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Sobivanje ptic in kmetijstva?

Cohabitation between birds and agriculture?

Intenzifikacija kmetijstva se je v Evropi pričela med drugo svetovno vojno iz potrebe po samooskrbi s pridelki. Kmetje so z uporabo različnih tehnologij želeli povečati učinkovitost obdelovanja zemlje in njeno produktivnost. Intenzifikacija je temeljila predvsem na uvedbi nove mehanizacije, gnojilih in pesticidih, nekoliko manj pa na izsuševanju površin ter žlahtnjenju rastlin. Spremembe v kmetijstvu so na ptice vplivale in še vedno vplivajo neposredno (izguba habitata, negativni vpliv mehanizacije, motenj in pesticidov na smrtnost ali gnezditveni uspeh) in posredno (spremembe v količini hrane, kvaliteti gnezdišč in prehranjevališč) (Fuller 2000, Newton 2004). Če so nekdaj ptice kmetijske krajine uspevale zaradi kmetovalnih praks, pa sedaj životarijo prav zaradi njih. Dokazov o negativnem vplivu intenzifikacije kmetijstva na ptice je ogromno, članki na to temo so skoraj nepreštevni. Naravovarstvena stroka se strinja o obstoju tega perečega problema, v zadnjem desetletju ali dveh pa je pričela že tudi ponujati rešitve. Te zahtevajo sodelovanje z obdelovalci in lastniki zemljišč, predvsem pa angažiranje stroke pri oblikovanju pravil skupne kmetijske politike, konkretno na primer kmetijsko-okoljsko-podnebnih ukrepov (KOPOP). Sobivanje modernega kmetijstva in ptic v primerih nekaterih vrst zahteva zgolj manjše prilagoditve kmetovanja, v drugih primerih pa so sodobne kmetijske prakse nezdružljive z dolgoročnim preživetjem vrst (npr. pri koscu *Crex crex*, repaljščici *Saxicola rubetra*) in bi za njihovo varstvo potrebovali večja sklenjena območja, kjer bi kmetijstvo narekovali varstveni režimi. Ker je nerealno pričakovati, da se bo proces intenzifikacije kmetijstva v Evropi kmalu zaustavil ali celo obrnil, ptice pa gnezdijo tudi na najbolj enoličnih in intenzivnih njivah, si pred problemom ne moremo zatiskati oči. V nadaljevanju so predstavljene nekatere možnosti varovanja gnezdilk na njivah.

Poljski škrjanec *Alauda arvensis*, katerega evropska populacija je v obdobju 1980–2016 upadla za 53 % (EBCC 2019), slovenska pa v pičlem desetletju (2008–2018) za 59,7 % (Kmecl & Šumrada 2018), je izvorno sicer gnezdilec step, vendar je dandanes v Evropi najpogostejši na velikih njivah. V Veliki Britaniji, Nemčiji, Švici in na Danskem so znanstveniki ugotovili, da so gnezditvena gostota, gnezditveni uspeh, telesna kondicija speljanih mladičev in/ali število poskusov gnezdenja poljskega škrjanca v sezoni večji na njivah s ploskvami golih tal kot na konvencionalno zasejanih njivah. Zaplate golih tal so ustvarili tako, da so med setvijo ugasnili sejalnico; skupna površina golih tal na hektar površine je znašala 32–144 m^2, razdeljena je bila na dve do štiri ploskve (Odderskær *et al.* 1997, Morris *et al.* 2004, Fischer *et al.* 2009, Schmidt *et al.* 2017). Zgolj ohranjanje omejkov, torej travnatih robov med njivami, na primer na Nizozemskem za poljskega škrjanca ni dalo želenih rezultatov, saj je za robne habitate značilna velika stopnja plenjenja (Kuiper *et al.* 2015). Hribski škrjanec *Lullula arborea* pri nas gnezdi v dveh povsem različnih habitatih – na zahodu Slovenije na suhih travnikih in pašnikih z redko lesno vegetacijo, na Goričkem pa predvsem na njivah s praho ali žitom. Te so zaradi časovnega ujemanja s kmetijskimi opravili (oranje, brananje, setev, nanos fitofarmacevtskih sredstev in umetnih gnojil) zanj lahko ekološka past (Denac 2018a). V letošnjem letu bomo skupaj s kolegi iz Javnega zavoda Krajinski park Goričko obiskali avstrijske ornitologe, ki so razvili različne kmetijsko-okoljske ukrepe za njive, s katerimi želijo izboljšati njegov gnezditveni uspeh na Zgornjem Štajerskem. Med ukrepi so prepoved opravljanja kmetijskih del na njivah med 15. 4. in 31. 5., spodbujanje malopovršinskega (0,5–1,5 ha) ekstenzivnega kmetovanja na ovršnih delih gričev, gojenja okopavin in spomladanskih žit, ohranjanje strnišč do 15. 2., izogibanje uporabi gnojil in pesticidov pri gojenju zimskih žit, zasaditev in vzdrževanje mejic ter posameznih dreves, vzpostavljanje večletnih cvetnih pasov, zasejanih z avtohtono plevelno vegetacijo (Uhl *et al*. 2008, Uhl & Rubenser 2012). Poleg varstva ekstenzivnih suhih travnikov, ki smo se ga lotili v okviru projekta Goričkа krajina, bo na Goričkem namreč treba najti učinkovite in dolgoročne načine varovanja na njivah gnezdečih hribskih škrjancev.

V Angliji so populacijo plotnega strnada *Emberiza cirlus* povečali za skoraj štirikrat s finančnim spodbujanjem gojenja jarega žita, sejanega na površinah, kjer so čez zimo pustili strnišče in mu s tem zagotovili zimska prehranjevališča. Vrsti je koristila tudi uvedba obveznega puščanja prahe leta 1992 ter zasaditev mejic (Aebischer *et al.* 2000). Zasaditev lesne vegetacije zelo koristi tudi rjavemu srakoperju *Lanius collurio*, ki za gnezdenje ne potrebuje velikih in gostih sestojev grmovja, pač pa mu zadoščajo že posamezni trnasti grmi (Kuźniak 1991, Casale *et al.* 2013), zasajeni ob rob travnika, pašnika, kolovoza ali njive. Druga možnost je, da ob robovih obdelovalnih površin postavimo t.i. Benjeseve mejice, to so v 1 – 2 m visok kup zložene odrezane veje (trnastega) grmovja. Dostopnost plena mu lahko izboljšamo s postavitvijo lovnih prež, 1–5 m visokih lesenih kolov, s katerih poletava na tla (van Nieuwenhuyse *et al.* 1999). Postavitev kolov je smiselna na meji med habitati z različno visoko in strukturirano vegetacijo, npr. med travnikom in njivo ali med travnikom in kolovozom. Enak ukrep se je kot zelo uspešen izkazal tudi na Ajdovskem polju za črnočelega srakoperja *Lanius minor* (Denac 2015) ter na Goričkem za zlatovranko *Coracias garrulus* (Domanjko & Gjergjek 2014, Denac *et al.* 2014, 2017) in velikega skovika *Otus scops* (Denac 2018b). Slednja vzporedno z izboljševanjem prehranjevalnih razmer potrebujeta tudi gnezdišča, ki jih najhitreje zagotovimo s postavitvijo gnezdilnic, dolgoročno pa z zasaditvijo visokodebelnega sadovnjaka ali drevesne mejice. Prosnik *Saxicola torquata* je poleg poljskega škrjanca tipična gnezdilka intenzivne kmetijske krajine v Sloveniji, kar je bilo ugotovljeno na Dravskem polju (Vogrin & Vogrin 1998) in na Goričkem (DOPPS *lastni podatki*). Njegova populacija v slovenski kmetijski krajini je v obdobju 2008–2018 strmo upadla (Kmecl & Šumrada 2018), najverjetneje zaradi izginjanja drobnih elementov, ki mu v intenzivni krajini omogočajo preživetje. Tako je z nekaterih delov Goričkega izginil po opravljenih komasacijah, ki jim je sledila odstranitev že tako pičle lesne vegetacije in omejkov (K. Malačič *osebno*). Na Dravskem polju se pojavlja le na njivah, ki imajo na robu kakšen grm oz. na katerih rastejo visoke steblike, npr. osati *Cirsium* spp. (Vogrin & Vogrin 1998). Prosniku bi torej lahko pomagali z ohranjanjem omejkov (po komasaciji bi morali ohraniti drobno strukturiranost parcel), posameznih grmov ali manjših otokov lesne vegetacije na robu njiv in s postavitvijo nizkih lovnih prež (1–2 m) v robne habitate.

Tudi za pribo *Vanellus vanellus* so tuji strokovnjaki razvili vrsto ukrepov, ki pa za zdaj – z redkimi izjemami – še ne dajejo želenih rezultatov, saj na gnezdeče pribe poleg kmetijskih opravil na njivah vpliva tudi visoka stopnja plenjenja. Večanje deleža površin s praho in spomladi sejanimi poljščinami (jaro žito, okopavine) (Sheldon *et al.* 2004), ustvarjanje cvetnih pasov, kamor se lahko zatečejo mladiči po izvalitvi in zakasnitev kmetijskih del vsaj do izvalitve mladičev (Müller *et al.* 2009) so finančno razmeroma nepotratni ukrepi, ki jih lahko kmet uresniči sam. Pri bolj vsebinsko in časovno zahtevnih ukrepih je nujna pomoč strokovnjaka, na primer pri iskanju in diskretnem označevanju gnezd, ki se jim nato kmet ob obdelavi tal izogne ali pa se gnezdo začasno odstrani in se ga po opravljenih delih namesti nazaj (Müller *et al.* 2009, Beyer *et al.* 2015, Bergmann 2016, Skibbe 2016, Eikhorst & Eikhorst 2017), pri prekrivanju gnezd z vedri med nanašanjem pesticidov in gnojil (Müller *et al.* 2009), fizičnem varovanju gnezd z železno kletko, nameščeno čeznje (Beyer *et al.* 2015, Skibbe 2016), ki lahko zaradi svoje očitnosti povečajo stopnjo plenjenja (Beyer *et al.* 2015, Eikhorst & Eikhorst 2017), ali pa pri ograditvi njiv z gnezdi z 90 cm visoko električno ograjo, ki zmanjša stopnjo plenjenja (Müller *et al.* 2009, Rickenbach *et al.* 2011).

V prihodnjih nekaj letih bomo tudi v Sloveniji preskusili nekatere varstvene ukrepe za ptice kmetijske krajine, predvsem v okviru različnih projektov, financiranih iz shem kohezijskega sklada in LIFE. Če bodo imeli pozitiven učinek na ciljne in druge vrste, se bomo trudili za njihovo vključitev med KOPOP za naslednje finančno obdobje (2021–2027). V veljavnih KOPOP za obdobje 2015–2020 namreč obstaja le en pticam namenjen ukrep, in sicer "Habitati ptic vlažnih ekstenzivnih travnikov" (VTR), ki je osredotočen na kosca *Crex crex*. Umestitev med KOPOP omogoča – seveda ob ustrezno visoki subvenciji za kmeta in terenski podpori kmetijskih svetovalcev – da ukrep doseže večjo površino (in s tem svoj namen) in trajnost. Zadnje, kar si namreč želimo, je, da ukrepi po izteku projekta ostanejo mrtva črka na papirju. Naša naloga je, da pri iskanju učinkovitih ukrepov sodelujemo z izkušenimi tujimi strokovnjaki, da ukrepe preskusimo v naših razmerah in da jim izbojujemo mesto v državni kmetijski politiki. Kajti slabo stanje "nekih metuljčkov in ptičkov" je tesno povezano s kvaliteto našega, človeškega bivalnega okolja in bi moralo pri ljudeh že davno prižgati vse alarme.

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In Europe, agricultural intensification began to be practised during World War II in need of food self-sufficiency. With utilization of various technologies, farmers strove to increase the efficiency of soil cultivation and its productivity. The intensification was based primarily on the introduction of new mechanization, fertilizers and pesticides and, to a lesser extent, on land claiming and "ennobling" of plants. The changes in agricultural practice affected (and still affect) birds directly (habitat loss, negative impacts of mechanization, disturbances and pesticides on mortality or breeding success) and indirectly (changes in food quantity and quality of breeding and feeding sites) (Fuller 2000, Newton 2004). If birds in agricultural landscape once proliferated owing to agricultural practices, they now live a miserable existence on the very account of them. There is enormous evidence of the agricultural intensification's negative impacts on birds as well as countless articles on this particular subject. Nature conservationists agree on the existence of this urgent problem, and in the last decade or two they indeed began to offer certain solutions. These demand cooperation with land tillers and owners and, above all, the experts' engagement in the making of common agricultural policy rules, concretely the agri-environment-climate measures (AECM). In cases of certain species, coexistence of modern agriculture and birds demands just some minor farming adaptions, while in other cases the modern agricultural practices are incompatible with long term survival of species (e.g. Corn Crake *Crex crex*, Whinchat *Saxicola rubetra*), which means that larger unfragmented areas would be needed for their conservation, where agriculture would be dictated by conservation regimes. But as it is totally unrealistic to expect that the process of agricultural intensification in Europe will soon stop or even reverse, we cannot turn a blind eye to the problem, given that birds breed in most monotonous and intensely farmed fields as well. Some possibilities of how to conserve field-breeders are presented in the ensuing text.

The Skylark *Alauda arvensis*, the European population of which decreased in the 1980–2016 period by 53% (EBCC 2019), whereas its Slovenian population fell in a mere decade (2008–2018) by 59.7% (Kmecl & Šumrada 2018), is originally a steppe-breeder, but is in Europe nowadays most abundant in large fields. In Great Britain, Germany, Switzerland and Denmark, scientists assessed that the breeding density, breeding success, body condition of fledged young and/or number of attempts by Skylark to breed in the season are greater in fields with bare soil surfaces than in conventionally sawn fields. Patches of bare soil were created by simply turning off the seeder during sowing; the total area of bare soil amounted to 32–144 m^2, divided in two to four planes (Odderskær *et al.* 1997, Morris *et al.* 2004, Fischer *et al.* 2009, Schmidt *et al.* 2017). In the Netherlands, for example, the pure retainment of hedgerows, i.e. grassy edges between fields, gave no desired results for the Skylark, as boundary habitats are characterized by high predation level (Kuiper *et al.* 2015). In our country, the Woodlark *Lullula arborea* breeds in two totally different habitats – in western Slovenia in dry grasslands and pastures with sparse woody vegetation, while in the Goričko region (NE Slovenia) it breeds primarily in fields with set-aside land (fallow ground) or cereals. Owing to the time coincidence with agricultural activities (ploughing, harrowing, sowing, utilization of phytopharmaceutical agents and artificial fertilizers), these can turn out to be an ecological trap for this species (Denac 2018a). This year we are planning to visit, together with our colleagues from the Public Institute of Goričko Landscape Park, our Austrian colleagues, who have developed various agricultural-environmental measures for fields, with the aid of which they wish to improve the Woodlark's breeding success in the Upper Styria. Among these measures are prohibition of agricultural activities in fields between 15 April and 31 May, promotion of small-scale (0.5–1.5 ha) extensive farming on the upper parts of hillocks, growing of root crops and spring cereals, retainment of stubbles till 15 February, avoiding application of fertilizers and pesticides for winter cereals, planting and maintenance of hedgerows and individual trees, and creation of multiyear flower strips planted with indigenous weed vegetation (Uhl *et al*. 2008, Uhl & Rubenser 2012). Apart from conserving extensively farmed dry grasslands, which we embarked upon within the framework of the "Goričko krajina project" , some effective and long-term conservation methods will have to be found for Woodlarks breeding in the fields.

In England, the population of Cirl Bunting *Emberiza cirlus* has been increased almost four – fold thanks to the financial stimulation for growing spring cereals, sown in places where stubbles were left over the winter to provide winter feeding sites for the species. Cirl Buntings also benefited from the introduction (1992) of compulsory letting the land lie fallow and planting of hedgerows (Aebischer *et al.* 2000). Planting of woody vegetation is highly beneficial also for the Red-backed Shrike *Lanius collurio*, which requires no large and thick shrub stands for breeding, but is satisfied merely by individual thorn bushes (Kuźniak 1991, Casale *et al*. 2013), planted on the edge of a meadow, pasture, cart track or field. Another possibility is to plant the Benjes (deadwood) hedges, 1–2 m high piles of stacked cut branches of (thorny) shrubs along the edges of tilled land. Prey access can be improved for the Red-backed Shrike by erecting perches, 1–5 m high wood poles from which it descends to the ground (van Nieuwenhuyse *et al*. 1999). The poles should be erected on the boundary between habitats with diversely structured vegetation of various heights, e.g. between grassland and field or between grassland and cart track. The same measure turned out to be very effective also at the Ajdovsko polje for the Lesser Grey Shark *Lanius minor* (Denac 2015), and at Goričko for the Roller *Coracias garrulus* (Domanjko & Gjergjek 2014, Denac *et al*. 2014, 2017) and the Scops Owl *Otus scops* (Denac 2018b). Parallel to the enhancement of feeding conditions, the last two species require breeding sites as well, which can quickly be established with nest boxes and, in the long run, with planting of either traditional orchard (with high-stemmed trees) or hedgerow trees. Stonechat *Saxicola torquata* is, apart from Skylark, a typical intensive agricultural landscape breeder in Slovenia, which was corroborated at Dravsko polje (Vogrin & Vogrin 1998) and Goričko (Bird Watching and Bird Study Association of Slovenia's *own data*). In Slovenian agricultural landscape, its population sharply declined in the 2008–2018 period (Kmecl & Šumrada 2018), most probably due to disappearance of tiny elements that enable its survival in intensive landscape. From some parts of Goričko, the species consequently disappeared after the carried out commassations, which were followed by removal of the already scanty wood vegetation and hedgerows (K. Malačič *personal communication*). At Dravsko polje it occurs only in fields bordered by a couple of bushes, or in which high-stemmed plants are striving, such as thistle *Cirsium* spp.

(Vogrin & Vogrin 1998). Consequently, the species could be helped by preserving hedgerows (after commassation, minute structuralization of plots should be retained), individual bushes or small islands of wood vegetation on the edges of fields and by erecting low perches (1 – 2 m) in boundary habitats.

For the Lapwing *Vanellus vanellus*, too, foreign experts developed a series of measures which have not produced, with a very few exceptions, desired results as yet, given that breeding Lapwings are affected not only by agricultural activities in the fields, but by high predation level as well. The increased share of set-aside land and cereals (spring cereals and root crops) (Sheldon *et al.* 2004), creation of flower strips where young can seek shelter soon after hatching, as well as postponed agricultural activities until the young are hatched (Müller *et al.* 2009) are, in financial terms, relatively frugal measures that can be implemented by farmers themselves. In more demanding measures with respect to contents and time, an expert's help is implicit, e.g. in the search and discrete marking of nests that can be avoided by farmers during tillage, or a nest is temporarily removed and then returned after the carried out jobs (Müller *et al.* 2009, Beyer *et al.* 2015, Bergmann 2016, Skibbe 2016, Eikhorst & Eikhorst 2017), in covering of nests with buckets during the application of pesticides and fertilizers (Müller *et al.* 2009), physical protection of nests with iron cages placed over them (Beyer *et al.* 2015, Skibbe 2016), which can due to their obviousness increase the predation level (Beyer *et al.* 2015, Eikhorst & Eikhorst 2017), or in fencing of fields with nests with app. 90 cm electric fences that decrease the predation level (Müller *et al.* 2009, Rickenbach *et al.* 2011).

In the ensuing few years, some protection measures for the birds of agricultural landscape will be tested in Slovenia as well, particularly within the framework of various projects financed from the Cohesion Fund schemes and LIFE. If they turn out to have a positive effect on target and other species, we shall do our best to include them among AECM for the ensuing financial period (2021–2027). Specifically, only one measure intended for birds subsists for the 2015–2020 period, i.e. the "wet extensive meadow bird habitats" , which is focused on the Corn Crake *Crex crex*. Its placing among AECM enables – with adequately high subsidy for farmers and field support of agricultural consultants, of course – a measure to reach a larger surface area (and its purpose with it) as well as sustainability. The very last thing we would wish for is that after the project termination the measures remain a dead letter. Our task is to participate with experienced foreign experts in the search for effective measures, to test the measures in our own conditions and to win a place for them in the national agricultural policy. For the fact is that a bad condition of some "little butterflies and birds" is closely associated with the quality of our human living environment and should have turned all alarms on in people ages ago.

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Black Kite *Milvus migrans* in Slovenia – its distribution, phenology, breeding and habitat

Črni škarnik *Milvus migrans* v Sloveniji – razširjenost, fenologija, gnezditev in habitat

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Between 1984 and 2017, 1,388 Black Kites were recorded, mostly in lowlands with 70% of observations made at Dravsko polje. They were observed from sea level to around 1,600 m a.s.l. with an average elevation of 271 m a.s.l. The species was present in Slovenia from mid-March to early December with indistinct spring and autumn migrations. The highest number of observations was recorded in May. The Black Kite was observed in 71 out of 238 10x10 km grid squares in Slovenia (29.8%), with more observations around known breeding sites and at sites with higher observer effort. Both the number of observations and the number of probable and confirmed breeding pairs increased. In 2011–2018, 10 breeding pairs were found at 7 sites (3–7 per year). Additionally, 11 probable breeding pairs at 9 sites (0–6 pairs per year) were found. The breeding population in 2011–2018 is estimated at 10–21 pairs with an average breeding density of 0.3–0.9 breeding pairs per 100 km^2. The highest density was recorded at Dravsko polje with 0.6–2.2 breeding pairs per 100 km^2. If possible breeding (breeding attempts) were also taken into consideration, the estimate would be up to five breeding pairs higher. The species was recorded at known breeding sites in most years after the breeding was confirmed. Black Kites were observed closer to larger water bodies and to rubbish tips than expected by chance. More Black Kites were recorded in areas with a lower percentage of forest and arable land and a higher percentage of meadows, settlements and wetlands.

Key words: breeding population, breeding density
Ključne besede: gnezdeča populacija, gnezditvena gostota

1. Introduction

The Black Kite *Milvus migrans* inhabits open landscapes of Europe, Asia, Africa and Australia (Del Hoyo *et al.* 1994). It inhabits almost all of Europe, with the exception of northern latitudes and most Mediterranean and Atlantic islands (Cramp 1998), representing around 11% of global range (BirdLife International 2018). The European population of Black Kite is estimated at 81,200–109,000 pairs (BirdLife International 2015), representing less than 24% of the global population (Birdlife international 2004). The largest European breeding populations are in Russia (30,000–50,000), France (22,500–26,300), Spain (2,500–10,000) and Germany (2,700–4,100).

With the exception of Italy (700–1,200 pairs), our neighbouring countries have small breeding populations in the range of 50 to 500 pairs (Birdlife international 2004).

In the 19th and early 20th century, Black Kite was present in Slovenia, but was rare and with no breeding record (Freyer 1824, Schiavuzzi 1883, Schulz 1890, Reiser 1925). It had the same status in the first half of the 20th century, when the species was a non-breeding visitor in NE Slovenia (Matvejev & Vasič 1973). Until 1990, when breeding was documented for the first time at Leško polje (Kozinc 1991), its breeding status in Slovenia was uncertain (Geister 1995). In 1999, the second breeding pair was confirmed at the confluence of the Sava and Ljubljanica Rivers (hereinafter referred to as "Confluence"), central Slovenia (Košir 1997, Kozamernik 2000), with the breeding population estimated at 1–3 breeding pairs at that time (Birdlife international 2004). Between 2000 and 2011, several breeding pairs were confirmed or considered probable. Confirmations were as follows: at Medvedce water reservoir in 2004 (hereinafter referred to as "Medvedce"; Kerček 2005, Bordjan & Božič 2009), in the Vipava valley in 2008 (Figelj 2007a), second and third pairs at Dravsko polje in 2009 and 2011. Nest building was observed near Žovnek water reservoir in 2009 (J. Novak *pers. comm.*). In 2011, the breeding population was estimated at 10–20 breeding pairs (Denac *et al.* 2011). Thereupon, breeding was confirmed in the eastern part of Ljubljansko barje (Denac 2016).

In Slovenia, Birds of Prey (Accipitriformes and Falconiformes) were mostly included in multiple species studies (e.g. Kmecl & Rižner 1993, Gregori & Šere 2005, Bordjan & Božič 2009, Škornik 2012, Bordjan 2012, 2015) and only rarely did they constitute a central part of study. Thus in more than 30 years of Acrocephalus magazine, there are only 19 articles with Birds of Prey as a central part of study, with most of them covering local problems of distribution (Bračko 1990, 1998, Božič 1992, Gjerkeš & Lipej 1992, Trebušak *et al.* 1999, Mihelič & Brajnik 2006, Figelj 2007b, Denac 2010) or nesting (Smerdu 1981, Škornik 1985, Kozinc 1991, Marenče 1998). One deals with the bird's diet (Kozinc 1999), one with conservation (Luskovec 1990) and one with unusual influx (Hanžel 2015). Considering all our journals, papers on Griffon Vulture *Gyps fulvus* (Mihelič & Genero 2005), White-tailed Eagle *Haliaeetus albicilla* (Vrezec *et al.* 2009), Common Kestrel *Falco tinnunculus* (Šumrada & Hanžel 2012) and Red Kite *Milvus milvus* (Bordjan 2017) submit a more detailed review of the status of certain birds of prey in Slovenia. Moreover, in the past 50 years, out of 38 Raptor species (also including Birds of Prey) 71% were part of a monitoring scheme and only 18% of species were part of national monitoring, while others were included in more or less local studies (Vrezec 2012). The purpose of this article is to give a more detailed overview of the Black Kite's distribution, phenology, breeding population development and habitat in Slovenia in the light of new knowledge and data.

2. Methods

Data on the Black Kite in Slovenia was obtained from the ornithological literature, as well as directly from observers. All volumes of the following journals were checked: Acrocephalus, Biota, Falco and Svet ptic up to and including the last issue published in 2017. Additionally, Google Scholar was used with key words "Črni škarnik" and "*Milvus migrans*" or "Black Kite" for Slovenia. Data from online data base NOAGS (Atlas ptic 2018) were obtained. Observations were also collected directly and indirectly from other observers.

Data till the end of 2017 were used for temporal and spatial distribution, but for breeding the 2018 breeding season was included as well. Data were drawn in map using program ArcGis 10.4.1 (ESRI 2015) and also used to calculate altitude and distance to the nearest large water body (rivers and lakes or fishponds with min. 3 ha of water surface), rubbish dump and settlements. Data on altitude were clustered in 100 meter groups to mask potential discrepancies between actual observation and point in the map. For breeding distribution coarser, 10x10 km squares were used, as well as smaller 2x2 km squares for habitat analysis. All entered points were overlaid with the 2x2 km grid (containing 5,405 squares) and percentage of land use (MKGP 2017) was calculated for squares with Black Kite observations (1,021 observations in 184 squares). For habitat analysis, 1,100 random points were generated in Arc GIS in 2x2 km grid, and those that were outside Slovenia were later removed (amounting to 1,090 points in 1,000 2x2 km squares). Distance to large water body, rubbish dump and settlements and share of land use was calculated for random points and 2x2 km squares with random points. For labelling breeding status, confirmed and probable breeding was used. Data were labelled as confirmed breeding in proximity of known nest sites or when one or two individuals remained in the same area for longer period (two or more observations distanced at least one month) in combination with courtship display, copulation, observation of fledged young (together with parents up to first half of August) or regular (at least two observations at least one week apart in breeding period) flights to a potential nest site. Observations were labelled as probable breeding when one or two individuals remained in the same area for a longer period within main breeding period (20 May–25 July), or observation of courtship display or copulation with the absence of later observations. Exception is the area of Krška ravan where breeding status given by Denac *et al.* (2009) was used. Observations in the western part of the Vipava valley were separated due to distance between two clusters of observations that are located more than 10 km from known nest site. Although Black Kites may go as far as 20 km from the nest in search of food during nesting, most feeding flights are made within 10 km from nest (Meyburg & Meyburg 2009). For the purpose of seasonal dynamics, we distributed data in 37 ten-day periods that are explained in more detail by Bordjan & Božič (2009). A regular monitoring of waterbirds and birds of prey has been conducted at Medvedce since 2002 (Bordjan & Božič 2009) and Rački ribniki – Požeg Country Park since 2011. From study at Medvedce, the average temporal distribution of Black Kite presence per visit was calculated in a ten-day period.

3. Results

3.1. Temporal distribution

We gathered data on 1,388 individuals between 1984 and 2017 (Figure 1). 70.7% of observations come from Dravsko polje and 61.5% from the breeding site at Medvedce. The number of observed Black Kites rose steadily with 7.6 individuals per year before 2001 and 124.4 between 2011 and 2017 (Pearson's r: 0.84; N = 32; $P < 0.001$). Even without individuals from Medvedce, the number of observations rose from average 7.3 to 20.1 individuals per year (Pearson's r: 0.61; N = 32; $P < 0.001$). Most observations (1,021) involved single individuals (780) with more than ten individuals simultaneously observed only three times; 12 individuals were observed at Ljubljana rubbish dump (central Slovenia), 15 near Kromberk (Gorica, SW Slovenia) and 16 around Medvedce (NE Slovenia).

Black Kite was present in Slovenia between mid-March and the beginning of December (Figure 2). The earliest observation dates to 14 Mar when one individual was observed near Maribor (NE Slovenia) in 2002 (Lončar 2003) and one at Ljubljansko barje (central Slovenia) in 2009 (Rubinić *pers. comm.*). Spring migration in Slovenia was weak in March and the number of observations peaked in May (Figure 2). In Slovenia, the maximum of observed individuals dates to mid-May. After the spring migration peak, observations decreased steadily until the beginning of October with some observations made between the end of October and December (Figure 2). The latest observation was from 8 Dec at Lake Cerknica (A. Škoberne & M. Cvetko *pers. comm.*).

The seasonal distribution was monitored more closely on breeding grounds at Medvedce (NE Slovenia) in 2002–2018. Black Kites were present continuously between mid-March and late September (Figure 3) with one observation in November (Bordjan 2004). The probability of observing a Black Kite at Medvedce in this particular period was on average 0.47 observations per visit and varied widely from 0.04–0.71 obs / visit (Figure 3). It was highest between late April and late July. Lowest probability was in 2002 (0.17 obs / visit) and in 2008 (0.25 obs. / visit) and highest in 2018 (0.63 obs. / visit).

3.2. Spatial distribution

Black Kite was observed in 71 out of 238 10x10 km squares covering Slovenia (29.8%; Figure 4). Observations were made in most flatlands of Slovenia with the exception of land around the Mura river.

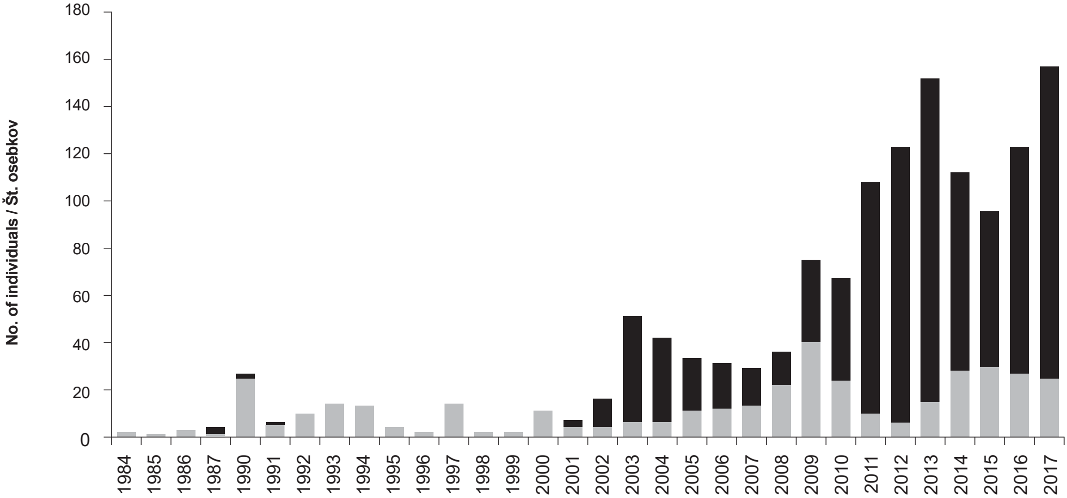

Figure 1: Number of Black Kites *Milvus migrans* observed between 1984 and 2017 in Slovenia. Black columns refer to observations at Medvedce water reservoir (NE Slovenia) and grey to observations from the rest of Slovenia).

Slika 1: Število črnih škarnikov *Milvus migrans*, opazovanih med letoma 1984 in 2017 v Sloveniji. Črni stolpci ponazarjajo opazovanja z zadrževalnika Medvedce (SV Slovenija), sivi pa opazovanja iz preostale Slovenije.

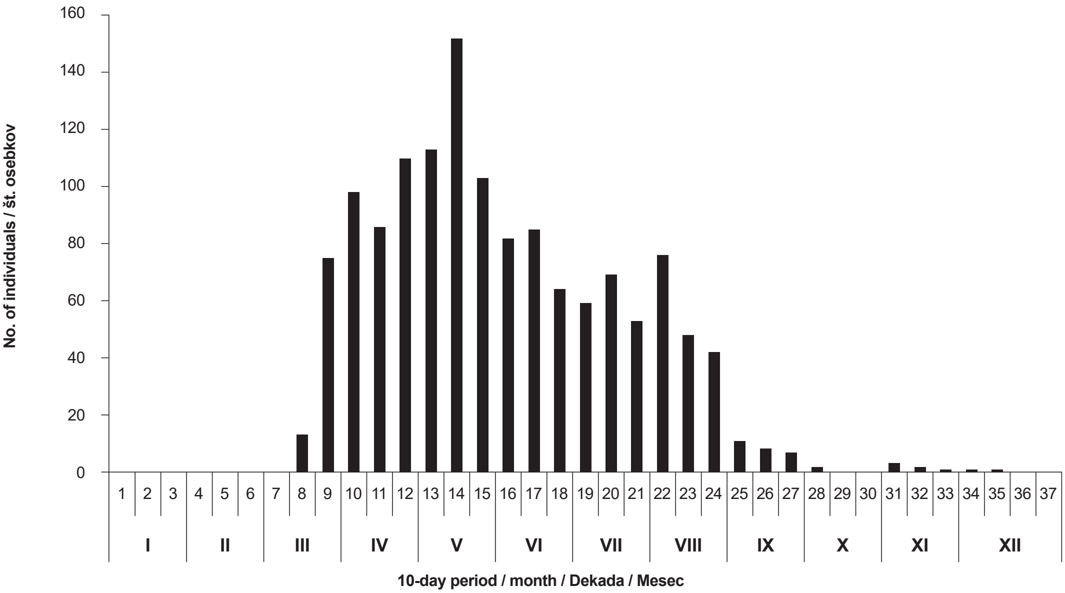

Figure 2: Number of Black Kites *Milvus migrans* observed in separate 10-day periods in Slovenia

Slika 2: Število črnih škarnikov *Milvus migrans*, opazovanih po posameznih dekadah v Sloveniji

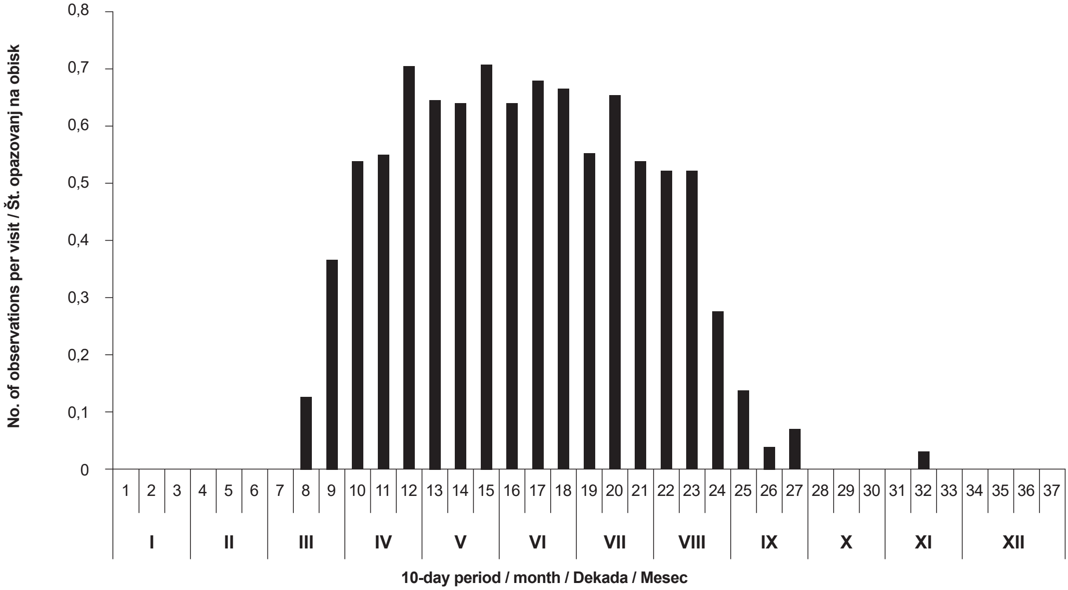

Figure 3: Seasonal dynamics of Black Kite *Milvus migrans* at Medvedce water reservoir (NE Slovenia) during 10-day periods between 2002 and 2010

Slika 3: Sezonska dinamika opazovanj črnega škarnika *Milvus migrans* na zadrževalniku Medvedce (SV Slovenija) po dekadah v obdobju 2002–2010

Highest densities of observations were recorded in the squares with confirmed breeding sites and squares with higher observation effort (i.e. Lake Cerknica). Black Kite observations were missing from extensive forested and mountainous areas.

Black Kite was recorded on the Slovenian coast in Sečovlje saltpans at sea level (Jančar 1991, Sovinc & Šere 1993). Highest altitude was recorded during bird of prey count on Breginjski stol in 2010 (Denac 2010) just below 1,600 m a.s.l. Only eight records were made above 1,000 m a.s.l. Average altitude of Black Kite observations is 271 m a.s.l. and 309 m a.s.l., if Medvedce data are excluded. Black Kites were observed more often than would be expected at random below 300 m a.s.l. (Figure 5).

3.3. Breeding of Black Kite *Milvus migrans* in Slovenia

Between 1990 and 2018, ten confirmed breeding pairs were observed at seven sites (Figure 6). Three were observed only in a single year. The observations indicate that pairs at the confirmed breeding sites bred there more or less regularly (Figure 6), with above mentioned exceptions and Leško polje where breeding data were absent for 22 years. The only pairs that were observed at breeding sites continuously were those at Medvedce and in Rački ribniki – Požeg Country Park, both with regular monitoring. From 2005 onwards, 3–7 pairs were registered in any given year.

In Slovenia, eleven pairs at nine sites meet criteria for probable breeding (Figure 7). With the exception of western part of the Vipava valley, N part of Ljubljana basin and NE part of Dravsko polje, the observations of Black Kites were more irregular then those for confirmed pairs. From 2000 onward, 0–6 probable pairs were observed in any given year.

The breeding population of Black Kites (considering confirmed and probable pairs in any given year) has risen steadily from 1–4 breeding pairs between 1990 and 2000 to 2–11 pairs in 2000–2010 and 6–12 pairs in 2011–2018 (Figure 6). The 10 confirmed or probable pairs

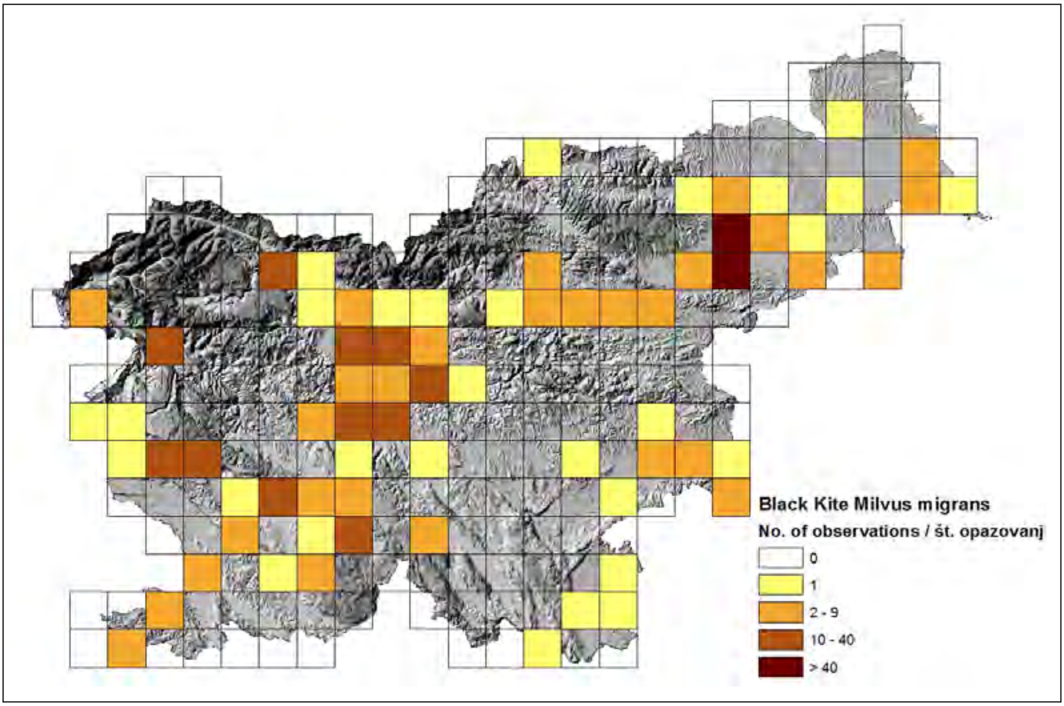

Figure 4: Distribution of Black Kite *Milvus migrans* in Slovenia with the number of observations in 10x10 km squares

Slika 4: Razširjenost črnega škarnika *Milvus migrans* v Sloveniji s prikazom števila opazovanj po posameznih kvadratih 10x10 km

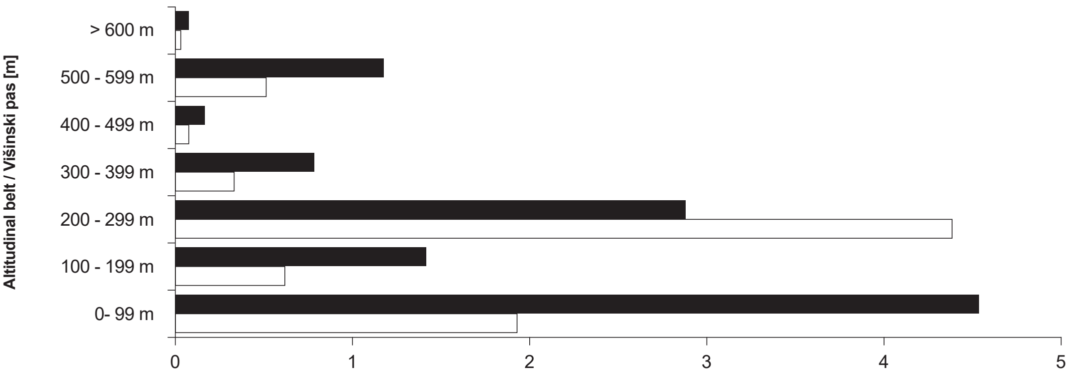

Figure 5: Distribution of Black Kite *Milvus migrans* in altitude belts compared to available area per altitudinal belt including data from Medvedce water reservoir (white) and without (black)

Slika 5: Razširjenost črnega škarnika *Milvus migrans* po nadmorskih pasovih glede na razpoložljivo površino posameznega nadmorskega pasu, vključujoč podatke z zadrževalnika Medvedce (belo) in brez (črno)

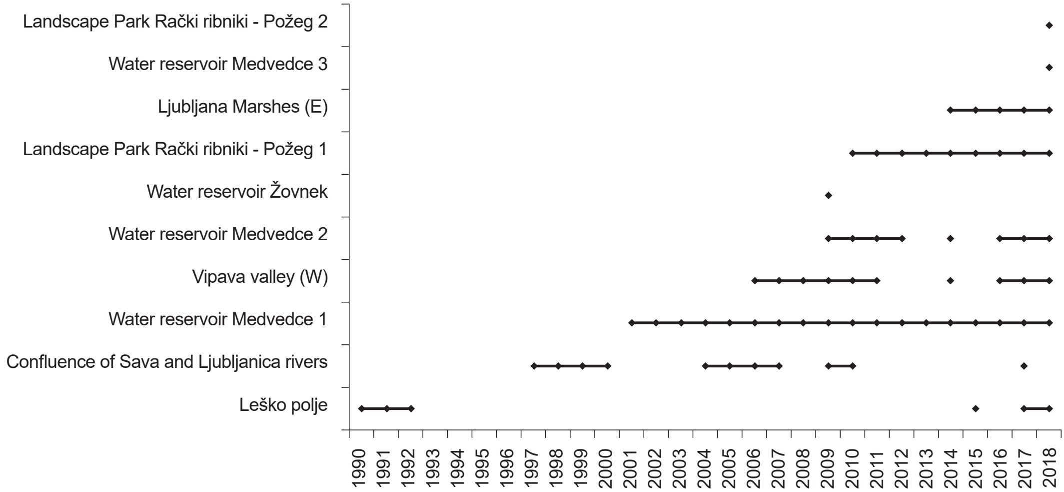

Figure 6: Yearly presence of Black Kites *Milvus migrans* at confirmed breeding sites

Slika 6: Pojavljanje črnega škarnika *Milvus migrans* na potrjenih gnezdiščih v posameznih letih

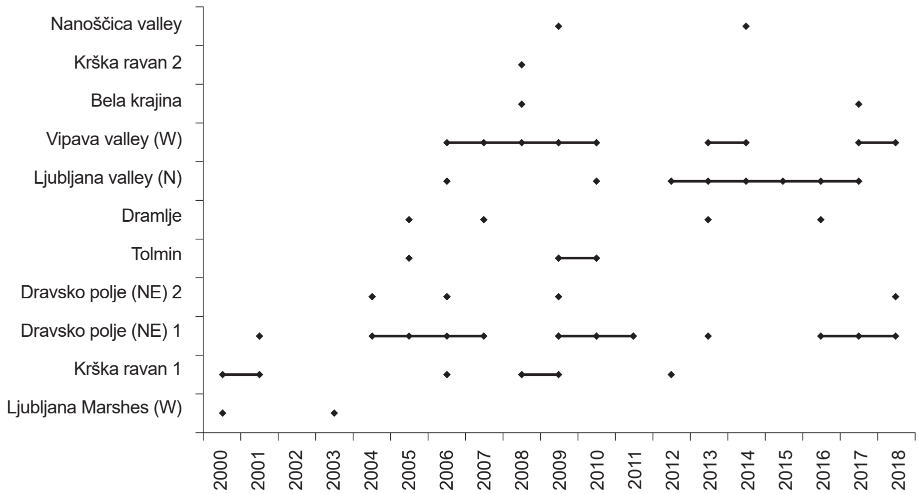

Figure 7: Yearly presence of Black Kites *Milvus migrans* at probable breeding sites

Slika 7: Pojavljanje črnega škarnika *Milvus migrans* na verjetnih gnezdiščih v posameznih letih

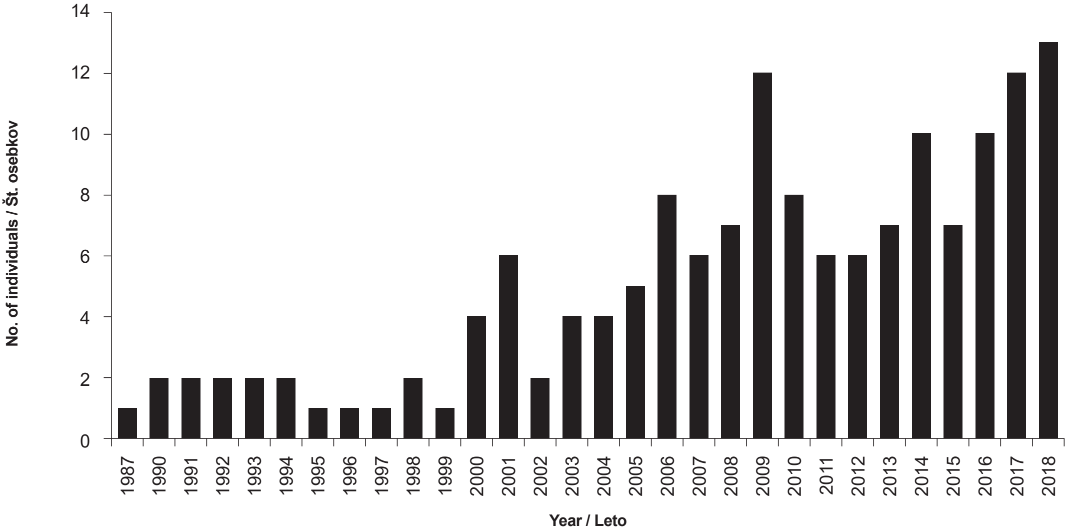

Figure 8: The dynamics of Black Kite *Milvus migrans* breeding pair numbers in Slovenia. Data includes confirmed and probable breeding attempts as well as possible breeding at otherwise confirmed breeding sites.

Slika 8: Dinamika števila gnezdečih črnih škarnikov *Milvus migrans* v Sloveniji. Podatki vključujejo potrjene in verjetne pare ter možne pare na sicer potrjenih gnezdiščih.

from the past ten years can be considered regular breeders, and as there was a total of 21 confirmed or probable breeding pairs, the population was estimated at 10–21 breeding pairs in Slovenia.

The breeding distribution is shown in figure 9. From the first observation of possible breeding in 1987 to the estimated breeding population in 2018, the population has been estimated to rise by 0.34 pairs/year (Figure 8). The average breeding density of Black Kites is 0.3–0.9 bp/100 km^2 with the highest at Dravsko polje, i.e. 0.6–2.2 bp/100 km^2 (Table 1). No semi-colonial breeding was observed. Closest nests were little less than five kilometres apart for three pairs near Medvedce in 2018.

3.4. Habitat

Black Kite observations were recorded closer to larger water bodies and rubbish dumps than expected from random points, but not to settlements (Table 2). Black Kites were observed in squares with less forest cover than would be expected (Table 2). More than half (58%) of all 2x2 km squares with Black Kite observations had less than 25% of forest cover and 85% of less than 50% as opposed to squares with random points (15% and 38%). Also, Black Kites were observed more often in squares with higher share of arable land (on average arable land covered 28% 2x2 km squares), meadows (24%), urban area (11%) and wetlands (3%; Table 2).

4. Discussion

The number of observed Black Kites and their breeding population in Slovenia rose during the past three decades to 10–21 breeding pairs and more than 120 observations per year on average. This trend is similar to that in Carinthia (PETUTSCHING & PROBST 2017), but could merely reflect a trend in our knowledge of breeding population in Slovenia and also the intensified observation effort with surveys for the national Breeding Bird Atlas (MIHELIČ 2002), Natura 2000 Monitoring Schemes (MIHELIČ 2005), Farmland Bird Index (BOŽIČ 2007), local monitoring schemes; i.e. Medvedce (BORDJAN & BOŽIČ 2009), Lake Cerknica (BORDJAN 2012), accumulations on the Drava river (L. BOŽIČ *pers. comm.*) and new available

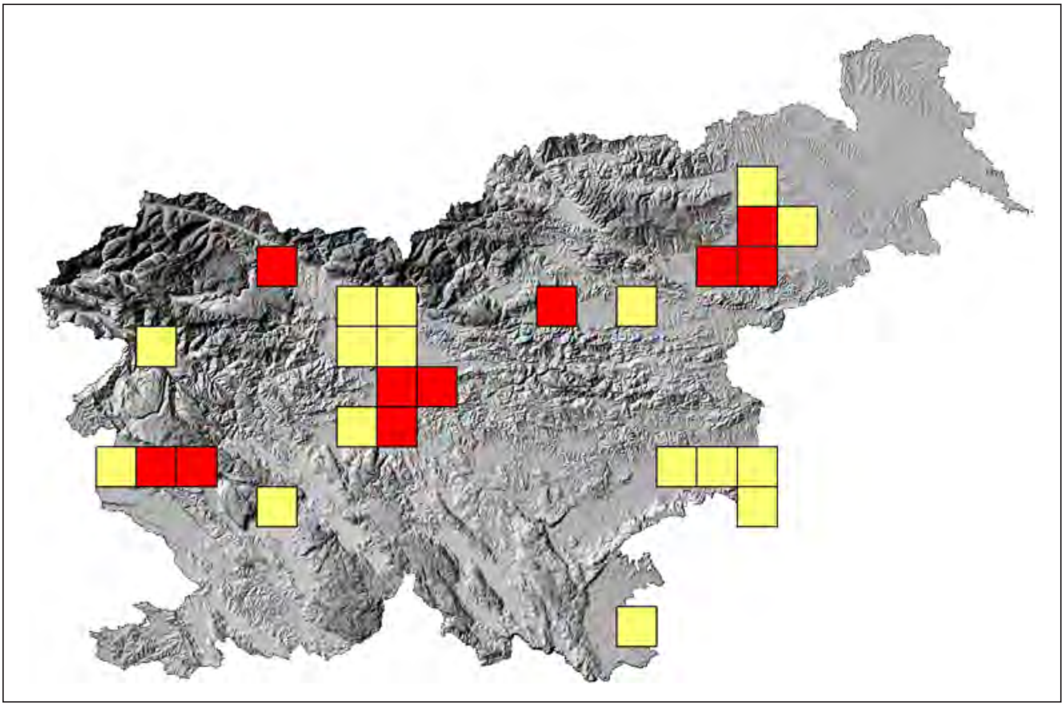

Figure 9: Breeding distribution of Black Kite *Milvus migrans* in Slovenia of confirmed (red) and probable breeding pairs (yellow) in 10x10 km squares

Slika 9: Razširjenost potrjenih (rdeče) in verjetnih (rumeno) gnezdečih parov črnega škarnika *Milvus migrans* v Sloveniji v kvadratih 10x10 km

Table 2: T-test values between habitat variables of Black Kite *Milvus migrans* observations (N = 1482) and random points (N = 1090). Area represents an average share of individual land uses per 2x2 km square.

Tabela 2: Rezultati T-testa med habitatnimi spremenljivkami opazovanj črnih škarnikov *Milvus migrans* (N = 1482) ter naključnih točk (N = 1090). Površina ponazarja delež povprečne rabe na kvadrat 2x2 km.

		Random		Black Kite			
		Mean	SD	Mean	SD	t-value	*P*
Distance [m]	Large water body	3621.7	2698.4	1176.4	1523.7	18.56	< 0.01
	Rubbish dump	9981.4	5164.1	6097.4	3520.3	14.95	< 0.01
	Settlement	367.8	382.9	396.6	350.3	-1.39	0.16
Area	Arable land	0.10	0.18	0.28	0.24	-12.28	< 0.01
	Meadows	0.19	0.14	0.24	0.18	-4.35	< 0.01
	Forest	0.57	0.27	0.25	0.22	15.02	< 0.01
	Urban area	0.05	0.08	0.11	0.14	-7.92	< 0.01
	Wetland	0.01	0.03	0.03	0.07	-8.10	< 0.01
	Other	0.08	0.10	0.08	0.09	-0.73	0.46

databases (Mihelič 2016). This is possible since it is in contradiction with the broader European trend, where the breeding population suffered a substantial decline in the past century (Viñuela & Sunyer 1994, Birdlife International 2004) and its current trend is uncertain (BirdLife International 2015). On the other hand at least locally, i.e. Dravsko polje, the population has risen substantially (from 1 to 7 pairs) and it may be similar to the population increase in Sicily (Sará 2003) that does not reflect national trend in Italy (Sergio & Boto 1999), where negative trends prevail (Sergio *et al.* 2003). Similarly, the trend differs in different parts of Austria with Carinthian population rising (Petutsching & Probst 2017) and the population in Donau-Auen National Park decreasing (Probst & Schuhbauer 2010). Overall it seems that the population trend in Slovenia is at least stable, with some local increases. The estimate of breeding population is similar to the one given by Denac *et al.* (2011) but includes only confirmed and probable and not possible breeding pairs. With the latter, the estimate would probably be higher by up to 5 pairs.

