

Narrowing down the search for the Aquatic Warbler wintering sites in Africa

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Existing evidence

- **Observations and ringing records**
- **Bioclimatic modelling**
- **Stable Isotope research**

Observations and ringing records

- In 2004, desk study conducted by N. Schäffer, B. A. Walther, K. Gutteridge and C. Rahbek
- published in: Bird Conservation International, 2006

Data acquisition

- Questionnaire sent to BirdLife Partners and BirdLife Representatives, Wetlands International Country Coordinators, private individuals with expert African knowledge, natural history museums, ringing schemes
- Tour operators and members of African Bird Club
- Literature and Internet search
- Information about 131 Aquatic Warbler records acquired

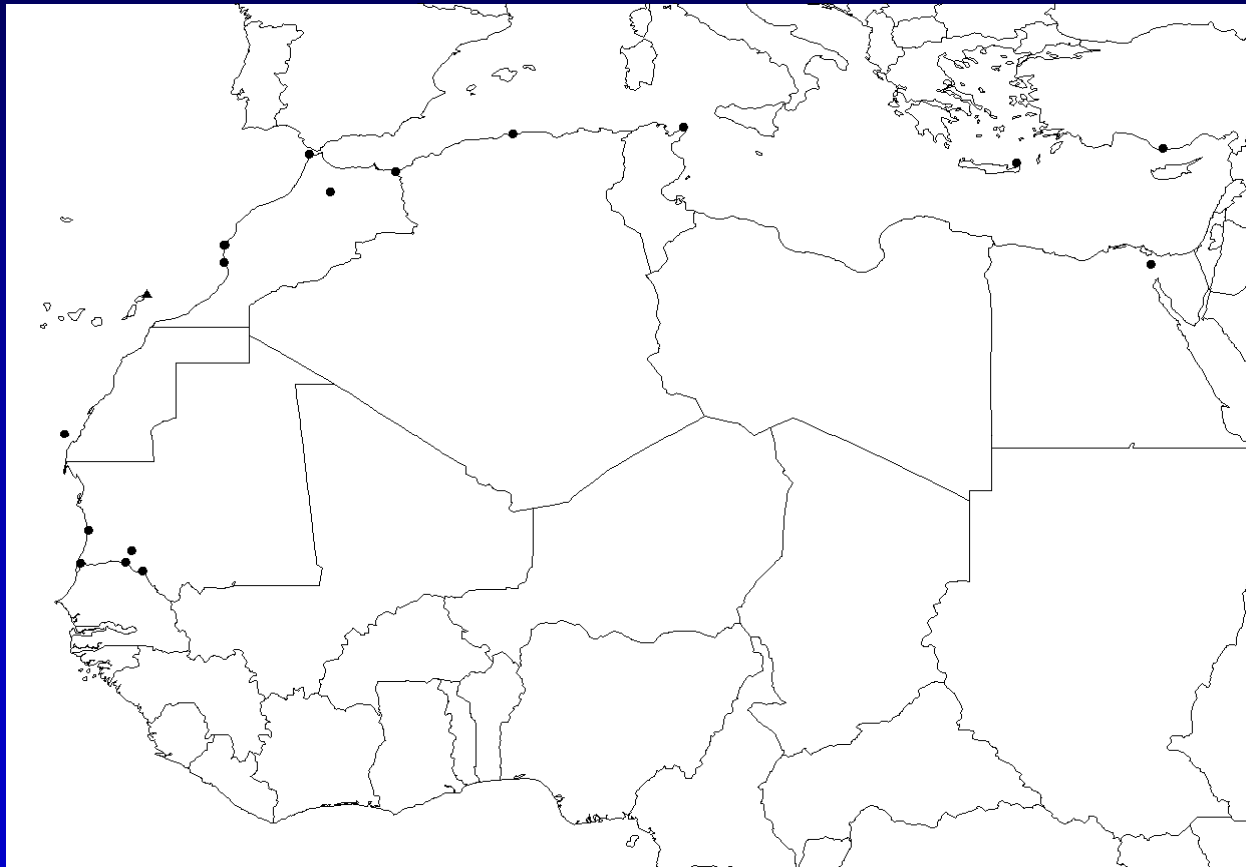
Records of the Aquatic Warbler on migration and wintering

