



THE MUSHROOM RED LIST

The mushroom Red List includes 1,619 species, which constitutes 62 percent of the total number of species in the Netherlands that were considered.

Of the 1,619 species on the Red List, 293 are under serious threat, including the **yellow coral mushroom**, *Clavulinopsis fusiformis*.



Frank Berendse,
professor of Nature Management
and Plant Ecology



Geert de Snoo,
endowed professor of Agricultural
Nature and Landscape Management



Paul Opdam,
extraordinary professor of
Landscape in Spatial Planning



Leon Braat,
Alterra researcher studying
Ecosystem services

We don't protect what we don't value

Nature everywhere is under pressure and biodiversity is still in decline. So how can we put a bit of spark into International Biodiversity Year? Four Wageningen experts explain how the tide could be turned – with or without the farmers.

TEXT RIK NIJLAND PHOTOS FOTO NATURA

'As I was walking through the Arkemheen polder a while ago, I felt there was something missing. And it was an almost suffocating feeling', says Frank Berendse, professor of Nature Conservation and Plant Ecology at Wageningen University. 'I couldn't put my finger on it at first, but after an hour I heard a skylark and I thought, oh yes! That's what was missing. Until some years ago, no matter where you went in the countryside in spring, you would always hear the skylark singing high up in the air. By now 90 per cent of the skylarks have disappeared. To me

that feels like more than the decline of one bird species; it is a fundamental change in the atmosphere.'

Berendse's feeling of suffocation cannot be seen in the statistics, and doesn't come into the Netherlands Environmental Assessment Agency's annual figures on the state of the Dutch countryside. They don't describe feelings, just the decline of nature in the Netherlands, or rather, the measurable component of that decline: the biological biodiversity, usually referred to as biodiversity, a somewhat vague term that came into fashion after the UN conference in Rio de Janeiro in

1992, which is now used both as a synonym for nature and to mean the sum total of wild species of plants and animals.

The statistics show clearly that all is not well with Dutch biodiversity. At the turn of this century, one memo after another came out of The Hague, all promising that the decline in biodiversity would be halted by 2010. But we cannot really hold our heads high and celebrate the UN's International Biodiversity Year with pride. Sure, nature is deteriorating a little more slowly, but the battle is far from won. Since 1700, biodiversity in the Netherlands has been slashed to less than >



The tiger lily, *Lilium bulbiferum*



The fly orchid, *Ophrys insectifera*



The green snaketail, *Ophiogomphus cecilia*

THE PLANT RED LIST

Since 1950, nearly 500 of the 1,536 indigenous wild plant species in the Netherlands have dwindled in numbers and more than 40 have died out. There were 499 species on the Red List of 2004. Of these, 97 are under serious threat of extinction, including: The **tiger lily**, *Lilium bulbiferum* and the **fly orchid**, *Ophrys insectifera*.

THE DRAGON FLY RED LIST

The Netherlands has 60 species of indigenous dragon flies, 27 of which are on the Red List. Five species are categorized as ‘seriously threatened’, among them the **green snaketail**, *Ophiogomphus cecilia*.

THE BUTTERFLY RED LIST

Forty eight of the 71 indigenous butterflies in the Netherlands are on the Red List. That is 68 percent of the total. Of these, 13 are under serious threat of extinction, including: The **heath fritillary butterfly**, *Mellicta athalia* and the **purple emperor**, *Apatura iris*.

15 percent of what it then was, according to the agency.

