BirdLife International's Position on Climate Change

BirdLife INTERNATIONAL

Partnership for **nature** and **people**

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Contributions, advice and comments were received from many BirdLife Partners during the consultation process and are reflected in the Position.

This document is a revision and update of the *BirdLife International Position on Climate Change* adopted in 2008, which was prepared by BirdLife's 2007-2008 Global Task Force on Climate Change:

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BirdLife International is the world's largest nature conservation Partnership. Together we are 119 BirdLife Partners worldwide – one per country – and growing with 13 million members and supporters, over 7,000 local conservation groups and 7,400 staff. BirdLife's vision is a world rich in biodiversity, where people and nature live in harmony. We are driven by our belief that local people, working for nature in their own places and connected nationally and internationally through our global Partnership, are the key to sustaining all life on this planet. This unique local-to-global approach delivers high impact and long-term conservation for the benefit of nature and people. BirdLife International is a UK-registered charity, no. 1042125

Cover images from bottom then clockwise: Acteon Gambier Island, French Polynesia (Island Conservation); tropical forest understorey, Ecuador (Murray Cooper); Harapan forest canopy, Indonesia (rspb-images.com); Briquette-making, Nepal (Bhopal Pandeya); geese flying over a stubble field near wind turbine, Germany (Nick Upton/rspb-images.com); chimneys (Wisconsin Department of Natural Resources/flickr); shorebirds, Panama Bay, Panama (K Kaufmann).

Foreword

The Fifth Assessment Report by the Intergovernmental Panel on Climate Change released last year is a stark reminder that climate change is unequivocal, that it is largely driven by human activities, and that it presents one of the greatest challenges of our time. Today it was reported in the news that the average global temperature this year is set to hit 1.02°C above pre-industrial levels. Without immediate and ambitious action, the average global temperature could rise by over 4°C by the end of the century.

Already, climate change has had widespread impacts on nature and people. It threatens to roll back years of development, undermine the livelihoods of communities across the globe – particularly poor and vulnerable communities least responsible for climate change – and drive biodiversity loss to a greater scale.

BirdLife's global synthesis report ***The messengers: what birds tell us about threats from climate change and the solutions for nature and people***, shows that the impacts of climate change on birds and their habitats are multiple, widespread and largely negative. These impacts are exacerbated by human responses to address and cope with climate change when they proceed without adequate consideration of nature.

But nature is not just a victim of climate change: more importantly, it is part of the solution. Conserving and restoring ecosystems can help reduce greenhouse gases in the atmosphere, and provide people and biodiversity with a natural defence against its impacts.

This document is the joint position of the BirdLife Partnership on climate change. It presents nine overarching policy positions and outlines the scientific and policy context that underpin these. The document was circulated among the BirdLife Partnership of over 120 national Partners and formally adopted in November 2015.

The adoption of this position is particularly timely. In December, governments will meet to finalise a global agreement to cut carbon emissions, and help communities and ecosystems cope with the negative impacts of climate change. The finer details of the agreement will be addressed after Paris and the agreement will need to be translated nationally; the BirdLife Partnership has a critical role to play in this process.

I hope this document will help guide and support the BirdLife Partnership and our allies to advocate and take appropriate climate action locally, nationally and internationally that is good for nature and good for people.

Operating in over one hundred countries, with a constituency of over 10 million members and supporters, the BirdLife Partnership can make a significant contribution to the climate change response.

Patricia Zurita
Chief Executive,
BirdLife International

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Wallasea Island, UK: coastal wetlands help buffer nature and people from the impacts of sea level rise and storm surges. Working in a unique partnership of engineers and conservationists, RSPB (BirdLife in the UK) created 670 ha of new wetland at Wallasea. Clean soil excavated during the construction of Crossrail tunnels in London was deposited to raise the level of the land prior to controlled breaching of the sea walls. (Image: BAM Nuttall).

Why the BirdLife Partnership is concerned about Climate Change

The scientific evidence is overwhelming: climate change is happening, it is largely caused by human activities, it presents very serious global risks for people and biodiversity around the world and it demands an urgent global response. The direct and indirect impacts of climate change are of central concern to BirdLife's objectives and targets, in terms of both biodiversity and human development. The BirdLife Partnership operates in over one hundred countries and territories worldwide, has over 2.7 million members and 10.8 million supporters, and owns or manages over four million hectares of reserves or protected areas. Together the BirdLife Partnership forms the leading authority on the status of birds, their habitats and the issues and problems affecting bird life. BirdLife has a significant contribution to make to the climate change debate.

Climate change threatens to undermine BirdLife's mission "to conserve birds, their habitats and global biodiversity, working with people toward sustainability in the use of natural resources," and it affects each of BirdLife's four strategic pillars: save species; conserve sites and habitats; encourage ecological sustainability; and empower people for positive change.[1]

Climate change poses new challenges to BirdLife's main approaches to conserving species and Important Bird and Biodiversity Areas (IBA) – over 12,000 sites of international significance for the conservation of the world's birds and other biodiversity, identified using a set of four internationally agreed criteria.[2] It is already having multiple impacts on birds and their habitats[3] including:

- Changes in morphology, behaviour and phenology, such as timings of breeding and migration;
- Range shifts and contractions;
- Disruption of species interactions and communities;
- Exacerbation of other threats and stresses, such as disease, invasive species and habitat fragmentation, destruction and degradation.

Investments in energy saving and low carbon energy supply, in particular using sustainable renewable energy sources, need to be stepped up around the world to tackle the climate threat to nature. Emissions from land use and forestry must be reduced, and ecosystems must be restored and conserved to enhance carbon sinks. However, some measures to mitigate climate change (e.g. reforestation and the deployment of renewable energy), and to adapt to the effects of climate change (e.g. flood defences; irrigation schemes), that are poorly planned or implemented are posing new threats to and stresses on birds and their habitats.

We know that the changes biodiversity faces due to climate change will be huge and wide-reaching in terms of both scale and speed. However, we cannot yet predict with certainty how and when individual species will respond to climate change, or how ecosystems will change. We do know that efforts now to address existing pressures, strengthen the resilience of the IBA network and enhance ecosystem connectivity will help species and ecosystems adapt to climate change in the future. This has implications for conservation planning and practice. BirdLife recognises that a wide range of conservation responses will be required, and these will differ across the world.

Biodiversity and people are closely linked. The conservation of IBAs and broader habitats has an important role to play in mitigating climate change and helping people adapt to its impacts. Healthy, intact ecosystems sequester and store carbon, and can offer a cost-effective defence against a range of climatic hazards such as erosion, flood and drought. They also provide food, fuel, clean water and medicine – resources that enable local communities to withstand, cope with and recover from disasters.

1 BirdLife International 2013a
2 BirdLife International 2014a
3 BirdLife International 2015

Background to BirdLife International's Position on Climate Change

The BirdLife Partnership first adopted a Position on Climate Change in June 2008. The Position was revised and updated in 2015 by the BirdLife Climate Change Programme Coordination Team, with contributions from BirdLife Partner and Secretariat staff to reflect developments in climate change science and policy, and BirdLife's experience working on climate change. The BirdLife Partnership adopted this revised Position in October 2015.

The Position contains a set of context statements that underpin the position, setting it in the context of biodiversity and bird conservation (pages 11-24), followed by a series of key policy messages (pages 25-33) that BirdLife advocates to address climate change.

The objectives of the position are:

- To articulate what BirdLife believes the key issues are and what should be done about them;
- To help the Partnership advocate appropriate action to political forums and external audiences;
- To provide guidance for the Partnership on the role BirdLife as a whole, and each organisation in the network can play in effectively tackling climate change.

The Position underpins BirdLife's Climate Change Programme and is also of relevance to the other eight BirdLife core programmes, such as the Forests of Hope, Important Bird and Biodiversity Areas, Flyways and Local Empowerment programmes. The Climate Change Programme has four expected results or areas of work, comprising activities on science, policy and advocacy, communication, capacity building and conservation to be undertaken by the BirdLife Partnership and Secretariat during the period of the BirdLife Strategy 2013-2020:

- Impacts of climate change on biodiversity assessed, using birds as indicators, and used to inform adaptive management at IBAs;
- Climate change adaptation approaches for people recognise the role of IBAs and ecosystems (habitats) and are implemented nationally and internationally;
- Impacts of energy developments, including renewables, on birds and biodiversity are recognised, assessed and when negative effectively avoided, mitigated and/or compensated;
- International climate change agreements influenced to strengthen mitigation measures and incorporate ecosystem-based approaches to adaptation.

Overview of BirdLife's Position on Climate Change

Context Statements

A Climate change and the alarming rate of biodiversity decline worldwide are the most important human-induced environmental challenges that society faces today. Policy must strive to address both of these closely inter-related challenges at the same time.

B People's lives and wellbeing are being affected by climate change – climate change, biodiversity and livelihoods are very closely linked.

