

Aquatic Warbler Conservation Team

Equipping Aquatic Warblers *Acrocephalus paludicola* with geolocators in the Supoy region, Ukraine

1st to 14th July 2010



Adult male Aquatic Warbler carrying a 0.6g SOI-GL05.10 geolocator, Supoy, Ukraine, 6th July 2010

Final Report

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on behalf of the

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1. Summary

The Djoudj National Park, Senegal, and adjacent areas is actually the only known wintering site of the globally threatened Aquatic Warbler *Acrocephalus paludicola*, but density estimates indicate that further wintering sites must exist in sub-Saharan Africa. At the second meeting of the signatory parties of the “Memorandum of Understanding concerning conservation measures for the Aquatic Warbler” an agreement under the Bonn Convention on Migratory Species (CMS), in May 2010 at Goniadz, Poland, the full identification of the African wintering grounds of the Aquatic Warbler was given highest priority in the adopted International Species Action Plan. Indirect approaches such as molecular methods or stable isotope analyses have been shown to be unsuitable to identify exact non-breeding areas, but geolocators may help to solve the problem. Geolocators measure light intensity and allow daily determination of the location of the bird carrying the logger with respect to latitude and longitude. The weight of the lightest currently used geolocators was with about 1 g still too high for a bird like the Aquatic Warbler with an average body mass of 10-12 g. The Swiss Ornithological Institute in co-operation with the Bern University of Applied Sciences, Switzerland, recently developed a new model of geocator (SOI-GL05.10) that has a weight of about 0.6 g.

Between 3rd and 12th July 46 adult male Aquatic Warbler were mistnetted in the floodplains of the Supoy river, Ukraine. Thirty of these birds were equipped with SOI-GL05.10. It is planned to recapture as many of these birds as possible in 2011 to retrieve the geolocators. Sixteen birds without locators will serve as a control group to analyse possible differences in survival rates. Once the geolocators are retrieved and the data analysed the results will help to implement site specific conservation strategies at stopover and wintering sites.

2. Participants of the expedition

- Dr. Volker Salewski, Regensburg, Germany: Expert for mistnetting and geolocators; organiser of the project.
- Dr. Anatoliy Poluda, Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv, Ukraine: Head of the Ukrainian bird ringing scheme; expert for Aquatic Warblers of the Ukrainian Society for the protection of birds and mistnetting; organiser of the field trip in the Ukraine.
- Grzegorz Kiljan, OTOP - BirdLife Poland, Swinouscie, Poland: Expert for Aquatic Warblers and ringing.
- Dr. Ivan Legeyda, Academy of Sciences, Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv, Ukraine: Organizer of local logistics.

3. Schedule

Table 1: Schedule of the expedition.

Date	Activities
29.-30.06.	<ul style="list-style-type: none"> • Volker travels from Regensburg to Sempach, Switzerland, to help with last preparations of the geolocators and to bring them to Germany.
01.07.	<ul style="list-style-type: none"> • Volker travels from Regensburg to Berlin. • Grzegorz travels from Miedzyzdroje to Berlin.
01.-02.07.	<ul style="list-style-type: none"> • Grzegorz and Volker travel from Berlin to Kiev.
02.07.	<ul style="list-style-type: none"> • Ivan sets up Camp 1 in the Supoy valley. • Anatoliy meets Grzegorz and Volker in Kiev, they drive to Camp 1.
03.-08.07.	<ul style="list-style-type: none"> • Mistnetting of Aquatic Warblers and equipping them with geolocators in the vicinity of Camp 1.
08.07.	<ul style="list-style-type: none"> • Moving to Camp 2.
08.-12.07.	<ul style="list-style-type: none"> • Mistnetting of Aquatic Warblers and equipping them with geolocators in the vicinity of Camp 2.
12.07.	<ul style="list-style-type: none"> • All members of the team travel back to Kiev.
13.-14.07.	<ul style="list-style-type: none"> • Grzegorz and Volker travel back to Miedzyzdroje and Berlin respectively.

