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Vsi smo raziskovalci

We are all researchers

Danes se človeštvo spopada z eno največjih kriz doslej – biodiverzitetno krizo. Vrste izumirajo tudi 100-krat hitreje, kot bi bilo to naravno pričakovano, in nobenega dvoma ni, da je to stanje povzročil človek. Stanje narave navadno ugotavljamo z dolgoročnim preučevanjem populacij indikatorskih vrst – monitoringi. S temi sicer ugotovimo trende, ne pa nujno razlogov zanje. Zato so potrebne dodatne, podrobnejše ekološke raziskave. Raziskovanje stanja narave je torej obsežno vprašanje, ki že zaradi narave vsebine – veliko število vrst, različni habitati, različne metode popisovanja – zahteva mobilizacijo velikega števila sodelavcev, nemalokrat govorimo o številkah nad 100. Namreč, samo dovolj velika količina podatkov lahko omogoči verodostojne in dovolj natančne analize za pojasnitev raziskovanih pojavov. Zato je na svetu danes povsem uveljavljeno mnenje, da mora pri raziskavah s področja varstvene biologije, ekologije ali ornitologije sodelovati širša javnost – ki je seveda primerno informirana in izobražena za takšno sodelovanje. V Sloveniji denimo v okviru raziskav, ki jih opravlja DOPPS, redno sodeluje okrog 250 članov pri vsakoletnem mednarodnem zimskem popisu vodnih ptic (t.i. IWC), dodatnih 100 pri vsakoletnem monitoringu kvalifikacijskih vrst na območjih Natura 2000 (ta monitoring je obveza RS in vsakih 6 let je o stanju treba poročati Evropski uniji), za izvedbo novega Atlasa ptic Slovenije pa je v 15-letnem terenskem delu na območju celotne Slovenje sodelovalo 632 prostovoljcev, knjigo pa je napisalo 44 avtorjev. Takšne raziskave zato nimajo manjše vrednosti, nasprotno, ob dobrem načrtovanju, kjer so praviloma vključeni znanstveniki in raziskovalci, omogočijo vpoglede v temeljne ekološke procese in razkrivajo probleme, ki jim sama znanstvena skupnost nikakor ne bi bila kos. Pri tem pa se dogaja še en proces. Javnost, torej "zunanji sodelavci" pri takšnih raziskavah, so prostovoljci, motivirani z željo po reševanju problemov, ki jih pomagajo raziskovati. Tem ljudem ni mar le za pridobivanje znanja, marveč predvsem za uporabo znanja v konkretnem reševanju problemov, sprejemanju drugačnih politik ipd. Ti ljudje se radi udeležujejo konkretnih naravovarstvenih akcij – denimo prostovoljnega dela za upravljanje s habitati, ker omogočajo gnezdenje ogroženim vrstam, ali kot t.i. varuhi skrbijo za konkretna gnezda, jih spremljajo in skrbno nadzirajo ter pazijo in tako izboljšujejo stanje populacij ogroženih vrst. Ti ljudje (npr. člani) so del gibanja, ki lahko ustvari pozitiven družbeni pritisk, da se neke nujne spremembe dejansko zgodijo. Znanstveni krogi s področja biologije in ekologije, z redkimi svetlimi izjemami, praviloma ob prepoznanih problemih nikoli ne reagirajo v javnosti, svoje delo zaključijo z objavo članka v reviji s faktorjem vpliva in ne delujejo v smeri uresničevanja sprememb. Velikokrat je razlog strah pred izgubo financiranja ali preprosto pomanjkanje volje, saj to delo ni cenjeno in ne prinaša točk, s katerimi se meri uspešnost v akademskih krogih. Hkrati so za uresničitev sprememb potrebna drugačna znanja, kadri in pristopi, ki si jih mnoge organizacije ne morejo privoščiti ali pa ne prepoznajo potrebe po njih.

* * *

Humanity is currently facing one of the biggest crises to date - the biodiversity crisis. Species are becoming extinct even 100 times faster than naturally expected, and there is absolutely no doubt that this state of affairs has been brought about by humans. The conservation status of nature is usually determined by long-term studies of populations of indicator species, i.e. monitoring. Indeed, this enables us to identify relevant trends, but not necessarily the reasons for them. Therefore, additional and more detailed ecological research is required. Researching the conservation status of nature is therefore a huge issue, which already due to the high number of species, diverse habitats and different census methods requires mobilization of a large number of participants, often well over 100. Specifically, it is only a large enough amount of data that can enable credible and sufficiently accurate analyses to explain the studied phenomena. Therefore, a well-established opinion prevails in the world today that research in the field of conservation biology, ecology or ornithology should involve the general public which, of course, should also be suitably informed and educated for this kind of participation. In our country, for example, around 250 members regularly participate within the framework of research conducted by DOPPS (Bird Watching and Bird Study Association of Slovenia) in the annual international waterbird census (IWC), and an additional 100 in the annual monitoring of qualifying species in Natura 2000 protected areas (an actual obligation of the Republic of Slovenia, which is liable to report on the situation to the European Union every 6 years), while for the implementation of the new Breeding Birds Atlas of Slovenia, 632 volunteers took part in the 15-year field work in the entire country, with the book written by 44 authors. Such research is therefore not of a minor value, on the contrary, with good planning, where scientists and researchers are, as a rule, usually involved, they provide insights into fundamental ecological processes and disclose problems that the scientific community itself cannot cope with. Here, another process takes place. The public, i.e. "external collaborators" participating in this kind of research, are volunteers motivated by a desire to help solving the problems occurring during the research. These people care not only about acquiring knowledge, but predominantly about utilizing knowledge in actual problem solving, adopting divergent policies, etc. They like to participate in concrete nature conservation actions – for example, in voluntary work for habitat management, thus enabling endangered species to nest, or as a kind of guardians take care of actual nests, monitor them and carefully watch over them, thus improving the status of the endangered species populations. These people (e.g. members) are part of the movement that can bring on positive social pressure for certain urgent changes to actually take place. With rare commendatory exceptions, scientific circles in the fields of biology and ecology never react, as a rule, in public to the identified problems. They complete their work merely by publishing an article or two in journals with an impact factor, without striving for changes. The reason for such attitude is fear of losing funding or simply a lack of willpower, considering that this work is not appreciated and does not bring points to measure their academic performance. At the same time, changes require different skills, personnel and approaches that many organizations cannot afford or simply do not recognize the need for them.

