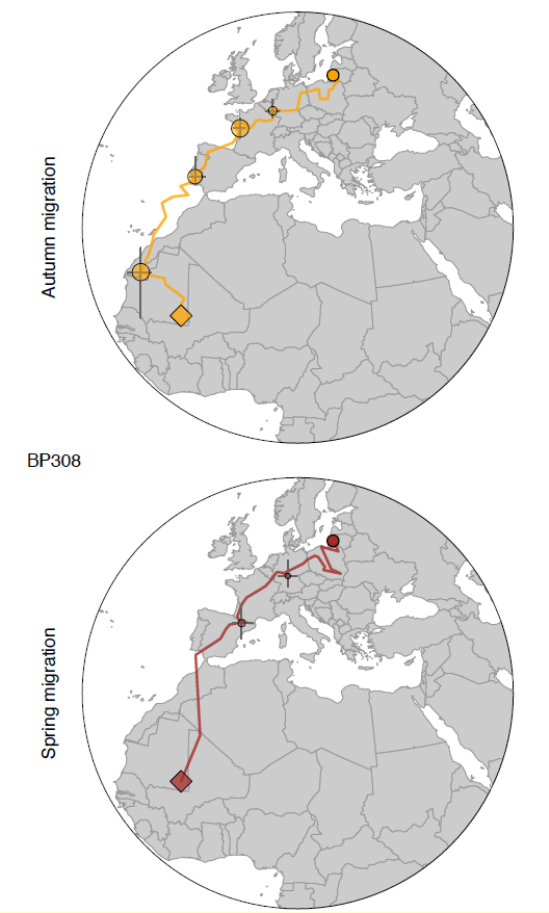
Current results of research on Aquatic Warbler's migratory trails

Martin Flade (AWCT)



Aquatic Warbler on migratory stopover sites and wintering grounds

Aquatic Warbler wintering grounds in West Africa

Cosima Tegetmeyer & Martin Flade (AWCT)

Global range of the Aquatic Warbler

CONNECTIVITY?

Global range of the Aquaric Warbler

wintering sites

- historical records
- 1 – 3 ind. captured
- 13, >170 captured

migration routes

- in autumn
- in spring

breeding sites (males)

- 0 – 9
- 10 – 499
- > 500

Global range of the Aquatic Warbler

Recoveries of Aquatic Warblers ringed in the wintering sites in the following breeding season (2011) (Poluda et al. 2012)

CONNECTIVITY?

Global range of the Aquaric Warbler

wintering sites

- historical records
- 1 – 3 ind. captured
- 13, >170 captured

migration routes

- in autumn
- in spring

breeding sites (males)

- 0 – 9
- 10 – 499
- > 500

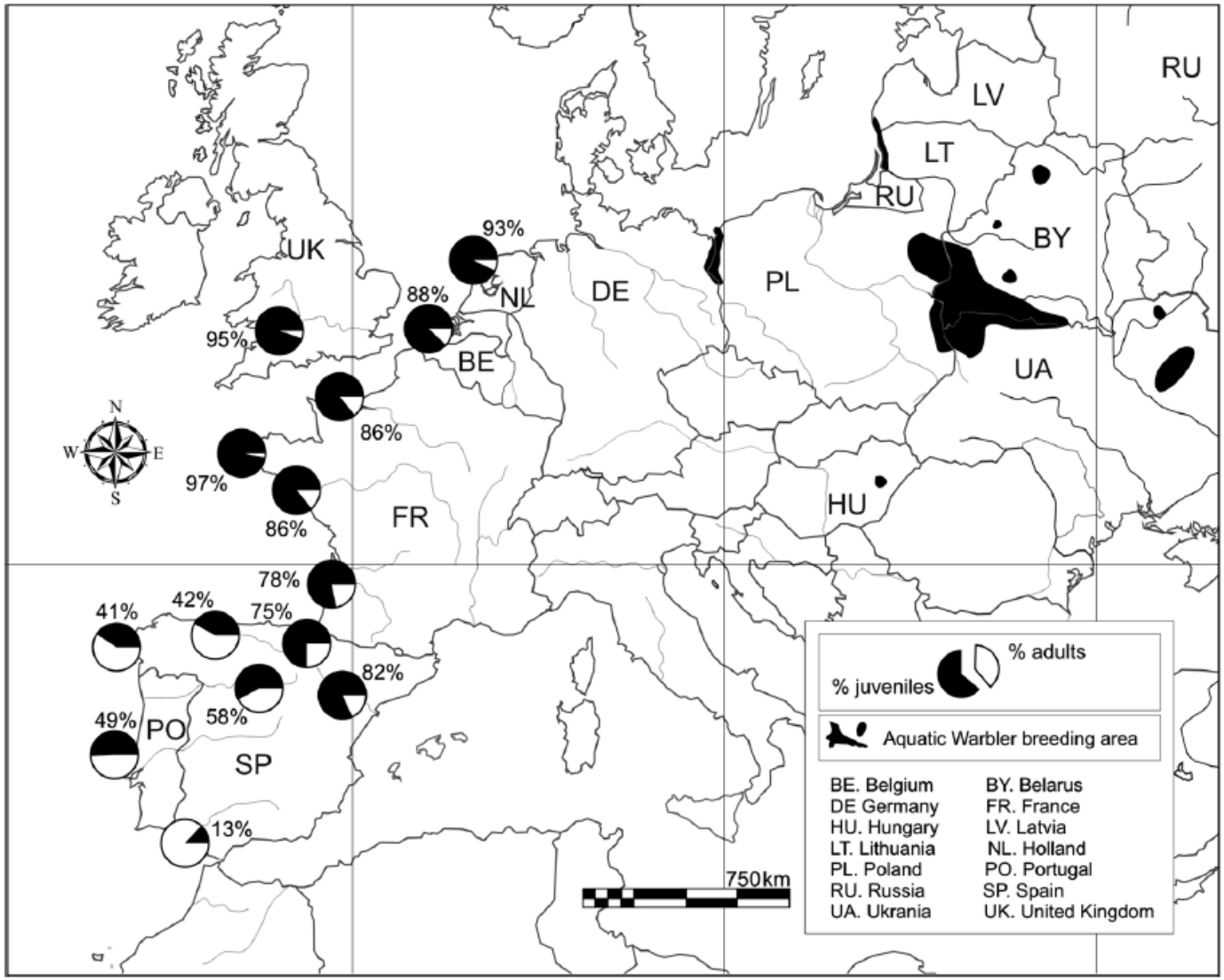
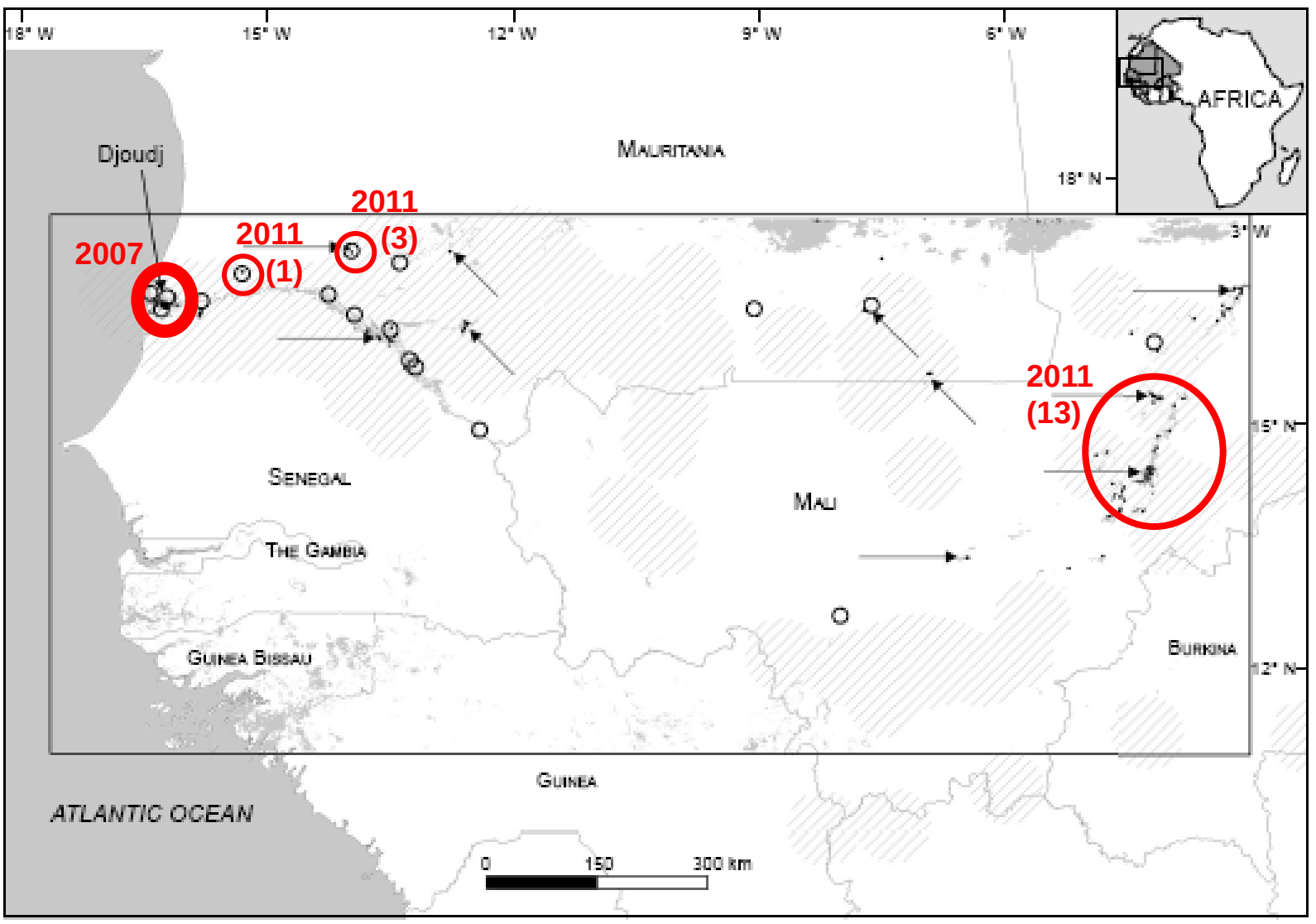
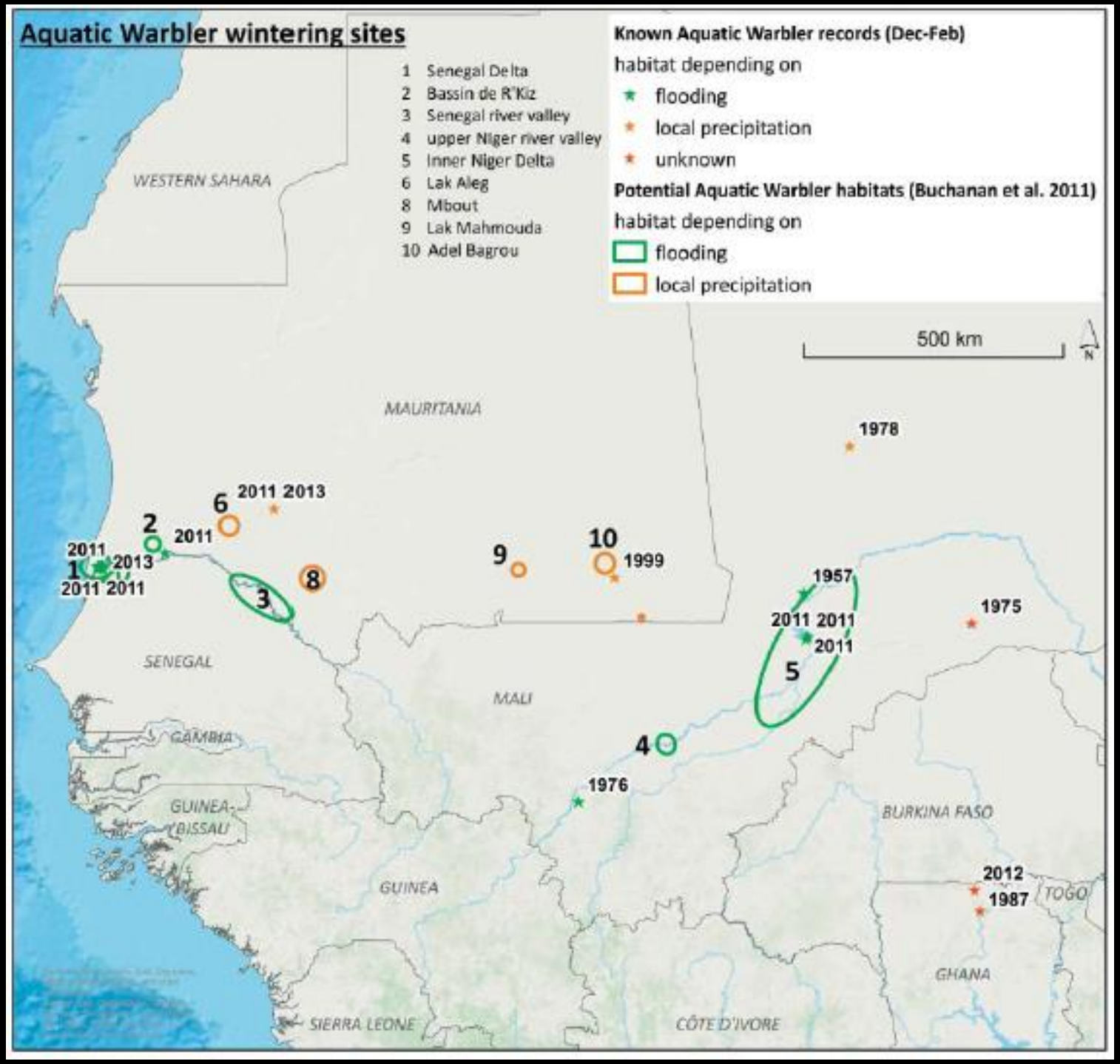