4. Background and targets

The Aquatic Warbler is the rarest migratory songbird of Europe, and the only globally threatened passerine bird found in mainland Europe. The species is classified as Vulnerable in the IUCN Red List of Globally Threatened Species. Once widespread and numerous in fen mires and wet meadows throughout Europe, the Aquatic Warbler has disappeared from most of its former range. The species became extinct in Western Europe during the 20th century and has declined dramatically in central Europe. Nowadays, its global population of only 10,200-13,800 vocalising males is confined to fewer than 40 regular sites in only five countries, with four sites supporting over 80 % of the global population (Flade 2008a).

To ensure the success of ongoing conservation efforts for the Aquatic Warbler, which have been undertaken almost exclusively in European countries until now, and to effectively protect the Aquatic Warbler populations from further decline, it is of uttermost importance to preserve the African resting and wintering grounds. A prerequisite for the protection of the winter habitats is sound knowledge of the sites used during the non-breeding season in order to determine the ecological factors generating suitable habitat conditions, and to assess current or potential threats.

Dramatic habitat changes in the sub-Saharan wetlands (habitat loss due to increase of hydro-agriculture and construction of fresh water reservoirs, long-term changes in Sahel precipitation and salinity of suitable habitats as well as grazing by cattle, Zwartz et al. 2009) obviously could be an important limiting factor, but the extent to which this is affecting the population dynamics of Aquatic Warbler remained unclear. Therefore, the knowledge of the wintering sites was given highest priority in the Aquatic Warbler Species Action Plan, which is annexed to a Memorandum of Understanding concerning conservation measures for the Aquatic Warbler, an agreement under the Convention on Migratory Species of Wild Animals (Bonn Convention, CMS).

In January 2007, wintering habitats in vast open water-logged grass marshes inside and north of the Djoudj National Park (Senegal) have been discovered by an AWCT expedition (Flade 2008b, Salewski et al. 2009). The density was roughly estimated at 0.5-1.0 (-1.5) birds per hectare over a total area of suitable habitat of 4,000 to 10,000 hectares (extrapolation 2,000-10,000 birds in total). Observations in the winter 2008/09 indicated that the real number is probably more at the lower end of this range and consequently the Djoudj area probably hosts only a certain proportion of the global population of Aquatic Warblers during the non-breeding season. There might be more wintering sites in wetlands and floodplains of southern Mauritania and Mali (several winter records), but further intensive search for suitable wintering sites in SW-Mauritania and Senegal as well as in Gambia have been unsuccessful so far (Flade & Salewski 2009, Flade 2010, Salewski & Seifert 2010). Therefore, it is still crucial for the conservation of Aquatic Warblers to identify all sites that are used during the non-breeding season and to investigate population-specific migration routes as well as moulting and wintering areas.

Recent reanalyses have revealed that attempts to localise wintering sites and population specific moulting areas with molecular methods (Gießing 2002) and studies of isotope composition of feathers (Pain *et al.* 2004) do not indicate wintering areas or habitats with enough accuracy to implement site specific conservation strategies (Vogel 2009; Oppel et al. submitted). There are also neither any recoveries of birds ringed in the breeding areas at the wintering site in Djoudj in Senegal nor any recoveries of the 167 Aquatic Warblers ringed in Senegal 2007-2009 in any of the breeding populations, and, therefore, direct hints for individual connectivity between European breeding areas and non-breeding areas in sub-Saharan Africa are still missing. As Aquatic Warblers with an average body mass of 10-12g are far too small

for even the lightest satellite transmitters this method is also not suitable to investigate individual migration routes. Such a possibility is, however, given by the application of newly developed light-weight geolocators.

