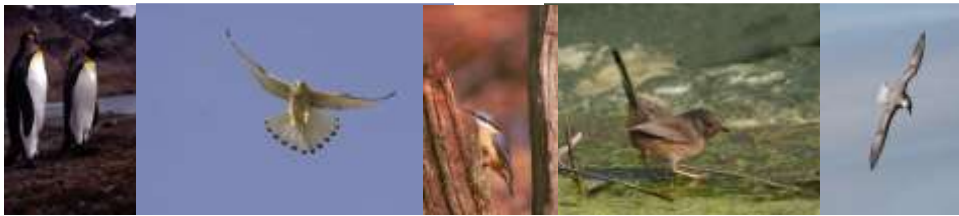


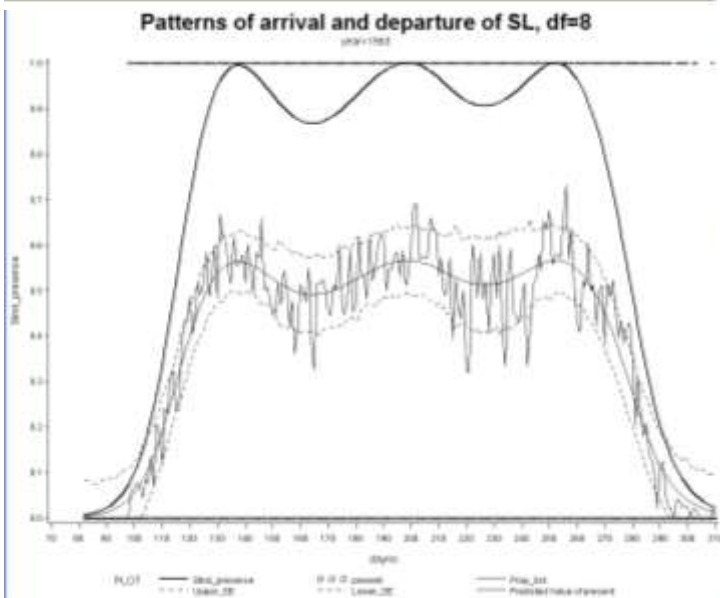


Climate change impacts on migratory species

James Pearce-Higgins
Principal Ecologist – climate change

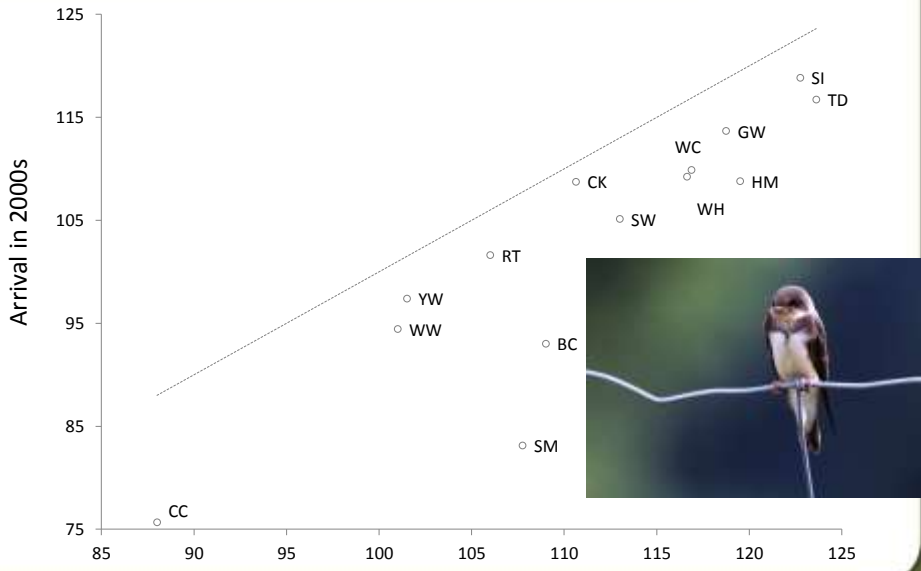


