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THE WICIE BIRD RINGING STATION (N POLAND) – RINGING RESULTS AND SEASONAL BIRD MIGRATION DYNAMICS IN 2010–2014

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ABSTRACT

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The Wicie ringing station was one of several stations which cooperate within the SEEN organization (SE European Bird Migration Network). The station was located west of the small village of Wicie located in northern Poland on the central part of the Baltic Sea coast. The station was situated on a narrow spit between Kopań Lake and the Baltic Sea and has operated since 2010. Data were collected during three spring and five autumn seasons. Birds were caught in mist-nets, which were placed mainly in bushes and reed beds. Over 55 000 birds of 113 species were caught and ringed during eight migratory seasons. Many of them were also tested for directional preferences in Busse's cages.

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STUDY AREA AND METHODS

The Wicie ringing station (54°29'N, 16°27'E) was situated in northern Poland, precisely in the middle of the Polish Baltic Sea coast, 262 km from the eastern border. The camp was located on a narrow spit of land (700 m wide) between the Baltic Sea and Lake Kopań. The habitat where the nets were placed was variable. Most of them were set on a wet meadow surrounded by a mixed forest consisting mainly of Common Alder (*Alnus glutinosa*), but also Oak (*Quercus robur*), Birch (*Betula pendula*) and Pine (*Pinus sylvestris*), with an admixture of berry species: Elderberry (*Sambucus nigra*), Mountain-ash (*Sorbus aucuparia*), Blackthorn (*Prunus spinosa*), Hawthorn (*Crateagus sp*.) and Alder Buckthorn (*Frangula alnus*). The habitat is in the next stage

of succession from peatland formation and now the area is covered by Willow (*Salix sp*.) and Alder Buckthorn bushes surrounded by a carpet of Soft Rush (*Juncus effuses)*.

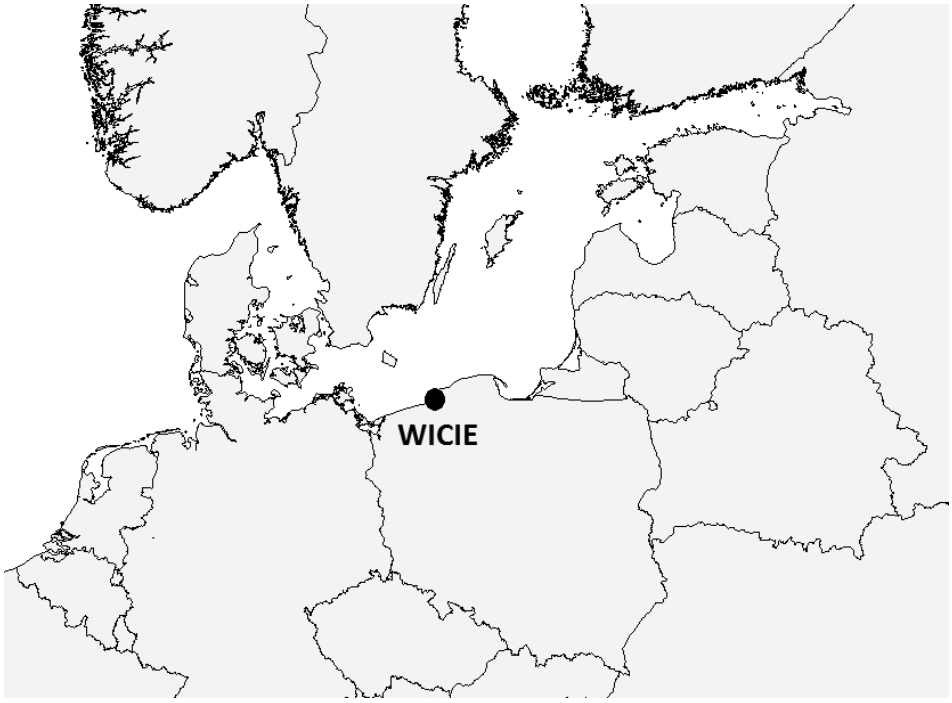

Fig. 1. Location of the Wicie ringing station

The ringing station was manned in the years 2010-2014, but netting covered nearly the entire spring and autumn bird migration seasons only between 2011 and 2013. Spring activities began on 25 March and continued to 25 May. During the autumn season netting was conducted from the beginning of August to mid-November. All nets were checked every hour from dusk to dawn. During all seasons we used about 450 linear metres of nets with mesh size 16 mm, usually placed in the same locations. During the field work we followed the standard protocol used by Operation Baltic and the SEEN network (Busse and Meissner 2015).