In Slovenia, Black Kite habitat is similar to habitat requirements in other countries, i.e. low forest cover and proximity to wetlands (Cramp 1998, Probst & Schuhbauer 2010). Wetlands and large water bodies that are rich in food are essential for Black Kite (Sergio *et al.* 2003, 2005) with increased breeding density and success in their proximity (Sergio & Boto 1999, Salvati *et al.* 2001, Sergio *et al.* 2003). Fish are important part of the Black Kite's diet (Probst & Schuhbauer 2010). Thus it is not surprising that most of our records were made at or near wetlands. The breeding density even rises with the size of wetland, but also with the size of open land (Sergio *et al.* 2005), as is the case in Slovenia. Open rubbish dumps represent important feeding areas for Black Kite (Blanco 1994) and most of our breeding pairs include one in their territory.

If the Black Kite's absence from the Alps (N and NW Slovenia) and hills of W, S and E Slovenia (hills of Zasavje, Snežnik, Kočevje, Polhograjsko, Škofjeloško and Cerkljansko) could be explained with higher altitudes and forest cover (Cramp 1998), the reason for its absence from Pomurje is more complex. Almost complete absence of observations in apparently suitable habitat (low altitude and open mosaic landscape with many water bodies) in NE Slovenia is somewhat surprising. There were only few records indicating possible breeding along the lower Mura River so far (i.e. Božič 1998). One of the reasons may lie in arable land, since Black Kites tend to avoid intensive farmland (Tanferna *et al.* 2013) and their breeding density decreases with the size of intensive arable land (Sergio *et al.* 2003). On the other hand, Dravsko polje is also known for its ample intensively farmed land, but this may be compensated with many shallow fishponds and drainage ditches. One explanation may be that colonisation has not reached Pomurje as yet. It is increasing on Dravsko polje but it is still rare in Styria, Austria (R. Probst *pers. comm.*).

Although Black Kite can cross high mountains on its migration (R. Probst *pers. comm.*), it is a lowland species (Salvati *et al.* 2001), which is also in agreement with observations in Slovenia. In Northern Italy, Black Kite breeds between 240 and 870 m a.s.l. with average at 515 m a.s.l. (Sergio & Boto 1999), although breeding density rises with lowering altitude (Sergio *et al.* 2003). In Switzerland, most pairs breed below 600 m a.s.l., and individuals observed higher in the Alps are thought to be non-breeding individuals on foraging trips (Schmid *et al* 1998), just like those on Breginjski stol (Denac 2010).

Migrating individuals in March correspond to peak migration across the Strait of Gibraltar and Suez (Panuccio *et al.* 2014). Similar to the central Mediterranean (Panuccio & Agostini 2010), the spring migration in Slovenia is weak in March, but unlike the Straight of Messina it does not peak in mid-April (Corso 2001), but rather in May. It is often difficult to separate breeding from migrating individuals, especially as the percentage of immature individuals is significant during the second part of migration (Panuccio & Agostini 2010). Seasonal dynamics differs from that in Algeria, where peak in the number of individuals is in August but similarly, Black Kites leave their breeding area at the end of September (Boumaaza *et al.* 2016). Although no Black Kites were observed in winter, such observations are expected in the future since wintering population is increasing in Europe, including all our neighbouring countries (Literák *et al.* 2017).

5. Povzetek

Med letoma 1984 in 2017 je bilo opazovanih 1388 osebkov črnega škarnika večinoma po nižinah z glavnino opazovanj na Dravskem polju (70,0 %). Opazovanja so razporejena od morske gladine do nekaj pod 1600 m n.m. s povprečno nadmorsko višino 271 m. Črni škarnik se v Sloveniji pojavlja med sredino marca in začetkom decembra z neizrazito spomladansko in jesensko selitvijo. Največje število opazovanj je v maju. Črni škarnik je bil opazovan v 71 od 238 kvadratih 10 x10 km (29,8 %), z večjim deležem opazovanj na gnezdiščih in območjih z večjim številom opazovalnih dni. Tako število opazovanj v posameznem letu kot tudi število potrjenih in verjetnih gnezdečih parov je v Sloveniji naraščalo. V obdobju 2011–2018 je bilo najdenih 10 gnezdečih parov na sedmih lokacijah (3–7 v vsakem letu). Ob teh je bilo najdenih še 11 verjetno gnezdečih parov na devetih lokacijah (0–6 v vsakem letu). Gnezdeča populacija v obdobju 2011–2018 šteje 10–21 verjetno in potrjeno gnezdečih parov s povprečno gnezditveno gostoto 0,3–0,9 gp/100 km^2. Najvišja gostota parov je na Dravskem polju (0,6–2,2 gp/100km^2). Ob upoštevanju možnih gnezditev bi bila ocena višja za do 5 gp. Na potrjenih gnezdiščih je gnezdil v večini let po potrditvi, najbolj konstantno na območju rednih monitoringov vodnih ptic in ujed. Črni škarnik je pogosteje opazovan ob večjih vodnih telesih in bližje smetiščem, kot bi pričakovali naključno. Hkrati so bila opazovanja razporejena na območjih z nižjim deležem gozda in njivskih površin ter z višjim deležem travnikov, naselij in mokrišč.

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Candling and field atlas of early egg development in Common Eiders *Somateria mollissima* in the central Baltic

Ovoskopija in terenski atlas zgodnjega razvoja pri gagah *Somateria mollissima* v Osrednjem Baltiku

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Here we present the results of candling 258 eggs from 50 nests of Common Eiders *Somateria mollissima* in a colony in the central Baltic. Of these, 223 (86%) had a developing foetus. Among the 35 (14%) failed eggs, 15 were unfertilized and 20 contained a dead embryo. The prevalence of failed eggs is similar to the average proportion of failed eggs reported previously by the Christiansø Scientific Field Station during 1998–2014. The reason for the high percentage of failed eggs is unknown; however, low pre-incubation body mass and energetic stress is likely to be the main factor. In addition, we incubated 8 eggs in the laboratory from day 0 to hatch in order to follow the development and foetal morphology. This resulted in a field atlas from which it is possible to estimate date of incubation start using candling in early incubation (days 1–12). The atlas is a new possibility for field biologists to estimate the first day of incubation of breeding eiders and the prevalence of unfertilized and rotten eggs, which is important for studying their biology and population dynamics.

Key words: Common Eider, Baltic, candling, fertilization, starvation, stress

Ključne besede: gaga, Baltik, ovoskopija, oploditev, stradanje, stres

1. Introduction

The Christiansø archipelago in the southern part of the Baltic Proper holds the second largest Danish colony of breeding Common Eiders *Somateria molissima* (Christensen & Bregnballe 2011). It consists of 1,500–1,700 pairs and has been monitored since 1950 (Lyngs 1992, 2009, 2014). This long-term monitoring revealed that during 1970–1990, the population increased from approximately 1,000 to approximately 3,000 breeding pairs, while from 1990 until today the population has declined by approximately 50% (Lyngs 2009, 2014). The reasons for this is unknown, however, limited access to food in wintering areas and the breeding location, infectious diseases, blooming toxic algae and failed eggs have been suggested as some of the main reasons (Buchman 2010, Camphuysen *et al.* 2002, Christensen *et al.* 2008, Larsson *et al.* 2014, Laursen & Møller 2014).

In order to understand the fluctuations in the number of breeding eiders and clutch size, we established a research programme running in 2015–18. Briefly, the study showed that incubating females underwent extreme physiological stress over the approximately 26-day incubation period. The weight loss for a certain proportion of the colony in some years is borderline to cachexia and breeding failure (Garbus 2016, Garbus *et al.* 2018). As part of this, the prevalence of failed eggs has been studied, since earlier indications suggest that this could be a potential problem for the colony and population dynamics (Lyngs 2009, 2014).

Here, we present the results of the controlled study of candling incubating eider eggs and provide the first field atlas of developmental stages in Common Eiders. Eggs were monitored and candled, and controlled incubation in the laboratory was conducted. The present publication is of value to field studies that measure fertility ratios and estimations of date of incubation start in breeding eiders.

2. Materials and methods

During April-May 2015, 258 eggs and egg membranes from 50 nests of incubating habituated eiders were monitored at Christiansø located northeast of Bornholm in the Baltic Proper (55°19'N 15°11'E, Figure 1). All 258 eggs were candled to investigate the frequency of failed eggs and the relation to the health of female eiders. An oviscope was constructed from a flashlight (Cree XPE High Power LED 3 W 150 Lumen) modified with a rubber cup on the top (Figure 2). The flashlight had a sufficient brightness to examine the eider eggs. The entire candling procedure was performed in darkness using a mackintosh covered cardboard box. Using nitrile examination gloves, the base of the egg was held between thumb and forefinger, placed directly against the light and tilted slightly to one side while rotating the egg. The candling was conducted from day 8 to 12 of the incubation stage as recommended for ducks having long incubation periods (Ernst *et al.* 2004). The 10-second candling is considered to pose no risk to the further egg development.

Birds were kept in a cotton bag during all procedures to reduce stress. In cases where all eggs were removed from the nest due to complete failure, artificial replacement eggs were used to keep birds at their nests and thereby reduce stress levels. All nests were checked daily and visually inspected at distance.

Eggs were divided into two groups: active eggs and failed eggs (Hemmings *et al.* 2011). Failed eggs were further divided into infertile eggs or dead embryos. Information on the methods and their interpretations is described in Ernst *et al.* (2004).

In addition to this, newly laid eggs in 2016 (n=4) and 2017 (n=4) were brought for incubation in the laboratory. The eggs were incubated on days 1–28 and the hatched ducklings were brought back to the nest and taken over by either the mother or a nanny. The nests were visually observed, and all ducklings were successfully accepted by their mothers or nannies. An America motor incubator (America A/S, Thisted, Denmark) was used for incubation. A thermometer and hygrometer were placed inside the incubator in order to monitor and adjust temperature and humidity. The settings used were 38.5°C on the first 21 days with a humidity of 55%. In the last 4–5 days of incubation, a temperature of 38.9°C was applied. From day 8, the eggs were humidified daily with a spray containing water at 38.5 °C. The eggs were turned four times daily (8.00, 12.00, 18.00 and 22.00). All eggs were photographed daily at 13.00 and simultaneously cooled during transport (1–2 minutes). Around the time of hatching, humidity was adjusted to 70%. For photodocumentation of egg development, a Cree XPE High Power LED 3 W 150 lumen was used for early development and an EC4S NITECORE® LED Flashlight 2150 Lumen for late development. Lumen settings varied from 1000–2150. Both flashlights were modified with rubber cubs placed in a holder fitting the morphology of the eggs. Pictures were taken with a Nikon D3S using a 60 mm macro lens (f/9, 1250 ISO, 1 sec exposure) in a partly dark room.

For basic training, the candling procedure was tested at the Department of Disease Biology, University of Copenhagen in March 2015 on day 10 of incubation. Candling of 200 chicken eggs showed fourteen unfertilized and seven dead embryos adding up to 10% failed eggs. No false negatives were observed.

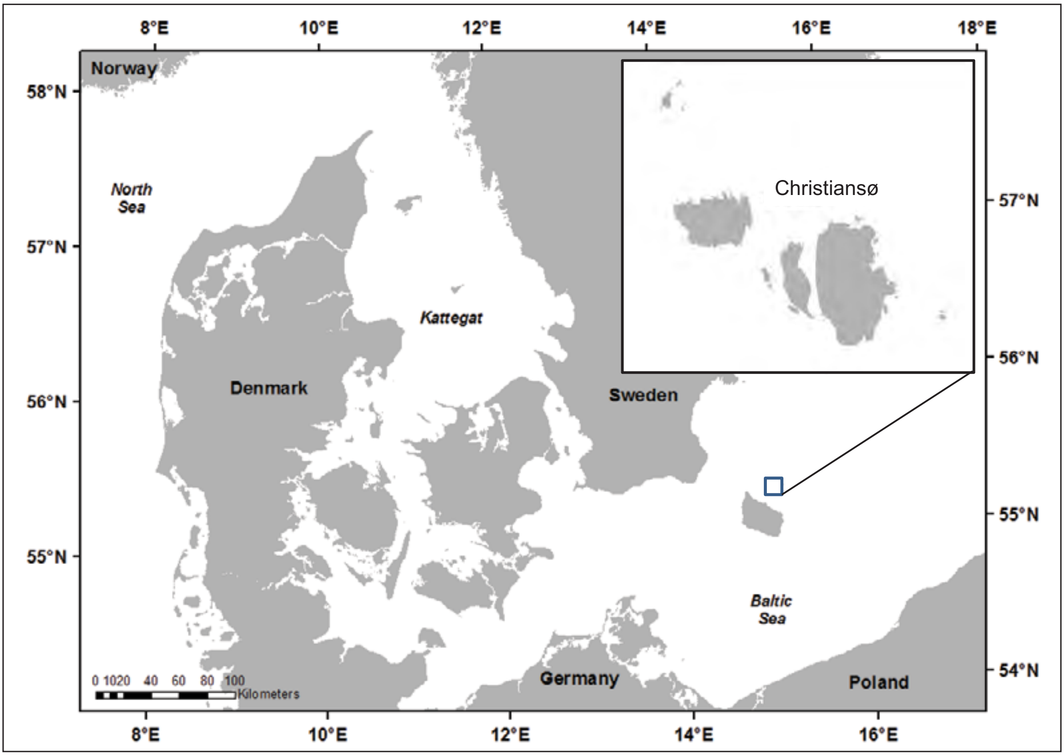

Figure 1. Map of the archipelago Christiansø study area

Slika 1: Zemljevid preučevanega območja v arhipelagu Christiansø

Figure 2. Egg candling using a modified Cree XPE High Power LED® as oviscope inside a cardboard box

Slika 2: Ovoskopija z uporabo modificiranega orodja Cree XPE High Power LED® kot oviskopa v kartonski škatli

3. Results and discussion

3.1. Candling and hatching

The candling and egg membrane counting showed that 223 (86%) eggs had a developing foetus. Among the 35 (14%) failed eggs, fifteen were unfertilized (6%) and twenty contained dead embryos (8%). This percentage of failed eggs (14%) is the same as the average proportion of failed eggs found by the Christiansø Scientific Field Station during 1998-2014 (14%; range 8–23%) (Lyngs 2014).

To the best of our best knowledge, no other large-scale investigations on failed eider eggs have been conducted, making it difficult to compare with the proportion of failed eggs in other colonies. However, the loss of incubated eggs from modern, high-hatching chicken strains, stored under optimal conditions, should be no more than 10%.

Losses in waterfowl may be slightly higher (Ernst *et al.* 2004). The reasons for the relatively large proportion of failed eggs in the Christiansø colony is unknown, however, low initial body weight and energetic stress is likely to be the main reason (Garbus 2016, Garbus *et al.* 2018, Hemmings *et al.* 2011). Nutritional deficiencies, early infections and contaminant exposure constitute the common cause of dead-in-shell embryos in chickens, which is a supporting weight of evidence for similar cause and effects in the present investigation of the Christiansø breeding colony (Alcorn 2008, Hoffman 1990).

3.2. Candling atlas

Figure 3 shows the atlas of the day 1–12 stages of incubating Christiansø eider foetus. It is seen that the centrally located embryo takes form as a small-condensed area forming into a red / dark area. From the embryo, blood vessels radiate to the extra-embryonic membrane. The simple circulatory system evolves into a more advanced system and the embryo takes gradually more space of the egg. After day 12, the examination of the egg is complicated or no longer suitable as a measure of foetal age as the foetus gets darker and takes up more space. During the last period of the egg development, the foetus is only visible as a dark shadow with a prominent air sac. In addition, Figure 4 shows examples of dead and infertile eggs, respectively, at Christiansø. A blood ring is seen in the dead egg, and the infertile egg appears clear and transparent with no development.

3.3. Future considerations

The atlas and candling method provide field biologists with a tool to estimate first day of incubation of breeding eiders and prevalence of unfertilized and rotten eggs, which is important for studying their biology and population dynamics (Robertson & Cooke 1993) including what is known about males during the winter season (Garbus *et al.* In press).

Acknowledgements

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Povzetek

Avtorji članka predstavljajo rezultate ovoskopije 258 jajc iz 50 gnezd gage *Somateria mollissima* v koloniji na Osrednjem Baltiku. Od teh jih je 223 (86 %) vsebovalo razvijajoče se zarodke. Med 35 (14 %) propadlimi jajci je bilo 14 neoplojenih, 20 pa jih je vsebovalo mrtve zarodke. Prevladujoče število propadlih jajc je podobno povprečnem deležu propadlih jajc, o katerem so v obdobju 1998–2014 poročali z Znanstvene terenske postaje v arhipelagu Christiansø. Razlog za ta visoki odstotek propadlih jajc sicer ni znan, vendar avtorji domnevajo, da gre glavni faktor za takšno stanje po vsej verjetnosti pripisati telesni masi pred valjenjem in energetskemu stresu. Da bi sledili razvoju in zarodkovni morfologiji, so se avtorji odločili za inkubacijo osmih jajc v laboratoriju od dneva 0. Rezultat je bil terenski atlas, iz katerega je mogoče oceniti datum začetka inkubacije z uporabo ovoskopije med zgodnjo inkubacijo (dnevi 1–12). Atlas ponuja terenskim biologom novo možnost ocenjevanja prvega dne valjenja gnezdečih gag in prevladujoče število neoplojenih in gnilih jajc, kar je pomembno za preučevanje njihove biologije in populacijske dinamike.

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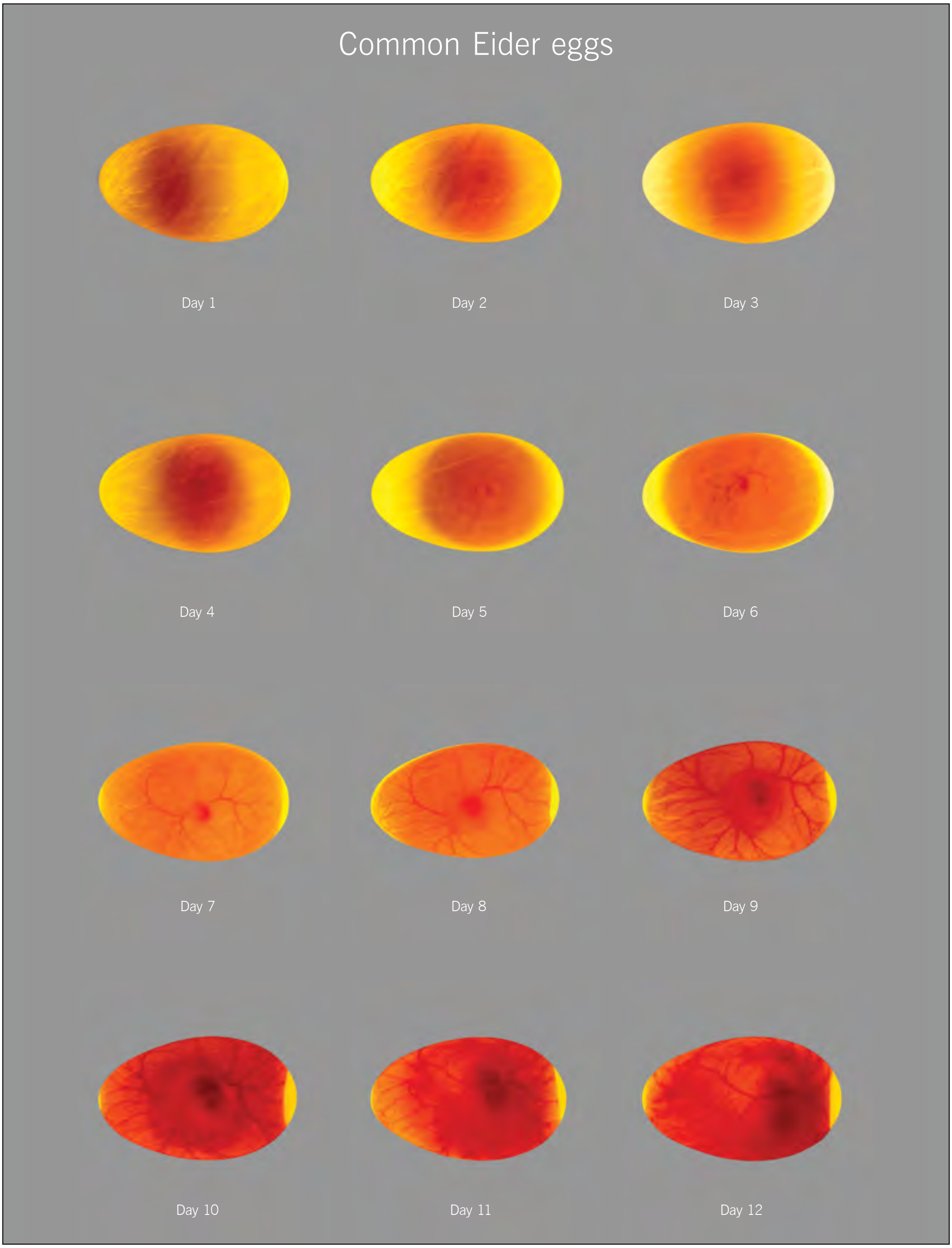
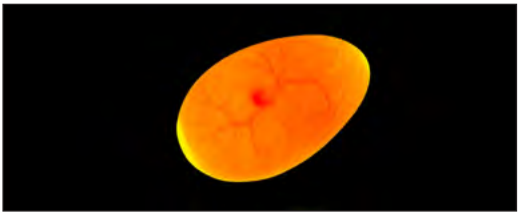
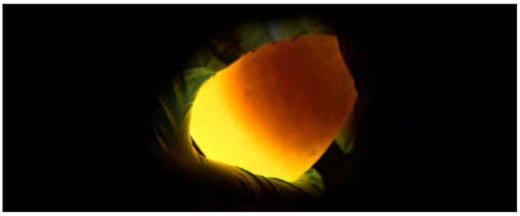


Figure 3: Stages of egg incubation on days 1–12 at Christiansø

Slika 3: Faze valjenja v dnevih 1–12 v arhipelagu Christiansø



The active egg (day 7) Note the circulatory system



The unfertilized egg Note the clear yolk

The dead embryo The blood rings observed indicates death of embryo

Figure 4: From top to bottom: active egg (day 7), unfertilized egg, egg containing dead embryo at Christiansø. Note the circulatory system in the active egg and that the infertile egg appears clear and transparent with no development, while the beginning of a blood ring is seen in the dead egg (arrow).

Slika 4: Od zgoraj navzdol: aktivno jajce (7. dan), neoplojeno jajce, jajce z mrtvim zarodkom. Glej obtočni sistem v aktivnem jajcu in kako je neplodno jajce videti čisto in prozorno brez znakov razvoja, medtem ko je v mrtvem jajcu opaziti začetek oblikovanja krvnega prstana (puščica).

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Incubation behaviour of Common Eiders *Somateria mollissima* in the Central Baltic: Nest attendance and loss in body mass

Valilno vedenje gag Somateria mollissima v Osrednjem Baltiku: prisotnost na gnezdu in izguba telesne mase

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Here we present the recording of body mass change and weight loss during incubation in a Common Eider *Somateria mollissima* colony at Christiansø in the Central Baltic (55°19'N 15°11'E). The study was conducted during April and May 2015 and a total number of four birds were followed (two were lost due to predation and three due to power outages). Body mass and nesting behaviour was recorded electronically over a period of 26–27 days using automatic poultry scales and a surveillance video camera. During incubation, the eiders underwent a 28–37% loss in body mass and left the nest on average 13 times (range: 7–17 times) for a period of 7–70 min. In general, birds with high initial body mass left their nest for a shorter total time than birds with lower initial body mass. The recorded daily changes in body mass indicate that the eiders foraged during the incubation period, not just leaving the nest for rehydration or in response to disturbance, which improve our current understanding of eider incubation behaviour. Such information is important to fully understanding of eider breeding biology in order to better conserve and manage the species during its breeding seasons where individual birds undergo extreme stress that may affect reproductive outcome and adult survival.

Keywords: camera, nest, hydrating, feeding, foraging, recess behaviour
Ključne besede: kamera, gnezdo, hidracija, prehranjevanje, iskanje hrane, vedenje med odsotnostjo z gnezda

1. Introduction

Common Eiders *Somateria molissima* are colonial breeders with females exhibiting a high degree of philopatry (Choate 1966, Clark 1968, Milne 1974, Wakeley & Mendall 1976). Initially, the male accompanies the female, defending its mate for fertilization assurance, but as incubation progresses the male loses interest in the female (Blumpton *et al.* 1988, Hario & Holmén 2004, Milne 1974). Eider clutches average 4 to 5 eggs in Danish and Finnish eider colonies and the eggs hatch after approx. 26 days of incubation (Bregnballe 2002, Goudie *et al.* 2000, Hario & Selin 1987).

During incubation, body reserves from wintering grounds are crucial for the reproduction of eiders (Laursen *et al.* 2018, 2019). As the sole incubator in the nesting process, the female eider relies primarily on these accumulated reserves. Prior to incubation, the process of egg development facilitates the mobilization of minerals and nutrients (Alonso-Alvarez *et al.* 2002, Wilcox 1965), which affect general health, physiology and biochemistry (Garbus 2016).

During incubation, the female rarely leaves the nest unless disturbed, for occasional preening or bathing or in need of rehydration (McArthur & Gorman 1978, Swennen *et al.* 1993, Bolduc & Guillemette 2003). The female relies on nutrient reserves and especially fat reserves and pectoral muscles are metabolised (Korschgen 1976, Milne 1976, Parker & Holm 1990). Studies have shown incubation intermissions to last for 4–17 min primarily during the night (Bolduc & Guillemette 2003, Bottitta *et al.* 2003, Criscuolo *et al.* 2000, Swennen *et al.* 1993).

The incubation period is energy-demanding and females lose 23-46 % of their pre-laying body mass. A proportion of the incubating females may not have sufficient nutrient reserves to complete the incubation period and, consequently, clutches of eggs are occasionally abandoned (Franzmann 1980, Gabrielsen *et al.* 1991, Harðardóttir *et al.* 1997, Mawhinney 1999, Parker & Holm 1990). During incubation, typically three metabolic stages exist, each addressing different types of energy. Throughout stage I, protein catabolism decreases and fat metabolism increases. During stage II, the energy utilized is primarily fat. In stage III protein catabolism increases again. In fact, these latter biochemical changes allowed a Finnish study on incubating eiders in 1997-199 to pinpoint specific years in which stage III was reached (Hollmén *et al.* 2001) which was shown again in the Christiansø eider colony by Garbus (2016) in 2015. The mobilization of lipids and nutritional reserves releases persistent organic pollutants and heavy metals to the blood, which together with nutrient-deficiency lead to immune suppression and affect the breeding success (Hollmén *et al.* 2001, Hanssen *et al.* 2003, Mallory *et al.* 2004, Baldassarre 2014). Furthermore, body mass or body condition may also affect brood care behaviour long after hatching, affecting survival of ducklings as well (Öst *et al.* 2003).

It is important to develop minimally invasive tools that allows us assessing the general health of eiders during the incubation period. Here we present data on body mass changes and nest attendance behaviour of the common eider using electronic scales and video surveillance. This allow us to further study behaviour and stress that incubating eiders undergo during the breeding season and determine the most important factors for breeding success. The study was conducted in a colony in the Central Baltic Sea. Here the eiders are migrants, returning to the colony in late February and conduct their main 26-day incubation from mid-April to mid-May. The very last eggs usually hatch in early June (Franzmann 1980, Lyngs 1992).

2. Materials and methods

2.1. Study design

The study colony is located on Christiansø which is part of the Ertholmene archipelago northeast of Bornholm in the Central Baltic Sea (55°19'N 15°11'E, DK-3760 Gudhjem) (Figure 1). Each year, ca. 1500 eiders breed at Ertholmene (Lyngs 2014). In April 2015, a study plot of app. 900 m^2 was checked daily (09.00-10.00 am) to locate potential nests for scale monitoring and camera surveillance. New nests with 1-2 pre-incubated eggs were marked with ID-number and GPS position. A thin spike was used to check if the layer of soil was sufficiently thick for placing the scale measuring

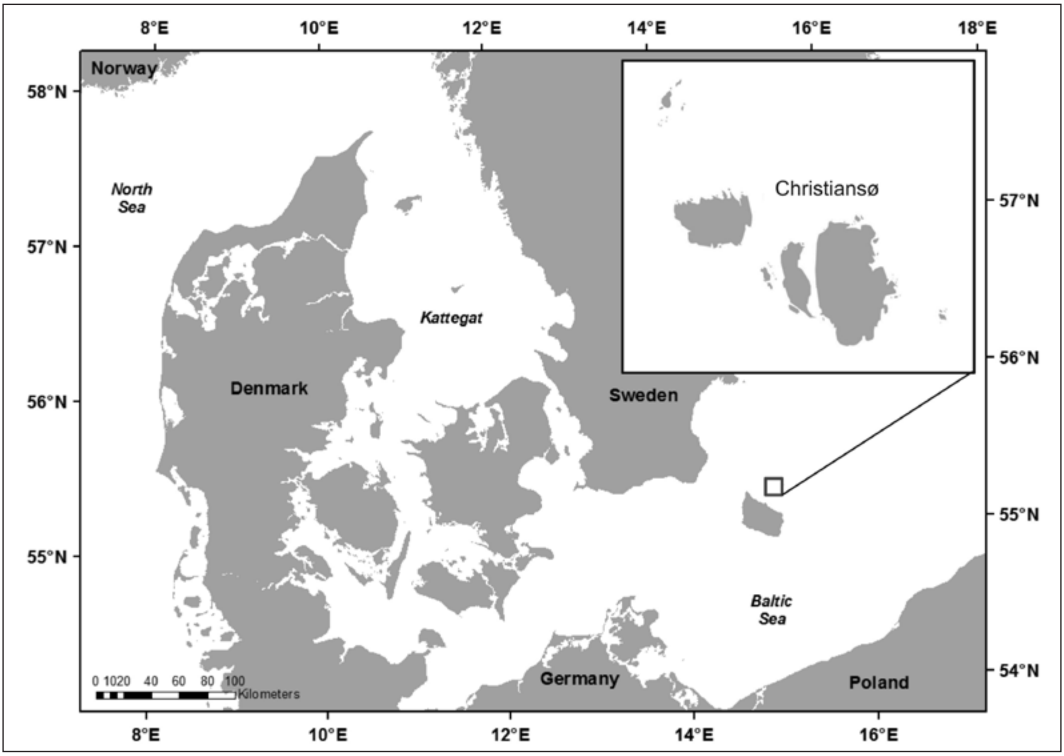

Figure 1: Map of the study area.

Slika 1: Zemljevid obravnavanega območja

22 cm × 7 cm (w×h). Then, eggs and nest material were temporarily removed and the soil excavated to make space for the scales. In addition, plastic saucers were used to separate the scales from the ground and the nest material. After deployment, the modified nests and their content were placed to the exact same level compared to the surrounding area as before (Figure S1). One camouflaged camera was installed within 1m of one of the nests installed with scale system (Figure S2). Recording of data started hereafter.

2.2. Automatic scale and camera surveillance

We placed an automatic poultry scale system based on the scales DOL 94-10 from SKOV A/S (Glyngøre 7870 Roslev, Denmark http://skov.com) in nine eider nests. Two nests were predated by Herring Gulls *Larus argentatus*, and in three nests data was lost due to power outages. Consequently, datasets were obtained from four nests that all hatched successfully. Scales were connected with a cable to a panel box and the surveillance camera was connected via network cable to a router hidden in a plastic container in the nesting area. Scales were finally connected to a modified Raspberry Pie Microcomputer (RPM), which collected and stored raw signals in a database by using an Analogue to Digital Converter (ADC). The measuring error due to the resolution of the scales and 18 bit ADC was ±10.6 g. This was considered more than sufficient since other disturbances like rain, wind, temperature, unstable power, dirt and movements of the bird affect the measurements with similar or larger perturbations. The RPM was programmed to acquire raw mass data and time every 5 sec. This information was stored in a database.

We mounted a Foscam FI9805 HD 4mm PoE surveillance camera near one nest site in the period April-June 2015. The Foscam Network

Video Recorder FN3104H camera was supplied by ShenZhen Intelligent Technology Cooperation. The camera recorded 10 frames per s and data was automatically stored on an external server. Recording during dark hours was made possible due to the cameras' build-in infrared light technology. Microsoft Movie editor (Microsoft Inc. 2015) was used to edit the recordings. In this study, the scales and surveillance camera were placed without disturbance as the placements were carried out during the pre-incubation period.

2.3. Body mass data

In order to increase the limited sample size of this present study, we also included data reported by Bolduc & Guillemette (2003) to see whether their results were different from those of this present study. The absolute recorded mass could not be used directly to determine the body mass of the bird. Instead, we used the recorded mass right before departure subtracting the mass of the nest content. This mass difference (ΔW) was extracted for all incubation intermissions for every bird (Figure 2).

2.4. Statistical analyses and graphical presentations

All basic statistics were performed using R (R Core Team 2018). Due to low sample size, only visual graphical interpretations were used. A moving average was applied to the graphical presentation of the mass development to smooth out short-term fluctuations.

3. Results and Discussion

3.1. Incubation intermissions and nest-leave behaviour

On average, the incubating eiders left their nests 13 times (range: 7–17 times; Table 1) during the 26-day incubation period. Each leave lasted for 34 min on average (range: 7–70 min; Table 1).

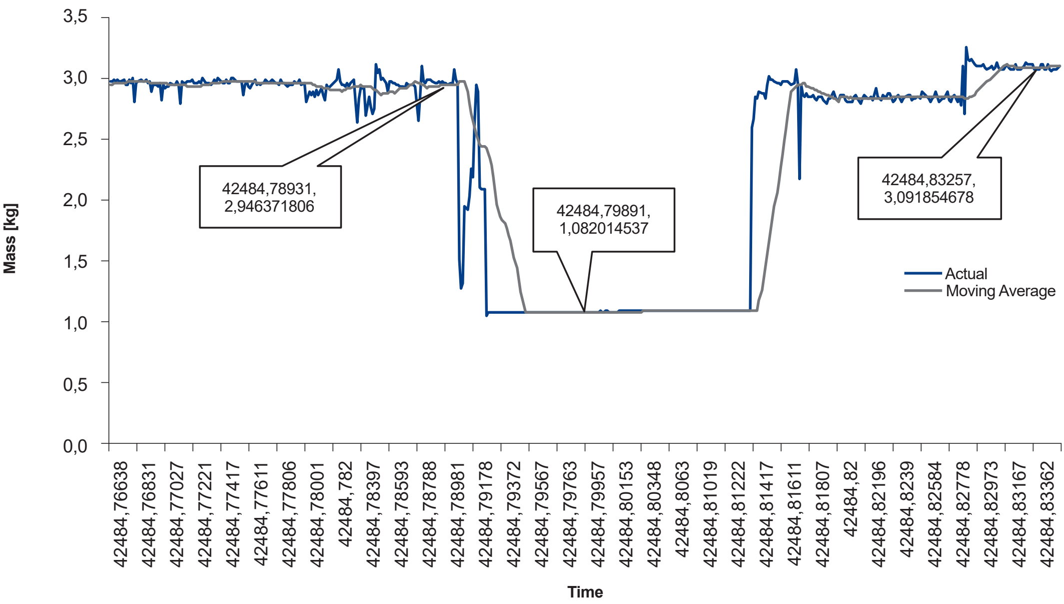

Figure 2: Data collected from one of the automatic poultry scales and illustrated graphically providing information of the mass of the nest and the incubating female. The flat part of the curve illustrates an incubation intermission.

Slika 2: Podatki ene od avtomatskih tehtnic, ki so beležile maso valeče samice. Ravni del krivulje predstavlja premor med valjenjem

Table 1: Basic incubation data of Christiansø Common Eiders *Somateria mollissima*

Tabela 1: Osnovi podatki o valjenju gag *Somateria mollissima* v arhipelagu Christiansø

	Incubation / Valjenje		Time away from nest / Čas z gnezda			Mass loss		
ID	Time / Čas (d)	Intermissions / Premori	Total / Skupno (min)	Per trip / Posamezen odhod (min)	Time on nest / Čas na gnezdu (d)	Rate (g d^{-1})	Absolute (g)	Relative (%)
#01	27	7	188	27 (7–43)	4 (2–7)	26	692 (2248–1556)	31
#02	26	17	534	31 (12–63)	2 (1–5)	20	529 (1884–1355)	28
#03	26	10	521	52 (35–70)	2 (1–5)	27	707 (1911–1204)	36
#04	26	16	442	28 (11–51)	2 (1–3)	25	655 (1761–1106)	37
Average / Povprečje	26	13	421	34	3 (1–5)	25	646	33

Table 2: Observed mass changes after incubation intermission of the Christiansø Common Eiders *Somateria mollissima* compared to the Saltholm study (BOLDUC & GUILLEMETTE 2003).

Tabela 2: Opazovane spremembe mase gag *Somateria mollissima* med premori v valjenju – primerjava te raziskave z raziskavo na otoku Saltholm (BOLDUC & GUILLEMETTE 2003).

Intermissions / Premori				Mass/Masa	
	Gain (g)	Loss (g)	No gain/loss	Gain (g)	Loss (g)
n=50	18 (36 %)	25 (50%)	7 (14 %)	49 ± 21 (16–88)	44± 22 (11–89)
n=76	12 (16%)	51 (67 %)	13 (17%)	117 ±75	

This is slightly longer compared to previous studies from the Danish island Saltholm showing that the number of incubation intermissions was on average 12 times (range: 9–19 times; Table 2) and lasting for on average 14 min (range: 3-42 min; Table 2, see below for details) (BOLDUC & GUILLEMETTE 2003). The reasons for this is unknown but could be due to differences in body condition, food access and presence of predators.

The birds left on average every second day and the interval between each incubation intermissions varied 1-7 days. As suggested from Figure S3-6, the time elapse between incubation intermissions (days) did not change from the beginning to the end of incubation while the length of intermissions (min) seem to decrease slightly. This, however, based on a few individuals and a larger sample is required for statistical tests. Incubation intermissions mostly took place around the same time of the day, i.e. after sunset between 21:00–24:00 (Figure S3–6). Out of 50 incubation intermissions only 3 (6 %) were found to occur during daylight and all by the same bird (#04; Figure S6). The investigations on Saltholm by BOLDUC & GUILLEMETTE (2003) showed a slightly higher daytime occurrence with eight of 61 intermissions (13 %). For every intermission, the birds carefully covered up their eggs with down (Figure S7). According to the webcam, this took approx. 60 s. While the female was absent, the eggs were thus protected by both dusk and down. The eiders left their nest for a total time of 421 min (range: 188-534 min; Table 1). In comparison, the Saltholm study (Bolduc & Guillemette 2003) showed that the birds left their nest for 190 min (range: 101–270 min). This suggests that the Saltholm population may have had a better body condition, better food access or was more affected by predators. The incubating eiders lost 33% (range: 28–37%) of their initial body mass on average. Other investigations have shown a mass loss of 23–46% (Bolduc & Guillemette 2003, Franzmann 1980, Gabrielsen *et al.* 1991, Harðardóttir *et al.* 1997, Korschgen 1976, Parker & Holm 1990). The incubating eiders lost on average 646 g (range: 529–707 g). The loss of body mass was 25 g d^{-1} (range: 20–27 g d^{-1}) on average. In comparison, the Saltholm study showed an average body mass loss of 975 g (range: 723–1126 g), a mass loss rate of 37.5 g d^{-1} and a relative mass loss of 42% likely due to a higher initial body condition. Other studies of nesting eiders have shown body mass loss of 15–30 g d^{-1} (Bolduc & Guillemette 2003, Criscuolo *et al.* 2002, Erikstad & Tveraa 1995, Franzmann 1980, Gabrielsen *et al.* 1991, Harðardóttir *et al.* 1997, Korschgen 1976, Laurila & Hario 1998, Parker & Holm 1990).

3.2. Changes in body mass

The distance to the sea from the study plot was 100–130 m. Due to an average incubation intermission of 34 min compared to the short distance to the sea it would be possible for the bird to allocate time for both rehydrating and foraging. Of 50 incubation intermissions recorded (Table S1–4), 18 were associated with mass gain, on average 48 g (range: 16–88 g), 25 with mass loss, on average 43 g (range: 11–89 g; Table 2), and seven were outside the confidence of measuring due to measuring error of ±10.6 (Materials and methods). The 18 intermissions associated with mass gain lasted on average 39 min (range: 11–70 min) while the average incubation intermission was at 34 min.

Although there has been consensus that nesting eiders do not feed during the incubation period (Korschgen 1976, Milne 1976, Parker & Holm 1990) it has recently been suggested that they may do so nevertheless (Bolduc & Guillemette 2003, Criscuolo *et al.* 2002). Numerous dives (Criscuolo *et al.* 2002), unusually long at times, and necks distended on the way back to the nest (Bolduc & Guillemette 2003) could be signs of food ingestion. At Christiansø, similar observations were reported. At a mass mortality event in 2007 caused by starvation small piles of 5–14 mm regorged blue mussels (*Mytilus edulis*) were found in close vicinity of seven incubating eiders (Lyngs 2007, Garbus *et al.* 2018), indicating foraging.

3.3. Intermissions and body mass

Blue mussels are the principal food item for eiders (Hario & Öst 2002, Hilgerloh 1999, Madsen 1954, Nehls 2002, Swennen 1976). The quality of mussels may affect both the time foraging and the amount of ingested food. If so, this may indicate that the blue mussel beds around Christiansø may be of poor condition. Earlier studies have suggested occasional poor health of blue mussels in the Baltic sea caused by *Prymnesium polylepsis* blooms (Larsson *et al.* 2014), which may be lethal to this species (John *et al.* 2002, Nielsen *et al.* 1990, Schmidt & Hansen 2001, Underdahl *et al.* 1989).

The incubation intermissions could be to rehydrate as well as forage. However, since the daily diving time usually required to maintain energy balance in this species is 140 min, the ingestion of prey is probably lower than outside incubation (Guillemette 1998). Bolduc & Guillemette (2003) found an average mass gain of 117 g in the Saltholm colony, when mass gains were observed under the incubation intermissions, which is higher than the present study. Altogether, the present and Bolduc & Guillemette (2003) studies suggest that incubating eiders with a lower mass at the onset of the incubation period may spend in total more time away from the nest than eiders with a higher initial mass. If that is true, incubating eiders with sufficient reserves will reduce their time away from the nest to avoid nest predation or risk of poor egg development (Garbus *et al.* In press). Studies on other incubating waterfowl indeed support our observations on incubating behavior in relation to initial body mass (Afton & Paulus 1992, Alrich & Raveling 1983, Yerkes 1998) but more data is required to investigate this further.

3.4. Scale and camera

Regarding the eiders nesting behaviour, only data for the eider #02 was presented for illustration of our methods (Figure 3). Figures for the remaining eiders are found in Figure S8-11. Movements of the incubating eiders on the nests were reflected as semi-long spikes (green arrows) in a diurnal pattern. The spikes were due to activities such as standing up, turning the eggs and preening in the nest. Hatching of the chicks was reflected as extra closely placed spikes (red arrows) on the graphs at the end of the incubation period. Selected points on the graph of #01 (Figure S8) were compared to the recorded video material (S12). The scale and camera instruments employed in the present study showed to be very effective in accurately measuring the timing of incubation intermissions as well as associated mass changes. As such, it can potentially elucidate how individual stress during the incubation period may ultimately result in dramatic population effects, as has been recorded for the Baltic population (Ekroos *et al.* 2012, Skov *et al.* 2011).

4. Conclusion

During incubation, the Christiansø eiders underwent a 28–37% loss in body mass and left the nest on average 13 times (range: 7–17 times) for a period of 7–70 min. Birds with high initial body mass seem to leave their nest for a shorter total time than birds with lower initial body mass. Our results contribute to the further understanding of eider incubation behaviour to fully understanding their breeding biology in order to better conserve and manage the species during its breeding seasons where individual birds undergo extreme stress that may affect reproductive outcome and adult survival.

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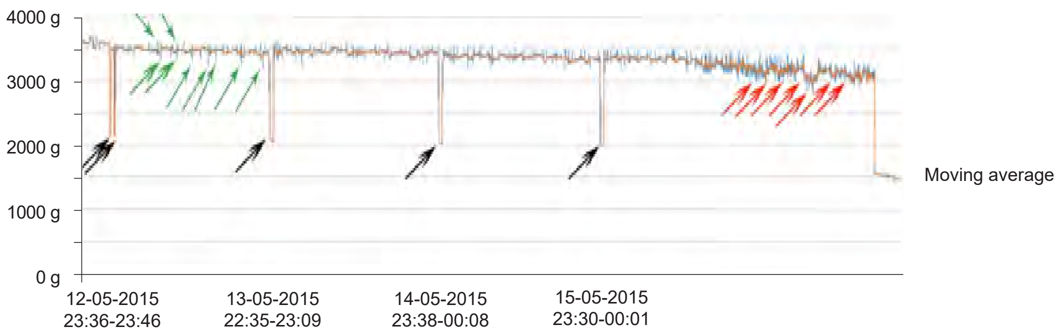

Figure 3. The last part of the 26-day incubation period of female #02 constructed from the raw time-mass data. Note the spikes facing downwards, showing the bird leaving the nest (black arrows). The smaller spikes are due to activity of the bird in the nest (green arrows). Hatching of chicks are reflected as extra closely placed spikes on the graphs at the end of the nesting periods (red arrows).

Slika 3: Zaključni del 26-dnevnega valjenja samice #02. Navzdol obrnjene konice (črne puščice) označujejo čas, ko je samica gnezdo zapustila, manjše konice označujejo aktivnost na gnezdu (zelene puščice), izvalitev mladičev pa rdeče puščice.

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Povzetek

Predstavljamo spremembe telesne mase pri gagah Somateria mollissima med valjenjem na koloniji na otočju Christiansø v osrednjem Baltiku (55°19'N 15°11'E). Raziskava je potekala aprila in maja 2015, spremljali smo štiri ptice (dve sta bili uplenjeni, pri treh manjkajo podatki zaradi težav z napajanjem). Telesno maso in gnezditveno vedenje smo 26–27 dni spremljali z avtomatsko perutninsko tehtnico in nadzorno kamero. Med valjenjem so gage izgubile 28–37 % telesne mase in gnezdo zapustile v povprečju 13-krat (razpon: 7–17) za 7–70 minut. V splošnem so ptice z višjo izhodiščno maso gnezdo zapuščale za krajši čas kot ptice z nižjo maso. Meritve mase kažejo, da so se ptice med valjenjem tudi prehranjevale in gnezd niso zapuščale le zaradi pitja in motenj. Ta nova spoznanja so pomembna za razumevanje gnezditvene biologije gag in načrtovanje varstvenih ukrepov med gnezditveno sezono.

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New marine IBAs for the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* in Slovenia

Nova morska območja IBA za sredozemskega vranjeka *Phalacrocorax aristotelis desmarestii* v Sloveniji

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The IBA network is being regularly updated, based on new data and their better quality. There have been three previous stages of the marine IBA identification in Slovenia and the Mediterranean Shag has been included as the qualifying species only in the most recent stage in 2011. However, the sites were limited to inshore coastal roost-sites and thus insufficient to cover the foraging areas of the species. To fill this gap in the Slovenian territorial sea, new marine IBAs have been identified for the Mediterranean Shag within the scope of the SIMARINE-NATURA (LIFE10NAT/SI/141) project in the 2011–2015 period. The new sites were identified following standardized methodology for the identification of marine IBAs from BirdLife International. The data on the Mediterranean Shag distribution and population size were collected using four field methods: (1) monthly monitoring at in-shore communal roost-sites, (2) monthly monitoring at sea following the standardized ESAS method, (3) GPS telemetry, and (4) unsystematic census of in-shore floating groups. Based on these data, one new site, the IBA Osrednji Tržaški zaliv, and one extension to the existing IBA Debeli rtič were identified, covering 8,218 ha and 155 ha, respectively. The new sites cover 39.2% of the Slovenian territorial sea.

1. Introduction

1.1. Marine IBAs in Slovenia

Conservation of marine biodiversity is widely implemented through IBA programme – Important Bird and Biodiversity Areas, established by BirdLife International. The main objectives of the programme are identification, protection and management of worldwide network of sites of crucial importance for the long-term conservation of wild bird populations (BirdLife International 2010c). In contrast to the birds of the terrestrial environment, the seabird populations were poorly assessed until recently due to difficult access to the ornithological data in the marine environment, and this was reflected in a low number of identified marine IBAs, especially in off-shore areas; however, the number of BirdLife partners (corresponding to number of countries) involved in marine IBA identification and protection increased to over 40 by 2010 (BirdLife International 2010a, c).

The IBA network is being updated regularly based on new data and their better quality. There have been three previous stages of IBA identification in Slovenia involving seabirds, however, the resulting marine IBA and Natura 2000 network has been assessed as insufficient by BirdLife International (BirdLife International 2014). Common characteristic of previous marine IBA identification is that it was part of the pan-national IBA identification and / or revisions, focused on terrestrial sites (Božič 2003, Denac *et al.* 2011, Polak 2000). Within these stages, four marine IBAs covering six species of seabirds were identified in the 2000–2011 period (Ibid.) The fourth (and most recent) stage of marine IBA identification in Slovenia, presented in this work, was implemented in the years 2011–2015 as part of the project SIMARINE-NATURA (LIFE10NAT/SI/141) (www.simarine-natura.ptice.si). Contrary to previous stages when seabird censuses were limited to coastal and inshore areas, the monitoring of target species, i.e. the Mediterranean Shag *Phalacrocorax aristotelis desmarestii*, was conducted systematically across the entire range of the Slovenian territorial sea.

1.2. Target species

The Mediterranean Shag belongs to the cormorant family (Phalacrocoracidae). It is distributed solely in the Mediterranean and the Black Sea. Their entire breeding population is estimated at 8,700–11,130 pairs, breeding in over 400 colonies (Bazin & Imbert 2012). The largest national breeding numbers are found in Croatia, Italy, Greece and France, ranging from 1,000 to 2,000 pairs (Bazin & Imbert 2012). The total non-breeding population of the Mediterranean Shags is estimated at 30,000 individuals (Wetlands International 2004). In the post-breeding season, part of the population spreads out of their breeding area, to the non-breeding areas up to several hundred kilometres from their breeding colonies (Škornik *et al.* 2011). The majority of the Adriatic population, almost entirely breeding in Croatian waters, migrates to the Gulf of Venezia (Sponza *et al.* 2013). In summer and autumn, only the Gulf of Trieste hosts around 6,000 and exceptionally even up to 10,000 individuals (Škornik *et al.* 2011), representing 20–33% of the total non-breeding population (Wetlands International 2004). The roosting population along the Slovenian coast was estimated at 2,000–3,000 individuals in the 2006–2011 period (Denac *et al.* 2011). Regular seasonal migration from the Croatian breeding areas to the Gulf of Trieste was established fairly recently, in the 1980s, and became massive at the end of the 1990s (Škornik *et al.* 2011). The onset of post-breeding migration to the north coincides with the period of extensive overfishing in the Croatian waters and could be triggered by the lack of food around the breeding colonies and facilitated by high foraging efficiency in the shallow Gulf of Trieste, abundant with easy accessible fish prey (Sponza *et al.* 2010). Moreover, the increase in the numbers of the Mediterranean Shags in the Gulf of Trieste coincides also with the swing of shellfish farming on filamentous floating farms that enable the shags' undisturbed roosting on otherwise highly populated coast of the Gulf. There are three such communal roost-sites along the Slovenian coast, near Debeli rtič, Strunjan and Sečoveljske soline (Bordjan *et al.* 2013, Koce & Lipej 2016). All sites have already been identified as marine IBAs and included in the Natura 2000 network (Denac *et al.* 2011, Koce & Lipej 2016).

The Mediterranean Shags forage predominantly on fish (Bazin & Imbert 2012, Cosolo *et al.* 2011, Lipej *et al.* 2016). They are foot propelled pursuit-divers, usually preying near sea-bed, but occasionally also in pelagic waters, especially in shallow coastal belt (Bazin & Imbert 2012). Their foraging dives are regularly 30 m deep, often up to 60 m and in extreme cases even up to 80 m (Bazin & Imbert 2012) and can last over one minute (Sponza *et al.* 2010). They usually forage solitarily or in small groups independently from one another, but they also socialize in large groups of up to few hundred individuals and communally prey on schools of small pelagic fish in coastal shoals (Nelson 2005), sometimes in the company of other seabird species, e.g. the Black-headed Gulls *Chroicocephalus ridibundus* (*pers. observation*). This is a common phenomenon in the marine environment known as multi species foraging groups (Camphuysen & Garthe 2004).

The Mediterranean Shag is a dietary opportunist preying on the commonest and most easily accessible prey in the benthic zone. The majority of its prey in the Adriatic sea represent economically unimportant fish species: around the Croatian breeding sites (Oruda Island), the diet consisted predominantly of big-scale sand smelt *Atherina boyeri*, brown comber *Seranus hepatus* and peacock wrasse *Crenilabrus tinca*, however, in the Gulf of Trieste their main food is black goby *Gobius niger* (Cosolo *et al.* 2011, Lipej *et al.* 2016).

As a species, the European Shag *(Phalacrocorax aristotelis)* is not endangered by the IUCN criteria and has a favourable conservation status at the European level (non-SPEC) (BirdLife International 2004). The status assessment after SPEC classification for the Mediterranean subspecies was not made. Although historical population estimates for the Mediterranean Shag are rather poor, the experts agree that its population has decreased (Aguilar & Fernández 2002). Due to the limited range and small population, the Mediterranean Shag is listed on the Annex I of the Bird Directive, Annex II of the Bern Convention and on the list of priority species of the Barcelona Convention.

2. Methods

2.1. Target geographic area

Within the scope of the SIMARINE-NATURA project (2011–2016), the target geographic area for the identification of marine IBAs was defined as part of the then-claimed Slovenian territorial sea within the Gulf of Trieste (hereafter referred to as 'project area'). The project area was selected based on previous data on importance of the Gulf of Trieste for the post-breeding population of the Mediterranean Shags (Vrezec 2006b). However, the Slovenian territorial sea was redefined in 2017 as a result of the arbitration between Slovenia and Croatia. As the present Slovenian territorial sea overlaps very well with the project area it represents the target geographic area in this work (Figure 1). Surface area of the target area, i.e. the Slovenian territorial sea, is 214 km^2. Surface area of the project area is 211 km^2.

2.2. Marine IBA identification methodology

The identification of marine IBAs in the Slovenian territorial sea was conducted following the protocol proposed by BirdLife International (2010b). The protocol recommends nine analytical steps: (1) identification of target species; (2) seabird and environmental data gathering from all possible sources, including systematic surveys, existing databases, reports and published work; (3) spatial data analysis resulting in GIS layers based on different data sources, species by species and organization of data for comparison between different months/seasons/years; (4) classification of data layers based on data quality to primary and supplementary; (5) identification of candidate sites for each seabird species; (6) application of standard IBA criteria and confirmation that the IBA candidates sites comply with the criteria; (7) delineation of final boundaries. Steps 5 and 7 were merged in our study because only one target species was defined. The IBA proposals with the descriptions are entered into the "World Birds and Biodiversity Database" (WBDB) managed by BirdLife International (https://www.global-conservation.info/). As the final step, the BirdLife Secretariat reviews the proposals and decides about the confirmation of proposed IBAs.

