

Report on monitoring of Aquatic Warbler in Sporava and Zvaniec mires and survey of potential sites.

produced within the framework of the following projects:

“International Cooperation for Aquatic Warbler Conservation – RSPB’s support for a charitable purpose”,

activity 5.1. Coordination of AW counts 2011 in 2 most important breeding sites in Belarus (Sporava and Zvaniec mires).

activity 5.2. Basing on recently available BY database of fen mires search for the new AW sites in Belarus.

“Catalyzing sustainability of the wetland protected area system in Belarusian Polesie through increased management efficiency and realigned land use practices“

Counts of animals indicator species in zakazniks “Sporaŭski”, “Zvaniec”, “Siaredniaja Prypiac” and “Prostyr”.

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1. AIMS OF THE STUDY

The principle aim of the study was to conduct aquatic warbler counts at the most important Belarusian breeding sites (Sporava and Zvaniec mires) and search for the new AW sites.

2. METHODS

The counts were carried out according to the international aquatic warbler monitoring scheme which was developed within the framework of the LIFE-Nature Project (Poland and Germany). The counts started one hour before the sunset and lasted for 2 hours maximum – the period of the highest singing activity of males. This time was enough to cover a monitoring route making up to 2 km. Counts were not attempted in windy or rainy weather.

Counts were simultaneously conducted by 1-5 persons at each monitoring route. Teams of 2 or more persons were moving in rows. For the counts at sample plots the distance between counters made 50 m, for the full counts it equaled to 50-100 m. Before being mapped, each vocalizing male had to be observed by at least 2 counters. Such methodology allows receiving reliable data from volunteers possessing different level of experience.

Depending on the size of the site and availability of volunteers the following methods were used:

- Counts on sample plots (Zvaniec).
- Full counts (at all other sites)

3. RESULTS

3.1 AW numbers

Aquatic warbler counts were carried out at 2 most important AW breeding sites: Sporava and Zvaniec mires. Double counts were carried out at 6 sample plots in Zvaniec. Full single counts were executed at 100% of the known area occupied by AW in Sporava (the most detailed counts ever carried out at this mire). Full counts were also carried out at some small locations. The results are presented in the table below. It should be underlined that total number can not be considered as a national population estimate as numbers are delivered from different years.



Fig.1: Location of the Aquatic Warbler breeding sites in Belarus.

Table 1: Aquatic Warbler numbers at breeding sites in Belarus

	Name of site / locality	Year	Coordinator	Number of counts	Type of counts	Accuracy	Area, ha**	Population on site, males	
								min	max
1	Zvaniec****						6,150	2,254	4,428
	<i>Zvaniec East (Selišča)</i>	2010	UM	1	full	good(obs)	125	20	20
	<i>Zvaniec Central</i>	2010	UM	2	reg. plots	good(est)	5,575	2,254	4,428
	<i>Zvaniec West</i>	2010	UM	1	guess	poor(susp)	*450	0	253
2	Dzivin						175	14	14
	<i>Dzivin-Chabovičy</i>	2011	UM	1	full	good(obs)	28	3	3
	<i>Dzivin-Lipava***</i>	2011	UM	1	full	good(obs)	17	2	2
	<i>Dzivin-Liubaň</i>	2011	UM	1	full	good(obs)	63	0	0
	<i>Dzivin-Rudziec</i>	2010	UM	1	full	good(obs)	67	9	9
3	Sporava						1,413	510	536
	<i>31 localities (within PA)</i>	2011	UM	1	full	good(obs)	1,358	496	522
	<i>Bielaje*** (in buffer zone)</i>	2011	UM	1	full	good(obs)	55	14	14
4	Dzikoje						1,277	162	231
	<i>Dzikoje</i>	2008	VF	1	full/est	good(est)	869	158	216
	<i>Hlybokaje</i>	2006	NC	1	full/est	good(est)	35	2	5
	<i>Lomaŭka</i>	2006	NC	1	full	good(obs)	139	0	0
	<i>Naraŭ</i>	1996-2005	NC	1	full/est	good(est)	234	2	10
5	Ščara						211	40	55
	<i>Babrovickaje</i>	2010	DL	1	full	good(obs)	3	0	0
	<i>Ščara-Dabramysl'</i>	2010	DL	2	full/est	good(est)	123	29	44
	<i>Ščara-Kaňki</i>	2010	DL	1	full	good(obs)	12	3	3
	<i>Ščara-Sviacica</i>	2010	DL	1	full	good(obs)	71	8	8
	<i>Vyganaščanskaje</i>	2010	DL	1	full	good(obs)	2	0	0
6	Middle Prypiac						647	26	26
	<i>Jasiel'da</i>	2011	OL	2	full	good(obs)	42	0	0
	<i>Korabje</i>	2011	SL	1	full	good(obs)	67	1	1
	<i>Mikaševičy</i>	2011	OL	1	full	good(obs)	23	1	1
	<i>Styr</i>	2010	MD	2	full	good(obs)	515	24	24
7	Prostyr						800	10	50
	<i>Prostyr</i>	2010	DZ	-	guess	poor(susp)	*500	10	50
	<i>Zarelišča</i>	2010	DL	1	full	good(obs)	300	0	0
8	Almany	2010	MD	1	estimate	med(est)	*1,500	0	0
9	Dzitva	2010	DL	1	full	good(obs)	31	2	2
10	Hajna	2010	SL	1	full	good(obs)	711	0	0
11	Lielčyckaja Ubaré	2010	PP	-	guess	poor(susp)	*600	0	0
12	Servač	2010	OL	1	full	good(obs)	272	31	31
13	Stary Žadzien	2006	VF	1	estimate	med(est)	*600	20	40
14	Svislač	2010	DV	1	full	good(obs)	212	37	37
15	Upper Pci****	2011	UM	2	full	good(obs)	36	2	2

