



# **Climate change, wildlife and adaptation**

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**RSPB Climate Change Policy Team**

**for birds • for people • for ever**

# Climate change: how much, how fast?

- **Scale** greater than for many 100,000s years
- **Unprecedented *rate*** – order of magnitude faster
- **Future climate without precedent in evolutionary lifetimes**
  - 40% UK will have climate unlike any currently found here under UKCIP02 2050s High scenario
- **Profound impact on biodiversity / UK wildlife**
- **Mitigation is an important adaptation action**



# Ladislav Miko, EC Director DG Env B

- Biodiversity and climate change are two sides of the same coin
- It is impossible to solve biodiversity loss without addressing climate change
- It is impossible to solve climate change without addressing biodiversity loss
- Human existence and well being is based on biodiversity and ecosystem services
- Biodiversity adaptation is essential



# How climate change affects wildlife

- Changes in location of suitable climate space
- Changes in timings of seasonal events
- Impacts of extreme and unseasonal weather
- Changes in community ecology
- Changes in land management and land use
  
- Individual response: observation, models, palaeoecology
- Communities will not simply shift north



# The Climatic Atlas of breeding birds

## A Climatic Atlas of European Breeding Birds

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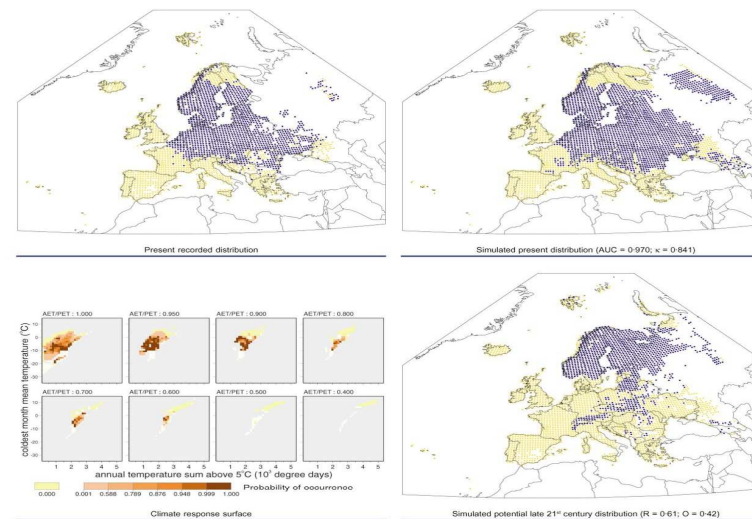


Sylviidae

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*Hippolais icterina*

Icterine Warbler



The Icterine Warbler breeds in the nemoral and southern boreal zones of central and eastern Europe. Its range, which extends from eastern France and Switzerland east to the Urals, and from the northern Balkans north to central Finland, is almost perfectly vicariant with that of its congener, *Hippolais polyglotta* (Melodious Warbler). Beyond Europe its range extends eastwards in a narrow band across western Siberia to the Ob<sup>2</sup> river, and it also breeds in north-west Turkey and northern Iran. It uses a variety of moist, open wooded and scrubby habitats, from lightly forested areas and forest margins to northern birch woods, riparian woodlands and even parks and gardens. It nests in a fork of a tree or bush and forages mainly amongst

the foliage of trees and bushes, often in the crowns of trees, occasionally flying out to take aerial prey. Its diet comprises mainly insects, although fruit is also taken in season. It winters in southern tropical Africa, from Angola to Mozambique and from southern Zaire and Kenya south to the northern Cape Province of South Africa.

This species breeds in Europe where annual temperature sum is between ca. 200 and 3000 degree days above 5°C, coldest month mean temperature is between ca. -20°C and 2°C, and seasonal moisture deficit is no more than moderate (AET/PET ≥ 0.6). Its coldest month mean upper limit varies systematically with temperature sum, from ca. -5°C at 300 to ca. 2°C at 2000 degree days.

The response surface model has a "very good" fit. Discrepancies include incorrectly simulated occurrences in the Pyrenees and Massif Central of France, northernmost Norway and Russia, several southern mountain ranges, including the Dinaric and Transylvanian Alps, southern Russia and Transcaucasia, although in the latter case the species has been recorded breeding in Azerbaijan. The simulated future potential distribution is shifted north-eastwards and markedly reduced in extent. Suitable areas are mostly in Fennoscandia, Russia and the mountains of central and eastern Europe, more than half of the present range being simulated as no longer suitable.