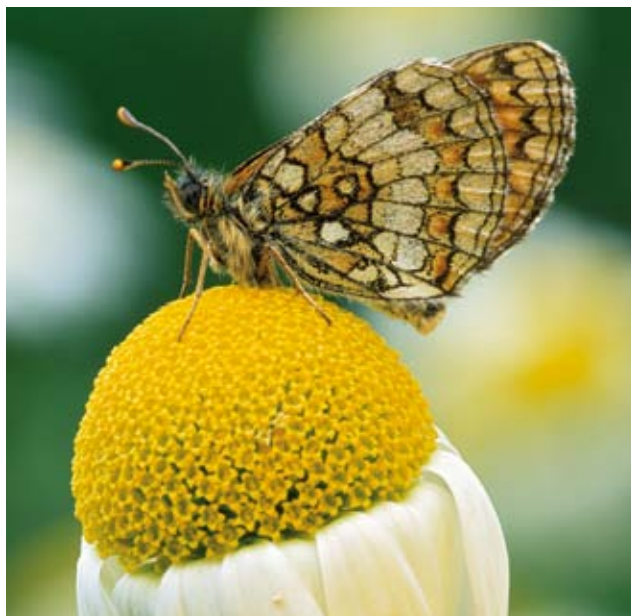
MUCH ACHIEVED

Geert de Snoo, endowed professor of Agricultural Nature and Landscape Management at Wageningen University and also working at the Leiden Institute of Environmental Sciences, thinks that is too pessimistic a picture. ‘I wonder whether it is very meaningful to make comparisons with 1700 or 1900. It is only in the past thirty years that we have made nature and environmental policy a reality. And in that time a lot of things have started going in the right direction. If you look at wild species of plants and animals, particularly in nature reserves, much has been achieved. That is not the case in agricultural areas, where nature is still under considerable pressure. But both the surface vegetation and the quality of the reserves are improving – slowly perhaps, but it is still a real sign that we can do something.’ And about time too, says De Snoo. ‘We eat biodiversity, and in a manner of speaking we breathe biodiversity: biodiversity is literally a matter of life and death. And that includes human beings. Just think what the disappearance of the honey bee would mean for agriculture.’

FIELD BIRDS

Frank Berendse agrees with his colleague that you cannot really generalize about bio-

diversity. ‘There are big differences between groups of plants and animals. In 1973 I inventoried birds in a section of the Gelderse Vallei region. The count was repeated a couple of years later and what came out was that of the fifteen true field species, twelve had declined by more than fifty percent. On the other hand, though, you see that forest birds are doing fine in the Netherlands, partly because the trees in our forests are getting taller and older. We are seeing more and more blackcaps, chiffchaffs and tree creepers.’ Still, Berendse sometimes sees the last thirty years as a tragedy, especially when he considers the decimation of many critical species that inhabit unusual environments such as bogs or nutrient-poor grasslands – ‘species that I have lost my heart to.’ Berendse: ‘There are two main reasons why we have not managed to halt the loss of biodiversity in spite of all the policy measures: we have reserved too little land for nature in the Netherlands. And there is still a lot wrong with the environmental conditions here, mainly through atmospheric deposition of nitrogen compounds, our water management and the use of pesticides.’ An all-too-familiar litany, and yet one that has lost little of its relevance. In January a group of international experts, including Berendse, published a study in *Basic and Applied Ecology* on the variation in the field birds, ground beetles and plants in winter wheat fields throughout Europe. Wild ani-



The heath fritillary butterfly, *Mellicta athalia*



The purple emperor, *Apatura iris*

mal species were directly correlated with the amounts of fungicides and insecticides that farmers sprayed on the fields.

REPORTS IN THE BOTTOM DRAWER

The biggest culprit, however, is intensive livestock farming, says Berendse. Since the 1960s, this sector has been spraying the Netherlands with layers of manure containing nitrogen compounds which it is impossible to keep out of nature areas. 'That has led to an incredible botanical impoverishment, especially among plant species in poorer environments such as bluegrass landscapes, fens, moors and bogs.' The government was dozing at the time, thinks Berendse. 'Minister Braks prioritized giving

pig farmers freedom, critical researchers were called on the carpet and reports disappeared into the bottom drawer. That was a real disaster. Okay, things have improved a bit since then, but there is only one systematic solution: livestock numbers have to be reduced considerably. Putting in extra filters and all that kind of thing is just fiddling while Rome burns.'

Even if Berendse's wish comes true, there is still a long way to go. 'Nitrogen accumulates in the ecosystem; it takes decades before you get rid of the harmful effects unless you go for expensive interventions such as digging up and replacing soil. It is much easier to protect than to restore, actually, but sadly we have not managed this. I sometimes really

have to force myself to see that the glass is still half full, but it depends a lot on which ecosystem or group of species you look at.'