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The diet, and pellet residue taphonomy, of Barn Owls *Tyto alba* on a Greek island reveals an exceptional diversity of avian prey

Prehrana in tafonomija ostankov izbljuvkov pegaste sove *Tyto alba* na grškem otoku razkriva izjemno raznolikost ptičjega plena

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Barn Owl *Tyto alba* pellets and loose bones on a cave floor from Amorgos (Cyclades, Greece) were examined and the birds found to have caught at least 39 species of bird, mostly identified from humeri, plus shrews *Crocidura suaveolens*, a few lizards and dung beetles, in addition to their principal diet of rodents (rats *Rattus rattus*, mice *Apodemus* spp. & *Mus musculus*). Amongst the birds, migrants appeared most vulnerable to owl predation, with some notable exceptions, while resident species were under-represented. The range of bird species found appears to be the largest recorded for any Barn Owl study of a single site. Considerable differences were found in species proportions of taxa in fresh pellets and in loose bones, probably due to differential rates of degradation. Photographs of all humeri are included to aid identification in other studies.

1. Introduction

The diet of owls is well studied due to the ease of analysing the pellets they eject of undigested vertebrate bones and invertebrate exoskeletons, and the food habits of the geographically widespread Barn Owl *Tyto alba* are among the best known (e.g. Bunn *et al.* 1982, Taylor 1994, Romano *et al.* 2020). In Barn Owls, small mammals almost invariably make up the majority of food items in both numbers and biomass, but reptiles and birds are also taken, and in some circumstances the latter can make a significant contribution. Here we report on the remarkable variety of avian species taken by Barn Owls on Amorgos, a small island (121 km^2, 33 km long by 6 km at the widest point) in the Cyclades/Kiklades southeast of Naxos in the Aegean.

As part of wider studies on the fauna of Amorgos (Cheke & Ashcroft 2017, Cheke *et al.* 2020), during 2015–2019 Barn Owl roosts in small caves and cavities notified to ASC by locals were examined by ASC and Ruth Ashcroft (REA) for intact pellets and loose bones on cave floors; owl prey has not previously been studied on Amorgos. Thirty-nine whole pellets were collected from three locations, and hundreds of bones retrieved from the floor of one cave, with a few from a fourth site (see below). The sites are not occupied continuously by the owls, and there appears to have been a decline to near extinction of these owls on the island in the last decade, probably related to poisoning of rats – a dead owl with no signs of injury was found by local tour guide Lonaïs Jallais in 2015. We found no recent (post 2015) pellets in 2016 or 2017, though

Figure 1: Location map of Amorgos (circled) in the eastern Aegean sea.

Slika 1: Lokacija otoka Amorgos (obkroženo) v vzhodnem Egejskem morju.

Figure 3: Photo of entrance to Site D (Dhri cave), with REA at the location of the main Barn Owl pellet deposit. Barn Owl excreta is visible on the stone wall to the left of REA. The loose bones were found on the cave floor in the foreground.

Slika 3: Fotografija vhoda na lokaliteto D (jama Dhri); REA označuje lokacijo glavnega nahajališča izbljuvkov pegaste sove. Na zidu levo od REA so vidni sovini iztrebki. Posamezne kosti so bile najdene na jamskih tleh (v ospredju fotografije).

three, still wet, were collected in April 2018, although the owl was not seen. Only an old dry pellet was found in 2019, and indeed most pellets we recovered were dry with no indication of when they had been produced.

Figure 2: Google Earth panoramic view of the Aegiale area, northeastern Amorgos, with location of Barn Owl sites indicated.

Slika 2: Google Earthov panoramski pogled območja Aegiale, severovzhodni Amorgos, z oznakami lokacij pegastih sov.

The four collection localities are all fairly close together around the village of Langada in the Aegiale area in the north-east of Amorgos (Figure 2). This part of the island consists of part-metamorphosed Triassic-Eocene limestone bedrock ('massive marble', Rosenbaum *et al.* 2007), with numerous cavities and some caves. The area is also the wettest part of the island with the richest vegetation, a maquis that is almost forest in parts of the area between Langada to Theologos, and consequently has the highest bird diversity throughout the year (Cheke *et al.* 2020; see Table 5 for status of prey species). The principal site (D; Figure 3), about 1 km NE of the village at Dhri, is a small cave in the wall of a wooded gorge, with a roost site on a dry-stone wall near the entrance – there is no evidence that the owls penetrate into the true interior. On a cliff above and just south of the village is the shrine of Aghia Triada (AT), were the owls used to nest (local informants, pers. comm. to ASC) but since c. 2010 now only used sporadically for roosting. Just NW, and as the Arakalos gorge opens out below the village, is a larger cave (A) in a cliff somewhat difficult of access where we only collected pellets once. Finally, south and up the talus slope from AT is a rock cleft (C) where ASC first found bones, but only a few, and not subsequently visited.

