

Werner Kunz

Species Conservation in Managed Habitats

The Myth of a Pristine Nature



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The Myth of a Pristine Nature with a Preamble by
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Opening Remarks: Preservation of Rare Species – Breaking Grounds for a New Approach

Many species are declining in Central Europe right now in our time. Most of them are threatened despite the fact that they are protected by law. A substantial number have withdrawn completely from the countryside in recent decades. Some have found an alternative to make their living in cities, on air fields and industrial areas, however. These non-natural habitats became more attractive even than protected areas. What is going on?

Why is our modern and seemingly highly enforced nature conservation legislature so insufficient in general, though some larger species of mammals and birds are expanding their ranges and increase in abundance? For globally threatened birds such as the white-tailed sea eagle, Germany now ranks among the most important countries with a subpopulation approaching a thousand breeding pairs. There is also a soaring population of wild boar numbering in many thousands. Grey wolves are thriving in a small but a well-doing population in Eastern Germany which has been the German Democratic Republic a quarter of a century ago. And in the winter months, nearly everybody can make the experience of seeing a snowy white heron standing in the snow out in the countryside. The numbers of wintering great white egrets now vastly exceed the former breeding population of this rare European bird species which managed to survive half a century ago mainly just at the inaccessible border areas of the time of the Cold War, for example, on the Lake of Neusiedl southeast of Vienna. Ornithologists have been very happy to catch a glimpse of the then shy and elusive white herons by approaching the Austrian–Hungarian border as close as security allowed. What a difference just a handful of decades later with great white egrets outnumbering the ‘normally’ much more common grey heron in most regions of Central Europe in winter. In winter! This matter of fact challenges the long standing view of the ‘niche’ of this ‘tropical bird’ and many other bird and mammal species according to conventional ecological wisdom of former times. Even in textbooks of ecology a lot of species has been misplaced according to the limited knowledge of where they can or could live, which more often than not is different from where we did find them under the local or regional conditions at a certain time.

So again the question, what is going on ‘out in nature’ as we tend to say, because we, the human people of the modern world, usually separate our immediate realm of living from the so-called free nature. Why became so many species rare or

vanished at all from our neat and clean and progressively healthier environment despite such an extraordinary amount of conservation efforts and so many million Euros, which have been spent by our nature conservation organisations?

The answers given point at a still too much spoiled and poisoned environment, claim unbearable high levels of human disturbance and the excessive construction of roads, spread of settlements and other forms of 'development' which generally means destruction of nature. The birds and bees, the butterflies and bats, they cannot find enough suitable habitats for sufficiently large, extinction-resistant populations. Or so the saying goes. This may be true in a number of special cases, but certainly not in all, however. The common view, as expressed by most nature conservationists and widespread in the public opinion as a result of their campaigning, is highly biased in fact. It is this bias of a much too human-centred view of nature and how it should look like which resulted in such a low success or failure of the species conservation efforts. A closer look onto the demise of the vast number of smaller species, best exemplified by butterflies, moths and songbirds due to extensive field studies available from recent decades, reveals the shortcomings and simultaneously makes understandable the success of the few larger ones, which are expanding.

The spread of grey wolfs and white-tailed sea eagles, of great white herons and black storks, of peregrines and beavers and also the finally successful reintroduction of the lammergeyer into the Alps beyond any doubt is the result of a very much reduced hunting pressure posed on that and other increasing species compared with the situation of the pre-Second World War times. They could recover due to reduced losses by shooting and poisoning and also due to a much greater tolerance of human presence they achieved in recent times. The great winners in fact have been such species which found their way into the relatively high safety of the cities. However, a striking geographical pattern is visible in central Europe in the distribution and abundance of many species of larger mammals, birds and invertebrates. It shows the separation of a species rich Eastern and an impoverished Western part by what has been the Iron Curtain a quarter of a century ago. There is no natural ecological condition or constraint existing for this once political separation, but quite a massive one with respect to the intensity of the agricultural use of the countryside. In the former East major tracts of land, many fine scale structures of unused sites and still a lower expectation on how high the yields of the fields should become characterise the East and contrast to the Western attitude of maximum exploitation. Moreover, abandoned villages, cottages, once used sites for industrial production and highly contaminated areas from socialist times are in existence and probably will last for some decades more, before they become subjected to the cleansing according to the Western style. There even small gravel pits have been viewed as 'wounds in nature' which have to be healed as soon as possible by re-cultivation, which invariably meant planting trees to cover the 'offence to the eyes' without taking the needs of so many species of animals and plants into consideration. This is one of the major points, which is made in this book, and which will make it hard to digest without putting aside all the preconceived views how (clean) nature should be.