Impacts



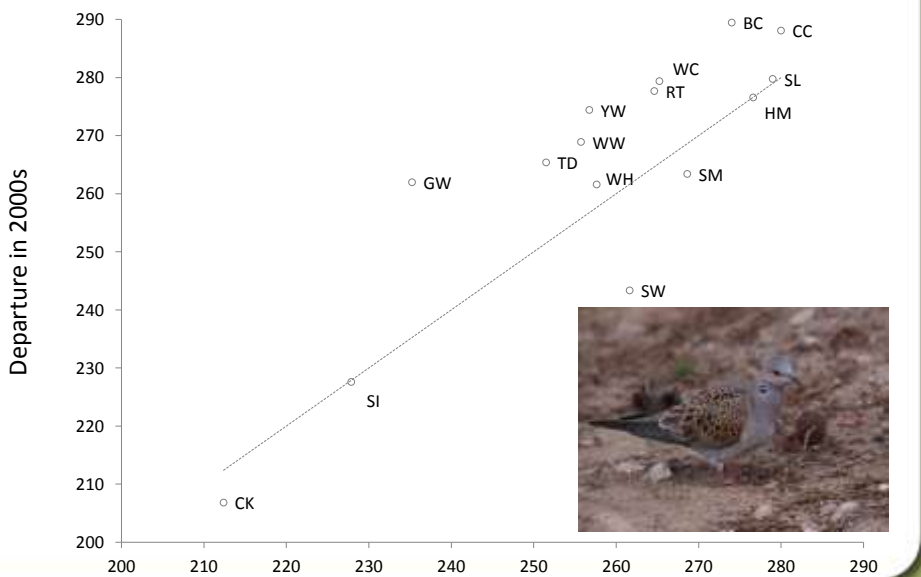
Newson et al. (unpubl.)

Impacts



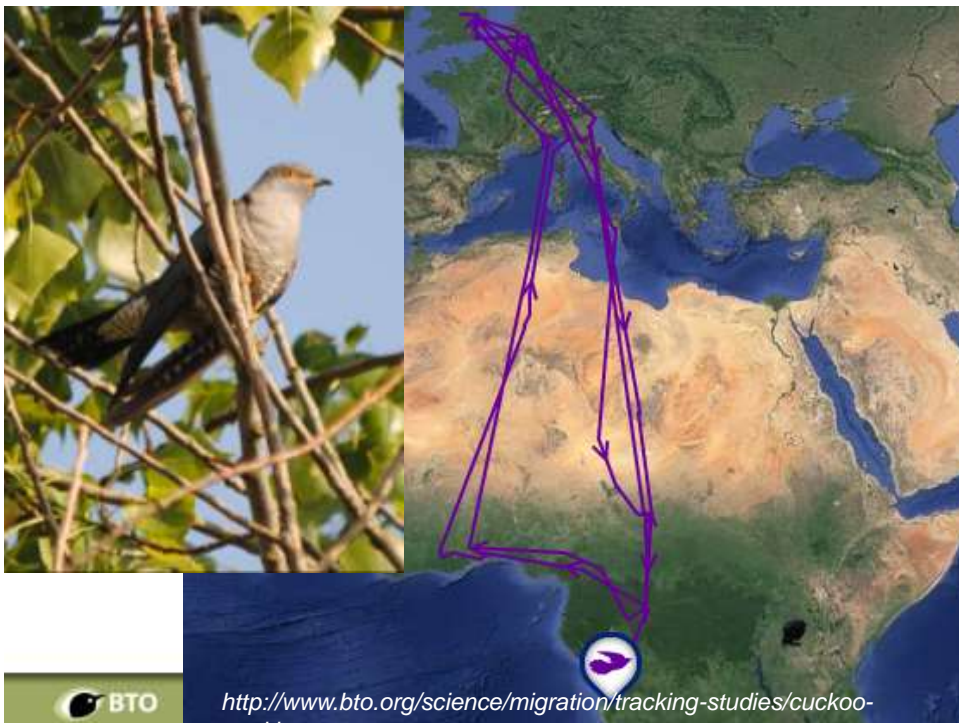
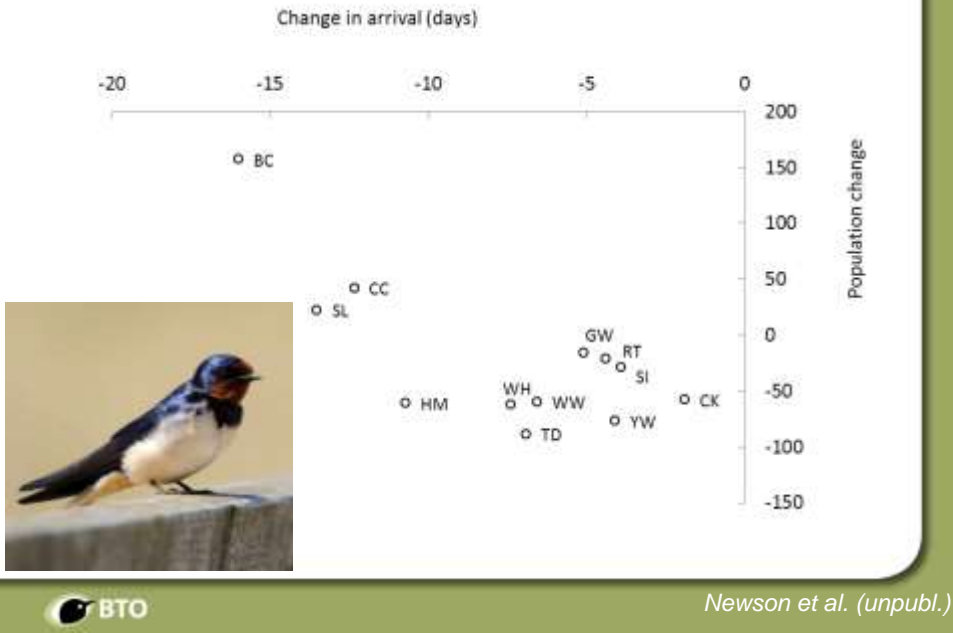
BTO Arrival in 1960s *Newson et al. (unpubl.)*

