

Annex 2: RSPB Adaptation Assessment: a framework for embedding climate change into nature conservation

Introduction

Nature is responding to climate change. It's well catalogued - in [LWEC's 2015 biodiversity and climate change report card](#), for example. This gives us two key questions – how will our nature conservation interests be affected by climate change, and what should we do in response?

To answer these questions, and start to embed climate change in our conservation work, the RSPB has developed a framework for assessing adaptation needs. This is straightforward to use, requires only a little climate change knowledge and, if undertaken for several areas of work, provides clear, consistent outputs that build to form an organisation's adaptation programme. It's framed around eight steps, with a workshop structured to bring people together to discuss the implications, and to complete four output tables which capture the thinking and results of the structured discussions.

Our adaptation assessment tool can be used with any level of data and information. We've used the tool principally at a more generic level with largely qualitative information. It doesn't require GIS and electronic datasets, yet these can be used in the analysis. The tool offers a methodology towards embedding climate change as an ongoing element of work programmes, rather than to produce one-off climate change reports. We've taken this approach because we now have to live with ongoing change, with considerable uncertainty about impacts and responses – we'll need to keep thinking about, and re-appraising, climate impacts throughout our working lives.

We've used this adaptation assessment framework across our Futurescape landscape partnerships – and also for other interests, including policy and nature reserves. It's widely applicable, practical and effective – so we are keen for its wider use among conservation partners.

Eight steps to adaptation

There's a logical sequence of eight steps to plan and implement adaptation:

1. Identify your broad objectives / activities / operations
2. Find out how climatic conditions, relevant to your activities, are expected to change
3. Consider how climate change may affect your objectives / activities / operations – from both direct, and indirect, impacts
4. Prioritise the key threats and opportunities from climate change
5. Explore actions to address the impacts of climate change on your objectives / activities / operations
6. Decide what actions should be taken and revise operational activities accordingly
7. Monitor and review effectiveness of action, progress of climate change, achievement of objectives
8. Communication – internal and external, spread best practice

We developed a workshop structure to guide discussion through these steps, with most of the time focussed on the impacts and adaptation actions. This workbook covers the practical organisation and techniques for running of the workshops, for example the 'carousel' method of circulating groups around all the topics for all the key discussions.

We've also developed four fill-in tables to guide and record the discussions and to ensure the required information is captured from the workshops in a consistent way.

Each of the steps is now explored in further detail below.

Step 1 Identify your objectives / activities / operations

What is the aim of this?

- To identify the range of your activities that climate change will affect

List the areas of your work and assess whether they may be affected by climate.

This may be wider than you first imagine. Examples include: managing site a, b, c for specific interests x, y, z; producing a spatial plan for an area; devising a species recovery plan; advising farmers on an agri-environment scheme; ecological research for species p; advising on a proposal for a new development; advocating for water policy; selecting species and provenance for habitat creation; acquiring a landholding; or preparing a strategic work plan.

Step 2 find out how climatic conditions, relevant to your activities, are expected to change

What is the aim of this?

- To get a broad-brush understanding of how climate is expected to change, relevant to your activities

The first step is to gain a descriptive overview of the expected regional / local climate for your interests, for a 2°C average global increase in temperature (the '2°C world'), which is projected to be with us in around 25 years.

Focusing adaptation on the 2°C world has several benefits. It links with the mitigation and political worlds, where 2°C is the widely, politically accepted 'safe' limit of global temperature increase, to which the world's governments are agreed to limiting climate change. It provides a realistic medium term planning horizon. We know we will reach this level of climate change – we can accommodate changes to our plans for this world sooner or later, as time passes. It does away with the need to understand emissions scenarios and simplifies the climatic projections required to understand the future.

The 2°C world is nonetheless most likely a milestone, and not an endpoint: climate change will be with us for centuries, if not millennia. It's also therefore useful to spend some time assessing a 4°C world, for potential long term planning – worst case scenarios have us reaching this in the last quarter of this century. It's also a world we'd best avoid - so learning about a 4°C world may help to bring action on climate change mitigation.

