# Modelling the winter distribution of Aquatic Warbler *Acrocephalus paludicola* with GIS analyses

# Aquatic Warbler
# *Acrocephalus paludicola*

- most threatened passerine of continental Europe

- one of only 17 globally threatened bird species in Europe

- classified as vulnerable by Birdlife International

# Breeding sites

- lowland marshes, mostly large open sedge and *Cladium* fen mires with water less than 10 cm deep

- massive draining projects in breeding area resulted in estimated loss of 80-90% of the total breeding habitat

W S Paton (RSPB Images)
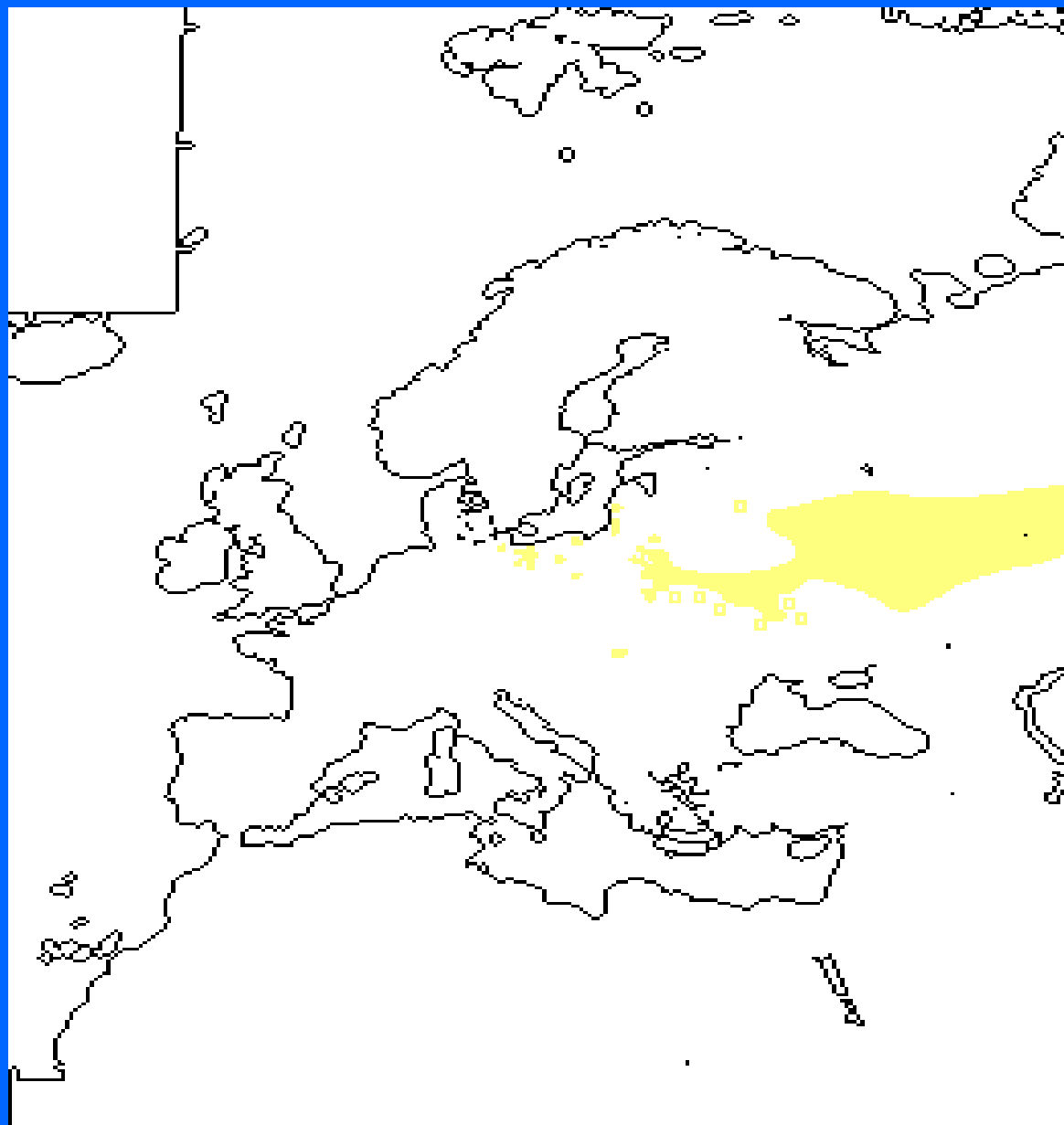
Current breeding range