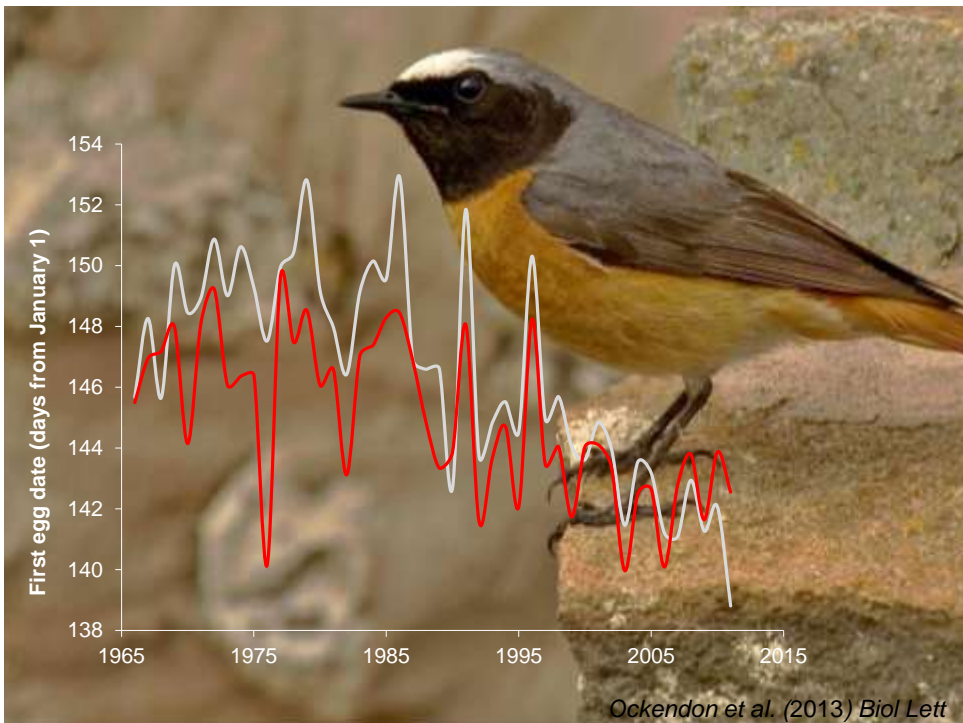
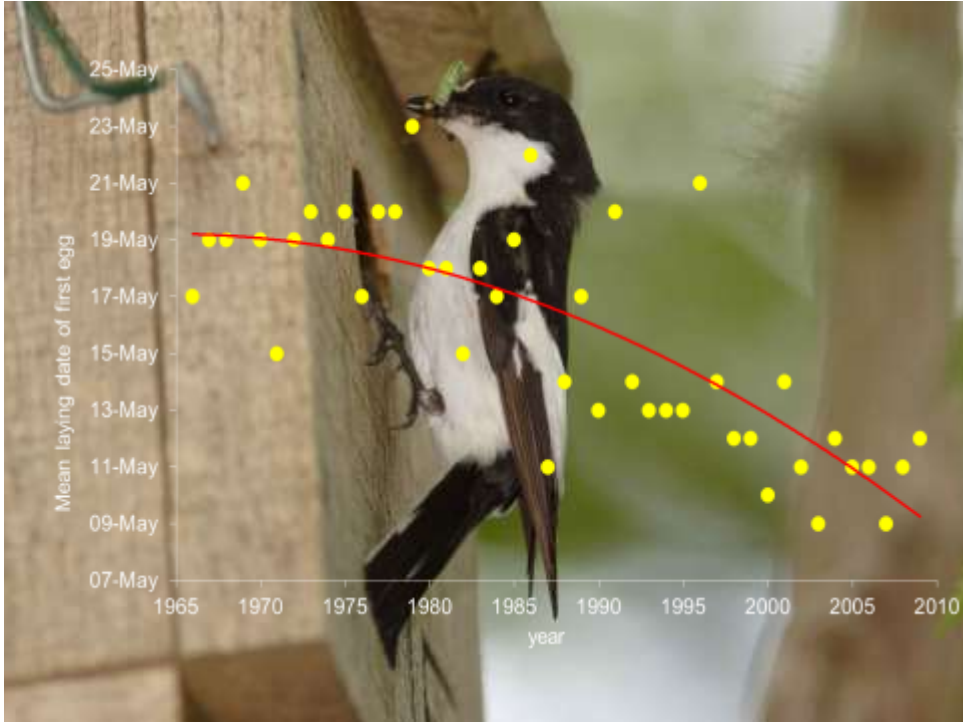
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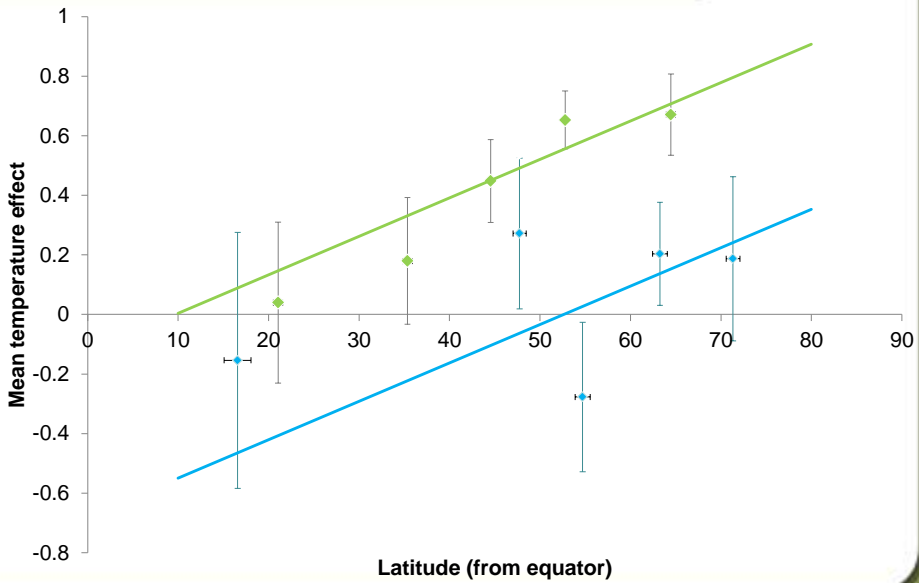
BTO Departure in 1960s *Newson et al. (unpubl.)*