The other central point deals with the invisible stuff called nitrogen compounds which floods the whole of Central Europe since decades due to over-fertilisation of the arable fields and flushing the meadows with liquid manure, the latter in a total amount which greatly exceeds all the peoples' sewage in Germany. This general eutrophication promotes the growth and ecological displacement strengths of a very limited number of plant species and has led to a much wetter and cooler microclimate down at the vegetation level of the countryside than is indicated by the official meteorological measurements and 'expected' as a result of climate warming. Most of the warmth-loving (thermophilic) species are in severe decline even in protected areas and they form the greatest bulk of species in the 'Red Lists'. In fact, most habitats became cooler in the last half of a century, not warmer as expected. Therefore, and this is the great message of the book, we are in bad need of open, dry and 'unproductive' areas, unfertilised and managed in a proper way to act against the accumulation of plant nutrients due to the influx of nitrogen compounds and nutritive dusts from the sky by wind and weather. The small scientific community which has the privilege to look into the military training areas at some times knows that these are the most diverse sites with the highest numbers of rare and endangered species – and not those protected by law officially. Second to the military training areas in species richness are major cities such as Berlin or the vast Rhine-Ruhr-Agglomeration where a lot of rarities found their place of living amidst the densest human population concentrations.

Such are the 'good news', though not from a conventional nature conservationist's point of view, because it means we have better possibilities to preserve species on up to now largely neglected and under-rated areas such as open mining sites, abandoned industrial areas and highly disturbed places. They are the last heavens for quite a lot of species which a great many of our nature lovers would not like to miss such as the singing skylark, which is best seen, under uncomfortable acoustic conditions however, on the major airports. Summing up, we as conservationists should apply much closer looks onto where the rare and endangered species still exist rather than hanging on concepts how we would like to see the so-called free nature with a low intensity of agriculture close to the hunger level of the peasants. Such concepts which are based on the condition of the nineteenth century are out of date in modern times not only due to the fact that everything has changed over the last one and a half century, but also because they provide no realistic outlook for the future. The best guides certainly still are the species themselves. Conservationists should follow their guidance rather than their outdated, more or less romantic ideals. This is the combined message of all the threads and new approaches which Werner Kunz explores in his outstanding and demanding book. If read carefully and open minded, it could become a similar benchmark publication like the 'Silent Spring' by Rachel Carson, because of the 'new song' it offers to nature conservation.

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Preface

Nature conservation is a good thing. Who would dare to raise objections against it? However, it is the moral–ideological and exaggerated approach, closely associated with the conservation movement since the second half of the last century that leads to the drawing of wrong conclusions. Nature and wildlife conservation were originally oriented on specific objectives, namely the protection of nature and species. In the 1970s and 1980s, however, a new concept was propagated, which embedded nature conservation and species protection into the vision of a clean environment and into the health of the population. This development expanded an area (that previously had reflected the interests of only some specific individuals) into a generally binding moral postulate. People had to be made aware that the protection of species presupposed an intact nature and that rubbish and pollution in the environment really endangered species. Since it was a moral duty to avoid environmental pollution, everyone had to automatically combine environmental cleanness with nature conservation and the protection of species.

However, the protection of some species has nothing at all to do with nature conservation and even less with a clean environment. Hygiene, cleanliness and orderliness are things that man needs; but they are not what many species necessarily need, at least not in the form in which human beings would like to see them. Exactly the opposite is often true. In recent centuries, hygiene and orderliness in our homes have put many formerly common animals into the endangered species categories. For example, the house rat (*Rattus rattus*), not to be confused with the brown rat (*Rattus norvegicus*) has become extremely rare. It had to be classified in Germany's Red List of Threatened Animals as 'critically endangered' (Category 1). The populations of the common bed bug have declined sharply in Central Europe in comparison to those of previous centuries. The same goes for fleas and lice. All these species used to be very common in Central Europe and they still are today in other countries around the world. They became rare in Central Europe thanks to hygiene, cleanliness and measures that serve the health of human beings. Most of us have of course no love for these creatures in our homes, but it is exactly this perception that reflects the anthropocentric standpoint. It is what human beings want, not what the animals want.

Just as in earlier times, civilisation saw homes being thoroughly cleaned of debris and dirt, and today's modern agriculture is 'cleaning' the landscape to an ever-increasing extent. We have recently begun to transfer a process, which formerly served domestic culture and health, to the countryside. During the last half century in Central Europe, farmland and pastures have been optimised for maximum yield and cleaned for machine processing. Agricultural land was cleared of stones and weeds and sandy or muddy surfaces and uneven ground were eliminated. The last square yards of unused gaps, corners and edge areas were incorporated into the production areas, and waste and crop residues were no longer left lying. Modern farmland is absolutely clean, homogeneous and as flat as a table.