# Protection of breeding sites

- key breeding sites in Belarus, Germany, Hungary and Poland are protected

- newly discovered and protected populations in Belarus effectively doubled known populations (from about 10,000 to 20,000 singing males)

- But what about wintering sites in West Africa?

# Data on African wintering sites

- contacted: BirdLife Partners and BirdLife Representatives, Wetlands International Country Co-ordinators, Tour Operators, members of the African Bird Club  private individuals with expert African knowledge, ringing schemes, natural history museums

- searched: literature, grey literature, internet

- result: 97 records in Middle East and Africa
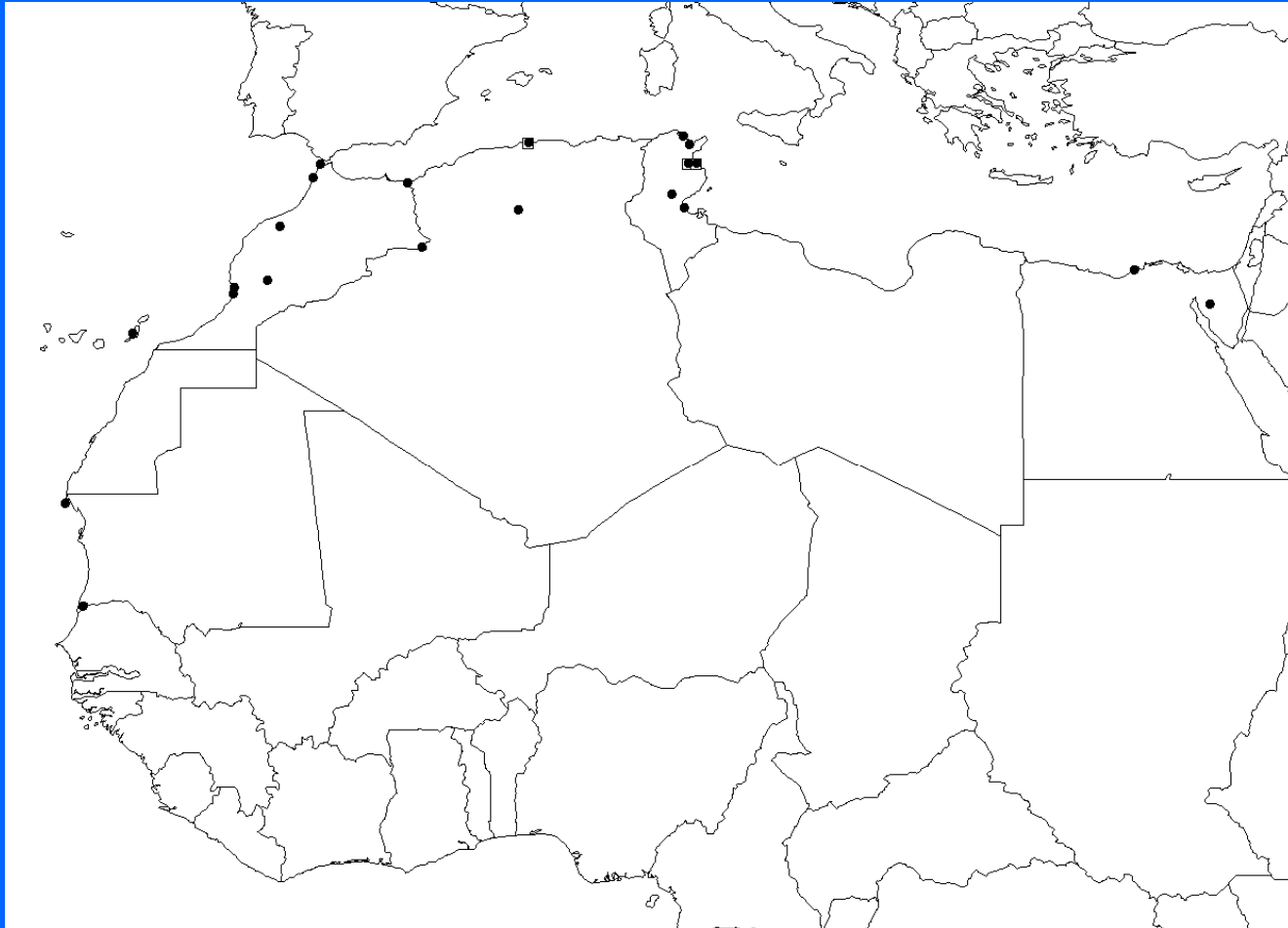
# September - October
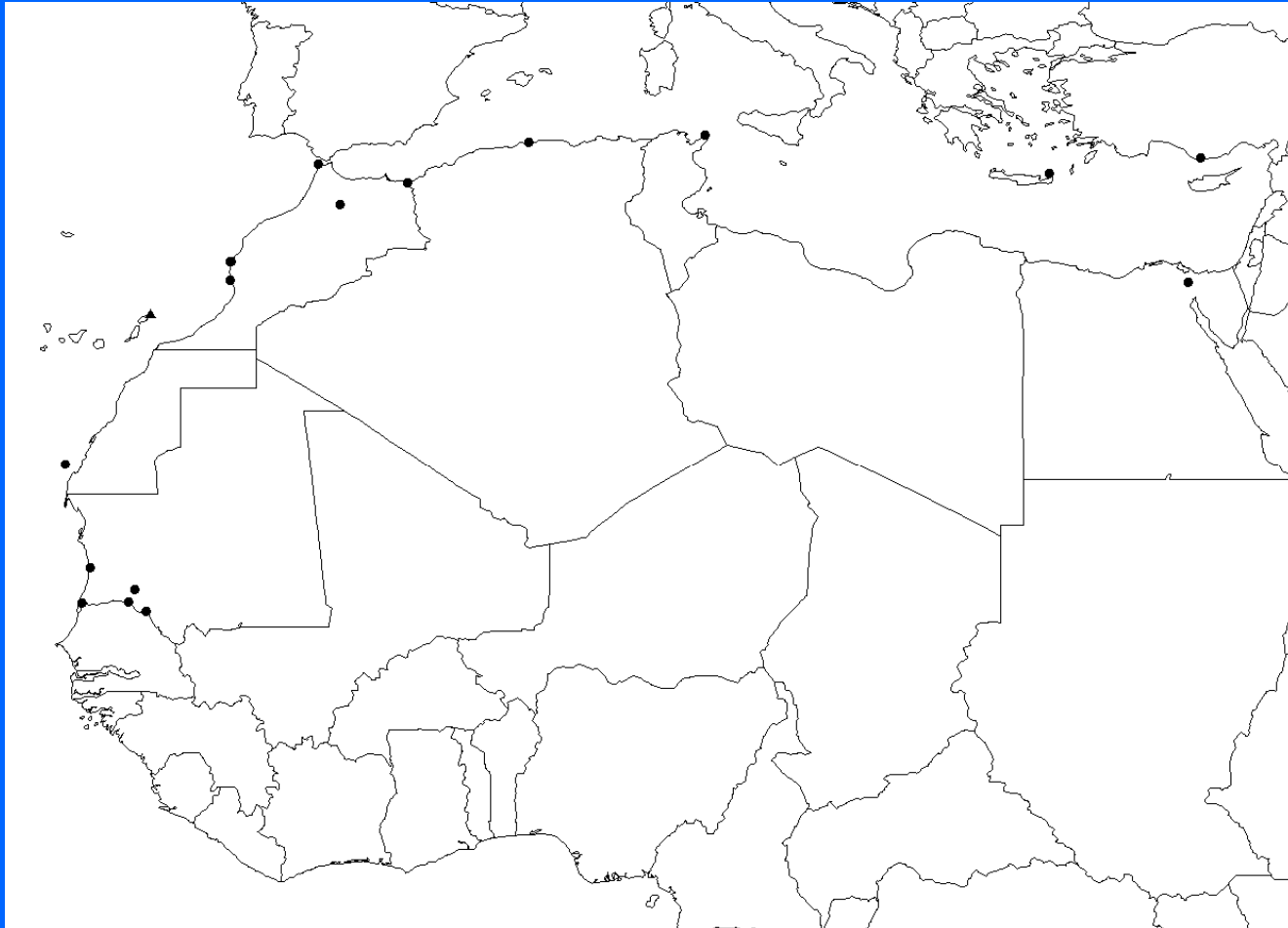
# November - December
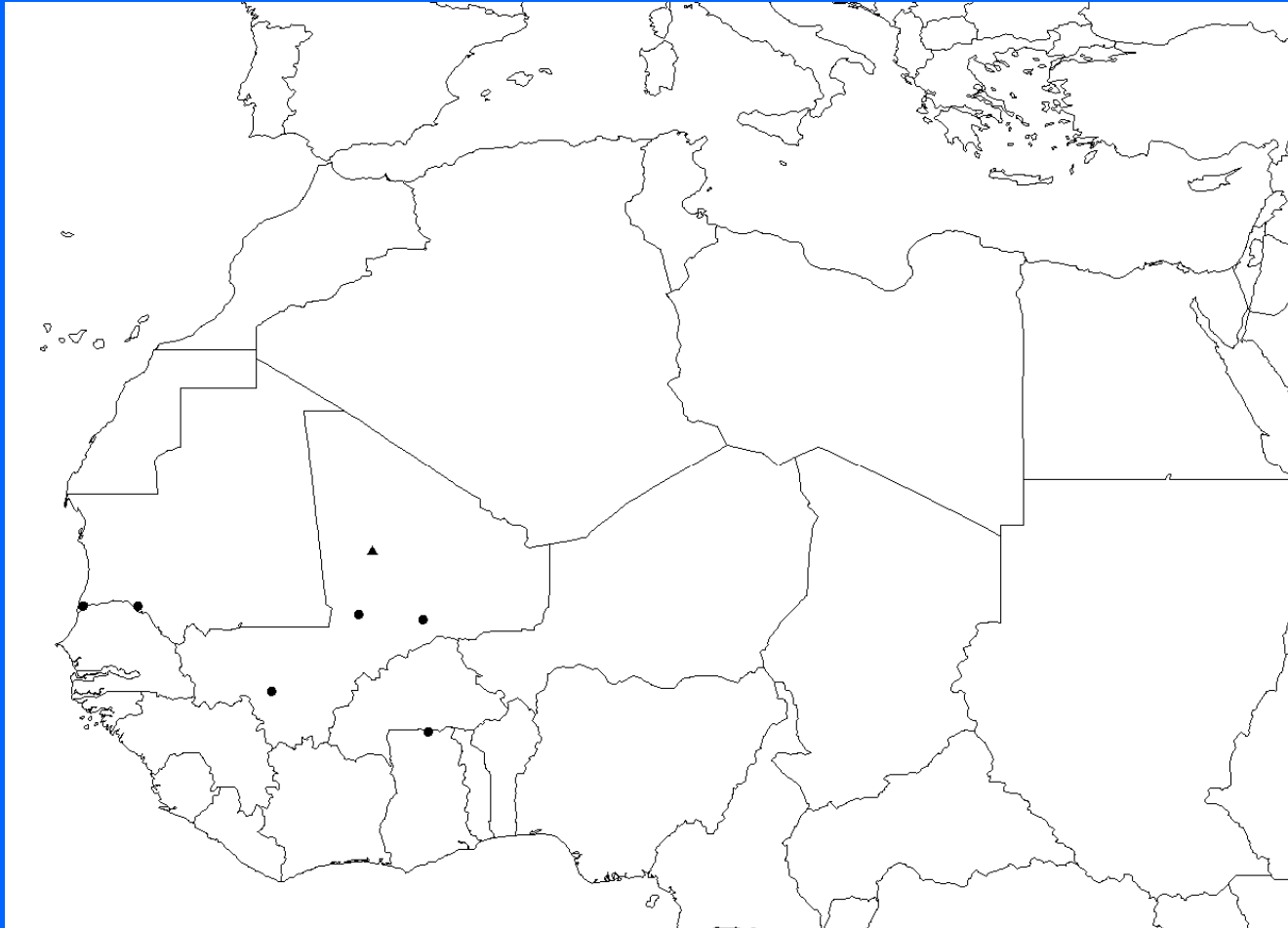
# January - February