Decade	Macaronesia	Africa	Middle East	Total
1860s	-	- (2?)	-	- (2?)
1870s	-	1	-	1
1880s	-	-	-	-
1890s	-	-	-	-
1900s	1	- (1?)	-	1 (1?)
1910s	-	2	-	2
1920s	-	1	-	1
1930s	1	1	-	2
1940s	-	2	-	2
1950s	-	7	-	7
1960s	-	11	1	12
1970s	1	31 (1?)	-	32 (1?)
1980s	4	24 (1?)	-	28 (1?)
1990s	3	35	1	39
2000s	-	4	-	4
Total	10	119 (5?)	2	131 (5?)

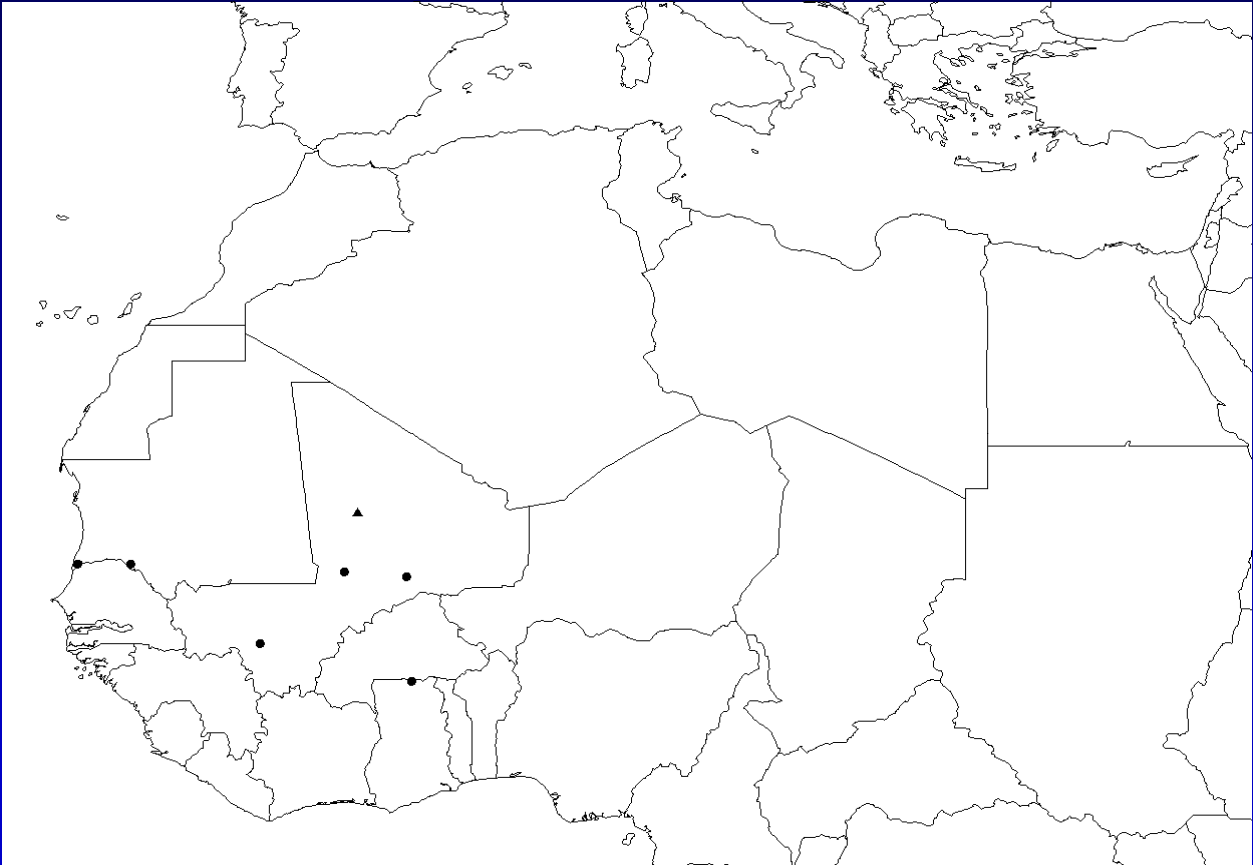
Migration of the Aquatic Warbler across African countries