However, animals have also been cleared from the fields, to the same extent as the fields have been cleared of 'refuse'. The modern field is almost species-free. Being clean and hygienic, it makes a 'proper' impression of course, but it is actually a desert that is hostile for species. Just as the cleaning of human domiciles removed the possibilities of survival for rats, bedbugs and fleas, the cleaning of the fields has left no room for the species. The brow hare, grey partridge, skylark and corn bunting can no longer find areas for food and nesting. If you take a walk over fields today, you will not hear the singing of the skylark at most locations; and it is for similar reasons that no more crickets chirp in our homes and no more rats frequent our cellars. It is not just the toxins that have made a desert out of our agricultural areas. A bit more dirt and grubbiness would have been good for the animals, an insight that is expressed by the provocative saying: 'A lazy farmer promotes biodiversity to a greater extent than ten hardworking nature conservationists'.

Orderliness and cleanliness have contributed considerably to the extermination of many species on agricultural land; but the popular belief that a clean environment also benefits species cannot be eradicated. Environmental cleanliness does indeed promote many aquatic species that breathe in the water, but a clean environment simply does not work for many terrestrial species. Of course, it is unhygienic and not at all aesthetic when rubbish is dumped in parking spots, or when food scraps are simply thrown out of cars to lie on village streets. This should be prevented in the interest of the vast majority of people; but this would only be in the interest of our own human needs for order and hygiene. In the same breath, we should not then regret that the sparrow is disappearing from the villages and the yellowhammer from the fields (Meyer, Eilers and Schnapper, 2003). The occurrence of the purple emperor butterfly on the streets in the midst of some Romanian villages is only thanks to the fact that there are no sewer systems in these locations.

Unpaved roads cause dust and dirt. If the roads are paved, we no longer make our shoes dirty, and there is not so much dust in the air; but then the swallows cannot find any more mud to build their nests. There are no more puddles on clean, paved roads; so there are also no more mosquitoes; but only we humans like this state of affairs, swallows do not.

Crumbling walls are a testament to the neglect of buildings and they are perceived as being 'not orderly'. 'Orderly' and hardworking homeowners ensure that their walls are well-plastered. However, a large number of mason bee species and other hymenoptera can no longer live on properly plastered walls; and they are

on the Red List in Germany today. Cavities under house roofs and on their outer facades are the breeding grounds of the bat, the swift and the owl, but this presupposes that such houses are old and in need of renovation, so the cavities and holes in these buildings have mostly been closed and filled to save energy and avoid losing heat. Every measure taken for the purpose of environmental protection is directly opposed to species protection, and the list goes on.

Besides cleanliness and orderliness, there is another ideal, which in the minds of many people equates with the protection of species, but in many ways is the opposite of species protection – and that is undisturbed, unspoiled nature. Its importance is much too highly ranked by nature conservationists.

The decision to write this book was made many years ago, when I first realised something the consequences of which I had not hitherto been aware of. While searching for rare bird and butterfly species as a student in the decades after the Second World War, I very soon noticed that to find any remarkable species I had to visit the destroyed military airfields of that period. In these areas, I encountered birds and butterflies that could only be rarely seen elsewhere, if at all. It was only much later that the full meaning of this came home to me. In a nutshell, this meant that many endangered species are found in habitats that are definitely not wildlife sanctuaries. These ex-airfields were habitats that had nothing to do with nature and only owed their existence to the fact that nature had been destroyed in them.

These were areas that were characterised by several features. First of all, the former military airfields were tree and shrub-free almost as far as you could see. Second, they were levels with very heterogeneous surfaces (exacerbated by the many bomb craters), and third, the ground was only sparsely covered with vegetation, and the grass layers were interspersed with bare earth and rocky and sandy areas (intensified by the former concrete runways, now destroyed). These areas had no similarities with the current landscape of Central Europe. They had a greater resemblance with the landscapes of earlier centuries that had been devastated by human overexploitation at a time when there was no afforestation and no mineral fertilisation.

These ruined airfield areas were home to many birds and butterflies which had to make way for afforestation and eutrophication elsewhere. On the dry areas of these airfields, I found skylarks brooding in large numbers; common snipe, red-shank and crakes were nesting in the rushes of the wetter areas and little ringed plovers had found suitable places to lay their eggs and rear their young on the destroyed runways. The wheatear populated the ruins of the former airport buildings and tawny pipits were breeding in considerable numbers on the sandy earth walls of the former airport boundaries (Kunz, 1959). On this landscape that was only sparsely covered with vegetation, silver-studded blue butterflies could be seen everywhere, alcon blues found suitable living conditions on the wetter surfaces and silver-bordered fritillaries were common.