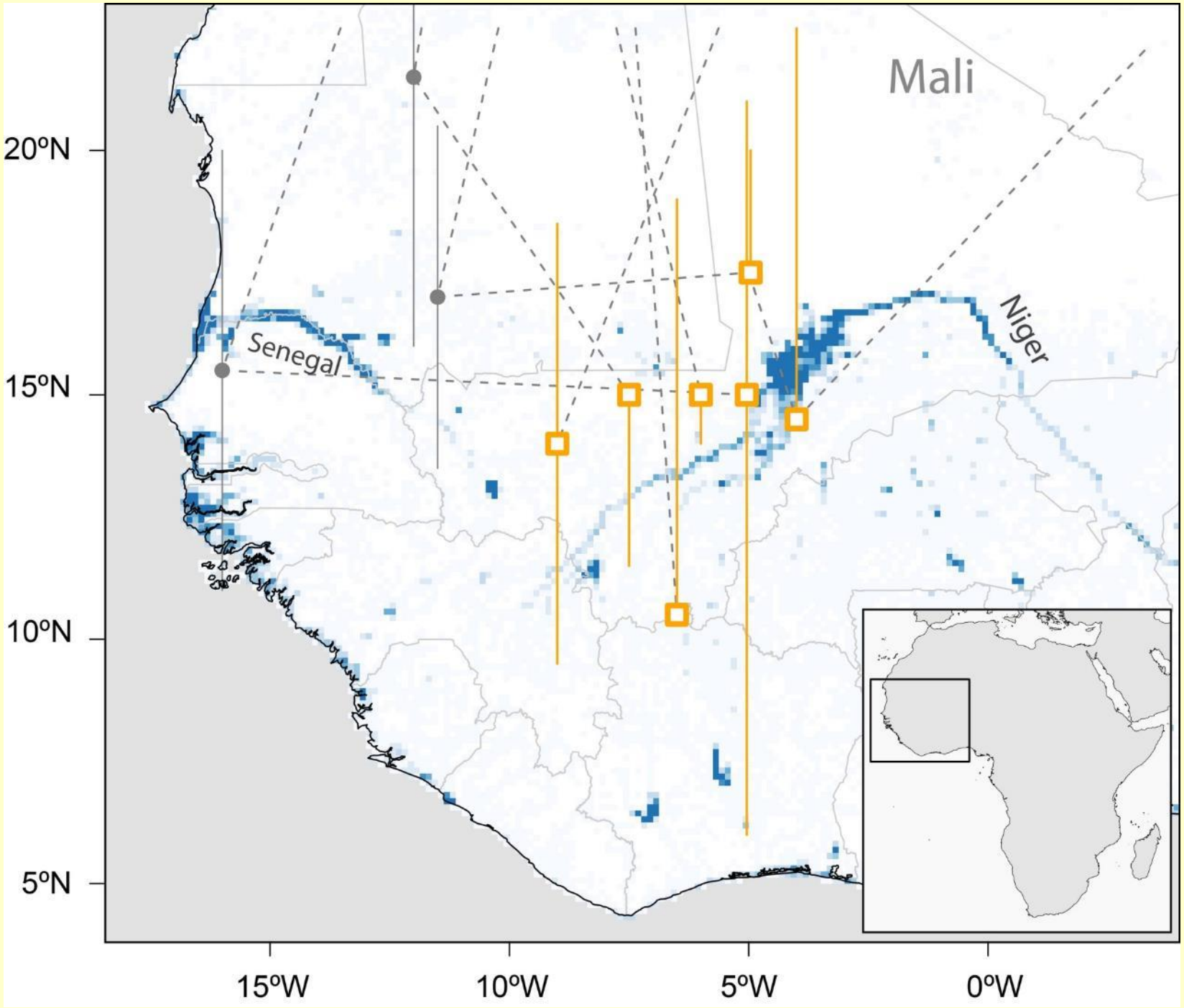
Fig. 1 Age ratio (juvenile vs. adult birds, given as a percentage) of Aquatic Warbler (*Acrocephalus paludicola*) during the autumn migration in Western Europe. For France, the percentages are from 2008–2009 (Le Nevé et al. 2011): in the northeast, $n = 445$; in Finistère, $n = 200$; in the centre of the Atlantic coast, $n = 448$; in wetlands on the southeast coast ($n = 232$). In The Netherlands, the percentages are from 1977–2005 ($n = 137$) (Boele and van Winden 2006). In Belgium, the percentage is from 1986–2006 ($n = 1{,}247$) (van Hove et al. 2011). The percentage of juveniles in the UK and Ireland are from 2006–2011 ($n = 37$) [British Trust for Ornithology (Thetford, Norfold, UK) ringing data]