After species determination the birds caught were aged and sexed (if possible) according to plumage features and sometimes skull ossification (Busse 1984, Svensson 1992), ringed, and measured. The data determined in the trapped birds included the level of fat deposits on a 9-point scale (from 0 to 8) proposed by Busse (2000), wing and tail length, wing formula, and weight to the nearest 0.1 g. Moreover, some of nocturnal migrants were tested in Busse's cages for their directional preferences (Busse 1995, 2000; Busse and Meissner 2015).

RESULTS

During three spring and five autumn seasons 55 264 birds of 113 species were caught and ringed. During spring migration 14 397 birds were ringed, and over twice this number in autumn – 40 867. In eight seasons of activity the Wicie ringing station provided 24 records of rare species, verified by the Polish Rarities Committee (Table 1).

Table 1
Number of ringed individuals of a particular species.
Species printed in bold are rare in Poland.

Scientific name	Spring			Autumn					**Total**
	2010	2011	2013	2010	2011	2012	2013	2014	
Acanthis hornemanni				2					**2**
Acanthis flammea	8	5	6	163	6	2	32	5	**227**
Accipiter nisus	2		1	9	5	7	16	7	**47**
Acrocephalus arundinaceus	13	3	1		4	13	1	15	**50**
Acrocephalus dumetorum		1	1						**2**
Acrocephalus palustris	3	8	15	2	58	85	29	82	**282**
Acrocephalus schoenobaenus	51	8	8	2	19	8	11	13	**120**
Acrocephalus scirpaceus	124	22	10	16	202	277	76	388	**1 115**
Aegithalos caudatus	14	2	8	221	29	54	26	69	**423**
Aegolius funereus				1	1	1		5	**8**
Alcedo atthis		2			2	4			**8**
Anthus pratensis				2	2			2	**6**
Anthus trivialis	4	4	4	10	7	4	3	3	**39**
Alauda arvensis					1				**1**
Apus apus	1								**1**
Asio fllammeus				5	6	16	5	12	**44**
Asio otus			1	34	38	18	28	30	**149**
Bombycilla garrulus						7			**7**
Buteo buteo					2				**2**
Caprimulgus europaeus				1	1	1		2	**5**
Carduelis carduelis	3	2			1	2			**8**
Certhia brahydactyla	1	1	4	7		4	3	4	**24**
Certhia familiaris	21	4	12	75	13	39	25	90	**279**
Chloris chloris	5	3	1		1	1	2	1	**14**
Chroicocephalus ridibundus					1				**1**
Coccothraustes coccothraustes	1	6	4		1	2	3	1	**18**
Columba palumbus	1				1	1	1		**4**
Cuculus canorus					2	1		3	**6**
Cyanistes caerulus	44	12	78	285	330	397	173	136	**1 455**
Delichon urbica					4				**4**
Dendrocopos major	5	3	8	18	6	20	18	8	**86**

Scientific name	Spring			Autumn					**Total**
	2010	2011	2013	2010	2011	2012	2013	2014	
Dendrocopos medius				2	1	2	11		**16**
Dendrocopus minor				3	2	5	3	2	**15**
Dryocopos martius				1	1		1	1	**4**
Emberiza citrinella	2	4	10	5	7	3	20	9	**60**
Emberiza hortulana			1						**1**
Emberiza schoeniclus	48	16	8	4	35	6	3	8	**128**
Erithacus rubecula	2480	2567	1308	2736	1815	2391	1721	2786	**17 804**
Erythrina erythrina	12	17	11		4	1	8	12	**65**
Falco subbuteo								2	**2**
Ficedula albicollis			1		4	1			**6**
Ficedula hypoleuca	87	51	98	17	124	72	85	68	**602**
Ficedula parva	16	25	41	1	5	3	25	5	**121**
Fringilla coelebs	113	104	167	98	94	95	52	63	**786**
Fringilla montifringilla	1	1	3	4	3	6	1	9	**28**
Gallinago gallinago				1	4	6			**11**
Garrulus glandarius	3	1	1	5	6	6	6	4	**32**
Hippolais icterina	7	18	10		15	17	32	20	**119**
Hirundo rustica	10	2	2		8	7	8	2	**39**
Jynx torquilla	4	2	1		3	3	7	3	**23**
Lanius collurio	10	43	49	6	48	48	32	62	**298**
Lanius exubitor	1			1	6	1	2		**11**
Locustella fluviatilis	2	1	2		2	1	1	3	**12**
Locustella luscinioides	6	2	3		6	2		7	**26**
Locustella naevia	14	6	13	5	22	29	16	7	**112**
Lophophanes cristatus	2	3		1	7	6	3	2	**24**
Loxia curvirostra		1		21		5			**27**
Luscinia megarhynchos					1				**1**
Luscinia luscinia	4	7	4		6	5		7	**33**
Luscinia svecica	5	3				2			**10**
Lymnocryptes minimus				1	1	1			**3**
Motacilla alba	2	2	3		3	1			**11**
Motacilla flava		1			1				**2**
Muscicapa striata	13	19	26	25	29	12	23	29	**176**
Numenius arquata					1				**1**
Oenanthe oenanthe	2				1	2		1	**6**
Oriolus oriolus								3	**3**
Panurus biarmicus								7	**7**
Periparus ater	6	6	5	29	28	7	8	15	**104**
Parus major	102	20	336	733	574	2518	2336	782	**7 401**
Phoenicurus ochruros	2	1	5		2	2	2	1	**15**
Phoenicurus phoenicurus	104	70	106	58	63	38	70	53	**562**
Phylloscopus collybita	135	97	104	49	107	89	67	82	**730**
Phylloscopus tristis				1					**1**