In later years, I again came across an area to which many Red List species had retreated, because they could no longer live on the modern-day, over-fertilised agricultural fields and overgrown areas of non-agricultural land. Here again, this area was not a wildlife sanctuary, nor did it meet the criteria, which would

have classed it as 'natural'. It was the large-scale, brown coal open-cast mining excavations west of Cologne in Germany. The nature and environmental conservation associations paraded these areas to the public as a terrible example of the destruction of nature, an example that should discourage us all from allowing such landscapes to exist. Again, these areas were characterised by the three features mentioned earlier, which are the conditions for the occurrence of many rare species: wide and treeless open spaces, a heterogeneous surface structure and bare earth.

Meadow pipits, corn buntings, wheatears and woodlarks were breeding on the untreated, nitrogen-poor soils that had been brought up from the depths of the mine and on the subsequent stages of these soils (provided that they were not already covered with dense vegetation), and all of these birds are now on the Red List in Germany (Südbeck *et al.*, 2007) (Plate 1). Swallowtail and small heath butterflies were very common there, and more than 15 species of orchids, the remaining populations of which have shrunk in Germany (and the locations of which are top secret) were also growing throughout the area (Albrecht *et al.*, 2005) (Plates 2 and 3).

Many nature observers got together on this landscape, having quickly realised that here they could find the rare species that have disappeared elsewhere. However, in the minds of a large part of the population, the open-cast excavations are a devastation of nature that arouses disgust, and they should really never have been allowed to exist. Some people fail to realise that the preservation of many endangered species in Central Europe has nothing to do with the aesthetics of a landscape, nor can species protection be achieved by leaving nature untouched.

One objective of this book is to make it clear that the protection of rare and endangered species in Central Europe in many cases has nothing to do with the conservation of nature. Indeed, it is correct that protecting Mother Nature first and foremost means protecting her from the encroachments of man, because human interventions lead to disruptions, since they interfere with natural development processes. However, this in itself is not always species protection. If a rare species still lives in a particular habitat, the nature conservation associations strive to place that habitat under protection, avoiding any attempts man may make at changing it. It is indeed true that altering that habitat would eventually drive out the species which is to be protected. However, what many people do not understand is that in many cases, it is not man but nature itself that changes the habitat over time, making it uninhabitable for the endangered species.

Almost all the habitats in Central Europe would become overgrown with trees if they were left to themselves without human intervention. Huge areas of Central Europe would become woodland. You could say that this is a good thing, a desirable natural condition. Indeed, this is an argument that cannot be contradicted from the viewpoint of nature conservation; but species protection pursues a different objective. In Central Europe, there is hardly an endangered bird or butterfly species that lives in forests, apart from some specialist species that need very specific forest structures (now missing from our forests) (Südbeck *et al.*, 2007). Today, nuthatches and almost all species of owls and woodpeckers

are more common than they have been for a long time. It is mostly the species of the open country that are endangered in Central Europe today. These include many species of birds and almost all the butterfly species. Open landscapes are the habitats that are lacking today. We have enough forests. Anyone who really wanted to save the greatest possible number of threatened species would never advocate the creation of new forests.

In this respect, Central Europe differs from the rainforest areas of the world where the loss of the forests is jeopardising species that live there. In Central Europe, however, many species do not benefit from too many forests, they are more likely endangered by the current abundance of forests. This is because Central Europe was deforested by mankind for thousands of years and as a result is now mainly inhabited by species that have adapted to open habitats. Species protection is facing a tough dilemma: the open land species were not threatened for centuries in Central Europe, because they could colonise agricultural land with no problems. Fields, meadows and pastures provided enough suitable habitats in which open land species could live and propagate. However, the situation has no longer existed for half a century, because it was then that agricultural land became yield-optimised and offered neither a home nor food for the species as a result. This is why the open land species have retreated from the agricultural and meadowland areas to non-farmed open areas; but these refuges, which include mountain slopes and valley bottoms, are starting to become overgrown, simply because they are no longer used and are also over-fertilised by nitrogen raining down from the atmosphere. Almost the only sparsely vegetated landscapes that remain for the threatened open land species today are wastelands in cities, industrial areas, port facilities, traffic areas (such as motorway embankments), gravel quarrying sites, brown coal open-cast mining sites and military areas (Plate 4).