Impacts



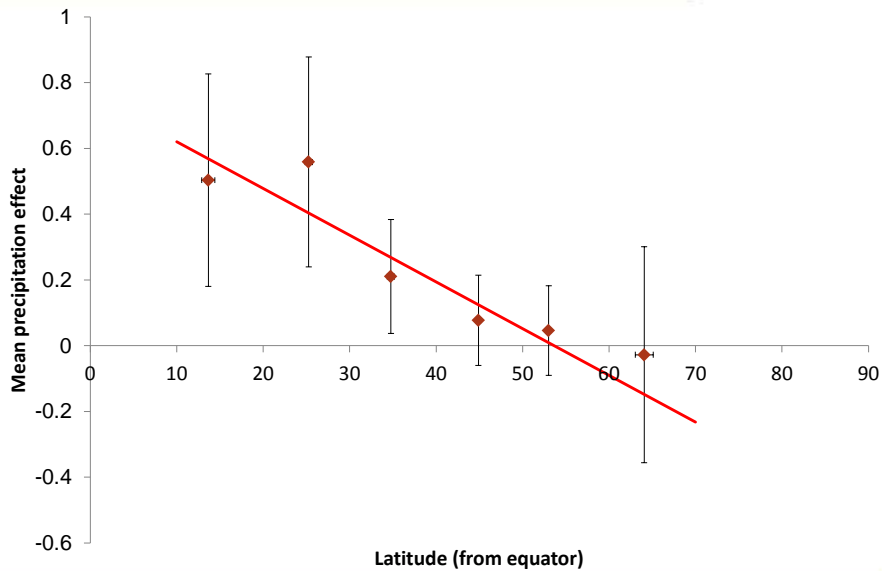


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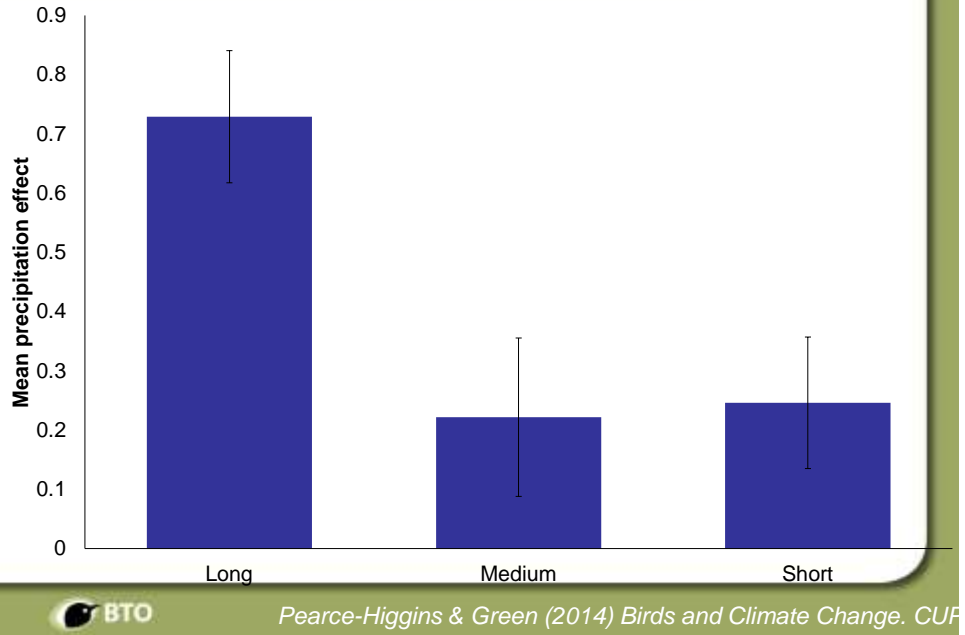
Pearce-Higgins & Green (2014) *Birds and Climate Change*. CUP