2.2.1. Identification of target species

According to BirdLife International (2010b), about 340 extant species are categorized as seabirds and theoretically all of them are suitable for the analysis in the process of the marine IBA identification. However, for practical reasons it is recommended that one or some priority species are defined based on their conservation status, data availability, and expected distribution at sea, etc. (BirdLife International 2010b). In Slovenia, 42 seabirds have been recorded in coastal and marine environment since 1950 (Koce & Lipej 2016), six of which met the criteria for either identification of new IBAs or inclusion in the existing IBAs in previous stages of the IBA identification (Božič 2003, Denac *et al.* 2011, Koce & Lipej 2016, Polak 2000). In opposition to previous stages when the identification of marine IBAs was limited to coastal and inshore areas and was focused on breeding colonies and communal roost-sites, the focus in the present stage was an identification of offshore marine IBAs with emphasis on species' foraging areas. Considering these recommendations from BirdLife International (2010b), the Mediterranean Shag was selected as the only target species, based on the following characteristics: (1) it is listed in the Annex I of the Birds Directive, Annex II of the Bern Convention and among priority species of the Barcelona Convention, (2) it has a negative population trend in a geographically limited range (Bazin & Imbert 2012), (3) it has a relatively large population in the target area (Vrezec 2006a), (4) it has expected concentrations rather than extremely dispersed distribution at offshore sea (Vrezec 2006b), (5) it qualifies as an umbrella species in the target marine environment (Koce & Lipej 2016). Other seabird species occurring at Slovenian sea at present failed to meet one or more of these

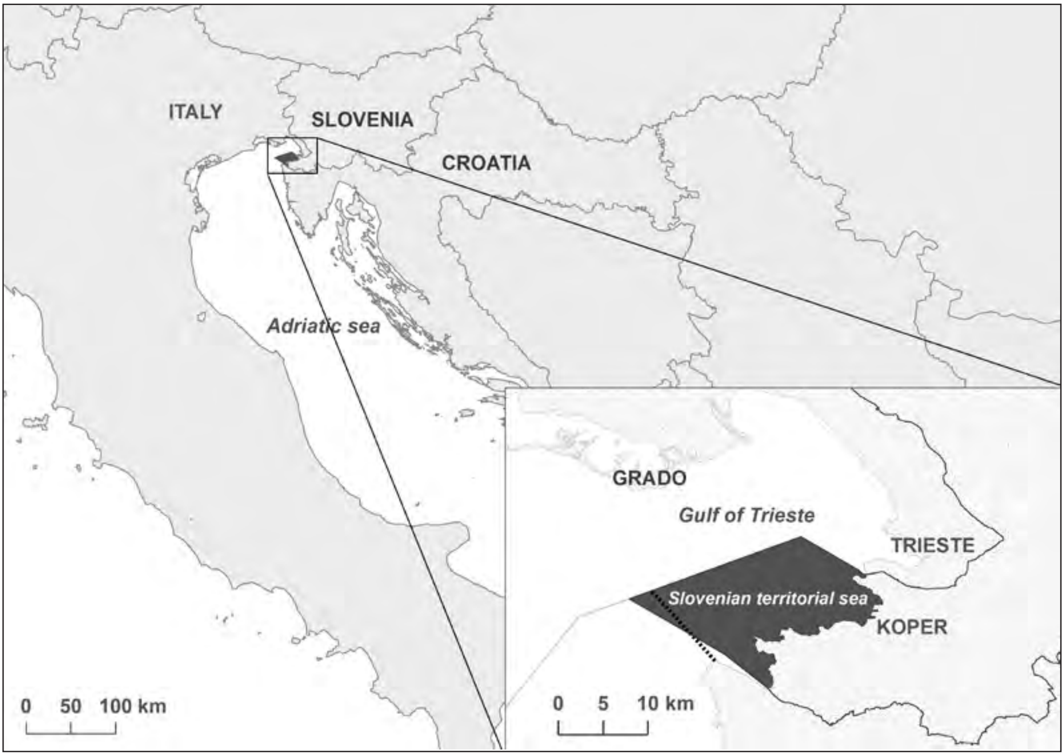

Figure 1. Target geographic area (Slovenian territorial sea) for the identification of marine IBAs for the Mediterranean Shag *(Phalacrocorax aristotelis desmarestii)*. Black dashed line on the bottom map denotes the non-overlapping part of the project area border as defined in the SIMARINE-NATURA (LIFE10NAT/SI/141) project.

criteria and were thus not selected as priority species for the identification of marine IBAs in this stage. Moreover, the Mediterranean Shag was a priority species for financing by LIFE, the EU financial instrument supporting the conservation projects for Natura 2000 qualifying species that enhanced the marine IBA identification process in the 2007–2013 programming period, including through the SIMARINE-NATURA project.

2.2.2. Data gathering

The data on the Mediterranean Shag distribution and population size were collected in the years 2011–2014, using four field methods: (1) monthly monitoring at in-shore communal roost-sites, (2) monthly monitoring at sea following standardized ESAS method, (3) GPS telemetry, and (4) unsystematic census of in-shore foraging groups.

2.2.2.1. Monitoring at communal roost-sites

Monitoring of roosting individuals was conducted to assess the size and temporal dynamics of the roosting population in the Slovenian sea. The monitoring was conducted between November 2011 and October 2013 at three inshore locations previously known as their main communal roost-sites along the Slovenian coast. They are situated on floating infrastructure (buoys) of shellfish farms, located in the Bay of St. Bartholomeus (Zaliv Sv. Jerneja), Strunjan Bay (Strunjanski zaliv) and Piran Bay (Piranski zaliv). The sites had been previously identified as marine IBAs Debeli rtič, Strunjan and Sečoveljske soline, respectively (Denac *et al.* 2011). The censuses of shags at the roost-sites were conducted once a month, synchronously at all three locations. Counts on one census occasion were done every half an hour, starting two hours before sunset and ending at the time when light conditions were too poor to continue counting. The shags were classified by age in two classes: adults and non-adults (juveniles and sub-adults). All shags within the area of a roost-site were counted, including individuals swimming in the sea among buoys, because most of them stayed within the roost-site and occupied buoys within short period of time. The roost-site in the Bay of St. Bartholomeus is divided by national border with Italy in two parts but the shags were counted on both sides of the border as the location is functionally one roost-site. Based on the results of the roost-site monitoring, the peak non-breeding season was defined as the period when the total number of individuals was higher than mid-range, calculated as 0.5 x (n_{max} + $n_{min.}$) (i.e. 763 individuals).

2.2.2.2. Monitoring at sea following ESAS method

Monitoring at sea was done every month between July 2012 and August 2013 following the standardized ESAS method ('European Seabirds At Sea'), whereby the birds were counted along line-transect, using boat (Camphuysen & Garthe 2004).

The transect line in this survey was placed on the project area in a pattern that ensured representativeness for the area (Figure 2). It covered an entire gradient of distances from the coast to the outer border of the territorial sea as well as longitude gradient. The total length of the transect line corresponded to the distance travelled by the survey boat in 4–5 hours (81.6 km), corresponding to the time available for an optimal at-sea census of the Mediterranean Shags in one day. The censuses were conducted during the diurnal period when most shags were expected to be active outside their roost-sites.

The boat was travelling at constant speed of 10 knots. The birds were recorded within 5 minute intervals. Given constant speed of 10 knots, this corresponds to segments of length 1,540 m. In case the boat changed its direction or speed, an ongoing census interval was aborted and a new interval started at the location of the change. The birds were recorded on both sides of the transect line in two bands: 300 m inner band and an unlimited outer band. The instant counting area was limited to a distance of 300 m in front of the boat. The distance was estimated by the rule of thumb by each observer upon prior calibration at a measured distance 300 m from the coast. The birds which were in contact with water were counted continuously, whereas the flying birds were counted in snapshots in one minute intervals. The birds were detected with a naked eye; binoculars were used only for the identification of individual's age class, whereby two classes were defined based on their plumage: non-adults and adults.

The data were entered in a standardized ESAS monitoring form. The following types of data were recorded: (1) census metadata (date, boat name and type, names of observers, type of census, group of recorded birds), (2) data about census interval (geographic coordinates of the starting point, interval start and end time, sea state on the Beaufort scale, visibility, floating objects and matter), and (3) interval specific bird data (age class, transect band, number of individuals, movement direction, association with objects or non-avian species, behaviour, prey, multi-species group membership).

2.2.2.3. GPS telemetry

The shags were being trapped in autumn 2012 and in summers 2013–2014. Self-made clap-traps with remote triggering system were used. The traps were adapted for mounting on three different floating objects: vertical cylindrical buoys (r = 1 m), cubic rafts (a = 1 m) and horizontal cylindrical buoys (r = 0.4 m). The trap was triggered remotely by the user when one or more shags sat on the buoy or raft.

The traps were set at three sites along the Slovenian coast: (1) in Viližan Bay on the east side of the town of Izola and within two communal roost-sites of the Mediterranean Shags near Strunjan (2) and Sečovlje (3). At the Izola trapping site, the traps were mounted on four existing vertical cylindrical buoys, two at a time. At the Strunjan and Sečovlje trapping sites, two cubic self-made rafts were tied among the existing buoys of the shellfish farms where the shags usually rest, one at each site. In addition, three traps were set on the existing surrounding horizontal cylindrical buoys at the Strunjan trapping site.

We tagged the shags with GPS-GSM loggers of Polish producer ECOTONE. Three units of DUCK-3 model and 26 units of SAKER model were used. 16 units of the SAKER model were filled with polyurethane and 10 units with resin.

The dimensions of the DUCK-3 model were 45 × 25 × 25 mm, weight = 40 g, and those of the SAKER model were 45 × 25 × 18 mm, weight = 25 (series with polyurethane filling) or 40 g (series with resin filling). The devices were mounted on birds permanently, as backpacks with teflon ribbon straps.

The devices were supplied with energy through solar panels, which provided enough energy in good light conditions to fix a GPS position every half an hour. The data were transferred to server by SMSs after every 4 GPS fixes. They were accessible to the user by the Internet through a password protected web panel. Frequency and accuracy of GPS fixes, and operating hours of the loggers could be set remotely via the web panel. We tended to set the highest frequency of fixes during the day but sometimes it needed to be lowered due to low natural light levels and consequent need for energy savings. The loggers were switched off during the mid-night hours.

2.2.2.4. Land-based census of large floating groups

In the years 2011–2014, the data on large floating groups of the Mediterranean Shags (≥ 10 individuals) were collected unsystematically based on participation of experienced volunteer observers. The data were reported by observers through online web form (http://simarine-natura.ptice.si/sodeluj/). To enhance the census effort, the public was also called to participate in data collection through different means of communication: DOPPS – BirdLife Facebook page, SIMARINE-NATURA project website, leaflets and newspaper articles as well as personal communication.

2.2.3. Production of basic spatial data layers and ecological models

2.2.3.1. ESAS dataset

Filtering of the ESAS data. The aim of the analysis was to identify the areas important for foraging shags, hence we omitted the following data from the original ESAS dataset: flying individuals, as the shags never predate from the air, and the individuals resting along the shore or floating objects at sea. The individuals which were not observed during their foraging activity but were swimming in the sea were retained in the dataset, assuming that they have most likely been foraging at or near the locations where observed, based on the information from the literature and results of the GPS telemetry analysis in this study. According to Nelson (2005), the breeding shags fly directly to their foraging area and return to the colony in the same manner. According to the results of the GPS telemetry survey in this study this holds also in case of non-breeding shags that take foraging trips from communal roost-sites. We refer to the resulting dataset as 'ESAS data subset 1'. Furthermore, we omitted the individuals which were associated with large (> 12 m) fishing boats, assuming that they were momentarily foraging on the discards and were thus not associated with their usual foraging habitat, i.e. marine benthos. We refer to the resulting dataset as 'ESAS data subset 2'.

Calculation of shag densities. The densities of shags were calculated at the level of transect and at the level of transect segments (intervals) based on the number of individuals registered in the inner 300 m band. They were calculated separately for each census occasion (denoted by date) and from each of the two ESAS data subsets.

Furthermore, a raster layer of mean densities in the peak non-breeding season at the transect was produced in ArcGIS 10.3 (ESRI 2014) with 'Polyline to Raster' tool, based on each of the two ESAS data subsets. Linear vector layers consisting of transect segments with shag density as an attribute were used as input data. Rasterization was conducted separately for each census conducted in peak non-breeding season. The final raster layer with mean densities was made using 'Cell Statistics' tool, using census-specific raster layers as input data.

Production of ecological models of the Mediterranean Shag distribution: To explain the distribution of the foraging Mediterranean Shags in the Slovenian territorial sea in peak non-breeding season, the number of shags in transect segments was modelled as a function of several ecological variables (Table 1). Two sets of models were fit each based on one of the ESAS data subsets (1, 2), whereby only the censuses from peak non-breeding season were included. The modelling was done in R (R Development Core Team 2018) using packages 'MASS' and 'mgcv' (Venables & Ripley 2002, Wood 2004). GAMM models with negative binomial distribution of the response variable (number of shags in transect segment) were fit, following Zuur *et al.* 2009. Logarithmically transformed surface area of a transect segment was included in the models as an offset variable due to differing length of the transect segments. The potential effects of pseudo-replication due to repeated censuses at the same transect were taken into account with the inclusion of 'census date' random variable. The ecological data represented by a set of fixed variables were obtained from GIS layers at the intersections with central points of the transect segments, or recorded at sea during census (Table 1). The variable 'sea depth' was eliminated from further analysis because it was in strong correlation with the variable 'distance from the coast' (Pearson's correlation coefficient = 0.7). The decision to eliminate the former instead the latter was based on the facts that (1) the bathymetry of the Slovenian sea is more or less uniform and most of the sea bottom belongs to the same depth class (20-30 m), (2) the depth of the sea in the area is not a limiting factor for the shags. The variables describing the presence of fishing boats were included only in the models which were fit based on ESAS data subset 1. The best model in each set was selected based on AIC (Akaike information criterion) (Burnham & Anderson 2002)

2.2.3.2. GPS telemetry dataset

Filtering of the GPS data. The original dataset was cleared before it was used for the analysis. In this step the following GPS locations were omitted from the dataset: locations which were fixed (1) before the shag was released, (2) after the shag died, was suspected to be dead or severely injured, (3) when the shag was apparently on migration or at breeding site, and (4) locations with an obvious error (i.e. more than 100 m inland). The outcome data subset in this step is referred to as 'clear dataset'. Moreover, the GPS locations in the 'clear dataset' were grouped by a date-individual grouping variable (i.e. GPS locations from one individual fixed in the same day were assigned unique and equal group number). Furthermore, the locations were classified into three daily periods according to the fixing time: (1) day, (2) twilight and (3) night, based on astronomical data about time of sunrise, sunset and beginning or end of nautical twilight in Ljubljana, Slovenia (http://www.timeanddate.com/sun/slovenia/ljubljana). Furthermore, GPS locations of five shags which were tracked for less than three days were excluded from the analysis at this point.

Identification of roost-sites along the Slovenian coast. Besides the three traditionally known main communal roost-sites on shellfish farms, the shags were suspected to regularly roost at several other locations along the Slovenian coast. These regularly used roost-sites were identified based on clusters of roosting locations of the tracked individuals. A roosting location of an individual shag was defined as the first fixed GPS location in a day (usually early in the morning before the shags leave their roost-sites). Roost-sites were then defined as clusters of at least five roosting locations not further than 500 m from one another

Table 1. Independent variables used in the modelling of the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* distribution in the Slovenian territorial sea

Independent variable	Variable type	Level	Data source
census date	date	census	ESAS dataset
presence of small fishing boats (up to 12 m)	binary	transect segment	ESAS dataset
presence of large fishing boats (above 12 m) <0,5 km away	binary	transect segment	ESAS dataset
presence of large fishing boats (above 12 m) 0,5–2 km away	binary	transect segment	ESAS dataset
sea state (Beaufort scale)	factorial	transect segment	ESAS dataset
sediment type	factorial	transect segment	GIS layer (Geodetski inštitut Slovenije)
distance from the coast	continuous	transect segment	calculated in ArcGIS

and delineated as minimal convex polygons. Only roost-sites along the Slovenian coast were taken into account and roosting events in the Italian and Croatian territorial sea were excluded from further analysis. A centre of each roost-site was defined as the mean mid-point of the cluster, which was used in the following steps of the analysis (referred to as a roost-site centre from hereon).

Further filtering of the data. In this step, only those locations were retained in the dataset that belonged to individual shags roosting at the three main communal roost-sites and roost-sites identified during the previous step. Furthermore, in order to focus on the areas where the shags have been most likely foraging and not only resting, more locations were omitted: (1) diurnal locations within roost-sites, (2) GPS locations at other daytime resting places, or (3) artificial feeding locations (i.e. locations next to the fish market where at least two tagged shags have been known to be fed by fish sellers), (4) night and twilight locations outside roost-sites (probably erroneous fixes). We refer to the resulting data subset as 'end dataset'. It was used during the following steps as an input dataset for the delineation of the marine IBA candidates.

2.2.3.3. Large floating groups dataset

The data were digitalized in ArcGIS 10.3 (ESRI 2014) and the groups distinguished according to their foraging activity at the time of observation to foraging and non-foraging.

2.2.4. Classification of spatial data layers

The spatial data layers were classified as primary or supplementary based on their quality, following the recommendations by BirdLife International (2010b).

2.2.5. Identification of marine IBA candidates by spatial data layers

2.2.5.1. ESAS dataset

Selection of 5% transect segments with the highest densities. Identification of the marine IBA candidate was based on the densities of shags at transect segments, calculated from both ESAS subsets. Only the peak-nonbreeding season of the Mediterranean Shags was considered, as revealed by the results of the roost-sites monitoring (Table 2). Following the recommendations by BirdLife International (2010b), 5% of transect segments with highest densities of shags were chosen for each census occasion (referred to as the best segments from hereon), separately for each ESAS subset (1, 2).

Selection of grid cells intersected by best transect segments. The target area was then overlaid with a grid of cells with side size 1,540 m (corresponding to the length of one standard transect segment, rounded to 10 m). The cells which were intersected by the segments identified during the previous step were selected from the grid. The selected cells were used as a basic framework for the delineation of the marine IBA candidate.

2.2.5.2. GPS telemetry dataset

The marine IBA candidates were identified following BirdLife International's protocol for the identification of marine IBAs using seabird tracking data (BirdLife International 2013). The protocol assumes central-place foraging, whereby an individual's roost-site was defined as the central place. The analytical method aims at the identification of core use areas (kernels) of tracked individuals on their round trips, taken from the roost-site to foraging areas and back to the roost-site (hereafter referred to as 'round foraging trips'). A core use area identified for a round foraging trip represents a foraging site of the individual shag making that trip.

The protocol consists of eight analytical steps. In step 1, the GPS data from the 'end dataset' were grouped by roost-sites. We thus obtained 10 subsets of 'end dataset', one for each roost-site, and from hereon we describe the method for analysing individual roost-site subsets. In step 2, each subset was further split to round foraging trips. A set of locations was considered to represent a trip when the shag moved at least a defined distance from the roost-site centre, stayed on its journey for at least 1 hour, and returned back to the same roost-site i.e. closer than a defined distance from the roost-site centre. The distances (referred to as inner and outer buffer) for each roost-site were defined according to the roost-site characteristics

(Table 9). Furthermore, trips with less than six locations were automatically omitted from the analysis as they were below the numerical threshold for identification of core use areas. In step 3 the scale of interaction with the environment was calculated and further used in step 4 for fitting the kernels, i.e. identification of core use areas. In step 5, a variance test was applied on the resulting set of kernels to check for significant site fidelity of any individual. In case site fidelity of one or more individuals was significant, only one randomly chosen core use area per individual was chosen for further analysis, to avoid bias due to pseudo replication. In step 6, bootstrapping was used to assess the representativeness of the dataset and to calculate the percentage of the roosting population utilizing the marine IBA candidate. If the dataset was not representative (bootstrap outcome < 70%), no IBA candidates could be identified. In step 7, the areas more intensively used by several individuals (i.e. marine IBA candidates) were identified, and in step 8 threshold values were applied to these areas, estimated as % of roosting population that visits each area. Steps 2–8 were applied separately to each data group as defined in step 1.

2.2.5.3. Large floating groups dataset

The marine IBA candidates were delineated based on a 1,000 m buffer around locations of the groups that were recorded at the time of active foraging. Additional criterion was used to include only the groups that were larger than the median group size, i.e. the threshold was set at minimum 130 individuals.

2.2.6. Delineation of final marine IBA proposals

The delineation of final marine IBA proposals was done based on integration of IBA candidates identified from different source data layers. The strength of each IBA proposal was evaluated against the rules outlined in BirdLife International (2010b). According to these rules, the most defendable cases of marine IBAs are those identified based on two primary data layers, followed by the cases identified based on one primary and one supplementary data layer, and the cases identified based on one primary data layer. The cases identified based on two supplementary data layers are defendable only exceptionally, depending on the data involved, and the cases identified based on one supplementary data layer cannot be confirmed.

2.2.7. Application of IBA criteria

2.2.7.1. Relevant IBA criteria

BirdLife International lists 20 criteria for the identification of IBAs (http://datazone.birdlife.org/site/ibacriteria), nine of which apply to the IBAs in the marine environment. The marine IBA proposals for the Mediterranean Shag in the Slovenian sea have been evaluated against three relevant criteria:

B1ii. Congregations: The site is known or thought to hold ≥ 1% of a distinct population of a seabird species.

C2. Concentrations of a species threatened at the European Union level: The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (listed on Annex I and referred to in Article 4.1 of the EC Birds Directive).

C6. Species threatened at the European Union level: The site is one of the five most important in the European region (NUTS region) in question for a species or subspecies considered threatened in the European Union (i.e. listed in Annex I of the EC Birds Directive).

2.2.7.2. Numerical thresholds

Two of the relevant IBA criteria, B1ii and C2, prescribe a numerical threshold that needs to be reached in the proposed IBA, i.e. the site has to hold at least 1% of migratory or biogeographic population (http://datazone.birdlife.org/site/ibacriteria). Based on the population estimates by Wetlands International (2004) for the non-breeding population of the Mediterranean Shag, this threshold is at 300 individuals. To check whether the numerical threshold has been reached in the marine IBA proposals, the number of individuals using the sites has been assessed for each proposal, using the data from different sources that were used for their delineation.

IBA Osrednji Tržaški zaliv. The number of individuals using the site was estimated based on

(1) the extrapolation from transect densities and (2) model predictions.

In case of the extrapolation, the ESAS dataset 1 was used as input data, i.e. the number of all floating shags in the area was estimated. The number of individuals was calculated within the target area and within the marine IBA proposal, for each census occasion separately, by multiplying density of shags at the transect with the surface area of either site. In case of the IBA estimates, only the part of the transect overlapping the IBA was considered for the calculation of shags' density. To check whether the number of shags reached the numerical threshold required in IBA criteria C2 and B1ii over two different years in at least one season, we tested whether the mean population estimates in the IBA proposal in meteorological summer (June to August) of both census years exceeded the threshold of 300 individuals, using one tailed Student t-test. The assumption of the test that the sample population size estimates need to be normally distributed was checked and confirmed with Shapiro-Wilcoxon test of normality ($W = 0.98$, $p = 0.93$).

The model predictions were done based on a new dataset, represented by a grid of cells that was used for the delineation of the marine IBA candidate. The grid was clipped to exactly match the target area or the area of the IBA proposal, resulting in several partial grid cells at the edges. To account for the different cell surface areas, logarithmically transformed surface area of cells was calculated (i.e. representing the offset variable as used in the models). The values of the variable 'distance from the coast' were obtained in ArcGIS 10.3 (ESRI 2014) as the distance of the cell central point from the coastal line. To simulate the effect of fishing boats variable 'presence of large fishing boats <0.5 km away' was set to "yes" in one randomly chosen cell, and variable 'presence of large fishing boats 0.5–2 km away' in two randomly chosen cells. The sea state was set to level zero to account for the optimal monitoring conditions. Any non-significant estimates were interpreted as not different from zero (i.e. the predictor has no effect). The mean predicted values and standard errors (SE) were calculated using 'predict.gam' function in R package 'mgcv' (Wood 2004), and 90% confidence intervals were calculated by the equation: mean ± 1,645 x SE. All values were calculated on the scale of the linear predictor and then transformed to the scale of the response variable, i.e. the number of individuals present in a grid cell. The total number of individuals in the IBA proposal was calculated as a sum of individuals across the cells which intersect the area of the site.

Extension to IBA Debeli rtič. The number of birds visiting the area was assessed based on the census of large foraging groups and on the estimated number of individuals using the IBA candidate 1A, identified in the analysis of GPS telemetry data (Table 10).

2.2.7.3. Regularity of use of the area

Besides the fact that the numerical thresholds have been reached it needs to be demonstrated that the site is being regularly used by the target species. According to the BirdLife International protocol for the identification of marine IBAs this means that the birds are visiting the area in different periods (seasons or years) or that the area is visited by the birds from different sites (i.e. breeding colonies or roost-sites) (BirdLife International 2010b).

3. Results

3.1. Monitoring at communal roost-sites

Altogether, 24 monthly censuses were conducted at three communal roost-sites of the Mediterranean Shags between November 2011 and the end of October 2012 (Table 2). Their number peaked in August 2013 when 1,494 individuals were counted. The minimum was observed in March 2012 when only 32 individuals were counted.

3.2. Monitoring at sea following the ESAS method

Altogether, 16 censuses were conducted between July 2012 and August 2013 (Table 3). The length of a standard transect was 81.58 km and the width was 600 m. The mean census time was 4:31. Two censuses (22.6.2012 and 21.5.2013) were not conducted entirely due to bad weather conditions and hence omitted from further analysis.

Densities of the Mediterranean Shags at the transect. The density of shags at the transect varied greatly between censuses (Table 14). The highest density at the transect was observed in July 2013 when it reached 4.4 ind./km^2 (all floating shags) or 3.4 ind./km^2 (floating shags without those associated with fishing boats) (Table 14). The lowest densities were observed in January, February and March 2013 when less than 10 floating individuals were observed at the transect (Table 14). The mean density of shags in peak non-breeding season (data pooled for years 2012 and 2013) was generally higher off-shore than in-shore whether the shags associated with fishing boats were considered or not (Figure 2).

Ecological models of the Mediterranean Shag distribution. Altogether, seven (set 1) and five (set 2) models were fit to describe the distribution of the Mediterranean Shags in the Slovenian sea (Table 4). The selected, most parsimonious model in set 1 (M1.5) contained five fixed variables. Four of these variables had significant coefficients: the 'distance from the coast', 'presence of large fishing boats <0.5 km away', 'presence of large fishing boats 0.5–2 km away' and the 'sea state'. All but the latter had positive effects on the number of shags in the transect segments (Table 5). The selected, most parsimonious model in set 2 (M2.5) contained two fixed variables, the 'distance from the coast' and

Table 2. The number of roosting Mediterranean Shags *Phalacrocorax aristotelis desmarestii* at three main communal roost-sites on shellfish farms along the Slovenian coast in 2011–2013; the difference between the total number of individuals (Total ind.) and the sum of adults (Ad.) and non-adults (Non-ad.) equals the number of individuals of unknown age. The shadowed censuses define the peak non-breeding season.

	All roost-sites	Debeli rtič			Strunjan			Sečovlje		
Date	Total ind.	Ad.	Non-ad.	Total ind.	Ad.	Non-ad.	Total ind.	Ad.	Non-ad.	Total ind.
22.11.2011	725			344			53			328
21.12.2011	485	141	32	173	10	34	44			268
14.1.2012	172	3	27	32			18			122
16.2.2012	90	6	14	22	0	46	46	7	15	22
15.3.2012	32	3	7	10			12	0	10	10
18.4.2012	89			33	2	12	14	1	41	42
16.5.2012	170			75	3	39	42	2	51	53
20.6.2012	1047			373			191			483
16.7.2012	1485			330	174	169	380			775
13.8.2012	1406			371			309			726
17.9.2012	1241			531			276			434
13.10.2012	1261			532			209			520
15.11.2012	691			357			108			226
19.12.2012	148	68	20	88			31			29
13.1.2013	56			29			8			19
19.2.2013	39	2	14	20	0	2	2	0	17	17
22.3.2013	114	0	17	17	0	18	18			79
17.4.2013	82			28	0	6	6			48
21.5.2013	395	128	37	165			83			147
17.6.2013	905	337	18	355			195			355
17.7.2013	1357			450			255			652
23.8.2013	1494	577	33	610			269			615
17.9.2013	1424			529			267			628
24.10.2013	1215	538	38	576			120			519

'sea state', both having significant coefficients with similar effects as in case of M1.5.

Identification of marine IBA candidates. The density of shags in top 5% transect segments (i.e. two segments per census occasion) spanned between 4.3 and 72.2 ind./km^2 in case of all floating shags were considered (ESAS data subset 1), and between 4.3 and 28.7 ind./km^2 in case of floating shags without those associated with fishing boats (ESAS data subset 2) (Table 6). The spatial distribution of the selected segments was very similar for both ESAS data subsets, resulting in equal distribution of the intersecting grid cells that represent the spatial framework for the delineation of the marine IBA candidate (Figure 3).

3.3. GPS telemetry

A total of 29 shags were tagged with GPS loggers between 3.10.2012 and 27.8.2014: 27 at the Izola trapping site and two at the Strunjan trapping site. There was no trapping success at the Sečovlje site. Two, 15, and 12 Shags were tagged in 2012, 2013 and 2014, respectively. In 2013, several devices stopped working soon after they were mounted on birds due to technical faultiness. The data from the devices that stopped working less than three days after they were mounted on birds (five devices) were excluded from further analysis. Data from 24 birds were thus analysed for the purpose of marine IBA identification.

The tracking data used in the analysis were obtained between 3.10.2012 and 30.9.2014. The number of tracking days in 'clear dataset' differed highly among shags (n = 24): from minimum of five to maximum of 445 days (mean: 78) and so did the number of fixed GPS locations: from minimum of 168 to maximum of 8,380 (mean: 1,653). The number of tracking days in 'end dataset' ranged from minimum of 5 to maximum of 437 days (mean: 70) and so did the number of fixed GPS locations: from minimum of 67 to maximum of 3,449 (mean: 608).

The core use areas (kernels) were fit for 21 of 24 individuals. The number of GPS locations in each round foraging trip of three individuals (Andro,

Table 3. Summary of ESAS censuses conducted in the Slovenian sea in 2012 and 2013. Censuses marked with asterisk were conducted within the peak non-breeding season. **Duration of census:** total census duration including short pauses.

Census date	Length of censused transect[km]	% of censused transect	Census start time (h:mm)	Census end time (h:mm)	Duration of census (h:mm)	No. of transect segments	No. of transect segments < 1000 m
22.6.2012*	74.73	91.6	7:03	11:30	4:27	54	6
17.7.2012*	81.58	100	7:15	11:41	4:26	62	12
7.8.2012*	81.58	100	7:53	12:29	4:36	60	11
23.8.2012*	81.58	100	8:47	13:43	4:56	60	12
7.9.2012*	81.58	100	9:00	13:54	4:54	62	12
18.10.2012*	81.58	100	11:09	15:56	4:47	59	11
16.11.2012	81.58	100	10:30	14:52	4:22	61	12
19.12.2012	81.58	100	10:18	15:05	4:47	60	12
23.1.2013	81.58	100	9:58	14:06	4:08	58	10
19.2.2013	81.58	100	11:05	15:36	4:31	62	13
22.3.2013	81.58	100	11:00	15:32	4:32	60	12
19.4.2013	81.58	100	11:10	15:31	4:21	60	12
21.5.2013	41.55	50.9	11:30	14:22	2:52	33	9
19.6.2013*	81.58	100	11:14	15:53	4:39	57	9
26.7.2013*	81.58	100	10:55	16:35	5:40	59	11
23.8.2013*	81.58	100	10:47	15:08	4:21	60	12
Total	**1.258,4**				**72:19**	**927**	**176**

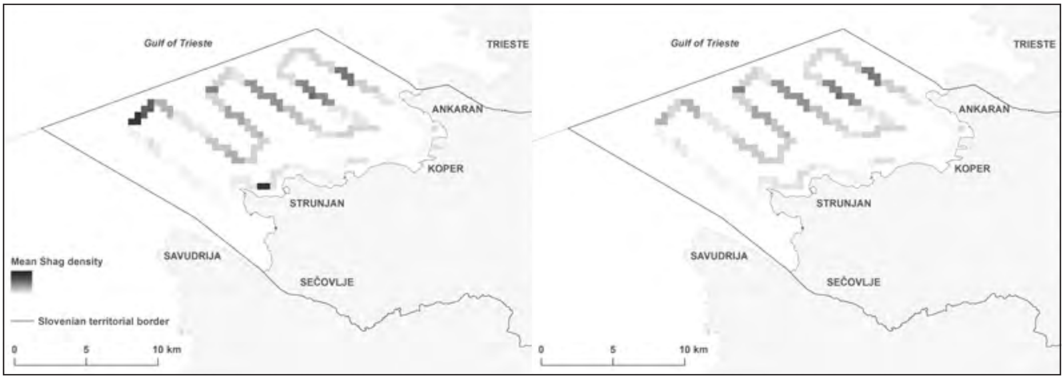

Figure 2. Mean densities of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* (ind./km^2) at the ESAS transect in peak non-breeding season; the data were pooled for the years 2012 and 2013. **Left:** density of all floating shags; **right:** density of floating shags without those associated with fishing boats.

Roko and Dino) was below the required threshold (i.e. six locations) to fit the kernels. The number of fit core use areas varied greatly between the individuals (1–112) (Table 7), as well as between roost-sites (1–160) (Table 8). Mean surface area of core use areas was 383.79 ± 222.56 ha. Mean distance from the coast, calculated as aerial distance of core use area central point from the corresponding roost-

Table 4. Models of the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* distribution in the Slovenian territorial sea in peak non-breeding season; the data were pooled for the years 2012 and 2013. **Set 1:** the response variable was defined as the number of all floating individuals in a transect segment (ESAS data subset 1). **Set 2:** the response variable was defined as the number of floating individuals not associated with fishing boats in a transect segment (ESAS data subset 2). The selected models in each set are printed in bold. Fixed variables included in a given model are denoted with 'Y'. **Distance:** distance from the coast; **Sfishb:** presence of small (<12 m) fishing boats; **Lfishb <0.5 km:** presence of large (>12 m) fishing boats <0.5 km away; **Lfishb 0.5–2 km:** presence of large fishing boats 0.5–2 km away; **Sediment:** sediment type; **Sea state:** sea state on the Beaufort scale; *GAM was fit. **Model did not converge.

						Fixed variables						
Set of models	Model	Degrees of freedom	AIC	Δ AIC	Random variable Date	Date	Distance	Sfishb	Lfishb <0.5 km	Lfishb 0.5–2 km	Sediment	Sea state
Set 1	**M1.5**	**11**	**1439.4**	**0**	**census date**		**Y**	**Y**	**Y**	**Y**		**Y**
	M1.6	8	1449.6	10.2	census date		Y	Y	Y	Y		
	M1.2	13	1451.6	12.2	census date		Y	Y	Y	Y	Y	Y
	M1.1	17	1467.8	28.4	none*	Y	Y	Y	Y	Y	Y	Y
	M1.7	8	1536.9	97.5	census date		Y					Y
	M1.3	5	1539.6	100.2	census date		Y					Y
	M1.4**	7	1540.9	101.5	census date		Y				Y	
Set 2	**M2.5**	**8**	**1437.54**	**0**	**census date**		**Y**					**Y**
	M2.2	10	1449.35	11.81	census date		Y				Y	Y
	M2.3	5	1452.98	15.44	census date		Y					
	M2.1	14	1457.27	19.73	none*	Y	Y				Y	Y
	M2.4	7	1468.32	30.78	census date		Y				Y	

Table 5. Regression coefficients of the selected GAMM models describing distribution of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* at the Slovenian sea in peak non-breeding season; **M1.5:** the response variable was defined as the number of all floating individuals in a transect segment (ESAS data subset 1). **M2.5:** the response variable was defined as the number of floating individuals not associated with fishing boats in a transect segment (ESAS data subset 2). **te:** denoting the smoothing function used in the additive modelling. **Sea state referential level:** Beaufort level 0.

Model	Predictor		Description	ß	p
M1.5	Intercept		Model intercept	-12.9	<0.001
	te(Distance)		Distance from the coast	1.22	<0.001
	Sfishb		Presence of small (<12 m) fishing boats	0.20	non-sig.
	Lfishb <0.5 km		Presence of large (>12 m) fishing boats 0.5 km away	2.74	<0.001
	Lfishb 0.5-2 km		Presence of large (>12 m) fishing boats 0.5-2 km away	0.87	<0.05
	Sea state	level = 1	Sea state on the Beaufort scale	-0.53	<0.05
		level = 2		-0.89	<0.01
		level = 3		-1.33	<0.01
		level = 5		-0.77	non-sig.
M2.5	Intercept		Model intercept	-12.8	<0.001
	te(Distance)		Distance from the coast	1.33	<0.001
	Sea state	level = 1	Sea state on Beaufort scale	-0.59	<0.01
		level = 2		-1.06	<0.001
		level = 3		-1.50	<0.01
		level = 5		-0.84	non-sig.

site was 3.61 ± 2.3 km. Nine of 21 individuals were using more than one roost-site (Table 7).

Using the GPS telemetry data, eight marine IBA candidates were identified in total, based on the individuals making round foraging trips from roost-sites 1, 3 and 5 (Figure 6). No sites were identified based on foraging trips from other roost sites (Table 9). It was estimated that the maximum numbers of shags visiting individual areas ranged between 7 and 220 individuals (Table 10).

3.4. Census of large floating groups

A total of 40 cases of large floating groups (≥10 individuals) of the Mediterranean Shags were reported between October 2011 and November 2014 (Table 11, Figure 7). All reports coincide with the autumn season, the earliest being from 21th September and the latest from 6th December. 13 (32.5%) groups consisted of 130 or more individuals, the largest two groups holding 300 and 310 individuals. 69.2 % of groups with 130 or more individuals and 40.7 % of groups with less than 130 individuals were observed during active foraging, in several cases in the company of Black-headed Gulls (*Chroicocephalus ridibundus*). Most groups were foraging in the intertidal zone preying on schools of small pelagic fish.

3.5. Data layer classification

The spatial data layers produced based on the ESAS dataset were classified as primary and the spatial data layers produced based on the GPS telemetry data and census of large floating groups as supplementary (Table 12). An additional environmental layer, i.e. the bathymetry layer, was used for a detailed delineation of final marine IBA borders.

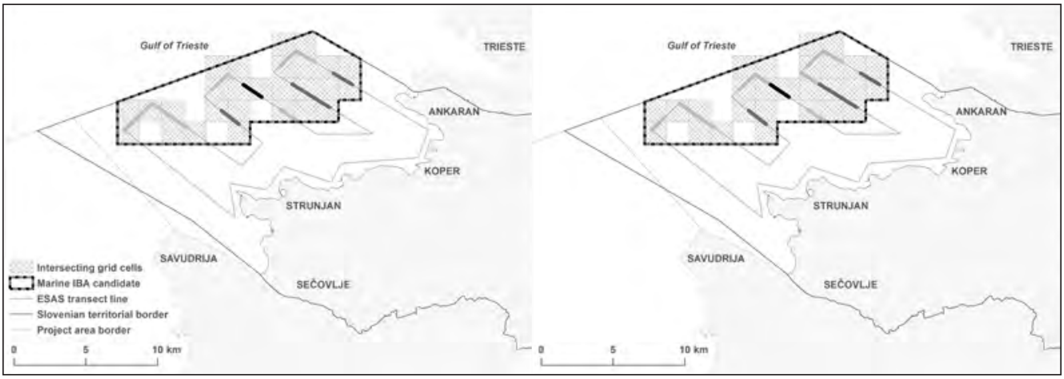

Figure 3. Marine IBA candidate as identified based on the locations of the top 5% transect segments with the highest densities of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* in peak non-breeding season in 2012 and 2013; **light grey segments:** year 2012; **dark grey segments:** year 2013; **black segments:** both years. **Left:** density of all floating shags; **right:** density of floating shags without those associated with fishing boats. The segments are overlaid with intersecting grid cells (a = 1,540 m), representing the spatial framework for the delineation of the marine IBA candidate.

Table 6. Densities of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* in the top 5% transect segments in peak non-breeding season by census occasion. The densities were calculated based on the number of all floating shags (ESAS data subset 1) or the number of floating shags without those associated with fishing boats (ESAS data subset 2). *Transect segments differ between data subsets.

	Mediterranean Shag density [ind./km^2]	
Census date	**ESAS data subset 1**	**ESAS data subset 2**
17.7.2012	21.6	21.6
	19.3	19.3
7.8.2012	56.3*	4.3*
	13.0	13.0
23.8.2012	72.2*	7.9*
	10.8	10.8
7.9.2012	5.4	5.4
	4.3	4.3
18.10.2012	10.0	10.0
	5.4	5.4
19.6.2013	26.0	24.9
	15.2	15.2
26.7.2013	28.7	28.7
	21.6	21.6
23.8.2013	19.5	19.5
	11.9	11.9

3.6. New marine IBA proposals and their compliance with the IBA criteria

3.6.1. Marine IBA proposals

The final marine IBA proposals for the Mediterranean Shags were delineated based on the IBA candidates that were identified as part of the analysis of the three data sources: ESAS dataset (Figure 3), GPS telemetry dataset (Figure 6), and land-based observations of large foraging groups (Figure 7). One new marine IBA and one extension to an existing marine IBA were delineated (Figure 8). The IBA Osrednji Tržaški zaliv was delineated based on one primary data layer (Table 13). The extension to IBA Debeli rtič was delineated based on two overlapping supplementary data layers and the bathymetry layer as an additional environmental data layer to limit the area to 0–10 m depth zone, as social foraging of shags on schools of small pelagic fish occurred most intensively in the shallow in-shore waters and the intertidal zone (Table 13). The new proposed areas and the previously identified IBAs represent four distinct IBAs for the Mediterranean Shag in the Slovenian territorial sea (Figure 8). Note that the marine IBA Škocjanski zatok does not include the Mediterranean Shag as a qualifying species.

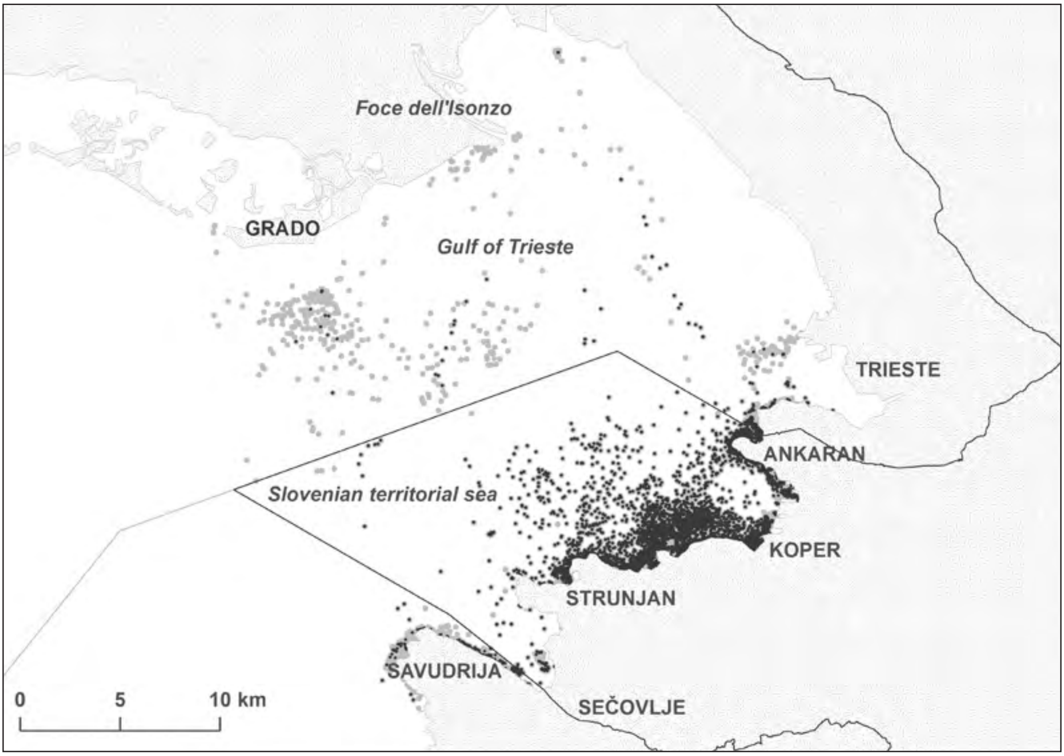

Figure 4. GPS locations of 24 Mediterranean Shags *Phalacrocorax aristotelis desmarestii* within the Gulf of Trieste, tagged along the Slovenian coast and tracked between 3.10.2012–30.9.2014; **grey dots:** clear dataset (n=39,670); **black dots:** end dataset (n=14,595)

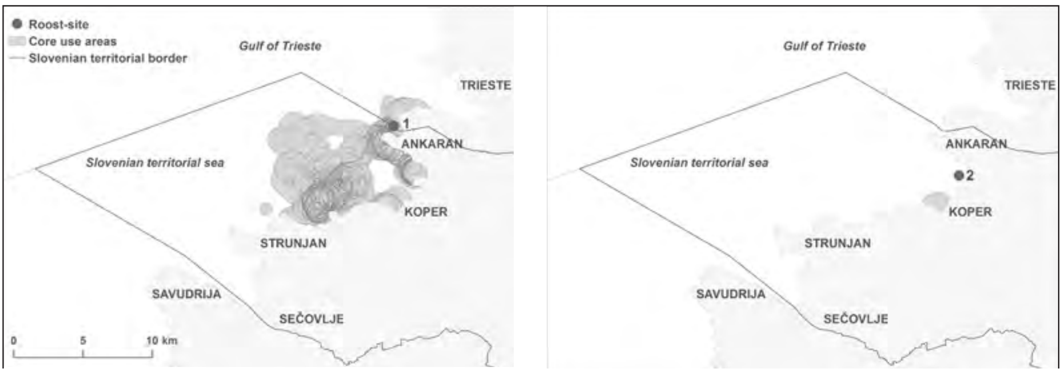

Figure 5. Core use areas of 21 of 24 tracked Mediterranean Shags *Phalacrocorax aristotelis desmarestii* making round foraging trips from roost-sites 1–10. Note that no core use areas were identified for three individuals (Andro, Dino and Roko). Numbers 1, 8 and 9 represent the main communal roost-sites along the Slovenian coast, Debeli rtič, Strunjan and Sečovlje, respectively.

Table 7. Core use area (CUA) statistics by individuals for 21 Mediterranean Shags *Phalacrocorax aristotelis desmarestii*. Note that no core use areas were identified for three individuals, Andro, Dino and Roko.

Individual	No. of CUA	Mean surface area (ha)	SD (ha)	Mean coast distance (km)	SD (km)	No. of roost-sites
Ante	1	147.24	NA	1.90	NA	1
Ari	3	457.79	77.48	1.34	1.36	1
Bepo	29	630.59	203.39	5.50	5.68	1
Dado	6	220.65	27.12	0.71	0.69	2
Ilija	4	871.15	392.35	11.62	8.65	1
Ivek	8	238.30	33.89	1.55	1.50	1
Jakomo	112	240.37	101.77	2.89	3.61	4
Karlo	44	595.18	164.78	6.59	6.74	2
Mihi	69	395.54	144.60	3.78	3.94	4
Momo	4	389.72	71.13	2.47	1.47	1
Nace	38	254.11	83.20	2.59	3.21	1
Nikola	63	587.95	209.13	4.50	4.38	3
Ogi	10	678.16	235.74	5.79	5.81	1
Oto	2	861.29	94.64	3.33	3.33	1
Pino	15	246.68	93.74	2.77	2.00	3
Srečko	26	332.43	77.60	1.75	1.56	4
Šime	5	329.61	169.54	2.67	2.87	1
Štelio	10	459.52	312.37	3.38	3.15	1
Tartini	10	527.98	179.13	2.93	2.62	1
Tonin	3	264.21	17.46	1.23	1.41	2
Ugo	55	183.21	68.87	2.58	1.69	3

Table 8. Core use area (CUA) statistics by roost-sites for 21 Mediterranean Shags *Phalacrocorax aristotelis desmarestii*. Note that no core use areas were identified for three individuals, Andro, Dino and Roko.

Roost-site	No. of CUA	Mean area (ha)	SD (ha)	Mean coast distance (km)	SD(km)	No. of individuals
1	119	426.76	223.89	4.70	2.38	9
2	1	169.12	NA	2.76	NA	1
3	160	420.45	220.79	3.82	1.81	7
4	8	246.32	36.12	1.31	0.45	2
5	93	243.58	122.23	1.33	1.21	7
6	8	335.92	30.25	1.69	0.58	1
7	10	385.34	79.38	2.13	0.54	1
8	103	412.11	246.93	4.10	1.51	8
9	8	584.18	406.85	9.20	5.04	2
10	7	272.95	128.14	4.29	1.78	1

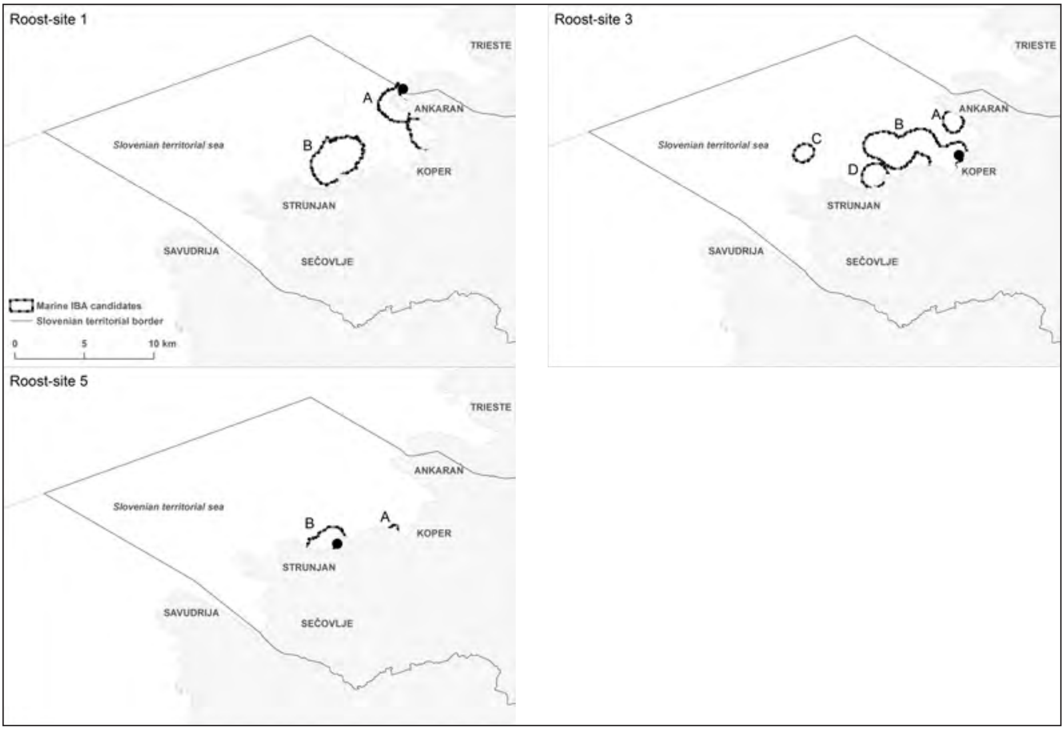

Figure 6. Marine IBA candidates as identified in the analysis of the GPS telemetry data of 21 Mediterranean Shags *Phalacrocorax aristotelis desmarestii* tagged along the Slovenian coast and tracked between 3.10.2012–30.9.2014. Note that no candidates were identified for shags roosting at roost-sites 2, 4, 6–7 and 9–10. Letters A to D denote individual IBA candidates.

Table 9. Parameters and outcomes of the identification of marine IBA candidates based on the GPS telemetry data of 21 Mediterranean Shags *Phalacrocorax aristotelis desmarestii* tagged along the Slovenian coast and tracked between 3.10.2012–30.9.2014.

Roost-site	Inner buffer [km]	Outer buffer [km]	Ars scale	Site fidelity	Sample representa-tiveness	Resulting marine IBA candidates
1 (Debeli rtič)	0.7	0.7	0.732	non-significant	97.42	1A–B
2	0.3	0.3		/		sample too small
3	0.35	0.35	0.675	significant	79.8	3A–D
4	0.4	0.4	0.7	/		sample too small
5	0.3	0.5	0.545	non-significant	99.31	5A–B
6	0.2	0.2	0.600	/		sample too small
7	0.2	0.2	0.629	/		sample too small
8 (Strunjan)	0.4	0.4	0.829	significant	56.07	sample not representative
9 (Sečovlje)	0.6	0.6	1.471	/		sample too small
10	0.3	0.3	1.067	/		sample too small

Table 10. Marine IBA candidates identified based on the GPS telemetry data of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* in the Slovenian sea, and estimates of the number of individuals utilizing each area. Roost-sites represent the central place of round foraging trips of the shags.

Roost-site	Area ID	Surface area [ha]	Roosting population	max. % of roosting population	max. mIBA site population
1	A	573	530—610 [1]	24.37	129-149
	B	888		36.13	191-220
3	A	168	~100 [2]	14.29	14
	B	1407		57.14	57
	C	147		14.29	14
	D	239		14.29	14
5	A	14	~50 [2]	12.9	7
	B	291		78.49	39

1 Roost-site monitoring yearly maxima in 2012 and 2013;
2 numbers assessed based on land observations (best expert opinion).

Table 11. The number of groups of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* along the Slovenian coast from October 2011 to December 2014 by months and years; the data were reported by random observers; **Total foraging:** number of groups observed during active foraging. The number in brackets denotes the number of groups with ≥ 300 individuals.

Month	< 130 ind.	≥ 130 ind.
September	1	4
October	11	7(2)
November	14	2
December	1	0
Year	**< 130 ind.**	**≥ 130 ind.**
2011	0	2(1)
2012	9	5
2013	10	3
2014	8	3(1)
Total	**27**	**13(2)**
Total foraging	**11**	**9(2)**

3.6.2. Estimated numbers of the Mediterranean Shags in proposed IBAs

Estimates based on extrapolation: Estimated number of shags in the target area was the highest in July 2013 and the lowest in March 2013 (Table 14). The estimated number of shags in the proposed IBA Osrednji Tržaški zaliv (OTZ) exceeded 300 individuals (1% of biogeographic population) in 5 out of 8 censuses within the peak non-breeding season, i.e. in July 2012, twice in August 2012, in June 2013 and July 2013 (Table 14). The mean number in summer months, pooled for both monitoring years, was 374 individuals (321–427, 90% CI). The probability that the mean was lower than 300 individuals was below 5% (Student $t = 2.8$, $df = 5$, $p = 0.02$).

Estimates based on the models: The estimated mean number of all floating shags within the Slovenian territorial sea was 866 (471–1,705, 90% CI), and 495 (265–988, 90 % CI) within the IBA Osrednji Tržaški zaliv (predictions from the model M1.5). The estimated mean number of floating shags without individuals associated with fishing boats was 745 (472–1,187, 90% CI) within the Slovenian territorial sea and 415 (263–658, 90% CI) within the IBA Osrednji Tržaški zaliv (predictions from the model M2.5). Note that the predictions of the models account for the number of shags averaged over the entire peak non-breeding season and are thus not directly comparable with the estimates based on extrapolation (expressed as mean number of shags in summer months).