SEA EAGLE AND EGRET

Paul Opdam is much more positive. He is extraordinary professor of Landscape Architecture and Planning at Wageningen University and a researcher at Alterra, part of Wageningen UR. 'There have been successes too. Species which had disappeared a long time ago are coming back – like the sea eagle and the great egret. The recovery of the badger is a great cause for celebration too. All three are species that spring to mind which are thriving thanks to our investments in nature conservation. But not everything is >

EHS IMPLEMENTATION STAGNATES

Dutch nature policy targets the preservation of biodiversity. The main cornerstone of the policy is protecting nature areas. To this end, the country has undertaken international commitments. For example, the main nature areas have been registered in the European Natura 2000 network. The Netherlands has also been working independently on its Ecological Main Structure (EHS) since 1990, with the aim of expanding and connecting nature areas. Over 620 thousand hectares of EHS are

already under the management of nature conservation organizations and individuals, but it is clear that the target of 730 thousand hectares by 2018 (half of which would be Natura 2000 areas) will not be reached. Without the other 110 thousand hectares, the EHS is an incoherent patchwork. One reason for the stagnation is the costs. From the interdepartmental policy research on nature that came out in March, it is clear that up to 2018 the government faces a shortfall of €2 billion for buying land for the EHS. There is also

a threat of shortfalls for the management of EHS areas and for the planned environmental improvements. Three different scenarios are doing the rounds in the Hague for a more modest nature network that is within the budget. Besides area-based nature management, the Netherlands is also trying to pursue nature values and preserve biodiversity on agricultural land by subsidizing farmers who look after landscape elements, field birds or wild plants.



The great crested newt, *Triturus cristatus*



The yellow-belled toad, *Bombina variegata*

THE AMPHIBIAN RED LIST

Of the 16 amphibians found in the Netherlands, nine are on the Red List, and two are under serious threat of extinction: the **great crested newt**, *Triturus cristatus* and the **yellow-belled toad**, *Bombina variegata*.

visible. When conservation organization Natuurmonumenten buys up a plot of land for the Ecological Main Structure, it is not going to be in full bloom the next year. It might take twenty years before the soil has recovered and another twenty before the species that you would expect there have established themselves. We create the conditions and nature follows.'

Opdam believes that the Netherlands should continue to invest in a network of interconnected nature reserves in the interests of biodiversity. The corridors connecting nature areas compensate for some of the loss of habitat that animals in particular suffer from and they offer both plants and animals a chance to find new habitats or recolonize old ones. 'Perhaps some new policies will be adopted for the Ecological Main Structure, and there is some delay in the final stages, but there is still enough support for it in the community', claims Opdam. 'That is hopeful. Particularly in a period of climate change, it is extremely

important to have a coherent network of nature areas.' And that goes for Europe too. It is inevitable, thinks Opdam, that certain target species such as moorland dwellers will disappear from the Netherlands in the long term. 'Not because there's anything wrong with our nature management, but because of climate change. When species are threatened it is even more important for Europe to set up a coherent chain of robust nature areas. And that means making choices. In any case, each country should focus on its strong points. The Netherlands could invest more in its delta areas, for example. The nature there contributes a lot to biodiversity in Europe; there are still bitterns in England because our country is a source of migrants that go there.' Biodiversity is also needed for maintaining ecosystems, Opdam argues. 'And they are indispensable to what we call our ecosystem services. A healthy biodiversity means that farmers are not troubled by as many diseases and pests, for example. And European involvement is important for that.' As for the disappearance of species due to climate change: 'That makes ecosystem services less reliable. You just have to hope that new species will come in to take the place of those that are gone, but to do that they have to be able to get here. We might have to intervene to make that happen.'