Geolocators are data loggers that measure ambient light intensity in regular intervals (e.g. every three or five minutes) and consequently allow the calculation of the length of daily light duration and the time of sunrise and sunset respectively. Therefore, geolocators allow the determination of the position of the bird carrying the logger with respect to latitude and longitude. In currently used models the accuracy of these measurements is about 150-200 km. Geolocators do not send data to a remote receiver but store the data for a maximum of one year. Therefore, the individual carrying the locator has to be recaptured to retrieve the data. Geolocators have already been applied to a number of bird species in America and Europe. In North America the return rate of migrating Purple Martins *Progne subis* carrying geolocators was distinctly lower compared to birds not carrying these loggers, but not so in Wood Thrushes *Hylocichla mustelina* (Stutchbury *et al.* 2009). However, in a different study survival of North American Tree Swallows *Tachycineta bicolor* equipped with geolocators was not different from those without geolocators (Vleck, pers. com.). The Swiss Ornithological Institute equipped 19 Hoopoes *Upupa epops* with geolocators of which five were recaptured after migration, which was a slightly higher return rate than from individuals that were ringed only (Bächler *et al.* 2010). Currently geolocators are used in projects with Alpine Swifts *Tachymarptis melba* (Liechti pers. com.), Nightingales *Luscinia megarhynchos* (Liechti pers. com.), Northern Wheatears *Oenanthe oenanthe* (F. Bairlein pers. com., S. Åkesson pers. com.) Great Snipes *Gallinago media* (Å. Lindström, pers. com.) and Great Reed Warblers *Acrocephalus arundinaceus* (S. Bensch pers. com.).

Geolocators are attached to a bird's back with a leg-loop harness similar to those used for normal radio transmitters. The harnesses for this project are made of water resistant silicon allowing flexibility when the birds accumulate fat for migration. This method has already been successfully used with nightingales and it has been shown that silicon harnesses last for more than a year and do not cause abrasions on the birds' skin (S. Hahn, pers. com.). The weight of geolocators used to the present was with about 1 g, still too high for a bird like the Aquatic Warbler with an average body mass of 10-12 g.

The Swiss Ornithological Institute in co-operation with the Bern University of Applied Sciences, Switzerland, recently developed a new model of geocator (SOI-GL05.10) with a weight of about 0.6 g (Figure 1). It has been assumed that in small birds transmitters of up to 5.8% of the body mass do not significantly affect body condition, manoeuvrability and range use (Naef-Daenzer *et al.* 2001). In general we expect an accuracy of about 150-200 km to be achieved. The expected accuracy is at the lower end of this range because Aquatic Warblers do not spend the night in holes but live in open flat landscapes with no shading mountains to cause bias in sunset and sunrise times. In addition, for the winter range there will be many position estimates available for each individual with an unbiased error, so allowing us to approximate the real position of residency in winter with a much greater accuracy than mentioned above.

In June 2010 31 of SOI-GL05.10 geolocators were made available for a project of the AWCT to investigate migration routes and non-breeding areas of Aquatic Warblers from the Supoy region, Ukraine. The isolated flood plain mires in the Supoy valley are situated in a vast black soil agricultural landscape. The site was selected because it had about 180-200 singing males in 2008 with an increasing trend (Poluda 2008) and is so large enough to bear the risk of disturbance caused by capturing individual birds and by the potential risk of increased mortality by carrying the loggers. Additionally, the population is isolated enough that it can be assumed that

birds returning after migration will be found in the area where they were captured in the subsequent year. Furthermore, Schäffer et al. (2006) report historical records of Aquatic Warblers in Egypt and the eastern Mediterranean possibly indicating a migration route to West Africa via the Balkan Peninsula. If such a route still exists, it is most likely used by the populations in Central Ukraine due to its geographical proximity.