Country	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Egypt	-	-	-	2	-	-	-	1	1	1	-	5 (2)
Tunisia	-	-	-	1	-	-	-	-	1	6	1	9 (2)
Algeria	-	-	-	1	-	-	-	1	2	4	1	9
Morocco	-	1	4	4	-	-	-	7	12	9	-	37 (2)
Canary Islands	-	1	2	-	-	-	-	2	4	1	-	10
Western Sahara	-	-	1	-	-	-	-	-	-	-	-	1
Mauritania	-	1	13	12	3	1	-	1	7	2	-	40
Mali	-	-	-	-	2	3	-	-	-	-	-	5
Senegal	-	-	-	-	-	4	2	4	5	-	-	15 (1)
Ghana	-	-	-	-	1	-	-	-	-	-	-	1
Total	-	3	19	20	6	8	2	16	31	23	2	132 (7)

September - October



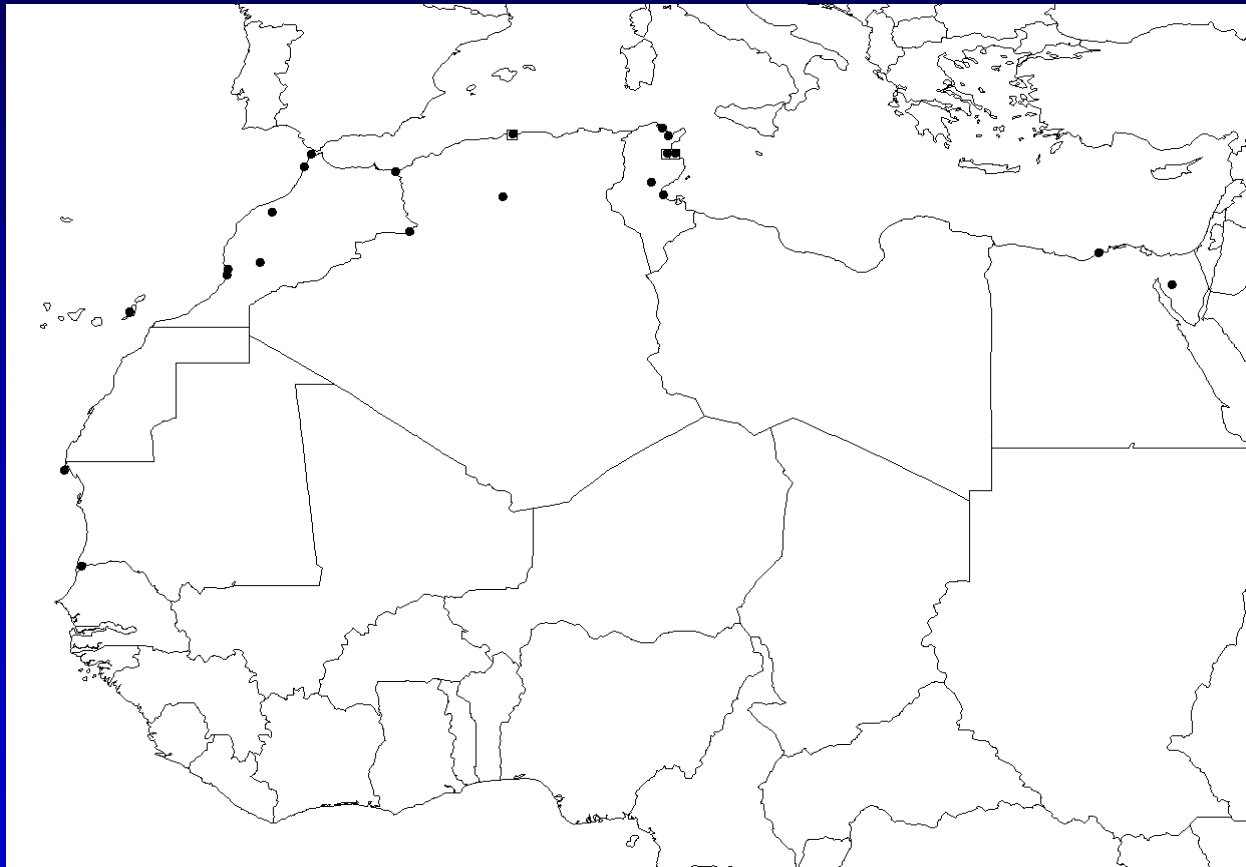
November - December



January - February



March - May



Habitat selection during migration and wintering in Africa



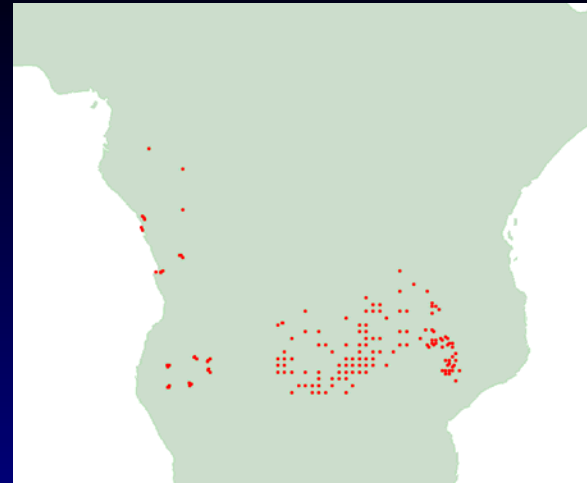