Scientific name	Spring			Autumn					**Total**
	2010	2011	2013	2010	2011	2012	2013	2014	
Phylloscopus trochiloides	1	1		1					**3**
Phylloscopus fuscatus					1				**1**
Phylloscopus inornatus					1	2	4	3	**10**
Phylloscopus proregulus				1		1	1		**3**
Phylloscopus sibilatrix	31	30	39	1	6	5	16	3	**131**
Phylloscopus schwarzi				1					**1**
Phylloscopus trochilus	113	110	81	24	207	127	91	84	**837**
Poecile montanus	2	1	1	42	24	54	15	21	**160**
Poecile palustris	2		1	18	7	28	14	8	**78**
Porzana porzana					1				**1**
Pica pica		1							**1**
Prunella modularis	37	13	50	105	59	107	18	72	**461**
Pyrrhula pyrrhula	27	7	11	246	47	38	67	7	**450**
Rallus aquaticus				1		4			**5**
Regulus ignicapillus	26	29	18	7	17	16	14	6	**133**
Regulus regulus	209	119	144	842	177	1119	61	1574	**4 245**
Remiz pendulinus	1	1	1						**3**
Riparia riparia								1	**1**
Saxicola rubetra	1			1	1		1		**4**
Saxicola torquata	4	1	2		13	6	4		**30**
Scolopax rusticola	1			12	23	11	7	10	**64**
Serinus serinus						1			**1**
Sitta europaea	1	1	3	13	4	18	9	8	**57**
Spinus spinus	134	100	550	938	116	463	116	120	**2 537**
Strix aluco				2		3	1	3	**9**
Sturnus vulgaris				3	19	8	82	118	**230**
Surnia ulula							1		**1**
Sylvia atricapilla	334	376	528	338	802	708	611	643	**4 340**
Sylvia borin	52	61	82	42	227	150	195	195	**1 004**
Sylvia communis	55	33	92	1	77	65	98	60	**481**
Sylvia curruca	197	134	136	11	76	85	80	50	**769**
Sylvia nisoria	3	5	5		19	11	11	33	**87**
Tarsiger cyanurus						1			**1**
Troglodytes troglodytes	38	25	54	100	70	106	51	67	**511**
Turdus iliacus	42	24	9	27	31	15	19	25	**192**
Turdus merula	190	126	377	200	292	410	477	319	**2 391**
Turdus philomelos	148	117	95	334	443	478	228	274	**2 117**
Turdus pilaris				11	8	3	2	6	**30**
Turdus torquatus			1			1			**2**
Turdus viscivorus	2		1		1		1	1	**6**
Tyto alba				1		1	1		**3**
Total	**5 145**	**4 491**	**4 761**	**7 981**	**6 551**	**10 402**	**7 291**	**8 642**	**55 264**

To show real dynamics of migration only individuals trapped in 2011-2013 within a standardized period were used. The standardized period for spring covered 61 days (24 March – 25 May), while for autumn it was extended to 104 days (1 August – 15 November). The median date for spring migration was 18 April and for autumn 8 October (Fig. 2).