2. Methods

Whole pellets were simply picked up from the floor of a site, dried in the sun or oven, and preserved in ziplock bags for later analysis in Oxford, UK. The bones were separated out in water and all bones and invertebrate remains removed, sorted and identified to major taxa (birds, lizards) or species (mammals) by ASC or Linda Losito (dung beetles). Rodents were identified to genus using Lawrence & Brown (1973), its clear and extensive diagrams not superceded by more recent guides; only one species each of *Rattus* and *Mus* are found on Amorgos (Cheke & Ashcroft 2017), and the two *Apodemus* species are separated by non-overlapping overall jaw size (*ibid*.), confirmed by the relatively larger tooth roots in *A. mystacinus*. Shrew bones were presumed to be from the only known species on the island, *Crocidura suaveolens* (Cheke & Ashcroft 2017). Gecko *Mediodactylus (Cyrtopodion) kotschyi* dentaries were identified from Villa *et al*. (2018), differing larger non-gekkonid lizard jaws assumed to be from the abundant wall lizard *Podarcis erhardii*, the only possibly candidate (Cheke & Ashcroft 2017). Bird names and sequence follow the standard English-language handbook of Greek birds (Handrinos & Akriotis 1997), with, in tables, more recently revised names in brackets where relevant. Pellets and whole skulls on the cave floor were often host to larvae of tapestry moths *Trichophaga tapetzella* and clothes moths *Tinea bisselliella,* revealed when the adults emerged in the ziplock bags.

The floor of cave D between the entrance and the roosting rock, semi-open to the elements, proved to be rich in bones from prey. The cave is used by goats so the bones from decayed pellets were scattered over several square metres of ground, but only in the top couple of centimetres after the layer of goat droppings was removed. Digging deeper revealed no further bones. Collections, made by carefully surveying and raking through the surface layer, were made on several occasions during 2015–2019 until the site was more or less worked out. There was no new owl-generated input over this period until four fresh pellets (birdless) were found in March 2018, and a partial fifth in April 2019, but old and including a bird, probably dating from the same batch. All bones found, including very small ones, were collected directly into ziplock bags, then sorted into major taxa back at ASC and REA's *pied-à-terre* in Langada, for later more specific identification by ASC in Oxford.

Birds (humeri, skull elements) were provisionally identified by ASC in Oxford using published material (principally Jánossy 1983, Brown *et al*. 1987 and online skullsite.com), but later rechecked together with JPH against reference material in the skeleton collection at the bird section of the Natural History Museum, Tring, UK (NHMUK). To aid the preliminary identifications a table of bone measurements of European birds in the size range found was compiled from the literature (available from the first author on request).

3. Results

Both by number (72% of loose bones, 82% in pellets) and biomass the main prey of the Amorgos Barn Owls were the four rodents present on the island – Black Rats *Rattus rattus*, some Rock Mice *Apodemus mystacinus*, many remains assigned provisionally to Wood Mice *Apodemus sylvaticus,* and a few House Mice *Mus musculus*. In addition to birds, other prey were frequent shrews *Crocidura suaveolens,* a very few lizards (Reptilia – Squamata), beetles (Coleoptera) and one unidentified dragonfly (Odonata) (Tables 1 & 2, Cheke & Ashcroft 2017).

Brown Rats *R. norvegicus* and voles Cricetidae, common prey in mainland Europe, are absent from Amorgos (Masseti 2012, Cheke & Ashcroft 2017).

The proportions of the various prey species amongst loose bones and pellets are strikingly different, and very significantly so on a χ^2 test (Table 3); possible reasons for this are discussed below.

Both in pellets (Table 1) and in the loose bones on the cave floor (Table 2) there was a small but significant proportion of bird remains. Amongst the floor bones, humeri were the most frequent and generally the best preserved avian bones recovered (Table 4), and these are also the most diagnostic to species in the absence of complete skulls (Jánossy 1983). The bird bones proved on study to come from a surprisingly wide range of species, although many were represented by only one or a few individuals. Overall a total of 39 species (Table 5, Figure 4 & 5) were recorded; in addition to loose bones,

there were eleven more or less complete associated skeletons in pellets (Table 4), including a Siskin *Carduelis (Spinus) spinus* (Fig. 8), the only species not represented in the loose bones on the cave floor.

The birds taken by the Barn Owls range from the very small (Chiffchaff *Phylloscopus collybita*) to quite bulky (Blackbird *Turdus merula*), a weight range of 6–10 to 80–125 g, though birds in the lower part of this range (15–25 g) predominate (Table 4; weights from Snow & Perrins 1998). All birds taken are passerines, except for Wryneck *Jynx torquilla,* which is, apart from Common Quail *Coturnix coturnix,* the only non-passerine (occasional waders excepted) recorded on the island in the same size range as the other prey (Cheke *et al*. 2020).