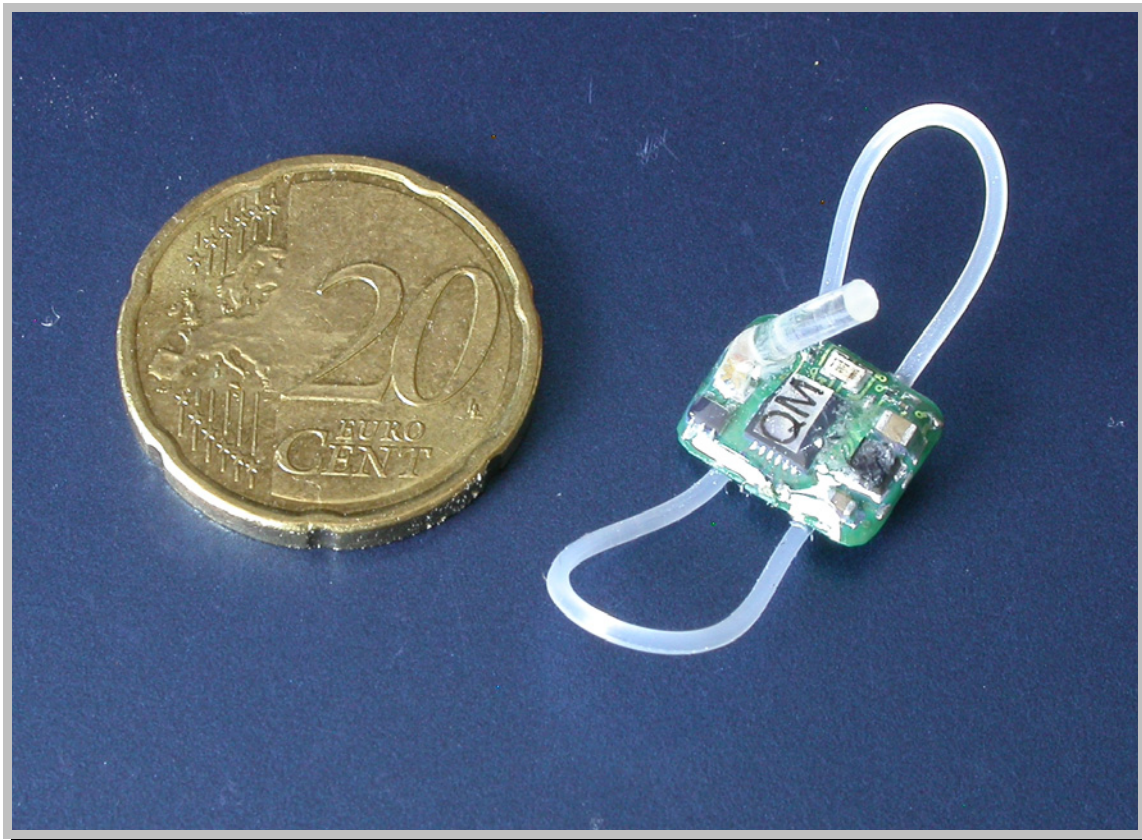


Figure 1: The 0.6g geolocator (SOI.GL05.10).

5. Methods

5.1 Study site

The study site was located in the floodplains of the Supoy river (Figure 2) between the villages of Bezulivka, Ozerne and Mala Berezanka (Figure 3). Aquatic Warblers were mistnetted in the vicinity of Camp 1 (50°25.180'N, 31°44.340'E) and Camp 2 (50°25.200'N, 31°44.100'E) respectively (area of plot 1 in Poluda 2006). During the time of mistnetting there was no standing water.

Dominant vegetation consists of sedges e.g. *Carex appropinquata*, *C. rostrata*, *C. lasiocarpa* and Swamp horsetail *Equisetum fluviatile*, interspersed with e.g. Marsh Fern *Thelypteris palustris*, Hogfennel *Peucedanum palustris*, Yellow Loosestrife *Lysimachia cf. vulgaris*, Purple Loosestrife *Lythrum salicaria*, Water Dock *Rumex hydrolapathum*, Buggleweed *Lycopus europaeus*, Bogbean *Menyanthes trifoliata*, Marsh Cinquefoil *Potentilla palustris*, Greater Spearwort *Ranunculus lingua* and willow bushes *Salix sp.* Green moss *Drepanocladus aduncus* is also common together with other moss species like *Bryum pseudotriquetum*, *Amblystegium serpens* and *Marschantia polymorpha*. Towards the Supoy river Common Reed *Phragmites australis* and Common Cattail *Typha latifolia* becomes dominating rendering the area unsuitable for Aquatic Warblers.



Figure 2: Supoy river floodplains near Camp 2, 9th July 2010.



Figure 3: Location of the study area. The small map shows Ukraine with the location of the study area (red marker). The detailed map shows the study area (encircled by the orange line) in the Supoy river floodplains with Camp 1 and Camp 2.