- Most commonly – sedges, rushes and reeds (*Carex*, *Juncus*, *Phragmites*)
- Also – dense grasses, shrubs and other vegetation in freshwater marshes, flooded or wet meadows,
- **Generally – habitat similar to that at breeding grounds**

Recent reports

- **The AWCT (Martin Flade) continues to collect winter records**
- **During recent years several observers (Otto Overdijk a.o.) reported bigger numbers of AW wintering (and singing!) in large Cattail (Typha) stands of the Senegal delta and also in Guinea-Bissau**

Bioclimatic Modelling

Following B. Walther, in preparation.:

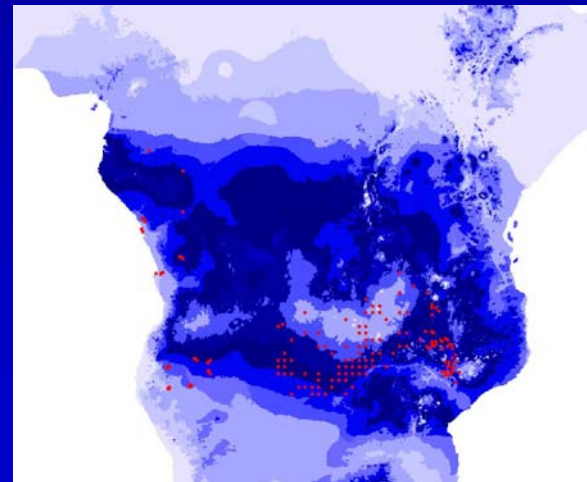


Bioclim modelling techniques

- 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.