# March - May

Bioclim modelling techniques

- BIOCLIM identifies values for each environmental layer that coincide with the species' point-locality records to calculate environmental envelopes.

For example, the 95% environmental envelope excludes the lower and upper 2.5% of the records from each tail of each environmental variable's distribution, while the 100% envelope is the most inclusive using all records.

- These predictions (or envelopes) are then projected back onto the given geography to generate distribution maps.
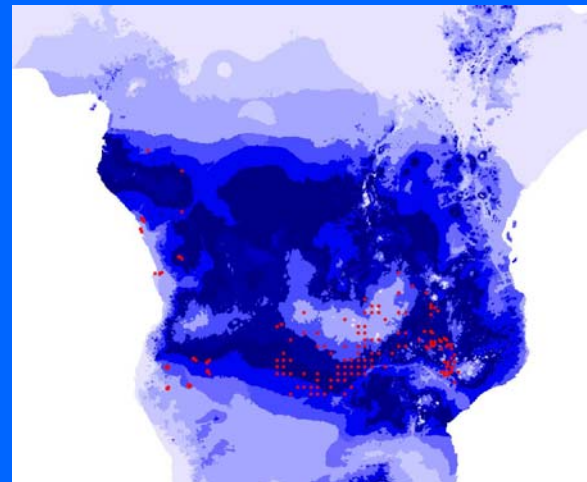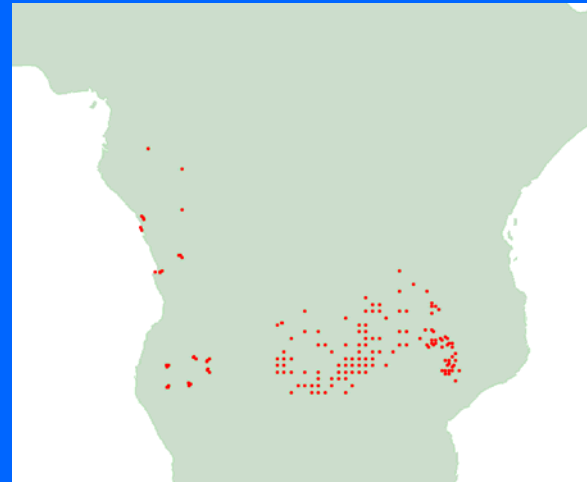
# Modelling of species distributions

- obtained 4 environmental coverages (= layers) of Africa at a 0.05 degree resolution including

- average temperature of the coldest month
- elevational range
- habitat heterogeneity
- percent forest cover