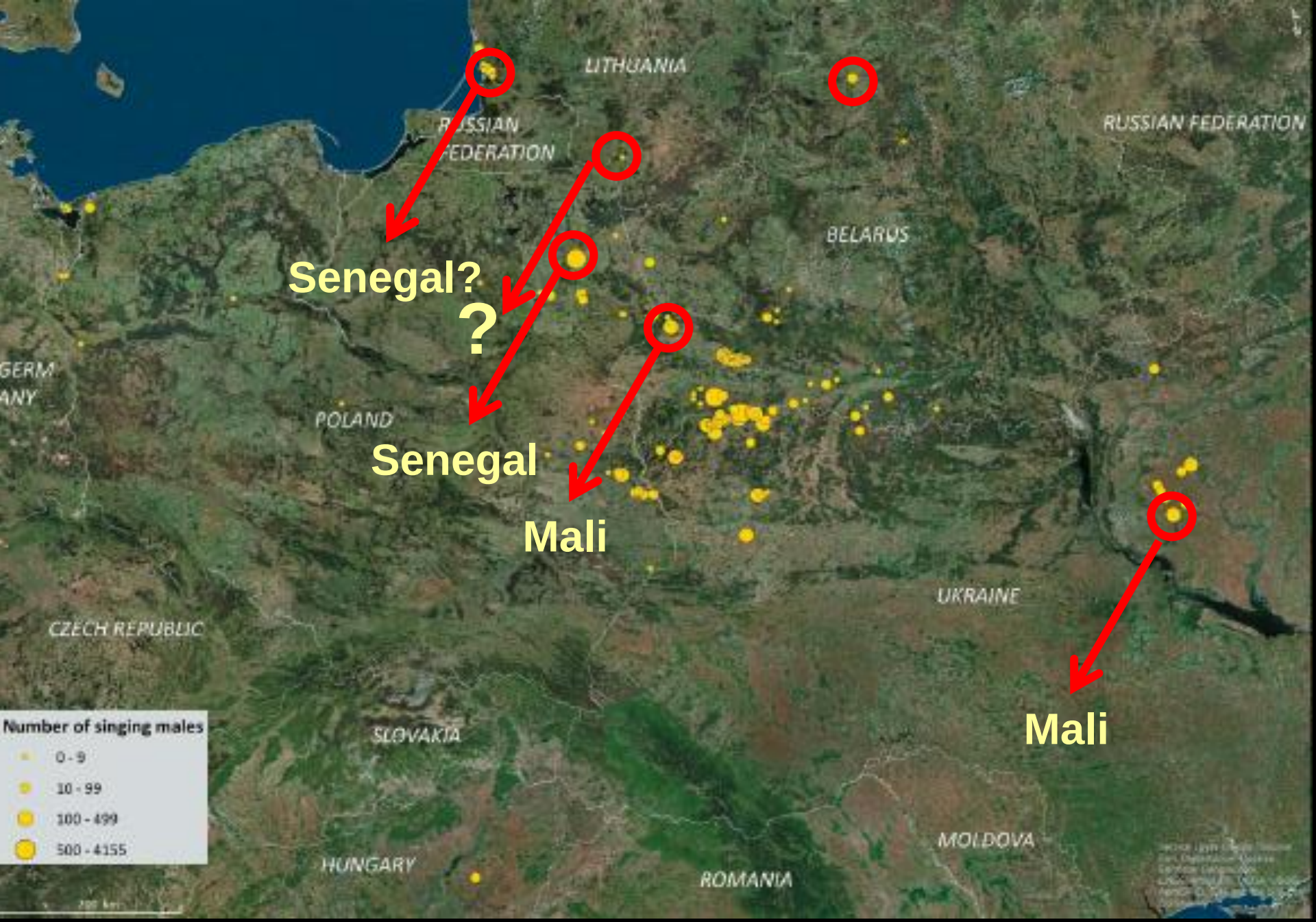


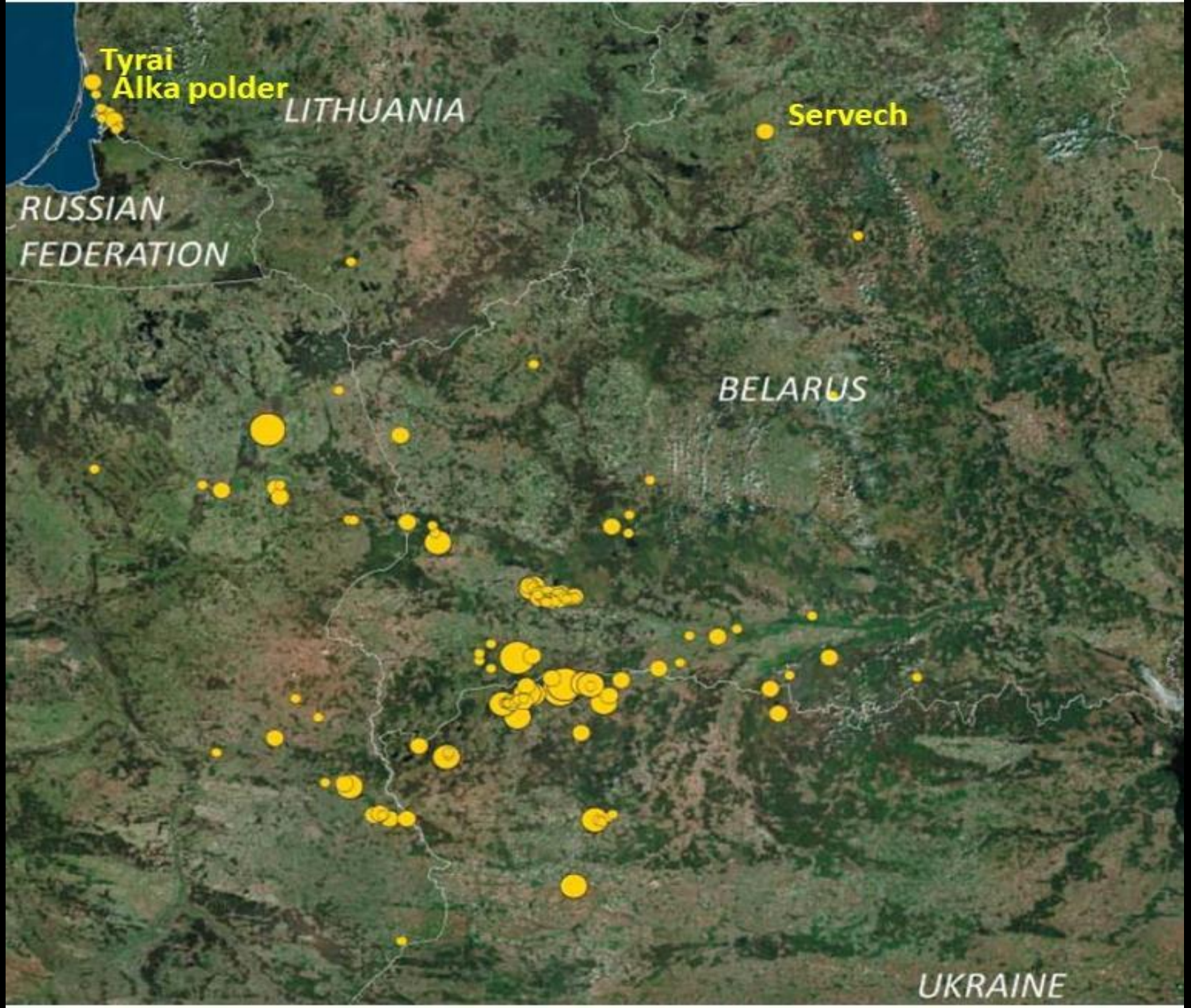
From: Buchanan et al. 2011, Ostrich 82: 81-85

Records/ringing captures 2011: Julien Foucher et al., group ACROLA


Aquatic Warbler wintering sites
1 Senegal Delta
2 Bassin de R'Kiz
3 Senegal river valley
4 upper Niger river valley
5 Inner Niger Delta
6 Lak Aleg
8 Mbout
9 Lak Mahmouda
10 Adel Bagrou
Known Aquatic Warbler records (Dec-Feb)
habitat depending on
flooding
local precipitation
unknown
Potential Aquatic Warbler habitats (Buchanan et al. 2011)
habitat depending on
flooding
local precipitation
500 km
N
WESTERN SAHARA
MAURITANIA
SENEGAL
MALI
GAMBIA
GUINEA-BISSAU
GUINEA
SIERRA LEONE
CÔTE D'IVORE
BURKINA FASO
GHANA
TOGO
1978
2011 2013
2011
2011
2013
2011 2011
1999
1957
1975
2011 2011
2011
1976
2012
1987


Mali
Senegal
Niger
20ºN
15ºN
10ºN
5ºN
15ºW
10ºW
5ºW
0ºW


LITHUANIA
RUSSIAN FEDERATION
BELARUS
Senegal?
?
POLAND
Senegal
Mali
UKRAINE
CZECH REPUBLIC
SLOVAKIA
Mali
MOLDOVA
HUNGARY
ROMANIA
Number of singing males
0 - 9
10 - 99
100 - 499
500 - 4155