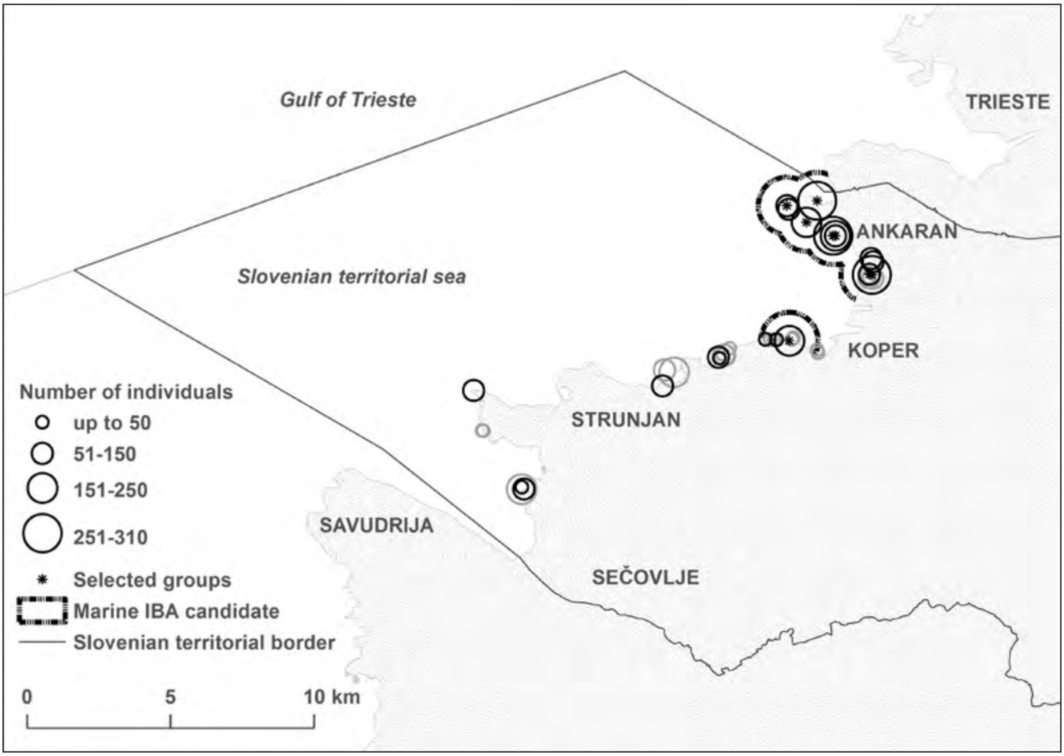

Figure 7. Large groups (≥ 10 individuals) of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* randomly registered between October 2011 and November 2014 along the Slovenian coast; **black circles:** the group was observed during active foraging; **grey circles:** the group was not actively foraging; the groups selected for delineation of marine IBA candidates are marked with asterisk.

Table 12. Classification of the spatial data layers used for delineation of marine IBA candidates for the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* in the Slovenian sea.

	Data layer	Data source	Data layer class
1	local densities of shags in the peak non-breeding season, i.e. top 5% transect segments with highest densities (the best segments)	ESAS monitoring	primary
2	grid cells (1,540 m) intersecting with the best transect segments		
3	core use areas of individual tracked shags	GPS telemetry	supplementary
4	large foraging groups of shags	unsystematic land-based census	supplementary
5	bathymetry layer	Geodetic Administration of the Republic of Slovenia (GURS)	environmental

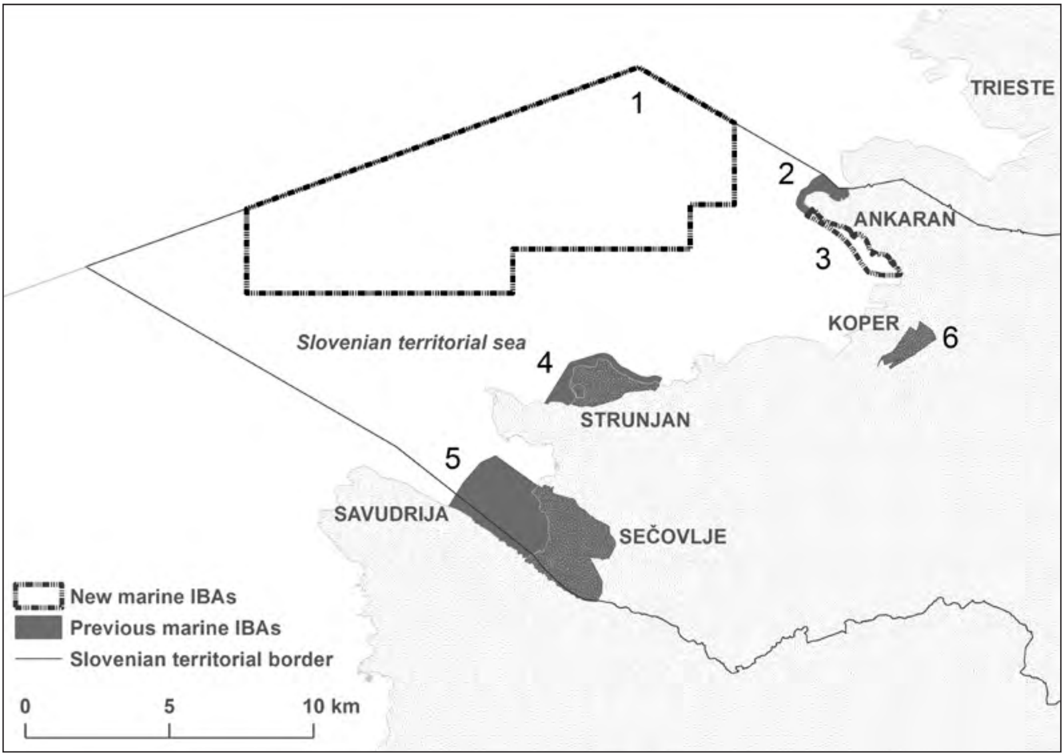

Figure 8. Marine IBAs in Slovenia; **dashed line:** new marine IBAs for the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* identified within the scope of the SIMARINE-NATURA project (this work); **dark grey polygons:** marine IBAs identified during previous stages in 2000–2011 (Denac *et. al* 2011). **1:** IBA Osrednji Tržaški zaliv; **2:** IBA Debeli rtič; **3:** extension to IBA Debeli rtič; **4:** IBA Strunjan; **5:** IBA Sečoveljske soline; **6:** IBA Škocjanski zatok. IBAs 2, 4 and 5 cover the three main roost-sites of the Mediterranean Shags along the Slovenian coast. The IBA Sečoveljske soline crosses the national border since it was identified before the marine border between Slovenia and Croatia was defined in the arbitration. Note that the IBA Škocjanski zatok does not include the Mediterranean Shag as a qualifying species.

4. Discussion

The Slovenian territorial sea has been previously recognized as an area of international importance for the Mediterranean Shag in the non-breeding season (Denac *et al.* 2011, Koce & Lipej 2016), however, this work delivers important new knowledge about the spatio-temporal distribution of this seabird within the area. Two new marine IBAs for the Mediterranean Shag were identified based on the results of this study, which essentially complement the previously existing marine IBAs covering three main communal roost-sites on the shellfish farms located along the Slovenian coast (Denac *et al.* 2011). The main added value of the new sites to the conservation of the global non-breeding population of the Mediterranean Shag is that they encompass two areas regularly used for foraging by at least 1% of the population.

The two new areas, IBA Osrednji Tržaški zaliv and the extension to the existing IBA Debeli rtič, differ in their ecological characteristics reflected in different ways the shags are using them. The IBA Osrednji Tržaški zaliv covers an off-shore area, spanning between approximately 3.5 and 10 km from the coast and lying within the 20–25 m depth zone, dominated by muddy and sandy benthic substrate and corresponding benthic community that is poorly investigated (Peterlin *et al.* 2013). We suggest that its importance for the foraging

Table 13. Marine IBAs proposed based on the data on the Mediterranean Shag *Phalacrocorax aristotelis desmarestii* distribution and numbers, gathered within the project SIMARINE-NATURA (LIFE10NAT/SI/141) in 2011-2014.

Marine IBA proposal	Underlying data sources	Surface area (ha)	Estimated population size	Regularity of use	Complies with IBA criteria
IBA Osrednji Tržaški zaliv	– ESAS dataset	8.218 ha	374 (321-427, 90% CI) [1] 495 (265-988, 90% CI) [2]	1% population threshold exceeded in two years (2012 and 2013)	B1ii, C2, C6
Extension to IBA Debeli rtič	– GPS telemetry dataset – large floating groups dataset – bathymetry layer	155 ha	up to 310 [3] 129-149 [4]	1% population threshold exceeded in two years (2011 and 2014)	B1ii, C2, C6

[1] Mean number of shags using the area in summer months over two years, estimated based on the extrapolation;
[2] mean number of shags using the area in peak non-breeding season, estimated based on the model M1.5;
[3] maximum number of shags observed within the same foraging group;
[4] estimated number of shags using the marine IBA candidate 1A, identified based on the GPS telemetry data.

Table 14. Estimated numbers of the Mediterranean Shags *Phalacrocorax aristotelis desmarestii* in the Slovenian territorial sea and in the IBA Osrednji Tržaški zaliv (OTZ), based on the extrapolation from the ESAS dataset. **(1):** Number of all floating shags, **(2):** number of floating shags without individuals associated with fishing boats. Results of the censuses from 22.6.2012 and 17.5.2013 were omitted due to unrepresentativeness of the sample. Censuses marked with asterisk were conducted within the peak non-breeding season.

Meteorological season	Census date	No. of Shagsat the transect (1)	No. of Shags at the transect (2)	Density of Shags at the transect (1) [no./km²]	Density of Shags at the transect (2) [no./km²]	Estimated no. of Shags at SLO (1)	Estimated no. of Shags in OTZ (1)	Estimated no. of Shags at SLO (2)	Estimated no. of Shags in OTZ (2)
Summer	17.7.2012*	131	131	2.7	2.7	572	349	572	349
	7.8.2012*	112	60	2.3	1.2	489	392	262	184
	23.8.2012*	145	95	3.0	1.9	633	425	415	225
Autumn	7.9.2012*	50	50	1.0	1.0	218	110	218	110
	18.10.2012*	36	36	0.7	0.7	157	124	157	124
	16.11.2012	21	13	0.4	0.3	92	26	57	26
Winter	19.12.2012	11	9	0.2	0.2	48	20	39	20
	23.1.2013	7	7	0.1	0.1	31	4	31	4
	19.2.2013	2	2	0.0	0.0	9	0	9	0
Spring	22.3.2013	1	1	0.0	0.0	4	0	4	0
	19.4.2013	19	19	0.4	0.4	83	44	83	44
Summer	19.6.2013*	142	127	2.9	2.6	620	344	555	337
	26.7.2013*	215	167	4.4	3.4	939	458	729	458
	23.8.2013*	101	101	2.1	2.1	441	277	441	277
All year		71	58	1.4	1.2	310	184	255	154
Summer		141	114	2.9	2.3	616	374	496	305
Peak non-breeding season		117	96	2.4	2.0	509	310	419	258

shags is established on high abundance and easy access of suitable prey species, especially the black goby *Gobius niger*. The species has been identified as the dominant prey of the Mediterranean Shags in the Gulf of Trieste in two recent studies (Cosolo *et al.* 2011, Lipej *et al.* 2016). The black goby is a common benthic fish species throughout the Gulf of Trieste (Lipej *et al.* 2016), however, its spatio-temporal dynamics within the Slovenian sea is not well known. Based on the existing data, it is not possible to conclude that the peak densities of the Mediterranean Shags, consistently found in off-shore areas within the scope of the systematic ESAS monitoring, reflect higher densities of prey in these areas, although this is a plausible hypothesis. Moreover, the distribution of shags at sea could also be affected by the level of disturbance but the effect of this factor was not considered in our study.

The IBA Osrednji Tržaški zaliv overlaps with the national B fishing zone (Klanjšček *et al.*), regularly exploited by bottom and midwater otter trawlers, purse seiners and pelagic pair trawlers (MKGP 2011). All these fishing techniques use vessels defined in this study as large fishing boats. Groups of shags have been occasionally observed to follow the boats and forage on the discards (own unpublished data and B. Marčeta, *personal communication).* This suggests that higher abundances of shags in the off-shore areas could be the consequence of fishing activities in these areas. In fact, the presence of large fishing boats in a transect segment or in its close vicinity (i.e. < 500 m from the instant observation point) had a strong positive effect on the number of shags, as revealed by one of the selected models fit for the ESAS dataset in this study. Nevertheless, a comparison of both selected models revealed that the number of shags within the transect segment increases with increasing distance from the coast independently of the presence of fishing boats. Moreover, the occasional discards probably do not represent an essential source of food for the Mediterranean Shag, as they are relatively scarce in this area (MKGP 2011). We thus suggest that fishing activity is not an ultimate factor influencing the distribution of shags in the Slovenian sea, but it can cause temporary aggregations of the individuals that primarily visit the overlapping area to prey on the bottom dwelling prey species, predominantly the black goby.

The IBA Osrednji Tržaški zaliv was identified based on one primary data source, the spatial distribution of shags, as revealed by the ESAS monitoring. However, the results of GPS telemetry do not comply with these findings as they suggest that the shags' most important foraging areas are located along the coast. According to the recommendations by the marine IBA identification protocol (BirdLife International 2010b), the GPS telemetry data, retrieved from more than 10 individuals, classifies as the primary data source, but we classified it as supplementary despite adequate number of tracked individuals. The reason for this lies in the fact that the sample of tracked shags was biased due to non-randomized catching. The majority of individuals were caught at one near-coast location, characterized as a resting spot used by the shags during their diurnal activities (i.e. between foraging episodes). As revealed by the results of this telemetry study, many shags tend to be faithful to their foraging areas, meaning that our sample was at least to some degree biased towards the locally-foraging population and thus not representative for the entire roosting population. To ensure random sampling, the majority of shags should be caught at their communal roost-sites. However, these individuals were extremely hard to catch as they tended to avoid the floating rafts and buoys with mounted traps, placed in the environment with abundant alternative traditional roosting structures, i.e. the shellfish farm buoys. Another possible source of bias could be the difference in total diving time when shags are foraging in shallow coastal waters or foraging in deep off-shore waters, which would affect the frequency of successfully fixed GPS locations. However, the total diving time of individuals was not assessed in this study.

Nevertherless, the GPS telemetry and land-based census of large floating groups importantly supplement the ESAS censuses that tend to overlook the shags closely associated with the sea-shore. As part of the maritime traffic rules, the ESAS census boat was not allowed to travel with required speed closer than 400 m from the shoreline, missing out at least the innermost 100 m coastal belt where most communal foraging occurs. Although the supplementary datasets do not provide adequate data to evaluate the entire Slovenian coastal belt, they do provide adequate information to identify an important foraging area extending from the existing marine IBA Debeli rtič along several kilometres of the coast. The importance of the site for the socially foraging shags is supported also with the findings of their diet analysis that revealed disproportionally high frequencies of sand-smelts in the diet of individuals roosting at the Debeli rtič roost-site (Lipej & Mavrič 2013, Lipej *et al.* 2016). However, the rest of the innermost coastal belt should be further evaluated in terms of its importance for foraging shags through systematic land-based monitoring from several spots at the coast and through systematic monitoring of innermost coastal belt by slow-speed travelling boat.

The standard IBA criteria used for site justification require two conditions to be met: (1) regular use, and (2) threshold number of individuals utilizing the site. For the purpose of marine IBA justification, the regularly used areas were defined as areas visited by birds from more than one site or during different periods (i.e. seasons or years) (BirdLife International 2010b).

Regular use of the IBA Osrednji Tržaški zaliv was demonstrated by repeated systematic censuses over the period of 13 months and two non-breeding seasons in 2012 and 2013. It was demonstrated that in both years the number of shags using the area exceeded 300 individuals in several months and that the average summer number over both years was above 300 individuals. It is of utmost importance to stress that these calculations do not take into account the turnover, i.e. the phenomenon that more birds are actually using the site over a period of time than the number of individuals recorded at any given moment during the census. The turnover rates for the foraging Mediterranean Shags in this study were not assessed and thus the true number of individuals using the IBA within one season cannot be estimated, but it could be considerably higher than the estimated numbers. This is very important to consider in the attempts to compare these estimated numbers against the size of the roosting population, acquired by total counts of static individuals within the roost-site monitoring. Moreover, the first few censuses implemented in 2012 (from July to September) were not conducted in the optimal time of the day, as their starting time was too early. Based on the data from a few all-day monitorings of the communal roots-sites, conducted after the onset of ESAS monitoring (Bordjan *et al.* 2013, Pavletič 2013, Rozman 2012), the optimal time for at-sea census in the peak non-breeding season is between 10 a.m. and 4 p.m. It was estimated that 48–70% shags were staying at the roost-sites during the first hour of the censuses that started around 8 a.m., 31–43% in the first hour of censuses starting around 9 a.m. and only 13–28% in the first hour of censuses started between 10–11 a.m. (*own unpublished data*). Based on these data we conclude that the estimated number of shags censuses between July and September 2012 does not reflect the peak diurnal numbers of shags in the IBA Osrednji Tržaški zaliv.

The estimated number of shags in the IBA Osrednji Tržaški zaliv and even in the entire target area was well below 300 individuals in two of the eight censuses during peak non-breeding season (September and October 2012), although the number of roosting population was at its highest level. These low estimated numbers of shags at sea coincide with the autumn period when the shags frequently formed large groups and foraged on schools of small pelagic fish in the shallow coastal waters. These groups were often formed of 100 or more individuals, and nine such cases were reported in September and October 2012 (max. 230 individuals in one group) only in random observations. Since the large groups foraging in the innermost coastal belt might have been overlooked from the ESAS census boat, this seasonal phenomenon could explain the lower numbers of shags in the autumn peak non-breeding season months, estimated based on the ESAS dataset.

The IBA Debeli rtič has been estimated to hold about 800 roosting individuals in the 2006–2011 period (Denac *et al.* 2011). In this study, however, a maximum of 532 and 610 individuals were registered during the peak non-breeding seasons in 2012 and 2013, respectively. The roost-site itself meets IBA criteria, but the extension can also be justified as an important foraging area. The shags tend to form large foraging groups around this roost-site, diving after schools of small pelagic fish along the coast outside the original IBA borders. Two groups of 300 and 310 individuals were observed in the area in two different years, proving that the numerical threshold has been met without even considering the turnover rates. Regular use of the extension to the existing IBA was demonstrated by both types of data used for its delineation. The large groups of 130 or more individuals were observed in the area in four different years and the area was visited by shags from two different roost-sites as revealed by the GPS telemetry data.

Least but not last, the results of this study should be viewed on the spatial scale of the entire Gulf of Trieste. The non-breeding population of the Mediterranean Shags within this region cannot be partitioned to national fragments. Although the identification of marine IBAs for the Mediterranean Shag was limited to the Slovenian territorial sea within the scope of the SIMARINE-NATURA (LIFE10NAT/SI/141) project, the data collected in this study as well as previous knowledge about the distribution of Mediterranean Shags in the region call for the identification of complementary sites within the Italian waters or transboundary sites spanning across the political borders.

Povzetek

Omrežje IBA redno posodabljamo na osnovi novih podatkov in njihove boljše kakovosti. V Sloveniji smo morska območja IBA v preteklosti opredelili v treh fazah, vendar je bil sredozemski vranjek vključen kot kvalifikacijska vrsta le v zadnji fazi leta 2011. Toda ker so bila območja omejena na njegova obalna prenočišča, niso zadostovala za pokrivanje prehranjevalnih območij te vrste. Da bi zapolnili to vrzel v slovenskem teritorialnem morju, smo v okviru projekta SIMARINE-NATURA (LIFE10NAT/SI/141) v obdobju 2011–2015 opredelili nova morska območja IBA za sredozemskega vranjeka, in sicer po standardizirani metodologiji naravovarstvene organizacije BirdLife International za opredelitev morskih območij IBA. Podatki o razširjenosti in velikosti populacij sredozemskega vranjeka so bili zbrani z naslednjimi terenskimi metodami: (1) mesečnim monitoringom na skupnih obalnih prenočiščih, (2) mesečnim monitoringom na morju po standardizirani metodi ESAS, (3) z GPS-telemetrijo, in (4) nesistematičnim štetjem obalnih skupin plavajočih osebkov. Na osnovi teh podatkov smo opredelili eno novo območje, IBA Osrednji Tržaški zaliv, in razširitev že obstoječega IBA Debeli rtič, ki pokrivata 8218 oziroma 155 ha. Novi območji tako pokrivata 39,2 % slovenskega teritorialnega morja.

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Poročilo o obročkanju ptic v Sloveniji v letu 2017 in kratek pregled barvnega obročkanja v obdobju 2012–2017

Bird ringing report for Slovenia in 2017 and short overview of colour ringing in the period of 2012–2017

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In 2017, the Slovenian bird ringing scheme concluded 90 years of continuous ringing in the country. In 2017, we collected data on 176 bird species. We ringed 79,886 birds of 164 species, recorded 177 recoveries of birds ringed in Slovenia and found abroad, 295 foreign recoveries in Slovenia and 2,209 local recoveries. The most ringed species were the Blackcap *Sylvia atricapilla* and Great Tit *Parus major* and, among pulli in the nest, the Great Tit, White Stork *Ciconia ciconia* and Barn Swallow *Hirundo rustica*. In 2017, 12 colour ringing schemes were active in Slovenia. In the 2012-2017 period, the number of recoveries of birds ringed in Slovenia and found abroad increased significantly due to colour ringing, especially regarding the waterbirds. With colour ringing, the likelihood of recoveries is considerably greater (75.20 ± 91.36 recoveries per 100 ringed birds) than with metal ringing only (0.11 ± 0.08 recoveries per 100 ringed birds). Among local recoveries, the most frequent were the Mute Swans *Cygnus olor* and Common Terns *Sterna hirundo*, and among foreign recoveries the Black-headed Gulls *Chroicocephalus ridibundus* predominated. In 2017, the first Broad-billed Sandpiper *Calidris falcinellus* was ringed in Slovenia (Sečovlje salinas), and additional three rare species were ringed as well: the Yellow-browed Warbler *Phylloscopus inornatus* (Ljubljansko barje), Paddyfield Warbler *Acrocephalus agricola* (Ljubljansko barje) and Little Bunting *Emberiza pusilla* (Šentrupert).

Key words: bird ringing, recoveries, Slovenia, 2017, colour ringing
Ključne besede: obročkanje, najdbe, Slovenija, 2017, barvno obročkanje

1. Uvod

Leto 2017 je bilo za slovensko obročkovalno dejavnost jubilejno, saj smo sklenili 90. sezono neprekinjene obročkovalne dejavnosti v Sloveniji (Gregori 2017), ki smo jo v okviru Slovenskega centra za obročkanje ptičev (SCOP) pri Kustodiatu za vretenčarje Prirodoslovnega muzeja Slovenije (PMS) tudi posebej obeležili z dogodki (Vrezec & Fekonja 2017a, Petras & Vrh Vrezec 2018) in s prevodom EURINGove knjižice (Baillie & Kestenholz 2017). Leta 1926 je bil namreč v Ljubljani ustanovljen Ornitološki observatorij, ki je že v drugem letu svojega delovanja, torej leta 1927, začel z organizirano dejavnostjo obročkanja ptic v raziskovalne namene pod vodstvom takratne gonilne sile obročkovalske in ornitološke dejavnosti na Slovenskem, dr. Jankom Ponebškom (Gregori 2017). Pred 90 leti pa ptic niso začeli le obročkati, pač pa beležiti podatke o njihovih opazovanjih tako, da so k delu poleg profesionalnih ornitologov pritegnili tudi ljubitelje ptic, ki so danes organizirani v okviru leta 1979 nastalega Društva za opazovanje in proučevanje ptic Slovenije (DOPPS-BirdLife Slovenia). Pričujoče poročilo za leto 2017 je tako še en prispevek k dolgi tradiciji obročkanja prosto živečih ptic pri nas v raziskovalne namene in dopolnjuje predhodna obročkovalska poročila (Ponebšek 1934, Božič 1980a, b, c, 1981, 1982, 1985, Šere 2009, Vrezec *et al.* 2013, 2014, 2015, Vrezec & Fekonja 2016, 2017b). V prispevku podajamo pregled števila obročkanih ptic v Sloveniji po vrstah v letu 2017, pregled redkih vrst, ugotovljenih v okviru slovenske obročkovalske sheme, ter pregled razrešenih domačih ter tujih najdb za leto 2017 ter dopolnila za leti 2015 in 2016 (dopolnilo poročil Vrezec & Fekonja 2016, 2017b).

2. Metode

Leta 2017 je bilo v okviru obročkovalne sheme SCOP dejavnih 93 obročkovalcev. Ti so imeli na podlagi dovoljenja za obročkanje ptic št. 35601-10/2010-6, ki ga je PMS-u izdala Agencija RS za okolje (ARSO), s PMS sklenjene letne pogodbe o sodelovanju. Obročkovalci so na terenu uporabljali različne pristope lova in obročkanja ptic glede na obstoječe obročkovalne sheme (Vrezec & Fekonja 2017b). Večji del obročkovalne dejavnosti so opravili prostovoljni zunanji sodelavci Prirodoslovnega muzeja Slovenija, manjši del pa je bil opravljen v okviru raziskovalnih projektov in monitoringa na različnih slovenskih inštitucijah, ki se ukvarjajo z ornitološkimi raziskavami: Društvo za opazovanje in proučevanje ptic Slovenije (DOPPS), Krajinski park Sečoveljske soline (KPSS), Nacionalni inštitut za biologijo (NIB) in Prirodoslovni muzej Slovenije (PMS). V letu 2017 je bilo dejavnih tudi 12 shem za barvno obročkanje (tabela 1). S sledilnimi

Tabela 1: Pregled barvnih obročkovalnih shem, ki so potekale v Sloveniji v letu 2017 v okviru različnih inštitucij: Društvo za opazovanje in proučevanje ptic Slovenije (DOPPS), Krajinski park Sečoveljske soline (KPSS) in Prirodoslovni muzej Slovenije (PMS)

Table 1: An overview of active colour ringing schemes in Slovenia in 2017 conducted by different organizations: DOPPS–BirdLife Slovenia (DOPPS), Sečovlje Salina Nature Park (KPSS), and Slovenian Museum of Natural History (PMS)

Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	Barvni obroček/ Colour ring	Kraj obročkanja/ Ringing site	Vodja sheme/ Coordinator	Inštitucija/ Institution
Labod grbec	*Cygnus olor*	rdeč nožni obroček s kodo / red coded legring	Maribor, Zbilje	Dare Fekonja	PMS
Bela štorklja	*Ciconia ciconia*	ELSA	Slovenija	Damijan Denac	DOPPS
Sabljarka	*Recurvirostra avosetta*	beli nožni obroček s kodo / white coded legring	Sečoveljske soline	Iztok Škornik	KPSS
Mali deževnik	*Charadrius dubius*	kombinacija nožnih barvnih obročkov/ combination of uncoded legrings	Drava	Luka Božič	DOPPS
Beločeli deževnik	*Charadrius alexandrinus*	bel nožni obroček s kodo / white coded legring	Sečoveljske soline	Iztok Škornik	KPSS
Rečni galeb	*Chroicocephalus ridibundus*	beli nožni obroček s kodo / white coded legring	Ptujsko jezero	Borut Štumberger	PMS
Mala čigra	*Sternula albifrons*	bel nožni obroček s kodo / white coded legring	Sečoveljske soline	Iztok Škornik	KPSS
Navadna čigra	*Sterna hirundo*	bel in moder nožni obroček s kodo / white and blue coded legring	Sečoveljske soline, Škocjanski zatok	Iztok Škornik	KPSS

Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	Barvni obroček/ Colour ring	Kraj obročkanja/ Ringing site	Vodja sheme/ Coordinator	Inštitucija/ Institution
Postovka	*Falco tinnunculus*	črn nožni obroček s kodo / black coded legring	Ljubljana z okolico	Dare Fekonja	PMS
Veliki srakoper	*Lanius excubitor*	kombinacija nožnih barvnih obročkov / combination of uncoded legrings	Ljubljansko barje	Dare Fekonja	PMS
Kavka	*Coloeus monedula*	bel nožni obroček s kodo / white coded legring	Vrhnika	Dare Fekonja	PMS
Planinska kavka	*Pyrrhocorax graculus*	moder nožni obroček s kodo / blue coded legring	Gorenjska	Dare Fekonja	PMS

napravami smo v letu 2017 sledili premikom kozač *Strix uralensis* z napravo GPS-GSM (NIB).

3. Rezultati in diskusija

3.1. Pregled obročkovalne dejavnosti

Leta 2017 je bilo obročkanih 79.886 ptic 164 vrst (tabela 2), od tega je bilo v gnezdih obročkanih 1.400 mladičev 43 vrst.

Leta 2017 smo v gnezdih obročkali največ mladičev velikih sinic *Parus major* (18,2 %), belih štorkelj *Ciconia ciconia* (14,4 %) in kmečkih lastovk *Hirundo rustica* (12,3 %), nad 100 pa smo obročkali še mladiče poljskih vrabcev *Passer montanus* (tabela 3). Pri obročkanju odraslih oziroma doraslih ptic smo v večji meri obročkali črnoglavke *Sylvia atricapilla* (18,6 %) in velike sinice (10,0 %), nad 1000 obročkanih osebkov pa je bilo še čižkov *Spinus spinus*, bičjih trstnic *Acrocephalus schoenobaenus*,

Tabela 2: Pregled števila obročkanih ptic (mladičev v gnezdu in doraslih ptic zunaj gnezda) in števila najdenih obročkanih ptic v Sloveniji v letu 2017. Tuje najdbe so na tujem obročkane ptice, zabeležene v Sloveniji, domače najdbe so v Sloveniji obročkane ptice, ponovno ujete v tujini, in lokalne najdbe so v Sloveniji obročkane in ponovno v Sloveniji zabeležene ptice.

Table 2: Birds ringed in Slovenia (nestlings and full-grown birds outside nest) and recoveries of ringed birds in 2017. Foreign recoveries in SLO are birds ringed abroad and later recorded in Slovenia, SLO recoveries abroad are birds ringed in Slovenia and later recorded abroad. Local recoveries are birds ringed in Slovenia and recaptured or resighted in Slovenia.

		Obročkanje / Ringing			Najdbe / Finds		
Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	mladiči/ nestlings	ostalo/ other	skupaj/ total	Tuje v SLO/ Foreign in SLO	Domače na tujem/ SLO abroad	Lokalne/ Local
Labod grbec	*Cygnus olor*		92	92	20	76	190
Siva gos	*Anser anser*				1		
Kreheljc	*Anas crecca*		2	2			
Mlakarica	*Anas platyrhynchos*		25	25			1
Čopasta črnica	*Aythya fuligula*				1		
Veliki žagar	*Mergus merganser*		4	4			
Prepelica	*Coturnix coturnix*		54	54			2
Fazan	*Phasianus colchicus*		1	1			

		Obročkanje / Ringing			Najdbe / Finds		
Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	mladiči/ nestlings	ostalo/ other	skupaj/ total	Tuje v SLO/ Foreign in SLO	Domače na tujem/ SLO abroad	Lokalne/ Local
Črna štorklja	*Ciconia nigra*				1		
Bela štorklja	*Ciconia ciconia*	202		202	5	5	5
Čapljica	*Ixobrychus minutus*		11	11			1
Velika bela čaplja	*Ardea alba*				5		
Žličarka	*Platalea leucorodia*				1		
Kormoran	*Phalacrocorax carbo*				4		
Vranjek	*Phalacrocorax aristotelis*						3
Rjavi škarnik	*Milvus milvus*				1		
Skobec	*Accipiter nisus*		16	16			
Kanja	*Buteo buteo*		2	2			
Mokož	*Rallus aquaticus*		23	23			1
Kosec	*Crex crex*		15	15			2
Grahasta tukalica	*Porzana porzana*		15	15			
Mala tukalica	*Porzana parva*		10	10			
Zelenonoga tukalica	*Gallinula chloropus*		3	3			
Žerjav	*Grus grus*				1		
Sabljarka	*Recurvirostra avosetta*	1		1			1
Priba	*Vanellus vanellus*	3		3			
Mali deževnik	*Charadrius dubius*	44	8	52			76
Beločeli deževnik	*Charadrius alexandrinus*		3	3		1	14
Komatni deževnik	*Charadrius hiaticula*		4	4			
Mali prodnik	*Calidris minuta*		5	5			
Temminckov prodnik	*Calidris temminckii*		2	2			
Spremenljivi prodnik	*Calidris alpina*		5	5			
Ploskokljunec	*Calidris falcinellus*		1	1			
Puklež	*Lymnocryptes minimus*		1	1			
Kozica	*Gallingo gallinago*		9	9			
Sloka	*Scolopax rusticola*		1	1			
Rdečenogi martinec	*Tringa totanus*		1	1			
Zelenonogi martinec	*Tringa nebularia*		9	9			2
Pikasti martinec	*Tringa ochropus*		12	12			
Močvirski martinec	*Tringa glareola*		17	17	1		
Mali martinec	*Actitis hypoleucos*		80	80			1
Rečni galeb	*Chroicocephalus ridibundus*	40	7	47	163	8	56
Sivi galeb	*Larus canus*				2		

		Obročkanje / Ringing			Najdbe / Finds		
Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	mladiči/ nestlings	ostalo/ other	skupaj/ total	Tuje v SLO/ Foreign in SLO	Domače na tujem/ SLO abroad	Lokalne/ Local
Rumenonogi galeb	*Larus michahellis*	4	4	8	8		
Črnomorski galeb	*Larus cachinnans*				21		
Navadna čigra	*Sterna hirundo*	49	1	50	6	29	2
Mala čigra	*Sternula albifrons*	12		12			
Domači golob	*Columba livia domestica*		3	3			
Divja grlica	*Streptopelia turtur*		5	5		1	
Turška grlica	*Streptopelia decaocto*	4	43	47			
Kukavica	*Cuculus canorus*		4	4			
Mali skovik	*Glaucidium passerinum*		3	3			
Veliki skovik	*Otus scops*	63	106	169			5
Lesna sova	*Strix aluco*	52	12	64			6
Kozača	*Strix uralensis*	31	4	35			5
Čuk	*Athene noctua*		3	3			1
Koconogi čuk	*Aegolius funereus*	7	11	18			
Mala uharica	*Asio otus*		5	5			
Podhujka	*Caprimulgus europaeus*		29	29			
Hudournik	*Apus apus*	14	6	20			1
Vodomec	*Alcedo atthis*		174	174			43
Čebelar	*Merops apiaster*		100	100		2	15
Smrdokavra	*Upupa epops*	9	7	16			
Vijeglavka	*Jynx torquilla*		258	258			10
Mali detel	*Dryobates minor*		26	26			
Srednji detel	*Dendrocoptes medius*		5	5			
Veliki detel	*Dendrocopos major*		131	131			9
Črna žolna	*Dryocopus martius*		4	4			
Zelena žolna	*Picus viridis*		12	12			
Pivka	*Picus canus*		15	15			1
Postovka	*Falco tinnunculus*	11	7	18	1	1	3
Rdečenoga postovka	*Falco vespertinus*		4	4			
Rjavi srakoper	*Lanius collurio*		201	201			1
Veliki srakoper	*Lanius excubitor*		15	15			25
Črnočeli srakoper	*Lanius minor*		2	2			
Kobilar	*Oriolus oriolus*		11	11			
Šoja	*Garrulus glandarius*		32	32			4
Sraka	*Pica pica*		15	15			

		Obročkanje / Ringing			Najdbe / Finds		
Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	mladiči/ nestlings	ostalo/ other	skupaj/ total	Tuje v SLO/ Foreign in SLO	Domače na tujem/ SLO abroad	Lokalne/ Local
Planinska kavka	*Pyrrhocorax graculus*		14	14			35
Kavka	*Coloeus monedula*	2		2			
Siva vrana	*Corvus cornix*	4	4	8			1
Krokar	*Corvus corax*						1
Meniščck	*Periparus ater*	6	2161	2167			59
Čopasta sinica	*Lophophanes cristatus*	6	164	170			7
Močvirska sinica	*Poecile palustris*		459	459			56
Gorska sinica	*Poecile montanus*		73	73			4
Plavček	*Cyanistes caeruleus*	86	3175	3261	2	3	157
Velika sinica	*Parus major*	255	7875	8130	2	2	456
Plašica	*Remiz pendulinus*		233	233	1	2	4
Brkata sinica	*Panurus biarmicus*		2	2	2		
Breguljka	*Riparia riparia*		1644	1644	4		180
Kmečka lastovka	*Hirundo rustica*	172	837	1009		2	
Skalna lastovka	*Ptyonoprogne rupestris*	4		4			
Mestna lastovka	*Delichon urbicum*		38	38			
Svilnica	*Cettia cetti*		15	15		1	
Brškinka	*Cisticola juncidis*		4	4			
Dolgorepka	*Aegithalos caudatus*		684	684			46
Mušja listnica	*Phylloscopus inornatus*		1	1			
Hribska listnica	*Phylloscopus bonelli*		5	5			
Severni kovaček	*Phylloscopus trochilus*		331	331	1		
Vrbji kovaček	*Phylloscopus collybita*		2233	2233	1	2	7
Grmovščica	*Phylloscopus sibilatrix*		431	431			
Rakar	*Acrocephalus arundinaceus*	34	459	493	2	1	14
Tamariskovka	*Acrocephalus melanopogon*		39	39	1		2
Bičja trstnica	*Acrocephalus schoenobaenus*		4869	4869	16	4	21
Srpična trstnica	*Acrocephalus scirpaceus*		4515	4515	5	13	11
Močvirska trstnica	*Acrocephalus palustris*		994	994	1	1	16
Plevelna trstnica	*Acrocephalus agricola*		1	1			
Kratkoperuti vrtnik	*Hippolais polyglotta*		3	3			
Rumeni vrtnik	*Hippolais icterina*		169	169			
Kobiličar	*Locustella naevia*		119	119			
Rečni cvrčalec	*Locustella fluviatilis*		19	19			2
Trstni cvrčalec	*Locustella luscinioides*		94	94			3

		Obročkanje / Ringing			Najdbe / Finds		
Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	mladiči/ nestlings	ostalo/ other	skupaj/ total	Tuje v SLO/ Foreign in SLO	Domače na tujem/ SLO abroad	Lokalne/ Local
Črnoglavka	*Sylvia atricapilla*	5	14.585	14.590	4	8	161
Vrtna penica	*Sylvia borin*		3519	3519	1		10
Pisana penica	*Sylvia nisoria*		9	9			
Mlinarček	*Sylvia curruca*		165	165		1	1
Rjava penica	*Sylvia communis*		331	331			8
Taščična penica	*Sylvia cantillans*		1	1			
Žametna penica	*Sylvia melanocephala*		1	1			
Rdečeglavi kraljiček	*Regulus ignicapilla*		155	155			5
Rumenoglavi kraljiček	*Regulus regulus*		1631	1631			21
Stržek	*Troglodytes troglodytes*		125	125			1
Brglez	*Sitta europaea*	22	212	234			32
Dolgoprsti plezalček	*Certhia familiaris*		45	45			3
Kratkoprsti plezalček	*Certhia brachydactyla*		28	28			1
Škorec	*Sturnus vulgaris*	38	502	540			3
Kos	*Turdus merula*	15	868	883		3	48
Komatar	*Turdus torquatus*	10	1	11			
Brinovka	*Turdus pilaris*		6	6			
Vinski drozg	*Turdus iliacus*		32	32		1	
Cikovt	*Turdus philomelos*	2	319	321			1
Carar	*Turdus viscivorus*	1	3	4			
Sivi muhar	*Muscicapa striata*	9	67	76			2
Taščica	*Erithacus rubecula*		3750	3750	2	4	54
Modra taščica	*Luscinia svecica*		41	41			
Veliki slavec	*Luscinia luscinia*		12	12			
Slavec	*Luscinia megarhynchos*		228	228			6
Črnoglavi muhar	*Ficedula hypoleuca*		375	375			5
Belovrati muhar	*Ficedula albicollis*	6	3	9	1		2
Šmarnica	*Phoenicurus ochruros*	14	73	87			
Pogorelček	*Phoenicurus phoenicurus*	3	76	79			
Repaljščica	*Saxicola rubetra*		48	48			
Prosnik	*Saxicola rubicola*	7	88	95			9
Kupčar	*Oenanthe oenanthe*	9	5	14			
Povodni kos	*Cinclus cinclus*	5	5	10			1
Domači vrabec	*Passer domesticus*		582	582			14
Italijanski vrabec	*Passer italiae*		1	1			1
Poljski vrabec	*Passer montanus*	122	1232	1354			21

		Obročkanje / Ringing			Najdbe / Finds		
Slovensko ime/ Slovene name	Latinsko ime/ Scientific name	mladiči/ nestlings	ostalo/ other	skupaj/ total	Tuje v SLO/ Foreign in SLO	Domače na tujem/ SLO abroad	Lokalne/ Local
Domači vrabec x poljski vrabec	*Passer domesticus x Passer montanus*		1	1			
Siva pevka	*Prunella modularis*		4293	4293	2		11
Rumena pastirica	*Motacilla flava*		17	17			2
Siva pastirica	*Motacilla cinerea*		16	16			
Bela pastirica	*Motacilla alba*	9	17	26			
Drevesna cipa	*Anthus trivialis*		113	113			1
Mala cipa	*Anthus pratensis*		6	6			
Vriskarica	*Anthus spinoletta*	5	4	9			
Planinski vrabec	*Montifringilla nivalis*		1	1			
Ščinkavec	*Fringilla coelebs*		642	642		1	7
Pinoža	*Fringilla montifringilla*		217	217			
Dlesk	*Coccothraustes coccothraustes*		182	182			5
Kalin	*Pyrrhula pyrrhula*		290	290			9
Škrlatec	*Carpodacus erythrinus*		10	10			
Zelenec	*Chloris chloris*	3	1684	1687	1	2	20
Repnik	*Linaria cannabina*		152	152			
Brezovček	*Acanthis flammea*		26	26			
Krivokljun	*Loxia curvirostra*		42	42		1	
Lišček	*Carduelis carduelis*		1425	1425	1		35
Grilček	*Serinus serinus*		307	307		1	17
Čižek	*Spinus spinus*		5705	5705	1	1	105
Veliki strnad	*Emberiza calandra*		5	5			
Rumeni strnad	*Emberiza citrinella*		177	177			16
Skalni strnad	*Emberiza cia*		21	21			
Mali strnad	*Emberiza pusilla*		1	1			
Plotni strnad	*Emberiza cirlus*		30	30			2
Trstni strnad	*Emberiza schoeniclus*		618	618	3		1
Skupaj/Total		1400	78.486	79.886	296	177	2209

srpičnih trstnic *A. scirpaceus*, sivih pevk *Prunella modularis*, taščic *Erithacus rubecula*, vrtnih penic *Sylvia borin*, plavčkov *Cyanistes caeruleus*, vrbjih kovačkov *Phylloscopus collybita*, meniščkov *Periparus ater*, zelencev *Chloris chloris*, breguljk *Riparia riparia*, rumenoglavih kraljičkov *Regulus regulus*, liščkov *Carduelis carduelis* in poljskih vrabcev (tabela 3).

3.2 Pregled najdb

Leta 2017 smo zabeležili 2682 najdb, od tega je bilo 82 % najdb lokalnih. Najdbe obročkanih ptic v povezavi s tujino smo zbrali iz 20 držav (tabela 4), pri čemer smo jih največ zabeležili iz Hrvaške. Med tujimi najdbami so prevladovali rečni galebi *Chroicocephalus ridibundus* (55,2 %), nad 10 najdb

Tabela 3: Pregled najpogostejših vrst obročkanih in ponovno zabeleženih ptic v Sloveniji leta 2017. Prikazane so vrste z več kot 1 % obročkanih osebkov v posamezni kategoriji po padajočem številu osebkov. N – število vrst.

Table 3: An overview of the most numerous species among ringed birds and recoveries in Slovenia in 2017. Species with more than 1% of individuals in a given category are shown in decreasing order of abundance. N – number of species.

V gnezdu / In nest (N=43)	**Zunaj gnezda/ Outside nest (N=158)**	**Tuje v SLO/ Foreign in SLO (N=38)**	**Domače na tujem/ SLO abroad (N=28)**	**Lokalne/Local (N=85)**
Parus major	*Sylvia atricapilla*	*Chroicocephalus ridibundus*	*Cygnus olor*	*Parus major*
Ciconia ciconia	*Parus major*	*Larus cachinnans*	*Sterna hirundo*	*Cygnus olor*
Hirundo rustica	*Spinus spinus*	*Cygnus olor*	*Acrocephalus scirpaceus*	*Riparia riparia*
Passer montanus	*Acrocephalus schoenobaenus*	*Acrocephalus schoenobaenus*	*Chroicocephalus ridibundus*	*Sylvia atricapilla*
Cyanistes caeruleus	*Acrocephalus scirpaceus*	*Larus michahellis*	*Sylvia atricapilla*	*Cyanistes caeruleus*
Otus scops	*Prunella modularis*	*Sterna hirundo*	*Ciconia ciconia*	*Spinus spinus*
Strix aluco	*Erithacus rubecula*	*Ardea alba*	*Acrocephalus schoenobaenus*	*Charadrius dubius*
Sterna hirundo	*Sylvia borin*	*Ciconia ciconia*	*Erithacus rubecula*	*Periparus ater*
Charadrius dubius	*Cyanistes caeruleus*	*Acrocephalus scirpaceus*	*Cyanistes caeruleus*	*Chroicocephalus ridibundus*
Chroicocephalus ridibundus	*Phylloscopus collybita*	*Phalacrocorax carbo*	*Turdus merula*	*Poecile palustris*
Sturnus vulgaris	*Periparus ater*	*Riparia riparia*	*Parus major*	*Erithacus rubecula*
Acrocephalus arundinaceus	*Chloris chloris*	*Sylvia atricapilla*	*Remiz pendulinus*	*Turdus merula*
Strix uralensis	*Riparia riparia*	*Emberiza schoeniclus*	*Phylloscopus collybita*	*Aegithalos caudatus*
Sitta europaea	*Regulus regulus*		*Chloris chloris*	*Alcedo atthis*
Turdus merula	*Carduelis carduelis*		*Merops apiaster*	*Pyrrhocorax graculus*
	Passer montanus		*Hirundo rustica*	*Carduelis carduelis*
	Acrocephalus palustris			*Sitta europaea*
	Turdus merula			*Lanius excubitor*
	Hirundo rustica			

pa smo zabeležili še pri črnomorskem galebu *Larus cachinnans*, labodu grbcu *Cygnus olor* in bičji trstnici (tabela 3). Opazujemo že več let trajajoči trend, pri katerem se znatno povečujejo tuje najdbe pri vrstah, obročkanih z barvnimi obročki, ki jih je mogoče prebrati na daljavo. Tako je vključenih več sodelavcev, tudi neobročkovalcev, predvsem pa pridobivamo podatke o vrstah, ki so bile pri nas malo znane oziroma jih še nikoli pri nas nismo obročkali, kakršen je črnomorski galeb, ki je bil pri nas prvič ugotovljen šele leta 1994 (Rubinič 1997).

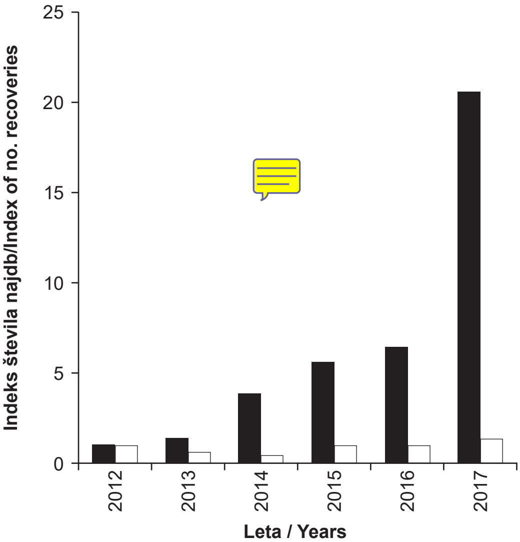
Med domačimi najdbami so prevladovale najdbe barvno obročkanih labodov grbcev (42,9 %) in navadnih čiger (16,4 %), čez deset najdb pa je bilo še bičjih trstnic (tabela 3). Med najdbami so v letu 2017 po razdaljah zbujali pozornost severni kovaček *Phylloscopus trochilus* iz 2540 km oddaljenega okrožja Murmansk v Rusiji (najditelj Dejan Grohar), črnoglavka, ki so jo ponovno na spomladanski selitvi ujeli 2386 km daleč v Izraelu (obročkovalec Peter Grošelj) in mlinarček *Sylvia curruca* iz 1582 km oddaljenega kraja na Švedskem (obročkovalec Franc Bračko). Zanimiva je tudi najdba prvoletnega belovratega muharja *Ficedula albicollis* na jesenski selitvi (najditelj Brane Lapanja), ki izvira iz najsevernejše gnezdeče evropske populacije s švedskega otoka Gotland v Baltiškem morju (Lundberg 1997). Med najdbami stopa v ospredje tudi precej najdb srpičnih trstnic iz Španije, saj je bila med 17 razrešenimi domačimi/

Tabela 4: Pregled držav glede na domače in tuje najdbe obročkanih ptic v letu 2017

Table 4: An overview of countries by the number of birds ringed or recovered in and outside Slovenia in 2017

Država / Country	Domače najdbe na tujem/ SLO recoveries abroad	Tuje najdbe v SLO/ Foreign recoveries in SLO	Skupaj / Total
Hrvaška	15	149	164
Madžarska	28	47	75
Poljska	30	31	61
Italija	44	14	58
Češka	13	17	30
Španija	15	4	19
Avstrija	15	3	18
Nemčija	2	7	9
Francija	5	1	6
Švedska	2	4	6
Slovaška	4	1	5
Litva	1	4	5
Belorusija		4	4
Finska		3	3
Rusija		3	3
Švica		2	2
Belgija	1	1	2
Ukrajina		1	1
Turčija	1		1
Izrael	1		1
Skupaj	177	296	473

tujimi najdbami večina (71 %) v povezavi s Španijo. V Španiji pa očitno prezimujejo tudi pri nas gnezdeči rečni galebi, kakršen je primer letošnjega mladiča s Ptujskega jezera, ki so ga pozimi (november, december) opazovali 1440 km daleč v Zaragozi (obročkovalec Borut Štumberger). V letu 2017 smo zabeležili dve starostno zanimivi najdbi, in sicer vsaj 10 let starega močvirskega martinca *Tringa glareola*, obročkanega leta 2007 v Italiji in



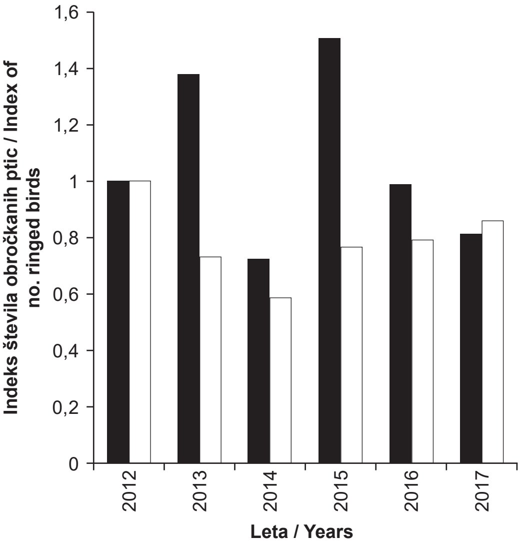
Slika 1: Medletne spremembe števila obročkanih ptic (prikazan je indeks števila, standardiziran glede na leto 2012) v obdobju 2012–2017 glede vrste, vključene v barvne obročkovalske sheme (črni stolpci; vključene vrste: labod grbec *Cygnus olor*, rečni galeb *Chroicocephalus ridibundus*, navadna čigra *Sterna hirundo*; N=1.506 obročkanih ptic), in vrste, obročkane zgolj s kovinskimi obročki (beli stolpci; vključene vrste: srpična trstnica *Acrocephalus scirpaceus*, bičja trstnica *A. schoenobaenus*, črnoglavka *Sylvia atricapilla*; N=132.444 obročkanih ptic).

Figure 1: Changes in the number of ringed birds between years (the standardized index according to the year 2012 is shown) in the period 2012-2017, taking into account species included in colour ringing schemes (black columns; included species: Mute Swan *Cygnus olor*, Black-headed Gull *Chroicocephalus ridibundus*, Common Tern *Sterna hirundo*; N=1.506 ringed birds) and species ringed only with metal rings (white columns; included species: Reed Warbler *Acrocephalus scirpaceus*, Sedge Warbler *A. schoenobaenus*, Blackcap *Sylvia atricapilla*; N=132.444 ringed birds)

ponovno ujetega v Hrašah (najditelj Žan Pečar), ter vsaj 7 let staro bičjo trstnico, obročkano leta 2010 na Švedskem in ponovno ujeto na Vrhniki (najditelj Brane Lapanja). V Evropi do sedaj najstarejši močvirski martinec je dočakal 11 let in 8 mesecev na Švedskem, najstarejša bičja trstnica pa je bila 11 let in 10 mesecev iz Danske (Fransson *et al.* 2017). Kot posebnost je tudi najdba kadavra prvoletnega rjavega škarnika *Milvus milvus* pri Logi pri Vipavi (najditelj Peter Krečič) s satelitskim oddajnikom, ki je bil del češkega programa daljinskega spremljanja rjavih škarnikov in je bil kot mladič v gnezdu obročkan istega leta na Češkem. Ptica je poginila zaradi trka z vozilom in je sedaj shranjena v Prirodoslovnem muzeju Slovenije (akcesijska št. 2017/460). Celoten pregled razrešenih domačih in tujih najdb je podan v Dodatku 1.

Pri domačih najdbah se podobno kot pri tujih najdbah kaže visok trend povečevanja števila najdb na račun vzpostavljenih barvnih obročkovalskih shem. Med letoma 2012 in 2017 so v Sloveniji delovale barvne obročkovalske sheme za skupno 19 vrst, med njimi v vseh šestih letih za tri vrste, beločelega deževnika *Charadrius alexandrinus*, navadno čigro in postovko *Falco tinnunculus*. Glede na število domačih najdb so bile v letu 2017 med barvno obročkanimi pticami najmočnejše vodne vrste, labod grbec, rečni galeb in navadna čigra s skupno 268 domačimi najdbami v letu 2017. Med vrstami, ki jih obročkamo zgolj s kovinskimi obročki, so bile glede na domače najdbe najmočnejše vrste srpična trstnica, bičja trstnica in črnoglavka s skupno 25 domačimi najdbami v letu 2017. Glede omenjenih šest vrst se število obročkanih ptic ni bistveno spremenilo med letoma 2012 in 2017 s sicer bistveno večjim letnim odstopanjem pri pticah, vključenih v barvno obročkanje (slika 1), bistvena razlika pa je pri število domačih najdb, ki pri barvno obročkanih vrstah strmo narašča (slika 2). Z barvnim obročkanjem se namreč število najdb skokovito poveča s povprečno učinkovitostjo 75,20±91,36 najdb/100 obročkanih ptic, medtem ko je zgolj pri obročkanju s kovinskim obročkom učinkovitost precej nižja z 0,11±0,08 najdb/100 obročkanih ptic. Uvajanje barvnih obročkovalnih shem je zato izredno smiselno, žal pa ni uporabno za vse vrste zaradi njihove velikosti in načina življenja ter možnosti branja barvnih obročkov na daljavo. Zaradi tega bo pri večini manjših ptic pevk, ki jih označujemo s kovinskimi obročki, to do nadaljnjega še vedno edini način označevanja.

Med lokalnimi najdbami so v letu 2017 prevladovale najdbe velikih sinic (20,6 %), več kot 100 najdb pa smo zabeležili še pri labodu grbcu, breguljki, črnoglavki, plavčku in čižku *Spinus spinus* (tabela 3).