	TOTAL						14,635	3,108	5,452
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* The sites are not sufficiently surveyed. The area of suitable habitat is considerably overestimated due to mosaic structure of site. Further surveys are needed to refine (reduce) these numbers.

** Area of suitable habitat

*** New localities discovered only in 2011

**** Due to low number of monitoring plots (six) surveyed in 2011 population estimate is not statistically reliable. Therefore numbers from 2010 are presented in the table.

Type of counts

Full = full counts covered the whole site.

Full/est = full counts were executed for the most part of the site and minimum figure corresponds to the number of counted males, an estimation resulting in a maximum figure was produced for the rest of the site.

Reg. plots = counts were implemented at sample plots located regularly.

Accuracy

Good (Observed) = based on reliable or representative quantitative data derived from complete counts.

Good (Estimated) = based on reliable or representative quantitative data derived from sampling or interpolation.

Medium (Estimated) = based on incomplete quantitative data derived from sampling or interpolation.

Poor (Suspected) = based on no quantitative data, but guesses derived from circumstantial evidence.

Below goes a detailed description of the AW monitoring results for the most important Belarusian breeding sites: Zvaniec and Sporava mires.

Sporava mire.

Full single counts of aquatic warbler covered **100%** (c. 1,400 ha) of known area of open fen mire suitable for the species. The counts took place from 21st May till 9th June 2011 and are currently the most detailed counts ever performed for Sporava. The results are presented in the table below.



Fig.2 – Location of area suitable for AW in Sporava (marked with yellow, boundaries of IBA “Sporava” – green, new sub site discovered in 2011 and located outside of zakaznik - red)

As it is seen from the table the number of AWs in 2011 is lower then in 2010 at most of subsites and in total for Sporava. In 2010 at the surveyed area of c.1,000 ha 501 males were counted, in 2011 the surveyed area increased up to c.1,400 ha, but only 496 males were counted.

Table 2: Results of full aquatic warbler counts in Sporava.