What resources should I use?

- The Met Office Hadley Centre produces climate change projections for the UK – the latest, called UKCP09, were completed in 2009. These include projections based on global average temperature change, at 25 km resolution for key aspects of climate at 2°C, 3°C and 4°C worlds. It's important to use the range of conditions projected by the Met Office – the 10% and 90% probability levels describe the likely range for each variable.
- EA, SEPA: changes to river flows, sea level rise, flooding: mapped projections to be made available via the Intranet, if possible
- Marine Climate Change Impacts Partnership: Annual Report Cards on marine climate change and special topic reports; hub for coastal and marine interests
- IPCC AR5 reports provide the authoritative, global perspective summarising the science of climate change, impacts and adaptation

How should I organise the information?

This Table captures info from Step 2. Start with CC projections for 2°C average global temperature increase and expect these conditions from around 2035-2045. Under current emissions trends, we may expect 3°C average global temperature increase from 2065-2075 and 4°C potentially from around 2090. As our knowledge of climate change increases these timings may change.

Use the 10% and 90% probability levels in the UKCP09 projections to define the range of expected change.

Table 1: Projected climate change relevant to <name work area>:

	Mean global temp increase	spring	summer	autumn	winter	Annual
Temperature	2°C	1.5 - 2.5 °C	2 - 3 °C	2°C	0.5 - 1.5 °C	1.5 - 2.5 °C
	3°C		-	-		
	4°C		-	-		
Precipitation	2°C	+10 - 20%	-15-25%	-10 to +10%	+10-25%	-5 to +5%
	3°C					
	4°C					
Other e.g. SLR, growing degree days etc.						

For some work areas, it may be helpful to use more than one table – for instance, to cover different geographical areas for a national policy interest.

Step 3 Consider how climate change may affect your objectives / activities / operations

What is the aim of this?

- To understand how your key interests, objectives, activities are likely to be affected by climate change

This brings together Steps 1 and 2 in a qualitative assessment of how the changed climatic conditions of a 2°C world might affect your specific activities. You may wish to include potential impacts of extreme weather events in your assessment of climate change impacts. There is however little specific information on predicting extreme events, other than they are expected to become more common in the future. At this stage, restrict this assessment to a short descriptive overview of a few words– e.g. medium level water shortage expected in summer; high risk of sea level inundation; concerns about soil desiccation and animal heat stress; area of proposed development likely to be in only remaining regional wetland; etc.

The impact of climate change may have is assessed by combining the amount of exposure, and the degree of sensitivity, to new / projected climate conditions. Sensitivity may be due both to direct climate conditions, e.g. drying soil or hotter summer temperatures, and to a range of other factors, such as isolated or populations, reduced productivity, species interdependencies, etc. The impacts of climate change may have either negative or positive outcomes.

This step is split into two parts: the direct impacts and indirect impacts of changed climatic conditions:

- Direct impact: e.g. higher summer temperature, greater spring rainfall, increased storminess, longer growing season etc.
- Indirect consequences, from the effect of climate change's impacts on other associations / activities / operations that influence your activities /operations / objectives. The most common types of indirect are those from other sectoral interests - e.g. how changes in farming, water supply, development etc. will impact the conservation interest.

This stage is likely to identify areas requiring further investigation and research to better understand the impacts of future climate.

Resources

Discussion / consideration of the results from Step 2: mix of local knowledge, common sense and scientific studies

- Climate envelope modelling may help guide biodiversity changes associated with future climates
 - Guidance about using climate envelope modelling
 - Climatic Atlas of European Breeding Birds
 - Other species studies: e.g. European butterflies, MONARCH, BRANCH etc.
- The Natural England/RSPB Adaptation Manual provides impacts on both impacts and adaptation
- Site based studies: European IBAs, African IBAs etc.