4. Discussion

4.1 Birds

All but one of the bird species identified in remains has been recorded live on the island by ASC and REA (Cheke *et al*. 2020) in the years since 2007. Some however occur infrequently, and in one case, Siskin, bones were identified in a pellet before living birds had been seen, and Wryneck humeri were found (though not identified) before a sight record. The cave floor produced a single Crossbill *Loxia curvirostra* humerus – a species not yet seen on the island, although known (but accidental) on nearby Iraklia (Gavalas 2014).

We believe owl prey was taken on Amorgos itself, not brought in from outside. In Greece most Barn Owls are resident, with a small number of immigrants from further north (Handrinos & Akriotis 1997). Home ranges in the Mediterranean area appear not to have been studied, but further north in Europe most birds range c.3km from their roosts, rarely to 16km (Taylor 1994, 2002). The only confirmed cases of regular foraging across sea gaps we have found are in the Balearic islands, where owls cross up to 4.5km of sea to forage on adjacent islands (Guerra *et al*. 2014) and on Skomer Island (Wales, UK; Loughran 2006) where the sea gap to the mainland is only 0.6km. On Amorgos the over-sea distance to the nearest potentially useful island is greater (6.6km across sea to Ano Antikeri), and it is a further 24km (overland) from the cave site; in the other direction it is 7.8km over land + 6.8km over sea to Liadi – in any case both are little more than rocky outcrops and it is a lot further to islands with suitable habitat. It is thus most unlikely that any but a tiny proportion of bones will have been brought in from outside Amorgos.

The list of birds taken is by no means a random set of the island's small and medium passerines. The bulk of the avian prey consists of migrants – summer visitors, passage migrants and winter visitors, as indicated in Table 4. Resident species in the relevant size range are noticeably under-represented, the most abundant (Sardinian Warbler *Sylvia melanocephala*, House Sparrow *Passer domesticus*, and Crested Lark *Galerida cristata*) barely making the list, and Blue Rock-thrush *Monticola solitarius* not showing up at all; some residents that are preyed on are species supplemented by more abundant winter visitors (Stonechat *Saxicola rubicola,* Goldfinch *Carduelis carduelis,* Linnet *Carduelis (Linaria) cannabina,* Chaffinch *Fringilla coelebs)*. This suggests the migrants are relatively naïve or vulnerable to Barn Owl predation, whereas the residents are more aware of the threat. Migrants from mainland areas will rarely have been subject to predation from Barn Owls, and in addition may on arrival be exhausted or weak and thus easy targets. We presume the owls catch the birds at night when roosting. There are anomalies however – in both spring and autumn migration Spotted Flycatchers *Muscicapa striata* can be the most abundant birds in the better vegetated parts of the island, yet they largely escape predation, whereas the less abundant, albeit still fairly common, Pied and Collared Flycatchers *Ficedula hypoleuca/F.albicollis,* indistinguishable osteologically, are rather frequent victims. Other common migrants that the owls do not

Please note: The following bone photo sets (Figs 4–7) are composites made up of photos of pairs of bones photographed separately. Therefore, the scale bar should be taken as a guide only; more exact measurements can be found in Table 5, column 2.

Opomba: Sledeče zbirke fotografij kosti (slike 4–7) so kolaži fotografij parov kosti, ki so bili fotografirani posamično. Merilo je zato zgolj vodilo, podrobne meritve so v tabeli 5.

Figure 4: Humeri in caudal view of passerines (warblers & chats) discussed in the text. In this and subsequent figures (Figure 5, 6 and 7) the left-hand image(s) with numbered codes are reference material from the UK Natural History Museum (NHM), the right-hand bones, labelled Amorgos, are samples collected in this study. In the list the individual bone captions are separated by vertical line '|'. A – Blackcap *Sylvia atricapilla* NHMUK S/1968.6.36 u/s | Garden Warbler *Sylvia borin* NHMUK S/1968.6.28 ♀ | Amorgos, B – Great Reed Warbler *Acrocephalus arundinaceus* NHMUK S/1998.92.22 u/s | Amorgos*, C – Nightingale *Luscinia megarhynchus* NHMUK S/1968.4.13 ♀ | Amorgos, D – Orphean Warbler *Sylvia hortensis*** NHMUK S/1968.6.24 ♂ | Amorgos, E – Common Whitethroat *Sylvia communis* NHMUK S/1968.4.25 ♂ | Amorgos, F – Robin *Erithacus rubecula* NHMUK S/1968.1.22 ♂ | Amorgos, G – Willow Warbler *Phylloscopus trochilus* NHMUK S/1968.1.11 ♂ | Amorgos, H – Chiffchaff *Phylloscopus collybita* NHMUK S/1968.1.20 ♂ | Amorgos, I – Sedge Warbler *Acrocephalus schoenobaenus* NHMUK 1930.3.24.457 u/s | Amorgos, J – Sardinian Warbler *Sylvia melanocephala* NHMUK S/1998.29.2 u/s | Amorgos, K – Subalpine Warbler *Sylvia cantillans*** NHMUK S/2002.40.1 u/s | Amorgos. Scale bar = 10mm.
* The Amorgos humerus in 'B' is not a Great Reed Warbler, but inferred to be from a Olive Tree Warbler *Hippolais olivetorum* on the basis of size and morphology (our comparisons and J.Kessler pers. comm.); there being no specimens of *H.olivetorum* in the NHM skeleton collection we used the bone that came nearest in size and appearance.
** *S.(h.) hortensis* and the eastern form *S.(h.) crassirostris* are not separated in the NHM skeleton collections, and are almost certainly indistinguishable; the same applies to the forms/species of the *S. cantillans* complex.