# Climatic bird atlas: key findings

- Centre of potential future range moves nearly 550 km NE average for all European breeding birds
- Predicted climate space contracts by 20% average
- 40% average overlap of current and future climate space
- 75% species likely to suffer range declines
- Projection details vary with different GCMs and climate scenarios: but main conclusions similar
  
- Thomas: 15-37% global sample extinction path by 2050
- Malcolm: 25 hotspots lose 56 k plants, 3.7 k vertebrates



# Twin track nature conservation response

- **Resilience**
  - Build strong populations
  - Reduce non-climate pressures
  - Develop management to reduce climate impacts
- **Accommodation**
  - Help wildlife track climate space
  - Coherent network of effective protected sites
  - Sustainably managed, more permeable landscapes



# Today's conservation: relevant & vital

- **Healthy populations**
  - Essential for future challenge
  - Essential to get to the future
- **Current actions: vital start to adaptation**
  - Halt biodiversity loss by 2010: Gothenburg target
  - Many other pressures on wildlife
  - UK shortfall: 1,149 BAP species with threat / concern
  - No UK marine protected area network
  - Increase current activity



# Biodiversity targets

- Important benchmark – identify risk, define actions
- Species targets still valid: reinforce healthy populations
- Revise actions, strategies to meet targets
- Revise targets through monitoring
  
- Habitats: stable communities unlikely
- Develop measures of habitat quality alongside species
- Current targets for extending habitat remain essential
- Revise targets through monitoring



# Maintain focus on species

## Many good reasons to maintain species focus

- Individualistic response, individual action
- Ecological function may not require wide biodiversity
- Components of communities, ecosystems
- Public interest, focus, support
- Moral - and legal - responsibility
- It works
- **Develop species conservation**
  - Location and scale
  - Key species to drive habitat, ecosystem action
- **Over time, revise key species: which is not new!**



# Bitterns – focus for reedbeds



- **Coastal sites at risk**
- **Research, population models**
  - Few females: Minsmere, Suffolk sites driving population expansion
  - Habitat needs and dispersal detail
- **Strategic development of site network**
  - Spatial – size and distance
  - Timeframe – creation and sea defence
- **Boomers at Lakenheath, Sedgemoor**
- **Good for other reedbed species**
  - Otter water vole bearded tit marsh harrier



# Protected areas

- **The need for wildlife strongholds remains, increases**
- **Special places: land use, biodiversity priority**
- **Adapt management, resilience and accommodation**
  - By 2015 need to be optimising biodiversity for 2050s
  - Assess impacts, risks, potential futures: species changes
- **Protected areas will increasingly need to:**
  - Buffer biodiversity – climate change and other problems
  - Drive population strength and dispersal
  - Accommodate changing interest, land-use refugees
  - Provide strategic locations for shifting populations
- **Increase size and number of protected areas**



# Landscape scale action

- **Landscape – the context for conservation action**
  - Species, habitats, protected areas, land uses
  - Breeding, wintering, dispersal
  - Integrated, targeted approach: eg WFD catchments
- **Facilitating large scale species movement, relocations**
- **Ecological connectivity**
  - Fragmentation, dispersal, ‘matrix’ countryside
  - Corridors and stepping stones: functional links?
  - Habitat features: hedges, ponds, river banks, etc
- **New approaches? – re-wilding?**



# Adaptation with other sectors

- **All activities / interests are starting to adapt**
- **Develop adaptation with other sectors**
  - Potential for conflict
  - Potential for synergies
- **Biodiversity / environment underlying theme**
  - Fundamental importance
- **Government role and recognition**
  - Defra Adaptation to Climate Change; EC Green Paper
- **Develop partnership projects: eg SCaMP**



# SCaMP: RSPB and United Utilities



- 39 farms in Bowland and Peak District
- Improve water quality, wildlife, landscapes
- Land management and habitat restoration
- Over-grazing, over-burning, over-drainage
- Hay meadows, moorland, woodland, bogs
- Economic, sustainable farming
  - grazing needs
  - new farm buildings & waste facilities
- Multiple benefits – including carbon sequestration
- Public and private funding
  - Ofwat £9 m