- Scientific studies – a literature search may be appropriate for your interests
- National studies: e.g. the UK Climate Change Risk Assessment
- Relevant public sector bodies: EA, SEPA, regional climate change groups
- Relevant professional bodies – many will have taken steps to understand the impact of climate change on their sector / interest
- Local / regional CC studies / groups

How should I organise the information?

Two tables have been developed to guide through a step by step assessment and encourage consistency in assessments across the RSPB. One table records direct impacts, the other indirect impacts from likely adaptation or changes in other activities likely to influence our objectives. This split is important to explore origins and types of impact and to help target adaptation actions.

Table 2: Direct impacts of climate change to <name work area>:

Work objective	Key climate change impact	Consequences of changed climatic conditions	Impact on objectives: Threats and opportunities	Level of impact	Timescale of impact
<i>Breeding waders on Sussex lowland wet grassland</i>	<i>Hotter drier summers</i>	<i>Lowered summer water table</i>	<i>Hard dry ground for breeding waders June-July</i>	<i>Med</i>	<i>5-10 years</i>
		<i>Fire risk increases</i>	<i>Destruction of habitat</i>	<i>Med</i>	<i>From 2015</i>
		<i>Early / longer growing</i>	<i>Sward too dense for breeding</i>	<i>High</i>	<i>From 2025</i>
<i>Pest and diseases</i>	<i>Milder winters</i>	<i>Lower winter pest mortality</i>	<i>Increased pest populations likely to harm oak trees</i>	<i>Med</i>	<i>Now</i>
	<i>Longer warmer summers</i>	<i>Increased pest productivity</i>	<i>As above</i>	<i>Med</i> <i>High</i>	<i>5-10 years</i> <i>15-25 years</i>

Column 1 is populated by Step 1 of the assessment and column 2 from Stage 2 and Table 1.

Columns 3 and 4 are from this section of the assessment, Step 3.

Columns 5 and 6 are populated in Step 4 of the assessment. Column 6 estimates when the climate change impact is likely to have the level of impact level described in column 5, which can record increasing impact with increasing timescale

Table 3: Indirect impacts to <name work area> from external factors eg likely sectoral adaptation responses:

Climate change issue	Objective of external adaptation responses	Likely activities to achieve objective	Threats / opportunity to conservation objective / interest	Level of impact	Time of impact
Rising atmospheric CO ₂ concentration	Increase yield	Crop breeding including GM	Increased GM crop issues	Low	5-15 years
		Field management changes	Changing management may change conditions for farmland birds e.g. earlier, denser sward, changes in inputs etc;	Medium	10-20 years
		New crops	Depends on crops: threats and opportunities	Medium	Current / ongoing
Reduced summer water availability in East Anglia	Agricultural interests seek to secure water for farming	Research; political / public lobbying	Farm water demand displaces water used for conservation	High	10-20 years

Step 4 Identify key threats and opportunities from climate change

What is the aim of this?

- To prioritise the impacts of climate change for action. This should take into account both scale of change and timing likely to be required.

From Step 3, prioritise what the key implications of climate change are likely to be for your objectives / activities / operations. Prioritisation is based on the combination of degree of impact and timescale of impact. Assign three levels of priority for each assessment. Use high, medium and low levels for both likely threats and likely benefits. To assess the time frame for action, use Short, Medium and Longer Term (within the next five years, five to 15 years, 15 to 30 years). Remember also that there are likely to be opportunities as well as problems and threats from new climatic conditions.

You should also consider the urgency of taking adaptive action, and plan for the longer term action that may be required.

Consider also the influence of your locally changed situation upon the national, UK or international perspective (e.g. summer water stress contributing to regional wader population declines). Central co-ordination of this information will be needed to assess future achievement of national conservation targets.

How should I organise the information?

The outline assessment of impact and timescale is recorded in Columns 5 and 6 of Tables 2 and 3.

You are then likely to need to prioritise the list impacts to take forward to Step 5, considering adaptation.

Step 5 Explore actions to address the impacts of climate change

What is the aim of this?

- To explore options for effective adaptation.