Slika 4: Nadlahtnice (kavdalno) pevk (trstnice in taščice), omenjenih v besedilu. V tej in sledečih tabelah (tabele 5, 6 in 7) so na levi strani referenčni primerki iz NHM, na desni, označeni Amorgos, pa primerki iz te raziskave. V opisu slik so posamezne vrste ločene s pokončno črto "|".A – Črnoglavka *Sylvia atricapilla* | vrtna penica *Sylvia borin* | Amorgos, B – rakar *Acrocephalus arundinaceus* | Amorgos,* C – slavec *Luscinia megarhynchus* | Amorgos, D – svetlooka penica *Sylvia hortensis* | Amorgos,** E – rjava penica *Sylvia communis* | Amorgos, F – taščica *Erithacus rubecula* | Amorgos, G – severni kovaček *Phylloscopus trochilus* | Amorgos, H – vrbji kovaček *Phylloscopus collybita* | Amorgos, I –bičja trstnica *Acrocephalus schoenobaenus* | Amorgos, J – žametna penica *Sylvia melanocephala* | Amorgos, K – taščična penica *Sylvia cantillans* | Amorgos,** Merilo = 10 mm.
* Nadlahtnica B ne pripada rakarju, vendar na podlagi velikosti in morfologije najverjetneje oljčnemu vrtniku *Hippolais olivetorum* (lastna primerjava in osebna komunikacija z J. Kassler). V zbirki NHM ni oljčnega vrtnika, zato smo uporabili kost, ki mu je po velikosti in videzu najbolj podobna.
** svetlooka penica *S. hortensis* in vzhodna svetlooka penica *S. crassirostris* v zbirki okostji NHM nista ločeni in ju ni mogoče razlikovati. Enako velja za vrsto oz. obliko taščične penice *S. cantillans.*