ECOSYSTEM SERVICES ARE DIVERSE

Leon Braat, a researcher at Alterra who spe-

cializes in ecosystem services, agrees that they are of key importance. 'A good ecosystem does a lot more jobs than a stripped-down one. For example, a maize field exists for one purpose alone: food production. A rainforest, by contrast, produces a hundred useful things. But only a couple of them reach the market; the rest are not recognized in the economy and no price is put on them. And that is why nature and biodiversity are badly undervalued in the economy.' Ecosystem services are highly diverse, explains Braat. They range from the production of wood, fish and other food to providing a buffer against climatic extremes, water storage, absorption of urban pollution, new medicines, recreation and a pleasant living environment. Economists and ecologists at the cutting edge between their disciplines have provided a number of ways of expressing these functions in money terms, says Braat. 'And if you can measure it, you can also value it. That is essential because we do not protect what we do not value. When you intervene in nature you should look not just at what happens to the deer and the flowers, but also at the bigger picture, including the sum total of ecosystem services.'

The EU has taken a step in the right direction, Braat explains. Partly on the basis of research by Alterra: it was agreed in March that the community wants to tackle not only the loss of biodiversity but also the loss of >



THE MAMMAL RED LIST

Of the 57 species of mammals that regularly breed in the Netherlands, 24 are on the Red List of 2006: forty two percent. Two species on the Red List come under the category 'seriously threatened', one of them the **garden dormouse**, *Eliomys quercinus*.



The ruff, *Philomachus pugnax*



The short-eared owl, *Asio flammeus*



The black grouse, *Tetrao Tetrix*

THE BIRD RED LIST

Forty three percent of the Netherlands' summer birds (78 out of 183) are on the Red List. Of these, 12 are categorized as under serious threat of extinction, including: the **ruff**, *Philomachus pugnax*, the **short-eared owl**, *Asio flammeus* and the **black grouse**, *Tetrao Tetrix*.

THE REPTILE RED LIST

There are six species on the reptile Red List: the adder, the smooth snake, the slow worm, the common wall lizard, the grass snake and the sand lizard. Apart from these species there is one other indigenous reptile in the Netherlands: the viviparous lizard. The most threatened of the species is the **wall lizard**, *Podarcis muralis ssp. brogniardii*.

THE FISH RED LIST

Thirty five of the 95 indigenous fish species in the Netherlands are on the Red List. Of these, three are under serious threat of extinction, including the **sea stickleback**, *Spinachia spinachia*.

ecosystem services. 'Only if you take these into account in your decision-making processes as well, can you make sound social cost-benefit analyses', says Braat. 'In the long term I think that is the only way to protect biodiversity. Otherwise I take a pessimistic view. We might have to send our grandchildren on a school trip to Poland to give them an appreciation of nature and biodiversity.'

Opdam shares the belief in the importance of ecosystem services for drawing attention to biodiversity and protecting it. 'Nowadays, farmers are often contrasted with nature, but producing food, however it is done, is always a way of utilizing the natural world. We have perfected this to an extreme, but with the same nature you can also store and purify water, develop recreational facilities or provide care services. The more urbanized our country becomes, the bigger the demand for nature services will be, I would expect. We do not want a degraded landscape with massive pig sheds and farmers producing food for the world market. In the short term I expect that on at least half of our farmland there will be a shift to a more extensive agriculture. That is very good for biodiversity too.'

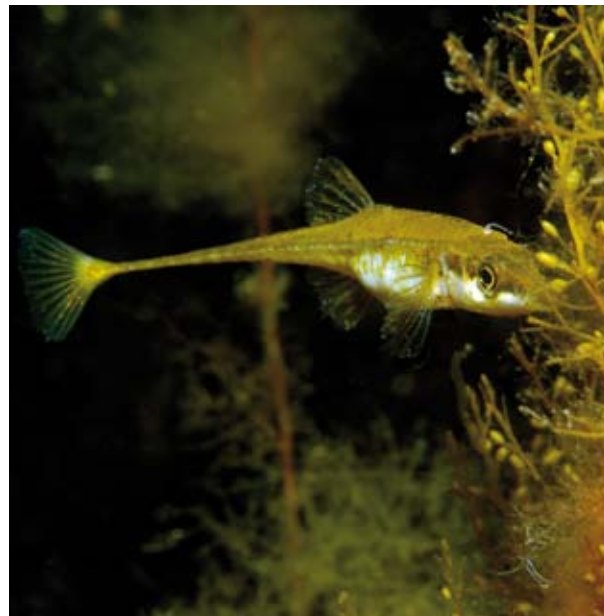
CIVILIZED BEHAVIOUR

Frank Berendse does not think ecosystem services are the most important motive. 'Of course biodiversity is important for human