C As well as their importance for biodiversity, habitats play a key role in regulating greenhouse gas levels in the atmosphere, by functioning as carbon sinks and sequestering carbon from the atmosphere.

D Climate change is an issue of extreme urgency – we need to act now to avoid large scale catastrophic impacts.

E Shifting from fossil fuels to renewable energy is fundamental for mitigating climate change. However, some renewables only deliver limited carbon savings over their life cycle. Furthermore, poorly-conceived renewable energy policies and projects pose new threats to birds and their habitats.

F Climate change is global in its causes and consequences – recognising common but differentiated responsibility, we all have a role to play to mitigate and adapt to climate change.

Key Policy Messages

1. BirdLife supports the target of keeping the average rise in the Earth's surface temperature to less than 2°C above pre-industrial levels (before the late 18th Century).
2. The impacts of climate change on biodiversity, and the role of biodiversity in helping to mitigate climate change, should be reflected in all policy sectors and across all relevant conventions.
3. Habitat conservation and appropriate management, including habitat restoration, can play a crucial role in sequestering carbon and reducing greenhouse gas emissions. There is a need for effective mechanisms to maintain and restore these carbon stocks.
4. It is essential to reduce emissions of greenhouse gases from fossil fuels through reduced energy consumption and increased energy efficiency.
5. There is an urgent need for investment in the development and deployment of sustainable renewable energy technologies to replace fossil fuels. However, the transition from fossil fuels to renewable energies must avoid harm to biodiversity.
6. Adaptation is urgently needed to build the resilience and reduce the vulnerability of nature and people to the current and expected impacts of climate change. Adaptation is an important element of conservation and sustainable development and needs to be integrated into conservation and development planning and practice.
7. There is a need for further studies, including monitoring and modelling, to understand the impacts of climate change on birds and biodiversity, and how how these relate to development and human livelihoods needs, particularly in developing countries.
8. BirdLife works with conservation and development organisations and industries that share the same concerns and solutions regarding climate change. Where possible, solutions should benefit both biodiversity and people, especially the poor, and should be agreed through inclusive, participatory processes that use local knowledge as well as sound science.
9. BirdLife is committed to reducing its own carbon footprint.

Harapan Rainforest, Sumatra, Indonesia: Conserving natural forest and better forest management provides a cost-effective way of reducing greenhouse gas emissions, as well as delivering a range of livelihood and environmental benefits that help both people and ecosystems to adapt to climate change. (Image: RSPB-images)

Mangroves provide a natural protective shield against strong waves and extreme storms, which are becoming more severe under climate change. Pronatura's Mangrove and Climate Change Corridor Initiative, supported by Ricoh, Bonafont and USAID, is working with local communities to restore mangroves (Image: Jesús García Rodríguez/Ricoh).

Context Statements underpinning BirdLife's Policy Position on Climate Change

Context Statement A:

Climate change and the alarming rate of biodiversity decline worldwide are the most important human-induced environmental challenges that society faces today. Policy must strive to address both of these closely inter-related challenges at the same time.

How the climate is changing

The scale of current and predicted changes in temperature is greater than the Earth has experienced for many hundreds of thousands of years. These changes are happening at a rate that many believe is unprecedented.

Human activities, especially the burning of fossil fuels, are releasing rapidly-increasing amounts of greenhouse gases such as carbon dioxide. This is causing the atmosphere to heat up. According to the Intergovernmental Panel on Climate Change (IPCC) "[w]arming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen."[4] The combined land and ocean surface temperature rose by 0.85°C [0.65 to 1.06°C] over the period 1880 to 2012.[5] The period from 1983 to 2012 was likely the warmest 30-year period of the last 1400 years in the Northern Hemisphere.[6]

Without greater efforts to reduce greenhouse gases than those in place today, global emissions will continue to rise, driven by growth in global population and economic activities. Projections of global mean surface temperature in 2100 in the absence of additional mitigation efforts, range from 3.7°C to 4.8°C above the average for 1850–1900, or 2.5°C to 7.8°C when including climate uncertainty.[7] This is a huge increase. For comparison, the average change in temperature between the peak and trough of a major ice age is 4 or 5°C. A 2.5°C warming would be the greatest global climatic shift since the end of the last ice age 10,000 years ago, but would happen far more quickly and would be to a higher average temperature.

The IPCC Fifth Assessment Report is recognized as the most reliable report with regards to scientific evidence about underlying causes of climate change, and will be used in future UNFCCC discussions as the baseline document. The most recent science indicates that the IPCC forecasts are conservative, and the amount of warming for a particular concentration of greenhouse gases may be higher than forecast.

Climate change interacts with other threats to biodiversity

Biodiversity is being lost and degraded at an escalating rate. Climate change adds another pressure, which acts in synergy with other major threats such as habitat loss and alien invasive species, together making their impacts on biodiversity even more detrimental.

Over the past 50 years, humans have changed ecosystems more rapidly and extensively than during any comparable period of time in human history, largely to meet rapidly growing demands for food, urban living space, transport and industrial infrastructure, fresh water, timber, fibre and fuel. The result has

4 IPCC 2014a
5 IPCC 2014a
6 IPCC 2014a
7 IPCC 2014a

been a substantial and largely irreversible loss in biodiversity.[8] Threatened species are becoming more threatened and many common ones are in decline. Current extinction rates are exceptionally high. The Red List Index shows that birds have become more threatened since 1988, with more species slipping closer to extinction. In total 1,373 bird species (13% of extant species) are globally threatened. Of these, 213 are Critically Endangered – facing imminent extinction.[9]

Most threats to bird species and the sites and habitats in which they live are caused by human activities. Habitat destruction, degradation and fragmentation associated with agricultural and forestry activities threaten, respectively, 73% and 49% of globally threatened bird species.[10] These serious impacts continue regardless of climate change and require urgent attention. Efforts to conserve biodiversity must be made more effective and resources for conservation massively up-scaled.

Climate change impacts directly on birds and their habitats but will also compound many of the existing pressures on biodiversity. For example, increased stress on water resources may exacerbate water pollution. The way humans respond to climate change may also impact biodiversity: for example, misguided policies on biofuels that results in habitat destruction for fuel crops, or large scale shifts in agricultural systems and where people live.

Impacts of climate change on biodiversity

Climate change is already impacting on biodiversity. By the end of the century, climate change and its impacts may be the dominant direct driver of biodiversity loss and changes in ecosystem services globally. Severe effects, including bird extinctions, are predicted.

The effects of climate change on ecosystems and wildlife are already being felt, and are projected to worsen.[11] A recent meta-analysis of 131 published predictions suggests that if we continue to follow our current, business-as-usual trajectory, leading to a 4.3°C rise in temperature by the end of the century, climate change threatens one in six species (16%).[12]

Impacts of climate change include increased extreme weather (floods and droughts), the retreat of mountain glaciers, the thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, changes in climatic conditions in cloud forests in the tropical highlands, lengthening of mid- to high-latitude growing seasons, poleward and altitudinal shifts of plant and animal ranges (resulting in declines in some plant and animal populations, and the potential extinction of species where no such shift in range is possible), disruption of interspecific ecological interactions and phenological changes, such as the earlier emergence of leaves and insects, earlier return of migrant species, and earlier egg-laying by birds.

These changes, particularly the shifts in range and abundance, will have profound impacts on species, sites and habitats.[13] [14] [15] Climate change may also impact species indirectly, combining with major threats such as alien invasive species and the spread of disease.

The role of biodiversity in climate change mitigation and adaptation

Action now to halt further loss or degradation of biodiversity will help to maintain future options for reducing the extent of climate change and managing its impacts.

Biodiversity can play a significant role in climate change mitigation and adaptation, by strengthening ecosystems and their ability to regulate climate. By conserving habitats rich in carbon, such as forests and peatlands, we can ensure that carbon remains stored in these ecosystems and also continues to be sequestered from the atmosphere. While investing in the protection of carbon-rich habitats is critical for addressing climate change, it is important that this does not result in a marginalisation of habitats that are low in carbon but important for biodiversity and the provision of other ecosystem services.

8 Millennium Ecosystem Assessment 2005
9 BirdLife International 2014b
10 BirdLife International 2013b
11 IPCC 2014a
12 Urban 2015
13 Huntley et al. 2007
14 Hole et al. 2009
15 Foden et al. 2013

Ecosystems also play an important role as buffers against the impacts of climate change. It is predicted that climate change will result in rising sea levels, as well as more frequent and more severe extreme weather events leading to an increased risk of flooding at coasts and rivers, but also droughts and forest fires. Healthy ecosystems and habitats can provide a natural protection against such extreme weather and slow onset events, reducing the vulnerability of humans. For example, coastal dunes and mangroves act as natural defences against sea level rise and hurricanes and consequent flooding of inland areas.