Tyrai
Alka polder
LITHUANIA
Servech
RUSSIAN
FEDERATION
BELARUS
UKRAINE

Servech

Tyrai

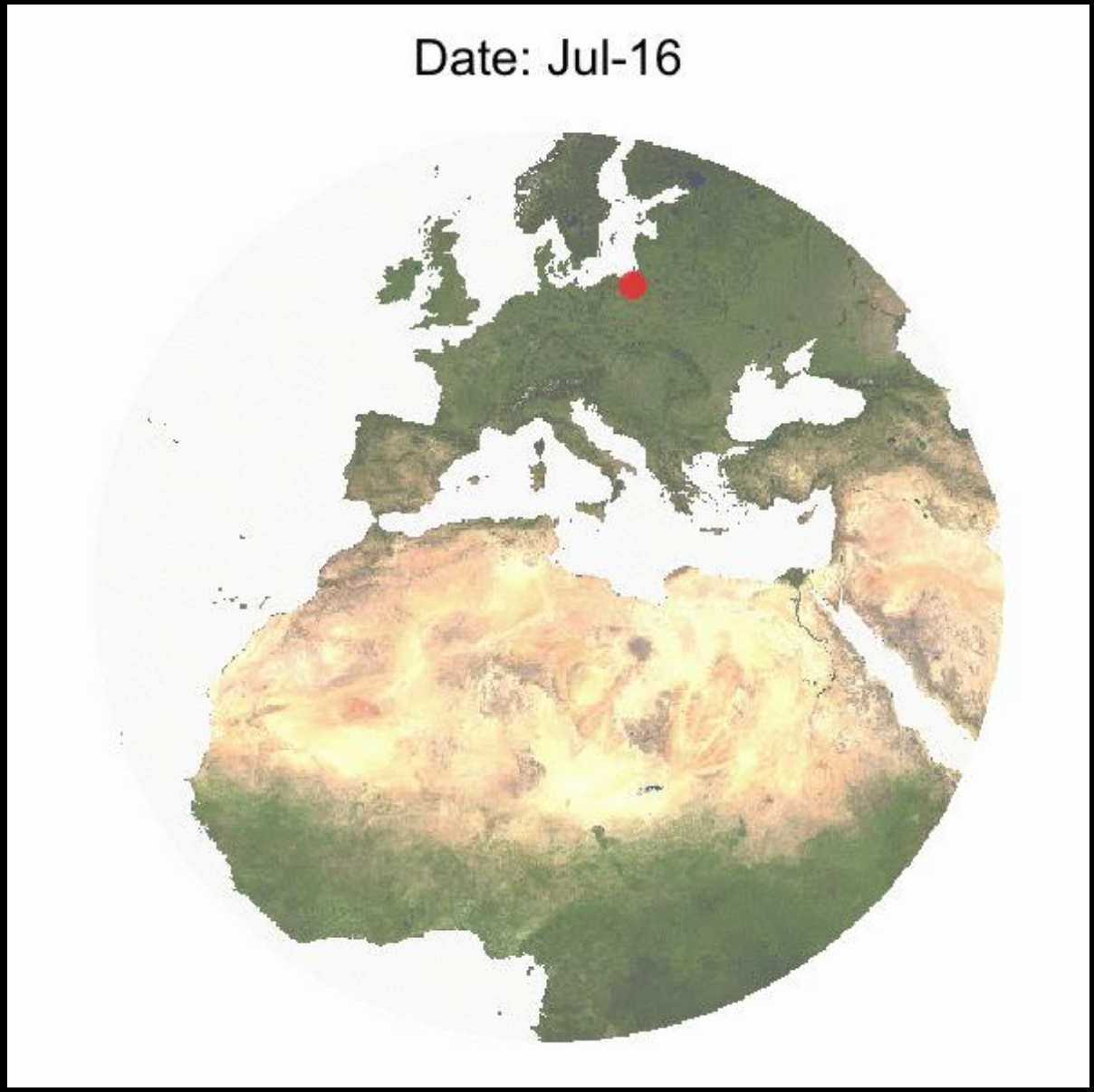

Alka polder

Table 3: Recovery ratios of AW fitted with geolocators

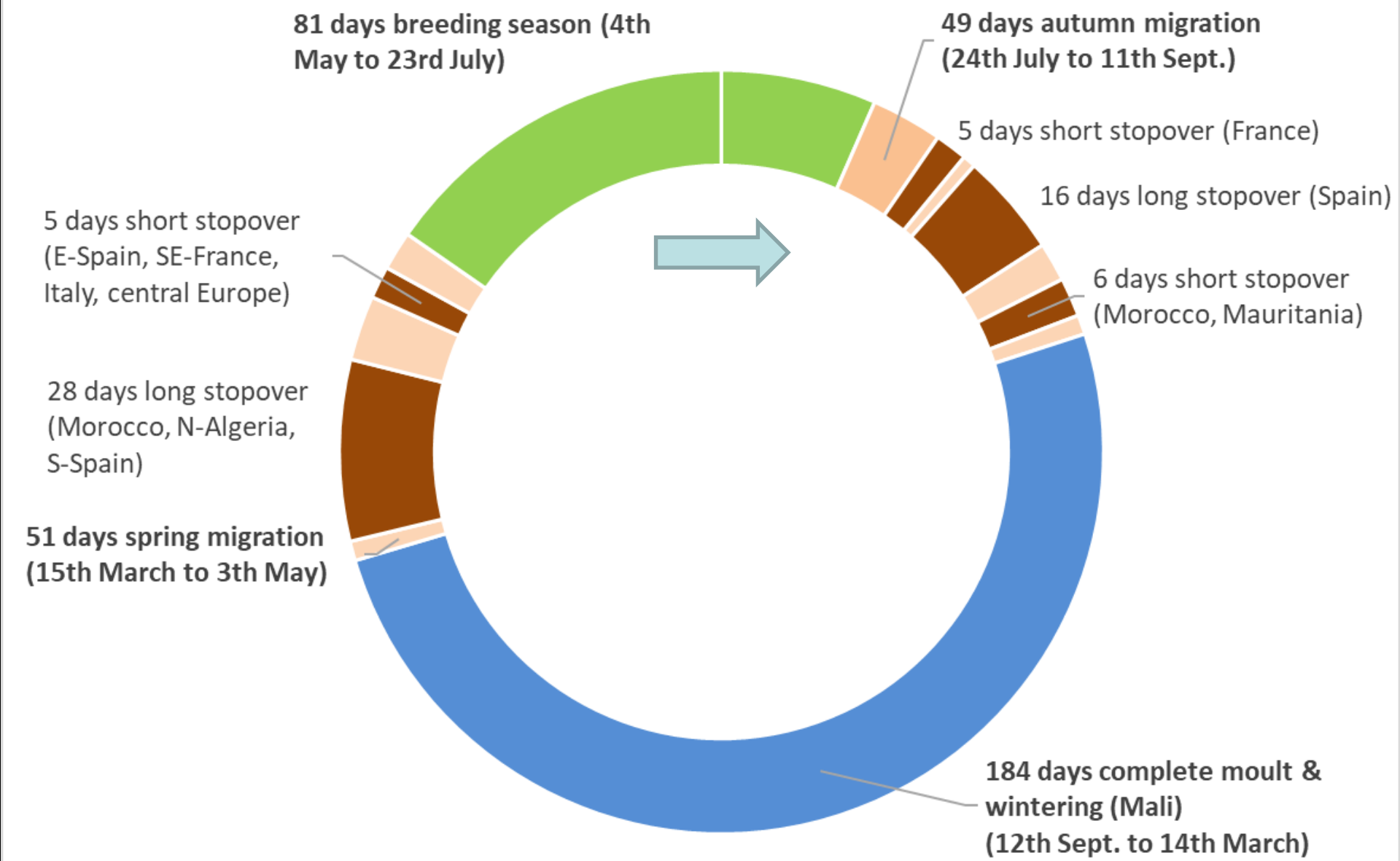
Study site	**AW fitted with geolocators in 2018**	**AW recaptured in 2019 and 2020 (=retrieved geolocators)**	**recoveries in %**
Servech, Belarus	29	7	**24 %**
Alka polder, Lithuania	*24*	*12*	*50 %*
Tyrai mire, Lithuania	*7*	*0*	*0 %*
total for Lithuania	31	12	**39 %**
total all sites	**60**	**19**	**32 %**

Table 5: Durance of successful data logging: Dates (in 2019) until the geolocators stored data.

Start of logging: 16th July 2018; valid logging stopped between 8th April (after 267 days) and 30th May (319 days), median was 12th May (301 days).


Date: Jul-16

Mean annual cycle of adult male Aquatic Warblers (n=19)



Overview on AW stopover (>2.5 days) and wintering sites (19 adult males)

migration perriod	Country	number of stopover sites	number of birds	durance of stay (days)		period of occurrence		median arrival	median departure
				mean	median	from	until		
autumn	Germany	1	1	3,0	3	15.08.	18.08.	15.08.	18.08.
	Luxembourg	1	1	4,0	4	14.08.	17.08.	14.08.	17.08.
	France	6	10	6,9	6	22.07.	31.08.	06.08.	12.08.
	Spain	10	12	15,8	13	26.07.	13.09.	10.08.	25.08.
	Portugal	4	8	8,5	8	06.08.	14.09.	21.08.	27.08.
	Morocco	4	6	10,6	8	10.08.	22.09.	09.09.	17.09.
	Mauritania	5	5	10,3	9	19.08.	23.09.	11.09.	19.09.
	Senegal	4	4	5,8	6	22.08.	09.09.	27.08.	31.08.
wintering	Senegal	1	1	202,0	202	25.08.	15.03.	25.08.	15.03.
	Mauritania	1	1	198,0	198	26.09.	11.04.	26.09.	11.04.
	Mali	15	14	196,4	187	27.08.	12.04.	11.09.	11.03.
	Burkina Faso	2	2	173,5	174	04.09.	03.03.	07.09.	27.02.
	Nigeria	1	1	157,0	157	26.09.	02.03.	26.09.	02.03.
spring	Mauritania	3	2	9,7	3	05.03.	06.04.	10.03.	12.03.
	Morocco	11	10	18,7	16	17.02.	12.04.	11.03.	07.04.
	Algeria	6	6	18,8	14	07.03.	24.04.	25.03.	16.04.
	Spain	6	6	18,2	5	16.02.	19.04.	13.04.	17.04.
	Spain/France	1	1	7,0	7	09.04.	16.04.	09.04.	16.04.
	Italy	2	2	6,0	6	06.04.	25.04.	14.04.	20.04.
	Croatia/Serbia	1	1	5,0	5	26.04.	01.05.	26.04.	01.05.
	Germany	1	1	3,0	3	21.04.	24.04.	21.04.	24.04.
	Poland	2	2	3,5	4	27.04.	04.05.	30.04.	03.05.
	Russia-Kalinin	2	1	9,5	10	29.04.	19.05.	03.05.	12.05.
	Belarus	4	2	4,4	4	09.05.	24.05.	14.05.	16.05.