The problem of the current biodiversity loss in Central Europe cannot be adequately solved by taking away the economical utilisation of habitats in which rare species still live, declaring these habitats to be 'nature reserves' and essentially leaving them well alone. Protected areas like this must be protected from nature itself. To achieve this, permanent habitat management with technical equipment is required. This approach must be adapted to the habitat needs of particularly endangered species and provide them with the food and reproductive opportunities they need; and this sometimes requires intensive technical engineering of the landscape.

But therein lies the problem. Public awareness has to be fully behind this type of species protection action in order to ensure its implementation, and it is this awareness that is woefully lacking. The emotional desire for an undisturbed nature which must be left alone is deeply ingrained in the consciousness of the population – in excessively ideological manner. This is why there is a considerable resistance against accepting the fact that leaving Mother Nature to her own devices does not encourage the survival of many species in Central Europe. As soon as efforts were made to save endangered species by cutting down trees or partially burning certain areas, or forestry machinery were used to remove the topsoil over large areas in order to recover lost heaths and dry grassland landscapes, storms

of protest from the population are more or less preprogrammed. These measures are perceived as being a destruction of nature (which they indeed are) and would arouse incomprehension and indignation. The sense that nature conservation and species protection are one single entity is so deeply entrenched in the public's consciousness that any attempts to dislodge it are doomed to failure, because it would be an attack against human emotions. This is why any large-scale technical habitat management projects are very difficult to implement politically in this day and age. In Germany in particular, the political conditions for intensive technical biotope management seem to be non-existent, due to insufficient information of the public. One can only tiptoe carefully forwards in very small steps (as is being done by some local nature conservation associations today); but these few steps may be too late to rescue some species.

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1 Introduction: Rare Species and Near-Natural Habitats in Central Europe

The progress in the environmental protection measures of recent decades has hardly stopped the decline of many endangered species.

The highly lauded, showpiece successes in saving some flagship species, such as the white-tailed eagles, cranes, black storks and peregrine falcons actually create a misleading picture about the real recent threat to species in general.

The preservation of many wildlife sanctuaries is not being threatened by man, but by nature itself.

Many red-listed species inhabit extreme habitats, which in Central Europe mostly bear no resemblance to pristine and unspoiled nature.

The loss of species in Central Europe is due to very different causes than the loss of species in the rainforest areas of the world. Consequently, the species protective measures being taken for Central Europe must be different from species protection in the tropics.

It is an illusion to believe that past agricultural practices could once again be revived for the purpose of species conservation. Organic farming methods would be of little help.

In certain cases, nature conservation associations must enforce species protection, even if it goes against their own nature conservation ideals.

1.1

Preliminary Remarks

This book deals with Central European species decline, mainly shown by the examples of selected bird and butterfly species. In the last few decades, Central Europe has lost more than half of its birds and a much larger number of butterflies (Thomas *et al.*, 2004). The book gets to grips with a phenomenon, namely that although the media-effective activities of the conservation organisations did change the public's ecological awareness in the 1970s and 1980s, the disappearance of many species is apparently progressing inexorably, even despite the

visible results in environmental protection that have been achieved by many political measures.

However, the progress in the environmental protection measures of recent decades has hardly stopped the decline of many endangered species. The disappearance of many species is continuing unabated, and it is unfortunately the majority of the red-listed species that are benefiting less than expected from the upward trend in environmental protection. The widespread belief that a clean environment almost automatically benefits species is being put to the test. Environmental conservation (and even nature conservation) is not the same as species protection.

Butterflies are less well known and not as popular as birds, so they are less effective tools in the promotion of nature and environmental conservation goals. This is why the nature conservation associations devote less attention to them. Who knows the different species of fritillaries, and regrets their dramatic disappearance in recent decades? Upon hearing the term *species protection*, most people associate it with the decline of many species of birds; but the focus on bird protection efforts and their partial success gives us a false impression of the real and recent threat to species in general. The highly lauded, showpiece successes in saving some flagship species, such as the white-tailed eagles, cranes, black storks and peregrine falcons actually create a misleading picture.

When birders or insect experts in Central Europe want to see rare (and therefore desirable) species, they often prefer not to go to national forest parks or even to the nature reserves. In many cases, those who are looking for uncommon unusual breeding birds or migrants, or those who would like to see rare butterflies do not go to the near-natural habitats. They travel instead to the man-made open spaces such as sandpits, sewage farms and the areas where open-cast mining excavations have been carried out; because it is here that they will find the rare red-listed species, and not primarily in the areas which approximate pristine nature in Central Europe.