Slika 2: Medletne spremembe števila domačih najdb (prikazan je indeks števila, standardiziran glede na leto 2012) v obdobju 2012-2017 glede vrste, vključene v barvne obročkovalske sheme (črni stolpci; vključene vrste: labod grbec *Cygnus olor*, rečni galeb *Chroicocephalus ridibundus*, navadna čigra *Sterna hirundo*; N=507 najdb) in vrste, obročkane zgolj s kovinskimi obročki (beli stolpci; vključene vrste: srpična trstnica *Acrocephalus scirpaceus*, bičja trstnica *A. schoenobaenus*, črnoglavka *Sylvia atricapilla*; N=101 najdba)

Figure 2: Between-years changes in the number of birds ringed in Slovenia and later recorded abroad (the standardized index according to the year 2012 is shown) in the period 2012-2017, taking into account species included in colour ringing schemes (black columns; included species: Mute Swan *Cygnus olor*, Black-headed Gull *Chroicocephalus ridibundus*, Common Tern *Sterna hirundo*; N=507 recoveries) and species ringed only with metal rings (white columns; included species: Reed Warbler *Acrocephalus scirpaceus*, Sedge Warbler *A. schoenobaenus*, Blackcap *Sylvia atricapilla*; N=101 recoveries)

3.3. Redke vrste

Leta 2017 so obročkovalci poročali o obročkanju štirih redkih vrst (tabela 5), ki so bile obročkane in izpuščene. Prvič je bil v Sloveniji obročkan ploskokljunec *Calidris falcinellus* (slika 3), ki je bil ujet v Sečoveljskih solinah med jesensko selitvijo (obročkal Tomaž Mihelič). Med drugimi obročkanimi redkostmi pa sta bili na Ljubljanskem barju ponovno ujeti mušja listnica *Phylloscopus inornatus* (obročkal Bogdan Vidic) in plevelna trstnica *Acrocephalus agricola* (tabela 5; obročkal Brane Lapanja). Obe vrsti sta bili na Ljubljanskem barju ujeti že v predhodnem letu 2016 (Vrezec & Fekonja 2016). Prav tako smo v letu 2017 ponovno obročkali malega strnada *Emberiza pusilla* (slika 4), ki ga je obročkal Jože Gračner.

Zahvala: Obročkovalno dejavnost, ki poteka v okviru Slovenskega centra za obročkanje ptic pod okriljem Prirodoslovnega muzeja Slovenije (PMS), in dogodke ob 90. obletnici obročkanja ptic v raziskovalne namene v Sloveniji je v letu 2017 podprlo Ministrstvo RS za kulturo. Dejavnost pa ne bi bila mogoča brez prostovoljnih in profesionalnih zunanjih sodelavcev PMS, ki so v letu 2017 obročkali ptice: Dušan Belingar, Dejan Bordjan, Ivo Božič, Luka Božič, Franc Bračko, Igor Brajnik, Jože Bricelj, Alfonz Colnar, Marjan Debelič, Dušan Dimnik, Jernej Figelj, Marjan Gobec, Jože Gračner, Dejan Grohar, Peter Grošelj, Vojko Havliček, Ludvik Jakopin, Marko Jankovič, Tone Jankovič, Milovan Keber, Branko Koren, Stane Kos, Brane Lapanja, Ivan Lipar, Anton Lisec, Tomaž Mihelič, Jože Nered, Žan Pečar, Miro Perušek, Dušan Petkovšek, Zdravko Podhraški, Mojca Podletnik, Dušan Pogačar, Milan Pustoslemšek, Aljaž Rijavec, Andrej Sovinc, Željko Šalamun, Dare Šere, Iztok Škornik, Polde Štricelj, Borut Štumberger, Rudolf Tekavčič, Tomi Trilar, Andrej Trontelj, Miro Vamberger, Bogdan Vidic, Jani Vidmar, Iztok Vreš, Davorin Vrhovnik in Ivan Zlobko. Poleg naštetih obročkovalcev so na center najdbe in opazovanja obročkanih ptic sporočili neobročkovalski sodelavci: Aleš Alijeski, Gregor Bernard, Vanesa Bezlaj, Blaž Blažič, Bojan Bratoz, Peter Černe, Damijan Denac, Gregor Domanjko, Matjaž Faris, Matej Gamser, Iztok Geister, Marijan Govedič, Juri Hanžel, Stanko Jamnikar, Vinka Kastelic, Katarina Kesič Dimic, Barbara Kink, Dušan

Tabela 5: Pregled obročkanih redkih vrst v Sloveniji v letu 2017

Table 5: Rare bird species ringed in Slovenia in 2017

Vrsta/ Species	Obroček/ Ring	Spol / Sex	Starost/ Age	Datum/ Date	Kraj/ Location	Obročkovalec/ Ringer	Foto/ Photo
Calidris falcinellus	VC 410			29.8.2017	Sečoveljske soline, Portorož	Tomaž Mihelič	Slika 3
Phylloscopus inornatus	KV 6355		1Y	27.10.2017	Črna vas, Ljubljana	Bogdan Vidic	da
Acrocephalus agricola	KT 90966		1Y	31.7.2017	Verd, Vrhnika	Brane Lapanja	ne
Emberiza pusilla	KV 33445	F	1Y	13.10.2017	Bistrica, Šentrupert	Jože Gračner	Slika 4

Slika 3: Ploskokljunec *Calidris falcinellus*, Sečoveljske soline, Portorož, Slovenija, 29. 8. 2017, obroček VC 410 (foto: Tomaž Mihelič)

Figure 3: Broad-billed Sandpiper *Calidris falcinellus*, Sečoveljske soline, Portorož, Slovenia, 29 Aug 2017, ring VC 410 (photo: Tomaž Mihelič)

Slika 4: Mali strnad *Emberiza pusilla*, Bistrica, Šentrupert, Slovenija, 13. 10. 2017, obroček KV 33445 (foto: Jože Gračner)

Figure 4: Little Bunting *Emberiza pusilla*, Medvedce, Pragersko, Slovenia, 13 Oct 2017, ring KV 33445 (photo: Jože Gračner)

Klenovšek, Stane Kljun, Danilo Kotnik, Simon Kovačič, Peter Krečič, Tomaž Kristofič, Branko Kromar, Mirko Kunšič, Bojana Lipej, Valibald Marič, Peter Maričič, Aleš Marsič, Matija Medved Mlakar, Aljaž Mulej, Franc Nagode, Jure Novak, Štefan Orban, Mirko Primorac, Tosja Pušenjak, Jože Rak, Bia Rakar, Franc Robič, S. Rudolf, Maks Sešlar, Laura Sgambita, Nataša Sivec, Vida Slavič, Robi Šiško, Danila Šraml, Zoran Vidrih, Tjaša Zagoršek, Anton Zalar in Miha Žvan.

Povzetek

V okviru obročkovalne dejavnosti v Sloveniji smo v jubilejnem 90. letu 2017 zbrali podatke o 176 vrstah ptic. Obročkali smo 79.886 ptic 164 vrst, zabeležili 177 domačih, 296 tujih in 2209 lokalnih najdb. Največ je bilo obročkanih črnoglavk *Sylvia atricapilla* in velikih sinic *Parus major*, med mladiči v gnezdu pa so prevladovale velike sinice, bele štorklje *Ciconia ciconia* in kmečke

lastovke *Hirundo rustica*. V letu 2017 je bilo v Sloveniji dejavnih 12 barvnih obročkovalnih shem. V obdobju 2012-2017 se je število domačih najdb bistveno povečalo na račun barvnega obročkanja, zlasti pri vodnih vrstah. Verjetnost najdbe pri barvnem obročkanju je namreč bistveno večja (75,20±91,36 najdb/100 obročkanih ptic) kot zgolj pri obročkanju s kovinskim obročkom (0,11±0,08 najdb/100 obročkanih ptic). Med domačimi najdbami so prevladovale najdbe labodov grbcev *Cygnus olor* in navadnih čiger *Sterna hirundo*, med tujimi pa rečnih galebov *Chroicocephalus ridibundus*. Med redkimi vrstami smo v letu 2017 prvič obročkali ploskokljunca *Calidris falcinellus* (Sečoveljske soline), sicer pa so bile obročkane še tri redke vrste, in sicer mušja listnica *Phylloscopus inornatus* (Ljubljansko barje), plevelna trstnica *Acrocephalus agricola* (Ljubljansko barje) in mali strnad *Emberiza pusilla* (Šentrupert).

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DODATEK 1 / APPENDIX 1

Pregled tujih in domačih najdb obročkanih in ponovno registriranih ptic izven meja Slovenije za leto 2017

Supplementation of an overview of recoveries of birds ringed or found outside Slovenia in 2017

Legenda / Legend:

AD	odrasla ptica / adult
JUV	mlada ptica / juvenile
PULL	ptica obročkana v gnezdu ali begavec ali nedorasel mladič izven gnezda / nestling (pullus)
1Y	prvoletna ptica / first year
2Y	drugoletna ptica / second year
v	kontrolna najdba / control recovery
o	obroček prebran z daljnogledom ali teleskopom / read by binoculars or telescope
+	ustreljen ali ubit / shot or killed
x	ptica najdena mrtva / found dead

Dopolnilo za leto 2015

Rečni galeb *Chroicocephalus ridibundus*

FINLAND	PULL	9.6.2015	Hyvinkaa, Uusumaa, FINSKA	60°39'N/24°59'E	M. Kallela	
ST 309201	o	23.12.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(197dni/1679km)

Rumenonogi galeb *Larus michahellis*

ZAGREB	+3Y	15.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
PS 00339	o	9.4.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Basrek	(480dni/75km)
ZAGREB	4Y	22.3.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
PS 00802	o	6.8.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	RC Slovenija	(137dni/75km)

Dopolnilo za leto 2016

Labod grbec *Cygnus olor*

LJUBLJANA	♂ AD	4.1.2013	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Grošelj	
LG 375	o	2.3.2016	Murstau Gralla, Steiermark, AVSTRIJA	46°49'N/15°34'E	D. Nayer	(1153dni/115km)
LJUBLJANA	♂ AD	28.1.2015	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 877	o	29.10.2015	Gbely, Skalica, SLOVAŠKA	48°43'N/17°02'E	J. Zanat	(274dni/262km)
	o	29.4.2016	Zahlinice, Pisečny pond, Hodoni, ČEŠKA	48°51'N/17°04'E	K. Šimeček	(457dni/276km)
	o	19.9.2016	Hlohovec, Jihomoravsky kraj, ČEŠKA	48°46'N/16°45'E	V. Sajfrt	(600dni/259km)

Lišček *Carduelis carduelis*

LJUBLJANA	♀ AD	5.1.2013	Ravnica, Nova Gorica, SLOVENIJA	45°59'N/13°42'E	D. Belingar	
AZ 80220	v	28.10.2016	Grunauberg, Almtal, Oberosterreich, AVSTRIJA	47°52'N/03°58'E	A. Riezinger	(1392dni/210km)

Krivokljun *Loxia curvirostra*

LJUBLJANA	♀ AD	6.4.2012	Resa, Kočevje, SLOVENIJA	45°39'N/15°02'E	V. Štolfa	
E 35548	v	5.10.2016	Saiherbachalm Bad Ischl, AVSTRIJA	47°44'N/13°36'E	A. Riezinger	(1643dni/256km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

Bela štorklja *Ciconia ciconia*

RADOLFZELL	PULL	26.6.2016	Tillmitsch, Steiermark, AVSTRIJA	46°49'N/15°31'E	H. Rosenthaler	
E0047	o	17.8.2016	Podova, Rače, Maribor, SLOVENIJA	46°25'N/15°41'E	M. Gamser	(52dni/46km)
RADOLFZELL	PULL	26.6.2016	Tillmitsch, Steiermark, AVSTRIJA	46°49'N/15°31'E	H. Rosenthaler	
E0051	o	17.8.2016	Spodnja Gorica, Rače, Maribor, SLOVENIJA	46°25'N/15°42'E	M. Gamser	(52dni/47km)
RADOLFZELL	PULL	26.6.2016	Tillmitsch, Steiermark, AVSTRIJA	46°49'N/15°31'E	H. Rosenthaler	
E0052	o	17.8.2016	Podova, Rače, Maribor, SLOVENIJA	46°25'N/15°41'E	M. Gamser	(52dni/46km)
RADOLFZELL	PULL	26.6.2016	Tillmitsch, Steiermark, AVSTRIJA	46°49'N/15°31'E	H. Rosenthaler	
E0055	o	17.8.2016	Spodnja Gorica, Rače, Maribor, SLOVENIJA	46°25'N/15°42'E	M. Gamser	(52dni/47km)

LETO 2017

Labod grbec *Cygnus olor*

BUDAPEST	♀ 2Y	4.9.2009	Balatonfured, Veszprem, MADŽARSKA	46°58'N/17°53'E	P. Szinai	
HN 919	o	27.12.2012	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	(1210dni/175km)
	o	28.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Sešlar	(2703dni/175km)
	o	31.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(2706dni/175km)
BUDAPEST	PULL	12.8.2016	Balatonszarszo, Somogy, MADŽARSKA	46°50'N/17°49'E	P. Szinai	
HK 686	o	16.2.2017	Ormoško jezero, Ormož, SLOVENIJA	46°23'N/16°10'E	L. Božič	(188dni/136km)
BUDAPEST	PULL	24.9.2016	Balatonfured, Veszprem, MADŽARSKA	46°57'N/17°53'E	P. Szinai	
HK 867	o	6.6.2017	Blejsko jezero, Bled, SLOVENIJA	46°22'N/14°06'E	A. Alijeski	(265dni/296km)
	o	2.8.2017	Blejsko jezero, Bled, SLOVENIJA	46°22'N/14°06'E	P. Dolta	(312dni/296km)
	o	7.8.2017	Blejsko jezero, Bled, SLOVENIJA	46°22'N/14°06'E	M. Žvan	(317dni/296km)
	o	17.8.2017	Blejsko jezero, Bled, SLOVENIJA	46°22'N/14°06'E	M. Žvan	(327dni/296km)
	o	29.8.2017	Blejsko jezero, Bled, SLOVENIJA	46°22'N/14°06'E	G. Csontos	(339dni/296km)
BUDAPEST	♀ 2Y	22.7.2010	Revfulop, Veszprem, MADŽARSKA	46°49'N/17°37'E	P. Szinai	
HW 157	o	17.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B.Štumberger	(2552dni/140km)
BUDAPEST	♀ +3Y	7.7.2015	Osli, Gyor Moson Sopron, MADŽARSKA	47°40'N/17°06'E	S. Tatai	
HT 267	o	7.8.2017	Ormoško jezero, Ormož, SLOVENIJA	46°23'N/16°10'E	L. Božič	(762dni/159km)
ZAGREB	+1Y	17.12.2009	Soderica, Koprivnica, HRVAŠKA	46°14'N/16°55'E	L. Jurinović	
UA 2103	v	16.8.2013	Balatonlelle, MADŽARSKA	46°47'N/17°40'E	P. Szinai	(1338dni/84km)
BUDAPEST		16.8.2013	Balatonlelle, MADŽARSKA	46°47'N/17°40'E	P. Szinai	
HT 532	o	5.6.2014	Muriša, Benica, Petišovci, SLOVENIJA	46°29'N/16°33'E	D. Bordjan	(1631dni/40km)
	o	15.11.2015	Muriša, Benica, Petišovci, SLOVENIJA	46°29'N/16°33'E	G. Domanjko	(2159dni/40km)
	o	26.5.2017	Muriša, Benica, Petišovci, SLOVENIJA	46°29'N/16°33'E	Š. Orban	(2717dni/40km)
GDANSK	♀ +2Y	29.1.2013	Rz. Wisla, Krakow, POLJSKA	50°03'N/19°55'E	A. Budyta	
AH 3016	o	26.1.2017	Šoštanjsko jezero, Šoštanj, SLOVENIJA	46°22'N/15°03'E	A. Mulej	(1458dni/545km)
PRAHA	♂ 2Y	21.7.2012	Hodonin, Jihomoravsky kraj, ČEŠKA	48°52'N/17°08'E	K. Makon	
LB 7628	o	6.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	Z. Karcza	(1630dni/280km)
ZAGREB	AD	8.3.2010	Rijeka, HRVAŠKA	45°20'N/14°27'E	A. Radalj	
UA 2367	o	2.4.2010	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	I. Škornik	(25dni/69km)
	o	7.4.2010	Portorož, SLOVENIJA	45°31'N/13°35'E	Slovenija	(30dni/71km)
	o	12.12.2010	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	L. Bembich	(279dni/59km)
	o	18.10.2011	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	W. Stani	(589dni/69km)
	o	24.5.2012	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	I. Škornik	(808dni/69km)
	o	24.2.2013	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	B. Rakar	(1084dni/69km)
	o	15.3.2013	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	B. Rakar	(1103dni/69km)
	o	12.8.2013	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	T. Pršin	(1253dni/69km)
	o	17.2.2015	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	D. Fekonja	(1807dni/69km)
	o	25.2.2015	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	T. Zagoršek	(1815dni/69km)
	o	1.4.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°35'E	T. Zagoršek	(2581dni/69km)
ZAGREB	♂ +2Y	9.2.2010	Varaždin, HRVAŠKA	46°18'N/16°20'E	L. Jurinović	
UA 2471	o	13.2.2011	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°38'E	RC Slovenija	(369dni/60km)
	o	6.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	Z. Karcza	(2523dni/58km)
BOLOGNA	♂ 1Y	11.9.2007	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	K. Kravos	
M 5667	o	11.3.2013	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	(2008dni/26km)
	o	30.7.2013	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(2149dni/26km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

	o	6.8.2013	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(2156dni/26km)
	o	6.10.2013	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(2217dni/26km)
	o	7.3..2014	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(2369dni/26km)
	o	13.3.2014	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(2375dni/26km)
	o	1.10.2014	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(2577dni/26km)
	o	15.4.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	(2773dni/26km)
	o	5.3.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	M. Gamser	(3098dni/26km)
	o	24.5.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3178dni/26km)
	o	25.7.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3240dni/26km)
	o	5.8.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3251dni/26km)
	o	4.10.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	B. Rakar	(3311dni/26km)
	o	4.11.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3342dni/26km)
	o	6.4.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3495dni/26km)
	o	13.4.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	B. Bratoz	(3502dni/26km)
	o	8.5.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	(3527dni/26km)
	o	9.6.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3559dni/26km)
	o	21.6.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	D. Bosch	(3571dni/26km)
LJUBLJANA	♂ AD	26.12.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	P. Grošelj	
LA 105	o	16.1.2016	Bundek, Zagreb, HRVAŠKA	45°50'N/16°00'E	S. Hodić	(21dni/64km)
	o	6.12.2017	Jarun, Zagreb, HRVAŠKA	45°47'N/15°56'E	L. Taylor	(711dni/69km)
LJUBLJANA	♀ AD	26.12.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	P. Grošelj	
LA 107	o	29.12.2017	Adamov, Gbely, SLOVAŠKA	48°44'N/17°02'E	P. Stepanek	(734dni/273km)
LJUBLJANA	♂ AD	29.12.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	P. Grošelj	
LA 111	o	23.12.2016	Bezenye, Gyor, Moson, Sopron, MADŽARSKA	47°57'N/17°14'E	A. Pito	(360dni/199km)
	o	19.1.2017	Bezenye, Gyor, Moson, Sopron, MADŽARSKA	47°57'N/17°13'E	T. Hadarics	(387dni/198km)
	o	20.1.2017	Bezenye, Gyor, Moson, Sopron, MADŽARSKA	47°57'N/17°13'E	P. Spakovszky	(388dni/198km)
	o	25.1.2017	Bezenye, Gyor, Moson, Sopron, MADŽARSKA	47°58'N/17°13'E	A. Pellinge	(393dni/200km)
	o	9.2.2017	Bezenye, Gyor, Moson, Sopron, MADŽARSKA	47°57'N/17°13'E	P. Spakovszky	(408dni/198km)
LJUBLJANA	♂ AD	29.12.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	P. Grošelj	
LA 115	o	21.1.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	F. Bračko	(23dni/24km)
	o	22.2.2017	Obere Alte Donau, Wien, AVSTRIJA	48°14'N/16°26'E	E. Fritze	(421dni/208km)
LJUBLJANA	♀ 2Y	8.2.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Grošelj	
LA 121	o	28.3.2016	Pilica Stawy, Slaskie, POLJSKA	50°28'N/19°39'E	A. Oruba	(49dni/616km)
	o	1.1.2017	Pilica Stawy, Slaskie, POLJSKA	50°28'N/19°39'E	A. Oruba	(328dni/616km)
	o	3.12.2017	Puhulanka, Stawy, Žarnowiec, POLJSKA	50°28'N/19°48'E	A. Oruba	(664dni/623km)
LJUBLJANA	2Y	23.3.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LA 137	o	9.5.2017	Szigetszentmiklos, Pest, MADŽARSKA	47°23'N/19°03'E	M. Batari	(412dni/273km)
LJUBLJANA	♀ 2Y	16.5.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Grošelj	
LA 140	o	28.6.2017	Balatonlelle, Somogy, MADŽARSKA	46°47'N/17°40'E	Z. Kerenyi	(408dni/259km)
	o	9.7.2017	Balatonoszod, Somogy, MADŽARSKA	46°49'N/17°47'E	L. Katalin	(419dni/268km)
LJUBLJANA	♀ 2Y	9.10.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Grošelj	
LA 148	o	30.1.2017	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	D. Bordjan	(113dni/0km)
	o	29.3.2017	Zalew Rawski, Rawa Mazowiecka, POLJSKA	51°45'N/20°13'E	P. Boguszewski	(171dni/752km)
	o	1.5.2017	Regnow, Lodzkie, POLJSKA	51°44'N/20°23'E	P. Boguszewski	(204dni/758km)
	o	24.5.2017	Regnow, Lodzkie, POLJSKA	51°44'N/20°22'E	P. Boguszewski	(227dni/757km)
LJUBLJANA	♀ 2Y	9.10.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Grošelj	
LA 149	o	30.1.2017	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	D. Bordjan	(113dni/0km)
	x	6.7.2017	Szigetszentmiklos, Pest, MADŽARSKA	47°23'N/19°03'E	M. Batari	(270dni/378km)
LJUBLJANA	♂ AD	9.3.2011	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 135	o	28.1.2017	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	Z. Darazsi	(2152dni/94km)
LJUBLJANA	♂ AD	9.3.2011	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 153	o	13.1.2012	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	G. Szabolcs	(310dni/93km)
	o	30.8.2012	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	Z. Oszkocsil	(540dni/93km)
	o	16.9.2012	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	Z. Oszkocsil	(557dni/93km)
	o	8.7.2013	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	K. Toth	(852dni/93km)
	o	23.9.2013	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	Z. Oszkocsil	(929dni/93km)
	o	23.10.2013	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	Z. Oszkocsil	(959dni/93km)
	o	25.12.2013	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	C. Szilard	(1022dni/93km)
	o	12.2.2017	Zalaegerszeg, Zala, MADŽARSKA	46°51'N/16°49'E	J. Varga	(2167dni/93km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

LJUBLJANA	♀ 2Y	9.3.2011	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	D. Grohar	
LG 184	v	11.8.2015	Stawy Walewice, Lodzkie, POLJSKA	52°05'N/19°42'E	R.Wlodarczyk	(1616dni/763km)
	o	13.9.2015	Pokrzywnica, Mlynow, Lodzkie, POLJSKA	52°03'N/19°27'E	T. Musial	(1649dni/751km)
	o	24.9.2015	Pokrzywnica, Mlynow, Lodzkie, POLJSKA	52°03'N/19°27'E	R. Wlodarczyk	(1660dni/751km)
	o	21.11.2015	Czchow, Malopolskie, POLJSKA	49°48'N/20°39'E	S. Mazgaj	(1718dni/616km)
	o	14.1.2017	Šmartinsko jezero, Celje, SLOVENIJA	46°16'N/15°16'E	M. Gamser	(2138dni/67km)
	o	18.2.2017	Šmartinsko jezero, Celje, SLOVENIJA	46°16'N/15°16'E	T. Romih	(2173dni/67km)
	o	7.6.2017	Moszna, Mazowieckie, POLJSKA	52°10'N/20°45'E	P. Strojek	(2282dni/811km)
LJUBLJANA	♂ AD	6.12.2012	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 331	o	6.1.2017	Varaždin, HRVAŠKA	46°18'N/16°20'E	Z. Karcza	(1492dni/58km)
LJUBLJANA	♂ AD	6.12.2012	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 332	o	20.5.2017	Studenka, Moravskoslezsky kraj, ČEŠKA	49°43'N/18°06'E	J. Hedrich	(1626dni/395km)
LJUBLJANA	♂ AD	20.12.2012	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 352	o	30.12.2014	Klosterneuburg, Niederosterreich, AVSTRIJA	48°17'N/16°20'E	C. Roland	(740dni/199km)
	o	7.7.2017	Okarec, Vysočina, ČEŠKA	49°12'N/16°05'E	O. Kauzal	(1660dni/296km)
	o	22.7.2017	Okarec, Vysočina, ČEŠKA	49°12'N/16°05'E	O. Kauzal	(1675dni/296km)
LJUBLJANA	♀ AD	29.12.2012	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 370	o	13.1.2015	Hradec Kralove, ČEŠKA	50°13'N/15°50'E	J. Vrana	(745dni/408km)
	o	7.2.2017	Pardubice, Pardubicky kraj, ČEŠKA	50°02'N/15°45'E	I. Mikšik	(1501dni/387km)
LJUBLJANA	1Y	6.12.2014	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	Ž. Pečar	
LG 379	o	4.1.2017	Murstausee, Gralla, Leibnitz, AVSTRIJA	46°50'N/15°33'E	W. Stani	(760dni/33km)
LJUBLJANA	1Y	15.11.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	Ž. Pečar	
LG 389	o	30.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(257dni/83km)
LJUBLJANA	♂ AD	26.11.2012	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	P. Štirn	
LG 421	o	14.12.2013	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	J. Hanžel	(383dni/22km)
	o	4.1.2017	Murstausee, Gralla, Leibnitz, AVSTRIJA	46°50'N/15°33'E	W. Stani	(1500dni/136km)
LJUBLJANA	1Y	28.12.2012	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	
LG 437	o	12.2.2015	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	(776dni/0km)
	o	4.1.2017	Murstausee, Gralla, Leibnitz, AVSTRIJA	46°50'N/15°33'E	W. Stani	(1468dni/115km)
LJUBLJANA	2Y	2.1.2013	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 442	o	4.1.2017	Murstausee, Gralla, Leibnitz, AVSTRIJA	46°50'N/15°33'E	W. Stani	(1463dni/33km)
LJUBLJANA	2Y	2.1.2013	Šmartinsko jezero, Celje, SLOVENIJA	46°16'N/15°16'E	P. Štirn	
LG 445	o	27.1.2017	Wellersdorfer Bucht, Drau, AVSTRIJA	46°32'N/14°11'E	H. Pirker	(1486dni/88km)
	o	4.2.2017	Draustau Feistritz, Karnten, AVSTRIJA	46°32'N/14°05'E	J. Bartas	(1494dni/95km)
LJUBLJANA	2Y	22.1.2013	Koseze, Ljubljana, SLOVENIJA	46°04'N/14°28'E	P. Štirn	
LG 463	o	27.8.2016	Zwirownia W Wolicy, Krakow, POLJSKA	50°03'N/20°12'E	K. Czajowski	(1313dni/614km)
	o	30.9.2016	Zwirownia W Wolicy, Krakow, POLJSKA	50°03'N/20°11'E	K. Czajowski	(1347dni/613km)
	o	17.3.2017	Zwirownia W Wolicy, Krakow, POLJSKA	50°02'N/20°12'E	K. Czajowski	(1515dni/613km)
	o	5.5.2017	Zwirownia W Wolicy, Krakow, POLJSKA	50°03'N/20°12'E	K. Czajowski	(1564dni/614km)
	o	24.5.2017	Zwirownia W Wolicy, Krakow, POLJSKA	50°02'N/20°12'E	K. Czajowski	(1583dni/613km)
	o	1.6.2017	Zwirownia W Wolicy, Krakow, POLJSKA	50°02'N/20°12'E	K. Czajowski	(1591dni/613km)
	o	1.7.2017	Zwirownia W Wolicy, Krakow, POLJSKA	50°02'N/20°12'E	K. Czajowski	(1621dni/613km)
	o	24.7.2017	Zwirownia W Wolicy, Krakow, POLJSKA	50°02'N/20°12'E	K. Czajowski	(1644dni/613km)
	o	12.11.2017	Zalew Bagry, Krakow, POLJSKA	50°02'N/19°59'E	A. Lobodzinska	(1755dni/602km)
LJUBLJANA	2Y	25.1.2013	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	P. Štirn	
LG 467	o	15.1.2017	Draustau Feistritz, Karnten, AVSTRIJA	46°32'N/14°05'E	J. Bartas	(1451dni/65km)
LJUBLJANA	♂ AD	1.2.2013	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	
LG 486	o	18.12.2016	Dabrowa Gornicza, Staw Pogoria 3, POLJSKA	50°21'N/19°12'E	A. Oruba	(1416dni/586km)
	o	18.12.2017	Dabrowa Gornicza, Staw Pogoria 3, POLJSKA	50°21'N/19°12'E	A. Oruba	(1781dni/586km)
LJUBLJANA	♀ 2Y	28.2.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	J. Bricelj	
LG 508	o	27.12.2016	Drau, Rakollach, AVSTRIJA	46°38'N/14°34'E	J. Feldner	(303dni/55km)
	o	27.1.2017	Draustau Feistritz, Karnten, AVSTRIJA	46°32'N/14°05'E	J. Bartas	(334dni/50km)
LJUBLJANA	♀ AD	25.1.2013	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 554	o	3.12.2017	Stekiny, Warminsko, Mazurskie, POLJSKA	53°48'N/20°11'E	G. Pilat	(1773dni/867km)
LJUBLJANA	2Y	7.5.2013	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	
LG 648	o	10.11.2014	stav Malina, Opolskie, POLJSKA	50°37'N/17°59'E	W. Michalik	(552dni/562km)
	o	12.11.2014	stav Malina, Opolskie, POLJSKA	50°37'N/17°59'E	L. Berlik	(554dni/562km)
	o	17.12.2014	stav Malina, Opolskie, POLJSKA	50°37'N/17°59'E	L. Berlik	(589dni/562km)
	o	18.12.2014	stav Malina, Opolskie, POLJSKA	50°37'N/17°59'E	W. Michalik	(590dni/562km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

	o	3.2.2015	Januskowice, Krapkowice, POLJSKA	50°23'N/18°08'E	J. Nogacki	(637dni/545km)
	o	2.11.2015	stav Malina, Opolskie, POLJSKA	50°37'N/17°59'E	L. Berlik	(909dni/562km)
	o	15.11.2015	stav Malina, Opolskie, POLJSKA	50°37'N/17°59'E	W. Michalik	(922dni/562km)
	o	17.8.2017	Chrzowice, Opolskie, POLJSKA	50°36'N/17°56'E	L. Berlik	(1563dni/558km)
LJUBLJANA	♀ AD	3.10.2013	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 675	o	2.4.2015	Ždar nad Sazavou, ČEŠKA	49°34'N/15°56'E	J. Čejka	(546dni/336km)
	o	2.4.2016	Ždar nad Sazavou, ČEŠKA	49°34'N/15°56'E	P. Zbynek	(912dni/336km)
	o	25.2.2017	Ždar nad Sazavou, Vysočina, ČEŠKA	49°33'N/15°56'E	V. Mikule	(1241dni/334km)
LJUBLJANA	2Y	6.12.2013	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	P. Štirn	
LG 704	o	29.3.2017	Sosnowiec, Zb. Stawiki, Slaskie, POLJSKA	50°16'N/19°06'E	E. Paprzycka	(1209dni/596km)
LJUBLJANA	♀ AD	3.9.2014	Blejsko jezero, Bled, SLOVENIJA	46°21'N/14°06'E	P. Štirn	
LG 772	o	22.9.2015	Draustausee Feistritz, Selkach, AVSTRIJA	46°32'N/14°05'E	J. Bartosch	(384dni/20km)
	o	30.4.2017	Boleraz, Trnava, SLOVAŠKA	48°28'N/17°29'E	I. Moncmanova	(970dni/347km)
LJUBLJANA	♂ AD	26.10.2014	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 790	o	12.11.2014	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(17dni/0km)
	o	5.1.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(71dni/0km)
	o	8.4.2016	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°07'E	R. Wlodarczyk	(530dni/640km)
	o	24.4.2016	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°07'E	M. Kubicki	(546dni/640km)
	o	26.4.2016	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°07'E	T. Janiszewski	(548dni/640km)
	o	9.7.2016	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°07'E	S. Wasiak	(622dni/640km)
	o	21.9.2016	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°06'E	R. Wlodarczyk	(696dni/639km)
	o	11.6.2017	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°07'E	M. Kubicki	(959dni/640km)
	o	25.9.2017	Stawy Sarnow, Dalikow, Lodzkie, POLJSKA	51°51'N/19°06'E	R. Wlodarczyk	(1065dni/639km)
LJUBLJANA	♀ AD	12.1.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 844	o	28.2.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	D. Fekonja	(47dni/0km)
	o	22.2.2017	Milleniumstover, Donau, Wien, AVSTRIJA	4814'N/1626'E	E. Fritze	(772dni/196km)
LJUBLJANA	♀ AD	15.1.2015	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	P. Štirn	
LG 848	o	22.2.2017	Obere Alte Donau, Wien, AVSTRIJA	48°14'N/16°26'E	E. Fritze	(769dni/299km)
LJUBLJANA	♂ AD	16.1.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 867	o	28.2.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	D. Fekonja	(43dni/0km)
	o	22.3.2015	Zb. Pokrzywnica, Opatowek, POLJSKA	51°43'N/18°10'E	Z. Hudzia	(65dni/602km)
	o	25.3.2015	Zb. Pokrzywnica, Cofka, POLJSKA	51°43'N/18°10'E	Z. Jedrysiak	(68dni/602km)
	o	26.3.2015	Zb. Pokrzywnica, Cofka, POLJSKA	51°43'N/18°10'E	Z. Jedrysiak	(69dni/602km)
	o	28.3.2015	Zb. Pokrzywnica, Opatowek, POLJSKA	51°43'N/18°10'E	Z. Hudzia	(71dni/602km)
	o	18.9.2015	Zb. Murowaniec, Kozminek, POLJSKA	51°48'N/18°17'E	H. Zbigniew	(245dni/614km)
	o	4.10.2015	Zb. Murowaniec, Kozminek, POLJSKA	51°48'N/18°17'E	Z. Hudzia	(261dni/614km)
	o	20.1.2016	Kerkaszentkiraly, Zala, MADŽARSKA	46°30'N/16°36'E	A. Lelkes	(369dni/72km)
	o	8.1.2017	Rz. Prosna, Kalisz:Mcdonald's, POLJSKA	51°45'N/18°04'E	J. Zbigniew	(723dni/604km)
	o	15.1.2017	Rz. Prosna, Kalisz:Mcdonald's, POLJSKA	51°45'N/18°04'E	J. Zbigniew	(730dni/604km)
	o	21.1.2017	Rz. Prosna, Kalisz:Mcdonald's, POLJSKA	51°45'N/18°04'E	J. Zbigniew	(736dni/604km)
	o	4.2.2017	Rz. Prosna, Kalisz:Mcdonald's, POLJSKA	51°45'N/18°04'E	A. Maly	(750dni/604km)
LJUBLJANA	♂ AD	28.1.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 873	o	2.2.2016	Koronco, Gyor, Moson, Sopron, MADŽARSKA	47°36'N/17°29'E	A. Pito	(370dni/180km)
	o	3.2.2016	Koronco, Gyor, Moson, Sopron, MADŽARSKA	47°36'N/17°29'E	A. Pito	(371dni/180km)
	o	19.1.2017	Gyor, Gyor, Moson, Sopron, MADŽARSKA	47°41'N/17°37'E	A. Pito	(722dni/194km)
	o	20.1.2017	Gyor, Gyor, Moson, Sopron, MADŽARSKA	47°41'N/17°37'E	T. Vizslan	(723dni/194km)
	o	21.1.2017	Gyor, Gyor, Moson, Sopron, MADŽARSKA	47°41'N/17°37'E	M. Falaki	(724dni/194km)
	o	23.1.2017	Gyor, Gyor, Moson, Sopron, MADŽARSKA	47°41'N/17°37'E	T. Vizslan	(726dni/194km)
	o	27.1.2017	Gyor, Gyor, Moson, Sopron, MADŽARSKA	47°40'N/17°37'E	T. Vizslan	(730dni/193km)
	o	11.2.2017	Gyor, Gyor, Moson, Sopron, MADŽARSKA	47°41'N/17°37'E	K. Lippai	(730dni/194km)
LJUBLJANA	♀ AD	26.12.2014	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 918	o	2.4.2015	Ždar nad Sazavou, ČEŠKA	49°34'N/15°56'E	J. Čejka	(97dni/336km)
	o	2.4.2016	Ždar nad Sazavou, ČEŠKA	49°34'N/15°56'E	P. Zbynek	(463dni/336km)
	o	25.2.2017	Ždar nad Sazavou, Vysočina, ČEŠKA	49°33'N/15°56'E	V. Mikule	(792dni/334km)
LJUBLJANA	♂ AD	29.11.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	
LG 946	o	11.6.2016	Tovačov, Olomoucky kraj, ČEŠKA	49°26'N/17°17'E	I. Urinovsky	(195dni/342km)
	o	26.10.2016	Murstausee, Gralla, Leibnitz, AVSTRIJA	46°50'N/15°33'E	W. Stani	(332dni/33km)
	o	16.1.2017	Mellach, AVSTRIJA	46°55'N/15°31'E	D. Nayer	(414dni/42km)
	o	4.2.2017	Mellach, AVSTRIJA	46°55'N/15°31'E	D. Nayer	(433dni/42km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

LJUBLJANA	1Y	21.12.2015	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	
LG 953	o	4.7.2017	Zaborze stawy, Malopolskie, POLJSKA	49°52'N/18°48E	J. Dadela	(561dni/526km)
LJUBLJANA	♀ AD	21.12.2015	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	
LG 955	o	10.11.2017	Rzeka Odra, Krapkowic, POLJSKA	50°28'N/17°59'E	M. Kubata	(690dni/547km)
LJUBLJANA	1Y	28.12.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 958	o	27.10.2017	Brenndorf, Volkermarkter Stausee, AVSTRIJA	46°38'N/14°35'E	W. Petutschnig	(669dni/83km)
LJUBLJANA	♂ AD	28.12.2015	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 961	o	22.7.2017	Okarec, Vysočina, ČEŠKA	49°12'N/16°05'E	O. Kauzal	(572dni/296km)
LJUBLJANA	2Y	13.1.2016	Zbiljsko jezero, Zbilje, Medvode, SLOVENIJA	46°09'N/14°25'E	P. Štirn	
LG 966	o	17.8.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(582dni/83km)
LJUBLJANA	2Y	28.1.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 975	o	9.7.2016	Balatonlelle, Somogy, MADŽARSKA	46°47'N/17°40'E	E. Vincze	(163dni/155km)
	o	11.8.2016	Revfulop, Veszprem, MADŽARSKA	46°49'N/17°37'E	R. S. Hattyu	(196dni/152km)
	o	17.11.2016	Balatonmariafurdo, Somogy, MADŽARSKA	46°42'N/17°22'E	P. Szinai	(294dni/131km)
	o	7.1.2017	Šoderica, Koprivnica, HRVAŠKA	46°14'N/16°55'E	Z. Karcza	(345dni/102km)
	o	5.2.2017	Šoderica, Koprivnica, HRVAŠKA	46°14'N/16°55'E	P. Szinai	(345dni/102km)
	o	27.5.2017	Balatonfured, Veszprem, MADŽARSKA	46°57'N/17°53'E	S. Papp	(485dni/175km)
	o	8.6.2017	Zamardi, Somogy, MADŽARSKA	46°53'N/17°56'E	A. Bodor	(497dni/177km)
	o	11.11.2017	Balatonboglar, Somogy, MADŽARSKA	46°46'N/17°38'E	G. Szabolcs	(653dni/152km)
	o	31.12.2017	Siofok, Somogy, MADŽARSKA	46°54'N/18°02'E	S. Borza	(703dni/184km)
LJUBLJANA	♂ AD	28.1.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 986	o	17.11.2017	Jastrzab, zbiornik Poraj, POLJSKA	50°39'N/19°12'E	J. Cabak	(659dni/524km)
LJUBLJANA	2Y	28.1.2016	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Štirn	
LG 998	o	12.11.2017	Hulin, Zlinsky kraj, ČEŠKA	49°16'N/17°27'E	Š. Jiri	(654dni/330km)

Bela štorklja ***Ciconia ciconia***

RADOLFZELL	PULL	23.6.2013	Gleisdorf, Weiz, Steiermark, AVSTRIJA	47°06'N/15°42'E	H. Haar	
AP821	o	14.7.2017	Berkovci, Ljutomer, SLOVENIJA	46°33'N/16°04'E	G. Domanjko	(1482dni/67km)
BOLOGNA	PULL	30.6.2008	Fagagna, Udine, ITALIJA	46°06'N/13°05'E	B. Dentesani	
PA078	o	9.3.2011	Šikole, Pragersko, SLOVENIJA	46°24'N/15°42'E	P. Štirn	(982dni/204km)
	o	30.1.2013	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	M. Vogrin	(1675dni/203km)
	o	27.12.2013	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	D. Bordjan	(2006dni/203km)
	o	16.12.2016	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	M. Gamser	(3091dni/203km)
	o	4.2.2017	Pragersko, SLOVENIJA	46°23'N/15°40'E	D. Bordjan	(3141dni/201km)
	o	8.3.2017	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	F. Bračko	(3173dni/203km)
SEMPACH	PULL	11.6.2003	Altreu, ŠVICA	47°11'N/07°27'E	C. Kanzig	
SA306	o	27.3.2017	Zbure, Šmarješke Toplice, SLOVENIJA	45°54'N/15°16'E	J. Vidmar	(5038dni/614km)
HIDDENSEE	PULL	25.6.2016	Spaatz, Havelland, Brandenburg, NEMČIJA	52°42'N/12°17'E	RC Nemčija	
AP90	o	25.5.2017	Pragersko, Maribor, SLOVENIJA	46°24'N/15°43'E	D. Bordjan	(334dni/742km)
LJUBLJANA	PULL	7.7.2012	Cirkovce, Maribor, SLOVENIJA	46°23'N/15°43'E	F. Bračko	
H 1906	x	13.5.2017	Mecser, Gyor Moson Sopron, MADŽARSKA	47°47'N/17°28'E	P. Kovacs	(1771dni/204km)
LJUBLJANA	PULL	23.6.2016	Mostje, Lendava, SLOVENIJA	46°36'N/16°25'E	F. Bračko	
W217	o	30.5.2017	Odayeri landfill, Istambul, TURČIJA	41°13'N/28°50'E	Sebnem	(341dni/1158km)
LJUBLJANA	PULL	26.6.2015	Pernica, Maribor, SLOVENIJA	46°34'N/15°43'E	F. Bračko	
W126	o	19.6.2017	Szecsisziget, Zala, MADŽARSKA	46°34'N/16°36'E	G. Szabolcs	(724dni/67km)
LJUBLJANA	PULL	24.6.2017	Tešanovci, Murska Sobota, SLOVENIJA	46°41'N/16°15'E	F. Bračko	
W687	x	7.8.2017	Berzence, Somogy, MADŽARSKA	46°12'N/17°09'E	E. Mezei	(44dni/87km)
LJUBLJANA	PULL	23.6.2015	Črešnjice pri Cerkljah, Brežice, SLOVENIJA	45°53'N/15°30'E	R. Tekavčič	
W510	v	8.8.2017	Stara Lubovna, SLOVAŠKA	49°18'N/20°38'E	V. Klč	(777dni/540km)

Črna štorklja ***Ciconia nigra***

PRAHA	PULL	13.6.2015	Hlasivo, Tabor, ČEŠKA	49°29'N/14°45'E	J. Jahelka	
BX 20748	o	23.7.2017	Žepovci, Gornja Radgona, SLOVENIJA	46°42'N/15°52'E	V. Marič	(771dni/320km)

Žličarka ***Platalea leucorodia***

PRAHA		1.6.2017	Česke Budejovice, ČEŠKA	49°00'N/14°26'E	J. Šimek	
BX 17533	o	8.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B. Štumberger	(37dni/309km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

Velika bela čaplja ***Ardea alba***

BUDAPEST	PULL	5.6.2013	Cegled, Pest, MADŽARSKA	47°13'N/19°52'E	V. Szenasi	
536597	x	3.2.2017	Soteljska cesta, Rogaška Slatina, SLOVENIJA	46°13'N/15°38'E	RC Slovenija	(1339dni/341km)
BUDAPEST	PULL	20.5.2017	Lipot, Gyor Moson Sopron, MADŽARSKA	47°51'N/17°27'E	S. Tatai	
539918	o	5.12.2017	jezero Komarnik, Lenart, SLOVENIJA	46°34'N/15°48'E	R. Šiško	(199dni/189km)
BUDAPEST	PULL	23.5.2017	Barbacs, Gyor Moson Sopron, MADŽARSKA	47°38'N/17°19'E	E. Gyorig	
539966	o	16.7.2017	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°40'E	D. Bordjan	(54dni/188km)
BUDAPEST	PULL	18.5.2017	Balatonszarszo, Somogy, MADŽARSKA	46°49'N/17°49'E	P. Szinai	
541252	o	16.7.2017	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°40'E	D. Bordjan	(59dni/172km)
MINSK	PULL	22.5.2017	Krasnoslobodskoe, Kopy, Minsk, BELORUSIJA	52°50'N/26°58'E	I. Bogdanovich	
C 00315	o	4.11.2017	Rački ribniki, Rače, Maribor, SLOVENIJA	46°26'N/15°40'E	D. Bordjan	(166dni/1078km)

Kormoran ***Phalacrocorax carbo***

BUDAPEST	PULL	21.4.2016	Zalaszabar, Zala, MADŽARSKA	46°39'N/17°08'E	P. Szinai	
SP 01121	o	25.2.2017	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	D. Bordjan	(310dni/118km)
	o	9.6.2017	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	M. Gamser	(414dni/113km)
	o	6.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(441dni/100km)
	x	10.8.2017	Cirkovci, Pragersko, SLOVENIJA	46°24'N/15°44'E	T. Kristofič	(476dni/111km)

Rečni galeb ***Chroicocephalus ridibundus***

ZAGREB	+2Y	5.2.2012	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 00137	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1859dni/73km)
ZAGREB	AD	30.12.2012	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 0475	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1522dni/73km)
ZAGREB	2Y	30.12.2012	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 0487	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1522dni/73km)
ZAGREB	2Y	3.3.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Basrek	
LA 0814	o	26.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1090dni/73km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1459dni/73km)
ZAGREB	+2Y	3.3.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 0911	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1467dni/73km)
	o	15.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1473dni/73km)
ZAGREB	1Y	5.12.2010	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 7445	o	26.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2244dni/73km)
	o	30.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(2248dni/73km)
	o	7.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(2256dni/73km)
ZAGREB	1Y	12.12.2010	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 7689	o	17.2.2017	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	M. Gamser	(2259dni/82km)
ZAGREB	2Y	6.2.2011	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8373	o	24.1.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	J. Figelj	(2179dni/178km)
ZAGREB	+2Y	26.2.2011	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8464	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2192dni/73km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2195dni/73km)
ZAGREB	2Y	6.3.2011	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8504	o	10.3.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1465dni/73km)
	o	27.10.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1696dni/73km)
	o	4.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	T. Basle	(2100dni/73km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(2187dni/73km)
ZAGREB	+2Y	6.3.2011	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8511	o	19.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(2177dni/94km)
ZAGREB	AD	19.11.2011	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8540	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1872dni/73km)
ZAGREB	1Y	19.11.2011	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8557	o	1.9.2016	Strunjan, Koper, SLOVENIJA	45°31'N/13°36'E	M. Gamser	(1748dni/190km)
	o	2.1.2017	Strunjan, Koper, SLOVENIJA	45°32'N/13°36'E	M. Sešlar	(1871dni/189km)
ZAGREB	2Y	29.1.2012	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LA 8877	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1866dni/73km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

ZAGREB	+2Y	5.2.2012	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 8996	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1848dni/73km)
ZAGREB	3Y	17.3.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 9027	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1453dni/73km)
ZAGREB	2Y	26.1.2014	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LA 09374	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1127dni/73km)
ZAGREB	2Y	26.1.2014	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LA 09578	o	20.1.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(359dni/73km)
	o	10.3.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(408dni/73km)
	o	27.12.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(700dni/73km)
	o	27.1.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(731dni/73km)
	o	6.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(741dni/73km)
	o	17.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(752dni/73km)
	o	19.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(754dni/73km)
	o	29.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1068dni/73km)
	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1073dni/73km)
	o	17.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(1087dni/94km)
	o	18.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(1088dni/94km)
	o	20.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(1090dni/94km)
ZAGREB	2Y	16.2.2014	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LA 09603	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1117dni/73km)
ZAGREB	+2Y	9.3.2014	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LA 09680	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1096dni/73km)
ZAGREB	+2Y	9.3.2014	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LA 09724	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1031dni/73km)
ZAGREB	2Y	31.1.2010	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LA 20042	o	29.11.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	P. Grošelj	(1055dni/73km)
	o	8.3.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2228dni/73km)
	o	12.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2507dni/73km)
	o	13.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2508dni/73km)
	o	29.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(2524dni/73km)
	o	30.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(2525dni/73km)
	o	7.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	J. Novak	(2533dni/73km)
	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(2583dni/73km)
ZAGREB	1Y	1.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	M. Martinović	
LS 00218	o	4.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(1130dni/94km)
ZAGREB	1Y	1.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	M. Martinović	
LS 00224	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1129dni/73km)
ZAGREB	AD	8.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	L. Jurinović	
LS 00399	o	24.1.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	J. Figelj	(1143dni/178km)
ZAGREB	1Y	8.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	S. Kapelj	
LS 00426	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1179dni/73km)
ZAGREB	1Y	8.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	S. Kapelj	
LS 00483	o	31.12.2014	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(388dni/73km)
	o	21.3.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(468dni/73km)
	o	27.1.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(780dni/73km)
	o	6.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(790dni/73km)
	o	1.3.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(814dni/73km)
	o	9.3.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(822dni/73km)
	o	26.11.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1084dni/73km)
	o	13.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1101dni/73km)
	o	17.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1105dni/73km)
	o	30.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1149dni/73km)
	o	7.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1157dni/73km)
	o	16.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1166dni/73km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1179dni/73km)
	o	17.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1195dni/73km)
	o	15.11.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1438dni/73km)
ZAGREB	1Y	8.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	S. Kapelj	

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LS 00489	o	5.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(789dni/73km)
	o	6.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(790dni/73km)
	o	19.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(803dni/73km)
	o	24.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(808dni/73km)
	o	7.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1157dni/73km)
ZAGREB	1Y	15.12.2013	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 00673	o	4.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(1116dni/94km)
ZAGREB	2Y	17.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 00855	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(352dni/73km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(409dni/73km)
ZAGREB	+2Y	17.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 00897	o	4.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(353dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(385dni/94km)
ZAGREB	+2Y	17.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 00900	o	8.12.2016	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(326dni/94km)
	o	12.12.2016	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(330dni/94km)
	o	15.12.2016	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(333dni/94km)
	o	17.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(366dni/94km)
	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(384dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(385dni/94km)
ZAGREB	2Y	17.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 00967	o	4.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(353dni/94km)
ZAGREB	1Y	8.2.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01009	o	3.11.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(634dni/73km)
	o	3.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	J. Novak	(664dni/73km)
	o	4.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	J. Novak	(665dni/73km)
	o	17.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(678dni/73km)
	o	27.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	P. Grošelj	(688dni/73km)
	o	30.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(722dni/73km)
	o	7.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(730dni/73km)
	o	12.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	D. Bordjan	(735dni/73km)
	o	16.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(739dni/73km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(752dni/73km)
	o	15.11.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1011dni/73km)
ZAGREB	+2Y	8.2.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01039	o	3.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(664dni/73km)
	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(760dni/73km)
ZAGREB	+2Y	8.2.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01117	o	23.11.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1019dni/73km)
ZAGREB	+2Y	8.3.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01509	o	9.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B.Štumberger	(854dni/73km)
ZAGREB	AD	29.11.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01719	o	13.1.2016	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(45dni/93km)
	o	15.1.2016	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(47dni/93km)
	o	6.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(69dni/73km)
	o	11.2.2016	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(74dni/94km)
	o	5.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(403dni/94km)
	o	31.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(429dni/94km)
	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(433dni/94km)
ZAGREB	1Y	29.11.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01745	o	4.1.2016	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(36dni/93km)
	o	19.1.2016	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(51dni/93km)
	o	21.1.2016	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	F. Bračko	(53dni/93km)
	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(433dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(434dni/94km)
	o	19.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(448dni/94km)
ZAGREB	1Y	20.12.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01796	o	5.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(382dni/94km)
	o	17.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(394dni/94km)

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	o	18.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(395dni/94km)
	o	20.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(397dni/94km)
	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(412dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(413dni/94km)
ZAGREB	+2Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01812	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(428dni/73km)
ZAGREB	+2Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01821	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(399dni/73km)
ZAGREB	3Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01828	o	3.11.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(649dni/73km)
ZAGREB	1Y	20.12.2015	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01835	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(380dni/73km)
ZAGREB	+2Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01893	o	27.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(369dni/94km)
	o	29.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	F. Bračko	(371dni/94km)
	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(377dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(378dni/94km)
	o	8.12.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	P. Grošelj	(684dni/94km)
ZAGREB	2Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 01918	o	4.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(346dni/94km)
	o	5.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(347dni/94km)
	o	9.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	J. Novak	(351dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(378dni/94km)
	o	14.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	J. Novak	(387dni/94km)
ZAGREB	2Y	5.2.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 02044	o	19.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(14dni/94km)
ZAGREB	2Y	5.2.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 02067	o	18.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(41dni/73km)
ZAGREB	2Y	5.2.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 02299	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(32dni/73km)
ZAGREB	2Y	22.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 02364	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(35dni/73km)
	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(46dni/73km)
	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(64dni/73km)
	o	9.4.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(77dni/73km)
ZAGREB	2Y	22.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 02385	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(13dni/94km)
	o	18.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(27dni/94km)
	o	19.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(28dni/94km)
ZAGREB	+2Y	26.2.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 02952	o	17.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(19dni/73km)
ZAGREB	+2Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03055	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(377dni/94km)
	o	5.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(378dni/94km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(402dni/73km)
ZAGREB	+2Y	24.1.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03067	o	6.5.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(103dni/73km)
	o	15.5.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(112dni/73km)
	o	16.5.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(113dni/73km)
	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(410dni/73km)
ZAGREB	+2Y	21.2.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03311	o	26.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(521dni/73km)
ZAGREB	1Y	4.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03650	o	22.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(80dni/94km)
ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03697	o	8.12.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	P. Grošelj	(355dni/94km)
ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03699	o	26.1.2017	Stjaža, Strunjan, Koper, SLOVENIJA	45°32'N/13°36'E	V. Kastelic	(39dni/189km)
ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	