Adaptation is all about taking practical action to achieve the best outcomes in a world of changing climatic conditions. This may be simple and straightforward in some cases, but in others it will require imaginative and flexible action. As well as considering actions required now, we all need to plan ahead for actions that may be required under particular future conditions.

This step therefore requires some consideration of whether your conservation objectives, and your strategic approaches to meeting those objectives, need revising. Timescales are also important to consider, both to allow time for the effective implementation of responses, and because climate conditions will continue to change: adaptation is a process of 'change management'. The columns in Table 4 take you through these considerations.

Two strategic directions. Adaptation actions fall within two broad categories: those designed to build resilience against climate change; and those to accommodate change. These are not mutually exclusive and actions for both can, and often will, be taken concurrently. In some cases they may even be the same thing: for example building stronger populations today, increases opportunities for dispersal to new locations with suitable climate conditions.

The early emphasis of adaptation is more likely to be focused on building resilience. This should not foreclose thinking about actions need to accommodate inevitable changes in biodiversity that climate change will bring, and how national objectives will need to be met through changes in local delivery. The balance of effort across these two types of action will be a key consideration for the success of many adaptation strategies over time, as climate change increasingly exerts its influence.

Exploring potential adaptation responses may address a range of different issues. Examples include:

- direct climatic change: e.g. micro-habitat, hydrological provisioning, windbreaks, shade planting etc.
- ecological issues: e.g. food sources, species associations, habitat change
- reducing non-climate stresses: e.g. over-grazing, disturbance, pollution
- encouraging distribution shifts e.g. increasing population strength to encourage dispersal, creating new habitat, providing ecological connectivity, etc.
- building adaptive capacity into existing systems: e.g. making provisions for future species distributions through spatial planning, considering potential future value of land proposed for a development for biodiversity and / or human adaptation (e.g. flood control).
- sustainability: both in terms of undertaking the initial response, and its contribution to social, economic and environmental sustainability

The impacts of climate change may change your objectives, particularly over a period of time. This is likely to reflect a shift in emphasis from increasing resilience of your conservation interests to climate change, to accommodating objectives to future climate conditions. Some actions to accommodate to future conditions may have long lead-in times, such as the creation or development of habitat to help shifts in species' distributions.

At the present time, the focus of climate change adaptation is expected to be given mainly to revising actions and strategies to meet existing objectives. Nonetheless thought should also be given to modifying objectives, as species distributions shift and local conditions change, influencing the type of habitat management, for example, that is both desirable and possible.

For example, building breeding wader populations at some south-east England sites may be achievable for the next 10 to 25 years, and be important to build strong, dispersing populations able to colonise newly suitable areas in the future. Longer term, this may be untenable at current locations, whose role in developing adaptation will subsequently change. Clear recognition of this development of objectives will help to guide both local and national adaptation planning.

Further information to guide adaptation actions and planning is given in the Annex.

How should I take this forward?

Developing adaptation actions is likely to be best considered by a group with a mix of expertise. It may also require and identify further research and so may be an ongoing process. Estimates should also be made for cost and time required to undertake actions.

Actions may be either generic or specific, for either a particular aspect of climate change, or for a particular impacted interest. Creating a central resource of ideas, knowledge and experience will help build efficiency across the RSPB's adaptation planning – see Steps 7 and 8.

How should I organise the information?

Table 4 brings together the key impacts of climate change on your objectives and summarises what should be done as consequence.

Table 4: Adaptation responses for <name work area>:

Impact, threat or opportunity	Objective of adaptation	Strategy to achieve objective	Key actions	Priority	Timescale to achieve adaptation
<i>Drier summers causing issues for summer breeding waders</i>	<i>Maintain strong breeding populations in current areas</i>	<i>Reduce abstraction pressure in catchment</i>	<i>Target farm irrigation demand / more suitable crops</i>	<i>Med</i>	<i>Changes needed by 2020</i>
		<i>Store more winter water on RSPB reserves</i>	<i>ID reserves, research potential landholdings, volumes, costs</i>		
		<i>Increase wetland areas in floodplains</i>	<i>Work with water management bodies to increase natural flood control</i>		
<i>Pest and diseases</i>	<i>Reduce pest damage</i>	<i>Reduce suitability for pest invasion</i>	<i>Research ecological resistance to pest invasion for xxx and yyy</i>	<i>Med</i>	<i>Results 3-5 years</i>
	<i>Reduce pest numbers</i>	<i>Pest eradication</i>	<i>Secure Defra policy / guidelines and action</i>	<i>High</i>	<i>Revised guidelines 2015</i>