5.2 Methods

Aquatic Warblers were captured with standard mist nets for passerines (Figure 4). Singing males were searched for in the study area. When a male was located two mist nets were placed next to nearby bushes and the singing males chased into the nets, occasionally with the help of sound luring. All Aquatic Warblers were ringed with an aluminium ring of the Ukrainian ringing scheme and standard morphological measurements and body mass were taken. Two out of three captured male Aquatic Warblers were equipped with a geocator. Due to the promiscuous breeding system of the species and the fact that only female birds breed and care for the young, capturing a limited proportion of male birds, of which there is an excess compared to female birds (54 % males according to genetic analyses; Gießing 2002, Vogel 2009), will not have a significant influence on current and future breeding success.



Figure 4: Mistnets to catch Aquatic Warblers near Camp 1, 3rd July 2010.

6. Results

Between 3rd and 12th July 54 Aquatic Warblers were mistnetted (Table 2) including five adult females and three juvenile birds of unknown sex. Females and juvenile birds were neither equipped with geolocators nor will they be considered in future analyses. Of the 46 adult males mistnetted 30 were equipped with geolocators. The weight of the geocator SOI-GL05.10 represented between 4.6% and 5.7% of the actual body mass of the respective birds (Table 2). The remaining birds were ringed and comprise the control group for future survival analyses. The control group includes three birds that were ringed already. Two birds were ringed by A. Poluda in 2009 in the Supoy valley, and one bird was ringed at the mouth of the river Loire, western France, in August 2009 (Annex). The latter bird was the first foreign recovery in the Ukraine.

One geocator was also left in the vegetation to be retrieved later and to serve to calibrate the accuracy of the geolocators used on the Aquatic Warblers.

Table 2: Capture details of Aquatic Warblers mistnetted in the Supoy region, Ukraine, July 2010. Sex and Age according to the EURING code. Wing and Tarsus in mm, mass in g.