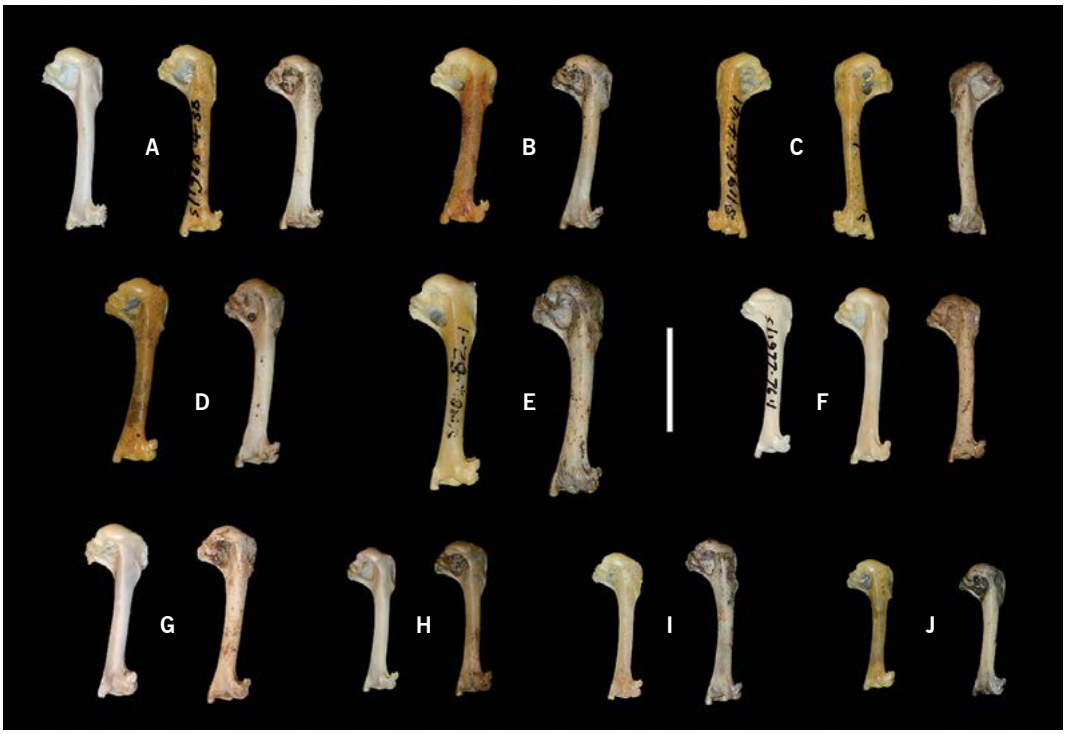

Figure 5: Humeri in caudal view of passerines (finches, buntings & sparrows) discussed in the text. A – Chaffinch *Fringilla coelebs* NHMUK S/1968.4.38 ♀ | Brambling *Fringilla montifringilla* NHMUK S/1976.20.1 u/s | Amorgos, B – Crossbill *Loxia curvirostra* NHMUK S/2008.6.1 u/s | Amorgos, C – Ortolan Bunting *Emberiza hortulana* NHMUK S/1968.4.39 ♀ | Cretzchmar's Bunting *Emberiza caesia* NHMUK S/1968.4.41 ♂ | Amorgos, D – Greenfinch *Carduelis chloris* NHMUK S/1982.22.2 u/s | Amorgos, E – Hawfinch *Coccothraustes coccothraustes* NHMUK S/1984.82.1 ♂ | Amorgos, F – House Sparrow *Passer domesticus* NHMUK S/1977.76.1 u/s | Spanish Sparrow *Passer hispaniolensis* NHMUK S/1968.1.41 ♀ | Amorgos*, G – Linnet *Carduelis (Linaria) cannabina* NHMUK S/1976.26.1 ♂ | Amorgos, H – Goldfinch *Carduelis carduelis* NHMUK S/2017.8.2 ♀ | Amorgos, I – Serin *Serinus serinus* NHMUK S/1961.13.30 ♂ | Amorgos**, J – 31. Siskin *Carduelis (Spinus) spinus* NHMUK S/1982.40.1 ♂ | Amorgos. Scale bar = 10mm.
* Note the marked difference in morphology between House and Spanish Sparrow humeri, presumably reflecting the greater muscle mass required in the migratory Spanish Sparrow; Amorgos sparrow humeri are clearly from House Sparrows, although a mandible is from a Spanish Sparrow.
** The Serin from Amorgos is very much in the upper end of the size range for the species.

Slika 5: Nadlahtnice (kavdalno) pevk (ščinkavci, strnadi in vrabci), omenjenih v besedilu. A – ščinkavec *Fringilla coelebs* | pinoža *Fringilla montifringilla* | Amorgos, B – krivokljun *Loxia curvirostra* | Amorgos, C – vrtni strnad *Emberiza hortulana* | balkanski strnad *Emberiza caesia* | Amorgos, D – zelenec *Chloris chloris* | Amorgos, E – dlesk *Coccothraustes coccothraustes* | Amorgos, F – domači vrabec *Passer domesticus* | travniški vrabec *Passer hispaniolensis* | Amorgos,* G – repnik *Carduelis (Linaria) cannabina* | Amorgos, H – lišček *Carduelis carduelis* | Amorgos, I – grilček *Serinus serinus* | Amorgos,** J – čižek *Carduelis (Spinus) spinus* | Amorgos. Merilo = 10 mm.
* Opazna morfološka razlika v nadlahtnici domačega in travniškega vrabca, ki je najverjetneje posledica večje mišične mase slednjega, ki je selivec. Nadlahtnice z otoka Amorgos nedvomno pripadajo domačemu vrabcu, najdene spodnje čeljusti pa travniškemu vrabcu.
** Grilček z otoka Amorgos dosega zgornjo mejo velikosti za to vrsto.

Figure 6: Humeri in caudal view of passerines discussed in the text. A – House Martin *Delichon urbica* NHMUK S/1973.29.3 u/s | Barn Swallow *Hirundo rustica* NHMUK S/1985.7.1.237 ♂ | Amorgos*, B – Stonechat *Saxicola (torquata) rubicola* ** NHMUK S/1968.1.28 ♂ | Amorgos, C – Whinchat *Saxicola rubetra* NHMUK S/1983.113.2 ♂ | Amorgos, D – Spotted Flycatcher *Muscicapa striata* NHMUK S/1968.6.82 ♂ | Amorgos, E – Pied Flycatcher *Ficedula hypoleuca* NHMUK S1968.6.45 ♂ | Collared Flycatcher *Ficedula albicollis* NHMUK S1968.6.79 ♂ | Amorgos, F – Black Redstart *Phoenicurus ochrurus* NHMUK S/1968.4.12 ♂ | Amorgos, G – Dunnock *Prunella modularis* NHMUK S/1996.50.6 ♂ | Amorgos, H – Wryneck *Jynx torquilla* NHMUK S/1968.4.5 ♀ | Amorgos, I – Woodchat Shrike *Lanius senator* NHMUK S/1983.41.1 u/s | Amorgos, J – Red-backed Shrike *Lanius collurio* NHMUK S/1968.6.85 ♂ | Amorgos. Scale bar = 10mm.
* Although both species are common migrants, Amorgos hirundine humeri are clearly from House Martins not Swallows.
** The segregates in the *Saxicola torquata* complex are not separated in the NHM skeleton collections.

Slika 6: Nadlahtnice (kavdalno) pevk, omenjenih v besedilu. A – mestna lastovka *Delichon urbica* | kmečka lastovka *Hirundo rustica* | Amorgos,* B – prosnik *Saxicola (torquata) rubicola* | Amorgos,** C – repaljščica *Saxicola rubetra* | Amorgos, D – sivi muhar *Muscicapa striata* | Amorgos, E – črnoglavi muhar *Ficedula hypoleuca* | belovrati muhar *Ficedula albicollis* | Amorgos, F – šmarnica *Phoenicurus ochrurus* | Amorgos, G – siva pevka *Prunella modularis* | Amorgos, H – vijeglavka *Jynx torquilla* | Amorgos, I – rjavoglavi srakoper *Lanius senator* | Amorgos, J – rjavi srakoper *Lanius collurio* | Amorgos. Merilo = 10 mm.
* Čeprav sta obe vrsti pogosti selivki, pripadajo najdene nadlahtnice mestnim lastovkam.
** Oblike in podvrste *Saxicola torquata* v zbirki okostji NHM niso ločene.