- **these coverages reflect open and unpredictable habitats prefered by migrants, e.g. open savannahs with seasonal rainfall**
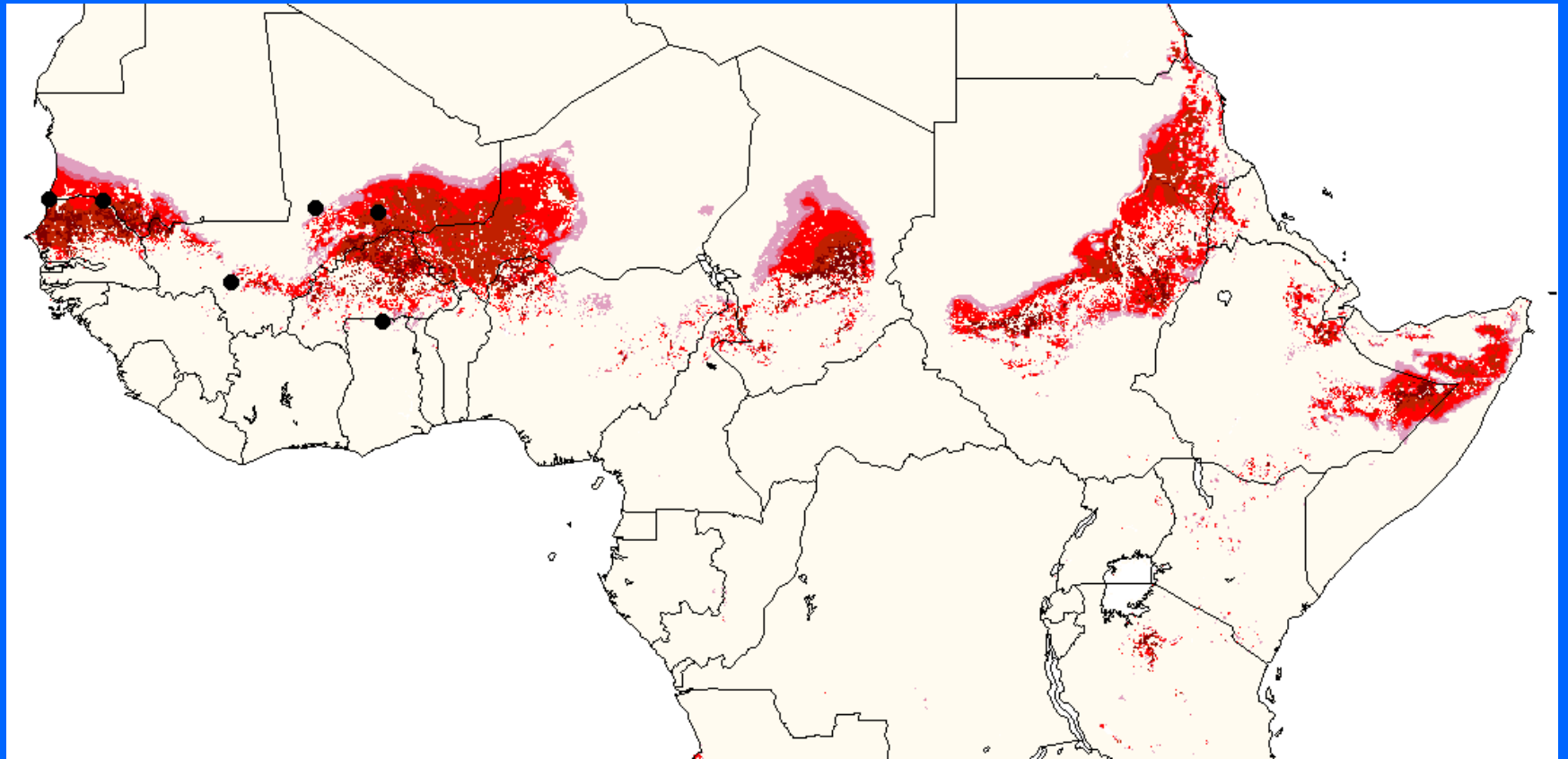
BIOCLIM predicted distribution of Aquatic Warbler using four environmental GIS data layers and six point-localities found in Ghana, Mali, Mauritania and Senegal

# So have we found all wintering sites?

- Probably not!

- No sub-Saharan records for the months January-February except Djoudj National Park, Senegal

- Research on stable isotopes of moult feathers suggests wintering areas further south in The Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo and Benin

# Undiscovered populations?

- some facts suggest an undiscovered Siberian population

- this population might migrate via the Middle East and Egypt to some Central or East African site yet undiscovered

- Clearly, more research in Africa needed!

# The future of the Aquatic Warbler

- a fundamental threat to the survival of this habitat specialist could still lie in the wintering sites and potentially destroy the conservation success in the breeding sites

- threats in Africa include drought, wetland drainage, intensive grazing, succession to scrub, desertification and salinisation of irrigated soils

*So the fate of the Aquatic Warbler is literally in our hands ...*