Date	Time	Ring	Sex	Age	Wing	Tarsus	Mass	GL ID	GL Mass	% Body Mass
03.07.	08:30	A058695	1	4	64.0		11.1	-		
03.07.	09:00	A058696	1	4	65.0		11.3	QM	0.64	5.7
03.07.	10:30	A058697	1	4	63.0		11.6	QU	0.65	5.6
03.07.	11:00	A058698	1	4	63.0		12.7	QV	0.64	5.0
03.07.	19:00	A058699	1	4	63.0	19.7	12.4	QR	0.65	5.2
04.07.	10:00	A083301	1	4	64.5	20.5	11.5	QP	0.65	5.7
04.07.	10:00	A083302	1	4	66.0	19.9	11.0	-		
04.07.	20:00	A083303	1	4	64.0	20.9	13.0	QL	0.65	5.0
04.07.	20:30	A083304	1	4	63.0	20.4	12.0	-		
04.07.	21:30	A083305	1	4	65.0	20.0	13.0	QI	0.63	4.8
04.07.	21:30	A083306	1	4	63.0	19.0	-	QK	0.62	-
05.07.	07:30	A083307	2	4	62.0	19.5	11.5	-		
05.07.	09:00	A058476	1	4	64.5	20.2	12.1	-		
05.07.	09:30	A083308	0	3	65.5	20.1	11.3	-		
05.07.	19:00	A083309	0	3	65.0	20.2	11.8	-		
05.07.	20:00	A083310	1	4	64.0	20.5	13.5	QO	0.63	4.7
05.07.	21:00	A083311	1	4	64.5	19.9	12.5	QN	0.64	5.1
05.07.	21:00	A083312	2	4	62.0	20.5	11.4	-		
05.07.	21:30	A083313	1	4	65.0	20.9	13.0	RT	0.62	4.8
05.07.	21:30	A083314	1	4	64.0	20.6	12.6	-		
06.07.	09:00	A083315	1	4	62.0	19.7	12.2	RM	0.60	4.9
06.07.	11:30	A083316	1	4	64.0	20.0	12.0	-		
06.07.	13:00	A083317	1	4	64.5	20.1	13.2	RG	0.61	4.6
06.07.	20:00	A083318	1	4	63.0	20.0	13.1	QT	0.62	4.7
06.07.	20:00	6051019	1	4	63.0	20.2	12.8	-		
06.07.	20:00	A083319	0	3	63.0	20.8	11.6	-		
06.07.	20:30	A083320	1	4	64.0	19.9	13.6	RN	0.63	4.6
06.07.	21:00	A083321	1	4	63.0	20.3	12.3	QW	0.64	5.2
06.07.	21:30	A083322	1	4	64.0	19.9	12.2	QZ	0.65	5.3
06.07.	21:30	A083323	1	4	66.0	18.5	12.8	-		
07.07.	18:00	A083324	1	4	65.0	20.6	13.0	QY	0.61	4.7
07.07.	19:30	A083325	1	4	61.0	20.0	12.2	-		
07.07.	19:30	A083326	1	4	62.0	20.0	12.3	QX	0.62	5.0
07.07.	20:30	A083327	1	4	62.0	20.0	11.6	RC	0.61	5.3
07.07.	20:30	A083328	1	4	63.5	20.0	13.1	-		
08.07.	19:00	A083329	2	4	61.5	18.6	11.4	-		
08.07.	19:30	A083330	1	4	60.5	20.3	11.8	RL	0.60	5.1
08.07.	19:30	A083331	1	4	65.0	20.3	12.5	RA	0.61	4.9
08.07.	19:30	A083332	1	4	61.0	20.5	13.5	-		
08.07.	20:00	A083333	1	4	63.0	19.2	12.1	RP	0.60	5.0
08.07.	21:30	A083334	1	4	63.0	20.3	12.2	RD	0.61	5.0
08.07.	22:00	A083335	1	4	64.0	20.8	12.0	-		
09.07.	10:00	A083336	1	4	61.0	20.5	12.0	RF	0.61	5.1
09.07.	11:00	A083337	1	4	62.0	20.5	12.1	RI	0.62	5.1
09.07.	11:30	A083338	1	4	63.0	19.4	12.3	-		
09.07.	12:00	A083339	1	4	63.0	20.2	12.4	QJ	0.67	5.4
09.07.	19:30	A083340	1	4	65.0	20.6	12.4	QQ	0.67	5.4
09.07.	21:00	A083341	1	4	64.0	23.0	13.0	RR	0.62	4.8
09.07.	21:00	A083342	1	4	63.0	20.0	11.9	-		
10.07.	20:30	A083343	1	4	66.0	21.6	12.4	RB	0.60	4.8
10.07.	21:00	A083344	1	4	61.0	19.1	11.8	-		
11.07.	10:20	A058471	1	4	62.0	20.1	12.0	-		
11.07.	11:00	A083345	2	4	61.0	19.8	13.1	-		
12.07.	10:30	A083346	2	4	62.0	20.3	12.1	-		

7. Discussion and outlook

In July 2010 46 adult male Aquatic Warblers were mistnetted in the Supoy flood plains, Ukraine. Thirty of these birds were equipped with geolocators. These geolocators will record light intensity every five minutes for 10 months, the estimated life span of the battery. During the next breeding season an active search for birds wearing rings will be performed. These birds will then be recaptured and if carrying a geocator the latter will be retrieved to download and to analyse the stored data. Sixteen birds that have been ringed without attaching a geocator will be the control group to analyse potential differences in survival and body condition of the two cohorts. Unfortunately it was not possible to capture more birds for the control group as initially planned. Due to time constraints, but also due to being there late in the breeding season when singing activity of Aquatic Warblers had already decreased compared to a month earlier (Poluda, pers. obs.) it was not possible to catch more adult male Aquatic Warblers. On 20 June 21 males had been counted singing on a 30 ha monitoring plot near Camp 2, but only 13 males have been captured between 8 – 12 July, a decrease of singing males by 38%.

The success of the project depends entirely on the return rate of the respective birds. During this project two out of only six birds ringed in 2009 were recaptured. Although the initial number of birds ringed in 2009 is low it suggests that Aquatic Warblers show a high rate of breeding site fidelity at least in the studied population. We are therefore optimistic to be able to retrieve a certain number of geolocators in 2011.