№	Name of locality	AW numbers, singing males		
		2010 counted	2011	
			Min counted	Max counted + potentially missed ^(c)
1	Čarniejevičy	-	6	6
2	Chomsk	1	2	2
3	Halavickija	5	2	2
4	Hieľčykaŭ Kašyl	1	0	0
5	Kakoryca_Bochancava	-	3	3
6	Kakoryca_Chiža	-	9	^(c) 12
7	Kakoryca_North	7	1	1
8	Kakoryca_Opaľskaje	9	^(b) 30	^(c) 34
9	Kakoryca_Pliesa ^(a)	-	1	1
10	Kakoryca_Voučyja_nory	62	^(b) 36	36
11	Kakoryca_West	29	14	^(c) 19
12	Kasciuki	45	35	35
13	Kašyl	-	1	1
14	Liadovičy	-	10	^(c) 16
15	Mastyki	-	26	26
16	Mastyki_chutar	2	9	9
17	Matviejevičy ^(a)	-	8	^(c) 12
18	Mitraŭka ^(d)	14	^(b) 61	61
19	Novaje	6	5	5
20	Perasudavičy	48	29	29
21	Piasčanka_Šylin	146	108	108
22	Puzi	-	0	0
23	Sporava	39	16	16
24	Stryhiń	8	11	11
25	Vysokaje	2	1	1
26	Vysokaje_farm	-	0	0
27	Žabier	-	0	0
28	Zašešnieŭ	10	3	3
29	Zdzitava	37	34	34
30	Zdzitava_Biaroza	18	21	21
31	Zdzitava_chutar	12	14	^(c) 18
Total		501 – 640^(e)	496	^(c)522

a) Subsites included into monitoring scheme in 2011.

b) Subsites, that were surveyed in more detail in 2011, so bigger numbers do not reflect population increase. For the rest of subsites the surveyed area in 2010 and 2011 was equal.

c) Figure is a sum of counted birds and an estimate produced for birds potentially not counted due to complicated geometry of the subsite.

d) The subsite is partly located outside of zakaznik.

e) Full counts were executed for the most part of the site in 2010 and minimum figure corresponds to the number of counted males, an estimation resulting in a maximum figure was produced for the rest of the site.

Zvaniec

The total area of IBA “Zvaniec” equal to 16,230 ha includes the area of 10,460 ha protected as a National landscape reserve (zakaznik) “Zvaniec”. Satellite images analysis with subsequent field checks made during aquatic warbler census in the year 2010 allowed to allocate the area suitable for AW roughly. The area makes about **6,150 ha** in total (Fig.3).