Impacts

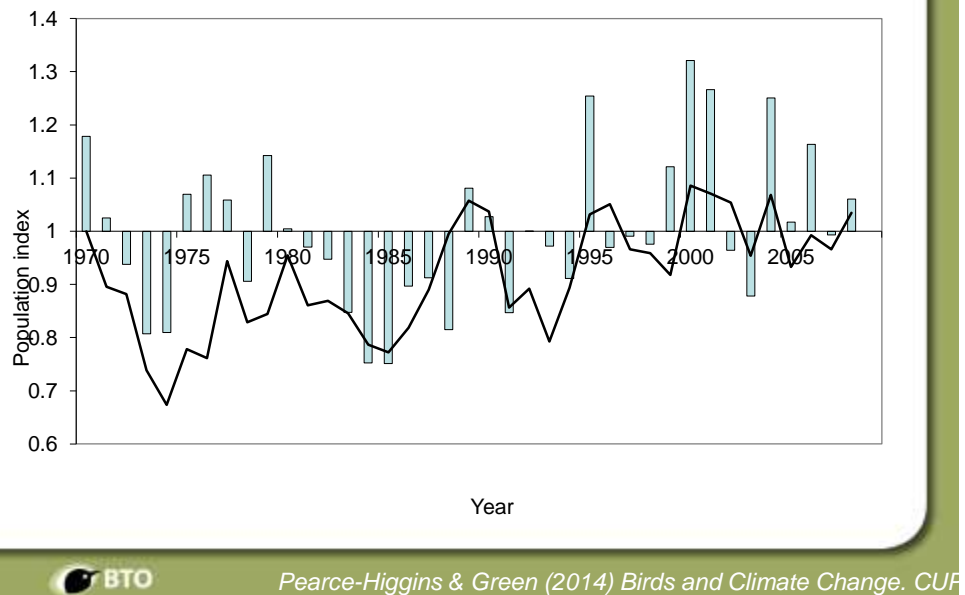


Pearce-Higgins & Green (2014) *Birds and Climate Change*. CU

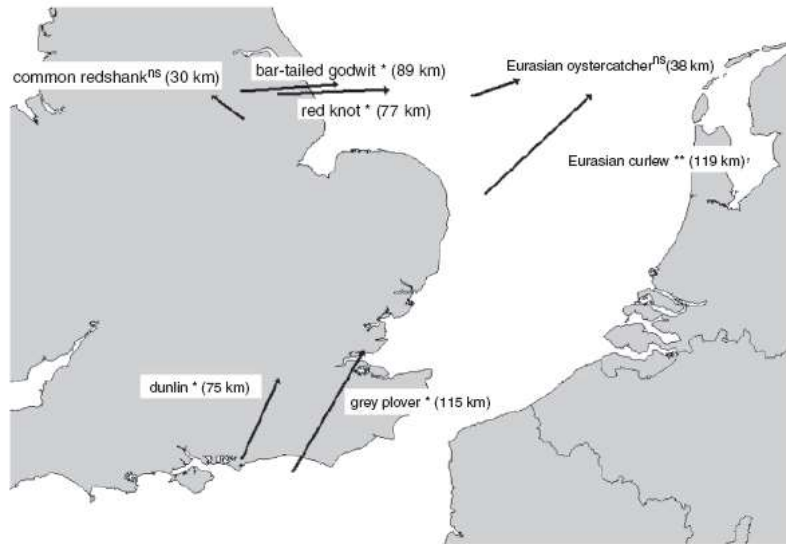
Impacts