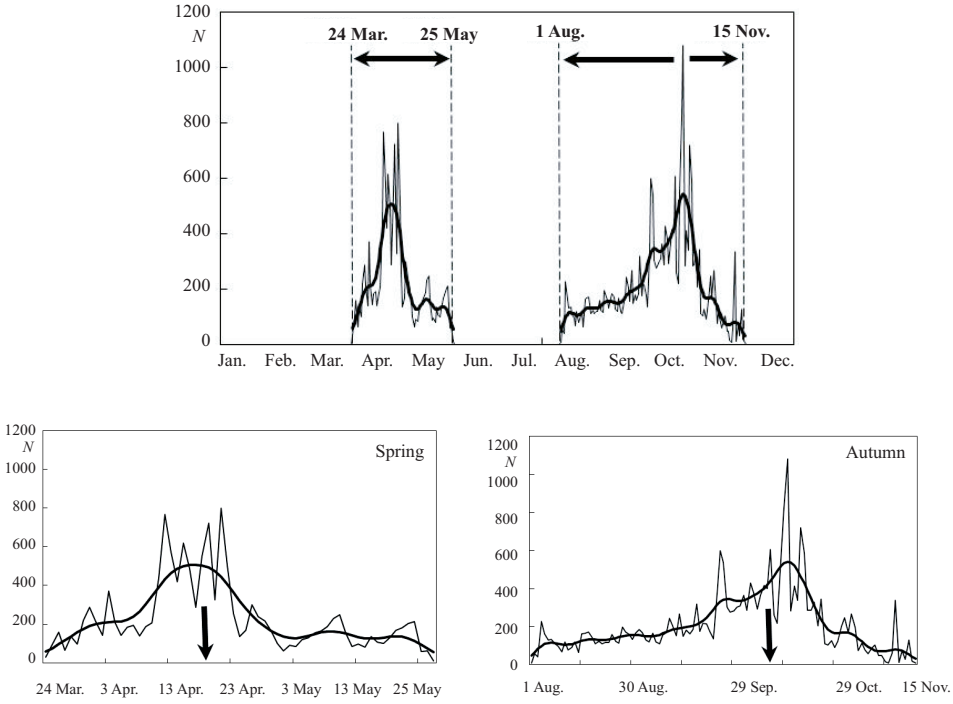

Fig. 2. Total dynamics of all birds caught at the Wicie station in standard periods in 2011-2013. Thin lines – raw daily numbers, thick lines – daily numbers smoothed by moving average. Above – general year-round pattern. Vertical broken lines show borders of standard periods. Below - seasonal results. Vertical arrows - median dates of migration in seasons.

Among the six most numerous species caught in the years 2011 to 2013, during spring migration the Siskin (*Spinus spinus*) was the earliest and the Blackcap (*Sylvia atricapilla*) the latest, while in autumn the first species to depart was the Blackcap and last were the Great Tit (*Parus major*) and Blackbird (*Turdus merula*) (Table 2).

Such an extended period of field work at 54° latitude should cover most of the spring and autumn passage of passerine species, with few exceptions, such as the Common Rosefinch (*Erythrina erythrin*) or Siskin – very late and very early spring migrants, respectively (Fig. 3). The Siskin, as a short-distance migrant feeding mainly on seeds, can afford such an early arrival in spring. The same strategy would be highly risky for many insectivorous species, which arrive much later in the season after vegetation has fully developed.

Table 2
Median passage date of six most numerous species caught at Wicie Station

	Spring	Autumn
Blackcap (*Sylvia atricapilla*)	30 April	8 September
Robin (*Erithacus rubecula*)	18 April	29 September
Blackbird (*Turdus merula*)	11 April	16 October
Goldcrest (*Regulus regulus*)	10 April	14 October
Great Tit (*Parus major*)	9 April	16 October
Siskin (*Spinus spinus*)	31 March	10 October

