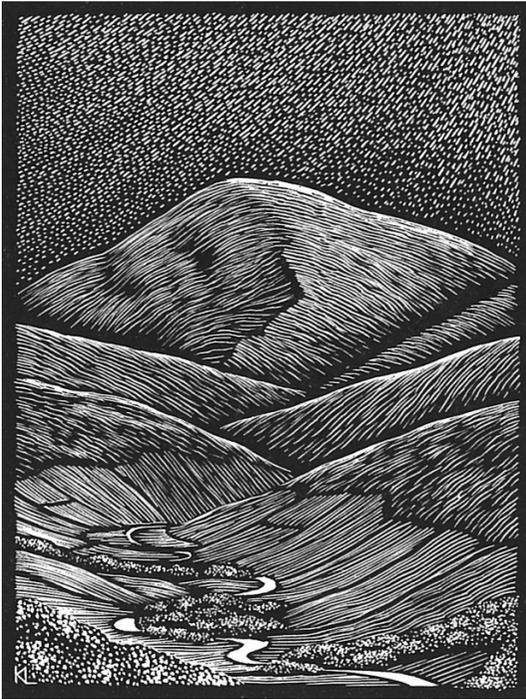
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I



LIVING WITH CHANGE

The aim of this chapter is to discuss the rates of survival and decline of plant and animal species worldwide, and thus to set in context the welfare of the species within Britain and Ireland. In order to consider the worldwide picture, we should first agree on how many species in total (of animals and plants and excluding bacteria) we are considering. There is an immediate difficulty, in that

estimates vary hugely, from perhaps 30 million to maybe even more than 50 million different species. The reason for the huge variation lies with the number of insects in rainforest canopy. There is little doubt that the number of bird species in the world is close to 10 000,¹ and the number of plant species is estimated to exceed 300 000,² but the number of different kinds of small insects (the majority of which are ants) in the canopies of tropical rainforest is huge, and very hard to get to grips with. A determined entomologist called Terry Erwin has tried hard to come up with accurate estimates.³ Erwin's technique has been to climb up into the canopy, release a fog cloud of dense insecticidal vapour and let it descend through the canopy. The resulting insect casualties are then caught in large plastic sheets covering the ground below. The challenge of counting the numbers of species caught, and relating it to the total numbers up there uncaught, has been to determine the percentage of the total caught that cannot be confidently ascribed to a known and already described species, and compute from that what percentage of those caught are new. Since the total of those already described is known, this can be multiplied up to estimate the total in existence by using the percentage figure of new and unrecognised species. This is clearly a difficult exercise, and the widely differing results obtained by repeat sampling in different forests largely explain the huge variation in the estimate of between 30 and 50 million different species.

But let us not get too caught up in the problem of the number of species, and let us plump for the lower estimate of 30 million. The next question is how many new ones are evolving in a particular time period and how many are becoming extinct in the same period. The rate of evolution of new species is fairly slow and is likely to be no more than a few hundred insect species per year in the world *in toto*, probably less.

NEW SPECIES: MUTATION AND SELECTION

How do new species arise? Before we can consider that question, we need to be sure of our ground by defining a species. A fairly satisfactory definition is as follows. A species consists of a population of freely interbreeding individuals, which are usually morphologically (size, colour and appearance) similar to one another, although the sexes may look different, and sometimes there is variation (so-called polymorphism) in the appearance of individuals of the same sex – as in human races, for example, and in the common banded snail (*Cepaea nemoralis*), which may have little or no banding or strong banding, and may be yellowish, white or pink in ground colour. Individuals of a single species do not usually interbreed with other similar species sharing the same territory, but exceptionally they may do, especially if mates are hard to find. Thus some hybridisation occurs in ducks, especially when individuals of closely related species are artificially brought together.