Impacts

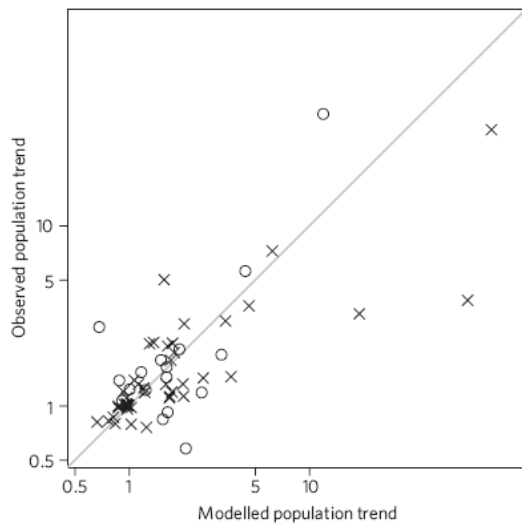


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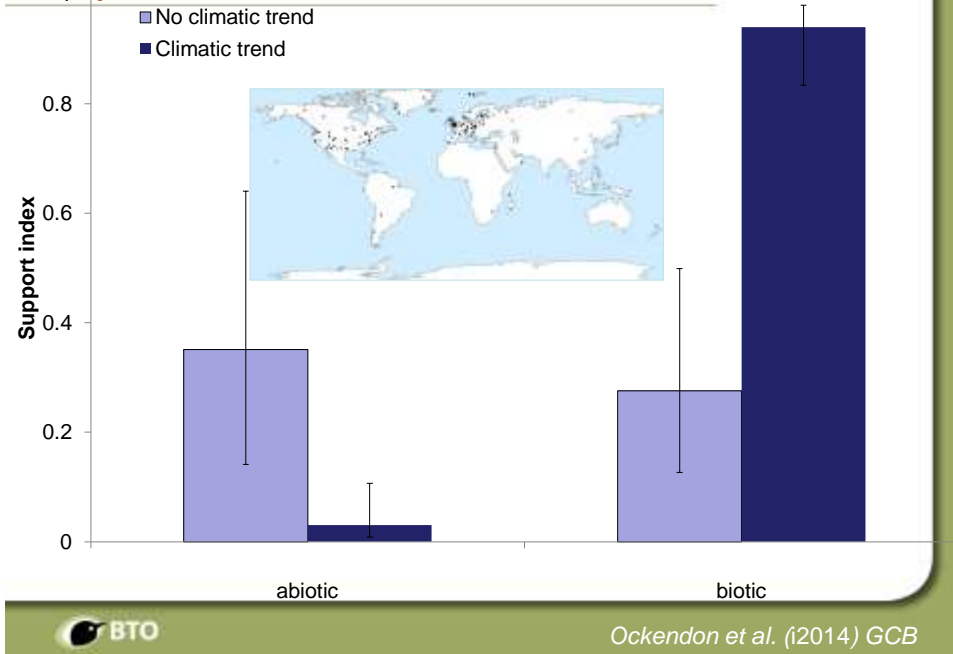
Maclean et al. (2008) GCB