This book is a plea for the protection of species. Many of my conclusions are focussed on the fact that the species which must be saved in Central Europe are those that live in habitats which have little to do with untouched nature. These habitats are primarily endangered by ecological succession; they can only be preserved or optimised by technical interventions, some of which must be carried out thoroughly. This will prevent unspoiled nature (and especially the forest) from being given top priority; but that does not equate with nature conservation in the eyes of many people, so they do not want it; instead they want a primordial nature (and especially the forest). That is understandable, and it is not dealt with negatively in this book. However, this book makes it clear that the desire for nature and the desire for species richness in Central Europe are two different issues, which often cannot be achieved by the same measures. People who desire unspoiled nature and as much forest as possible will have to admit (albeit rather unwillingly) that they do not want species richness.

1.2

A Plea for Open Landscapes

An ecological movement was established in the 1970s and 1980s. Its objective was to tackle the lack of environmental awareness in our industrial society (Engels, 2006). In Germany, the effective media appearance of personalities such as Heinz Sielmann, Bernhard Grzimek, Horst Stern and others founded an ideology of alleged intact ecosystems being destroyed by human intervention. Ecological importance was attached to species and a sense of awareness arose that the extinction of certain species would cause entire ecosystems to collapse. The threat to many species was associated with a hazard to human health and poisoned food. The eco-classic 'Silent Spring' by Carson (1962) became a 'nature bible' for many. The question of what an 'ecological balance' and an 'intact ecosystem' actually are (if these two concepts even exist) was not asked by many people, or was repressed, because a non-contentious and valuable conviction lay behind the ideology from the outset. The extinction of several species, however, has nothing to do with natural balance. The value of a species equals the value of a historical monument (Reichholf, 2010). The loss of many species is of an ideational nature; in most cases, no balance is endangered.

Man was seen as the main enemy of many endangered species. Targeted human intervention for habitat regulation was frowned upon, and the popular definition of nature conservation areas was seen in the protection of the remaining 'residual nature' from further human intervention. For many nature reserves, however, it emerged that their preservation was not being threatened by man, but by nature itself. Gravel and sand surfaces become overgrown, dry grasslands become covered with bushes and shallow waters silt up. Nature is untamed ecological succession. It turns many currently existing protected areas into bush-covered, overgrown areas, which makes them worthless for many species, and it is exactly such habitats which could be described (with much more justification) as being real nature. Nature itself reduces the value of many currently existing protected areas by turning them into habitats which are no longer refuges for many endangered species. Many wildlife sanctuaries in Central Europe are not virgin nature, they are man-made habitats; and these man-made qualities are exactly the properties of the nature reserves that must be protected – not from human intervention but from nature itself, because nature would reclaim the land by ecological succession if it was not prevented from doing so.

Recent decades have seen many nature reserves (seen as refuges for endangered species) facing considerable competition from areas which earlier would never have been expected to become important for the conservation of threatened species. These are areas that were created for the military, the economy and transport; in other words, the planning and creation of these landscapes did not pursue the goal of setting up a refuge for endangered species. For several decades now, wastelands in towns and industrial sites, major road embankments, gravel

pits, sewage plants, open-cast mining sites and military training areas have been the sites on which many rare birds such as the grouse, the grey partridge, the quail, the lapwing, the tree and meadow pipits, the woodlark, the wheatear and the corn bunting can most likely be seen, together with butterflies such as the swallowtail, the pale clouded yellow, the clouded yellow, the wall brown and other rare species (Plates 1, 2, 5 and 6). None of these species owe their preservation to any active species protection measures; their preservation evolved passively as a by-product of man's landscaping, which was intended for completely different purposes. Habitats like this have nothing to do with nature and would not exist in Central Europe if man himself had not created them.

What these areas have in common is that humans keep them free of vegetation for their own purposes; but the fact is that specific plant and animal species benefit from these areas, the purpose of which was certainly not species protection when they were created. Earlier, sparsely vegetated open habitats like this existed almost everywhere; but nowadays they have become scarce as habitats in Central Europe and are limited almost exclusively to industrial, residential, traffic and military areas (Plate 4). While it is correct that the current expansion of industry, housing and traffic pushes nature back more and more, it would be wrong, however, to associate the decline of the species in all cases with these factors and to complain about them. Species do not always need nature.