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LS 03711	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(73dni/73km)
	o	18.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(90dni/73km)
ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03726	o	25.10.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(311dni/73km)
ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03776	o	11.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(83dni/73km)
	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(99dni/73km)
ZAGREB	+2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03835	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(52dni/73km)
	o	3.11.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(299dni/73km)
ZAGREB	+2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03848	o	18.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	J. Novak	(10dni/94km)
	o	20.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	J. Novak	(12dni/94km)
	o	31.1.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(23dni/94km)
	o	4.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(27dni/94km)
	o	22.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(45dni/94km)
ZAGREB	2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03931	o	15.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(66dni/73km)
	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(78dni/73km)
ZAGREB	+2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03957	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(78dni/73km)
ZAGREB	2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03959	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(78dni/73km)
ZAGREB	2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03963	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(49dni/73km)
	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(60dni/73km)
	o	26.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	J. Hanžel	(77dni/73km)
ZAGREB	+2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03973	o	22.2.2017	Maribor, SLOVENIJA	46°33'N/15°38'E	M. Gamser	(45dni/94km)
ZAGREB	+2Y	8.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
LS 03975	o	7.11.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(303dni/73km)
MADRID	+3Y	5.3.2010	ZOO Barcelona, ŠPANIJA	41°23'N/02°11'E	RC Španija	
NC14	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(2553dni/1227km)
BUDAPEST	PULL	10.6.2012	Balatonlelle, Somogy, MADŽARSKA	46°45'N/17°44'E	G. Kovacs	
387269	o	18.4.2014	reka Drava, Ormož, SLOVENIJA	46°24'N/16°08'E	L. Božič	(677dni/128km)
	o	8.6.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B.Štumberger	(1459dni/147km)
	o	15.6.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	M. Gamser	(1831dni/147km)
	o	26.6.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1842dni/147km)
BUDAPEST	PULL	13.6.2015	Balatonlelle, Somogy, MADŽARSKA	46°45'N/17°44'E	G. Kovacs	
SH 01226	o	19.2.2017	reka Drava, Maribor, SLOVENIJA	46°33'N/15°39'E	M. Gamser	(617dni/160km)
BUDAPEST	+1Y	27.9.2015	Szeged, Csongrad, MADŽARSKA	46°18'N/20°08'E	A. Domjan	
SH 01972	o	26.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(518dni/327km)
BUDAPEST	PULL	31.5.2014	Retszilas, Fejer, MADŽARSKA	46°50'N/18°34'E	P. Szinai	
SH 02434	o	5.1.2015	reka Drava, Maribor, SLOVENIJA	46°33'N/15°39'E	M. Gamser	(219dni/225km)
	o	6.1.2015	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(220dni/223km)
	o	25.1.2015	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	(239dni/223km)
	o	27.2.2015	reka Drava, Ptuj, SLOVENIJA	46°25'N/15°52'E	P. Grošelj	(272dni/211km)
	o	18.3.2016	Rače, Maribor, SLOVENIJA	46°27'N/15°41'E	M. Gamser	(657dni/224km)
	o	23.10.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°36'E	I. Škornik	(1241dni/411km)
	o	31.10.2017	Lucija, Portorož, SLOVENIJA	45°30'N/13°36'E	V. Bezlaj	(1249dni/410km)
BUDAPEST	+2Y	2.1.2016	Budapest Xlll., Pest, MADŽARSKA	47°30'N/19°02'E	L. Katalin	
SH 02954	o	25.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	M. Gamser	(420dni/270km)
	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(424dni/270km)
BUDAPEST	PULL	28.5.2015	Nagyrada, Zala, MADŽARSKA	46°37'N/17°08'E	M. Csaba	
SH 04107	x	25.5.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(728dni/99km)
BUDAPEST	PULL	19.6.2016	Mocsa, Komarom, Esztergom, MADŽARSKA	47°41'N/18°10'E	G. Batky	
SH 05267	o	15.5.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°36'E	I. Škornik	(330dni/427km)
	o	1.10.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°36'E	I. Škornik	(469dni/426km)
BUDAPEST	PULL	15.6.2017	Balatonlelle, Somogy, MADŽARSKA	46°45'N/17°44'E	P. Szinai	

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SH 05475	x	13.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B.Štumberger	(28dni/147km)
BUDAPEST	PULL	14.6.2015	Mocsa, Komarom, Esztergom, MADŽARSKA	47°41'N/18°10'E	G. Batky	
HA 14274	o	1.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	M. Gamser	(626dni/225km)
BUDAPEST	+2Y	9.3.2014	Sopron, Gyor Moson Sopron, MADŽARSKA	47°39'N/16°36'E	T. Hadarics	
HA 15013	o	12.12.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(1009dni/150km)
	o	5.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	M. Gamser	(1064dni/150km)
	o	16.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	M. Gamser	(1075dni/150km)
	o	19.2.2017	reka Drava, Maribor, SLOVENIJA	46°33'N/15°39'E	M. Gamser	(1078dni/142km)
	o	8.12.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°52'E	P. Grošelj	(1370dni/148km)
	o	30.12.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Božič	(1392dni/147km)
BUDAPEST	+2Y	7.4.2013	Sopron, Gyor Moson Sopron, MADŽARSKA	47°39'N/16°36'E	T. Hadarics	
HA 15315	o	7.4.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1461dni/149km)
PRAHA	PULL	25.5.2012	Mušov, Breclav, ČEŠKA	48°54'N/16°36'E	F. Zicha	
ES 31029	o	3.2.2014	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(619dni/270km)
	o	12.1.2015	Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(962dni/270km)
	o	30.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(1711dni/281km)
PRAHA	♀ 2Y	6.1.2015	Vinohrady, Stredočasky kraj a Praha, ČEŠKA	50°04'N/14°25'E	I. Mikšik	
ET 08153	o	8.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(702dni/402km)
	o	12.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(706dni/402km)
	o	16.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(710dni/402km)
	o	21.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(715dni/402km)
	o	23.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(717dni/402km)
	o	27.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(721dni/402km)
	o	5.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(730dni/402km)
PRAHA	1Y	11.9.2012	Litomyšl, Pardubicky kraj, ČEŠKA	49°52'N/16°17'E	U. Lubor	
EX 95423	o	4.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(1576dni/371km)
GDANSK	+3Y	3.1.2016	Zglowiaczka, Wloclawek, Kujawsko, PLJSKA	52°39'N/19°03'E	J. Pietrasik	
FN 36424	o	21.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(353dni/720km)
	o	23.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(355dni/720km)
	o	27.12.2016	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	(359dni/720km)
	o	6.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(369dni/720km)
	o	30.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(393dni/729km)
GDANSK	1Y	17.11.2016	Staw Rubinowy, Szczecin, POLJSKA	53°22'N/14°39'E	L. Borek	
FS 24247	o	26.12.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	(404dni/761km)
	o	31.12.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	P. Grošelj	(409dni/761km)
GDANSK	PULL	28.5.2017	Poraj, Slaskie, POLJSKA	50°38'N/19°14'E	J. Betleja	
THE7	o	4.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B. Štumberger	(37dni/531km)
GDANSK	+2Y	15.12.2013	Warszawa, Mokotow, Mazowieckie, POLJSKA	52°10'N/21°03'E	M. Sidelnik	
T3A2	o	14.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(1126dni/743km)
GDANSK	+1Y	28.10.2016	ul. Dworcowa, Stargard, POLJSKA	53°20'N/15°01'E	L. Borek	
T4T5	o	27.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(150dni/773km)
GDANSK	+1Y	9.11.2016	ul. Dworcowa, Stargard, POLJSKA	53°20'N/15°01'E	L. Borek	
T6T2	o	16.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(99dni/773km)
	o	22.2.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(105dni/755km)
GERMANY		18.10.2015	Binnenalster, Hamburg, NEMČIJA	53°33'N/10°00'E	RC Nemčija	
5419548	o	31.10.2017	Lucija, Portorož, SLOVENIJA	45°30'N/13°36'E	V. Bezlaj	(744dni/931km)
KIEV	PULL	6.6.2017	Zdolbuniv, Rivne, UKRAJINA	50°31'N/26°17'E	RC Ukrajina	
J 006836	o	1.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B.Štumberger	(25dni/892km)
LITHUANIA	PULL	20.6.2012	Striunos tvenk., Kauno r., LITVA	55°07'N/23°45'E	D. Musteikis	
HA 16909	o	4.2.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(1690dni/1107km)
	o	5.2.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(1691dni/1107km)
LITHUANIA	PULL	16.6.2012	Kretuono ež. Didžioji sala, Švenčioniu, LITVA	55°14'N/26°04'E	G. Varnas	
HA 19801	o	20.1.2015	reka Drava, Maribor, SLOVENIJA	46°33'N/15°39'E	M. Gamser	(948dni/1208km)
	o	18.1.2016	reka Drava, Maribor, SLOVENIJA	46°33'N/15°38'E	F. Bračko	(1311dni/1208km)
	o	4.2.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°39'E	M. Gamser	(1694dni/1207km)
	o	5.2.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°39'E	M. Gamser	(1695dni/1207km)
LJUBLJANA	PULL	24.6.2015	novi otok, Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B. Štumberger	
8528	o	3.1.2017	Port de Vilanova, Geltru, Barcelona, ŠPANIJA	41°12'N/01°43'E	M. Olive	(559dni/1272km)
LJUBLJANA	PULL	24.6.2015	novi otok, Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B. Štumberger	

Nadaljevanje dodatka 1 / Continuation of Appendix 1

8532	o	14.1.2017	Fare les Oliviers, FRANCIJA	43°34'N/05°12'E	E. Durand	(570dni/896km)
LJUBLJANA	PULL	24.6.2015	novi otok, Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B. Štumberger	
8539	o	26.11.2016	C. na Ambrosiana, Milano, ITALIJA	45°25'N/09°12'E	A. Nicoli	(521dni/528km)
	o	23.3.2017	Zalaegerszeg, Zala, MADŽARSKA	46°47'N/16°49'E	G. Szabolcs	(638dni/83km)
LJUBLJANA	PULL	12.6.2017	novi otok, Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	B. Štumberger	
VT 3	o	16.11.2017	Ejea de los Caballeros, Zaragoza, ŠPANIJA	42°05'N/01°08'W	L. Garcia	(157dni/1434km)
	o	14.12.2017	Zaragoza, ŠPANIJA	41°38'N/00°55'W	L. Garcia	(185dni/1440km)
LJUBLJANA	PULL	23.6.2017	mali otok, Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	B. Štumberger	
VT 17	o	7.10.2017	C.Na Ambrosiana, Milano, ITALIJA	45°25'N/09°12'E	L. Bonomelli	(106dni/528km)
LJUBLJANA	PULL	13.7.2017	prodnati otok, Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	B. Štumberger	
VT 24	o	18.10.2017	Foce Del Tronto, Martinsicuro, ITALIJA	42°54'N/13°55'E	D. Marrone	(97dni/421km)
	o	25.11.2017	Porto Di Pescara, Abruzzo, ITALIJA	42°28'N/14°14'E	A. Antonucci	(135dni/458km)

Sivi galeb *Larus canus*

BUDAPEST	2Y	16.3.2013	Gyal, Pest, MADŽARSKA	47°21'N/19°14'E	D. Hegedus	
VR 02470	o	14.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(1400dni/277km)
	o	18.1.2017	reka Drava, Lent, Maribor, SLOVENIJA	46°33'N/15°40'E	M. Gamser	(1404dni/285km)

Rumenonogi galeb *Larus michahellis*

ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
PS 01232	o	26.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	J. Hanžel	(98dni/75km)
ZAGREB	1Y	18.12.2016	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
PS 01272	o	17.5.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Božič	(150dni/75km)
ZAGREB	2Y	12.3.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
PS 01932	o	9.4.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(28dni/75km)
	o	13.5.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Božič	(62dni/75km)
ZAGREB		22.1.2017	Jakuševac, Zagreb, HRVAŠKA	45°45'N/16°01'E	RC Hrvaška	
PS 02699	o	26.7.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(185dni/75km)
	o	8.9.2017	Dragonja vas, Pragersko, SLOVENIJA	46°22'N/15°42'E	D. Bordjan	(229dni/73km)
ZAGREB	PULL	28.5.2006	o. Zečevo, o. Krk, HRVAŠKA	45°00'N/14°50'E	K. Mikulić	
PA 19948	o	15.11.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(3824dni/177km)
	o	1.8.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(4083dni/177km)

Črnomorski galeb *Larus cachinnans*

BRATISLAVA	PULL	17.6.2014	Slanica, Namestovo, SLOVAŠKA	49°25'N/19°30'E	S. Oldrich	
E 4591	o	7.4.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Božič	(1025dni/429km)
GDANSK	PULL	15.5.2014	Zb. Kozielno, Paczkow, POLJSKA	50°28'N/16°58'E	J. Betleja	
03P2	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°23'N/15°54'E	L. Božič	(964dni/461km)
GDANSK	PULL	26.5.2016	Rz. Wisla, Zastow Karczmiski, POLJSKA	51°15'N/21°51'E	L. Bednarz	
242P	o	16.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(266dni/694km)
	o	25.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(275dni/694km)
GDANSK	PULL	12.5.2011	Zb.Kužnica, Dabrowa Gornicza, POLJSKA	50°22'N/19°11'E	P. Kmiecik	
71P6	o	14.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(2074dni/504km)
GDANSK	PULL	25.5.2016	Zb. Kozielno, Paczkow, POLJSKA	50°28'N/16°59'E	J. Batleja	
821P	o	30.12.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(584dni/457km)
GDANSK	PULL	25.5.2016	Zb. Kozielno, Paczkow, POLJSKA	50°28'N/16°58'E	J. Betleja	
921P	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(288dni/459km)
	o	15.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	M. Gamser	(288dni/459km)
	o	26.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°50'E	J. Hanžel	(305dni/458km)
	o	29.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(308dni/459km)
GDANSK	PULL	25.5.2016	Zb. Kozielno, Paczkow, POLJSKA	50°28'N/16°58'E	J. Betleja	
971P	o	26.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°50'E	J. Hanžel	(305dni/458km)
GDANSK	PULL	21.5.2009	Žwirownia Zakole, Babice, POLJSKA	50°02'N/19°28'E	J. Betleja	
PANB	o	3.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°23'N/15°54'E	L. Božič	(2784dni/484km)
GDANSK	PULL	21.5.2009	Žwirownia Zakole, Babice, POLJSKA	50°02'N/19°28'E	J. Betleja	
PAOO	o	14.1.2017	Ormoško jezero, Ormož, SLOVENIJA	46°23'N/16°09'E	L. Božič	(2795dni/474km)
GDANSK	PULL	27.5.2010	Zb. Kozielno, Paczkow, POLJSKA	50°29'N/16°58'E	J. Betleja	

Nadaljevanje dodatka 1 / Continuation of Appendix 1

PDTX	o	26.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(2436dni/461km)
GDANSK	PULL	27.5.2010	Zb. Kozielno, Paczkow, POLJSKA	50°29'N/16°58'E	J. Betleja	
PDZH	o	26.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(2436dni/461km)
	o	2.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Božič	(2443dni/459km)
GDANSK	+3Y	19.4.2011	Żwirownia Zakole, Babice, POLJSKA	50°02'N/19°28'E	J. Betleja	
PEAK	o	14.1.2017	Ormoško jezero, Ormož, SLOVENIJA	46°23'N/16°09'E	L. Božič	(2097dni/474km)
GDANSK	PULL	25.5.2012	Zb. Kozielno, Paczkow, POLJSKA	50°28'N/16°58'E	J. Betleja	
PKTN	o	8.1.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°53'E	L. Božič	(1689dni/459km)
GDANSK	PULL	25.5.2012	Zb. Kozielno, Paczkow, POLJSKA	50°28'N/16°58'E	J. Betleja	
PLDL	o	16.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	L. Božič	(1728dni/459km)
MINSK		17.6.2016	Roof Selitskogo, Minsk, BELORUSIJA	53°49'N/27°41'E	RC Belorusija	
DA 00712	o	25.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(253dni/1173km)
MINSK		17.6.2016	Roof Selitskogo, Minsk, BELORUSIJA	53°49'N/27°41'E	RC Belorusija	
DA 00788	o	15.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(271dni/1173km)
MINSK	PULL	3.7.2014	Gatovo, Minsk, BELORUSIJA	53°47'N/27°40'E	RC Belorusija	
D 00764	o	28.2.2015	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	L. Božič	(240dni/1170km)
	o	5.2.2016	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(582dni/1170km)
	o	9.3.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°25'N/15°53'E	M. Gamser	(980dni/1170km)

Navadna čigra *Sterna hirundo*

ZAGREB	PULL	26.7.2017	Raktije, Zagreb, HRVAŠKA	45°48'N/15°50'E	B. Jačmenica	
HA 40346	o	1.8.2017	Krško, SLOVENIJA	45°58'N/15°29'E	D. Klenovšek	(36dni/33km)
ZAGREB	PULL	27.6.2017	Raktije, Zagreb, HRVAŠKA	45°48'N/15°50'E	B. Jačmenica	
HA 40835	o	14.7.2017	Stari Grad, Brežice, SLOVENIJA	45°55'N/15°32'E	D. Klenovšek	(17dni/27km)
ZAGREB	PULL	12.7.2017	Raktije, Zagreb, HRVAŠKA	45°48'N/15°50'E	B. Jačmenica	
HA 40852	o	31.7.2017	Krško, SLOVENIJA	45°58'N/15°29'E	D. Klenovšek	(34dni/33km)
ZAGREB	PULL	27.6.2017	Raktije, Zagreb, HRVAŠKA	45°48'N/15°50'E	B. Jačmenica	
HA 40854	o	14.7.2017	Stari Grad, Brežice, SLOVENIJA	45°55'N/15°32'E	D. Klenovšek	(17dni/27km)
ZAGREB	PULL	27.6.2017	Raktije, Zagreb, HRVAŠKA	45°48'N/15°50'E	B. Jačmenica	
HA 40858	o	30.7.2017	Krško, SLOVENIJA	45°58'N/15°29'E	D. Klenovšek	(33dni/33km)
ZAGREB	PULL	12.7.2017	Raktije, Zagreb, HRVAŠKA	45°48'N/15°50'E	B. Jačmenica	
HA 40858	o	30.7.2017	Krško, SLOVENIJA	45°58'N/15°29'E	D. Klenovšek	(18dni/33km)
LJUBLJANA	PULL	31.5.2011	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 32303	o	7.7.2011	Staranzano, Goricia, ITALIJA	45°49'N/13°31'E	S. Candotto	(37dni/36km)
	o	27.8.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(2280dni/26km)
LJUBLJANA	PULL	31.5.2011	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 32310	o	3.7.2011	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°49'N/13°31'E	S. Candotto	(33dni/36km)
	o	7.5.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(2168dni/26km)
LJUBLJANA	PULL	10.6.2011	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°35'E	I. Brajnik	
E 32351	o	28.7.2011	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°49'N/13°31'E	S. Candotto	(48dni/26km)
	o	6.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(2249dni/46km)
	o	14.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(2257dni/46km)
LJUBLJANA	PULL	23.5.2012	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 32396	o	23.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1887dni/26km)
LJUBLJANA	PULL	28.5.2012	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 36105	o	13.10.2014	Camargue, Bouches du Rhone, FRANCIJA	43°22'N/04°48'E	M. Thibault	(868dni/749km)
	o	30.8.2015	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1189dni/26km)
	o	15.8.2016	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1540dni/26km)
	o	21.5.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1819dni/26km)
LJUBLJANA	PULL	29.5.2013	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 36182	o	31.8.2016	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1190dni/26km)
	o	7.5.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1439dni/26km)
LJUBLJANA	PULL	29.5.2013	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 36188	o	9.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1502dni/26km)
LJUBLJANA	PULL	3.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	J. Figelj	
E 36212	o	9.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(767dni/26km)
LJUBLJANA	PULL	25.5.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39761	o	9.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(776dni/26km)

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LJUBLJANA	PULL	25.5.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39762	o	6.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(804dni/53km)
LJUBLJANA	PULL	25.5.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39766	o	26.6.2015	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(32dni/26km)
	o	9.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(776dni/26km)
LJUBLJANA	PULL	4.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39783	o	26.7.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(783dni/53km)
	o	28.7.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(785dni/53km)
	o	19.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(807dni/53km)
LJUBLJANA	PULL	4.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39785	o	9.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(766dni/26km)
LJUBLJANA	PULL	3.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39823	o	25.6.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(753dni/26km)
LJUBLJANA	PULL	3.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39836	o	5.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(763dni/26km)
LJUBLJANA	PULL	3.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39837	o	26.7.2015	Le Salin des Pesquiers, Hyeres, FRANCIJA	43°04'N/06°08'E	A. Audevard	(53dni/665km)
o		9.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(767dni/26km)
LJUBLJANA	PULL	12.6.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 39844	o	25.6.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(744dni/26km)
LJUBLJANA	PULL	18.6.2014	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	T. Mihelič	
E 40240	o	21.8.2014	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(64dni/26km)
	o	24.8.2014	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(67dni/26km)
	o	6.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(1145dni/53km)
	o	7.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(1146dni/53km)
	o	27.8.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1166dni/26km)
LJUBLJANA	PULL	16.6.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°36'E	I. Škornik	
SH 111	o	21.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(35dni/29km)
LJUBLJANA	PULL	4.7.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°36'E	I. Škornik	
SH 118	o	27.7.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(23dni/46km)
LJUBLJANA	PULL	4.6.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°36'E	I. Škornik	
SH 122	o	14.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(71dni/46km)
	o	19.8.2017	Rovinj, Istra, HRVAŠKA	45°04'N/13°38'E	L. Taylor	(76dni/46km)
LJUBLJANA	PULL	18.6.2014	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
X 3761	o	28.6.2016	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(741dni/26km)
	o	27.6.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(1105dni/26km)
LJUBLJANA	PULL	6.7.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
VX 113	o	23.7.2017	Foce Dell'Isonzo, Staranzano, Goricia, ITALIJA	45°43'N/13°33'E	S. Candotto	(17dni/26km)

Močvirski martinec *Tringa glareola*

OZZANO	2Y	26.7.2007	C. Rossi, Rimini, ITALIJA	44°06'N/12°29'E	R. De Carli	
ZN 39379	v	23.7.2017	Hraše, Medvode, SLOVENIJA	46°10'N/14°27'E	Ž. Pečar	(3650dni/277km)

Beločeli deževnik *Charadrius alexandrinus*

LJUBLJANA	♀ AD	16.5.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°29'N/13°36'E	I. Škornik	
CA 38	o	7.7.2017	Porto Di Lido, Venezia, ITALIJA	45°26'N/12°24'E	M. Picone	(52dni/94km)

Žerjav *Grus grus*

HIDDENSEE		25.1.2016	Garlitz, Brandenburg, NEMČIJA	52°33'N/12°33'E	B. Block	
BA 033004	o	15.4.2017	Medvedce, Pragersko, SLOVENIJA	46°21'N/15°39'E	D. Bordjan	(446dni/724km)

Siva gos *Anser anser*

BUDAPEST	PULL	8.6.2016	Fertoujlak, Gyor Moson Sopron, MADŽARSKA	47°41'N/16°51'E	G. Kovacs	
SP 00116	o	5.2.2017	Renče, Ajdovščina, SLOVENIJA	45°53'N/13°39'E	S. Kovačič	(242dni/315km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

Čopasta črnica *Aythya fuligula*

PRAHA	♀ AD	9.7.2016	Frahelž, Jihočesky kraj, ČEŠKA	49°07'N/14°44'E	P. Musil	
CX 3242	o	7.2.2017	Ptujsko jezero, Ptuj, SLOVENIJA	46°24'N/15°52'E	M. Gamser	(213dni/314km)

Rjavi škarnik *Milvus milvus*

PRAHA	PULL	8.6.2017	Mikulov, ČEŠKA	48°47'N/16°40'E	M. Hynek	
CT 793	x	30.10.2017	Log pri Vipavi, Vipava, SLOVENIJA	45°52'N/13°56'E	P. Krečič	(144dni/384km)

Divja grlica *Streptopelia turtur*

LJUBLJANA	AD	14.8.2016	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	R. Tekavčič	
T 29705	+	2.9.2017	La Magione, Chiusdino, Siena, ITALIJA	43°12'N/11°08'E	A. Bortone	(384dni/320km)

Čebelar *Merops apiaster*

LJUBLJANA	1Y	12.9.2015	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	Ž. Pečar	
X 3807	v	19.7.2016	Salzlandkreis, Sachsen, Anhalt, NEMČIJA	51°42'N/11°49'E	M. Harz	(311dni/705km)
	v	18.7.2017	Salzlandkreis, Sachsen, Anhalt, NEMČIJA	51°42'N/11°49'E	M. Harz	(675dni/705km)
LJUBLJANA	1Y	14.9.2015	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	J. Bricelj	
X 3834	v	14.7.2017	Anhalt-Bitterfeld, Sachsen-Anhalt, NEMČIJA	51°41'N/11°51'E	M. Harz	(669dni/703km)

Postovka *Falco tinunculus*

BUDAPEST	PULL	20.5.2017	Pomaz, Pest, MADŽARSKA	47°39'N/19°02'E	C. Spilak	
HA 29185	x	2.10.2017	Pirmane 4, Cerknica, SLOVENIJA	45°50'N/14°28'E	A. Zalar	(135dni/402km)
LJUBLJANA	♂ 2Y	6.5.2015	Kleče, Ljubljana, SLOVENIJA	46°05'N/14°29'E	D. Fekonja	
K 1021	o	15.6.2015	Žale, Ljubljana, SLOVENIJA	46°04'N/14°31'E	D. Fekonja	(40dni/3km)
	o	14.4.2017	Csanyoszro, Baranja, MADŽARSKA	45°53'N/17°54'E	A. Meiszterics	(709dni/265km)

Plavček *Cyanistes caeruleus*

SEMPACH	♂ 1Y	27.10.2016	Lauwil, Baselland, ŠVICA	47°22'N/07°39'E	S. Hohl	
B 543477	v	8.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(346dni/530km)
GDANSK	♂ 1Y	28.9.2017	Kaliszany Kolonia, POLJSKA	51°04'N/21°47'E	A. Aftyka	
K6T 6971	v	21.10.2017	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	I. Vreš	(23dni/689km)
LJUBLJANA	♂ AD	2.12.2015	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	I. Vreš	
AC 89434	x	1.3.2017	Zduny, Kujawsko Pomorskie, POLJSKA	53°08'N/19°32'E	W. Grochowalski	(455dni/802km)
LJUBLJANA	AD	13.10.2014	Prelesje, Mirna, SLOVENIJA	45°57'N/15°06'E	J. Gračner	
AC 56717	v	15.10.2017	Ventes ragas, Šilutes, LITVA	55°20'N/21°11'E	V. Eigirdas	(1098dni/1127km)
LJUBLJANA	1Y	26.10.2015	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
AH 7129	v	12.11.2017	Plesivec, Rožnava, SLOVAŠKA	48°33'N/20°24'E	M. Olekšak	(748dni/605km)

Velika sinica *Parus major*

PRAHA	♂ AD	25.9.2016	Horni Nemči, Zlinsky kraj, ČEŠKA	48°56'N/17°38'E	P. Kunčik	
N 774019	v	24.10.2017	Langusova 20, Ljubljana, SLOVENIJA	46°02'N/14°30'E	S. Kos	(394dni/399km)
GDANSK	♂ AD	29.9.2016	Siemianowka, Narewka, POLJSKA	52°54'N/23°51'E	P. Kokocinski	
K7K 7100	v	30.10.2017	Preradovićeva 6, Ljubljana, SLOVENIJA	46°04'N/14°31'E	T. Trilar	(396dni/1014km)
LJUBLJANA	♂ AD	5.2.2016	Spodnje Radvanje, Maribor, SLOVENIJA	46°32'N/15°37'E	F. Bračko	
AC 80212	v	8.1.2017	Glogow Malopolski, Podkarpackie, POLJSKA	50°09'N/21°57'E	J. Wozniak	(338dni/616km)
LJUBLJANA	♀ 1Y	1.10.2017	Ig, Ljubljana, SLOVENIJA	45°58'N/14°33'E	B. Vidic	
AH 71329	v	22.11.2017	Bertiolo, Codroipo, ITALIJA	45°56'N/13°01'E	M. Giordano	(52dni/119km)

Plašica *Remiz pendulinus*

PRAHA	1Y	27.7.2017	Pohorelice, Jihomoravsky kraj, ČEŠKA	48°57'N/16°32'E	I. Frohlich	
J 99999	v	9.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(74dni/372km)
LJUBLJANA	1Y	22.9.2017	Ormoške lagune, Ormož, SLOVENIJA	46°23'N/16°11'E	I. Vreš	

Nadaljevanje dodatka 1 / Continuation of Appendix 1

AH 67435	v	18.11.2017	Codevigo, Padova, ITALIJA	45°17'N/12°08'E	L. Sattin	(57dni/337km)
LJUBLJANA	1Y	4.11.2017	Vnanje Gorice, Ljubljana, SLOVENIJA	46°00'N/14°25'E	R. Tekavčič	
AH 81841	v	18.11.2017	Codevigo, Padova, ITALIJA	45°17'N/12°08'E	L. Sattin	(14dni/194km)

Brkata sinica *Panurus biarmicus*

BUDAPEST	♀ 1Y	4.7.2017	Fertoujlak, Gyor Moson Sopron, MADŽARSKA	47°40'N/16°49'E	S. Mogyorosi	
K 819632	v	2.11.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	T. Mihelič	(121dni/333km)
BUDAPEST	♂ 1Y	4.7.2017	Fertoujlak, Gyor Moson Sopron, MADŽARSKA	47°40'N/16°49'E	S. Mogyorosi	
K 819633	v	2.11.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	T. Mihelič	(121dni/333km)

Kmečka lastovka *Hirundo rustica*

LJUBLJANA	JUV	10.7.2017	Požeg, Pragersko, SLOVENIJA	46°25'N/15°39'E	I. Vreš	
KV 26534	v	6.8.2017	Keszthely, Zala, MADŽARSKA	46°42'N/17°14'E	J. Varga	(27dni/125km)
LJUBLJANA	1Y	13.9.2016	Sečovelske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	P. Grošelj	
KT 34025	x	26.6.2017	Carbonaia, Viscone, Udine, ITALIJA	45°56'N/13°22'E	F. Barbarino	(286dni/55km)

Breguljka *Riparia riparia*

ZAGREB	1Y	31.8.2014	Vransko jezero, Pakoštane, HRVAŠKA	43°53'N/15°33'E	T. Blažev	
BJ 50110	v	14.6.2016	Brinje, Ljubljana, reka Sava, SLOVENIJA	46°06'N/14°36'E	R. Tekavčič	(653dni/257km)
	v	22.6.2016	Brinje, Ljubljana, reka Sava, SLOVENIJA	46°06'N/14°36'E	Ž. Pečar	(661dni/257km)
	v	20.6.2017	Brinje, Ljubljana, reka Sava, SLOVENIJA	46°06'N/14°36'E	Ž. Pečar	(1024dni/257km)
ZAGREB	1Y	19.6.2016	Samoborski Otok, Samobor, HRVAŠKA	45°50'N/15°43'E	T. Blažev	
BJ 77316	v	3.7.2017	Ravno, Smednik, SLOVENIJA	45°54'N/15°22'E	Ž. Pečar	(379dni/28km)
ZAGREB	AD	19.6.2016	Samoborski Otok, Samobor, HRVAŠKA	45°50'N/15°43'E	T. Blažev	
BJ 77256	v	3.7.2017	Ravno, Smednik, SLOVENIJA	45°54'N/15°22'E	Ž. Pečar	(379dni/28km)
ZAGREB	AD	25.6.2013	Samoborski Otok, Samobor, HRVAŠKA	45°50'N/15°43'E	D. Leiner	
BH 13876	v	9.7.2017	Ravno, Smednik, SLOVENIJA	45°54'N/15°22'E	Ž. Pečar	(1475dni/28km)

Belovrati muhar *Ficedula albicollis*

STOCKHOLM	PULL	17.6.2017	Pankar, Grotlingbo, Gotlands Lan, ŠVEDSKA	57°08'N/18°22'E	RC Švedska	
DA 77268	v	26.9.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(101dni/1272km)

Severni kovaček *Phylloscopus trochilus*

MOSKVA	1Y	24.8.2017	Kandalakshskiy, Luvenga, Murmansk, RUSIJA	67°06'N/32°46'E	RC Rusija	
VF 75768	v	22.9.2017	Zeleni rob, Velika planina, SLOVENIJA	46°18'N/14°38'E	D. Grohar	(29dni/2540km)

Vrbji kovaček *Phylloscopus collybita*

MOSKVA		14.10.2017	Zelenogradskiy, Rybachiy, Kaliningrad, RUSIJA	55°05'N/20°44'E	RC Rusija	
VP 11466	v	28.10.2017	Kozlarjeva gošča, Ljubljana, SLOVENIJA	46°00'N/14°30'E	D. Šere	(14dni/1100km)
LJUBLJANA	1Y	16.10.2016	Parte, Ig, Ljubljana, SLOVENIJA	45°58'N/14°33'E	S. Kos	
KV 9882	v	25.12.2016	Ribera, Agrigento, ITALIJA	37°29'N/13°17'E	A. Di Lucia	(70dni/949km)
	v	8.1.2017	Ribera, Agrigento, ITALIJA	37°29'N/13°17'E	A. Di Lucia	(84dni/949km)
	v	15.1.2017	Ribera, Agrigento, ITALIJA	37°29'N/13°17'E	A. Di Lucia	(91dni/949km)

Svilnica *Cettia cetti*

LJUBLJANA	1Y	18.8.2016	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	T. Mihelič	
AH 1844	x	7.1.2017	San Dona' Di Piave, Venezia, ITALIJA	45°39'N/12°36'E	F. Panzarin	(142dni/82km)

Rakar *Acrocephalus arundinaceus*

HIDDENSEE	1Y	31.7.2016	Sawall, Oder, Spree, Brandenburg, NEMČIJA	52°04'N/14°12'E	RC Nemčija	
OB 91562	v	8.9.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(404dni/678km)
ZAGREB	AD	5.8.2017	Vransko jezero, Pakoštane, HRVAŠKA	43°56'N/15°30'E	B. Ende	
CA 121591	v	6.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	T. Trilar	(1dan/245km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

LJUBLJANA	1Y	27.7.2016	Ormož, SLOVENIJA	46°25'N/16°10'E	I. Vreš	
CL 24554	v	30.4.2017	Biskupice, Zlinsky kraj, ČEŠKA	49°05'N/17°43'E	J. Sviečka	(277dni/318km)

Srpična trstnica ***Acrocephalus scirpaceus***

ARANZADI	AD	1.5.2017	Castello d'Empuries, Barracot, Girona, ŠPANIJA	42°12'N/03°06'E	S. Will	
2Y 50130	v	11.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	T. Trilar	(102dni/986km)
MADRID	AD	14.5.2017	Tancat De L'illa, Sueca, Valencia, ŠPANIJA	39°16'N/00°17'W	RC Španija	
5L 27157	v	2.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(80dni/1403km)
MADRID	1Y	16.9.2016	Tancat De la Pipa, Valencia, ŠPANIJA	39°21'N/00°21'W	RC Španija	
4L 09974	v	15.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	Ž. Pečar	(333dni/1402km)
PARIS	1Y	9.9.2015	Rousty, Arles, Bouches du Rhone, FRANCIJA	43°40'N/04°38'E	RC Francija	
7312155	v	16.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	D. Pogačar	(707dni/803km)
PRAHA	1Y	29.6.2017	Mutenice, Jihomoravsky kraj, ČEŠKA	48°54'N/17°03'E	K. Jaroslav	
TU 17254	v	22.8.2017	Hraše, Medvode, SLOVENIJA	46°10'N/14°27'E	D. Grohar	(54dni/361km)
LJUBLJANA	1Y	14.8.2011	Sečoveljke soline, Portorož, SLOVENIJA	45°28'N/13°37'E	R. Tekavčič	
KS 29996	v	11.4.2017	Barracot, Girona, ŠPANIJA	42°12'N/03°06'E	F. Broto	(2067dni/917km)
LJUBLJANA	1Y	6.8.2015	Sečoveljke soline, Portorož, SLOVENIJA	45°28'N/13°37'E	I. Škornik	
KT 88117	v	29.4.2017	Gabbinello Di Sopra, Firenze, ITALIJA	43°59'N/11°17'E	G. Battaglia	(632dni/247km)
LJUBLJANA	1Y	23.9.2015	Št. Jurij, Grosuplje, SLOVENIJA	45°55'N/14°37'E	T. Mihelič	
KV 5116	v	29.4.2017	Barranco Carraixet, Valencia, ŠPANIJA	39°30'N/00°20'W	R. Vera	(584dni/1411km)
LJUBLJANA	1Y	8.8.2015	Vnanje Gorice, Ljubljana, SLOVENIJA	46°00'N/14°25'E	R. Tekavčič	
KT 15612	x	5.5.2017	Sant Quirze de Bosora, Barcelona, ŠPANIJA	46°06'N/02°13'E	O. Car	(636dni/940km)
LJUBLJANA	AD	6.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	T. Trilar	
KV 10392	v	21.8.2017	El Coronil, Sevilla, ŠPANIJA	37°01'N/05°42'W	F. Lopez	(15dni/1931km)
LJUBLJANA	AD	8.8.2017	Ormoške lagune, Ormož, SLOVENIJA	46°23'N/16°11'E	I. Vreš	
KV 26933	v	25.8.2017	Canal Vell, Deltebre, Tarragona, ŠPANIJA	40°44'N/00°47'E	C. Abella	(17dni/1387km)
	v	26.8.2017	Canal Vell, Deltebre, Tarragona, ŠPANIJA	40°44'N/00°47'E	C. Abella	(18dni/1387km)
LJUBLJANA	1Y	21.8.2016	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	V. Havliček	
KS 95393	v	1.9.2017	Biskupice, Zlinsky kraj, ČEŠKA	49°05'N/17°43'E	J. Sviečka	(376dni/507km)
LJUBLJANA	1Y	12.8.2017	Hraše, Medvode, SLOVENIJA	46°10'N/14°27'E	Ž. Pečar	
KV 4750	v	3.9.2017	Canal Vell, Deltebre, Tarragona, ŠPANIJA	40°44'N/00°47'E	P. Pares	(22dni/1255km)
LJUBLJANA	1Y	8.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	T. Trilar	
KV 10470	v	7.9.2017	Barriada Hipolito, Pizarra, Malaga, ŠPANIJA	36°45'N/04°42'W	RC Španija	(30dni/1880km)
LJUBLJANA	1Y	18.8.2016	Sečovlje, Portorož, SLOVENIJA	45°28'N/13°37'E	T. Mihelič	
KV 5334	v	9.9.2017	Castello d'Empuries, Girona, ŠPANIJA	42°12'N/03°06'E	R. Calderon	(387dni/917km)
LJUBLJANA	1Y	18.9.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	T. Trilar	
KV 10939	v	1.10.2017	Illa de Buda, Sant Jaume d'Enveja, ŠPANIJA	40°42'N/00°49'E	D. Bigas	(13dni/1235km)
LJUBLJANA	1Y	3.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	
KT 93800	v	19.10.2017	Mas Thibert, Marais du Vigueirat, FRANCIJA	43°29'N/04°47'E	M. Gregoire	(16dni/800km)

Močvirska trstnica ***Acrocephalus palustris***

BRUSSELS	1Y	1.8.2017	Waremme, Liege, BELGIJA	50°42'N/05°16'E	RC Belgija	
14893798	v	14.8.2017	Vnanje Gorice, Ljubljana, SLOVENIJA	46°00'N/14°25'E	R. Tekavčič	(13dni/853km)
LJUBLJANA	1Y	13.8.2016	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	R. Tekavčič	
KT 17515	v	28.7.2017	Solre Sur Sambre, Hainaut, BELGIJA	50°19'N/04°10'E	RC Belgija	(349dni/886km)

Bičja trstnica ***Acrocephalus schoenobaenus***

STOCKHOLM	1Y	28.7.2010	Varmlands Lan, Skare, Hynboholm, ŠVEDSKA	59°28'N/13°23'E	RC Švedska	
CG 81782	v	26.7.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(2555dni/1502km)
STOCKHOLM	1Y	8.8.2017	Ukno, Lofta, Kalmar Lan, ŠVEDSKA	57°55'N/16°33'E	RC Švedska	
DA 42631	v	19.8.2017	Brest, Ig, Ljubljana, SLOVENIJA	45°59'N/14°29'E	J. Bricelj	(11dni/1334km)
STOCKHOLM	1Y	15.9.2017	Kalmar lan, Lofta, Ukno, ŠVEDSKA	57°55'N/16°33'E	RC Švedska	
DB 19983	v	24.9.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	Ž. Pečar	(9dni/1398km)
FINLAND	1Y	18.8.2017	Espoo, Uusimaa, FINSKA	60°12'N/24°49'E	H. Ekblom	
804787 H	v	30.8.2017	Hraše, Medvode, SLOVENIJA	46°10'N/14°27'E	D. Grohar	(12dni/1701km)
FINLAND	1Y	14.8.2017	Tuulos, Kanta Hame, Hame, FINSKA	61°10'N/24°47'E	H. Kolunen	
885727 H	v	9.9.2017	Cerkniško jezero, Cerknica, SLOVENIJA	45°47'N/14°22'E	R. Tekavčič	(26dni/1838km)

Nadaljevanje dodatka 1 / Continuation of Appendix 1

HIDDENSEE	1Y	13.8.2017	Sawal, Oder Spree, Brandenburg, NEMČIJA	52°04'N/14°12'E	RC Nemčija	
ZH 11285	v	29.8.2017	Ormoške lagune, Ormož, SLOVENIJA	46°23'N/16°11'E	I. Vreš	(16dni/648km)
HIDDENSSE	AD	8.7.2017	Rietzer See, Potsdam Mittelmark, NEMČIJA	52°22'N/12°39'E	RC Nemčija	
ZH 11995	v	27.7.2017	Ormoške lagune, Ormož, SLOVENIJA	46°23'N/16°11'E	F. Bračko	(19dni/712km)
MOSKVA	1Y	4.9.2015	Zelenogradskiy distr., Rybachiy, RUSIJA	55°09'N/20°51'E	RC Rusija	
XR 75237	v	29.7.2017	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	I. Vreš	(694dni/1042km)
PRAHA	1Y	31.7.2017	Bartošovice, Moravskoslezsky kraj, ČEŠKA	49°40'N/18°01'E	L. Harmačkova	
TP 65342	v	10.8.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	R. Tekavčič	(10dni/571km)
PRAHA	1Y	6.8.2017	Stredočesky kraj, Praha, ČEŠKA	50°04'N/14°34'E	M. Brožova	
TT 67350	v	14.8.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	(8dni/508km)
PRAHA	1Y	2.8.2017	Ražice, Jihočesky kraj, ČEŠKA	49°15'N/14°06'E	J. Šebestian	
TU 56776	v	9.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	T. Trilar	(7dni/365km)
PRAHA	1Y	12.8.2017	Loučna nad Desnou, Olomoucky kraj, ČEŠKA	50°07'N/17°09'E	J. Rezniček	
TU 62639	v	14.8.2017	Vnanje Gorice, Ljubljana, SLOVENIJA	46°00'N/14°25'E	R. Tekavčič	(2dni/500km)
BUDAPEST	1Y	14.7.2017	Keszthely, Zala, MADŽARSKA	46°42'N/17°14'E	L. Katalin	
K 753573	v	10.8.2017	Ormoške lagune, Ormož, SLOVENIJA	46°23'N/16°11'E	F. Bračko	(27dni/88km)
BUDAPEST	1Y	9.8.2017	Tass, Bacs, Kiskun, MADŽARSKA	47°02'N/18°59'E	D. Sarlos	
K 800742	v	13.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	D. Pogačar	(4dni/377km)
GDANSK	1Y	26.7.2017	Jezero Druzno, Žolwiniec, Markusy, POLJSKA	54°03'N/19°26'E	C. Nitecki	
K7X 2353	v	17.8.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	Ž. Pečar	(22dni/970km)
BOLOGNA	1Y	12.9.2015	Mortizzuolo, Mirandola, Modena, ITALIJA	44°52'N/11°07'E	R. Gemmato	
31A 4377	v	23.8.2017	Hraše, Medvode, SLOVENIJA	46°10'N/14°27'E	D. Grohar	(711dni/297km)
LJUBLJANA	1Y	23.7.2016	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	I. Vreš	
KV 13514	v	4.6.2017	Kremže, Jihočesky kraj, ČEŠKA	48°54'N/14°20'E	P. Vesely	(316dni/298km)
LJUBLJANA	AD	28.4.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapajna	
KT 90267	x	4.7.2017	Hofors, Bergviksvagen, ŠVEDSKA	60°34'N/16°25'E	RC Švedska	(67dni/1629km)
LJUBLJANA	AD	14.8.2016	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	R. Tekavčič	
KT 17639	v	30.7.2017	Bartošovice, Moravskoslezsky kraj, ČEŠKA	49°40'N/18°02'E	L. Harmažkova	(350dni/572km)
LJUBLJANA	1Y	13.8.2017	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	I. Vreš	
KV 29040	v	15.8.2017	Naszaly, Komarom Esztergom, MADŽARSKA	47°41'N/18°16'E	A. Lengyel	(2dni/246km)

Tamariskovka *Acrocephalus melanopogon*

OZZANO	1Y	26.10.2013	Mortizzzuolo, Mirandola, Modena, ITALIJA	44°52'N/11°07'E	R. Gemmato	
11A 4035	v	12.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(1447dni/277km)

Črnoglavka *Sylvia atricapilla*

ZAGREB	♂ 1Y	18.9.2015	lokva Rovozna, Učka, HRVAŠKA	45°12'N/14°13'E	B. Ječmenica	
BA 434227	v	11.9.2017	Slovenja vas, Ptuj, SLOVENIJA	46°27'N/15°49'E	I. Vreš	(350dni/186km)
KLIVV.AT	1Y	22.7.2017	Murinsel Tamsweg, Salzburg, AVSTRIJA	47°07'N/13°48'E	H. Gressel	
TO 25024	v	14.9.2017	Jeprca, Medvode, SLOVENIJA	46°09'N/14°24'E	M. Pustoslemšek	(54dni/117km)
OZZANO	2Y	17.4.2016	Casale, Vicenza, ITALIJA	45°32'N/11°33'E	L. Piva	
LS 11378	v	6.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(537dni/219km)
OZZANO	1Y	25.8.2017	Lago Di Caldaro, Bolzano, ITALIJA	46°22'N/11°15'E	D. Vassallo	
LW 36817	v	27.9.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	D. Pogačar	(33dni/209km)
LJUBLJANA	♂ 1Y	21.9.2014	Hauptmance, Škofljica, Ljubljana, SLOVENIJA	46°00'N/14°33'E	J. Bricelj	
AC 22135	x	12.2.2017	Florinas, Sassari, Sardegna, ITALIJA	40°42'N/08°33'E	A. Lentini	(875dni/763km)
LJUBLJANA	♀ 1Y	28.8.2016	Vnanje Gorice, Ljubljana, SLOVENIJA	46°00'N/14°25'E	R. Tekavčič	
AC 43651	x	7.3.2017	Montee de la Paveigne, Toulon, FRANCIJA	43°08'N/05°53'E	C. Bersan	(191dni/747km)
LJUBLJANA	♂ 1Y	4.8.2016	Bevke, Vrhnika, SLOVENIJA	45°57'N/14°37'E	P. Grošelj	
AH 4758	v	18.3.2017	Katef Wadi, Beer Sheva Valley, IZRAEL	31°15'N/34°50'E	E. Shochat	(226dni/2386km)
LJUBLJANA	♂ 1Y	27.9.2015	Medvedce, Pragersko, SLOVENIJA	46°22'N/15°39'E	I. Vreš	
AC 86581	x	17.6.2017	Mosonmagyarovar, Csaba u. 5, MADŽARSKA	47°52'N/17°16'E	P. Fazekas	(629dni/207km)
LJUBLJANA	JUV	3.8.2017	Kozlarjeva gošča, Ljubljana, SLOVENIJA	46°01'N/14°29'E	D. Šere	
AC 94976	v	17.9.2017	T. Roial, Cordenons, Pordenone, ITALIJA	45°58'N/12°44'E	P. Taiariol	(45dni/135km)
LJUBLJANA	♂ 1Y	26.8.2017	Ig, Ljubljana, SLOVENIJA	45°58'N/14°33'E	B. Vidic	
AH 3940	v	15.10.2017	Marais des Estagnetes, Hyeres, FRANCIJA	43°02'N/06°08'E	A. Aurelien	(50dni/742km)
LJUBLJANA	♀ 1Y	6.9.2017	Sečoveljske soline, Portorož, SLOVENIJA	45°28'N/13°37'E	J. Bricelj	

Nadaljevanje dodatka 1 / Continuation of Appendix 1

AH 49210	v	17.10.2017	El Vendrell, Tarragona, ŠPANIJA	41°11'N/01°33'E	M. Bonilla	(41dni/1084km)
LJUBLJANA	♂ 1Y	27.9.2017	Sečoveljska soline, Portorož, SLOVENIJA	45°28'N/13°37'E	D. Pogačar	
AC 64900	v	10.12.2017	Pineta D'Ischitella, Caserta, ITALIJA	40°57'N/14°00'E	D. Mastronardi	(74dni/503km)

Vrtna penica *Sylvia borin*

OZZANO	1Y	19.8.2017	Valle Da Pesca Cavanata, Grado, ITALIJA	45°43'N/13°27'E	T. Zorzenon	
LV 73154	v	28.8.2017	Sečoveljska soline, Portorož, SLOVENIJA	45°28'N/13°37'E	T. Mihelič	(9dni/31km)

Mlinarček *Sylvia curruca*

LJUBLJANA	1Y	18.9.2016	Sestrže, Pragersko, SLOVENIJA	46°22'N/15°42'E	F. Bračko	
AH 21649	v	17.5.2017	Uppsala Lan, Graso, Orskar, ŠVEDSKA	60°31'N/18°24'E	RC Švedska	(241dni/1582km)

Kos *Turdus merula*

LJUBLJANA	♀ 1Y	13.10.2016	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	
E 44822	+	6.11.2017	Curcio, Colico, Lecco, ITALIJA	46°07'N/09°23'E	M. Morganti	(389dni/344km)
LJUBLJANA	♀ AD	20.6.2017	Šikole, Pragersko, Maribor, SLOVENIJA	46°24'N/15°52'E	I. Vreš	
E 48648	+	7.12.2017	Cagliari, ITALIJA	39°13'N/09°07'E	RC Italy	(170dni/969km)
LJUBLJANA	♀ JUV	3.9.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	
E 49317	+	14.10.2017	Colto Alle Bolle, Siena, ITALIJA	43°27'N/11°24'E	F. Merli	(41dni/361km)

Vinski drozg *Turdus iliacus*

LJUBLJANA	AD	28.10.2017	Kozlarjeva gošča, Ljubljana, SLOVENIJA	46°00'N/14°30'E	D. Šere	
E 50123	+	9.11.2017	Marchino, Pisa, ITALIJA	43°47'N/10°41'E	P. Lippi	(12dni/389km)

Taščica *Erithacus rubecula*

PRAHA	1Y	5.9.2017	Lužnice, Jihočesky kraj, ČEŠKA	49°04'N/14°45'E	J. Vlček	
TU 36779	v	29.9.2017	Jeprca, Medvode, SLOVENIJA	46°09'N/14°24'E	M. Pustoslemšek	(24dni/325km)
ZAGREB	1Y	4.9.2016	lokva Rovozna, Učka, HRVAŠKA	45°12'N/14°13'E	I. Šoštarić	
BJ 55276	x	15.5.2017	Mali kraj Višnje, Ajdovščina, SLOVENIJA	45°53'N/14°03'E	S. Rudolf	(253dni/77km)
LJUBLJANA	2Y	9.3.2014	Požeg, Pragersko, SLOVENIJA	46°25'N/15°39'E	I. Vreš	
AZ 99888	x	17.2.2017	Via Curta 8, Pieris, Friuli, ITALIJA	45°48'N/13°26'E	S. Cosolo	(1076dni/184km)
LJUBLJANA	1Y	14.10.2016	Bilje, Nova Gorica, SLOVENIJA	45°56'N/13°39'E	M. Keber	
AH 10478	v	10.4.2017	Tancat De Milia, Sollana Valencia, ŠPANIJA	39°18'N/00°21'W	RC Španija	(178dni/1359km)
LJUBLJANA	1Y	12.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapajna	
AH 42970	x	23.10.2017	C. Colombarine, Casalgrande, ITALIJA	44°36'N/10°45'E	M. Gustin	(11dni/316km)
LJUBLJANA	1Y	31.10.2017	Babna gorica, Ljubljana, SLOVENIJA	45°58'N/14°32'E	Ž. Pečar	
AH 79895	x	19.11.2017	Marchon, Arbent, FRANCIJA	46°16'N/05°40'E	D. Mme/Mr	(19dni/684km)

Siva pevka *Prunella modularis*

PRAHA	PULL	9.6.2017	Nova Paka, Kralovehradecky kraj, ČEŠKA	50°30'N/15°32'E	M. Brandejsky	
TP 66691	v	5.10.2017	Verd, Vrhnika, SLOVENIJA	45°58'N/14°18'E	B. Lapanja	(118dni/512km)
GDANSK	1Y	8.9.2017	Miszkowice, Lubawka, POLJSKA	50°42'N/15°55'E	F. Hayatli	
K4X 7864	v	9.10.2017	Tezno, Maribor, SLOVENIJA	46°35'N/15°40'E	M. Vamberger	(31dni/458km)

Grilček *Serinus serinus*

LJUBLJANA	♂ 2Y	2.4.2015	Puhtejeva ulica, Vič, Ljubljana, SLOVENIJA	46°02'N/14°28'E	J. Nered	
KP 53441	v	9.4.2017	Pruhonice, Stredočesky kraj a Praha, ČEŠKA	49°59'N/14°33'E	F. Zicha	(738dni/439km)

Zelenec *Chloris chloris*

ZAGREB	♀ 1Y	31.7.2016	Kukuljanovo, Rijeka, HRVAŠKA	45°20'N/14°30'E	P. Corva	
CA 160573	v	19.3.2017	Goriča vas, Ribnica, SLOVENIJA	45°43'N/16°44'E	S. Kljun	(231dni/179km)
LJUBLJANA	♀ AD	16.3.2016	Gore 13 A, Idrija, SLOVENIJA	45°59'N/14°03'E	P. Grošelj	

Nadaljevanje dodatka 1 / Continuation of Appendix 1

AH 4527	v	14.3.2017	Zywocice, Krapkowice, POLJSKA	50°27'N/17°57'E	J. Siekiera	(363dni/574km)
LJUBLJANA	♂ AD	7.11.2017	Šebrelje, Cerkno, SLOVENIJA	46°06'N/13°55'E	B. Lapajna	
AH 43821	o	11.11.2017	Sestola, Maranello, Modena, ITALIJA	44°30'N/10°50'E	G. Rossi	(4dni/300km)

Ščinkavec *Fringilla coelebs*

LJUBLJANA	♀ 1Y	30.9.2015	Bilje, Nova Gorica, SLOVENIJA	45°56'N/13°39'E	M. Keber	
AZ 86735	v	8.12.2017	Palude Del Brusa, Carea, Verona, ITALIJA	45°10'N/11°13'E	R. Pollo	(800dni/208km)

Lišček *Carduelis carduelis*

OZZANO		10.5.2017	San Canzian D'Isonzo, Gorizia, ITALIJA	45°48'N/13°27'E	M. Benfatto	
2A 47923	v	6.8.2017	Bilje, Nova Gorica, SLOVENIJA	45°56'N/13°39'E	M. Keber	(88dni/21km)

Čižek *Spinus spinus*

KLIVV.AT	♂ 1Y	17.10.2016	Rudmannser Teich, Niederosterreich, AVSTRIJA	48°35'N/15°13'E	B. Watzl	
V 001431	v	20.2.2017	Verje, Medvode, SLOVENIJA	46°09'N/14°25'E	M. Pustoslemšek	(126dni/277km)
LJUBLJANA	♂ 2Y	9.3.2017	Verje, Medvode, SLOVENIJA	46°09'N/14°25'E	M. Pustoslemšek	
KV 32268	v	19.3.2017	Posilek, Rogow Opolski, POLJSKA	50°31'N/17°54'E	W. Michalik	(10dni/549km)

Krivokljun *Loxia curvirostra*

LJUBLJANA	♀ 1Y	12.11.2015	Resa, Kočevje, SLOVENIJA	45°39'N/15°02'E	J. Gračner	
E 44469	v	15.11.2017	Gmundnerberg, Altmunster, AVSTRIJA	47°54'N/13°43'E	M. Kreuzer	(734dni/269km)

Trstni strnad *Emberiza schoeniclus*

BUDAPEST	♀ 1Y	28.9.2016	Davod, Bacs Kiskun, MADŽARSKA	45°59'N/18°51'E	A. Morocz	
K 697865	v	20.2.2017	Škocjanski zatok, Koper, SLOVENIJA	45°32'N/13°45'E	I. Brajnik	(145dni/399km)
FINLAND	♀ 1Y	13.9.2016	Oulu, Pohjois Pohjanmaa, FINSKA	64°57'N/25°29'E	S. Timonen	
667573 V	v	15.3.2017	Pragersko, SLOVENIJA	46°23'N/15°40'E	I. Vreš	(183dni/2147km)
HIDDENSEE	♂ 1Y	21.8.2017	Mennewitz, Anhalt, Bitterfeld, NEMČIJA	51°51'N/11°58'E	RC Nemčija	
VG 81364	v	8.10.2017	Zbure, Škocjan, SLOVENIJA	45°54'N/15°15'E	J. Gračner	(48dni/703km)

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Little Owl *Athene noctua* survey in the area of Ulcinj (S Montenegro) in 2015

Popis čuka *Athene noctua* na območju Ulcinja (J. Črna gora) leta 2015

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Abstract

Between 29 Mar and 10 Apr, 2015, a Little Owl *Athene noctua* survey was carried out using the playback method in the southern part of Montenegro. The study area was situated between the town of Ulcinj and the Bojana River delta. A total of 55 calling males were registered at 26 survey points with a maximum of 4 calling males per survey point. Considering the low response rate of the Little Owl, its local population was estimated at be 55–110 calling males. This study presents the first systematic survey of the Little Owl in Montenegro.