Impacts

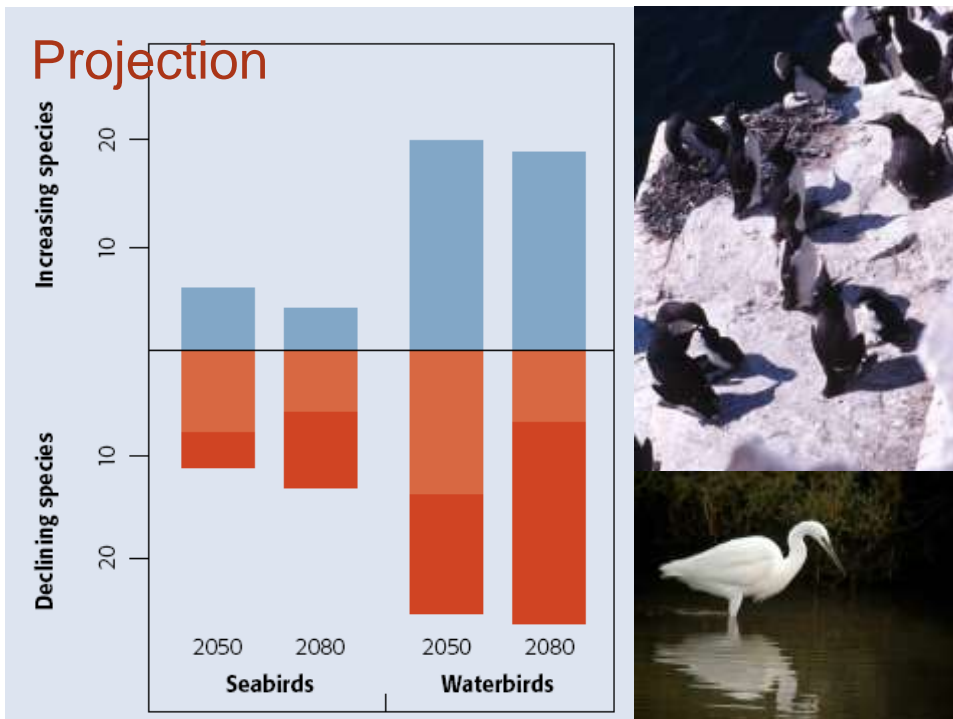


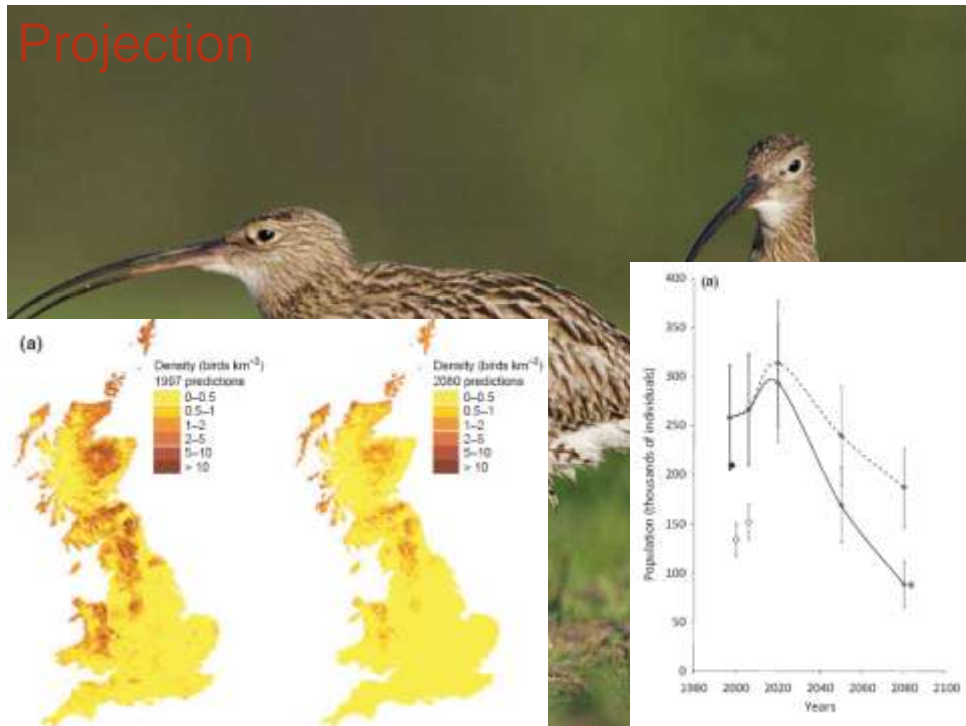
Johnston et al. (2013) Nature Climate Change