Many red-listed species inhabit extreme habitats, which mostly bear no resemblance to pristine and unspoiled nature in Central Europe. This seems to be a paradox, because these habitats are usually in a condition that makes the environmentalists want to avoid them as much as possible (and usually to eliminate them) (Anonymous, 2008). The lapwing and the grey partridge (both Red List species) breed on brownfields and on the terrains flattened by machines on the terrain of inland ports on the Rhine and Elbe rivers, where heavy cranes and trucks dominate the landscape. Some rare plant species have retreated to brittle asphalt surfaces in the parking areas between department stores because these spaces are more or less prevented from becoming overgrown by lush vegetation. Endangered plants which have a strong affinity for salt (halophytes) have again found favourable living conditions on the edges of major roads and have been able to propagate there, because they benefit from the use of road salt (Feder, 2014). These are probably the best examples that show why species protection, nature conservation and environmental protection are not the same, but are often at opposite poles of purpose.

National park and nature reserve policies aim to preserve or to create an ecosystem that is as near-natural as possible. However, it is hard to justify what a near-natural ecosystem really is in Central Europe; and after its millennia-long exposure to man's activities, it is doubtful if pristine nature can be restored at all in Central Europe. One thing, however, would appear to be certain: the habitats inhabited by a major proportion of the endangered Red List species are not near-natural.

In Central Europe, many Red List species live in open, sparsely vegetated areas where few trees and shrubs grow. These species need open ground or stone surfaces, escarpments with crumbling earth or gravel banks, that is, surfaces that warm up quickly when exposed to sunlight. Thick grass growth, which looks so beautifully green and healthy to the human eye (and gives the impression of

intact nature), offers no possibilities for life for many Red List species, because the ground beneath the dense grass growth is too moist and cool. This is why sparsely vegetated grasslands are more species-rich than green meadows (Plate 4).

In past centuries, a great variety of flowers, butterflies and other insects flourished on the overexploited and nutrient-poor soils. It has almost become an ecological basic rule in Central Europe that nutrient-poor areas produce a great variety of species, but nutrient-rich areas produce a low number of species. This basic rule alone makes it easy to understand why so many species in Central Europe today have become rare. We are losing the nutrient-poor areas. Intensive fertilisation in modern agriculture and the nitrogen raining down from above (even far from the agricultural land) have taken away the chances of existence for many species during the last half century. The loss of species in Central Europe is due to very different causes than the loss of species in the rainforest areas of the world. Consequently, the species protective measures being taken for Central Europe must differ from species protection in the tropics. It is wholly remarkable that this receives minimal emphasis in the public statements on species protection.

Even in the early Middle Ages, the forest in Central Europe could no longer be called *wilderness*. Wilderness was the heathland. In north-western Central Europe and in many mountain ranges, dwarf shrub growth spread relatively quickly, and in the warm regions with calcareous soils it was the steppe-like juniper heath that propagated profusely. Areas that had steppe to semi-desert-like characteristics, gravel plains and sand dunes were the dominant landscapes in northern Germany and also on the plateaus of the Central German Uplands (Mittelgebirge), in Rheinhessen and on similar terrains elsewhere in Central Europe. Paintings and watercolours from earlier centuries show the land, almost bereft of shrubs and trees, reaching to far horizons in flat land, or barren, stony dry areas on the slopes of the mountains (Tauch, 1974). The landscape was more reminiscent of the Mediterranean area, the eastern steppes or the timberline of the north than the heart of Central Europe today.

It is not surprising that the Central Europe of past centuries and millennia was settled by many open land species of the north, the east and the Mediterranean area. In Central Europe today, many species such as brow hares, skylarks, buntings and most butterflies are not forest species; they were only able to spread when the sedentary, crop-cultivating humans started to partially re-establish the glacial primeval landscape in the midst of the expanding forests during the post-glacial Holocene period. Today, the forests are regaining the upper hand and that is why it is the open land species that are on the Red Lists, from the black grouse to the hoopoe. The re-forestation of Central Europe since the nineteenth century must be mentioned at the forefront if an explanation for the current loss of species is sought. Central Europe's modern landscape is completely different from what it was many centuries ago. Forestation, bush encroachment and ground-covering grasses and herbs have taken up a considerable proportion of land in the last half century and they bring about a frightening species decline and of insects in particular.

The transformation of Central Europe from an open land to forest and scrubland has taken place almost unnoticed for many people and it is not a risk potential for many species that the nature and environmental protection organisations wish to denunciate with top priority. If a man could go back in time for only 100 years, he would believe that he was in an entirely different country. In many locations, he would be able to look to the far horizon. He would see the neighbouring village from the edge of his own village. He would see castle ruins that still exist today standing on bare rock and not on wooded hills. He would see bare riverbanks and gravel banks, and above all he would see sandy and earthy areas with hardly any vegetation in the middle of meadows and fields. These macro- and mini-habitats have disappeared across the board in many places, and this has happened to a dramatic extent, particularly in the last 60 years. The Central European landscape has not looked as it does today for many centuries, neither in its detail nor in its overall picture.