Autumn migration

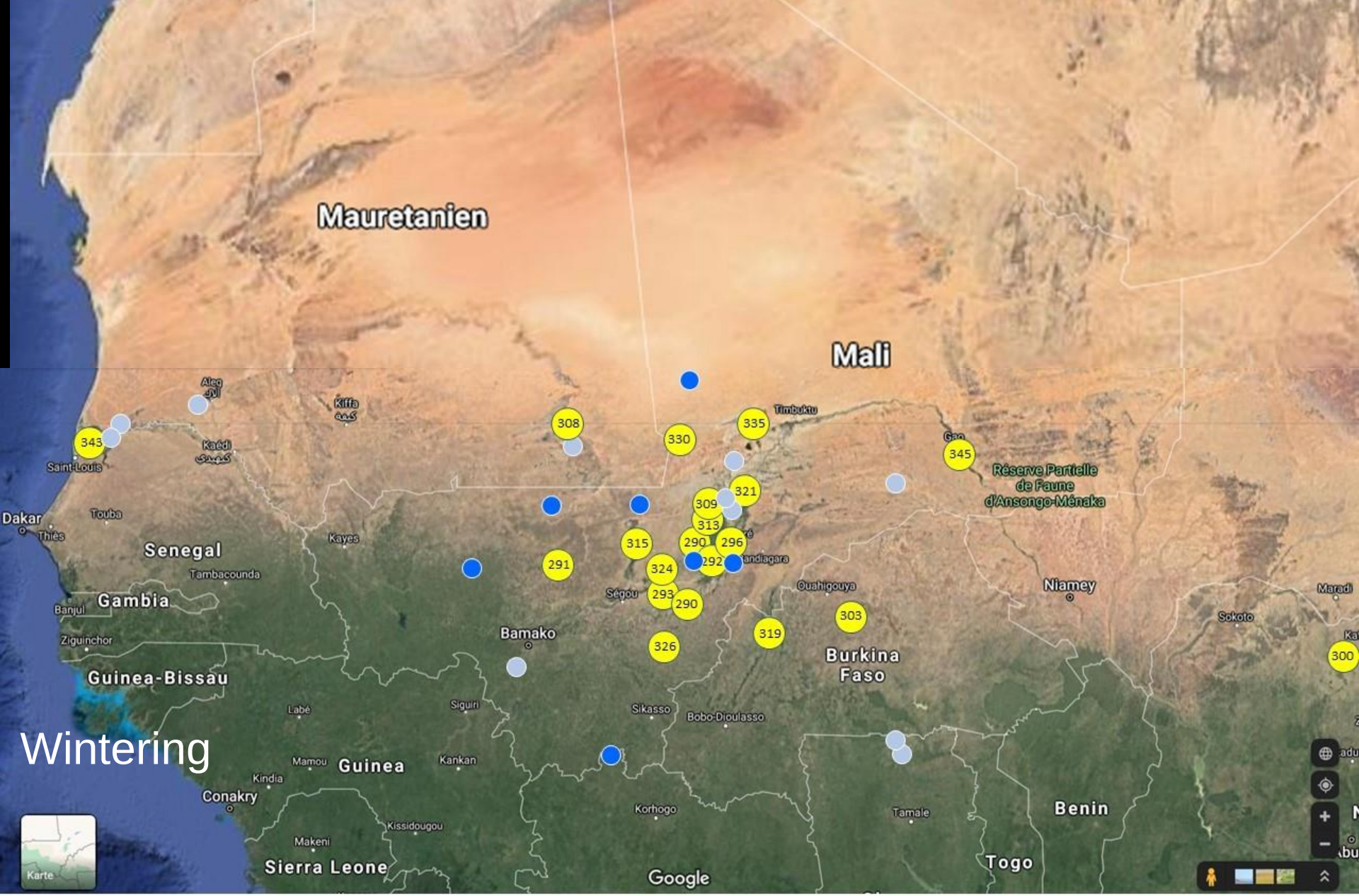
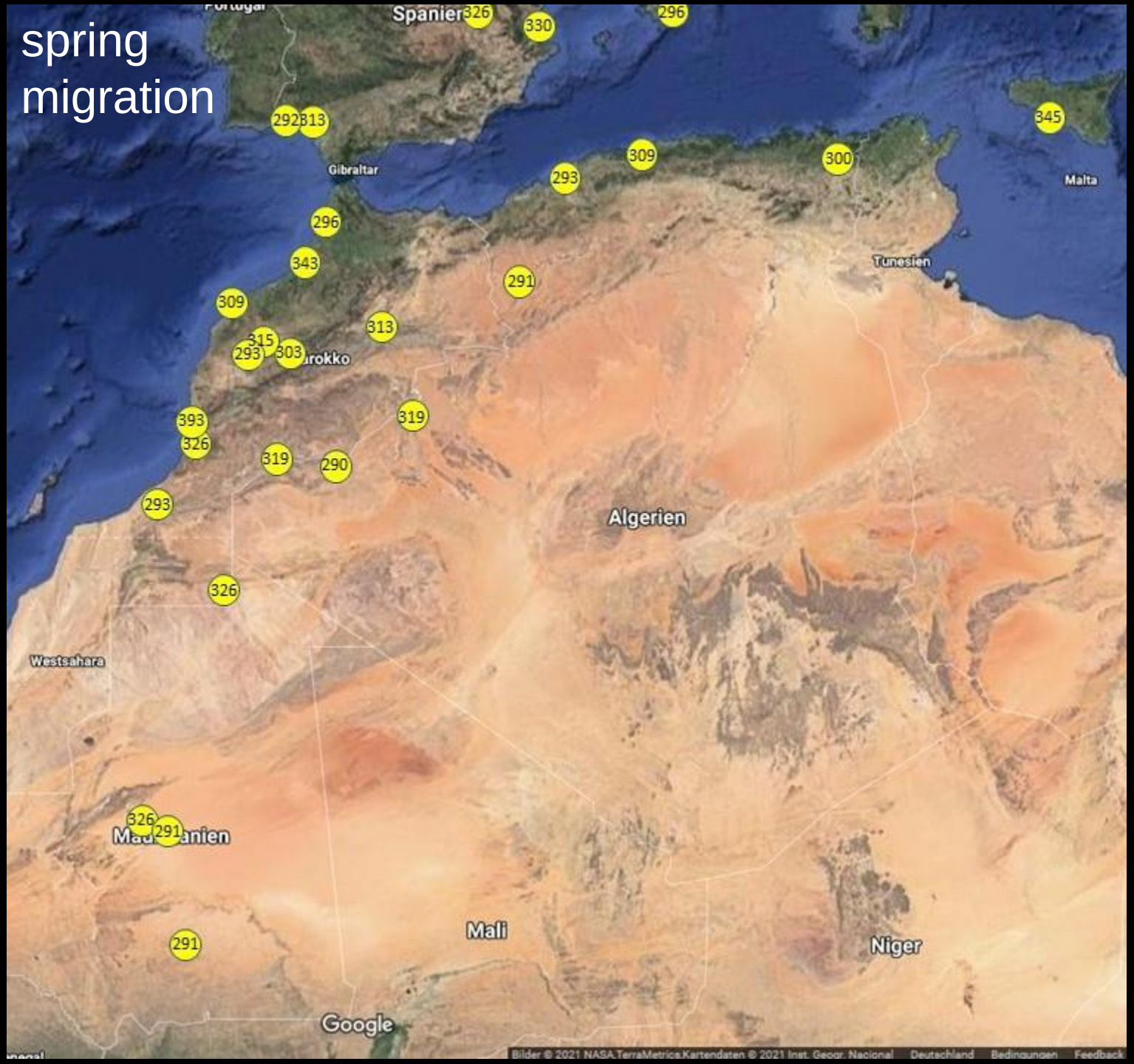
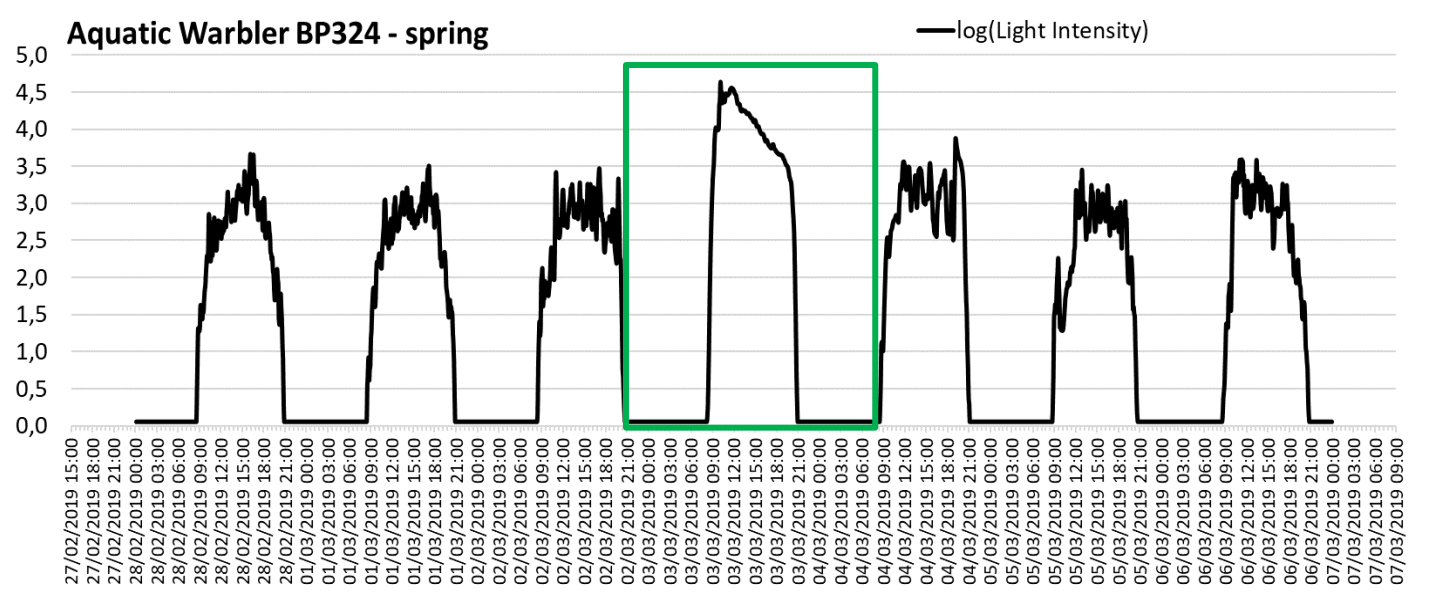
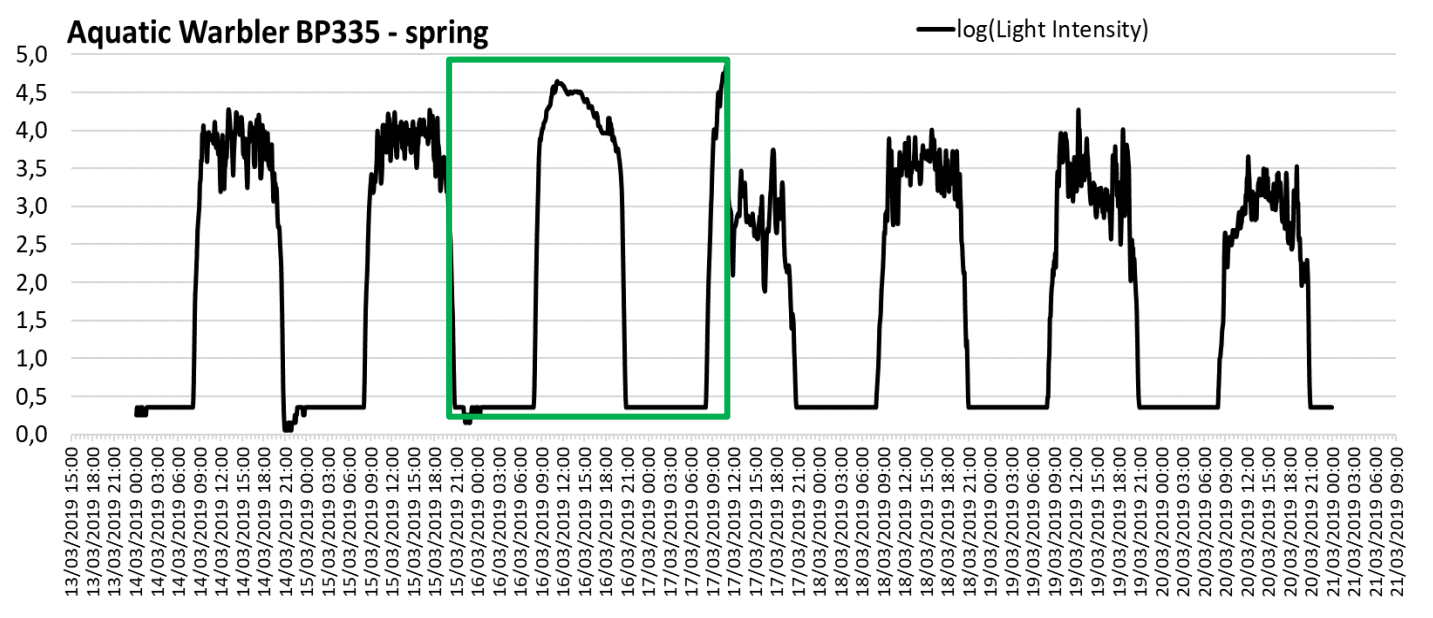