Healthy ecosystems also provide important resources such as food, fuel and fresh water that can help communities cope with and recover from climatic hazards.[16] [17] Efforts are needed now to improve the resilience of species and ecosystems – by addressing existing pressures and through climate-smart conservation – to help nature and people cope with the current effects of climate change and prepare for expected effects. It is also essential that measures taken to adapt to changing climate conditions, such as flood defences, hydrological projects or changes in agricultural systems do not harm, but support the resilience of species and ecosystems.

Policy development and implementation

Policy development and implementation are needed at local, national, regional and global levels to ensure that the twin challenges of climate change and biodiversity loss are addressed.

Due to the interdependencies between biodiversity and climate, we believe that it is possible to develop strategies that achieve mutually supportive outcomes. Mitigation of and adaptation to climate change must be in harmony with nature, and go hand in hand with more biodiversity-friendly and sustainable land-use around the world. Commitments made under existing international agreements, such as the Convention on Biological Diversity (CBD),[18] the United Nations Framework on Climate Change (UNFCCC),[19] the United Nations Convention to Combat Desertification (UNCCD), the Ramsar Convention, and the United Nations Environmental Assembly[20], have resulted in positive steps in collaboration and integrated action on biodiversity and climate change. These agreements have enormous potential to achieve biodiversity conservation and contribute to sustainable development. However, they need to be activated in national policy and legislation, and made effective in practice. The development and implementation of national climate change strategies, national adaptation plans (NAPs), and national biodiversity strategies and action plans (NBSAPs) are important processes for achieving this.

Context Statement B:

People's lives and wellbeing are being affected by climate change – climate change, biodiversity and livelihoods are very closely linked.

The effects of climate and land-use change on people

Climate change threatens the basic elements of life for people around the world – access to water, food production, health, and use of land.

Ecosystems and biodiversity underpin biological productivity and socio-economic development, through the provision of many goods and services to people and industry. These ecosystem services include food, water, timber, fuel and fibre; regulating services that affect climate, floods, disease, waste and water quality; and supporting services such as soil formation, photosynthesis and nutrient cycling.

Humans are fundamentally dependent on the flow of ecosystem services, and climate change threatens these basic elements of life. In many cases, these threats have already started to materialise. For example, the IPCC finds that glaciers are shrinking almost worldwide, affecting runoff and water resources downstream, crop productivity has declined in many regions and ocean acidification is affecting marine organisms, with potential impacts on coastal fisheries. It is projected that local temperature increases

16 CBD 2009
17 Royal Society 2014
18 CBD 2015
19 UNFCCC 2010
20 UNEA 2015

of 2°C or more could reduce production of staple foods such as wheat, rice and maize in tropical and temperate climates, and that a global temperature increase of 4°C or more "would pose large risks to food security globally".[21] While humans and nature can adapt to small changes in climate, in some cases loss (e.g. of human lives, species or ecosystems) and damage (e.g. to natural and built infrastructure) will be inevitable.

Vulnerability of developing countries

The impacts of climate change are not evenly distributed – the poorest countries and people will suffer earliest and most.

Developing countries are often already warmer, on average, than developed ones, and they suffer from high rainfall variability. Further warming will bring higher costs and few benefits. All humans depend on the services provided by natural systems. However, environmental assets and the services they provide are especially important for poor people. Many developing countries are heavily dependent on agriculture, the most climate-sensitive of all economic sectors. Climate change also threatens to wipe out plant species used in traditional medicines. The World Health Organisation estimates that 80% of the population in developing countries depends on traditional medicine for primary health care. Unchecked climate change will become a major obstacle to continued poverty reduction, and efforts to achieve the Sustainable Development Goals.[22]

Vulnerability of low-lying island communities

Small island developing countries have minimal greenhouse gas emissions and contribute little to climate change. Nevertheless, they bear the brunt of its effects.

Most island nation communities are economically dependent on fisheries, agriculture or forestry. These resources may become scarce as a result of changing climate. Sea level rise and extreme weather events particularly threaten island ecosystems and their people. Sea level rise since the 1850's has occurred at a rate of 1.3-1.7 mm per year over much of the 20th century and increased to 2.8-3.6 mm per year since 1993. Further sea-level rise is projected throughout the 21st century and beyond, leading to adverse impacts such as submergence, coastal flooding and coastal erosion in low-lying areas.

The intensity (mean maximum wind speed) of tropical cyclones is projected to increase by 2%-11% over the 21st Century and the frequency of the most intense storms will increase by a substantially larger percentage in some oceanic basins.[23] Some low-lying developing countries and small island states are expected to face very high impacts with significant damage and adaptation costs.[24]

Healthy and diverse ecosystems help people adapt to the impacts of climate change

Conservation, restoration and sustainable use of biodiversity and ecosystem services can be an effective strategy for helping people adapt to climate change.

There is a growing recognition of the fundamental role of ecosystem-based adaptation (EbA) in building resilience, and reducing the vulnerability of people and the ecosystems they depend upon. EbA refers to "the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change".[25] It involves strategically maintaining or enhancing ecosystem services under changing climatic conditions with the primary objective of helping people adapt to climate change, and may deliver a range of additional social, economic and environmental benefits if done right.

21 IPCC 2014a
22 UNDESA 2015
23 Knutson et al. 2010
24 IPCC 2014a
25 CBD 2009

A child stands amongst the remains of buildings destroyed by flooding in Sindh province, Pakistan in 2011. Some countries will experience more frequent and intense floods because of climate change. (Image: DFID/Russell Watkins).

EbA is embedded within international policies, including UNFCCC, UNEA and CBD[26 27 28] and an increasing number of national policies in both developed and developing countries. The role of ecosystem-based approaches has also been recognised within the context of Disaster Risk Reduction, and integrated into the Sendai Framework for Disaster Risk Reduction 2015-2030.[29] Further capacity building, knowledge-sharing and investment are needed to effectively scale-up EbA. Developing countries in particular need extra resources to allow them to safeguard and manage their natural assets sustainably. National adaptation planning needs to integrate options for meeting biodiversity, climate and sustainable development objectives.

Context Statement C:

As well as their importance for biodiversity, habitats play a key role in regulating greenhouse gas levels in the atmosphere, by functioning as carbon sinks and sequestering carbon from the atmosphere.

Ecosystems such as forest, peatlands, wetlands and oceans play an especially large role in climate regulation. Conserving existing ecosystems enables them to continue to function as carbon sinks, while environmentally-appropriate afforestation, reforestation and restoration increase the carbon being sequestered from the atmosphere. Many of these sinks already face considerable threats.

Land use change is a major driver of biodiversity loss and of greenhouse gas emissions. About a quarter (24%) of all human-induced emissions come from land use, mainly from agriculture and deforestation.[30] We cannot therefore stay below two degrees without cutting land use emissions and enhancing sinks. Stopping deforestation in particular can provide a large contribution to mitigation efforts, whilst delivering biodiversity conservation objectives. Tropical forests alone are home to 70% of the world's vascular plants, 30% of all bird species and 90% of invertebrates, and provide a plethora of important services to local communities. The adoption of the mechanism on reducing emissions from deforestation in developing countries (REDD+) has been one of the major successes of the UNFCCC, and should help to maintain carbon stocks. More is needed, however, to scale up REDD+ finance and to ensure effective implementation of social and environmental safeguards.

Although peatlands only cover 2-3% of the global land surface they hold huge carbon stocks, equivalent to around 100 years of fossil fuel emissions. The majority of the world's tropical peatlands are in Indonesia, Malaysia and Papua New Guinea. Largely within the last 30 years, more than 12 million hectares (45%) of these peat swamp forests have been systematically drained, clear-felled and converted into plantations, initially rubber and now oil palm and acacia.[31] The conversion rate and extent is phenomenal. This process transforms a stable carbon stock into a major source of emissions.

Mangrove wetlands are important for sequestering and storing carbon in the biomass of living trees and soils. The root systems of mangroves also help build soil levels and dissipate the energy of wave action, providing a buffer from sea level rise and storm surges. In addition to climate regulation, mangroves provide critical habitat for waterbirds, fuelling sites for migratory birds, and important habitat for littoral and marine wildlife. The destruction of mangroves releases carbon dioxide, increases vulnerability of coastal communities and drives biodiversity loss.

Unsustainable intensive agriculture practices are also a major cause of greenhouse gas emissions. The application of nitrogen fertiliser causes the emission of nitrous oxide (N_2O), one of the most potent greenhouse gases. Raising cattle and other livestock, particularly in intensive farms, causes very significant emissions of methane (CH_4), another key greenhouse gas. The ploughing of permanent grassland and intensive management of arable land causes the loss of soil carbon contributing to CO_2 emissions. All

26 UNFCCC 2010
27 UNEA 2015
28 CBD 2010
29 UNISDR 2015
30 IPCC 2014b
31 Hooijer et al. 2006

of these emissions can be reduced through more sustainable agricultural practices, which also usually benefit biodiversity and the wider environment.