Impacts



Projection



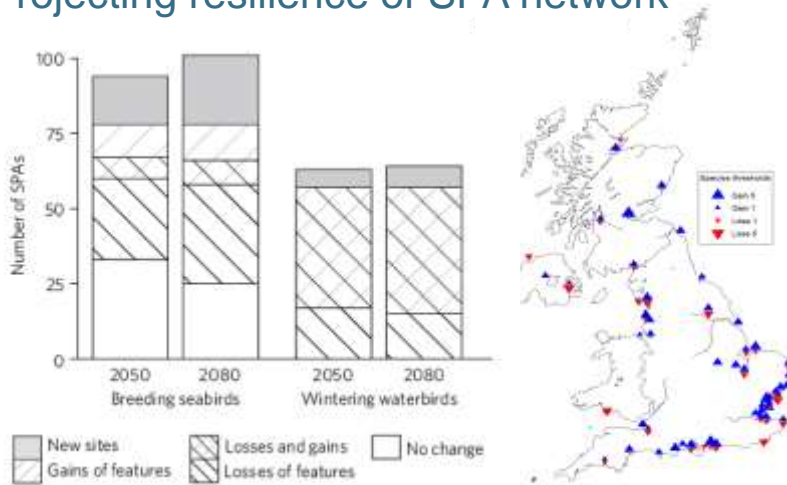


Projection

		Risk of decline			
		Very high	High	Moderate	Low
Benefit of expansion	Low	Cuckoo, Curlew, Lesser redpoll, Red grouse, Ring ouzel, Tree pipit, Twite, Wood warbler, Garden warbler, Peregrine, Redstart, Short-eared owl, Whinchat, Barnacle goose	Grey partridge, Hen harrier, Lapwing, Marsh tit, Dipper	Black grouse, Spotted flycatcher, Yellowhammer, Canada goose, Merlin, Treecreeper	Bullfinch, Corn bunting, Dunnock, House sparrow, Linnet, Reed bunting, Skylark, Song thrush, Starling , Tree sparrow, Turtle dove, Yellow wagtail, Blackbird , Buzzard, Collared dove, Coot, Feral pigeon / Rock dove, Green woodpecker, Great-crested grebe, Great spotted woodpecker, House martin, Kestrel, Little grebe, Mallard, Nuthatch, Oystercatcher, Redshank, Rook, Stonechat, Stock dove, Whitethroat, Wren
	Moderate	Willow tit			
	High	Stone Curlew		Hawfinch, Goshawk	Black-tailed godwit, Cirl bunting, Lesser-spotted woodpecker, Savi's warbler, Woodlark, Barn owl, Red-backed shrike, Manx shearwater, Water rail
	Very high			Gannet	Bittern, Corncrake, Grasshopper warbler, Herring gull, Nighthawk, Roseate tern, Spotted crane, Black redstart, Cormorant, Cetti's warbler , Lesser black-backed gull

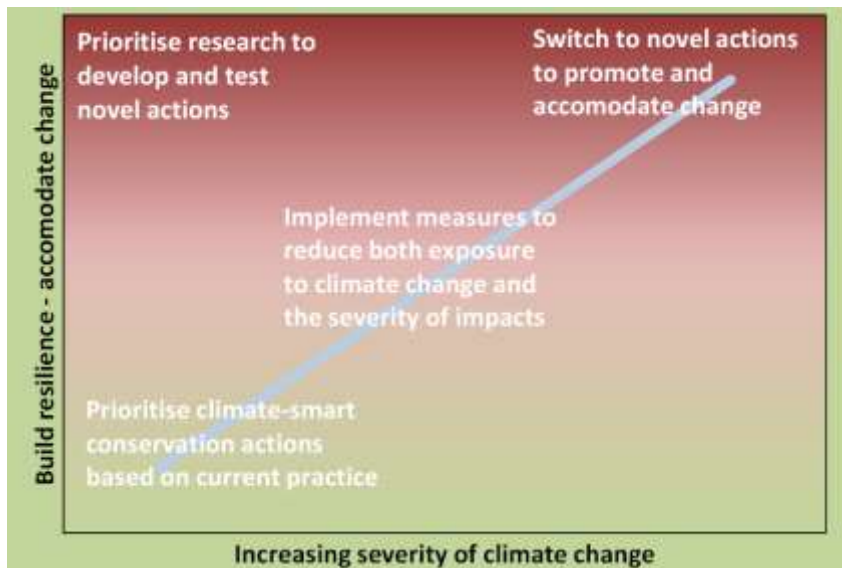
Adaptation

• Projecting resilience of SPA network



Johnston et al. (2013) *Nature Climate Change*

Adaptation



Pearce-Higgins & Green (2014) *Birds and Climate Change*. CUF

Conclusions

- Increasing evidence of climate change impacts on populations, distributions and communities (but cc is not only driver).
- Warming drives impacts at high latitudes, but water availability in the tropics
- Impacts will increasingly occur through altered interactions between species, rather than direct effects
- We can use models (with caveats) to assess potential future impacts and species' vulnerability to climate change.
- Increasing evidence in support of protected areas benefiting species in the face of climate change
- Site-based management can also increase resilience of populations to some climate change
- But with increasing climate change, it will be harder for species to adapt.