Column 1 is populated from the fourth column of Tables 2 and 3, (direct and indirect impacts). You may want to summarise and/or amalgamate the information in those columns to produce a workable list of impacts that you can address.

Developing the strategic approach (column 3) may involve a wide range of approaches, policy, public relations, marketing, community and other responses, as well as direct conservation management responses.

Step 6 Decide what actions should be taken and revise operational activities accordingly

What is the aim of this?

- To agree and action the practical adaptation best able to meet objectives.

Prioritise adaptation actions and select those to be taken forward. This should include recognition of actions likely to be needed in the future, as well as those for early implementation.

Give particular focus to:

- No regrets actions that are robust across the range of expected future climate conditions
- Win-win actions that have additional benefits to core objectives, providing ecosystem based adaptation and/or services to other sectors e.g. flood control or carbon storage
- Involvement of partnerships for co-delivery
- Costs and opportunities for co-funding
- The sustainability of different options, aiming to choose, where possible, the most sustainable option.

Actions at this stage are likely to contribute to existing strategies, and be an embedding of adaptation and climate change into our current objectives. They will also help to develop our current strategies, for example, understanding species vulnerability to climate change will contribute to prioritisation of species in the species recovery strategy.

How should I organise the information?

Table 4 outlines your adaptation options. You should prioritise these options, and integrate appropriate responses in your strategies, actions and work programmes. This will probably include both the detail required for action that may be required over the next five years (or to 2020) as well as likely actions required thereafter (Medium and Longer Term as per Step 4), as climate change progresses towards a 2°C world around 2040. Any estimate costs may need to be assessed more thoroughly, and consideration given to budget requirements.

influencing the type of habitat management, for example, that is both desirable and possible.

Step 7 Monitor and review

What is the aim of this?

- To assess the effectiveness of the implementation and ongoing performance of adaptation actions as climatic conditions change and to modify adaptation actions as required.

Adaptation action should include devising monitoring requirements to test the effectiveness of the adaptation actions undertaken. This should assess the deployment of the actions themselves and their role as integral components of the wider workplan activities and objectives. A key objective of this monitoring will be to find out what adaptation actions work well, and so to be able share learning and expertise. Monitoring requirements should be integrated with the implementation of adaptation actions.

Biological monitoring of the results of adaptation actions will usually be picked up by, and integrated into, current national monitoring programmes. These may require some modification as climate change introduces new concerns and priorities, and potentially new time scales, into our work. The national monitoring schemes should thus also provide information to guide adaptation, providing information on habitat, population and distribution changes, as the influence of climate change increases.

How should I organise the information?

Set up regular review of monitoring results appropriate to methods and speed of change:

- develop adaptation actions as appropriate
- develop activities and objectives of the wider programme / interest as appropriate

Step 8 Communication – internal and external, spread best practice

What is the aim of this?

- To share experience and expertise on climate change adaptation and build capacity
- To build support and advocate for appropriate adaptation action.

Time constraints in the workshop programme allow only a short discussion on communications. Adaptation brings new problems to solve, and new expertise and experience gained. Discussing approaches and sharing experience helps to build more concerted and effective adaptation for nature.

Adaptation also provides some 'good news' stories for supporters and the wider public. Using ecosystem approaches for adaptation can help build awareness of the value of the natural environment. Adaptation also helps to make climate change become more real for more people, making responses to climate change more commonplace in society and helping to address feelings that climate change is too big and too distant to be able to do much about.