It was initially assumed that the applied geolocators would have a weight of only 0.5g. However, due to recent experiences with geolocators used on nightingales *Luscinia megarhynchos*, the SOI-GL05.10 has an improved coating by epoxy and carries an optical fibre which increases the total weight of the device to 0.60g to 0.67g, which equals between 4.6% and 5.7% of the body mass of the respective birds. Nevertheless, these numbers are still in the range of the proportion of body mass considered suitable by Naef-Daenzer et al. (2001).

Once the data are retrieved from the geolocators it will be possible to analyse the migration of every individual bird from which the data are available within the given accuracy. Daily positions during the entire autumn and spring migration periods as well as on the wintering sites will allow us to determine the exact migration routes, stopover sites during migration, moulting and wintering areas as well as possible changes of sites during the non-breeding period ("itinerancy", Moreau 1972). Furthermore, if the described project is successful, the geolocators can also be applied to Aquatic Warblers of other populations to determine whether there are population-specific migration routes and wintering areas which require site specific conservation strategies and management plans. The results will also allow assessment of whether there are different threats in the non-breeding areas of populations that show different population trends with no obvious reason detectable on the breeding grounds. This information will be used as guidance for further expeditions to analyse habitats used by Aquatic Warblers during migration and wintering and to assess potential threats at these sites. It will enable the AWCT to implement site specific conservation strategies to protect this globally threatened species during the non-breeding period, which includes the major part of its annual cycle.

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Annexes

I. Financial Report (original receipts were send to Martin Flade, AWCT):

Date	No.	Purpose	CHF ¹	PLN ²	UAH ³	€
Collecting geolocators in Sempach, Switzerland, by Volker Salewski:						
29.06.	1	Return ticket Regensburg-Luzern				96.20
29.06.	2	Ticket Luzern-Sempach	3.20			2.37
29.06.	nr ⁴	Accommodation in Switzerland				100.00
30.06.	3	Ticket Sempach-Luzern	3.20			2.37
Return trip from Regensburg to Kiev by Volker Salewski:						
01.07.	4	Taxi to railway station				8.00
01.07.	5	Ticket Regensburg-Kiev				114.50
13.07.	6	Ticket Kiev-Berlin			1273.00	127.30
13.07.	7	Ticket Berlin-Regensburg				50.50
14.07.	8	Taxi from railway station				8.00
Return trip from Miedzyzdroje to Kiev by Grzegorz Kiljan:						
01.07.	nr	Ticket from Miedzyzdroje to Berlin		75.00		18.75
01.07.	9	Ticket from Berlin to Kiev				97.60
13.07.	10	Ticket from Kiev to Poznan			722.00	72.20
14.07.	nr	Ticket from Poznan to Miedzyzdroje		50.00		12.50
Expenses in the Ukraine:						
	nr	Food			1570.00	157.00
	nr	Petrol			460.00	46.00
	nr	Allowance for Ivan Legeyda				150.00
	nr	Allowance for Anatoliy Poluda				150.00
Sum of Expenses:						1213.29

¹ 1 CHF = 0.74 €

² 1 PLN = 0.25 €

³ 1UAH = 0.10 €

⁴ no receipt available

II. Birds observed in the Supoy region (trips from and to Kiev excluded, nomenclature of scientific names and systematic follows Bauer et al. 2005):

Anatinae

Anas platyrhynchos Mallard

Phasianidae

Coturnix coturnix Common Quail

Ardeidae

Botaurus stellaris Great Bittern
Casmerodius albus Great White Egret
Ardea cinerea Grey Heron

Ciconiidae

Ciconia ciconia White Stork

Accipitride

Pernis apivorus Honey Buzzard
Circus cyaneus Hen Harrier
Circus pygargus Montague's Harrier
Circus aeruginosus Marsh Harrier
Milvus migrans Black Kite
Buteo buteo Eurasian Buzzard