The oceans are one of the two main sinks for CO_2, the other being forests. Ocean warming and acidification reduce this sink, impact oceanic productivity, threaten coral reef systems and calcareous invertebrates, and have knock-on effects on the whole ecosystem. Climate change will also impact oceanic ecosystems through changes in invasive species, parasites and disease. Ocean ecosystems are already affected by several threats, including excessive fishing pressure that may also be compounded by climate change.

Context Statement D:

Climate change is an issue of extreme urgency – we need to act now to avoid large scale catastrophic impacts.

It is widely recognised that if the worst impacts of climate change are to be avoided, the average rise in the surface temperature of the Earth needs to be kept to less than 2°C above the levels prevailing during the pre-industrial period, i.e. before the late eighteenth century. However if we continue on our current trajectory temperatures are projected to rise by about 4°C by the end of this century. We need to sharply cut global emissions now in all sectors, not just energy but land use too.

It is clear that some climate change is inevitable. We have already seen an increase in average global temperatures and, even applying the most stringent mitigation strategy, we are likely to experience a further 1°C increase. We have probably already used about two-thirds of the cumulative carbon dioxide emissions budget consistent with an emissions pathway that keeps us below the globally agreed goal of 2°C and we have only about 1000 billion tonnes left.[32] We must act now to reduce emissions of greenhouse gases from fossil fuels through reduced energy consumption and increased energy efficiency. We also need to be cutting emissions from other emissive activities, including many industrial processes, agriculture and other land use.

This means setting and sticking to hard targets. Energy use patterns within society need to change. A growing share of our current and future energy production worldwide has to shift from fossil fuels to sustainable renewable energy sources. Land use practices also need to be changed so as to reduce emissions and enhance removals – and actions that reduce emissions are almost always good for biodiversity too, like protecting and enhancing natural forests. There is an urgent need to raise awareness on the impact of climate change on birds, biodiversity and people, and on the positive steps people can and must take to adapt to and mitigate climate change. In economic terms alone, as summarised in the Stern Review, "The evidence shows that ignoring climate change will eventually damage economic growth. The earlier effective action is taken, the less costly it will be."[33]

There are many possible emission pathways for attaining greenhouse gas stabilisation at a particular atmospheric concentration. However, a widespread view remains that achieving the 2°C target would have required global emissions to peak and start to decline steeply by 2015. This has not happened and so although it is still possible to stabilize if emissions start to decline soon, the IPCC now moots the possibility of first overshooting the required concentration, followed by either a very rapid decline or active removal of carbon dioxide from the atmosphere.

There is still limited evidence and considerable uncertainty around the potential role of carbon dioxide removal (CDR) technologies such as bioenergy, carbon capture and storage (BECCS). Application of BECCS entails a number of risks: it could lead to considerable land take with impacts on biodiversity, water and other ecosystem services; and it could also compromise food security.[34]

32 UNEP 2014
33 Stern 2007
34 IPCC 2014a

Context Statement E:

Shifting from fossil fuels to renewable energy is fundamental for mitigating climate change. However, some renewables only deliver limited carbon savings over their life-cycle. Furthermore, poorly-conceived renewable energy policies and projects pose new threats to birds and their habitats.

Renewable Energies

To have any chance of holding the rise in average global temperature below 2°C, the world must transition from fossils fuels to renewable sources of energy. The deployment of renewable energy is expanding rapidly, and an increasing number of renewable energy technologies are becoming cost-competitive. However, further cost reductions and increased investment will be needed to achieve the scale of renewable energy production necessary. Investment in the development and deployment of renewable energy technologies is being hampered by enormous subsidies for fossil fuels – much larger than those to renewable energy – that need to be eliminated.[35] While the potential benefits of renewable energy are huge, like any other development they can have negative impacts on biodiversity if they are not planned and implemented appropriately. Furthermore, some renewables only deliver limited or zero carbon savings over their life-cycle.

Wind farms can be beneficial in tackling climate change and can be deployed at large scale with minimal negative impacts if strategically sited. Poorly-sited windfarms, however, have been shown to have detrimental impacts on birds.

Wind energy generation can play an important role in the reduction of greenhouse gas emissions as a clean and cost-competitive solution to address climate change. While some locations are too ecologically sensitive for deployment of wind power, it has been demonstrated that large scale deployment can be achieved with minimal impacts to biodiversity. The main potentially detrimental effects of wind farms on birds that need to be considered when deploying wind energy are: collision leading to direct mortality; disturbance and displacement from around the turbines or exclusion from the whole wind farm; barriers to movement disrupting ecological links between feeding, wintering, breeding and moulting areas; change to or loss of habitat due to wind turbines and associated infrastructure.[36] [37] [38] However, these impacts have a predominant site-species-season specificity and also depend on the turbine technology used, further underlining the importance of ecological baselines and strategic wind siting.[39] [40] There are also uncertainties about the potential impacts of offshore windfarms, and more research is required in identifying best practices for offshore wind farms by improving sensitivity maps and improving techniques for monitoring of bird impacts.

Although bioenergy is recognised to have considerable greenhouse gas mitigation potential, the current deployment of bioenergy is leading to the conversion of natural habitats on a huge and potentially catastrophic scale, often with limited savings in greenhouse gas emissions.

Bioenergy refers to energy derived from biomass (living or recently living organisms), using different sets of technologies, for electricity, heating, and transport fuels. Global bioenergy use has been steadily growing over the past four to five decades, and further expansion, particularly in developing and transitional economies, is assumed in many of the IPCC climate scenarios.[41] [42] Biomass is still a major source of energy worldwide, particularly in poor countries, and is linked to forest degradation and health issues resulting from indoor burning of charcoal and other biomass. Biological resources such as land and forests are already under significant pressure from overexploitation by humans. These demands are expected to grow as we need to feed more people, provide materials for construction and for many

35 IEA 2014
36 Hötker et al. 2006
37 Langston and Pullmans 2003
38 BirdLife International 2008
39 Schuster et al. 2015
40 Wang and Wang, 2015
41 Chum et al. 2011
42 IPCC 2014b

Sugar cane plantations among remnant forest patches, north-east Brazil. Demand for bioenergy derived from biomass such as sugar cane is driving conversion of natural habitats on a huge scale. (Image: L C Marigo/BirdLife).

other needs. As land and forests are also limited resources their contribution to energy production can, at its best, also only be limited.

While some forms of bioenergy can result in significant emission savings, others have limited savings and in the worst case may result in higher emissions than the fossil fuel they substitute. Savings are reduced dramatically, and indeed flip into a net increase, where bioenergy production results in the conversion of natural and semi-natural, carbon-rich habitats such as rainforests, peatlands, savannahs and grasslands, either directly or indirectly.[43] [44] Emissions from indirect land use change have been particularly linked to biofuels used in transport and produced out of food crops. Increased bioenergy production can also decrease the size of carbon stocks in ecosystems such as forests, further reducing net emissions savings, even if no land use change takes place. For example, increased demand for bioenergy can lead to expansion and intensification of forest loggings, and in conversion of natural forests to plantations.[45] [46] The establishment of oil palm plantations is already a major driver of lowland forest loss in Indonesia and Malaysia.[47] There is also evidence of biofuels displacing food crops, raising food prices or leading to food scarcity, which would particularly impact the poor in society.[48]

Bioenergy sources of low environmental risk include efficient, small and decentralized technologies, as well as modern high performance wood stoves and anaerobic digesters using agricultural or wood waste, manure and different kinds of residues and side products from agriculture, forestry and related industries. Win-win solutions need to be explored where habitat restoration and management can be combined with biomass harvesting.

Nevertheless, without a clear and comprehensive policy framework and careful deployment, bioenergy poses a number of risks: competition for land, wood resources and water; conversion of natural habitats; food insecurity; and increased emissions.[49]

Solar energy is an important element of a sustainable energy mix. If deployed appropriately it may have relatively low environmental risks, but further research is needed to determine this.

There is considerable potential in the short and long-term to scale up solar energy. While solar energy currently represents a small fraction of total energy consumption, markets for solar technologies are growing rapidly.[50] Solar energy technologies include thermal and passive solar, various solar photovoltaic technologies (PV) and concentrated solar power (CSP).[51] This section focuses on solar PV electricity generation, which involves turning solar radiation directly into electricity in a solar panel, and CSP, which consists of a series of mirrors or heliostats which reflect sunlight. The heat is concentrated onto a central receiver tower and standby focal points, and is used to raise steam to drive turbines and generators.