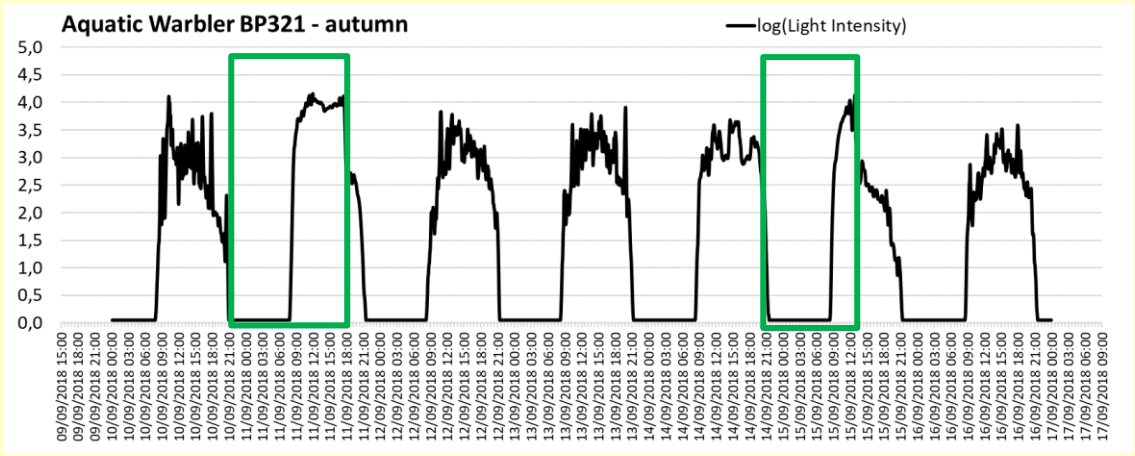
Fig. 32: Wintering locations of the Aquatic Warblers studied in this geolocator study (with geolocator number);
wintering locations of the former geolocator study (Salewski et al. 2018);
sites with confirmed winter records (mostly from ringing) December to February (Tegetmeyer et al. 2018)

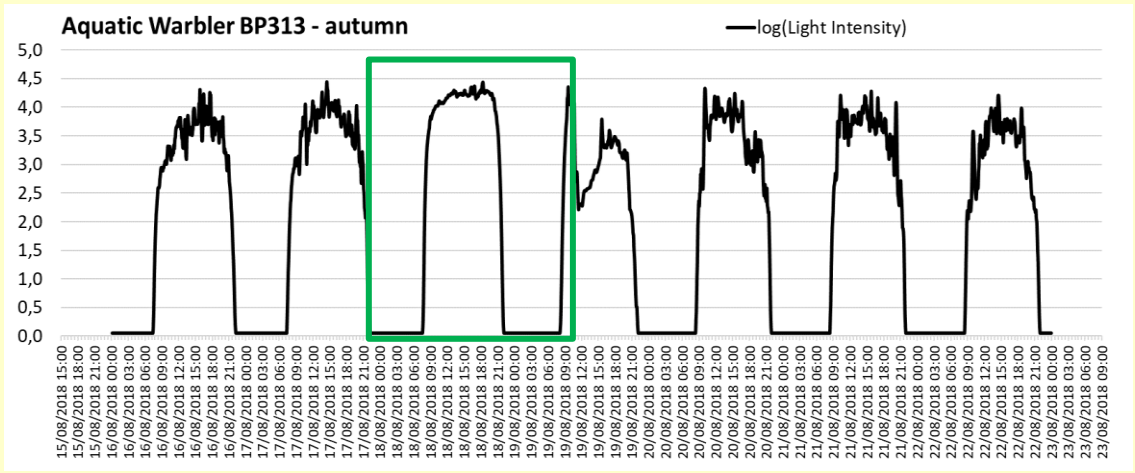

spring
migration
Spanien
Gibraltar
Malta
Tunesien
Algerien
Westsahara
Mali
Niger
Google
326
330
296
292
313
345
309
300
293
296
343
291
309
313
315
293
303
319
393
326
319
290
293
326
326
291
291

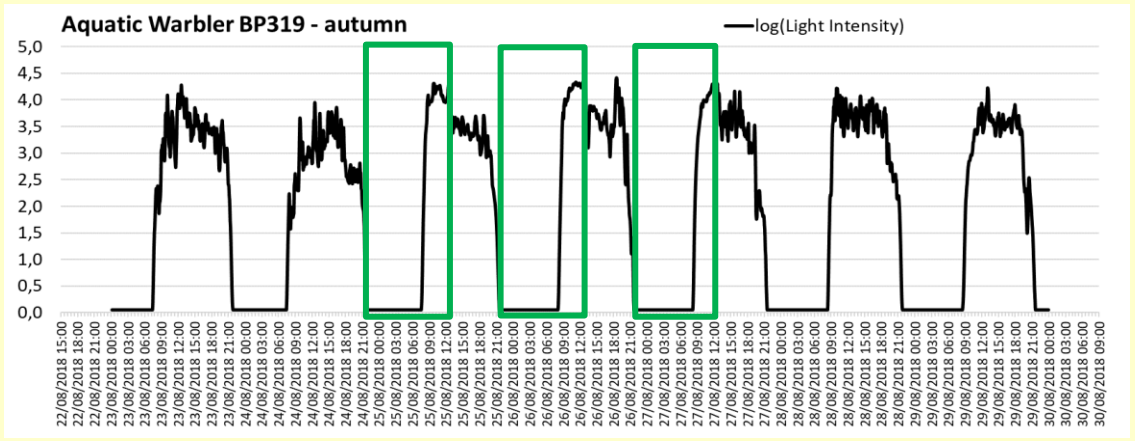
Barrier crossing strategies (FRÉDÉRIC JIGUET)

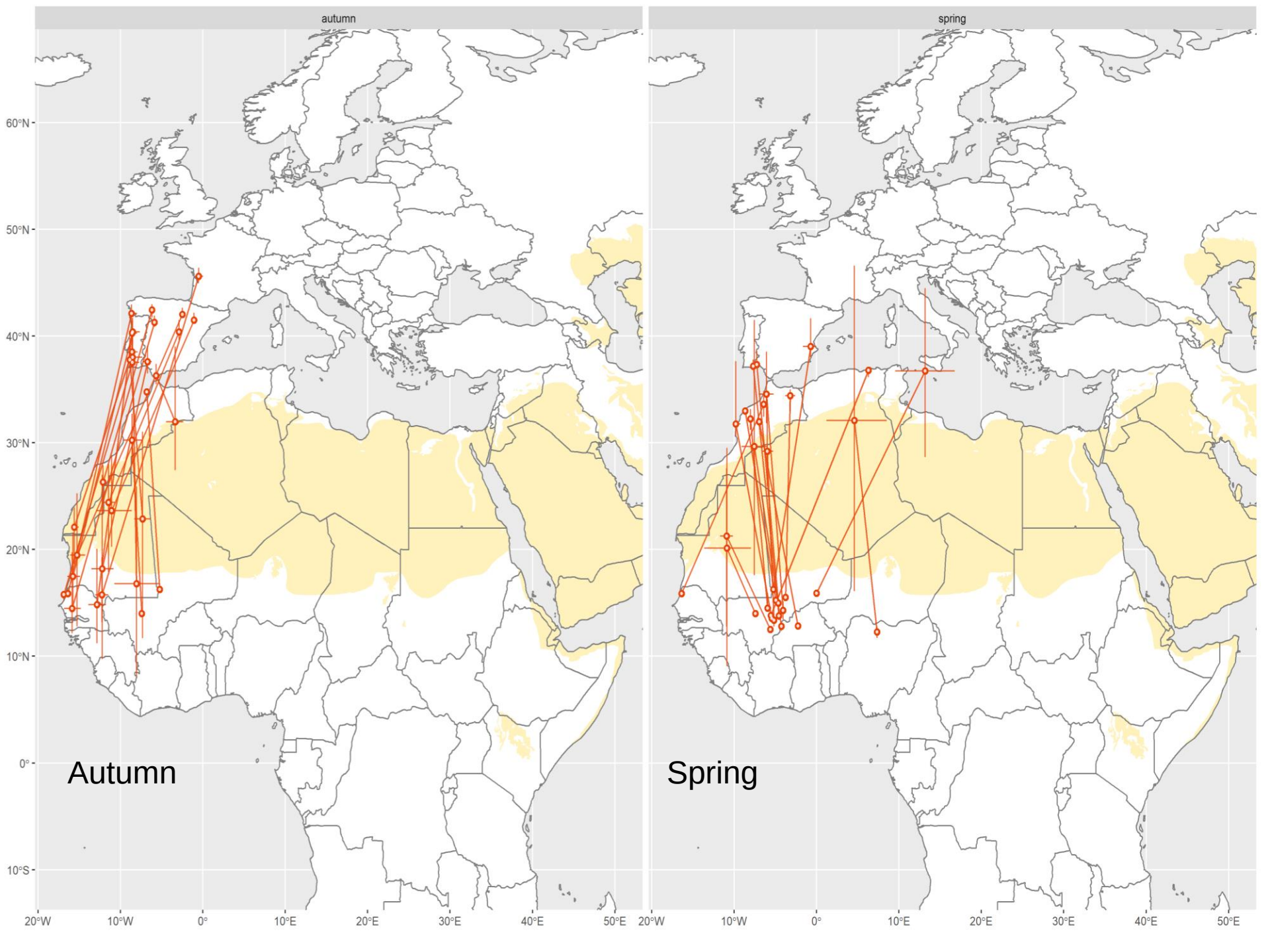





Aquatic Warbler BP321 - autumn
log(Light Intensity)
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0