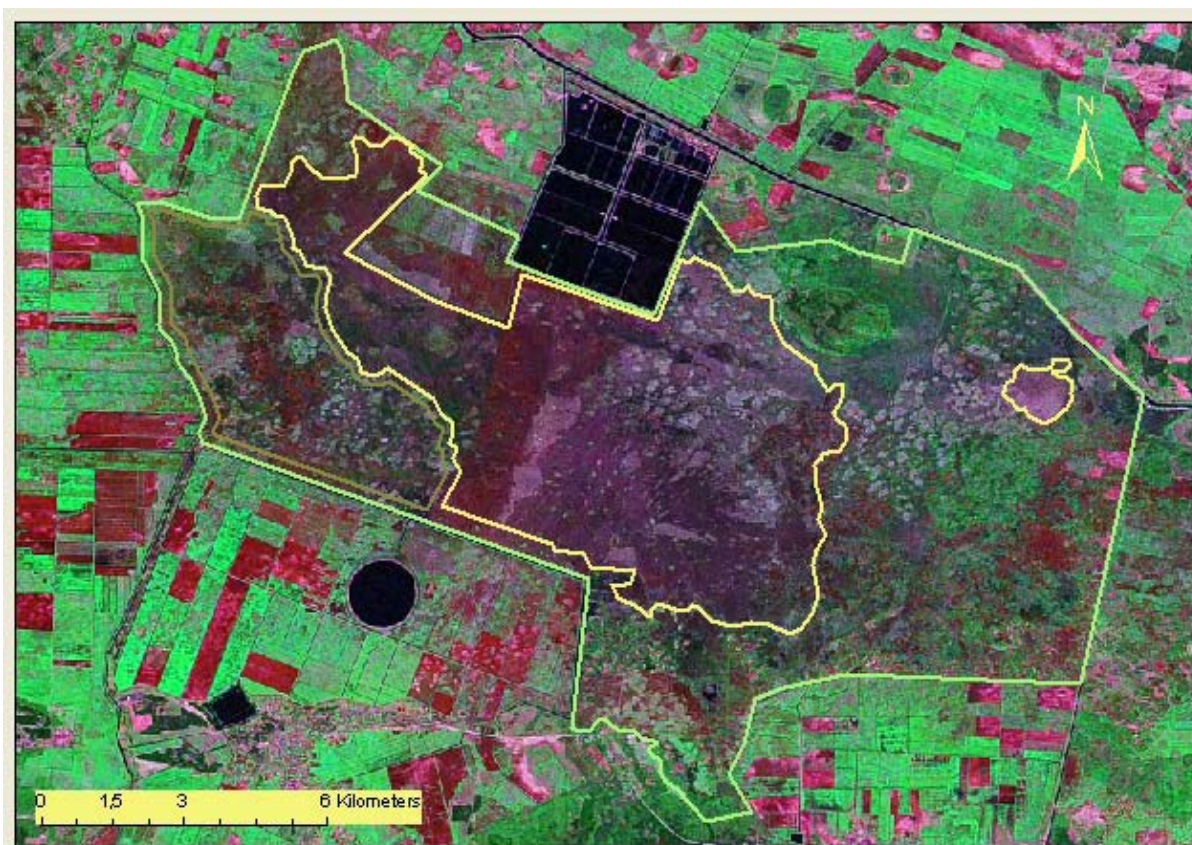


Fig.3: **Area suitable** for aquatic warbler in Zvaniec (*marked with yellow line, not surveyed area – brown, boundaries of IBA “Zvaniec” – green*).

According to 2010 data the area suitable for the species in the central part of the mire equals to 5,575 ha, the corresponding area located in the eastern part makes 125 ha. The western part has not been surveyed, however, it contains separate patches potentially suitable for aquatic warbler having the total area of about 450 ha.

Eastern part. There is a small 125 ha patch of open fen mire in the eastern part of IBA. AW counts were not performed here in 2011. In 2010 **20** singing males were counted at this sub site in the course of full counts.

Central part. The estimated area suitable for aquatic warbler in the central part of IBA makes 5,575 ha. Considering the scale of this sub site, AW was counted at regularly located sample plots. The data from sample plots was extrapolated to the entire territory covered with sampling.

In Zvaniec, fixed monitoring plots have been established in the best habitat patches and counted since the mid-1990s. An improved systematic sample plot design has been established in 2006 and (further improved) 2009. Since then regularly distributed plots of 100 ha size include also borders of suitable habitat at the edges of the mire, and mineral islands surrounded by bushes inside the mire. Inclusion of such zones into monitoring scheme helps to detect habitat loss due to overgrowing as successions in Zvaniec develop from the edges of the mire as well as from mineral islands in the centre.

In 2011 double counts were performed for 6 plots, a single count took place for 1 monitoring plot (Fig.4). The rest of monitoring plots were not covered with counts in 2011. First counts took place between May 22nd and 23rd, second counts – between June 30th and July 2nd.