Solar power deployed at a domestic or small-scale on existing infrastructure (built environment), such as PV panels installed on car parks and roofs, pose relatively low risks to the natural environment. The environmental risks associated with CSP and PV developments in non-built environments are largely determined by the ecological characteristics and sensitivity of the site where they are located. Potential negative impacts from solar energy include habitat loss, fragmentation or modification and disturbance/displacement of species through construction, operation and maintenance activities. Solar farms may also have direct impacts on birds and other taxa. As with most man-made infrastructure, there is a risk of collision, and bird fatalities from collisions have been documented at solar projects of all technology types.[52] There is also evidence to suggest that concentrated solar power installations can cause bird fatality through burns from intense solar radiation.[53] [54] When correctly sited with appropriate mitigation measures solar energy provides a sustainable source of renewable energy, and if strategically deployed may deliver net positive benefits to biodiversity.[55] [56]

43 Scientific Committee of the European Environmental Agency 2011
44 Science Advisory Board of the US Environmental Protections Agency 2011
45 Scientific Committee of the European Environmental Agency 2011
46 Science Advisory Board of the US Environmental Protections Agency 2011
47 Hai 2000
48 FAO 2008
49 IPCC 2014b
50 IEA 2014
51 Arvizu et al. 2011
52 Walston et al. 2015
53 Turney and Fthenakis 2011
54 Kagan et al. 2014
55 Arzivu et al. 2011
56 BRE 2014

Hydropower is a mature and cost-competitive source of renewable energy, but poses a high risk to biodiversity and has a poor environmental track record.

Hydropower accounts for 16% of world electricity and 85% of global renewable energy electricity. It dominates the energy mix of a number of developing, emerging and developed economies. In addition to being a low-carbon source of energy, hydropower can enable a greater contribution of other renewable energy sources to the grid by stabilizing fluctuations between demand and supply. Globally, only modest expansion of hydropower capacity is projected. However, there is variation between regions: while most of Europe's capacity has already been harnessed, considerable expansion is expected in a number of African countries.[57]

There are four main types of hydropower schemes: reservoir or storage schemes (conventional dams that store water for later consumption); run-of-the-river schemes, which draw energy from the available flow of the river without major changes to river flow; pumped storage, which is used to store grid energy and can operate outside the river basin as a separate system; and in-stream technology using existing facilities like weirs and canals, which function like run-of-the river schemes.[58]

All forms of hydropower can have negative impacts on the environment. The deployment of reservoir schemes that result in large scale damming of main stem rivers is one of the most ecologically harmful forms of development. Poorly-planned small to medium-sized dams, as well as dams on secondary tributaries, can also have devastating impacts on ecological and hydrological integrity, drive biodiversity loss and result in displacement of human populations. While run-of-the-river schemes are generally associated with lower environmental impacts than reservoir schemes, they too can have significant negative impacts on biodiversity, especially in small river basins with highly fragile biodiversity. In some cases, several run-of-the-river hydro systems have been established as a chain extending along entire tributaries, resulting in fragmented and dry segments of the river no longer suitable for biodiversity.

Impacts from hydropower schemes on biodiversity can occur during the construction, operation and decommissioning phase and include direct mortality (e.g. of fish in turbines), habitat loss of shallow, fast flowing riverine habitats and riparian edges, changes in hydrological regimes and water quality leading to habitat degradation and alteration, and in-stream barriers (habitat fragmentation) to aquatic organisms such as fish. Impacts on birds mainly arise from direct habitat loss and habitat degradation and alteration, particularly in downstream habitats.[59] [60]

Power line deployment is necessary for transmitting renewable energy to end users but without careful planning can have detrimental impacts on birds.

Addressing climate change requires a massive scaling up of renewable energy, which in turn requires the development of infrastructure such as power lines to transmit energy to end users. Depending on the type of voltage of a power line, bird impacts will vary. It is well established that existing power lines are a major cause of bird mortality, with scientifically robust evidence of observed effects on bird populations. The most significant impacts are bird collisions that are generally associated with high voltage power line, and bird electrocutions that are generally associated with medium voltage power line. Disturbance and habitat loss may also occur in all types of power line developments through, for example, habitat alterations and birds avoiding feeding and breeding grounds that lead to the reduction of the carrying capacity of the habitat.[61]

57 IEA 2014
58 Kumar et al. 2011
59 Kumar et al. 2011
60 Van Der Winden et al. 2015
61 For guidelines and best practices refer to the Migratory Soaring Birds project Guidance on Power Line, available at www.migratorysoaringbirds.undp.birdlife.org/en/sectors/energy/electrical-power-lines-toc and BESTGRID, available at http://bestgrid.eu/

Context Statement F:

Climate change is global in its causes and consequences – recognising common but differentiated responsibility, we all have a role to play to mitigate and adapt to climate change.

We all have a responsibility to adapt our behaviour and actions to help reduce future impacts of climate change.

BirdLife has an important role to play regarding climate change. BirdLife is committed to raising awareness of the key issues within and outside the BirdLife Partnership. BirdLife's worldwide network comprises over 100 autonomous non-governmental organisations (NGOs) supported by a large grassroots membership of over two million people, representing civil society and local communities. Birds are well-established indicators of biodiversity that can provide early warning of changes to the stability of ecosystems.[28] Birds tell us many things about the state of the environment, partly because a great deal of high quality data exists on birds, and new data are relatively inexpensive to collect, especially through a global network as substantial as the BirdLife Partnership.

Clearly BirdLife cannot work on this agenda on its own. The BirdLife Partnership has strong relations with many local, national and international organisations, as well as national and local governments and institutions and with industries that share our climate change objectives, for example promoting ecologically sensitive development of renewable energy and associated infrastructure. At the national and international level, BirdLife is a member of networks working together to minimise the impact of climate change on biodiversity. These include the Climate Action Network (CAN), a worldwide network of over 800 Non-governmental Organisations working to promote action by governments and individuals that will limit human-induced climate change to ecologically sustainable levels.

Given the close links between climate change, biodiversity and livelihoods, it is clear that agendas of organisations concerned with climate change, biodiversity and people must converge to achieve our shared goals. Policy development and implementation will need to be coherent and result in mutually supportive outcomes. This will be fundamental for achieving the Sustainable Development Goals.

All countries have a role to play. Developed countries should, for reasons of both fairness and practicality, take the lead in cutting emissions, but the rapidly-industrialising developing nations must act effectively too. Countries with little industry must attend to the conservation of their natural habitats which will, almost always, have biodiversity benefits too. Improving agricultural practices is likely to have climate benefits too. Addressing climate change will require a substantial increase in climate finance. Richer countries, for reasons of fairness and equity, have a responsibility to support developing countries to adapt to climate change through the provision of adequate, predictable and sustainable climate finance, as well as technical support.

There are currently massive inequalities in global energy access. Globally, 1.2 billion people are without access to electricity. Close to 85 percent of these live in rural areas, and 87 percent are geographically concentrated in Sub-Saharan Africa and South Asia.[62] Addressing these inequalities is critical – developing countries have a right to expand their energy use for development, and support should be given to help them onto a green pathway to development.

BirdLife is committed to reducing its own carbon footprint through reduced energy use and greenhouse gas emissions associated with its activities.

62 IEA 2013

To keep the average global temperature rise to less than 2°C would require atmospheric concentrations of greenhouse gases to be stabilised in the range 430-480 parts per million. (Image: Marko_Pixelmaniac/flickr).

BirdLife's Key Policy Messages on Climate Change

1. BirdLife supports the target of keeping the average rise in the Earth's surface temperature to less than 2°C above pre-industrial levels.

1.1 It is widely recognised that if the worst impacts of climate change are to be avoided then the average rise in the surface temperature of the Earth needs to be kept at less than 2°C above the levels prevailing during the pre-industrial period, i.e. before the late eighteenth century. This is a globally agreed position, first agreed in the Copenhagen Accord in 2009 and confirmed by all 192 countries attending the UNFCCC conference of parties the following year in Cancún. Importantly, it is recognised that some areas have already experienced 'too much' temperature change, such as the Arctic and marine environments. Given the considerable impacts projected to occur with a 2°C warming, there is a need to consider strengthening the target to 1.5°C, with full consideration of the associated risks that will arise from relying heavily on negative emissions, including bioenergy and carbon capture and storage (BECCS) technologies.

1.2 Keeping the average global temperature rise to less than 2°C will be hard. It would require atmospheric concentrations of greenhouse gases being stabilised in the range 430-480 parts per million (ppm). There are many possible emission pathways for attaining greenhouse gas stabilisation at a particular atmospheric concentration. However, a widespread view remains that achieving the 2°C target would have required global emissions to peak and start to decline steeply by 2015. This has not happened and so although it is still possible to stabilize if we peak soon, the IPCC now moots the possibility of first overshooting the required concentration, followed by either a very rapid decline or active removal of carbon dioxide from the atmosphere.

1.3 BirdLife urges governments to take immediate action to stabilise emissions so as to avoid shifting the burden of responsibility to future generations and putting confidence in uncertain, high-risk carbon dioxide removal technologies.

1.4 Whilst developed countries should take a lead in reducing emissions, by at least 50% by 2030 (from 1990 levels), it is also now necessary for major developing countries to act too, because developing country emissions are now well over half of the global total. Developed and major developing countries have a role to play in providing financial and technical support to help least-developed countries and other developing countries to move towards low-carbon climate-resilient development pathways.