Since the availability of fossil fuels made it unnecessary to cut the firewood from the forests, cattle are no longer driven into the woods to graze and the eutrophication of the landscape has increased thanks to excessive nitrogen, a process is happening which is very threatening for many species: Central Europe is becoming overgrown. Nature is reclaiming the areas that were kept open for centuries and millennia because of food deficiency; open rock, stone, gravel and sand areas are disappearing, because the vegetation is no longer being removed and the landscape is being fertilised by an excess of nitrogen. Large parts of the Central European landscape resemble a neglected garden that is no longer tended and in which wild growth has returned. Heaths and moors were once open areas with almost no bushes and no trees. In today's terminology, sandy pine forests are called *heaths and marshy birch forests are designated as moors*. There are people who no longer know what a moor or heath is, even though certain areas and even protected areas are still given these names.

Some believe that the species richness of earlier centuries had something to do with the more caring, more resource-conserving and, therefore, more sustainable relationship with Mother Nature we had in the past, while our present-day affluent and throwaway society simply exploits her. This is simply not true. The landscape was ruthlessly plundered in the past centuries. In the prevailing hardships of those days, the soils were drained, the humus layers of the heaths and forests were cut out and carried off, the emerging vegetation was removed, the slopes of the hills were overgrazed, and the bushes and forests were cleared or at least thinned out in almost all the accessible places (Paffen, 1940; Plachter, 1997; Küster, 2008). The fields were only used for a few years in succession, until nitrogen and the other minerals were exhausted; only sparsely vegetated areas remained.

However, it was exactly this exploitation of nature that suited numerous species in many ways. The centuries of agricultural and forest exploitation of nature and landscape in Central Europe was accompanied by an abundance of species, the pinnacle of which was reached about 1850 (Blab *et al.*, 1984; Häpke, 1990). The plundering of the countryside did not harm the majority of species – on the contrary, it even caused the explosion of species richness seen in the past. Nowadays,

we can only dream about many of the bird and butterfly species that existed in Germany at that time. The hen harrier used to breed in numbers on the high plains of the Eifel; the marginal zones of the rocky crater lakes in the south-eastern Eifel and the embankments along the Rhine were the breeding places for many rock thrushes; the Rhine and Mosel valleys played host to the short-toad eagle, which found plenty of reptiles there and the arid heaths of north-western Germany – with an unobstructed view stretching to the horizon – harboured great numbers of black grouse. The great bustard also bred in Germany in its thousands (Schulze-Hagen, 2005).

The sparsely vegetated soil surfaces of the past were able to bask in hot, direct sunlight and were, therefore, more suitable for thermophilic species than today's overgrown, bushy and forested landscapes in this era of 'global warming' (Plates 1–4, 7 and 8). In the 'Little Ice Age' that lasted until the early nineteenth century, there was a greater abundance of heat-loving butterfly species in Central Europe than we find today in the midst of climate warming.

Anyone who searches for rare species (e.g. rare birds or butterflies) today will soon understand that the nature and environmental conservation organisations are leading a fight against the destruction of nature through gravel quarrying and open-cast mining, so they do not want to encourage important habitats which are actually refugia for rare species. A discrepancy is revealed here, one which is based on the fact that the fight for a pristine and unspoilt nature is not the same as the struggle to preserve the Red List species.

It is difficult for most people today to understand that the deforested, exploited landscape of Central Europe became an ideal habitat for a great variety of plants and animals that are threatened species today. The reason why it is so difficult to associate former species richness with a destroyed landscape can be found in the fact that no distinction is being made between nature conservation and species protection. It is regarded as a paradox that a destroyed nature was the prerequisite for the occurrence of many species. If, however, we can understand that nature conservation and species protection are two different entities, then species richness in the earlier ruined landscape of Central Europe will no longer be perceived as a contradiction. In the landscapes of Central Europe, which have been anthropogenously overformed for millennia, the nature that has been destroyed cannot be equated with a corresponding destruction of biodiversity.

Since most people do not know the difference between nature conservation and species protection, they find it paradoxical that military training areas have become perfect habitats for many Red List species. They are amazed that rare species occur in areas where tank treads destroyed shrubs and bushes and explosions ripped open the earth. Public opinion must become fully aware that the rare species do not flourish on military areas *'despite* the fact that tanks drive around there', but *'because* of the fact that tanks drive around there'. The tanks flatten and uproot the vegetation and explosions clear vegetation. This provides open ground, creating the habitats which have become very scarce indeed.