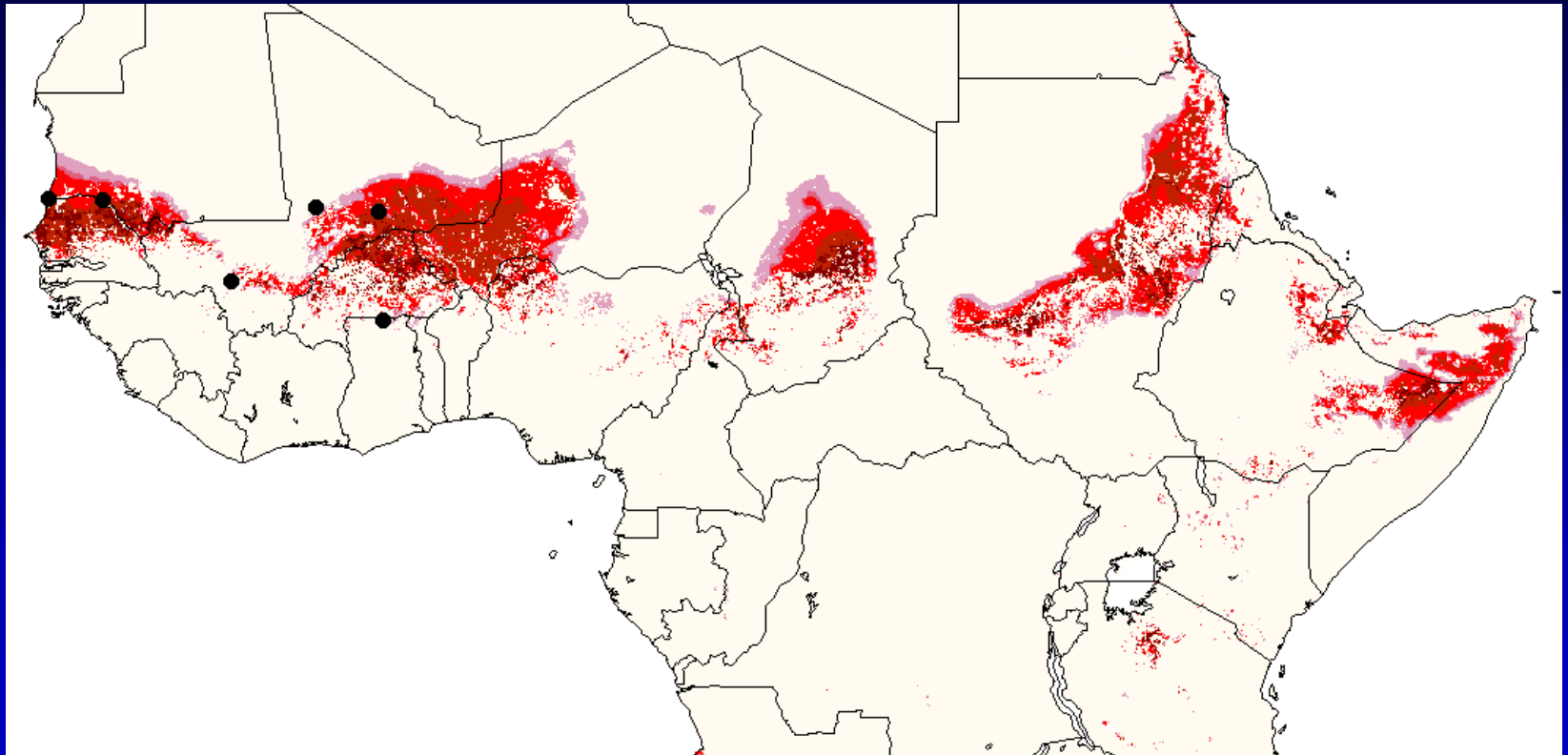
- These predictions (or envelopes) are then projected back onto the given geography to generate distribution maps.



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 preferred by migrants, e.g. open savannahs with seasonal rainfall**

Preliminary result:



BIOCLIM predicted distribution of Aquatic Warbler using four environmental GIS data layers and six point-localities found in Ghana, Mali, Mauritania and Senegal