2. The impacts of climate change on biodiversity, and the role of biodiversity in helping to mitigate climate change, should be reflected in all policy sectors and across all relevant conventions.

2.1 BirdLife believes that the value of biodiversity should be more explicitly recognised by the United Nations Framework Convention on Climate Change (UNFCCC).

2.2 BirdLife strongly supports the introduction of comprehensive common accounting rules for agriculture, forests and other land use (AFOLU). This would not only reduce emissions and enhance sinks but be better for biodiversity too - if appropriate safeguards are in place to ensure that emission reductions are carried out in harmony with nature.

2.3 BirdLife strongly supports the initiative on 'Reducing Emissions from Deforestation and forest Degradation in developing countries' (REDD+) adopted by the UNFCCC. BirdLife urges Parties to

Sword-billed Hummingbird *Ensifera ensifera* feeding on Passiflora flower *Passiflora mixta*, Ecuador. Policy responses are needed that help biodiversity adapt, and that recognise the critical role healthy ecosystems play in mitigating climate change and helping people adapt. (Image: Murray Cooper).

comprehensively implement safeguards for REDD+ (i.e. the Cancún Safeguards) and to maximise non-carbon benefits such as biodiversity conservation, climate change adaptation and poverty reduction.

2.4 BirdLife supports continued efforts of the Convention on Biological Diversity, the Ramsar Convention, the United Nations Convention to Combat Desertification (UNCCD) and the Convention on Migratory Species (CMS), to integrate climate change impacts and response activities across their programmes of work in a coherent and coordinated way.

2.5 Climate change is projected to affect agricultural biodiversity, diminishing some crop yields and threatening food security. Agricultural policy needs to recognise the impacts climate change may have, and the value of biodiversity to help mitigate these impacts. Policy-makers and businesses need to recognise the potential for reducing emissions through low-impact farming, sustainable land management and reduced crop and food wastage.

2.6 Climate change impacts need to be recognised in all sectoral policies, and should include complimentary and sustainable responses – adaptation actions in one sector should not compromise sustainable development in another.

3. Habitat conservation and appropriate management, including habitat restoration, can play a crucial role in sequestering carbon and reducing greenhouse gas emissions. There is a need for effective mechanisms to maintain and restore these carbon stocks.

3.1 By working to conserve and effectively manage forests, peatlands and other habitats for birds and biodiversity, BirdLife is already reducing emissions of greenhouse gases. The BirdLife Partnership has extensive experience of conserving and managing such habitats in different parts of the world. BirdLife's efforts to conserve forests and other habitats will help strengthen these ecosystems, so that they make an increasing contribution to regulating future climate change.

3.2 BirdLife seeks recognition of the diverse values that ecosystems such as forests provide, in terms of biodiversity and other ecosystems services, and of the benefits to local communities and human wellbeing.

3.3 BirdLife believes the initiative on 'Reducing Emissions from Deforestation and forest Degradation in developing countries' (REDD+) has a critical role to play in addressing short and long-term mitigation needs. Although REDD+ has been successfully negotiated with a comprehensive set of decisions in the Warsaw Framework on REDD+ adopted in 2013, more work is needed to mobilise finance, better implement biodiversity safeguards and build the capacity of poorer countries. This will increase the mitigation contribution of REDD+ whilst protecting the unique wildlife of tropical forests, and building sustainable and climate-resilient livelihoods for the many people who depend on tropical forests.

3.4 BirdLife wishes to see continuation of the carbon markets under the UNFCCC, including for afforestation and reforestation projects.

3.5 Carbon offsetting should not be encouraged in place of reducing emissions for either companies or individuals. Nevertheless, BirdLife recognises that carbon trading and offsetting mechanisms under strict regulatory standards have potential value in mitigating unavoidable emissions, and in combining climate change and biodiversity benefits. BirdLife will continue to explore the potential of natural habitat conservation and management for responsible carbon offsetting, monitored and certified to a high standard.

3.6 National, regional and global legislation to provide for robust habitat conservation measures in the light of climate change needs to be strengthened and fully implemented.

3.7 Extreme caution should be exercised regarding claims that changing semi-natural habitats will be carbon-positive. The conservation benefit of conserving a given habitat which is important for biodiversity should not be sacrificed for conversion to a different habitat type for potential but often negligible carbon benefit.

4. It is essential to reduce emissions of greenhouse gases from fossil fuels through reduced energy consumption and increased energy efficiency.

4.1 BirdLife strongly advocates the reduction of emissions of greenhouse gases from fossil fuels through reduced energy consumption (by changing energy consumption patterns within society) and increased energy efficiency (through investment and legislation).

4.2 BirdLife advocates specific and appropriate energy reduction and efficiency targets at local, national and regional levels and for different sectors (e.g. energy conversion, industry, transport, agriculture, forestry and waste management).

4.3 BirdLife advocates stronger emission reduction targets for developed countries compared to developing ones, but recognises that all countries must take action if we are to address the global challenge of climate change. BirdLife promotes incentives for developing countries to limit their emissions.

4.4 BirdLife believes a large and growing share of our current and future energy production worldwide has to shift from fossil fuels to truly sustainable renewable sources.

4.5 BirdLife recognises that there are currently massive inequalities in global energy access and consumption. Addressing these inequalities is critical – developing countries have a right to expand their energy use for development, and support should be given to help them on a green pathway to development.

5. There is an urgent need for investment in the development and deployment of sustainable renewable energy technologies to replace fossil fuels. However, the transition from fossil fuels to renewable energies must avoid harm to biodiversity.

Sustainable deployment of renewable energy: policy messages that apply to all forms of renewable energy

5.1 Sustainable renewable energy sources are critical for combatting climate change: they reduce dependence on fossil fuels, thereby decreasing harmful emissions of greenhouse gases. BirdLife calls for governments to eliminate fossil fuel subsidies and to promote further renewable energy investment and technology transfer to advance the development and deployment of efficient and biodiversity-friendly renewable energy technologies.

5.2 Reduced energy consumption and increased efficiency are essential to address climate change, as well as to limit the ecological impacts of overall land use, infrastructure and raw material requirements for energy production. Investment in renewable energy should not be at the expense of efforts to reduce energy consumption and increase overall efficiency generation and use.

5.3 It is essential that renewables have a major positive carbon balance across their entire life cycle including land use and management (i.e. renewable energy only makes sense if it leads to much lower greenhouse gas emissions over its whole life cycle). They must provide at least 60% greenhouse gas savings across their whole life-cycle.

5.4 No energy generation is without its own potentially damaging consequences for nature. This applies as much to renewable energy sources as it does to fossil fuel sources. There is a need to balance the environmental risks and benefits. Energy production from renewable sources must not be at the expense of biodiversity.

5.5 The full environmental impacts (e.g. extraction, large power plants, emissions) caused by continued or extended use of fossil fuels need to be taken into account when assessing the comparative impacts of alternative renewable technologies.

5.6 Renewable energy should be deployed within robust environmental legal and regulatory frameworks and in a context of sustainable development in order to maximize synergies and minimize trade-offs between social, economic and environmental policy objectives. A carefully considered mix of renewable energy sources will be needed to deliver sustainable climate change mitigation.

5.7 Sustainable deployment of renewable energy requires strategic planning, applying tools such as Strategic Environmental Assessments and Environmental Impact Assessments, and a commitment to the mitigation hierarchy. Environmental assessments should consider the direct, indirect, cumulative and transnational impacts across the entire life-cycle. Where risks to biodiversity are high and proposed mitigation measures inadequate, the project should not go ahead.

5.8 BirdLife supports and promotes the local generation of energy to reduce emissions and deliver socio-economic benefits for local communities, while supporting nature conservation – especially in less developed regions of the world. However, the individual or cumulative impact of many small projects can compromise conservation efforts. This should be examined on a case by case basis, to try to balance benefits and risks.

5.9 Renewable energy developments must be appropriate to the site/region/country and subject to strategic planning and sensitivity mapping. Efforts should be made to avoid areas that are ecologically sensitive or of exceptional biodiversity value, such as Important Bird and Biodiversity Areas and Key Biodiversity Areas.

5.10 Governments and investors should ensure greater transparency and stakeholder engagement for renewable energy investments. Engaging stakeholders early in project design and planning can help avoid significant biodiversity impacts, reduce business risks and increase community support for projects. Environmental Impact Assessments (EIA) and monitoring reports should be made publicly available and accessible to all stakeholders.

5.11 Monitoring of socio-economic and environmental impacts should continue throughout the life-cycle of renewable energy projects and continuously inform project activities and policy responses.

5.12 Rigorous standards and safeguard measures, such as greenhouse gas emissions guarantees and environmental impact assessments, need to be developed based on sound research, advocated for, and put in place for all renewable energy developments.

5.13 Investors, businesses and governments should adhere to international and national standards and commitments to biodiversity conservation, and develop their capacity to effectively apply best practice environmental safeguards.