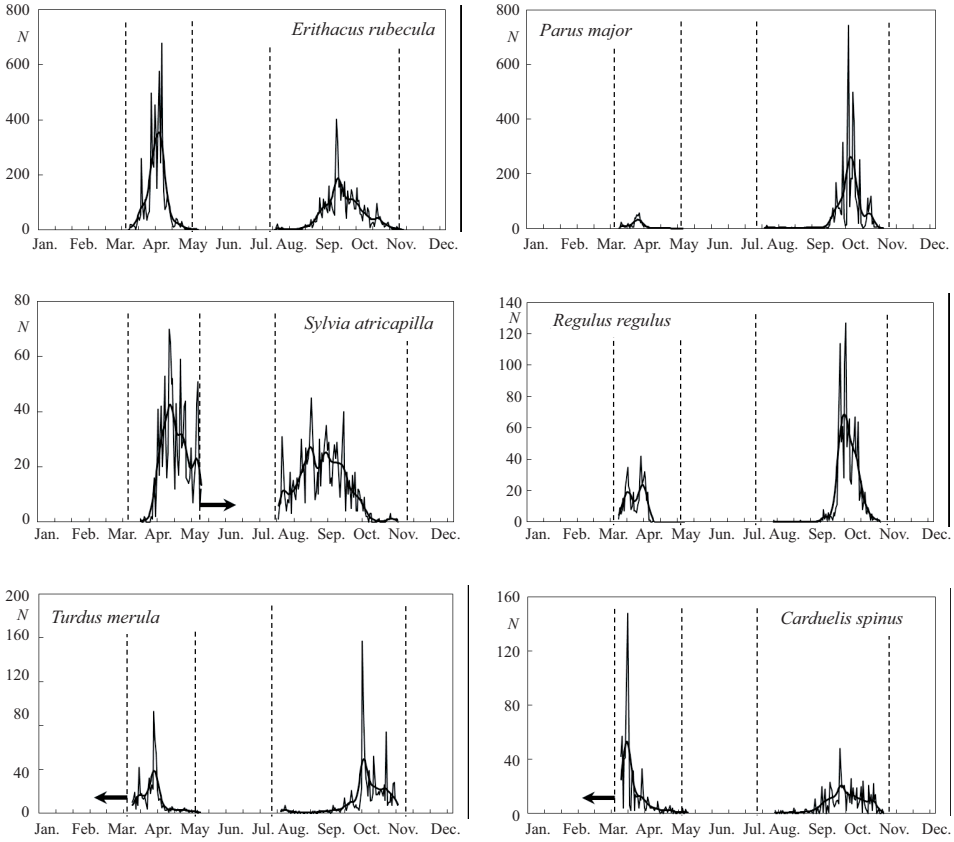

Fig. 3. Total dynamics of the six most numerous species caught at the Wicie station in standard periods in 2011-2013. Horizontal arrows indicate where the standard period may not cover the entire migration of the species. Other explanations as for Fig. 2.

The pattern of median passage dates among the six species analysed more or less followed general rules, where the latest species in spring migrate earliest in autumn (Buskirk *et al*. 2008). Moreover, for different species this general migration schedule is connected with distance of migration and preferred food type. A good example which confirms this mechanism is the Blackcap and the Robin (*Erithacus rubecula*).

Plate 1. Biotopes surrounding the Wicie ringing station where mist-nets were placed (Photo by G. Zaniewicz)

Both of these species are mainly insectivorous and among the species analysed they have the longest migration distance, particularly the Blackcap, of which some populations spend the winter south of the Sahara.

In the period 2011-2013, both during the spring and autumn migration seasons, the most numerous species caught was the Robin (*N Spring* = 6 355, *N Autumn* = 5 927) (Fig. 4).

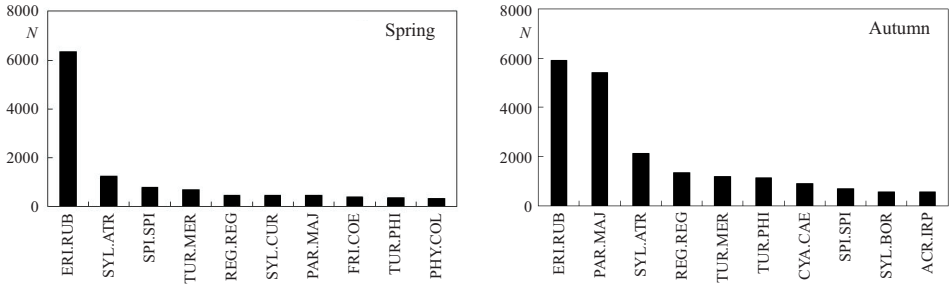

Fig. 4. Total numbers of individuals of the ten most numerous species caught at the Wicie station. ERI.RUB – *Erithacus rubecula*, SYL.ATR – *Sylvia atricapilla*, SPI.SPI – *Carduelis spinus*, TUR.MER – *Turdus merula*, REG.REG – *Regulus regulus*, SYL.CUR – *Sylvia curruca*, PAR.MAJ – *Parus major*, FRI.COE – *Fringilla coelebs*, TUR.PHI – *Turdus philomelos*, PHY.COL – *Phylloscopus collybita*, CYA.CAE – *Cyanistes caeruleus*, SYL.BOR – *Sylvia borin*, ACR.IRP – *Acrocephalus scirpaceus*.

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