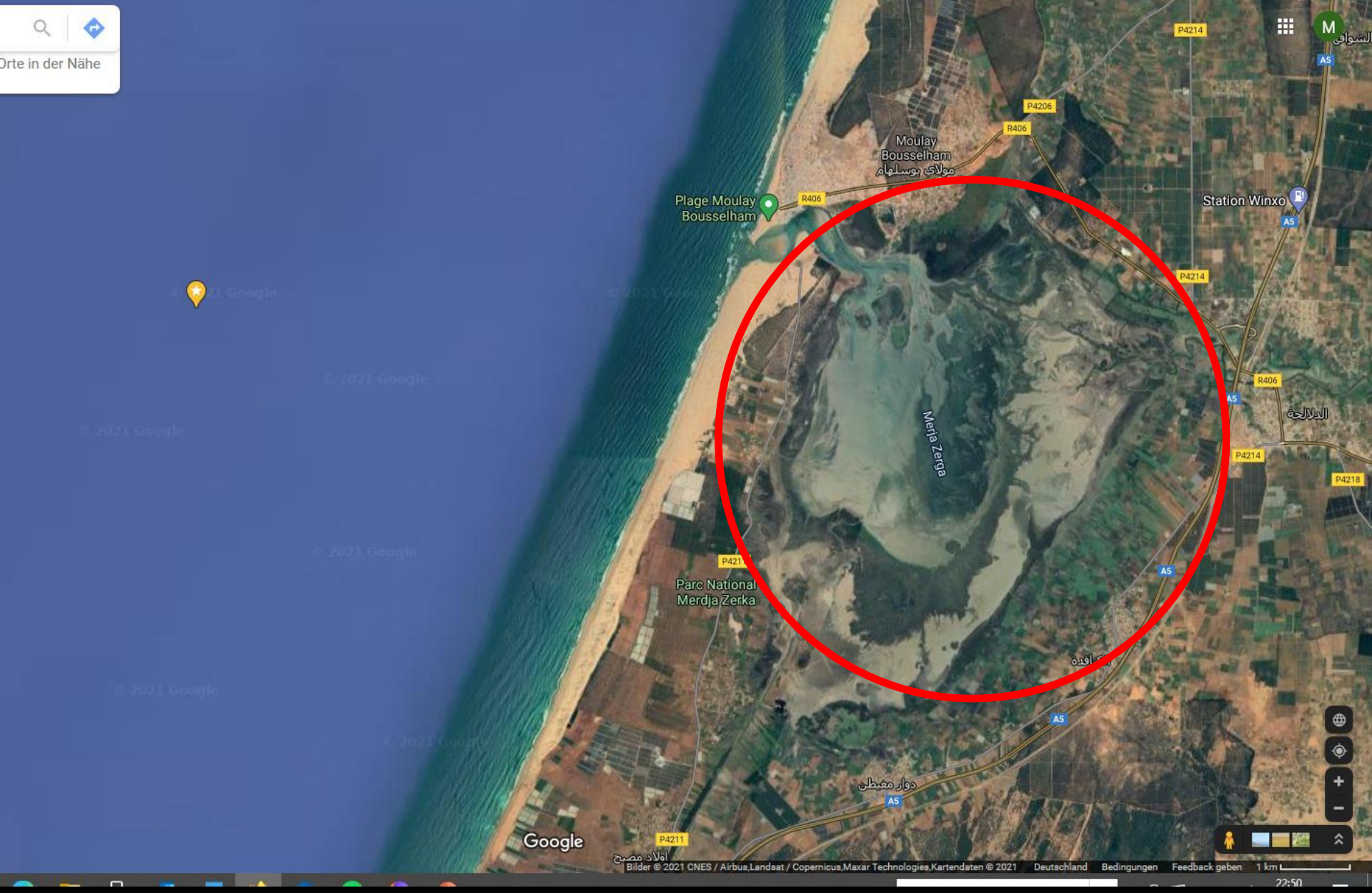

Aquatic Warbler BP313 - autumn
log(Light Intensity)
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0


Aquatic Warbler BP319 - autumn
log(Light Intensity)
5,0
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0


autumn
spring
60°N
50°N
40°N
30°N
20°N
10°N
0°
10°S
20°W
10°W
0°
10°E
20°E
30°E
40°E
50°E
Autumn
Spring

Annex 4: AW wintering sites (>60 days October-February)

		coordinates		stopover durance	dates of stopover		probable/possible site ('informed guess')					
Country	geolocator	latitude	longitude	days	arrival	departure	probability of correct apointment	name	latitude	longitude	distance from GL localisation	comments/ habitat information
		15,5347	-16,2612									Flooded part of Senegal delta
Senegal	BP 343	15,8785	-16,3756	202	25.08.	15.03.	medium	Djoudj NP	16,4200	-16,2000	60 km NNE	grassy marshes, regularly
		15,9955	-16,4442									flooded in winter
		16,8578	-6,7624									
Mauritania	BP 308	16,8891	-6,7742	198	26.09.	11.04.	medium	Inner Issil Delta	16,5490	-7,1705	55 km SW	inner delta of river Issil
		16,9183	-6,7850					E Benibafat				wetland in the desert
		16,4570	-3,7417									
Mali	BP 335	16,6917	-3,7616	214	11.09.	12.04.	high	Lak Takara/ Lac Télé	16,6900	-3,7600	0 km	desert lakes N IND
		17,2350	-3,7977					W Timbuktu				
		16,2232	-5,2426									
	BP 330	16,2591	-5,2474	222	29.08.	08.04.	no					
		16,3244	-5,2559									
		15,5869	0,0684									
	BP 345	15,9144	0,0120	187	26.09.	31.03.	medium	Niger Houssa Foulan	15,9741	0,1212	13 m ENE	Niger floodplain
		16,1030	-0,0140					to Gargonne				
		15,5009	-3,7637									
	BP 321	15,5100	-3,7656	192	27.09.	07.04.	medium	Lake Korientze	15,3240	-3,8000	15 km SSW	Large shallow lake in the IND
		15,5136	-3,7664					NE edge of IND				
		15,0419	-4,8516									
	BP 309	15,2641	-4,9425	182	10.09.	11.03.	medium	Inner Niger Delta IND	14,7200	-4,5000	33 km SE	regularly flooded part of IND
		15,3976	-4,9930									
		14,6847	-4,5852									
	BP 313	14,9697	-4,6331	163	02.09.	12.02.	high	western part of IND			0 km	regularly flooded part of IND
		15,1417	-4,7108									
		14,4600	-5,5009									
	BP 315	14,4986	-5,9350	190	30.08.	08.03.	high	River Sahel floodplain	14,5000	-6,0000	6 km W	regularly flooded river flood-
		15,8963	-5,9418									plain with low marshy vegetation



Morocco: Merja Zerga


SE-Mauritania
198 days!?
Néma
النعمة
Jrari
Google
Bilder © 2021 TerraMetrics,Kartendaten © 2021
Deutschland
Bedingungen
Feedback geben
10 km
Adresse
22:52