1. Introduction

Little Owl *Athene noctua* is a transpalearctic species covering Central Europe, the Mediterranean, the Middle East and through Central Asia reaching China. A part of the species' range is located in Ethiopia and in the southern part of the Arabian Peninsula (BirdLife International 2017). In Central Europe, the species mainly occurs at low altitudes (up to 600 m a.s.l.). It is a species of open-country and avoids dense forests and other types of dense vegetation (Cramp 1985). It nests in tree cavities, rock crevices and buildings. One of the limiting factors for the expansion of Little Owls is the limited number of suitable nesting sites (Van Nieuwenhuyse *et al*. 2008). Perching spots for hunting and a spot for roosting during the day are also important. The availability of grassland and arable land is beneficial but not obligatory for its occurrence (Żmihorski *et al*. 2009).

Generally, the population of Little Owl is non-threatened (BirdLife International 2017), but some local European populations suffered great declines in the last 60 years (Cramp 1985; Van Nieuwenhuyse *et al*. 2008) and in some areas populations decreased substantially, with populations in Denmark, for example, on the brink of disappearance (Sunde *et al*. 2009). The species is a resident in Europe (BirdLife International 2017) and considered a regular breeder in Montenegro (Stumberger *et al*. 2008, Saveljić & Jovićević 2015). While ample data are at hand on the breeding, migrating and wintering waterbirds and raptors in the wider Bojana River delta area, including salt pans at Ulcinj Solana (Stumberger *et al*. 2008, Sackl *et al*. 2016), several other species of birds have not been included in systematic surveys of the area. There are 1-2 breeding pairs of Little Owls nesting in buildings at Solana (Stumberger *et al*. 2008), while the estimate for the wider Bojana delta is >18 breeding pairs (Schneider-Jacoby et al. 2006). The data leading to this first estimate was collected in the Bojana delta during systematic surveys of other species and area surveys of rare species, especially during the surveys within the Rapid Assessment of Birds in the Bojana-Buna Area in 2004 (Schneider-Jacoby et al. 2006). The majority of data were collected during daytime surveys of different species and sites within the Bojana delta, but some were also collected during night surveys of other species, specifically Scops Owl *Otus scops*, European Nightjar *Caprimulgus europaeus* and Baillon's Crake *Zapornia pussila*. No systematic survey of Little Owls was carried out in this area. Our aim was to survey the population of Little Owl between the town of Ulcinj and the mouth of the Bojana River (S Montenegro).

2. Study area and methods

2.1. Study area

The study was conducted in the southern part of Montenegro, between the town of Ulcinj and the

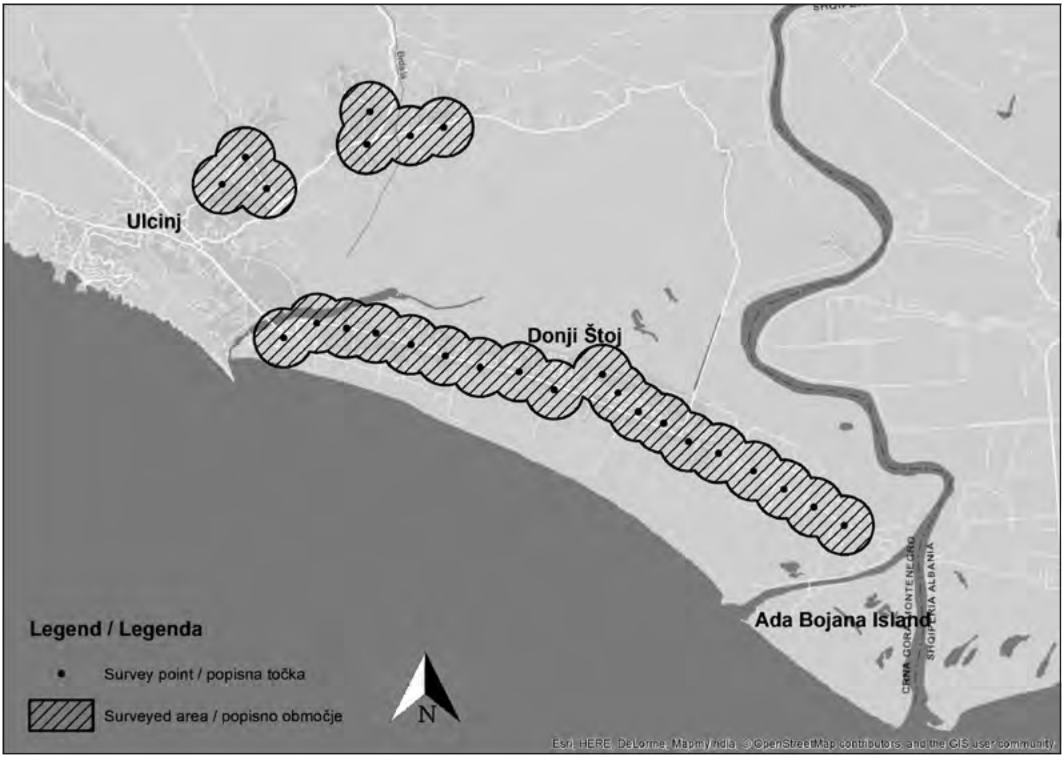

Figure 1: Map of the study area between Ulcinj and the Bojana River delta. The survey points are presented as black spots, while the surveyed area is marked as a hatched polygon.

Slika 1: Karta raziskovanega območja med Ulcinjem in delto reke Bojane. Popisne točke so označene s črnimi pikami, popisano območje je označeno kot šrafiran poligon.

Bojana River delta (UTM CM53, CM54, CM63 and CM64; 41°54.5'N 19°17'E). The survey points were located in the area of Štoj and suburbs of Ulcinj. Štoj is approximately 10-km long stretch of hinterland beyond the Velika plaža (Long Beach), a 12 km long stretch of sandy beach. It also includes a 7 km long tourist village Donji Štoj and a smaller Gornji Štoj. The beach of Velika plaža is heavily visited in the summer months. The size of the surveyed area was 15.4 km^2 and calculated as the surface covered by the 500 m detection radius around the survey points (Johnson *et al.* 2007). The surveyed area is a mosaic of settlements, wet and moist meadows, salina, swamps, small-scale agriculture, scattered orchard and vineyard plantations and mostly fragmented stands of Willow *Salix* sp., Poplar *Populus* sp. and Alder *Alnus* sp. forests (Schwartz 2010).

2.2. Methods

We used the playback method as described by Johnson *et al.* (2007). Initially, we determined 26 survey points which were more than 500 m apart, with two exceptions that were 400 and 491 m apart. The Little Owl in the Mediterranean region has its peak in vocal activity at the end of March and the beginning of April (Johnson *et al.* 2007). Therefore, we decided to conduct the fieldwork in the nights of 29th March, 2nd and 10th April 2015. We chose calm and clear nights with no or little wind, as weather conditions could affect the vocal activity of the owls (Zubergoitia & Campos 1998). The surveys started at sunset and finished around 23:00. For every Little Owl we recorded the approximate direction in order to minimize count replications.

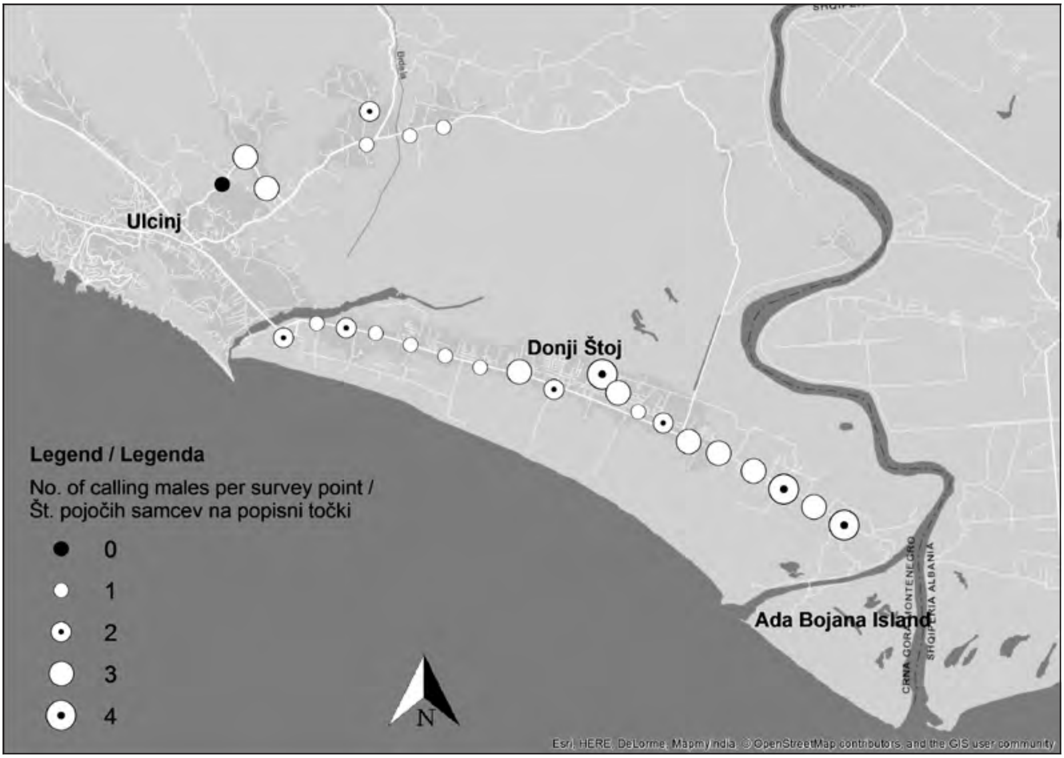

Figure 2: Map of the study area with symbols indicating the number of calling males of Little Owl *Athene noctua* per survey point

Slika 2: Karta raziskanega območja z označenim številom pojočih samcev čuka *Athene noctua* na popisnih točkah

The method by Johnson et al. (2007) suggests at least 3 visits to every survey point to be made to determine non-occupancy owing to the low response rate of the species. Nonetheless, due to time limitations and high response by the owls we visited every survey point only once. In the areas of high density, however, the owls responded more readily (Zubergoitia & Campos 1998), so we concluded that repeating surveys would not increase our results substantially. Maps were created using ArcGIS software by Esri.

3. Results and discussion

We recorded 55 calling males at the 26 survey points. The density of calling males in the surveyed area was 3.57 per km^2. Only one survey point was without a response. On average, we registered 2 calling males per survey point, with the highest number of 4, which occurred three times.

Centini (2001) concluded that the response rate by the Little Owl to playback was 49.6 %. Considering this and the fact that the response rate is higher in the areas more densely populated by Little Owls (Zubergoitia & Campos 1998), we assume that we registered considerably more than half of the local population. We estimate the local population to be 55-110 calling males.

A comparison of breeding densities from around Europe shows that the Ulcinj area has high local density of breeding Little Owls. Furthermore, it is mostly higher than those in Central and Western Europe (Exo 1992, Vogrin 1997, Ille *et al*. 2001, Berce & Kmecl 2008) and comparable to other studies from the Mediterranean (Hof 2007, Tomé *et al*. 2008).

Table 1: Published average Little Owl densities with data on the country, area, unit and reference for the research

Tabela 1: Objavljene povprečne gostote čuka s podatki o državi, območju, enoti in referencah za raziskovanje vrste

Country	Area	Singing males/ km^2	Pairs/ km^2	Reference
Italy	Tolfa Mountains, Lazio		0.55	Centili 1995
1Italy	Pavi	1.1		Cesaris 1988
[2]Slovak republic	Michalovce district		1	Danko *et al.* 1994
[1,2]Poland	Mazowsze lowland		1.4	Dobrowski *et al.* 1991
[2]Austria	Burgenland		1.5	Dvorak *et al.* 1993
[1]Italy	Po plain		9,3–11	Estoppey 1992
[1]Germany		1,2–1,7		Exo 1983
[2]Poland	South Podlasie		0.4	Fronczak *et al.* 1991
[1]The Netherlands	Betuwe		2.1	Fuchs 1986
[3]France	10 areas	0.21		Génot 1996
[3]Austria	5 areas		0.08	Ille *et al.* 2001
[1]Germany			Up to 5,6	Illner *et al.* 1989
[1,2]Poland	Kampinos National Park		0.6	Kowalski *et al.* 1991
Italy	Plain of Bergamo, Lombardia		0.69	Mastrorilli 1997
Italy	Plain of Pavia, Lombardia		0.4	Pirovano & Galeotti 1999
Czech Republic	Southern Bohemia		0.024	Pykal *et al.* 1994
[1]Germany	East-Germany	0.1		Schönn 1986
[3]Czech Republic	27 areas		0.12	Schröpfer 2000
Denmark	Jutland		0,04–0,06	Sunde *et al.* 2009
Hungary	Hortobagy	0.501		Šalek *et al.* 2013
Italy	Castel Porziano, Lazio		3.14–4.62	Tomassi *et al.* 1999
Portugal	Cabeça da Serra		7	Tomé *et al.* 2008
Portugal	S. Marcos da Atabueir		2.5	Tomé *et al.* 2008
Portugal	Quinta da Rocha	6.44		Hof 2007
Slovenia	Dravsko polje		Up to 0,48	Vogrin 1997
Montenegro	Ulcinj	3.57		This research

1 summary and references by Génot (1996)
2 summary and references by Vogrin (1997)
3 summary and references by Hof (2007)

Little Owls prefer habitats with more build-up areas and less forested areas (Żmihorski *et al*. 2009). The high density of Little Owls in the surveyed area seems supportive of this finding. Also, many buildings at Donji Štoj are empty during most of the year, since they are occupied only during the summer holidays, meaning lower human disturbance. Additionally, the abundance of meadows and pastures with very low vegetation height in the survey area offer suitable feeding places for Little Owls which require areas of low vegetation height or bare ground to spot the prey (Grzywaczewski 2009, Framis 2011). Surveys in the floodplain of the Bojana River delta (250 km^2), which includes the towns of Ulcinj and Štoj, revealed high numbers of other conservationally important insectivorous species such as Scops Owl (*Otus scops*) >89 bp (breeding pairs), Nightjar (*Caprimulgus europaeus*) 111-500 bp, Roller (*Coracias garrulus*) 9-15 bp, Hoopoe (*Upupa epops*) >51 bp and Bee-eater (*Merops apiaster*) >261 bp (Schneider-Jacoby *et al*. 2006). The relatively high density of Little Owls in the study area corroborates the high biodiversity and conservation value of the Bojana River delta.

Povzetek

Med 29. 3. in 10. 4. 2015 smo opravili popis čuka Athene noctua z metodo predvajanja posnetka v južni Črni gori. Preučevano območje je bilo med mestom Ulcinj in delto reke Bojane. Skupno smo zabeležili 55 kličočih samcev na 26 točkah, maksimum za eno točko so bili štirje samci. Upoštevajoč slabo odzivnost vrste na posnetek lokalno populacijo ocenjujemo na 55–110 kličočih samcev. Raziskava je prvi sistematični popis čuka v Črni gori.

Key words: Little Owl, *Athene noctua*, playback survey method, S Montenegro
Ključne besede: čuk, *Athene noctua*, metoda predvajanja posnetka, J Črna gora

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A contribution to the knowledge of diet composition of the Barn Owl *Tyto alba* in the area of Pisa (Italy)

Prispevek k poznavanju prehrane pegaste sove *Tyto alba* na območju pise (Italija)

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Abstract

We examined the pellets of the Barn Owl *Tyto alba*, collected in Pisa, Italy, in 2012. Altogether, 219 specimens of small mammals were found in 85 pellets. The Barn Owl diet was composed of ten species of small mammals, representing three different families (Muridae, Cricetidae, Soricidae). The main prey species was the Wood Mouse *Apodemus sylvaticus*, followed by the House Mouse *Mus musculus* and the Savi's Pine Vole *Microtus savii*. While the smallest of the small mammals from the area, the Etruscan Shrew *Suncus etruscus*, was well represented in the pellets, some larger species of small mammals were not represented at all. The reason for such result may lie in the upper limit for our Barn Owl's prey size. Results suggest that optimal prey weight for our Barn Owl may be between 26–75 g of body mass, however, the prey can be occasionally as heavy as almost 100 g, represented by adult Rat *Rattus* spp. Nevertheless, our results may not reflect the true hunting strategy of the Barn Owl, but the availability of a certain food item at one point in time.

1. Introduction

Barn Owl *Tyto alba* (Scopoli, 1769) is a widespread resident across much of Europe, which accounts for less than a quarter of its global range (Birdlife International 2004). Its diet has been studied more extensively than that of any other bird of prey (Mikkola 1983, Everett *et al.* 1992, Taylor 1994, 2009, Bontzorlos *et al.* 2005, Leonardi & Dell'arte 2006). It mostly hunts small terrestrial mammals, mainly rodents (Mikkola 1983, Taylor 1994), members of the three mammal families Soricidae (shrews), Cricetidae (voles) and Muridae (mice and rats) (Mikkola 1983, Brichetti & Fracasso 2006). Occasionally it preys on insects, amphibians, reptiles, birds (Mikkola 1983, Taylor 1994, Bontzorlos *et al.* 2005, Leonardi & Dell'arte 2006), fish and arthropods (Bontzorlos *et al.* 2005). Its pellets are easy to find and small mammal bone parts are well preserved and easy to identify (Paspali *et al.* 2013). However, its hunting tactics remain controversial (Tores *et al.* 2005). Most researchers claim that the Barn Owl shows no food preferences and that the abundance of each species in the diet is a true reflection of prey abundance or accessibility in the field (Bunn *et al.* 1982, Tores *et al.* 2005, Yom-Tov & Wool 1997). On the other hand, some researchers suggest that it shows preference for small-sized prey and that its diet does not reflect the abundance of prey species in the field (Mikkola 1983, Tores *et al.* 2005, Yom-Tov & Wool 1997). These contrasting assumptions supposedly originate from different length of the studies (Tores *et al.* 2005). In his study, Contoli (1981) asserts that analysis of Barn Owl diet can provide information on the availability of small mammal prey species in a particular area, even when only few pellets are available (Bose & Guidali 2001). Mikkola (1983) suggests that the study of the Barn Owl's diet is suitable for determining the presence of nocturnal small mammal species within its hunting territory. On the other hand, some researchers have claimed that the Barn Owl is a selective predator, hunting its prey by preference (Yom-Tov & Wool 1997, Tores *et al.* 2005) and that its diet would not represent the true abundance of prey species in the field (Tores *et al.* 2005).

Nevertheless, studies that compared pellet analyses with data from field trapping have also shown that prey size is an obvious limiting factor

Figure 1: Study area near Marina di Pisa in Italy where the Barn Owl pellets were collected

Slika 1: Obravnavano območje blizu kraja Marina di Pisa (Italija), kjer so bili nabrani izbljuvki pegaste sove

(Tores *et al.* 2005, Yom-Tov & Wool 1997). And for that, its diet may reflect not the true hunting strategy of a predator, but the availability of a certain food item at one point in time (Tores *et al.* 2005, Yom-Tov & Wool 1997). A selective predator is expected to consume a narrow range of prey species regardless of their abundance, while an opportunistic predator will take its prey in proportion to its abundance at any point in time (Tores *et al.* 2005, Yom-Tov & Wool 1997).

The Italian population of the Barn Owl is poorly known (Galeotti 2003). It appears to be declining in almost the entire Po Valley and in some central Italian areas of Mugello and province of Florence (0,03 pairs/km^2) (Galeotti 2003). In Tuscany, its population is estimated at 500-1,500 pairs, which are locally in decline (Brichetti & Fracasso 2006).

The aim of our study was to: (1) present the diet of a local Barn Owl in Pisa (Italy); (2) examine whether its diet reflects species assemblage of the local fauna of small mammals in the community the owl preyed upon, and (3) to check if there is an upper limit in prey size.

This paper should be considered to contribute to the knowledge of the Tyto alba 's diet in Italy.

2. Materials and methods

2.1. Study area

Pellets were collected in an abandoned house (43°39'38.2"N 10°17'55.9"E) near Marina di Pisa in Italy. Marina di Pisa lies on the left bank of the Arno River and is located directly north of Tirrenia and about 10 kilometres west from Pisa. The area is mostly cultivated with fields of corn and cereals, with coniferous woods nearby. The climate in this region is warm and temperate (Merkel 2018). Precipitation occurs mostly in winter, with relatively little rain in the summer. The average annual temperature is 14.8°C and the average annual rainfall is 877 mm (Merkel 2018).

2.2. Methods

Pellets (n=85) were collected in July 2012 during a single visit of the nest site. We only collected pellets that were 4 – 5 days old (still damp and soft), 1 – 2 months old (dried out, black and shiny) or 2 – 4 months old (black colour slowly wears off, and they turn progressively grey). We determined the age of the pellets collected by following Chandler (2011).

Their content was examined in the laboratory. Pellets were examined individually. To identify the skulls, teeth and other remains found in pellets, a stereo microscope with 20x magnification was used. We identified the remains to the species level by following Kryštufek (1985) and Aulagnier *et al.* (2009). The mean body mass of prey was taken from literature Aulagnier *et al.* (2009). Statistical analysis was conducted in the programme Past version 3.16 (Hammer *et al.* 2001).

3. Results

We identified 219 individual mammal species from 85 pellets. The owl's diet was composed of ten species of small mammals representing three different families, Muridae, Cricetidae and Soricidae (Table 1).

The main prey species of the Barn Owl was Wood Mouse (*Apodemus sylvaticus*) (34.7%). The second most important prey species in its diet was House Mouse (*Mus musculus*) (16.9%), followed by the Savi's Pine Vole (*Microtus savii*) (14.9%). The presence of Black Rat (*Rattus rattus*) and Brown Rat (*Rattus norvegicus*) was low (0.45 %).

The commonest prey weight in the investigated area was 11 – 30 g (Figure 2). Only in two cases was the prey heavier than 70 g, reaching a maximum of almost 100 g. In both cases, the prey species was an adult Rat (*Rattus rattus* and *Rattus norvegicus*, respectively).

We tested if there were statistically significant differences between the proportions of prey species in different samples (Table 2). Only a single prey item in the pellet was present in 18.8% of all pellets collected. The observed proportion of all species found in the pellets contained a single prey item, and the proportion expected from the content of all pellets showed statistical differences between

Table 1: Proportion of species identified from pellets of the Barn Owl (*Tyto alba*) found in an abandoned house near Marina di Pisa, Italy, in July 2012 (N=219)

Tabela 1: Delež vrst, ki so bile identificirane iz izbljuvkov pegaste sove (*Tyto alba*), najdenih v zapuščeni hiši blizu Marina di Pisa (Italija) julija 2012 (N=219)

Family	Species	Proportion (%)	Number of prey (N)
Muridae	**Wood Mouse** *(Apodemus sylvaticus)*	34,7	76
	House Mouse *(Mus musculus)*	16,9	37
	Yellow-Necked Mouse *(Apodemus flavicollis)*	2,7	6
	Black Rat *(Rattus rattus)*	0,45	1
	Brown Rat *(Rattus norvegicus)*	0,45	1
Cricetidae	**Savi's Pine Vole** *(Microtus savii)*	14,9	33
	European Water Vole *(Arvicola terrestris)*	9,6	21
Soricidae	**Lesser White-Toothed Shrew** *(Crocidura suaveolens)*	13,2	29
	Etruscan Shrew *(Suncus etruscus)*	3,6	8
	Bicolored Shrew *(Crocidura leucodon)*	3,2	7

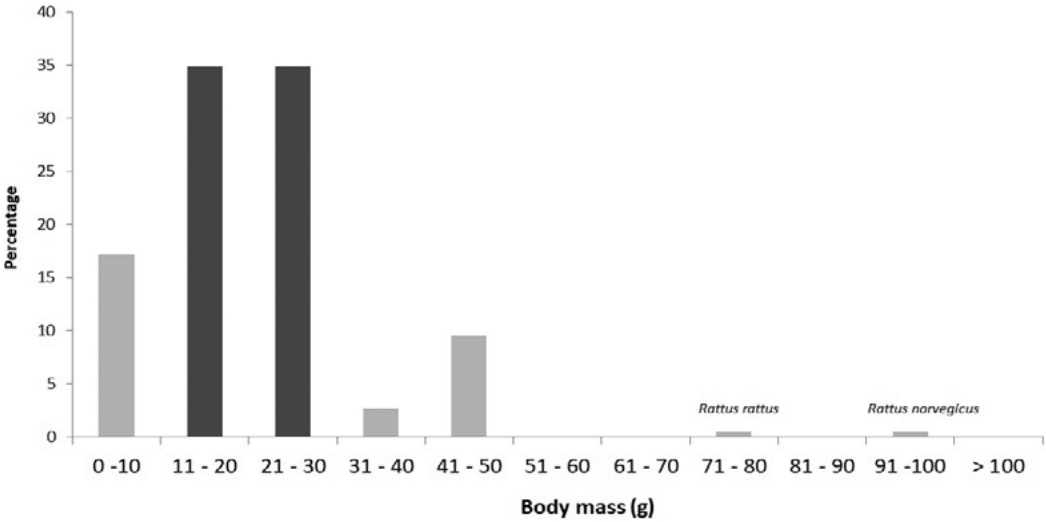

Figure 2: The percentage of individual mass classes of prey in the diet of Barn Owl *(Tyto alba)* from the pellets found in an abandoned house near Marina di Pisa, Italy, in July 2012 (N=219)

Slika 2: Odstotek posameznih masnih razredov plena v prehrani pegaste sove *(Tyto alba)*, ki so bili najdeni v izbljuvkih, nabranih v zapuščeni hiši blizu kraja Marina di Pisa (Italija) julija 2012 (N=219)

Table 2: Chi-square test of expected and observed percentage of small mammals where one prey item was present in a pellet (N=16)

Tabela 2: Hi-kvadrat test med pričakovanimi in opazovanimi odstotki malih sesalcev, kjer je bil v izbljuvku najdena vsaj ena enota plena (N=16)

Species	Expected	Observed	P
Apodemus sylvaticus	34.7	43.8	N.S.
Mus musculus	**16.9**	**0**	**< 0.001**
Microtus savii	15.1	12.5	N.S.
Crocidura suaveolens	13.2	6.3	N.S.
Arvicola terrestris	**9.6**	**37.5**	**< 0.001**
Suncus etruscus	3.7	0	N.S.
Crocidura leucodon	3.2	0	N.S.
Apodemus flavicollis	2.7	0	N.S.
Rattus rattus	0.5	0	N.S.
Rattus norvegicus	0.5	0	N.S.
χ^2 – test = 47.7			**< 0.001**

samples. The comparison of two samples, first representing the whole sample and other containing only one item, showed statistically significant differences indicating that the hunting strategy of our Barn Owl is not opportunistic.

4. Discussion

Small mammals were the most important prey in the Barn Owl's diet in the area of Marina di Pisa, Italy. The most preyed species was the Wood Mouse, which is consistent with the articles of other authors (LOVARI *et al.* 1976, LOVARI 1974, MIKKOLA 1983, OBUCH & BENDA 2009, CHANDLER 2011). Small presence (2.7%) of the Yellow-necked Mouse in the diet may be due to the fact that habitat suitable for this species is very rare within the hunting area of the Barn Owl. The important species in the diet was also Lesser White-toothed Shrew with the frequency of 13.2%, while its congeneric species, the Bicoloured White-toothed Shrew, was four times less common. The Etruscan Shrew is making a very small contribution to our Barn Owl diet. This may be due to the fact that species is very small in size and has a low biomass. The presence of Black Rat and Brown Rat was low, and its presence can be explained by a farm and farmland in the study area.

In his study of the Barn Owl diet, TAYLOR (1994) analyzed pellets from the different European countries. He assumed that one pellet per day is produced by an owl, and came up with a figure of about 75g of food per day needed for the adult Barn Owl. This indicates that prey body mass is a limiting factor. This may be due to the fact that for any predator, and particularly a flying one, there may be an upper limit for prey size which can be captured and carried away (TAYLOR 1994). The results from our analysis of the pellets indicate that our Barn Owl does not prey opportunistically. The commonest prey weight in the investigated area was 11 – 30 g. Only in two cases was the prey heavier than 70 g, reaching a maximum of almost 100 g. In both cases, the prey species was an adult Rat (*Rattus rattus* and *Rattus norvegicus*, respectively). Numbers of prey individuals of small mammals in our pellets are showing that by increasing the number of prey items within a single pellet the relative abundance of large species – in this case, the heaviest of the five most commonly preyed species is *Arvicola terrestris* – decreases, whereas on the other hand the smallest species *Suncus etruscus* was only detected in pellets with four and five prey items and never less. Our results suggest that pellet contents do not reflect the relative abundance of small mammals in the area, but it can be used as a complementary tool to supplement the faunal lists of small mammals in a given area. This study also indicates that Barn Owl may not be an opportunistic predator as the proportion of small mammals in different samples of pellets greatly differs and an obvious upper limit in prey body size exists for our Barn Owl.

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I am grateful to Katarina Denac and Urša Koce for their valuable comments and suggestions on the draft. A very special thank you goes to Dr Gianluca Bedini from Centro Recupero Uccelli Marini e Acquatici di Livorno with his help during the fieldwork.

Povzetek

Preučili smo izbljuvke pegaste sove *Tyto alba*, zbrane v okolici Pise (Italija) leta 2012. Skupno smo našli 219 osebkov malih sesalcev v 85 izbljuvkih. Prehrano pegaste sove je sestavljalo 10 vrst malih sesalcev iz treh družin (Muridae, Cricetidae, Soricidae). Glavna vrsta v prehrani je bila gozdna miš *Apodemus sylvaticus*, sledita ji hišna miš *Mus musculus* in Savijeva kratkouha voluharica *Microtus savii*. Najmanjša vrsta z območja, etruščanska rovka *Suncus etruscus*, je bila dobro zastopana v izbljuvkih, medtem ko nekaterih večjih vrst nismo ugotovili, kar morda odseva zgornjo mejo velikosti za plen pegaste sove. Zdi se, da je optimalna teža plena med 26 in 75 g, občasno pa upleni tudi osebke, ki tehtajo do 100 g, npr. odrasle podgane *Rattus* spp. Kljub vsemu se moramo zavedati, da naši rezultati kažejo na razpoložljivost plena v določenem časovnem obdobju, ne pa nujno prehranske strategije pegaste sove.

Key words: Barn Owl, *Tyto alba*, diet, small mammals, Pisa, Italy

Ključne besede: Pegasta sova, *Tyto alba*, prehrana, mali sesalci, Pisa, Italija

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Redke vrste ptic v Sloveniji v letu 2017 – Poročilo Nacionalne komisije za redkosti

Rare birds in Slovenia in 2017 – Slovenian Rarities Committee's Report

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Poročilo Nacionalne komisije za redkosti (KRED) obravnava opazovanja redkih vrst med 1. 1. in 31. 12. 2017 z dodanimi datumi iz leta 2018, če je bil osebek, prvič zabeležen v letu 2017, opazovan tudi v tem letu. Pri nekaterih vrstah so dodane dopolnitve za prejšnja leta. Komisija je delovala v naslednji sestavi (po abecednem vrstnem redu): Dejan Bordjan, Luka Božič, Jurij Hanžel (predsednik), Kajetan Kravos, Milan Vogrin.

Kot redke so obravnavane vrste, ki so bile kot take označene v Seznamu ugotovljenih ptic Slovenije s pregledom redkih vrst ter v zadnjem poročilu komisije (Hanžel & Šere 2011, Hanžel 2016, Hanžel 2017a), ne glede na poprej veljavni kriterij, da je vrsta redka, če zanjo obstaja manj kot 10 podatkov, znanih po 1. 1. 1950. Seznam obravnavanih vrst in podvrst je dostopen na [http://cdn.ptice.si/ptice/2014/wp-content/uploads/2015/10/2015_redke_vrste_si.xlsx].

Razvrstitev v kategorije, način navajanja kraja opazovanja in način navajanja virov sledijo smernicam v Seznamu. Upoštevane so sprotne spremembe iz poročil Taksonomske podkomisije komisije za redkosti pri Britanski zvezi ornitologov (British Ornithologists' Union Rarities Committee Taxonomic Subcommittee) (BOURC TSC). Taksonomska podkomisija je avgusta 2016 prenehala z delovanjem, zato je to poročilo prvo, kjer sledimo priporočilom Mednarodnega ornitološkega kongresa (International Ornithological Congress) (Gill & Donsker 2018). Številki v oklepaju ob imenu posamezne vrste pomenita število opazovanj med 1. 1. 1950 in 31. 12. 2016 ter število opazovanih osebkov v istem časovnem obdobju. Takšno podajanje opazovanj je standardizirano po priporočilih Združenja evropskih komisij za redkosti (AERC – Association of European Rarities Committees) (AERC 2007). Za redke vrste, ki jih KRED obravnava od 1. 1. 2013 (37 dodatnih vrst, od tega 17 regionalnih redkosti), podatki o opazovanjih pred tem datumom niso sistematično zbrani, zato tudi niso predstavljeni. Iz istega razloga ta opazovanja niso oštevilčena. Opazovanja nacionalnih in regionalnih redkosti so predstavljena ločeno. Od 1. 1. 2017 zaradi rednega pojavljanja ne obravnavamo več opazovanj srebrnega galeba *Larus argentatus* iz porečja Drave.

V letu 2017 smo zabeležili prve podatke iz kategorije A za belolično gos *Branta leucopsis*. Pozornost zbujajo tudi tretje opazovanje rdečevrate gosi *Branta ruficollis*, peto opazovanje za brkatega sera *Gypaetus barbatus*, lopatasto govnačko *Stercorarius pomarinus* in prekomorskega prodnika *Calidris melanotos* ter sedmo opazovanje za ploskokljunega liskonožca *Phalaropus fulicarius* in velikega galeba *Larus marinus*. Zaradi prilagoditve taksonomije smo seznamu dodali eno vrsto: njivska gos *Anser fabalis* je sedaj ločena na vrsti *Anser fabalis* in *Anser serrirostris* (vsebuje podvrsto *rossicus*, ki je bila opazovana v Sloveniji). Do vključno 31. 12. 2017 je bilo v Sloveniji ugotovljenih 390 vrst (375 v kategoriji A, 6 v kategoriji B, 9 samo v kategoriji C; štiri vrste so uvrščene v kategoriji A in C hkrati). V kategoriji D je sedem vrst, v kategoriji E pa 39, med katerimi sta dve v podkategoriji E*. Vrste teh dveh kategorij niso del seznama.

V Dodatku 1 so dokumentarne fotografije opazovanj, ki doslej še niso bile objavljene v slovenskih tiskanih virih z navedenim krajem, datumom in številom osebkov.

Potrjena opazovanja iz kategorije A / Accepted Category A records

Rdečevrata gos *Branta ruficollis* (2, 2)
– 14. 1. 2017, Gajševsko jezero, 2 os. (Božič 2017)

Belolična gos *Branta leucopsis* (0, 0)
- 12. 1. 2017, Babinci, 1 os. (R. Šiško *pisno*)
- 14. 1. 2017, Amerika, Ormoško jezero, 1 os. (L. Božič *pisno*)
- 28. 10. 2017, zadrževalnik Medvedce, 1 os. (E. Horvat *pisno*)

Labod pevec *Cygnus cygnus* (13, 27)
- 1.–14. 2. 2017, HE Brežice, reka Sava, 2 os. (D. Klenovšek *pisno*)

Beloliska *Melanitta fusca*
- 11. 3. 2017, Fontanigge, Sečoveljske soline, 15 os. (B. Blažič *pisno*)

Črna raca *Melanitta nigra*
- 22. 2.–29. 3. 2017, Žovneško jezero, 1 ♀ (M. Gamser, J. Novak *pisno*)

Zimska raca *Clangula hyemalis*
- 7. 2.–29. 4. 2017, Šturmovci, Ptujsko jezero, 1–3 os. (1 ♂, 2 ♀) (L. Božič *pisno*)
- 8. 1.–7. 2. 2017, Ormoško jezero, 2 os. (1 ♂, 1 2cy ♀) (L. Božič *pisno*)
- 17. 2. 2017, zadrževalnik Medvedce, 1 ♂ (M. Gamser *pisno*)
- 9.–17. 3. 2017, Amerika, Ormoško jezero, 1 ♀ (L. Božič *pisno*)

Ledni slapnik *Gavia immer* (7, 16)
- 24. 11.–17. 12. 2017, Prule, Ljubljana, reka Ljubljanica, 1 ad. (Poljanec 2017)

Sredozemski viharnik *Puffinus yelkouan*
- 17.–18. 6. 2017, morje pred Piranom, do 75 os. (Hanžel 2017b)

Zlatouhi ponirek *Podiceps auritus*
- 1. 1. 2017, Fontanigge, Sečoveljske soline, 3 os. (M. Sešlar *pisno*)
- 11. 2.–11. 3. 2017, Fontanigge, Sečoveljske soline, 1–11 os. (B. Blažič *pisno*)
- 9. 4. 2017, Piran, 1 os. (J. Hanžel *pisno*)
- 20. 9. 2017, zadrževalnik Medvedce, 1 os. (M. Gamser *pisno*)
- 25. 10. 2017, Šturmovci, Ptujsko jezero, 1 1cy (L. Božič *pisno*)
- 3. 11. 2017, Turnišče, Ptujsko jezero, 2 ad. (L. Božič, A., E., G. Vrezec, P. Vrh Vrezec *pisno*)
- 10. 11. 2017, zadrževalnik Medvedce, 1 os. (M. Gamser *pisno*)
- 10. 11. 2017, Ptuj, Ptujsko jezero, 2 ad. (L. Božič *pisno*)
- 13. 12. 2017, Turnišče, Ptujsko jezero, 2 ad. (L. Božič *pisno*)
- 30. 12. 2017, Šturmovci, Ptujsko jezero, 2 ad. (L. Božič *pisno*)

Plamenec *Phoenicopterus roseus* (17, 69)
- 6. 10. 2017, Fontanigge, Sečoveljske soline, 1 os. (A. Božič *pisno*)

Plevica *Plegadis falcinellus*
- 1. 1. 2017, Fontanigge, Sečoveljske soline, 1 os. (M. Sešlar *pisno*)
- 28. 9. 2017, Amerika, Ormoško jezero, 8 os. (L. Božič, M. Gamser *pisno*)
- 5.–10. 10. 2017, Amerika, Ormoško jezero, 2 ad. (L. Božič *pisno*)

Kravja čaplja *Bubulcus ibis* (34, 97)[1]
- 17. 5. 2017, zadrževalnik Medvedce, 1 os. v svatovskem perju (D. Bordjan *pisno*)
- 18. 9. 2017, zadrževalnik Medvedce, 1 os. (M. Gamser *pisno*)
- 20. 12. 2017–25. 1. 2018, Cerkno, 1 os. (D. Vidmar *pisno*)

Mali klinkač *Clanga pomarina* (8, 8)
- 21. 5. 2017, Kozlarjeva gošča, Ljubljansko barje, 1 os. (Šere 2017)

Veliki klinkač *Clanga clanga* (25, 27)
- 15. 11. 2017, zadrževalnik Medvedce, 1 1cy (Bordjan 2017)

Kraljevi orel *Aquila heliaca* (9, 9)
- 12. 3. 2017, Griško polje, Senožeče, 1 imm. (I. Kljun *pisno*)

[1] Od 1. 1. 2015 ne obravnavamo več opazovanj iz Naravnega rezervata Škocjanski zatok, saj se vrsta tam redno pojavlja vse leto. / From 1 Jan 2015, the Committee no longer assesses records from Škocjanski Zatok Nature Reserve, where the species is regularly present throughout the year.

Stepski lunj (50, 52)
- 15. 4. 2017, zadrževalnik Medvedce, 1 ♀ (D. Bordjan *pisno*)
- 25. 4. 2017, Mengeš, 1 2cy (D. Bordjan *pisno*)
- 10. 9.–15. 9. 2017, Šikole, 1 ad. ♂ (M. Gamser *pisno*)
- 8. 11. 2017, Dolenje Jezero, Cerkniško jezero, 1 2cy ♀ (M. Gamser *pisno*)

Koconoga kanja *Buteo lagopus*
- 5. 2. 2017, Velike Bloke, 1 os. (A. Kotnik *pisno*)
- 4–17. 2. 2017, zadrževalnik Medvedce, do 3 os. (D. Bordjan, M. Gamser *pisno*)
- 8. 11. 2017, letališče Lesce, 1 os. (B. Blažič, B. Kozinc, A. Mulej *pisno*)
- 8. 11. 2017, Bloke, 1 os. (P. Veenvliet *pisno*)
- 23. 11. 2017, Divača, 1 os. (M. Hario *pisno*)
- 2. 12. 2017, zadrževalnik Medvedce, 1 1cy (D. Bordjan *pisno*)

Rjasta kanja *Buteo rufinus* (7, 7)
- 29. 8. 2017, Kalič, 1 os. (M. Gamser *pisno*)

Dular *Charadrius morinellus* (19, 42)
- 22.–23. 9. 2017, planina Klek, Pokljuka, 1 os. (R. Iskra *pisno*)

Kamenjar *Arenaria interpres*
- 11. 9. 2016, Amerika, Ormoško jezero, 3 os. (L. Božič *pisno*)

Veliki prodnik *Calidris canutus*
- 7. 8. 2017, Fontanigge, Sečoveljske soline, 1 os. (A. Božič, M. Sešlar *pisno*)
- 2. 9. 2017, Turnišče, Ptujsko jezero, 1 juv. (L. Božič *pisno*)
- 3. 9. 2017, Fontanigge, Sečoveljske soline, 1 os. (M. Denac, A, Kotnik, M. Mlakar Medved, M. Sešlar *pisno*)
- 18. 9. 2017, Turnišče, Ptujsko jezero, 1 juv. (L. Božič, M. Gamser *pisno*)
- 5.–6. 10. 2017, Ormoško jezero, 1 juv. (L. Božič *pisno*)

Ploskokljunec *Calidris falcinellus* (12, 29)
- 29. 8.–3. 9. 2017, Fontanigge, Sečoveljske soline, 1 obr. (Vrezec & Fekonja 2018)

Peščenec *Calidris alba*
- 18. 8. 2017, Turnišče, Ptujsko jezero, 1 juv. (L. Božič *pisno*)
- 18. 9. 2017, zadrževalnik Medvedce, 1 juv. (M. Gamser *pisno*)
- 25. 9. 2017, Pobrežje, Ptujsko jezero, 1 juv. (L. Božič *pisno*)

Prekomorski prodnik *Calidris melanotos* (4, 4)
- 6. 7. 2017, zadrževalnik Medvedce, 1 os. (M. Gamser *pisno*)

Čoketa *Gallinago media* (15, 15)
- 13. 9. 2017, Ig, Ljubljansko barje, 1 os. (M. Denac *pisno*)

Ploskokljuni liskonožec *Phalaropus fulicarius* (6, 6)
- 3. 11. 2017, Turnišče, Ptujsko jezero, 1 ad. ♂ (kadaver; zbirka Prirodoslovnega muzeja Slovenije 2017/378) (A., E., G. Vrezec, P. Vrh Vrezec *pisno*)

Triprsti galeb *Rissa tridactyla*
- 10. 11. 2017, zadrževalnik Medvedce, 1 1cy (M. Gamser *pisno*)

Veliki galeb *Larus marinus* (6, 8)
- 8. 9. 2017, Podova, 1 2cy (M. Gamser *pisno*)

Lopatasta govnačka *Stercorarius pomarinus* (4, 5)
- 18. 9. 2017, zadrževalnik Medvedce, 1 ad. (M. Gamser *pisno*)

Bodičasta govnačka *Stercorarius parasiticus* (11, 11)
- 23. 5. 2017, Ptujsko jezero, 1 ad. (temna oblika) (M. Gamser *pisno*)
- 26. 7. 2017, zadrževalnik Medvedce, 1 3cy (M. Gamser *pisno*)

Močvirska uharica *Asio flammeus* (33, 49)
- 28. 11. 2016–6. 3. 2017, Kozlarjeva gošča, Ljubljansko barje, do 14 os. (Denac 2017c, Hanžel 2017)
- 11. 2.–18. 4. 2017, zadrževalnik Medvedce, do 2 os. (T. Basle, D. Bordjan, M. Gamser *pisno*)
- 20. 9. 2017, zadrževalnik Medvedce, 1 os. (M. Gamser *pisno*)
- 10. 11. 2017, zadrževalnik Medvedce, 1 os. (M. Gamser *pisno*)

Zlatovranka *Coracias garrulus*
- 16. 5. 2017, Brestovica pri Povirju, 1 ad. (Denac 2017b)
- 26. 7. 2017, Vodice, 1 ad. (Blažič 2017a)

Rjavoglavi srakoper *Lanius senator*
- 13. 5. 2017, Lesce, 1 ♂ (A. Mulej *pisno*)

19. 5. 2017, Prhajevo, Velike Lašče, 1 ♂ (Denac K. 2017)
- Kratkoprsti škrjanček *Calandrella brachydactyla* (14, 45)
- 13.–14. 5. 2017, Ig, Ljubljansko barje, 2 os. (A. Kotnik *pisno*)

Mušja listnica *Phylloscopus inornatus* (19, 19)
- 27. 10. 2017, Lipe, Ljubljansko barje, 1 1cy obr. (Vidic 2017)

Plevelna trstnica *Acrocephalus agricola* (8, 8)
- 16. 9. 2016, Verd, Vrhnika, 1 1cy obr. (Vrezec & Fekonja 2017)
- 31. 7. 2017, Verd, Vrhnika, 1 1cy obr. (Vrezec & Fekonja 2018)

Svetlooka penica *Sylvia crassirostris* (3, 3)
- 8. 4. 2017, Hrastovlje, 1 ♂ (Šere 2017b)

Rožnati škorec *Pastor roseus* (16, 150)
- 23. 5. 2017, Naravni rezervat Škocjanski zatok, 1 os. (I. Brajnik *pisno*)

Snežni strnad *Plectrophenax nivalis*
- 13. 2. 2017, HE Brežice, 1 os. (D. Klenovšek *pisno*)

Beloglavi strnad *Emberiza leucocephalos* (18, 19)
- 23. 10. 2017, letališče Lesce, 1 ad. ♂ (Blažič 2017b)

Mali strnad *Emberiza pusilla* (22, 22)
- 13. 10. 2017, Bistrica, Šentrupert, 1 1cy (Vrezec & Fekonja 2018)

Potrjena opazovanja iz kategorije D / Accepted Category D records

Mala gos *Anser erythropus* (0, 0)
- 17. 2.–18. 4. 2017, Družmirsko jezero, 1 os. (A. Bolčina, M. Gabor, J. Gojznikar, R. Kraševec *pisno*)

Regionalne redkosti / Regional rarities

Pritlikavi kormoran *Microcarbo pygmeus*
- 4. 7. 2017, Teharsko jezero, 1 os. (A. Božič, M. Gamser *pisno*)

Školjkarica *Haematopus ostralegus*
- 3. 5. 2017, Pobrežje, Ptujsko jezero, 1 ad. (L. Božič *pisno*)

Srebrni galeb *Larus argentatus*
- 19. 2. 2017, Zbiljsko jezero, 1 2cy (M. Sešlar *pisno*)

Črnomorski galeb *Larus cachinnans*
- 27. 1. 2017, HE Moste, reka Sava, 1 2cy (Rutnik 2017)
- 11. 3. 2017, Fontanigge, Sečoveljske soline, 1 2cy (A. Božič *pisno*)

Kaspijska čigra *Hydroprogne caspia*
- 6. 4. 2017, zadrževalnik Medvedce, 3 os. (B. Blažič *pisno*)
- 7. 4. 2017, Žovneško jezero, 2 os. (J. Gojznikar *pisno*)

Mala čigra *Sternula albifrons*
- 17. 5. 2017, Turnišče, Ptujsko jezero, 2 ad. (D. Bordjan, L. Božič *pisno*)
- 23. 5. 2017, Turnišče, Ptujsko jezero, 1 ad. (M. Gamser *pisno*)
- 10. 9. 2017, Amerika, Ormoško jezero, 3 ad. w./1cy (L. Božič *pisno*)

Taščična penica *Sylvia cantillans*
- 19. 5. 2017, Žovneško jezero, 1 ♂ (J. Leskošek *pisno*)

Rjava cipa *Anthus campestris*

– 6. 5. 2017, Ptujsko jezero, 2 os. (B. Blažič, A. Božič, M. Denac, R. Lobnik, M. Mlakar Medved, M. Sešlar *pisno*)

Potrjena opazovanja iz kategorije C / Accepted Category C records

Brkati ser *Gypaetus barbatus* (4, 4)
– 17. 6. 2017, Velika Zelnarica, 1 1cy (Denac 2017a)

Potrjena opazovanja iz kategorije E / Accepted Category E records

Tibetanska gos *Anser indicus* (4, 5)
– 12. 4. 2009, Hraške mlake, Smlednik, 1 os. (M. Cerar *pisno*)

Moškatna bleščavka *Cairina moschata* (76, 194)
– 28. 12. 2017, zadrževalnik Medvedce, 1 os. (A., E., G. Vrezec, P. Vrh Vrezec *pisno*)

Nevestica *Aix sponsa* (22, 24)
– 14. 1. 2017, Gazice, Cerklje ob Krki, 3 os. (1 ♂, 2 ♀) (G. Bernard, A. Božič, J. Vidmar *pisno*)
– 16. 2. 2017, Ptujsko jezero, 1 ♀ (M. Gamser *pisno*)
– 18. 2. 2017, Nova Gorica, 1 ♂ (S. Tzar *pisno*)

Mandarinka *Aix galericulata*
– 14. 1. 2017, Gazice, Cerklje ob Krki, 1 ♂ (G. Bernard, A. Božič, J. Vidmar *pisno*)
– 27. 1. 2017, Trnovo, reka Ljubljanica, Ljubljana 1 ♀ (M. Gaberšek *pisno*)
– 29. 1. 2017, Lent, Maribor, reka Drava, 1 ♂ (M. Sešlar *pisno*)

Virginijski kolin *Colinus virginianus* (8, 18)
– 5. 6. 2017, Sečovlje, 1 os. (A. Božič *pisno*)

Klavžar *Geronticus eremita* (12, 21)
– 5. 6. 2017, Groblje pri Prekopi, Šentjernejsko polje, 1 os. (E. Šinkec *pisno*)
– 6. 6. 2017, Vopovlje, Cerklje na Gorenjskem, 1 os. (B. Blažič, M. Sešlar *pisno*)
– 1. 7.–8. 7. 2017, Kranj, 1 os. (M. Bežek, G. Ceferin *pisno*)
– 22. 8. 2017, letališče Lesce, 1 os. (G. Kobler *pisno*)

Aleksander *Psittacula krameri* (6, 12)
– 28. 1. 2017, Fužine, Ljubljana, 1 os. (I. A. Božič *pisno*)

Zebrica *Taeniopygia guttata* (0, 0)
– 6. 7. 2017, Ig, Ljubljansko barje, 1 os. (E. Gašparič *pisno*)

Zavrnjena opazovanja / Rejected records

Leta 2017 ni bilo zavrnjenih opazovanj. / There were no rejected records in 2017.

Summary

This report by the Slovenian Rarities Committee presents records of rare bird species in Slovenia in 2017, with some addenda for previous years. The numbers in brackets refer to the number of records (first number) and individuals (second number) recorded between 1 Jan 1950 and 31 Dec 2016. Since 1 Jan 2013, submission to the Committee has been required for 37 additional species, 17 of which are regional rarities. Records of these species are not numbered, since records from previous years were not collected by the Committee. The Barnacle Goose *Branta leucopsis* was first recorded in Category A, in addition to previous Category D and E records. Other notable observations were the third record of Red-breasted Goose *Branta ruficollis*, fifth records of Lammergeier *Gypaetus barbatus* and Pomarine Skua *Stercorarius pomarinus*, and seventh records of Greater Black-backed Gull *Larus marinus* and Red Phalarope *Phalaropus fulicarius*. The list of birds recorded in Slovenia (as of 31 Dec 2017) contains 390 species (375 in Category A, 6 in Category B, 9 exclusively in Category C; 4 species are both in Categories A and C). Category D contains 7 species, while Category E contains 39, two of which are classified into Subcategory E*. These two categories are not part of the list.

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Prispelo / Arrived: 5. 2. 2019
Sprejeto / Accepted: 3. 3. 2019

DODATEK 1 / APPENDIX 1

Dokumentarne fotografije izbranih opazovanj iz leta 2017, ki doslej še niso bile objavljene v slovenskih tiskanih virih z navedenim krajem, datumom in številom osebkov.
Documentary photos from 2017, so far unpublished in Slovenian printed sources with site name, date and number of individuals given.

(1)

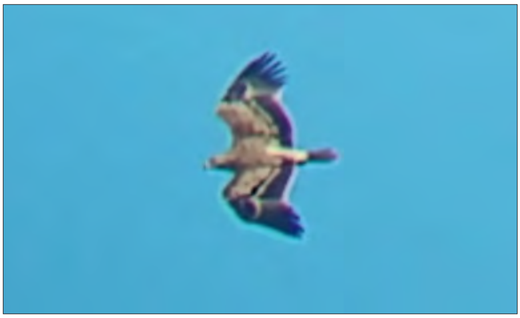
(2)

(3)

(4)

(5)

(6)



Slike 1–6 / Figures 1–6: (1) belolična gos *Branta leucopsis,* 12. 1. 2017, Babinci (foto: R. Šiško); (2) belolična gos *Branta leucopsis,* 14. 1. 2017, Ormoško jezero (foto: L. Božič); (3) beloličnа gos *Branta leucopsis,* 28. 10. 2017, zadrževalnik Medvedce (foto: E. Horvat); (4) črna raca *Melanitta nigra,* Žovneško jezero, 22. 2. 2017 (foto: J. Novak); (5) veliki klinkač *Clanga clanga,* 15. 11. 2017, zadrževalnik Medvedce (foto: D. Bordjan); (6) kraljevi orel *Aquila heliaca,* 12. 3. 2017, Griško polje, Senožeče (foto: I. Kljun).