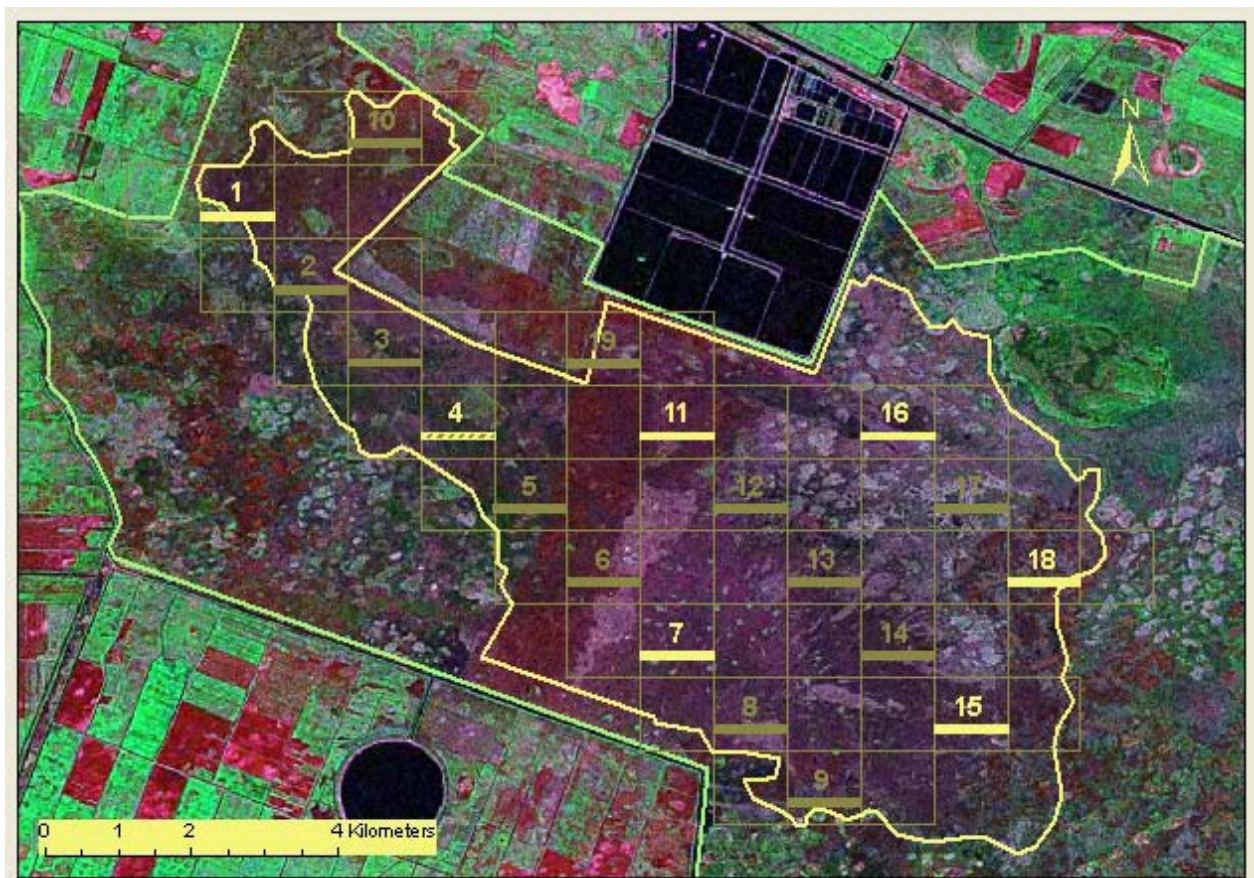


Fig.4: Location of **sample plots** in Central part of Zvaniec (*area suitable for AW – yellow, double counted sample plots – yellow, single counted – dashed, not counted – brown, boundaries of IBA “Zvaniec” – green*)

Each sample plot was counted by 3 persons. The counters were moving in one row in latitude direction at 50m distance from each other using GPS navigators. Those located at the edges were moving along Northern and Southern borders of monitoring plot respectively. Only singing males registered within borders of monitoring plots were considered for density estimation. Singing males outside the sample plots as well as all females and other bird species were registered just for reference.

The results of the counts at sample plots are presented in Table 3. The data received from the second counts was used for further calculations. The number of birds counted during first counts was lower reflecting seasonal variations.

Table 3: Estimation of AW numbers in the Central part of Zvaniec

	Sample plot	Density, males/km ²				
		2009	2010 1 st counts (23 th May-7 th June)	2010 2 nd counts (28 th June-5 th July)	2011 1 st counts (22 nd - 23 th May)	2011 2 nd counts (30 th June-2 nd July)
	1	22	55	30	30	70
	2	5	15	10	-	-
	3	39	45	35	-	-
	4	-	95	10	50	-
	5	45	30	80	-	-
	6	72	-	60	-	-
	7	119	70	70	45	30
	8	58	50	40	-	-
	9	84	0	20	-	-
	10	46	89	30	-	-
	11	101	-	-	100	140
	12	27	100	50	-	-
	13	-	50	40	-	-
	14	-	-	-	-	-
	15	172	110	95	50	80
	16	80	60	220	140	135
	17	32	30	0	-	-
	18	-	0	0	0	0
	19	-	100	70	-	-
Mean		54	56	51	59	76
SD		44	36	52	46	56
SE		12	9	13	18	23
Area, km²		57	57	57	57	57
Number, singing males		4 062	3 202	2 884	3 379	4 323
LCI* (min), singing males		2 620	2 234	1 478	1 532	2 013
UCI* (max), singing males		5 246	4 155	4 289	5 234	6 613

* Lower and upper confidence limits were calculated by Johannes Kamp, RSPB through bootstrapping (n=1,000) using R-statistics software.