SE-Mauritania: Inner Issil Delta

SW-Mauritania: M‘Barwadji, January 2011

SW-Mauritania: Guimi, January 2011

SW-Mauritania: Guimi, December 2011

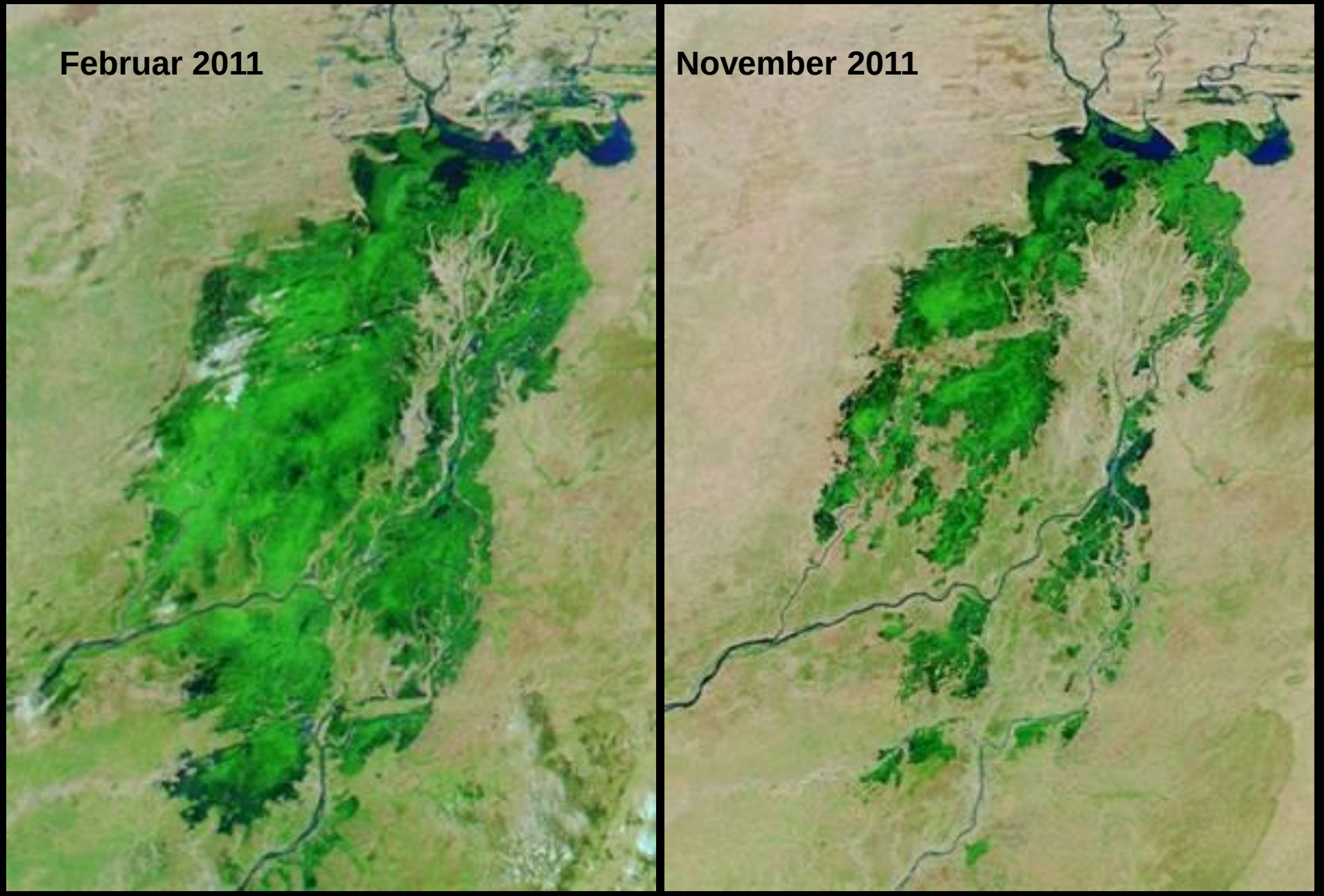
SW-Mauritania: Guimi

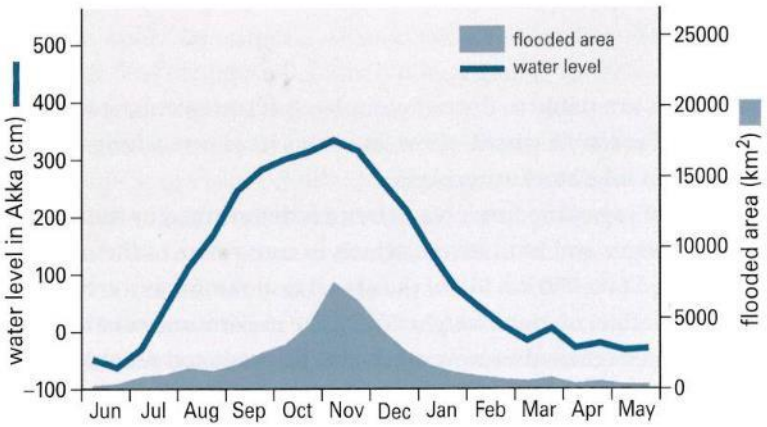

Senegal: Djoudj

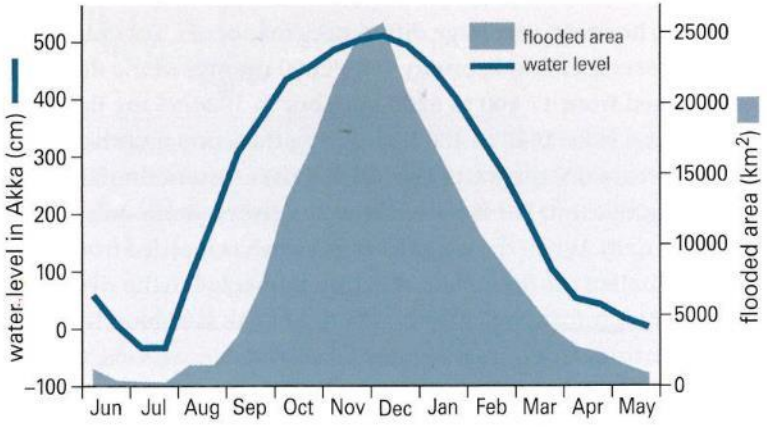

12a
12b
11
10b
10a
8
7
6
5
4
13
9d
9b
9a
9c
1
2b
2a
3
15
station
SITES DE BAGUAGE
2
0
2
4
Kilomètres

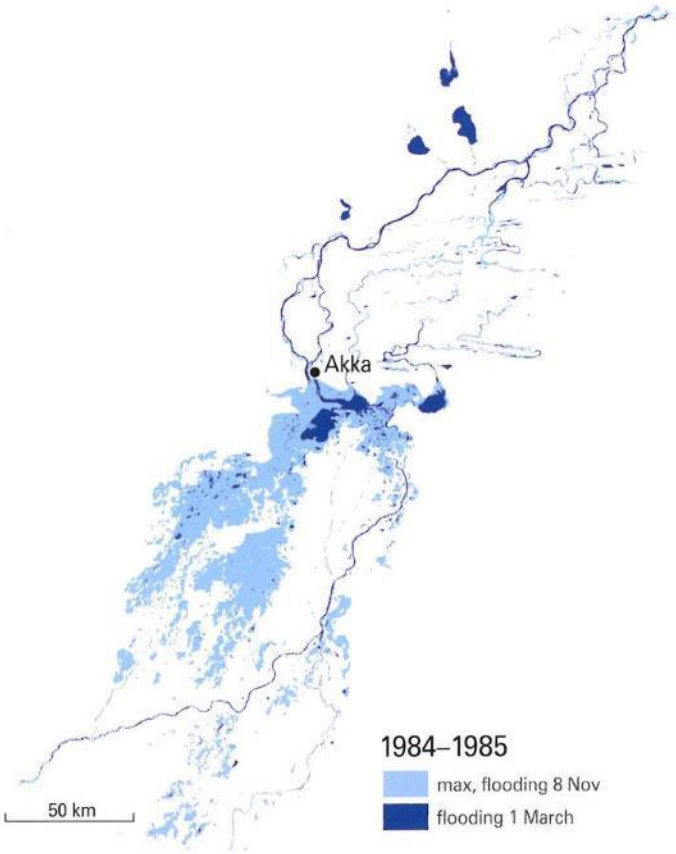
Inner Niger Delta

From Zwarts et al. 2009: Living on the edge


Februar 2011
November 2011


flooded area
water level
water level in Akka (cm)
flooded area (km²)
500
400
300
200
100
0
−100
25000
20000
15000
10000
5000
0
Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May

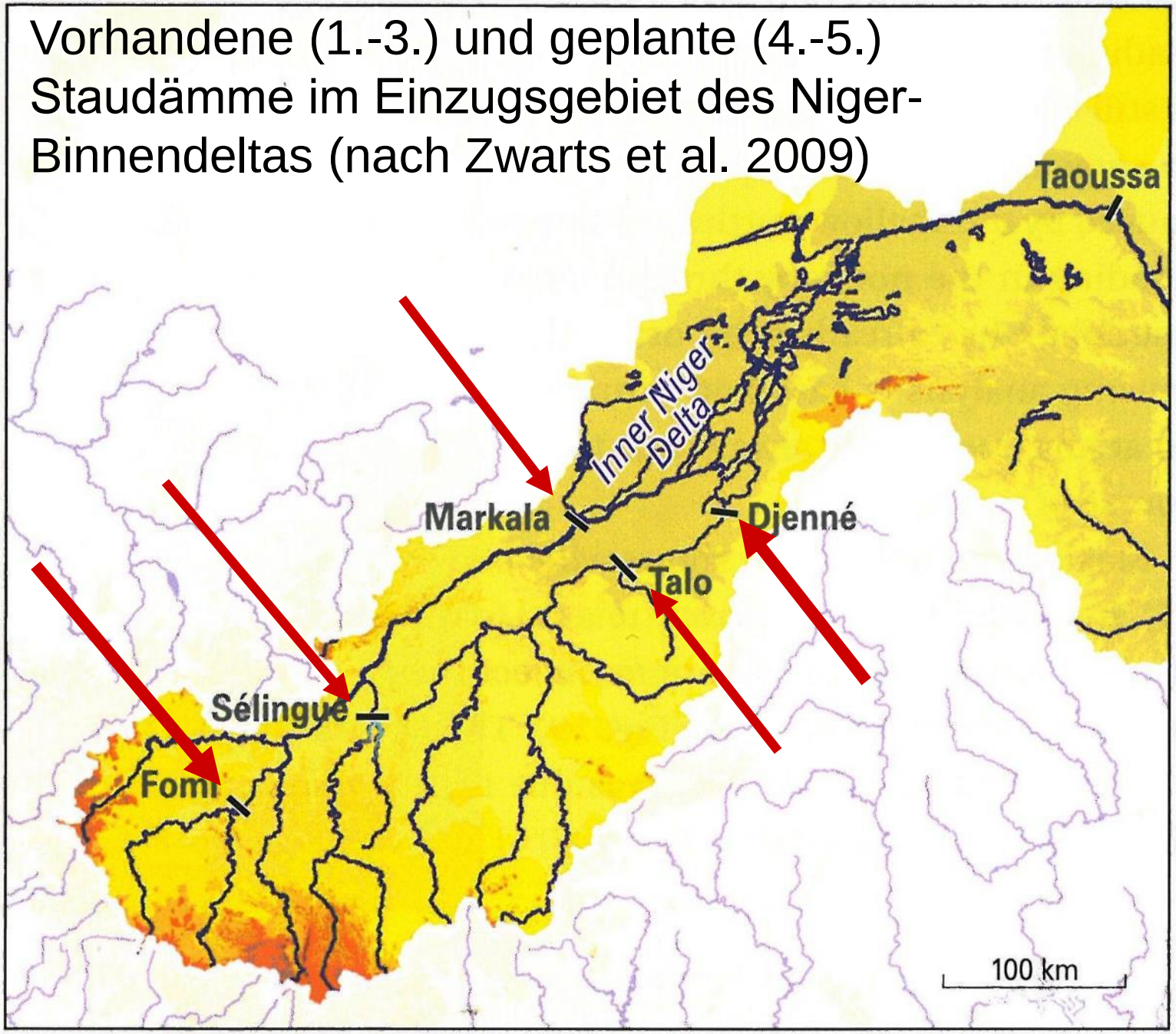

flooded area
water level
water level in Akka (cm)
flooded area (km²)
500
400
300
200
100
0
−100
25000
20000
15000
10000
5000
0
Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May


Akka
50 km
1984–1985
max, flooding 8 Nov
flooding 1 March


50 km
1999–2000
max, flooding 8 Dec
flooding 1 March


5
1
4
1
7
1
0
10
20 km

Vorhandene (1.-3.) und geplante (4.-5.) Staudämme im Einzugsgebiet des Niger-Binnendeltas (nach Zwarts et al. 2009)



Conclusions

1. >70 %, probably even >90 % of the global AW population winters in Mali and adjacent areas of Mauritania, Burkina Faso and possibly Ghana; AW wintering in Senegal (Djoudj) are probably coming mainly from Poland;

2. The Inner Niger Delta is of outstanding importance as AW wintering area;

3. On autumn migration, France, Spain and Portugal are of great importance as stopover sites; male AW fuel up mainly on the Iberian peninsula;

4. On spring migration, most important stopover sites are in Morocco, N-Algeria and S-Spain with stopovers of up to 53 days;

5. Adult male AW stay more than half a year (up to >220 days) in the winter quarter, c. 100 days on migration and only 81 days on average in the breeding grounds;

6. In the wintering areas, AW stay mostly at the same site for 5-7 months; only one (out of 19) male AW changed the site once in January;

7. Identification and conservation of the wintering sites in the Sahel and of the stopover sites in SW-Europe and NW-Africa are of uttermost importance for AW conservation.

Thank you!

Participants in the fieldwork (geolocator study 2018/19):

From Belarus: Maxim Nemtchinov, Ivan Bogdanovich, Maxim Koloskou, Dima Zhuravlev, Daniil Zhuravlev

From Germany: Sven Baumung, Yves Brendahl, Martin Flade, Benedikt Gießing, Benjamin Herold, Filibert Heim, Ulf Kraatz, Klaus Nigge, Andreas Prott, Cosima Tegetmeyer, Florens Waldschmidt, Landelin Winter

From Latvia: Toms Endziņš, Aivis Gulbis, Roberts Jansons, Valts Jaunzemis, Oskars Keiss, Elza Zacmane

From Lithuania: Vytautas Eigirdas, Jurate Zarankaite

From Poland: Grzegorz Kiljan

Organisational support: **APB** (A. Vintchevski), **BEF** (Z. Morkvenas), Gorden Trettin

Geolocators: **Migrate Technology Ltd**., James Fox

Geolocator data analysis: Simeon Lisovski

Analysis of desert crossings: Frédéric Jiguet

Photography: Klaus Nigge

Funding: **NABU Germany** (Lars Lachmann), **Förderverein Naturschutz Peenetal** (Franziska Tanneberger, Kees Vegelin)