beings. A striking example is our research that showed that the more plant species grow on a dyke, the better it can withstand erosion. But I am afraid that there will be insufficient reason to save a rare plant species if there does not happen to be an ecosystem service at stake. To me, another important motive for conserving wild plants and animals is our ethical responsibility. Just as we are responsible for the survival of South American Indian tribes, so we are for the survival of populations of wild plants and animals. It is a question of civilized behaviour. It is only 100 years ago that we banned child labour, but now no one would think of putting children to work.' Berendse has little faith as yet in the idea that farmers will make a real contribution to conserving biodiversity. 'Research has shown time and again that agricultural nature management makes very little difference. There is only any point in it if key factors such as the groundwater level and the use of pesticides are really tackled, but those are precisely the factors that are very difficult for a farmer to fit into a profitable business. I am pessimistic: our agricultural land is already dead, in fact. I think the focus should be on buying up as much land as possible for nature reserves and optimizing conditions in them. Whether they attract the common snipe, the black-tailed godwit or the bluethroat does not really matter much. Devoting a large area to na-



The wall lizard, *Podarcis muralis ssp. brogniardii*



The sea stickleback, *Spinachia spinachia*

ture is crucial to being able to resist negative influences from outside, such as drainage of water and excess nitrogen, and to giving species that need a lot of space a chance.'

MORE SPACE FOR NATURE

Geert de Snoo takes a different line. 'I think we do nature a great disservice if we bank on nature reserves to the exclusion of anything else. It is not only that what happens on agricultural land affects the reserves, but this land is also home to very many species that we consider worth conserving.' It is therefore crucial, thinks De Snoo, to create the right conditions there, such as clean soils, water and air. 'That is really important, but it is not enough for nature to thrive. I argue that farmers should make more space for nature. Currently only two to three percent of the land is not allocated to production, the banks of ditches and road verges for example. That is very little; there should be a place for biodiversity somewhere of course. My question is therefore: perhaps we should raise that to five percent, like in other countries?' We are justifiably proud of our productive agriculture, says De Snoo. 'But society does not only want good products. People also want responsible production, and attractive countryside and nature conservation. It is time for that extra care to be seen as part of a farmer's normal business operations.'

So De Snoo thinks that every farm should undertake agricultural nature management, with things like flowering green verges, ditch banks and field edges. 'In Groningen, improving the field edges led to a spectacular recovery by the hen harrier', he notes. Together with Berendse, De Snoo is supervising three PhD students who are going to examine how a green mosaic of this kind works in arable farming and livestock farming. 'In future you could give farmers a subsidy if they manage perhaps five percent of their farm extensively. But then you

should not set all kinds of conditions beforehand. The current regulations about target species for agricultural nature management have gone too far', thinks De Snoo. 'They only lead to disappointment and they ignore the dynamics of nature itself. I say: let us be open to surprises. Whether a lapwing comes or a godwit doesn't matter. Make sure the conditions are right, make sure there are worms in the ground, then we'll see which bird comes to eat them. Nature should be given back its future.' ■

ONLY 15 PERCENT LEFT

Biodiversity is more than the sum of the 35,000 species of plants and animals in the Netherlands, says the Environmental Assessment Agency. It is the measure of the variety in nature, not just in terms of the number of species, but also in the variety of ecosystems and the genetic variation, in agricultural crops for example. According to the agency's calculations, only 40 percent of the country's original biodiversity was left by 1900; in 2000 that was down to 15 percent. The reason lies in the way habitats have been chopped up, and in poor environmental conditions and intensive land use. But it is not just a tale of woe. Since the late

1990s, the loss of biodiversity has been going more slowly even though the loss of variety is still going on: opportunists are increasing and the number of choosy species is going down. So the Red Lists of threatened species keep on getting longer. And there is a clear difference between two kinds of landscape. In nature areas, the numbers of the nature policy's target species are generally rising, with the exception of moorland areas and other nutrient-poor environments. In agricultural areas, however, the numbers of these species are still going down. Green is getting greener, the rest is getting greyer.