# Adaptation & ecosystem services

- **Semi natural habitats provide ecological services**
  - Provisioning, regulating, cultural, supporting
  - Valued at hundreds of million pounds
- **Adaptation should maintain, restore these services**
  - Pitt review natural processes and flooding
  - Pollination, food, materials, water quality, tourism, health
- **Opportunities and shortcomings for biodiversity:**
  - Cross sectoral, multi benefit, env recognition
  - Ecosystems services won't safeguard all biodiversity



# Uncertainty – a new dimension

- Central theme to adaptation
- Assess futures: impacts, scenarios, risks, opportunities
- Adaptive management: learn from experience – including other countries
- No- and low-regret actions to cover range of futures
- Visionary, flexible, pragmatic, active
- Window of higher predictability: 2040s vs 2080s
- Research to reduce uncertainties, monitoring



# Wildlife laws: framework for action

- **Legal underpinning works for climate change:**
  - RSPB 2005 legal advice
  - Birds Directive study
  - Natura 2000 network
- **EC Birds, Habitats Directives**
  - Articles to create more permeable countryside
  - Protected area designation features, locations can change
  - Framework for development proposals
  - Litmus test for sustainable living
- **More focus to plan and fund their full and imaginative implementation**

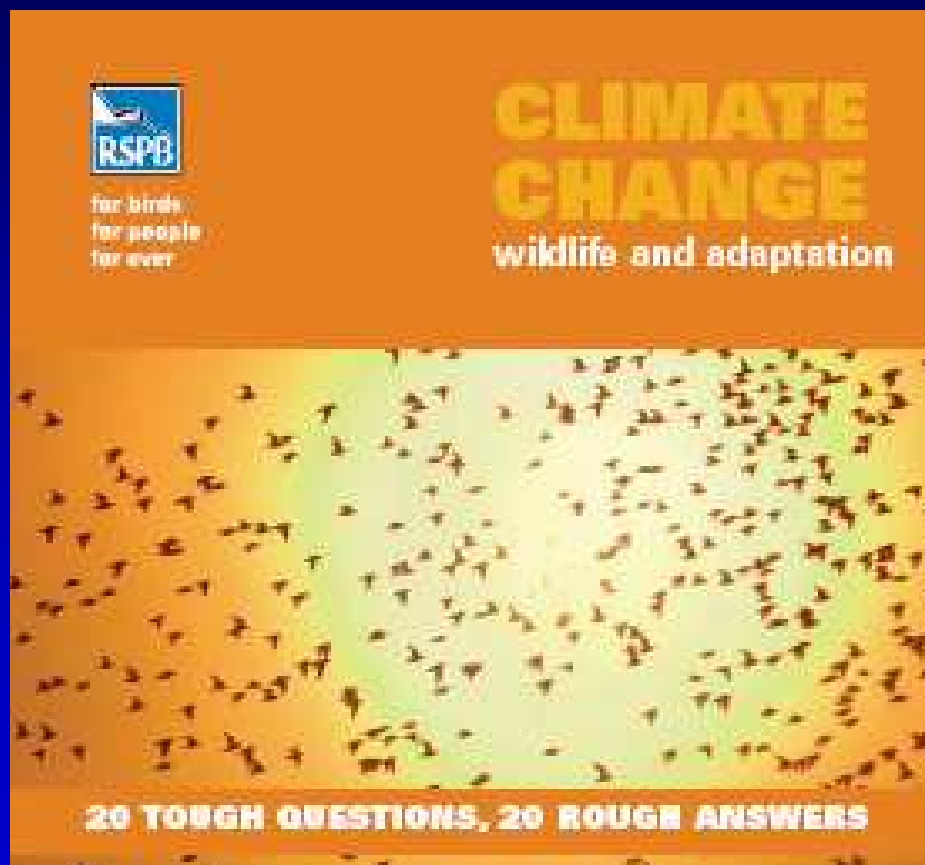


# In summary

- **Fundamental importance of biodiversity adaptation**
  - Human wellbeing depends upon the environment
- **Resilient populations of wildlife in healthy habitats**
  - Action now, increase effort
- **Develop, integrate conservation at the landscape scale**
  - Species, protected areas, habitat recreation: more land
  - Accommodate the movement of biodiversity
- **Cross sectoral, stakeholders, multiple benefits, government**
- **Biodiversity conservation and sustainability safeguards in all adaptation**
  - Ensure healthy ecosystems for wildlife and people



# 20 tough questions, 20 rough answers



- [www.rspb.org.uk](http://www.rspb.org.uk)