Western part. This part of the mire has an area of 2,250 ha (Fig.3). It is heavily overgrown with shrubs and highly fragmented. This part of Zvaniec is not covered by the survey due to its limited accessibility. There is no published data on confirmed registrations of AW for this area. However, some separate patches of open fen mire are potentially suitable for AW. About 20% of the western part of Zvaniec, that is 450 ha or 4.5 km², make up the area for such habitat (*Skuratovich A. Personal communication*). Basing on the average density of 76 males/km² calculated for the central part in 2011, potential AW numbers in the western part could be estimated at **0 – 341** singing males.

The total number of AW in Zvaniec is estimated at **2,033-6,974** singing males (Tab.4).

Table 4: Estimation of the total number of AW in Zvaniec.

Part of the mire	Type of counts	Area of suitable habitat, ha	Mean number, males	Min number, males	Max number, males
Eastern (Sielišča)	full counts in 2010	125 (2%)	20	20	20
Central (2 nd counts)	counts at regular sample plots	5575 (91%)	4323	2013	6613
Western	guess	450 (7%)*	171	0	341
TOTAL		6150 (100%)	4513	2033	6974

* Potentially suitable habitat. In order to confirm its occupancy by AW as well as to define the area occupied by the species, further surveys are needed.

3.2 Search for the new sites.

In 2011 the list of potential sites was developed basing on:

- recently developed BY GIS database of mires;
- old vegetation map;
- analysis of Google Earth images;
- personal communication with experts.

As a result c.80 potential sites were added to the list. A number of them were checked in 2011 (Fig.5).