5.14 A precautionary approach should be adopted for renewable energy developments.

Sector specific policy messages[63]

Wind energy

5.15 BirdLife believes wind energy can be an important and sustainable source of renewable energy if well-planned. A wind farm's location is critically important in determining the likelihood of negative impacts on birds. Wind farms must be located, designed and managed so that there are no significant adverse impacts on birds of acknowledged national and international importance, or their habitats.

5.16 There should be precautionary avoidance of locating wind farms in Key Biodiversity Areas (including IBAs), with special attention given to offshore wind farms, and wind farms along migration flyways.

5.17 Independent rigorous research and monitoring should be implemented, funded by national governments and the wind energy industry, in consultation with relevant experts, to improve our understanding of the impacts of wind farms on nature conservation and to support mitigation technologies and lower impact turbines. This should be an iterative process that should inform decision-making, appropriate site selection and wind farm design.

63 These policy statements are specific to a type of renewable energy and are intended to supplement the policy messages 5.1-5.14, which apply to all renewable energy developments.

Common Eurasian crane Grus grus flock flying close to wind turbine, Germany, Wind energy can be an important and sustainable source of renewable energy. Strategic siting of wind farms can help reduce the likelihood of negative impacts on birds. (Image: Nick Upton/rspb-images.com).

Bioenergy

5.18 BirdLife believes that bioenergy only has a limited role to play in mitigating climate change. We are concerned that current development models and pathways tend to be overly optimistic and dependent on the mitigation potential of bioenergy, do not adequately consider the adverse impacts bioenergy deployment can have on biodiversity and food security and overestimate the availability of land and forests for energy production. BirdLife calls for all countries to work together to reach international agreement on honest and science-based protocols for accounting carbon emissions from bioenergy, taking into account the reduction of carbon stores and sinks and the displacement of existing uses such as food production.

5.19. BirdLife also calls for the adoption of stringent sustainability criteria for any public support for bioenergy and bioenergy policies to be designed to ensure that demand does not outstrip sustainable supply. Priority should be given to improved efficiency in current use of biomass, recovery of waste and residue streams and recuperation of degraded land.

Solar power

5.20 In principle, BirdLife supports the deployment of all current forms of solar power where this is in harmony with the natural environment. We strongly encourage the deployment of solar arrays on existing infrastructure such as car parks and building roofs, to minimise the risks posed to the natural environment.

5.21 BirdLife also supports the development of solar farms, provided these are sited in areas of low biodiversity value and appropriately designed and managed. We encourage developers to proactively manage such sites to benefit nature.

5.22 BirdLife calls for further research and monitoring to better understand the potential impacts of solar developments on birds and determine effective mitigation measures, and recommends that EIAs for all solar energy developments consult bird specialists.

Hydropower

5.23 BirdLife is concerned about the widespread impacts of hydropower schemes on biodiversity and believes that the ecological risks posed by hydropower are in many cases unacceptably high. While hydropower has a role to play in the renewable energy mix, its current deployment is having unsustainable impacts on the natural environment.

5.24 BirdLife calls for a prudent and sparing use of hydropower, applying the most environmentally benign technologies and best practice safeguards. Robust regulatory and legal environmental frameworks are a precursor for sustainable deployment.

Power Lines

5.25 For power lines to support renewable energy in a sustainable way, developments must be well-planned, taking into consideration location and design so that there are no significant adverse impacts on birds of acknowledged national and international importance, and their habitats.

6. Adaptation is urgently needed to build the resilience and reduce the vulnerability of nature and people to the current and expected impacts of climate change. Adaptation is an important element of conservation and sustainable development, and needs to be integrated into conservation and development planning and practice.

6.1 Addressing existing threats will increase the resilience of species, habitats and broader ecosystems to the current and future effects of climate change. Considerations of climate change only strengthen BirdLife's commitment to its existing conservation strategy and programmes, which address species, sites and habitats, ecological sustainability and people.

6.2 BirdLife recognises that conservation planning and action need to integrate adaptive strategies to moderate, cope with and, where possible, take advantage of climate change now and in the future.

6.3. The Important Bird and Biodiversity Area network must continue to function to conserve birds and other biodiversity, and to provide ecosystem services to people. To ensure this, BirdLife will continue to conserve, manage and monitor the existing IBA network, and expand it to include additional sites and corridors projected to become important as a result of actual and predicted changes in species distributions.

6.4 BirdLife strongly advocates biodiversity-friendly land use everywhere. Species should be helped to adapt by facilitating their movements through the countryside. This can be done by avoiding habitat fragmentation, increasing site connectivity and maintaining a biodiversity-friendly wider landscape.

6.5. Conservation planning and practice should be climate-smart to address the future impacts of climate change and be more strongly focused on the support and maintenance of ecosystem services generated by natural systems.

6.6 Conservation, restoration and sustainable use of biodiversity and ecosystem services can help people adapt to climate change. BirdLife strongly advocates for ecosystem-based approaches to adaptation (EbA) to be integrated into adaptation planning.

6.7 It is essential that measures taken to adapt to changing climate conditions, such as flood defences, hydrological projects or changes in agricultural systems, must not harm, but support the resilience of ecosystems and biodiversity. Measures that fail to do this can be maladaptive – perversely increase the vulnerability of nature and people.

6.8 BirdLife calls for national, regional and global legislation to provide for robust conservation measures in the light of climate change. A variety of adaptation responses may be appropriate, and these may differ across the world depending on local circumstances.

6.9 Much knowledge and information crucial to finding effective adaptation responses will come from the local level, where change is being experienced. This must be taken into account in planning and decision making, and further efforts should be made to enhance knowledge-sharing, optimising the use of recent advances in information technology that enhance the sharing of information generated at the local level.

6.10 More resources, capacity and research are needed on adaptation, in particular on integrated approaches for enhancing the resilience of social and natural systems at local and national levels.

6.11 Developed and major developing countries need to substantially scale up the level of financial and technical support provided to vulnerable countries, in particular Least Developed Countries and Small Island Developing States.

6.12 In some cases, it will be impossible to adapt to all the effects of climate change and there will be inevitable loss (e.g. of human lives, species or ecosystems) and damage (e.g. to infrastructure). In Warsaw in 2013 Governments adopted the Warsaw International Mechanism on Loss and Damage to start to address this issue. BirdLife calls for a strong commitment from governments to address loss and damage, including of biodiversity and ecosystem services, along with recognition that inadequate mitigation and insufficient adaptation will lead to more loss and damage and further need for financial and technical support to address this.

7. There is a need for further studies, including monitoring and modelling, to understand the impacts of climate change on birds and biodiversity, and how these relate to development and human livelihoods needs, particularly in developing countries.

7.1 BirdLife will continue to work collaboratively with other scientific organisations to monitor and assess current and potential climate change impacts on birds, biodiversity more generally, and ecosystem services, and to advise climate change responses. The need for further science should not be a reason for delaying action to reduce emissions or adapt; rather, uncertainty should be built into responses and adaptive management approaches established.

7.2 Models should be used to identify areas of vulnerability. These areas should be a priority focus for monitoring, from which appropriate responses can be developed. In particular, models of predicted changes in the climate envelopes of bird species will enable BirdLife to assess the impacts of climate change on the functioning of the Important Bird and Biodiversity Areas network, in order to recommend adaptive measures to help ensure that the network continues to function into the future. Ideally models would also be able to inform development and would resonate with those engaged with human adaptation and development needs, who are most closely linked to decision making in governments and development agencies.

7.3 BirdLife believes that citizen science, made readily accessible through online platforms, plays an important role in monitoring and enhancing our understanding of climate change and its impacts on birds and biodiversity.

7.4 There is a need for further detailed research and assessment of the potential impacts of renewable energy sources (including bioenergy, wind farms, solar and hydropower) on bird species, especially Globally Threatened Birds and IBAs.

8. BirdLife works with conservation and development organisations and industries that share the same concerns and solutions regarding climate change. Where possible, solutions should benefit both biodiversity and people, especially the poor, and should be agreed through inclusive, participatory processes that use local knowledge as well as sound science.

8.1 BirdLife believes that effective policy and action is informed by sound science and indigenous and local expertise. In particular, we recognise that communities have always adapted to changes in their ecosystems and therefore have essential knowledge to contribute in the development of policy and action for climate change adaptation. We are committed to using participatory and inclusive processes that engage with local people, their knowledge and capacity for change.

8.2 BirdLife recognises that climate change and poverty are linked and neither can be addressed individually. Actions to mitigate and adapt to climate change can either enhance or erode natural resources and ecosystems. People living in degraded ecosystems are more vulnerable to the impacts of climate change, including through loss of livelihood opportunities and disasters. As such, BirdLife will promote a co-benefits approach in which policy and action for climate change mitigation and adaptation will aim to maximise on opportunities to benefit natural resources, ecosystems and human livelihoods.

8.3 BirdLife works in partnership with development and conservation organisations and industries that share the same concerns and solutions regarding climate change.