Falconidae

Falco subbuteo Hobby

Gruidae

Grus grus Common Crane

Rallidae

Crex crex Corncrake
Porzana porzana Spotted Crake
Fulica atra Coot

Scolopacidae

Gallinago media Great Snipe
Gallinago gallinago Common Snipe
Tringa ochropus Green Sandpiper

Laridae

Larus ridibundus Black-headed Gull

Sternidae

Clidonias leucopterus White-winged Tern

Columbidae

Columba palumbus Wood Dove
Streptopelia turtur Turtle Dove

Cuculidae

Cuculus canorus Cuckoo

Strigidae

Asio otus Long-eared Owl

Apodidae

Apus apus Eurasian Swift

Meropidae

Merops apiaster Eurasian Bee-eater

Upupidae

<i>Upupa epops</i>	Hoopoe
Picidae	
<i>Dendrocopos syriacus</i>	Syrian Woodpecker
<i>Dryobates minor</i>	Little-spotted Woodpecker
Oriolidae	
<i>Oriolus oriolus</i>	Golden Oriole
Lanidae	
<i>Lanius minor</i>	Lesser Grey Shrike
<i>Lanius collurio</i>	Red-backed Shrike
Corvidae	
<i>Pica pica</i>	Magpie
<i>Corvus corone cornix</i>	Hooded Crow
<i>Corvus corax</i>	Common Raven
Remizidae	
<i>Remiz pendulinus</i>	Penduline Tit
Paridae	
<i>Parus major</i>	Great Tit
<i>Parus caeruleus</i>	Blue Tit
Alaudidae	
<i>Alauda arvensis</i>	Skylark
Hirundinidae	
<i>Riparia riparia</i>	Sand Martin
<i>Hirundo rustica</i>	Barn Swallow
<i>Delichon urbica</i>	House Martin
Megaluridae	
<i>Locustella naevia</i>	Grasshopper Warbler
<i>Locustella luscinioides</i>	Savis Warbler
Acrocephalidae	
<i>Acrocephalus paludicola</i>	Aquatic Warbler
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler
<i>Acrocephalus palustris</i>	Marsh Warbler
<i>Acrocephalus scirpaceus</i>	Reed Warbler
<i>Acrocephalus arundinaceus</i>	Great Reed Warbler
Sylviidae	
<i>Sylvia communis</i>	Common Whitethroat
Sturnidae	
<i>Sturnus vulgaris</i>	Starling
Turdidae	
<i>Turdus pilaris</i>	Fieldfare
Muscicapidae	
<i>Saxicola rubetra</i>	Whinchat
<i>Luscinia svecica</i>	Bluethroat
<i>Phoenicurus ochrurus</i>	Black Redstart
Passeridae	
<i>Passer domesticus</i>	House Sparrow
<i>Passer montanus</i>	Tree Sparrow
Motacillidae	
<i>Anthus pratensis</i>	Meadow Pipit

<i>Motacilla citreola</i>	Citrine Wagtail
<i>Motacilla flava</i>	Yellow Wagtail

Fringillidae

<i>Fringilla coelops</i>	Chaffinch
<i>Carduelis chloris</i>	Greenfinch
<i>Carduelis cannabina</i>	Linnet

Emberizidae

<i>Emberiza citrinella</i>	Yellowhammer
<i>Emberiza schoeniclus</i>	Reed Bunting

III. Details of the control of the Aquatic Warbler ringed in France:**RING RECOVERY**

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RING NUMBER      Paris Museum 6051019

SPECIES          Acrocephalus paludicola

SEX

AGE              ?

RINGING DATE     18.08.2009

PROVINCE         France

RINGING PLACE    Pays de la Loire, mouth of Loire river

COORDINATES      47.15 N      1.56 W

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FINDING DATE     06.07.2010

PROVINCE         Ukraine, Kyiv O.

FINDING PLACE    Zgurivka, Mala Berezanka, river Supiy

COORDINATES      50.23 N      31.44 E

FINDING          Acrocephalus paludicola

DETAILS          controlled

COMMENT

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DISTANCE 2424 km      DIRECTION 82 degrees      ELAPSED TIME 322 days
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ref. 43/10