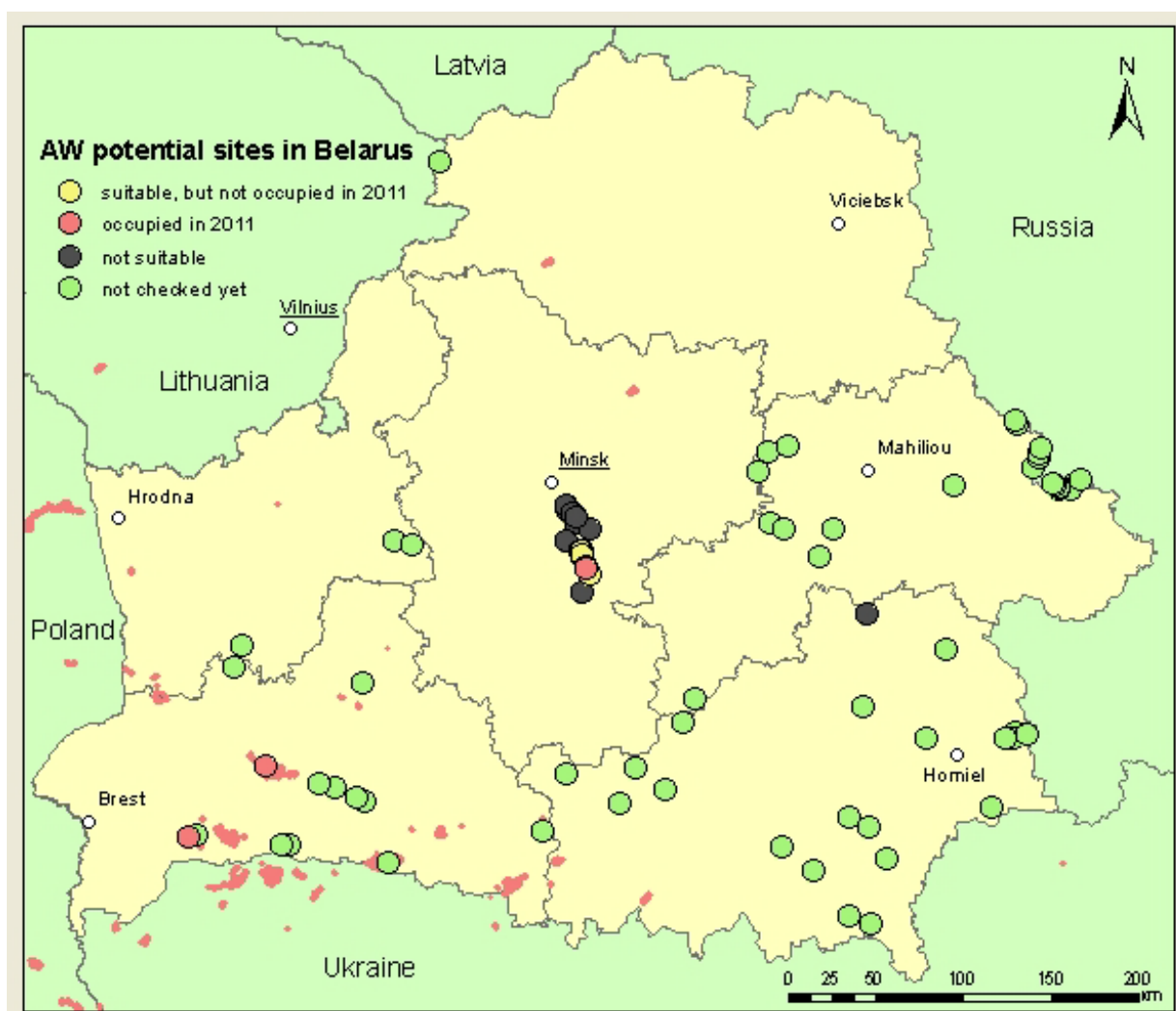


Fig.5: Potential Aquatic Warbler sites in Belarus.

Upper Pcič

A new site was discovered in Upper Pcič river valley. The total area suitable for the species is roughly estimated at 100 ha and could be even more. However, only one locality (close to Ržyšča village) was occupied by 2 singing males both in late June and in late July 2011. Today it is the only site occupied by Aquatic Warbler in Minsk region.

Sporava-Bielaje

The locality is situated outside of protected area (Sporava mire) on the shore of the lake Bielaje (Fig.2). The area of the locality is c.55 ha and it holds 14 singing males. This very nice looking open fen mire had been partly destroyed in winter 2010-2011 before AW was found here in June 2011. One of the channels of power station was extended and ran across the mire (Fig.6).



Fig.5: Newly discovered Aquatic Warbler locality situated close to Bielaje Lake. Before AW was found here the habitat was partly destroyed by channel and dam construction.

Dzivin-Lipava

A new locality within known site (Dzivin) was found in early July 2011. The area of the locality is c.20 ha and it holds 2 singing males.

CONCLUSION

In 2011 aquatic warbler numbers in Zvaniec are estimated at 2033-6974 singing males. These figures are based on the results of double count at 6 monitoring plots. As a result of full counts in Sporava species population was estimated at 496-522 singing males. Important population trends were noticed as follows:

- In Zvaniec **average density** of aquatic warbler was higher in 2011 comparison to 2009 and 2010. One of the most obvious reasons is water level that was only slightly higher then optimal in 2011. On the contrary long-lasting floods were registered in 2009 and 2010, improper water regime in those years is one of the key reasons of progressing fast reed expansion. However, it should be underlined, that insufficient number of monitoring plots in 2011 (six) do NOT allow to tell about statistically reliable **total population** increase in this site. Progressing vegetation succession that leads to decrease and fragmentation of suitable habitat quite the reverse indirectly proves potential population decline in Zvaniec mire.

- Full aquatic warbler counts in Sporava mire covered 100% of all known suitable localities. Counts 2011 are the most detailed counts ever carried out at this mire to date. Results shows that species **population size** is lower comparison to 2010 and reached the lowest value since the beginning of monitoring at this in 1990-s. Thick dense litter layer, that blocs development of green vegetation is one of the key reasons of population decline together with decrease and fragmentation of suitable habitat. The layer of dead vegetation is especially represented in the parts of fen mire located in surroundings of villages Kakoryca and Sporava.

In order to prevent further degradation of open fen mires vegetation management system should be urgently introduced in Sporava and Zvaniec mires. Active vegetation management is determined as essential activity both by International Species Action Plan as well as by Management plans of zakazniks (reserves). Implementation of such conservation activities will help to conserve not only aquatic warbler, but the complex of rare and threatened plants and animals of fen mires.

Development of the list and on ground check of potential sites is an important step towards finalization the inventory of breeding sites. As these small and unknown sites are very likely to disappear if they are not given special conservation attention, firstly because the occurrence of Aquatic Warblers is not known and secondly because without management smaller sites are

more likely to deteriorate quickly than bigger sites (BirdLife International 2008. International Species Action Plan).

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