9. BirdLife is committed to reducing its own carbon footprint.

9.1 The BirdLife Partnership is committed to reducing its own carbon footprint. The primary focus is the reduction of direct emissions through efficient use of electricity and heating fuel, improving energy efficiency, and reducing carbon emissions from air travel. BirdLife's conservation work necessitates travel, including by air. However, BirdLife will invest, as far as possible, in greater use of and training in technologies which can potentially reduce travel, such as web-, phone- and video-conferencing.

9.2 Wherever possible BirdLife also aims to cut indirect emissions by sourcing its products and services (including energy) from companies that are offering low-carbon products or processes. BirdLife will explore using renewable energy sources for the generation of electricity, heating and cooling. This will not only reduce BirdLife's carbon footprint, but will encourage the companies and organisations with which it works to consider their carbon emissions and environmental impacts.

9.3 For all those direct emissions (from travel, office-running and other sources) that cannot be avoided, BirdLife will aim to pay towards activities which support the maintenance and enhancement of the carbon value of natural ecosystems, favouring projects that invest in conservation which prevents habitat loss.

References

Arvizu, D., P. Balaya, L. Cabeza, T. Hollands, A. Jäger-Waldau, M. Kondo, C. Konseibo, V. Meleshko, W. Stein, Y. Tamaura, H. Xu, R. Zilles (2011), *Direct Solar Energy. In IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation* [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

BirdLife International (2008), *State of the world's birds: Indicators for our changing world.* Cambridge, UK: BirdLife International. www.birdlife.org/sowb

BirdLife International (2013a), *BirdLife International Strategy 2013-2020*, Global Partnership Meeting. Cambridge, UK: BirdLife International.

BirdLife International (2013b), *State of the world's birds: indicators for our changing world.* Cambridge, UK: BirdLife International.

BirdLife International (2014a), *Important Bird and Biodiversity Areas: A global network for conserving nature and benefiting people.* Cambridge, UK: BirdLife International.

BirdLife International (2014b), One in eight of all bird species is threatened with global extinction. Presented as part of the BirdLife State of the world's birds website. www.birdlife.org/datazone/sowb/casestudy/106. Checked: 25/08/2015

BirdLife International and National Audubon Society (2015) *The messengers: what birds tell us about threats from climate change and solutions for nature and people*. Cambridge, UK and New York, USA: BirdLife International and National Audubon Society

BRE (2014), *Biodiversity Guidance for Solar Developments.* Eds G E Parker and L Greene. www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf

CBD (2009), *Connecting biodiversity and climate change mitigation and adaptation: Report of the second ad hoc technical expert group on biodiversity and climate change.* Convention on Biological Diversity. Montreal, Canada: Technical Series No. 41

CBD (2010), *COP 10 Decision X/33 Biodiversity and Climate Change.* Convention on Biological Diversity. www.cbd.int/decision/cop/?id=12299

CBD (2015), *COP Decisions: Biodiversity and Climate Change Decisions.* Convention on Biological Diversity. www.cbd.int/climate/decision.shtml

Chum, H., A. Faaij, J. Moreira, G. Berndes, P. Dhamija, H. Dong, B. Gabrielle, A. Goss Eng, W. Lucht, M. Mapako, O. Masera Cerutti, T. McIntyre, T. Minowa, K. Pingoud, (2011), Bioenergy. In *IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation* [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

FAO (2008), *Bioenergy, food security and sustainability – towards an international framework.* High Level Conference on food security. Rome, Italy: United Nations.

Foden, W., et al. (2013), *Identifying the World's Most Climate Change Vulnerable Species: A Systematic Trait-Based Assessment of all Birds, Amphibians and Corals*, PLOS one, vol. 8, issue 6

Hai, T. C. (2000), *Land Use and the Oil Palm Industry In Malaysia.* Malaysia: WWF.

Hole, D.G., S.G. Willis, D.J. Pain, L.D. Fishpool, S.H.M. Butchart, Y.C. Collingham, C. Rahbek and B. Huntley (2009), *Projected impacts of climate change on a continent-wide protected area network.* Ecology Letters 12: 420-431.

Hooijer, A., Silvius, M., Wösten, H. and Page, S. (2006), *Assessment of CO_2 emissions from drained peatlands in SE Asia.* (Delft Hydraulics report Q3943 2006).

Hötker, H., Thomsen, K.-M. and Jeromin, H. (2006), *Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation.* Bergenhusen: Michael-Otto-Institut im NABU.

Huntley, B., Green, R., Collingham, Y. and Willis, S. G. (2007), *A climatic atlas of European breeding birds.* Barcelona, Spain: Lynx Editions.

IEA (2013), Overview Global Tracking Framework, SE4ALL, www.iea.org/media/freepublications/oneoff/GlobalTrackingFrameworkOverview.pdf

IEA (2014), *World Energy Outlook 2014*, Released 12 Nov. 2014. www.worldenergyoutlook.org/publications/weo-2014/

IPCC (2014a), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

IPCC (2014b), *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Kagan, R., Viner, T., Trail, P., and E Espinoza (2014), *Avian Mortality at Solar Energy Facilities in Southern California: A Preliminary Analysis,* National Fish and Wildlife Forensics Laboratory

Knutson, T., J. McBride, J. Chan, K. Emmanuel, G. Holland, C. Landsea, I. Held, J. Kossin, A. Srvivastava, and M. Sugi (2010), *Review Article: Tropical Cyclones and Climate Change*, Nature Geoscience 3: 157-163, DOI:10.1038/NGE0779

Kumar, A., T. Schei, A. Ahenkorah, R. Caceres Rodriguez, J.-M. Devernay, M. Freitas, D. Hall, Å. Killingtveit, Z. Liu, (2011), Hydropower. In *IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation* [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

Langston, R. H. W. and Pullan, J. D. (2003), *Windfarms and Birds: An analysis of the effects of windfarms on birds, and guidance on environmental assessment criteria and site selection issues.* Brussels, Belgium: BirdLife International

Millennium Ecosystem Assessment (2005), *Ecosystems and human well-being: synthesis*. Washington, DC: Island Press.

Royal Society (2014), *Resilience to extreme weather, The Royal Society Science Policy Centre report* 02/14 Issued: November 2014 DES3400

Schuster, E., L. Bulling, and J. Köppel (2015), *Consolidating the State of Knowledge: A Synoptical Review of Wind Energy's Wildlife Effects*, Springer 2015 Aug; 56(2): 300-31

Science Advisory Board of the US Environmental Protections Agency (2011), http://yosemite.epa.gov/sab/sabproduct.nsf/0/57B7A4F1987D7F7385257A87007977F6/$File/EPA-SAB-12-011-unsigned.pdf

Scientific Committee of the European Environmental Agency (2011), www.eea.europa.eu/about-us/governance/scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas/view

Turney, D., and V. Fthenakis (2011), *Environmental Impacts from the Installation and Operation of Large-scale Power Plants,* Renewable and Sustainable Energy Reviews 15 (2011) 3261– 3270

UNDESA (2015), Sustainable Development Knowledge Platform https://sustainabledevelopment.un.org/index.html

UNEP (2014), *The Emissions Gap Report 2014.* United Nations Environment Programme (UNEP), Nairobi

UNEA (2015), Resolution 1/8 *Ecosystem-based Adaptation in Resolutions and decisions* adopted by the United Nations Environment Assembly of the United Nations Environment Programme at its first session on 27 June 2014

UNFCCC (2010), Decision 1/CP.16 in *Report of the Conference of the Parties* on its sixteenth session, FCCC/CP/2010/7/Add.1 http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf

UNISDR (2015), *Sendai Framework for Disaster Risk Reduction 2015-2030*, Resolution Adopted by the General Assembly on 3 June 2015 A/RES/69/283 www.preventionweb.net/files/resolutions/N1516716.pdf

Urban (2015), *Accelerating extinction risk from climate change*, Science 1 May 2015: Vol. 348 no. 6234 pp. 571-573

Walston, L., Jr., Katherine E. Rollins, Karen P. Smith, and Kirk E. LaGory Environmental Science Division, Argonne National Laboratory Karin Sinclair, Craig Turchi, Tim Wendelin, and Heidi Souder (2015), *A Review of Avian Monitoring and Mitigation Information at Existing Utility-Scale Solar Facilities*, National Renewable Energy Laboratory prepared for U.S. Department of Energy, SunShot Initiative and Office of Energy Efficiency & Renewable Energy, April 2015

Wang and Wang (2015), *Impacts of wind energy on environment: A review*, Elsevier, Renewable and Sustainable Energy Reviews, 49, 2015: 437–443

Van der Winden, J., F. van Vliet, C. Rein, and B. Lane (2014), *Renewable Energy Technology Deployment and Migratory Species: an Overview*, commissioned by: International Renewable Energy Agency, Convention on Migratory Species, African-Eurasian Waterbird Agreement and Birdlife International, UNDP/GEF/Birdlife MSB project

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