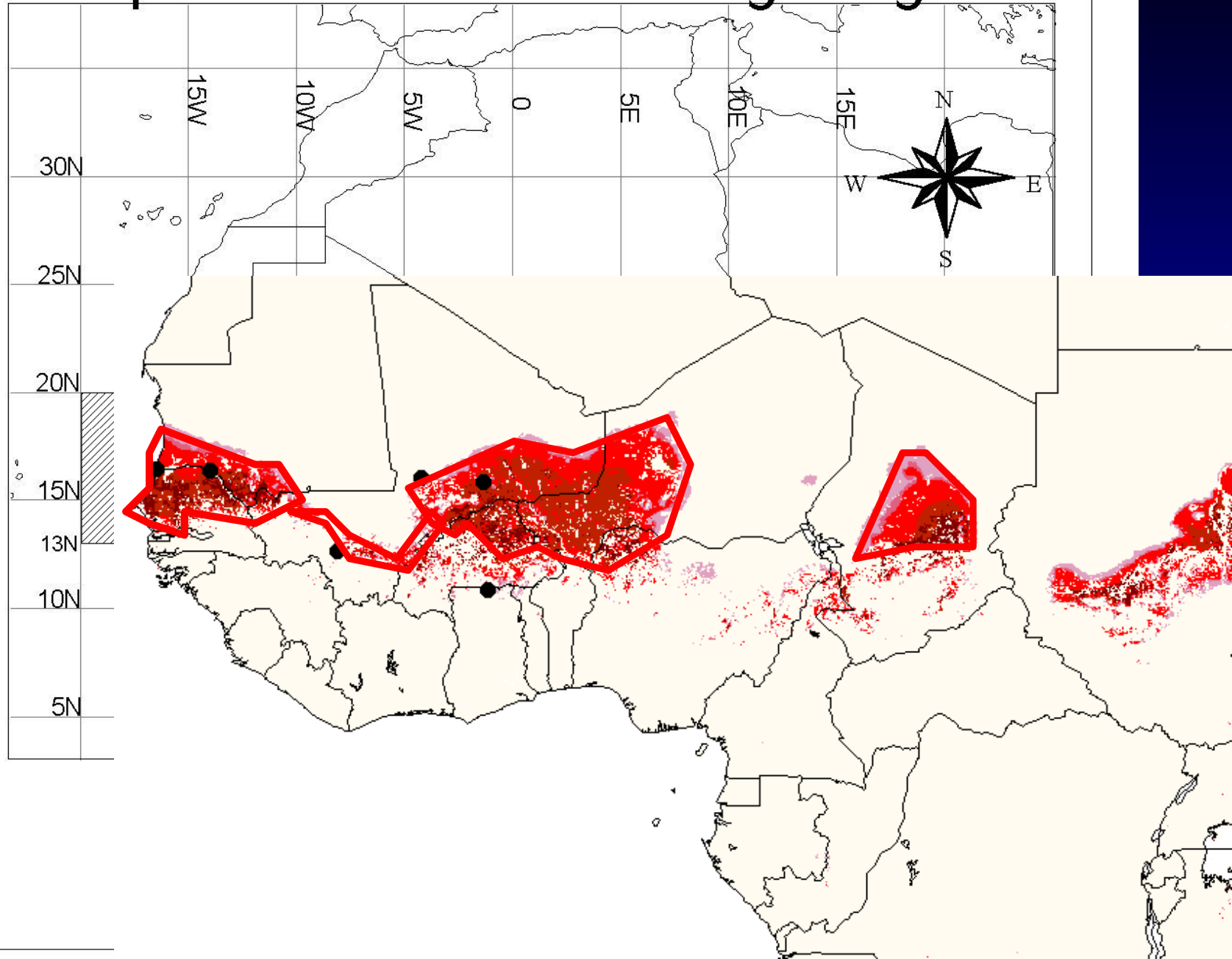
Stable Isotope Research

- **Conducted by the RSPB (Debbie Pain et. al.) during the past years, including comparative research in Africa in 2004 (funded by DEFRA and CMS)**
- **The principle:
Adult AW moult their feathers in the wintering grounds. Their feathers therefore reflect the typical Carbon-isotope ratio of their wintering sites. This ration varies with geographic location**