Nadaljevanje dodatka 1 / Continuation of Appendix 1

(7)

(8)

(9)

(10)

Slike 7–10 / Figures 7–10: (7) ploskokljuni liskonožec *Phalaropus fulicarius*, 3. 11. 2017, Ptujsko jezero (foto: A. Vrezec); (8) rjavoglavi srakoper *Lanius senator*, 13. 5. 2017, Lesce (foto: A. Mulej); (10–11) mala gos *Anser erythropus*, 17. 2. 2017, Družmirsko jezero (foto: J. Gojznikar

Acrocephalus 39 (178/179): 185–195, 2018
10.1515/acro-2018-0014

Rezultati januarskega štetja vodnih ptic leta 2018 v Sloveniji

Results of the January 2018 waterbird census in Slovenia

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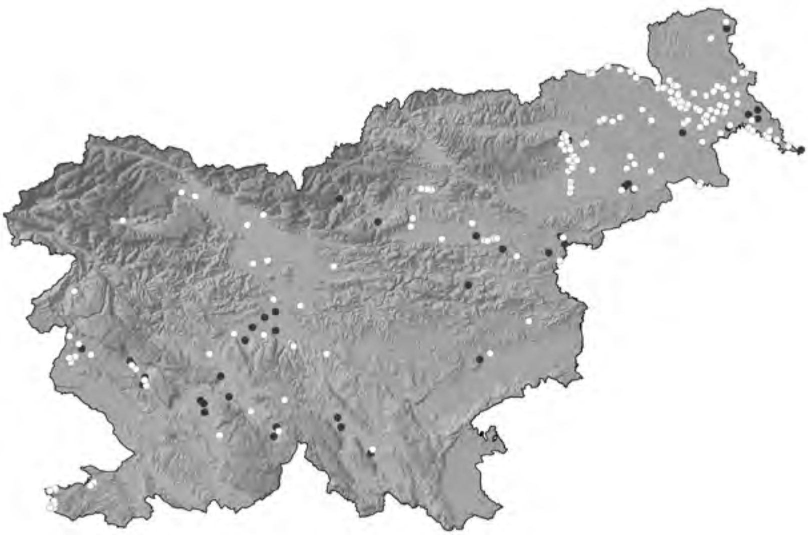
Januarsko štetje vodnih ptic (IWC) poteka v Sloveniji od leta 1988, leta 1997 pa je bilo prvič zastavljeno kot celosten, koordiniran in standardiziran popis vodnih ptic na ozemlju celotne Slovenije (Štumberger 1997). Od takrat naprej štetje pokriva vse večje reke, Obalo in večino pomembnejših stoječih vodnih teles v državi (Štumberger 1997, 1998, 1999, 2000, 2001, 2002, 2005, Božič 2005, 2006, 2007, 2008a, 2008b, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017). K temu sta pripomogla predvsem dobra organizacija in veliko število sodelujočih prostovoljnih popisovalcev. V poročilu so predstavljeni rezultati januarskega štetja vodnih ptic leta 2018, ki je v podobnem obsegu potekalo že dvaindvajsetič zapored.

Leta 2018 smo vodne ptice šteli 13. in 14. januarja. Organizacija, potek, uporabljena metoda štetja in popisni obrazci so bili takšni kot leta 1997 (Štumberger 1997). Pri obdelavi in predstavitvi rezultatov smo upoštevali tudi nekatere podatke, zbrane zunaj organiziranega štetja, nekaj dni pred ali po koncu tedna, predvidenega za štetje. Kormorane *Phalacrocorax carbo* smo na števnih območjih Mure, Drave in Savinje sistematično posebej šteli na znanih in domnevnih skupinskih prenočiščih. Na skupinskih prenočiščih smo šteli tudi pritlikave kormorane *P. pygmeus*, velike bele čaplje *Ardea alba*, zvonce *Bucephala clangula*, male žagarje *Mergellus albellus*, velike žagarje *Mergus merganser* in galebe Laridae na števnem območju Drave ter velike žagarje na števnem območju Savinje. Mokože *Rallus aquaticus* smo na ptujskih studenčnicah in potoku Črnec (Murska ravan) sočasno s štetjem drugih vodnih ptic popisali s pomočjo predvajanja posnetka oglašanja. Metoda je podrobneje opisana v Božič (2002). V štetje so bile tako kot vsako leto vključene vrste iz naslednjih skupin ptic: plovci Anatidae, slapniki Gaviidae, kormorani Phalacrocoracidae, čaplje Ardeidae, štorklje Ciconiidae, plamenci Phoenicopteridae, ponirki Podicipedidae, tukalice Rallidae, pobrežniki Charadriiformes ter belorepec *Haliaeetus albicilla*, rjavi lunj *Circus aeruginosus*, močvirska uharica *Asio flammeus*, vodomec *Alcedo atthis* in povodni kos *Cinclus cinclus*.

Januar 2018 je bil občutno toplejši od dolgoletnega povprečja, saj je bila povprečna mesečna temperatura v pretežnem delu Slovenije višja za 3 do 5 °C; nekoliko manjši je bil le odklon na Goriškem. Najvišja izmerjena temperatura v januarju je v kar nekaj krajih presegla 15 °C, odkloni povprečne dnevne temperature pa so bili marsikje največji ravno v tednu pred štetjem. Dolgoletno povprečje padavin je bilo preseženo v več kot polovici Slovenije, največ v delu Dolenjske in Zasavja. Manj od povprečja je bilo padavin na Obali, delu Gorenjske, na Koroškem in v severovzhodni Slovenije, najbolj izrazito na vzhodu Pomurja. December 2017 je bil v večjem delu države toplejši kot običajno, vendar pa temperaturni odkloni, z izjemo skrajnega severovzhoda in jugovzhoda, niso presegli 2 °C. V delu Gorenjske in na Goriškem je povprečna mesečna temperatura nekoliko zaostajala za dolgoletnim povprečjem. Padavine so decembra povsod v Sloveniji presegle dolgoletno povprečje, bolj v zahodni polovici države, kjer so na Obali zabeležili do 272 % dolgoletnega povprečja (Cegnar 2017, 2018). Prva polovica januarja bila izredno vodnata, s pretoki rek približno 50 % nad povprečjem, reke so se ponekod razlile na območjih pogostih poplav, ojezerjena so bila kraška polja. Podobne razmere so bile tudi decembra, ko je bila vodnatost rek v povprečju enkrat večja kot v dolgoletnem primerjalnem obdobju. Ob poplavah v zahodni in osrednji Sloveniji so bile ponekod dosežene 20–30-letne povratne dobe velikih pretokov (Strojan 2017, 2018). V času štetja je nad severovzhodno Evropo prevladovalo območje visokega zračnega tlaka, nad južnim Balkanom pa ciklonsko območje. Z vetrovi vzhodnih smeri je nad naše kraje pritekal postopno hladnejši in vlažen zrak. Na Primorskem je bilo zmerno oblačno, pihala

Slika 1: Popisni odseki januarskega štetja vodnih ptic (IWC) na rekah in obalnem morju v Sloveniji leta 2018; črne črte označujejo popisane, bele pa nepopisane odseke.

Figure 1: Survey sections of the January 2018 waterbird census (IWC) on the rivers and coastal sea in Slovenia, with black lines denoting examined and white lines unexamined sections



Slika 2: Lokalitete, popisane med januarskim štetjem vodnih ptic (IWC) v Sloveniji leta 2018; beli krogi označujejo stoječe vode, temni krogi pa potoke in manjše reke.

Figure 2: Localities surveyed during the January 2018 waterbird census (IWC) in Slovenia, with white circles denoting standing waters, and dark circles designating smaller rivers and streams

je šibka do zmerna burja, ki pa je drugi dan oslabela. Drugod je bilo oblačno, občasno so bile ponekod rahle padavine, vendar je bila količina padavin večinoma majhna. Najvišje dnevne temperature so bile od –1 do nekaj stopinj nad 0, na Primorskem do 11 °C (Markošek 2018). V času štetja 2017 so bila vsa popisana vodna telesa nezaledenela.

Sodelovalo je 246 popisovalcev. Pregledali smo 415 popisnih odsekov na rekah in obalnem morju v skupni dolžini 1415,6 km (tabela 1), kar je 77,4 % celotne dolžine odsekov, vključenih v popis. Poleg tega smo pregledali tudi 211 lokalitet (168 stoječih in 43 tekočih voda) od skupno 331 (tabela 2), kar je 63,7 % vseh lokalitet, evidentiranih v bazi

Tabela 1: Število vseh in pregledanih popisnih odsekov na rekah in obalnem morju ter njihova skupna dolžina na posameznem števnem območju in v celotni državi med januarskim štetjem vodnih ptic (IWC) leta 2018 v Sloveniji

Table 1: Number of all and surveyed sections on the rivers and coastal sea, as well as their total length in separate count areas and in the entire country during the January 2018 waterbird census (IWC) in Slovenia

Števno območje/ Count area	Št. vseh popisnih odsekov / Total no. of survey sections	Dolžina/ Length (km)	Št. pregledanih odsekov/ No. of sections surveyed	Dolžina/ Length (km)
Mura	61	220,2	56	198,0
Drava	138	374,4	127	333,5
Savinja	38	141,5	36	130,5
Zgornja Sava / Upper Sava	113	387,1	101	324,3
Spodnja Sava / Lower Sava	71	272,7	50	181,1
Kolpa	14	118,0	5	38,6
Notranjska in Primorska	44	272,9	28	167,0
Obala / Coastland	12	42,6	12	42,6
Skupaj / Total	491	1829,4	415	1415,6

Tabela 2: Število vseh in pregledanih lokalitet (stoječih voda, potokov in manjših rek) na posameznem števnem območju in v celotni državi med januarskim štetjem vodnih ptic (IWC) leta 2018 v Sloveniji

Table 2: Number of all and surveyed localities (standing waters, streams and smaller rivers) in separate count areas and in the entire country during the January 2018 waterbird census (IWC) in Slovenia

Števno območje/ Count area	Št. vseh lokalitet – stoječe vode/ Total no. of localities (standing waters)	Št. vseh lokalitet – tekoče vode/ Total no. of localities (streams)	Št. pregledanih lokalitet - stoječe vode/ No. of surveyed localities (standing waters)	Št. pregledanih lokalitet - tekoče vode/ No. of surveyed localities (streams)
Mura	81	10	67	7
Drava	56	23	38	7
Savinja	19	6	14	5
Zgornja Sava/ Upper Sava	24	15	18	5
Spodnja Sava/ Lower Sava	11	10	4	4
Kolpa	1	4	1	3
Notranjska in Primorska	21	33	16	12
Obala / Coastland	14	3	10	0
Skupaj / Total	227	104	168	43

januarskega štetja vodnih ptic do vključno leta 2018. Popisne odseke, pregledane v štetju leta 2018, prikazuje slika 1, razširjenost pregledanih lokalitet pa slika 2.

Skupaj smo prešteli 45.194 vodnih ptic, pripadajočih 58 vrstam. Poleg tega smo zabeležili še tri druge taksone (domačo gos, domačo raca in en vrstno nedoločen takson). Tako skupno število vodnih ptic kot število zabeleženih vrst sta bila podpovprečna (51.162 / 60) in manjša kot v prejšnjem štetju. Skupno število vodnih ptic je bilo v zadnjih 22 letih manjše le v štetjih leta 1997 in 1998. Tako kot v vseh štetjih doslej smo tudi leta 2018 največ vodnih ptic prešteli na števnem območju reke Drave, in sicer 20.103. To je 44,5 % vseh vodnih ptic, preštetih v Sloveniji. S tem je bil odstotek vodnih ptic na tem števnem območju blizu povprečnemu (43,3 %), samo število pa občutno manjše od povprečnega (22.165). Tako kot v večini štetij doslej števila 10.000 preštetih vodnih ptic nismo presegli na nobenem drugem števnem območju. Leta 2018 na nobenem števnem območju nismo prešteli največjega ali najmanjšega števila vodnih ptic v dosedanjih januarskih štetjih. Med najmanjšimi doslej so bila števila vodnih ptic na območjih Mure in Zgornje Save (najmanjše po letu 2004) in Obale (drugo najmanjše število doslej). Na območjih Kolpe ter Notranjske in Primorske sta bili števili vodnih ptic večji od povprečja in največji po letu 2012 oz. 2013. Na območju Savinje je bilo število vodnih ptic večje od povprečja, vendar najmanjše po letu 2012. Majhna števila vodnih ptic so vsaj ponekod posledica velike vodnatosti rek v času popisa – popisovalci so poročali o kalni in deroči vodi s srednje Save, Ljubljanice in Krke. Poplavljena kraška polja na Notranjskem so privabila številne vodne ptice (največ po letu 2013), med katerimi so bile tudi nekatere za ta del Slovenije neobičajne vrste.

Mlakarica *Anas platyrhynchos* je bila leta 2018, tako kot med vsemi štetji doslej, daleč najštevilnejša vrsta (18.415 os., 40,7 % vseh vodnih ptic). Po številu preštetih osebkov sledijo kormoran (3112 os., 6,9 % vseh vodnih ptic), čopasta črnica *Aythya fuligula* (2878, 6,4 % vseh vodnih ptic), rečni galeb *Chroicocephalus ridibundus* (2721 os., 6,0 % vseh vodnih ptic) in liska *Fulica atra* (2492 os., 5,5 % vseh vodnih ptic). S tem je bil vrstni red najštevilnejših vrst, z izjemo mlakarice, precej drugačen od običajnega. Kormoran in čopasta črnica še nikoli nista bila tako visoko na seznamu najštevilnejših vrst, liska pa še nikoli doslej tako nizko. Še bolj izrazito to velja za sivo gos *Anser anser* (6. najštevilnejša vrsta), ki v nobenem izmed predhodnih štetij ni bila med 15 najštevilnejšimi vrstami. Število 1000 preštetih osebkov so leta 2018 presegli še sivka *Aythya ferina*, labod grbec *Cygnus olor*, rumenonogi galeb *Larus michahellis*, zvonec *Bucephala clangula* in kreheljc *Anas crecca*. Sivka in zvonec sta omenjeno mejo tokrat presegla sedmič, nazadnje leta 2014 oz. 2011, ko sta bila tudi zadnjič pred letom 2018 med 10 najštevilnejšimi zabeleženimi vrstami. Rezultati januarskega štetja vodnih ptic leta 2018 po shemi razdelitve na osem števnih območij (Božič 2007, 2008a, 2008b, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017) so predstavljeni v tabeli 3. V dodatku 1 so števna območja podrobneje razčlenjena na posamezne reke in manjša območja z večjim številom lokalitet, kot so poplavne ravnice, doline, ravnine ipd.

Leta 2018 smo prvič med januarskim štetjem vodnih ptic zabeležili plevico *Plegadis falcinellus* (Škocjanski zatok), kar je verjetno prvi podatek o zimskem pojavljanju te vrste v Sloveniji (npr. Sovinc 1994), objavljenih podatkov pa ni tudi za druga severnojadranska mokrišča (Guzzon *et al.* 2005, Kravos *et al.* 2014). Vrsta v manjšem številu prezimuje v Sredozemlju, večinoma pa v podsaharski Afriki (Bauer *et al.* 2005). Od redkejših vrst smo popisali nilsko gos *Alopochen aegyptiacus* (drugič zapored v glinokopu Volčja Draga, Primorska; tretje opazovanje v januarskem štetju vodnih ptic), zlatouhega ponirka *Podiceps auritus* (Strunjanski zaliv in Planinsko polje; devetič v januarskem štetju vodnih ptic), pukleža *Lymnocryptes minimus* (Radensko polje; tretje zaporedno in skupaj peto opazovanje v januarskem štetju vodnih ptic), sloko *Scolopax rusticola* (zadrževalnik Medvedce; deveto opazovanje v januarskem štetju vodnih ptic, prvo po 2010) in rjavega galeba *Larus fuscus* (Ptujsko jezero, peto opazovanje v januarskem štetju vodnih ptic). Leta 2018 smo prešteli največ sivih gosi, duplinskih kozark *Tadorna tadorna* (skupaj z letom 2014), dolgorepih rac *Anas acuta*, tatarskih žvižgavk *Netta rufina* in čopastih črnic v okviru januarskih štetij vodnih ptic doslej. Razen tega je bilo izmed vrst, ki se pojavljajo redno, konopnic *Anas strepera* več le med štetjem leta 2008, rac žličaric *A. clypeata* leta 2015, zelenonogih martincev *Tringa nebularia* pa leta 2008. Med največjimi doslej so bila tudi števila preštetih beločelih gosi (večje le 2013 in 2017), moškatnih bleščavk (večje le trikrat pred tem), sivk (večje le 1998 in 2003), zvoncev (večje le trikrat pred tem), velikih žagarjev (večje le v predhodnih treh štetjih), kozic *Gallinago gallinago* (večje le 2006 in 2010) in pritlikavih kormoranov. Najmanjše število v dvaindvajsetih letih januarskih štetij vodnih ptic smo leta 2018 zabeležili pri žvižgavki *Anas penelope*, liski in kričavi čigri *Sterna sandvicensis*. Števila naslednjih vrst so bila med najmanjšimi doslej: kreheljcu (manjše le 2004 in 2016), mlakarici (manjše le 1997 in 1998), malem žagarju *Mergellus albellus* (manjše le v obdobju 2012–2014), srednjem žagarju *Mergus serrator* (manjše le 2015), malem ponirku *Tachybaptus ruficollis* (manjše le 2014), čopastem ponirku *Podiceps cristatus* (manjše le 2004 in 2012), zelenonogi tukalici *Gallinula chloropus* (manjše le trikrat pred tem), rečnem galebu (manjše le 2005) in rumenonogem galebu (manjše le trikrat pred tem). Od redno pojavljajočih se vrst smo rdečegrlega slapnika *Gavia stellata* in spremenljivega prodnika *Calidris alpina* prešteli prvič po dveh letih brez podatka, slednjega šele drugič v zadnjih petih letih. Drugič doslej v štetju nismo zabeležili črnoglavega galeba *Larus melanocephalus*.

Pri večini vrst z največjimi (siva gos, duplinska kozarka, dolgorepa raca) in velikimi zabeleženimi števili (veliki žagar, pritlikavi kormoran, konopnica, raca žličarica, zelenonogi martinec), kot tudi nekaterih vrstah z najmanjšimi (žvižgavka, liska) oz. majhnimi zabeleženimi števili (mlakarica, mali in srednji žagar, oba omenjena ponirka, zelenonoga tukalica, rečni galeb), so rezultati štetja leta 2018 nadaljevanje dolgoročnih populacijskih trendov njihovih januarskih populacij v Sloveniji (Božič 2014, 2015, 2016, 2017). Ti trendi zlasti pri vrstah z naraščajočimi populacijami večinoma ustrezajo recentnim trendom širših regionalnih biogeografskih populacij (Wetlands International 2018). V štetju leta 2018 so na posameznih območjih tri vrste dosegle mejno vrednost 1 % za opredeljevanje mokrišč mednarodnega pomena (Wetlands International 2018). Pritlikavi kormoran (c. 1 % črnomorsko-mediteranske populacije na IBA Drava) in veliki žagar (mejna vrednost iz Denac *et al.* 2011 presežena na IBA Drava, Savinji med Mozirjem in sotočjem s Savo ter zgornji Savi s pritoki) sta to vrednost na navedenih delih rek že dosegla v preteklih štetjih, siva gos pa tokrat prvič v Sloveniji. Preštetih 1534 sivih gosi na zadrževalniku Medvedce sestavlja po najnovejših podatkih c. 2 % regionalne populacije podvrste *anser* v Srednji Evropi/Severni Afriki (1 % mejna vrednost je 770 os.). Na tej lokaliteti je bilo prešteto tudi večje število beločelih gosi, ki pa nove, povečane mejne vrednosti za populacijo zahodne Sibirije/srednje Evrope (1600 os.), v nasprotju s štetjem leta 2017 tokrat ni doseglo.

Streljanje vodnih ptic v času štetja je bilo zabeleženo na nekaterih odsekih Drave, Voglajne, Krke in Kolpe ter tudi na slovenski strani Ormoškega jezera, ki je zavarovano kot Rezervat Ormoško jezero (Uradni vestnik občin Ptuj in Ormož 1992). Plašenje kormoranov s strani ribičev je potekalo na nekaterih odsekih Save Bohinjke.

Zahvala: Vsem popisovalcem, ki so šteli vodne ptice, in lokalnim koordinatorjem gre zasluga, da smo ponovno in sistematično hkrati popisali vse pomembnejše vodne površine v Sloveniji. Brez nesebičnega truda to ne bi bilo mogoče. Vsem najlepša hvala.

Summary

In 2018, the International Waterbird Census (IWC) was carried out in Slovenia on 13 and 14 Jan. Waterbirds were counted on all larger rivers, along the entire Slovenian Coastland and on most of the major standing waters in the country. During the census, in which 246 observers took part, 415 sections of the rivers and coastal sea with a total length of 1,415.6 km and 211 other localities (168 standing waters and 43 streams) were surveyed. The census was characterized by mild winter conditions and unfrozen water bodies. Altogether, 45,194 waterbirds of 58 species were counted. Thus, the number of waterbirds and the number of species recorded were below the 22-year average, the former was lower only during the 1997 and 1998 censuses. The highest numbers of waterbirds were counted in the Drava count area, i.e. 20,103 individuals (44.5% of all waterbirds in Slovenia). By far the most numerous species was Mallard *Anas platyrhynchos* (40.7% of all

Tabela 3: Števila preštetih vodnih ptic na posameznem števnem območju in v celotni Sloveniji med januarskim štetjem vodnih ptic (IWC) leta 2018 (1 – Mura, 2 – Drava, 3 – Savinja, 4 – Zgornja Sava, 5 – Spodnja Sava, 6 – Kolpa, 7 – Notranjska in Primorska, 8 – Obala)

Table 3: Numbers of waterbirds counted in separate count areas and in the entire Slovenia during the January 2018 waterbird census (IWC) (1 – Mura, 2 – Drava, 3 – Savinja, 4 – Upper Sava, 5 – Lower Sava, 6 – Kolpa, 7 – Notranjska & Primorska, 8 – Coastland)

Vrsta / Species	1	2	3	4	5	6	7	8	Skupaj / Total
Cygnus olor	368	585	100	196	115	3	14	120	1501
Anser albifrons		574						3	577
Anser anser		1534		3			220	4	1761
Alopochen aegyptiaca							1		1
domača gos / domestic goose		1							1
Tadorna tadorna	1	2					54	103	160
Aix galericulata							3		3
Cairina moschata		9	7	1					17
Anas penelope	6	106		2			20	46	180
Anas strepera		116	1	4	6		2	23	152
Anas crecca	128	458	80	28	28	27	113	270	1132
Anas platyrhynchos	2331	6421	1715	2355	2098	723	2108	664	18415
Anas acuta		18	2	1			8	1	30
Anas clypeata				1	1			145	147
Netta rufina	14		1	1	1				17
Aythya ferina	206	1230	55	41	3		8	6	1549
Aythya nyroca							1		1
Aythya fuligula	42	2419	75	322	11		9		2878
Bucephala clangula	1	1093	3	15	1		45		1158
Mergellus albellus		44							44
Mergus serrator								24	24
Mergus merganser	52	151	133	228	40	13	47		664
domača raca / domestic duck							1		1
Gavia stellata	1							1	2
Gavia arctica		2		1				19	22
Phalacrocorax carbo	496	694	349	451	739	34	68	281	3112
Phalacrocorax aristotelis								52	52
Phalacrocorax pygmeus		912						2	914
Botaurus stellaris								1	1
Egretta garzetta		1						125	126
Ardea alba	79	307	11	68	59	1	36	19	580
Ardea cinerea	79	272	132	163	199	14	59	56	974
Plegadis falcinellus								3	3
Tachybaptus ruficollis	7	173	9	131	98	17	19	42	496
Podiceps cristatus	8	42	20	17	43	2	5	60	197
Podiceps grisegena								2	2

Nadaljevanje tabele 3 / Continuation of Table 3

Vrsta / Species	1	2	3	4	5	6	7	8	Skupaj / Total
Podiceps auritus							1	2	3
Podiceps nigricollis		1		7	2		35	43	88
Haliaeetus albicilla	6	2					1		9
Rallus aquaticus	10	32	2	3	2			4	53
Gallinula chloropus	22	19	18	18	17	4	2	13	113
Fulica atra	210	1291	151	265	39		7	529	2492
Vanellus vanellus							2		2
Calidris alpina								6	6
Lymnocryptes minimus				1					1
Gallinago gallinago		17	1	20	2		27	12	79
Scolopax rusticola		1							1
Numenius arquata								10	10
Actitis hypoleucos	1							5	6
Tringa ochropus	17	9	1		1				28
Tringa nebularia								22	22
Chroicocephalus ridibundus	2	877		5	10		2	1825	2721
Larus canus	30	366	2		1		32	4	435
Larus fuscus		2							2
Larus argentatus		4							4
Larus michahellis		178	3	2			174	1064	1421
Larus cachinnans		98							98
Larus michahellis / cachinnans		8	2		53				63
Sterna sandvicensis								7	7
Alcedo atthis	6	13	15	17	22	1	9	10	93
Cinclus cinclus	8	21	57	293	15		149		543
Skupaj / Total	4131	20103	2945	4660	3606	839	3282	5628	45194

waterbirds), followed by Cormorant *Phalacrocorax carbo* (6.9% of all waterbirds), Tufted Duck *Aythya fuligula* (6.4% of all waterbirds), Black-headed Gull *Chroicocephalus ridibundus* (6.0% of all waterbirds) and Coot *Fulica atra* (5.5% of all waterbirds). The number of 1,000 counted individuals was also surpassed by Pochard *Aythya ferina*, Mute Swan *Cygnus olor*, Yellow-legged Gull *Larus michahellis*, Goldeneye *Bucephala clangula* and Teal *An. crecca*. Among the rarer recorded species, the Glossy Ibis *Plegadis falcinellus* (registered for the first time during the January Waterbird Censuses) deserves special mention. Numbers of the following species were the highest so far recorded during the IWC: Greylag Goose *Anser anser*, Shelduck *Tadorna tadorna* (together with 2014), Pintail *Anas acuta*, Red-crested Pochard *Netta rufina* and Tufted Duck. Number of Wigeons *Anas penelope*, Coots and Sandwich Terns *Sterna sandvicensis* were the lowest so far recorded during the IWC.

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DODATEK / APPENDIX 1

Število preštetih vodnih ptic v januarskem štetju leta 2018 v Sloveniji (M – Mura, ŠČ – Ščavnica, LD – Ledava, MR – Mura razno: jezera, ribniki, gramoznice, mrtvice in potoki v Pomurju ter bližnji okolici, DA – Drava Alpe: meja z Avstrijo pri Libeličah–Selnica ob Dravi, MM – Meža in Mislinja, D – Drava: Selnica ob Dravi–meja s Hrvaško pri Središču ob Dravi, DV – Dravinja, P – Pesnica, DPP – Dravsko in Ptujsko polje: ribniki, gramoznice, kanali, potoki in polja na Dravskem in Ptujskem polju ter bližnji okolici, S – Savinja (vključuje Pako in Voglajno), ŠAL – Šaleška jezera: Škalsko, Velenjsko, Šoštanjsko in Gabrško jezero, SR – Savinja razno: jezera, ribniki, manjše reke in potoki na Savinjski ravni ter v bližnji okolici, ZGS – zgornja Sava: Sava Bohinjka, Sava Dolinka, Sava do Gornje Save (Kranj), vključuje Radovno, Tržiško Bistrico in Kokro, SOR – Selška Sora, Poljanska Sora in Sora, SRS – srednja Sava: Gornja Sava (Kranj)–Breg pri Litiji, KBI – Kamniška Bistrica, LB – Ljubljanica, SAR – Savska ravan: jezera, gramoznice, manjše reke in potoki na Savski ravni, LBA – Ljubljansko barje: jezera, ribniki, kanali in potoki na Ljubljanskem barju, SSO – Sava soteska: Breg pri Litiji–Zidani Most, SS – spodnja Sava: Zidani Most–meja s Hrvaško, K – Krka, ST – Sotla, SSR – spodnja Sava razno: jezera, ribniki, gramoznice in potoki na Krški ravni ter bližnji okolici, KO – Kolpa, KOR – Kolpa razno: vodna telesa v Beli krajini in Ribniško-Kočevskem podolju, SO – Soča, I – Idrijca, VI – Vipava, VID – Vipavska dolina: jezera, glinokopi in potoki v Vipavski dolini, NOT – Notranjska: notranjska kraška polja in ponikalnice, Cerkniško jezero, O – Obala: slovensko obalno morje, OS – Obala soline: Sečoveljske in Strunjanske soline, OZ – Obala zatok: Škocjanski zatok, OR – Obala razno: stoječe vode in smetišča v Koprskih brdih. Število vodnih ptic, ki so bile v celoti preštete na prenočiščih, je označeno s krepkim tiskom.

The number of waterbirds counted during the January 2018 waterbird census (IWC) in Slovenia (M – Mura, ŠČ – Ščavnica, LD – Ledava, MR – Mura other: lakes, fishponds, gravel pits, oxbows and streams in Pomurje and its immediate vicinity, DA – Drava Alps: from the border with Austria at Libeliče to Selnica ob Dravi, MM – Meža and Mislinja, D – Drava: from Selnica ob Dravi to the border with Croatia at Središče ob Dravi, DV – Dravinja, P – Pesnica, DPP – Dravsko polje and Ptujsko polje: fishponds, gravel pits, channels, streams and fields on Dravsko and Ptujsko poljes and in their immediate vicinity, S – Savinja (including Paka and Voglajna), ŠAL – Šalek Lakes: Škalsko, Velenjsko, Šoštanjsko and Gabrško Lakes, SR – Savinja other: lakes, fishponds, small rivers and streams on Savinja plain and along it, ZGS – Upper Sava: Sava Bohinjka, Sava Dolinka, Sava to Gornja Sava (Kranj); including Radovna, Tržiška Bistrica and Kokra, SOR – Selška Sora, Poljanska Sora and Sora, SRS – Middle Sava: from Gornja Sava (Kranj) to Breg pri Litiji, KBI – Kamniška Bistrica, LB – Ljubljanica, SAR – lakes, gravel pits, small rivers and streams on the Sava plain, LBA – lakes, fishponds, channels and streams on Ljubljansko barje, SSO – Sava gorge: from Breg pri Litiji to Zidani Most, SS – Lower Sava: from Zidani Most to the border with Croatia, K – Krka, ST – Sotla, SSR – Lower Sava other: lakes, fishponds, gravel pits and streams on Krško plain and nearby, KO – Kolpa, KOR – Kolpa other: water bodies in Bela krajina and Ribnica-Kočevje valley, SO – Soča, I – Idrijca, VI – Vipava, VID – lakes, gravel pits and streams in Vipava Valley, NOT – Notranjska: karst fields and disappearing streams, Cerkniško jezero (Lake Cerknica), O – Slovene coastal sea, OS – Coastal saltpans: Sečovlje and Strunjan saltpans, OZ –Škocjanski zatok, OR – other localities on the coastland: standing waters and rubbish tips in Koprska brda. The number of waterbirds counted entirely at their roosting places is denoted in bold.

Vrsta / Species	Mura					Drava							Savinja				Zgornja Sava / Upper Sava							
	M	ŠČ	LD	MR	Skupaj/ Total	DA	MM	D	DV	P	DPP	Skupaj/ Total	S	ŠAL	SR	Skupaj/ Total	ZGS	SOR	SRS	KBI	LB	SAR	LBA	Skupaj/ Total
Cygnus olor	86	87	76	119	368	60		356	5	67	97	585		53	47	100	8	1	116		4	26	41	196
Anser albifrons										2	572	574												
Anser anser											1534	1534											3	3
Alopochen aegyptiaca																								
domača gos / domestic goose								1				1												
Tadorna tadorna		1			1			2				2												
Aix galericulata																								
Cairina moschata								4			5	9	7			7			1					1
Anas penelope		4	2		6	1		58			47	106						1				1		2
Anas strepera								115			1	116			1	1							4	4
Anas crecca	2	2	47	77	128		30	316			112	458	29		51	80	5		21			2		28
Anas platyrhynchos	215	438	464	1214	2331	307	163	2822	217	225	2687	6421	1088	58	569	1715	532	152	472	300	427	293	179	2355
Anas acuta								12			6	18			2	2							1	1
Anas clypeata																	1							1
Netta rufina				14	14										1	1			1					1
Aythya ferina		1		205	206	4		1194		1	31	1230		26	29	55	26		15					41
Aythya nyroca																								
Aythya fuligula		5		37	42	5		2404		8	2	2419		65	10	75	2		318			2		322
Bucephala clangula	1				1			**1093**				1093		2	1	3			15					15
Mergellus albellus								**44**				44												
Mergus serrator																								
Mergus merganser	51			1	52	45		63		27	**16**	151		2	**131**	133	21	23	109	10	26	39		228
domača raca / domestic duck																								
Gavia stellata				1	1																			
Gavia arctica						2						2					1							1
Phalacrocorax carbo	**220**	**43**	**233**		496	38		**464**		192		694	**304**	45		349	211	4	176		58	2		451
Phalacrocorax aristotelis																								
Phalacrocorax pygmeus								**912**				912												
Botaurus stellaris																								
Egretta garzetta											1	1												
Ardea alba	4	32	21	22	79			129		27	151	307			11	11			6		6	4	52	68
Ardea cinerea	11	23	21	24	79	15	20	133	34	35	35	272	85	3	44	132	53	32	31	10	23	9	5	163
Plegadis falcinellus																								
Tachybaptus ruficollis	1	1		5	7	14		159				173	1	5	3	9	18		87		14	8	4	131
Podiceps cristatus			1	7	8			40			2	42		20		20	10		7					17
Podiceps grisegena																								
Podiceps auritus																								
Podiceps nigricollis								1				1					3		4					7
Haliaeetus albicilla	3			3	6			2				2												
Rallus aquaticus		1		9	10			32				32		1	1	2			1		2			3
Gallinula chloropus		4	12	6	22			19				19		18		18					11		7	18
Fulica atra		27		183	210	22		1176		8	85	1291		115	36	151	38		214			11	2	265
Vanellus vanellus																								
Calidris alpina																								
Lymnocryptes minimus																							1	1
Gallinago gallinago								15			2	17			1	1							20	20
Scolopax rusticola											1	1												
Numenius arquata																								
Actitis hypoleucos	1				1																			
Tringa ochropus	17				17			9				9	1			1								
Tringa nebularia																								
Chroicocephalus ridibundus	2				2	7		**870**				877									5			5
Larus canus				30	30			**363**		1	**2**	366	1	1		2								
Larus fuscus								**2**				2												
Larus argentatus								**4**				4												
Larus michahellis								**177**			**1**	178	3			3	1		1					2
Larus cachinnans								**97**			**1**	98												
Larus michahellis / cachinnans						6				2		8	2			2								
Sterna sandvicensis																								
Alcedo atthis	3		1	2	6			10		2	1	13	11	3	1	15	3	2	5		6		1	17
Cinclus cinclus	8				8	1	19		1			21	57			57	195	61	17	19		1		293
Skupaj / Total	625	669	878	1959	4131	527	232	13098	257	597	5392	20103	1589	417	939	2945	1128	276	1617	339	582	398	320	4660

	Spodnja Sava / Lower Sava						Kolpa			Notranjska & Primorska						Obala / Coastland					Slovenija
	SSO	SS	K	ST	SSR	Skupaj/ Total	KO	KOR	Skupaj/ Total	SO	I	VI	VID	NOT	Skupaj/ Total	O	OS	OZ	OR	Skupaj/ Total	Skupaj vse/ Total overall
C. olo.		22	93			115		3	3	1				13	14		90	30		120	1501
A. alb.																		3		3	577
A. ans.													186	34	220			4		4	1761
A. aeg.													1		1						1
																					1
T. tad.														54	54		102	1		103	160
A. gal													1	2	3						3
C. mos.																					17
A. pen.														20	20		21	25		46	180
A. str.		5	1			6								2	2		7	16		23	152
A. cre.		22	2	4		28	4	23	27					113	113		122	148		270	1132
A. pla.	11	816	552	712	7	2098	648	75	723	240	102	52	309	1405	2108	49	403	187	25	664	18415
A. acu.														8	8		1			1	30
A. cly.		1				1											72	73		145	147
N. ruf.		1				1															17
A. fer.		1	2			3								8	8			6		6	1549
A. nyr.														1	1						1
A. ful.		11				11								9	9						2878
B. cla.		1				1								45	45						1158
M. alb.																					44
M. ser.																18	6			24	24
M. mer.	9	31				40	13		13	22	12	6	7		47						664
											1				1						1
G. ste.																1				1	2
G. arc.																19				19	22
P. car.	40	434	176	89		739	33	1	34	13	4	12	10	29	68	165	85	31		281	3112
P. ari.																52				52	52
P. pyg.																		2		2	914
B. ste.																		1		1	1
E. gar.																5	109	11		125	126
A. alb.		26	16	15	2	59		1	1	1		7	5	23	36		16	3		19	580
A. cin.	4	69	82	38	6	199	13	1	14	9	6	13	16	15	59	5	35	16		56	974
P. fal.																		3		3	3
T. ruf.		31	67			98	9	8	17	2		2	3	12	19	15	6	20	1	42	496
P. cri.		43				43		2	2				5		5	51	1	8		60	197
P. gri.																2				2	2
P. aur.														1	1	2				2	3
P. nig.		2				2								35	35	37		6		43	88
H. alb.														1	1						9
R. aqu.					2	2											1	3		4	53
G. chl.			17			17	2	2	4	1		1			2		2	6	5	13	113
F. atr.		10	26	3		39							5	2	7	11		513	5	529	2492
V. van.														2	2						2
C. alp.																6				6	6
L. min.																					1
G. gal.			2			2							27		27		7	5		12	79
S. rus.																					1
N. arq.																5	1	4		10	10
A. hyp.																5				5	6
T. och.		1				1															28
T. neb.																5	2	15		22	22
C. rid.		10				10								2	2	1046	583	191	5	1825	2721
L. can.		1				1								32	32	2	1	1		4	435
L. fus.																					2
L. arg.																					4
L. mic.										3	2	46	123		174	594	431	37	2	1064	1421
L. cac.																					98
L. mic. / cac.		53				53															63
S. san.																7				7	7
A. att.		6	7	9		22	1		1	3	2	1	1	2	9	1	4	3	2	10	93
C. cin.	2		13			15				83	44	4	16	2	149						543
	66	1597	1056	870	17	3606	723	116	839	378	173	144	715	1872	3282	2103	2108	1372	45	5628	45194

Iz ornitološke beležnice

From the ornithological notebook

Slovenija / Slovenia

Rjavi lunj *Circus aeruginosus*

Marsh Harrier – a dark-morph individual observed on 25 Apr 2016 at Medvedce Reservoir (NE Slovenia); first Slovenian record of this rare morph

Dne 25. 4. 2016 sem opazoval ptice na zadrževalniku Medvedce. Ker nisem imel daljnogleda, sem oddaljene ptice določal s pomočjo teleobjektiva in fotoaparata. Šele doma sem med pregledovanjem fotografij na računalniku opazil, da sem med drugim fotografiral tudi temno obliko rjavega lunja (slika 1). Po mojem vedenju in pregledu literature ta oblika v Sloveniji doslej še ni bila dokumentirana. Temna oblika je redka in se pojavlja predvsem v vzhodni polovici območja razširjenosti vrste (Clark 1987).

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Slika 1 / Figure 1: Rjavi lunj / Marsh Harrier *Circus aeruginosus,* zadrževalnik Medvedce, 25. 4. 2016 (Foto: A. Ploj)

Poljski škrjanec *Alauda arvensis*

Skylark – 48 individuals recorded on 19 Jan 2019 near Lavrica (Ljubljansko barje, C Slovenia); an unusually large winter flock

Dne 19. 1. 2019 sem se namenil pogledat na Ljubljansko barje, in sicer na polje z imenom V Doleh pri Lavrici. Prejšnji dan je zapadlo 3–5 cm snega. Domneval sem, da je sneg, ki je zapadel na kopno površino, zmedel nekatere vrste ptičev. Na tem polju je ogromna površina sončnic (osem njiv), ki jih kmetje očitno ne nameravajo pospraviti, in računal sem, da bi lahko opazil tudi katero od redkejših vrst. Še preden sem prišel od omenjenih njiv s sončnicami, sem opazil na koruzišču veliko jato ptic, ki so iskale hrano okoli koruznih stebel. Okoli teh stebel so srne razbrskale sneg, verjetno je bilo tam najti ostanke koruznih zrn. Ko sem se približal omenjenemu mestu, se je jata spreletela in že po oglašanju sem ugotovil, da gre za poljske škrjance, naštel sem jih 48 (slika 2). Naslednji dan sem ponovno obiskal to mesto, vendar škrjancev ni bilo več. Tako velike jate so pozimi redke, najpogosteje opazimo posameznike ali jate do deset osebkov (Sovinc 1994), na Barju pa jih pozimi opazimo le izjemoma (Tome *et al.* 2005). Največja pozimi zabeležena jata pri nas pa je štela 300 osebkov, in sicer 2. 1. 1995 v Škocjanskem zatoku (Senegačnik *et al.* 1998).

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Slika 2 / Figure 2: Poljski škrjanec / Skylark *Alauda arvensis,* Lavrica, Ljubljansko barje, 19. 1. 2019 (Foto: D. Šere)

Črnoglavi muhar *Ficedula hypoleuca*

Pied Flycatcher – unusually high numbers of the species observed in September 2017; eventually, 370 individuals were ringed, as opposed to the average annual numbers between 50 and 90; no recoveries were made

September leta 2017 je bil po številu opazovanih črnoglavih muharjev v Sloveniji nekaj posebnega, če ne enkratnega. Številni so bili opazovani praktično povsod, od parkov v mestih in naseljih, do sadovnjakov in gozdnih obronkov. Posedali so tudi po živih mejah, grmih in različnih rastlinah pri tleh – povsod tam, kjer so lahko z malo višjega mesta oprezali za hrano in se spuščali na tla. Dne 21. 9. 2017 sem se s kolesom peljal iz Ljubljane proti Lavrici in na manjšem avtobusnem postajališču Debeli hrib na Lavrici opazil črnoglavega muharja, ki se je v letu zaletaval v prozorno steklo omenjenega postajališča (slika 3). Ker mu nikakor ni uspelo najti poti iz te avtobusne postaje, sem odložil kolo in ga z roko ujel. Odnesel sem ga do svojega avtomobila v bližini, kjer sem ga obročkal, zapisal vse biometrične podatke, fotografiral (slika 4) in izpustil. Vreme v septembru 2017 je bilo zelo nestabilno, občasno je deževalo, potem se je zjasnilo in sledilo je zopet oblačno in deževno vreme. Ljubljansko barje je bilo tudi poplavljeno, vendar v okviru običajnih vsakoletnih poplav. Temu vremenu pa je verjetno pripisati neobičajno število opazovanih črnoglavih muharjev, ki so bili v tem času na selitvi prek Slovenije. Tudi obročkovalci smo se srečali s to vrsto na terenu in v mreže so se radi lovili. V Sloveniji v jesenskem času navadno obročkamo okoli 50 do 90 črnoglavih muharjev, v jeseni 2017 pa kar 370. Po podatkih Slovenskega centra za obročkanje ptičev (SCOP) ni bila zabeležena nobena najdba te vrste od drugod, da bi lahko ugibali o njihovem izvoru. Na osnovi podatkov z geolokatorji iz skandinavskih držav (Ouwehand *et al.* 2016) lahko domnevam, da so bili v tem času na selitvi črnoglavi muharji iz Finske, Rusije ali držav vzhodno od naštetih. Prezimujejo na območju zahodne Afrike, severno od ekvatorja, in to od Senegala prek Liberije do Nigerije (Ouwehand *et al.* 2016). Številčno pojavljanje te vrste jeseni 2017 je zanimivo tudi zato, ker od leta 1974 dalje nisem imel priložnosti videti toliko osebkov v mesecu septembru. Prav je, da takšno pojavljanje ne gre v pozabo, saj sem v naslednjem letu ob istem času (jesen 2018) videl samo enega črnoglavega muharja na Ljubljanskem barju, ujel pa nobenega.

Slika 3 / Figure 3: Avtobusno postajališče / Bus stop, Lavrica, Ljubljansko barje (Foto: D. Šere)

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Slika 4 / Figure 4: Črnoglavi muhar *Ficedula hypoleuca*, Lavrica, Ljubljansko barje, 21. 9. 2017 (foto: D. Šere)

Močvirska Sinica *Poecile palustris*

Marsh Tit – two individuals in their 10th calendar year caught – in Sp. Radvanje, Maribor (NE Slovenia) and at Tomačevski prod, Ljubljana (C Slovenia)

Pri lovu in obročkanju močvirsko sinico ujamemo v mreže v manjšem številu. Na primer: v obdobju 1926–1982 je bilo v Sloveniji obročkanih 3532 osebkov (BOŽIČ 2009). V letih 1983–2008 pa 3781 močvirskih sinic (ŠERE 2009). Tako je bilo v tem zadnjem obdobju v posameznem letu, obročkanih najmanj 112 in največ 459 osebkov (povprečno 145,4). Od gozdnih sinic v manjšem številu obročkamo le še čopasto sinico *Lophophanes cristatus* in gorsko sinico *Poecile montanus*. Leta 1998 je bila v vrbovju na vznožju Pohorja v Sp. Radvanju v Mariboru obročkana močvirska sinica in znova ujeta ob krmilnici na istem mestu leta 2007, v 10 koledarskem letu starosti. Prav toliko star je bil tudi osebek ujet

Tabela 1: Podatki o obročkanju in ponovno ujetih močvirskih sinic *Poecile palustris* v 10 koledarskem letu starosti.

Številka obročka	Starost	Dol. peruti	Teža	Datum	Kraj
A938058	1y	66	-	16.09.1998	Sp. Radvanje, Maribor
	AD	68	11,2	10.02.2007	Sp. Radvanje, Maribor
A827830	1y	63	10,1	04.12.1996	Tomačevski prod, LJ
	AD	63	10,3	01.01.2005	Tomačevski prod, LJ

ob krmilnici na Tomačevskem produ v Ljubljani leta 2005, obročkan na istem mestu leta 1996. Oba podatka predstavljata pomembni starostni najdbi za to vrsto.

Euring na svoji spletni strani (https://euring.org/files/documents /EURING longevity_list_20170405.pdf), objavlja dve najstarejši najdbi močvirske sinice iz Švedske, prva je bila stara 13 let in 2 meseca, druga pa 11 let in 11 mesecev.

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Kratkoprsti škrjanček *Calandrella brachydactyla*

Short-toed Lark – two individuals observed on 13 and 14 May 2017 near Ig (C Slovenia); fifth record for Ljubljansko barje, 15th for Slovenia

Dne 13. 5. 2017 sem se odpravil na Ljubljansko barje, da bi pregledal območje in naštel pojoče kobiličarje. Na Barje sem prispel že zelo zgodaj, zato je bilo Barje še ovito v meglo in mrak. Sprehajal sem se po makadamski potki v okolici Iga, ko mi je izpod nog zletel škrjanec in pristal 50 metrov stran od mene. Že v letu mi je deloval nekoliko manjši, in ko sem ga videl še na tleh, sem takoj vedel, da gre za opazovanje kratkoprstega škrjančka. V istem trenutku pa je za škrjancem stal Mitja Denac, s katerim sva škrjanca kasneje še fotografirala. Megla se je kasneje že razpršila in vidljivost je bila odlična. Izkazalo se je, da škrjanec ni sam, saj sva prav kmalu opazovala še enega. Kasneje sta se nam pri opazovanju pridružila še Dare Fekonja in Aleksander Božič. Škrjanca sta se na Barju zadržala še do naslednjega dne, pozneje pa ju nisem več opazil. Kratkoprsti škrjanček je na Barju naključen preletni gost (Tome *et al.* 2005). Vsa opazovanja prejšnjega stoletja na Barju so bila zabeležena v aprilu. Zanimivo pa je, da je bil škrjanček 15. 5. 2016 opazovan ob podobnem datumu in skorajda na istem kraju (Denac 2016, Hanžel 2017). Res zanimiv pojav, ki morda ni posledica naključja, a bi lahko bil znak večjega pojavljanja v prihodnosti, morda pa celo gnezditve. Opazovanje je potrdila Komisija za redkosti kot 15. za Slovenijo.

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Dolgoprsti plezalček *Certhia familiaris*

Treecreeper – nest found behind a sign nailed onto a Spruce *Picea abies* at Krvavec (C Slovenia) on 2 Jun 2018

Dne 2. 6. 2018 sem s prijateljem Dušanom Dimnikom obročkal ptice na Krvavcu. Ko sva se vračala proti Kriški planini (1450 mnv), sem iz avtomobila zagledal letečega plezalčka, ki je imel nekaj v kljunu. Ustavila sva se in iz

Slika 5 / Figure 5: Gnezdo dolgoprstega plezalčka *Certhia familiaris* za opozorilno tablo / Treecreeper's *Certhia familiaris* nest behind a signpost, Kriška planina, Krvavec, 1,450 m n.v. / a.s.l., 2. 6 .2018 (Foto: D. Šere) avtomobila opazovala osamljene smreke v bližini. Ni bilo treba dolgo čakati, ko je ponovno mimo naju priletel dolgoprsti plezalček s hrano za mladiče v kljunu. Začel je plezati po deblu nama najbližje smreke in ob pribiti kovinski tabli na deblu smreke smuknil za njo (slika 5). Oba sva bila presenečena, saj nisva pričakovala, da bo gnezdo prav za to opozorilno tablo. Običajno ima dolgoprsti plezalček gnezdo za starim lubjem ali v špranji med dvema skupaj zraščenima smrekama. Pred leti sva ravno tako našla gnezdo te vrste v špranji na lesenem opazovalnem stolpu na barju Šijec na Pokljuki. Dne 7.6.2018 je Dušan v tem gnezdu obročkal šest mladičev, ki so bili tik pred tem, da zapustijo gnezdo. Znano je, da je možno ob deblo pribiti ostanke lubja od sečnje in tako ponuditi tej vrsti primerno gnezdišče.

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Brkata sinica *Panurus biarmicus*

Bearded Tit – 5 individuals caught and ringed on 4 Dec 2018 at Lake Pernica in the Pesnica Valley (NE Slovenia); first record for the site

Torek, 4. 12. 2018, je bil nenavadno topel, bolj spomladanski kakor pa zimski dan, z dnevno temp. do 12 °C. Zjutraj sem se odpravil lovit in obročkat ptiče v trstišče zgornjega dela Perniškega jezera. Že v mraku so se pričeli loviti stržki *Troglodytes troglodytes*, kar 15 jih je bilo na koncu. Pri jemanju stržkov iz mrež v bližini zaslišim oglašanje brkate sinice in brž pričnem predvajati njeno oglašanje. Kmalu se ujameta samec in samica, čez kakšno uro še dva samca in nato še eden (slika 6). To je moj prvi (zimski) podatek o brkati sinici za Perniško jezero. Tudi v raziskavi o ptičih Pesniške doline (GREGORI 1989) brkata sinica ni bila ugotovljena. Dne 9. 12. sem ponovno obiskal omenjeno trstišče. V celotnem dopoldnevu o brkatih ni bilo več sledu. Me je pa dogodek spomnil na konec osemdesetih let, ko sva z Iztokom Vrešem v oktobru in novembru v trstišču Ormoškega jezera ujela prek 120 teh zanimivih dolgorepih sinic (BRAČKO 1990, MLAKAR 1990). Pojavljale so se v skupinah od 10–80 osebkov, posebno leta 1990. V Ormožu obročkane štiri brkate sinice so bile kasneje znova ujete v tujini, ena leta 1990 v kraju Gbelce na Češkem (239 km, 295 dni), kar je prva slovenska najdba za to vrsto (ŠERE 2009). Naslednje leto pa so bile tri ujete 89 km proč, in sicer ob Balatonu na Madžarskem (podatkovna baza SCOP).

Slika 6 / Figure 6: Brkata sinica / Bearded Tit *Panurus biarmicus,* Perniško jezero, 4. 12. 2018 (foto: F. Bračko)

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Hrvaška / Croatia

Ploskokljunec *Calidris falcinellus*

Broad-billed Sandpiper – two observations on 10 and 19 Aug 2018 at Nin Saltworks (N Dalmatia); a rare species in Croatia with only seven records in 2005–2016 from Dalmatian coast and north Kvarner islands

Naključen obisk solin pri Ninu je bila dobra priložnost tudi za opazovanje in fotografiranje nekaterih tamkajšnjih ptic. Med primerki malih belih čapelj, pritlikavih kormoranov ter gracioznih polojnikov se je 10. 8. 2018 v eni izmed plitvin Ninskih solin med rastlinjem sprehajal tudi ploskokljunec (slika 7, spodaj). Teden kasneje, 18. 8. 2018, sem obisk ponovil v zgodnjih jutranjih urah in v enem izmed skoraj praznih bazenov, vzhodno od solin, v plitvini ponovno opazil ploskokljunca. Opazovani osebek se je neboječe prehranjeval in ponudila se je priložnost tudi za bližnje fotografiranje (slika 8, zgoraj). Na osnovi dosedanjih podatkov so ploskokljunci redko zabeleženi na Hrvaškem, kjer so omejeni na dalmatinsko obalo in južne otoke Kvarnerja (Tome 2011, Kralj & Barišić 2013, Barišić *et al.* 2016). Skupno je bilo v letih med 2005 in 2016 dokumentiranih le sedem opazovanj. Pri Ninu oziroma bližnjih Ninskih solinah je bil opazovan en primerek avgusta leta 2016 (Barišić *et al.* 2016).

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Slika 7 / Figure 7: Ploskokljunec / Broad-billed Sandpiper *Calidris falcinellus*, Nin Saltworks, Nin, 19. 8. in / and 10. 8. 2018 (določitev na osnovi fotografij / determination from photo by Al Vrezec) (foto: M. Križnar)

Mali galeb *Hydrocoloeus minutus*

Little Gull – three individuals observed on 22 Aug 2015 at Kolansko blato (Pag Island, N Dalmatia); a rare record for the island

Dne 22. 8. 2015 sem bil na Kolanskem blatu. Na območju, kjer se občasno izteka voda iz Kolanskega blata v morje (Rogoza), sem okoli poldneva iz tamkajšnjega kampa opazil tri male galebe (slika 8). To je moje prvo opazovanje vrste na otoku Pagu. Verjetno je na Pagu mali galeb v času preleta ali prezimovanja bolj pogost, kot priča moj podatek. Rucner (1998) poroča, da vrsta prileti na jadransko obalo na prezimovanje, ravno tako ga je možno videti v toplih obdobjih leta.

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Grčija / Greece

Pochard x Ferruginous Duck *Aythya ferina* x *Aythya nyroca*

Sivka x kostanjevka – križanec opazovan na jezeru Kerkini (SZ Grčija) dne 4. 2. 2019

On 4 Feb 2019 at 16.00hrs along the Eastern dike of lake Kerkini I photographed a male hybrid looking duck, which was later identified as a hybrid between Ferruginous Duck and Common Pochard (Figure 9). The bird was beside male Common Pochards which allowed easily spotting the difference between the birds. The bird stayed in the area for several days at least and was repeatedly spotted.

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Slika 8 / Figure 8: Mali galeb / Little Gull *Hydrocoloeus minutus*, Rogoza, Kolansko blato, otok Pag, 22. 8. 2015 (foto: D. Šere)

Slika 9 / Figure 9: Sivka x kostanjevka / Pochard x Ferruginous Duck *Aythya ferina* x *Aythya nyroca*, Kerkini, 4. 2. 2019 (foto: N. Petkov)

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