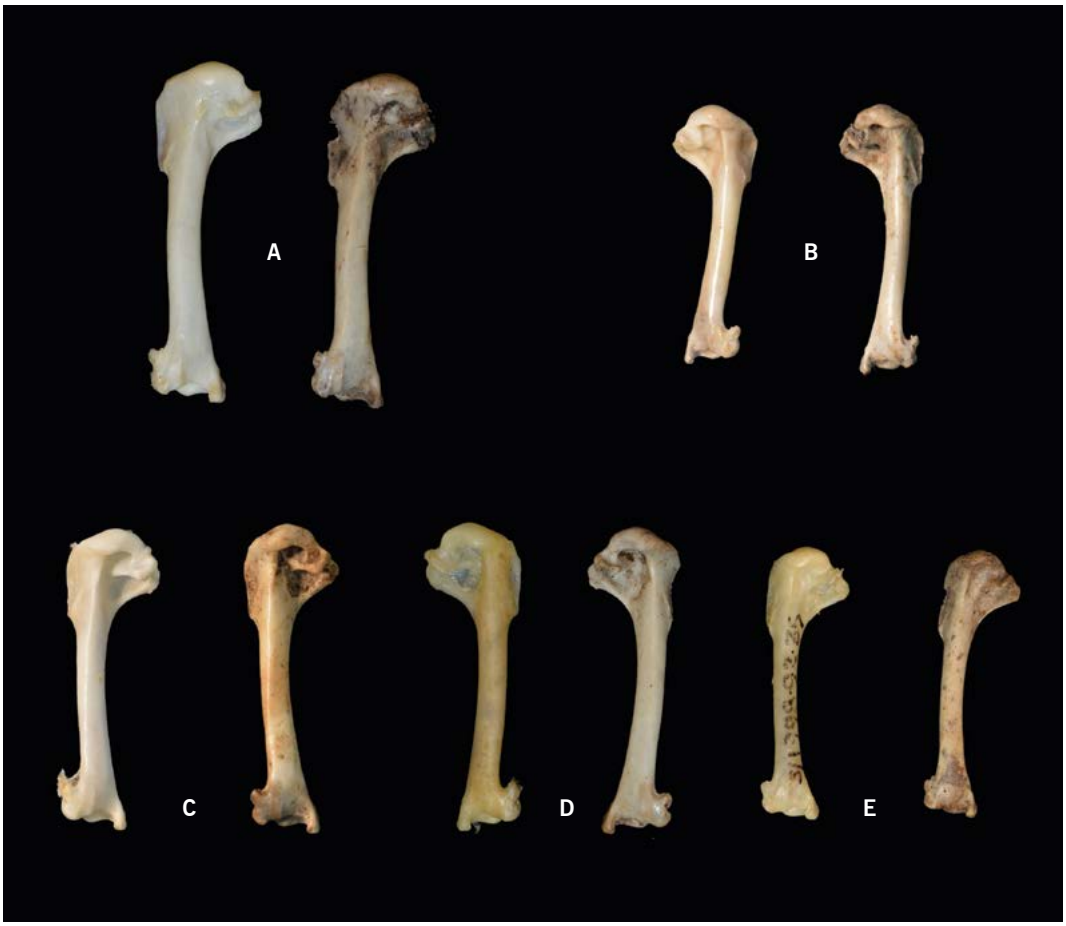

Figure 7: Humeri in caudal view of the largest passerines discussed in the text. A – Golden Oriole *Oriolus oriolus* NHMUK S/1968.6.10 ♂ | Amorgos, B – Starling *Sturnus vulgaris* NHMUK S/1973.46.1 ♀ | Amorgos, C – Blackbird *Turdus merula* NHMUK S/1982.134.1 ♂ | Amorgos, D – Songthrush *Turdus philomelos* NHMUK S/1982.48.1 u/s | Amorgos, E – Crested Lark *Galerida cristata* NHMUK S/1998.92.35 u/s | Amorgos. Scale bar = 10mm.

Slika 7: Nadlahtnice (kavdalno) večjih pevk, omenjenih v besedilu. A – kobilar *Oriolus oriolus* | Amorgos, B – škorec *Sturnus vulgaris* | Amorgos, C – kos *Turdus merula* | Amorgos, D – cikovt *Turdus philomelos* | Amorgos, E – čopasti škrjanec *Galerida cristata* | Amorgos. Merilo = 10 mm.

Figure 8: An associated Siskin *Carduelis (Spinus) spinus* recovered from a single Barn Owl pellet. Scale bar = 10mm.

Slika 8: Okostje čižka, sestavljeno iz enega samega izbljuvka pegaste sove. Merilo = 10 mm.

Table 1: Barn Owl prey in Amorgos analysed in 39 pellets. Codes: *a* – Pied/Collared Flycatcher *Ficedula hypoleuca/albicollis*, *b* – Woodchat Shrike *Lanius senator*, *c* – Blackcap *Sylvia atricapilla*, *d* – Chaffinch *Fringilla coelebs*, *e* – Blackbird *Turdus merula*, *f* – Siskin *Carduelis (Spinus) spinus*, *g* – Chiffchaff *Phylloscopus collybita*, *h* – gecko *Mediodactylus kotschyi*, *j* – wall lizard *Podarcis erhardii*, *k* – *Copris hispanus*, *m* – *Thorectes* cf. *bruelli*, *n* – Stonechat *Saxicola (torquata) rubicola*, *x* – not identified. Localities & dates: D – Dhri cave (1–23: 21. 5. 2015, 24–27: 21. 4. 2018, 28: 5. 4. 2019), AT – Agia Triada Shrine (6. 3. 2015, none found subsequently), A – Araklos gorge cave (22. 5. 2015), UL – unlabelled sample (labels lost, but UL1 & 2 probably from D (30. 3. 2016, old pellets missed in 2015), 3 & 4 from A (22. 5. 2015).