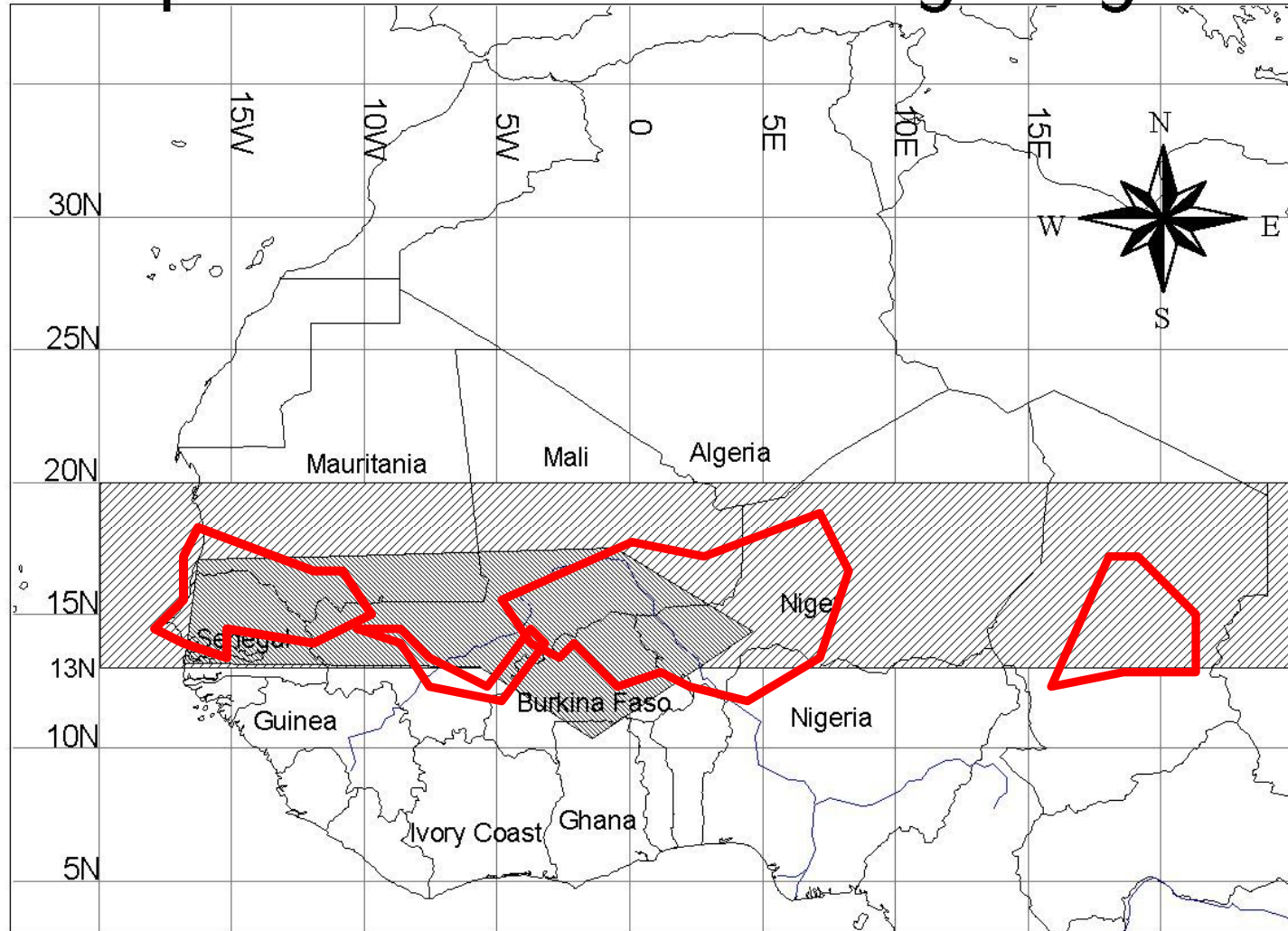
Results:

- **AW winter in the Sahelian zone of Africa between 13° and 20° N**
- **Most breeding populations seem to winter in varying latitudes depending on weather conditions in the area (further south in dry years)**
- **The Pommerania population (W-Poland, Germany) seems to winter further north than other populations (not significant in all years)**

Aquatic Warbler wintering range



Aquatic Warbler wintering range



winter moulting range
according to isotope research



observations in Jan/Feb

0 900 1800 2700 3600 Kilometers

The evidence of AW wintering grounds:

- Definitely, in sub-Saharan Sahel zone between 13-20°N
- Verified wintering countries – Mauritania, Mali, Senegal and Ghana
- Main passage countries in Africa are Morocco and Mauretania
- Wintering habitats similar to breeding and passage stopover habitats
- Probably not every year in the same sites

The search area:

- Senegal/Mauritania and the Niger plains in Mali/Niger/Burkina Faso
- Size of search area over 1m km²
- In this area, relatively few and small areas of suitable habitat available (e.g. results of Spanish expedition Dec. 05)
- Birds seem to sing in February!

What next?

- Identifying and protecting the wintering sites of AW is of key importance (see: CMS MoU Action Plan).
- narrow down the search by identifying potential sites in the general wintering area (desk study using satellite images, wetland inventories)
- Expedition to verify presumed wintering sites (Djoudj NP/Senegal and others)
 - Strontium samples
 - Feather and blood samples (migratory connectivity)
 - Possibly: estimation of wintering numbers)