Summary statement

The tables record the discussion and thought processes of the workshop, yet its also useful to have a succinct report summarising climate adaptation. The following headings provide the essential structure for such a report, which ideally should be non-technical, and brief – two to four pages of A4:

- Two sentence overarching summary
- What are the key climate changes expected for a 2°C world? How different would a 4°C world be likely to be from this?
- What are the main changes that climate change is likely to bring?
- What current activities are helping to meet the challenges of climate change?
- What will we need to do differently because of climate change? Are there new things that we'll have to do to adapt successfully? What are the time frames for action, and who needs to be involved?

Butterfly bank under construction, RSPB Winterbourne Downs Nature Reserve, Wiltshire © Patrick Cashman/RSPB



Annex – some useful pointers towards successful adaptation

Five principles for adaptation to climate change are identified by the England Biodiversity Strategy¹:

- Maintain and increase ecological resilience
- Accommodate change
- Develop knowledge and plan strategically
- Integrate action across all sectors
- Take practical action now

Four things useful to consider, when starting to think about embedding climate change into work programmes:

- **Ongoing.** Adaptation is a continuing journey of progressive change over a period of years and decades. For example, nature conservation cannot just adapt to meet future, worst-case climate conditions – it has to provide suitable conditions for wildlife in the intervening years, too. While there may well be urgent, short term actions, adaptation also needs forward planning and investment of time.
- **Action now.** Anticipatory action is likely to be cheaper and more efficient and we should seek to avoid future emergency remedial action. While timescales for habitat creation are perhaps obvious, thinking ahead is important for less extreme adaptation actions too: for example having a sense of future direction helps steer partnerships, and allows time for developing appropriate adaptation.
- **Planning ahead.** There is considerable uncertainty in the detail of climate change projections, and of how biodiversity may respond. Yet the overall direction of change is clear, and we need to learn to make decisions in this context. Adaptation will need to address a wide range of conditions and so will require flexibility in our approach and in our decision-making, with recognition that we need room for error. We should expect to have less uncertainty for the near-future, than for further ahead.
- **Flexibility.** Biodiversity and ecosystems are naturally dynamic, which adaptation should recognise. Climate change will bring further change and dynamism to ecosystems, and this needs to be recognised, separately from natural background change. The chaotic nature of the weather may also cloud recognition of changing climatic trends, yet also emphasises that adaptation is likely to have to address a wide range of conditions
- **How will people adapt?** Considerations of societal and sectoral adaptation may help integrate environmental adaptation, through ecosystem-based approaches for adaptation and ongoing provision of ecosystem services.

¹ Climate Change Adaptation Principles: conserving biodiversity in a changing climate. Smithers *et al* Defra 2008

Some further points that may be useful in considering climate change adaptation:

- Climate change impact results from the combination of the amount of exposure, and degree of sensitivity, to different climatic conditions. Adaptation action may address these independently, or simultaneously.
- Vulnerability is a combination of the degree of impact, as above, and the potential for successful adaptation: effective adaptation will reduce vulnerability. Overall risk from climate change would include measures both of the degree of impact, and of vulnerability.
- Adaptation may either be autonomous (e.g. species moves location, or switches to a different food source) or externally delivered (e.g. conservation action, or societal response) or a combination of both (e.g. habitat enhancement to improve conditions for natural dispersal). Understanding what autonomous adaptation is likely will help guide our actions.
- Adaptation is likely to be ongoing - there is no known end-point for climate change – so early actions may eventually shift to different actions over time
- Uncertainty in knowledge about future climatic conditions, and about the response of both natural and human systems to climate change, means that actions must be appropriate to cover a range of future scenarios – ‘no regrets’ actions.
- Adaptation for biodiversity conservation will often be undertaken with other interests, which are also developing adaptation responses. Devising adaptation strategies and actions for biodiversity that contribute ecosystem based adaptation or benefits to other sectors, and are sustainable in a wide context, are more likely to be successfully adopted - ‘win-win’ actions.

Contact

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