Sample / Vzorec	**D**																										
Prey / Plen	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Rattus rattus		1	1			1	1								1			1					1	2	2	1	1	
Apodemus mystacinus	1							1	1							2	1						1					1
A. cf. *sylvaticus*	1	1		2	5	2		1	1	1	2	3	3	2	5				3	2	2	4	2	2	1	1	1	
Mus musculus				2					1	1	2			2						1				1	1	2	1	
Crocidura suaveolens				1		1				1				1	1		2			1								
Bird / Ptica			1*a*									1*a*				1*a*												1*n*
Lizard /Kuščar										1*h*							1*h*							1*j*				
Dung beetle / Govnač					1*k*	1*k*						1*k*																
Dragonfly / Kačji pastir																												1*x*
TOTALS / SKUPAJ																												

Tabela 1: Plen pegastih sov na otoku Amorgos, analiziran iz 39 izbljuvkov. Oznake: *a* – črnoglavi/belovrati muhar *Ficedula hypoleuca/albicollis*, *b* – rjavoglavi srakoper *Lanius senator*, *c* – črnoglavka *Sylvia atricapilla*, *d* – ščinkavec *Fringilla coelebs*, *e* – kos *Turdus merula*, *f* – čižek *Carduelis (Spinus) spinus*, *g* – vrbji kovaček *Phylloscopus collybita*, *h* – gekon *Mediodactylus kotschyi*, *j* – Erhardova pozidna kuščarica *Podarcis erhardii*, *k* – *Copris hispanus*, *m* – *Thorectes* cf. *bruelli*, *n* – prosnik *Saxicola (torquata) rubicola*, *x* – ni določeno. Lokacije & datumi: D – jama Dhri (1–23: 21. 5. 2015, 24–27: 21. 4. 2018, 28: 5. 4. 2019), AT – svetišče Agia Triada (6. 3. 2015, brez novejših najdb), A – jama v soteski Araklos (22. 5. 2015), UL – neoznačeni vzorci (oznake izgubljene, UL1 in 2 najverjetneje z lokalitete D (30. 3. 2016, stari izbljuvki spregledani v letu 2015), 3 & 4 z lokalitete A (22. 5. 2015).

	AT						A	UL				
Total:D	**1**	**2**	**3**	**4**	**5**	**6**	**1**	**1**	**2**	**3**	**4**	***Grand Total / Skupaj***
13–13% (14)		1	1									**15**–12%
8–8% (8.5)								1	1			**10**–8%
47–47% (50)				1	2	1	1	2	3		1	**58**–46%
14–14% (15)		1										**15**–12%
8–8% (8.5)									2			**10**–8%
4–4% (4)	1*b*			1*c*			2*de*			3*dfg*		**11**–9%
3–3% -												**3**–2.5%
3–3% -	1*x*	1*m*										**5**–4%
1–1%												**1**–0.8%
101 (94)												**125** (119)

Table 2: Numbers of rodent and shrew jaws, and minimum total of bird humeri (from Table 5) recovered loose from the floor of Dhri Cave (L – left, R – right jaws). Minimum number of mammal individuals indicated by the higher figure for left or right in italics, numbers then used in Table 3. Minimum bird numbers as shown in Table 5.The lizard is *Podarcis erhardii*.

Tabela 2: Število čeljusti glodalcev in rovk ter minimalno število nadlahtnic ptic (iz tabele 5), pridobljenih iz tal jame Dhri (L – leva, R – desna čeljust). Minimalno število osebkov sesalcev (višja vrednost za levo ali desno čeljust) je zapisano ležeče, vrednost pa je nato uporabljena v tabeli 3. Minimalno število ptic, kot jih prikazuje tabela 5. Kuščar je *Podarcis erhardii*.

Species / Vrsta	*Rattus rattus*		*Apodemus mystacinus*		*A.cf. sylvaticus*		*Mus musculus*		*Crocidura suaveloens*		Bird /Ptica	Lizard / Kuščar
Date / Datum	L	R	L	R	L	R	L	R	L	R	min.	dentary
May 2015	51	50	*6*	*6*	18	19			7	5		
March 2016	63	60	10	13	30	29		2	12	4		
October 2017	12	15	2	1	5	7	1	1	4	3		
April 2018	42	49	11	9	38	30	4	3	16	21		1
April 2019	17	12	*6*	2	10	10	3	3	1	3		1
TOTALS (459) / SKUPAJ (459)	185	*186*	*35*	31	*101*	95	8	*9*	*40*	37	*86*	2
% (rounded)		40.5	7.5		22			2	9		19	

or rarely catch are summer visitors Olivaceous Warbler *Hippolais (Iduna) pallida*, and wheatears *Oenanthe* spp., passage migrants Common Redstart *Phoenicurus phoenicurus,* Wood Warbler *Phylloscopus sibilatrix* and Tree Pipit *Anthus trivialis,* and winter visitors Meadow Pipit *Anthus pratensis,* Pied Wagtail *Motacilla alba* and Corn Bunting *Emberiza calandra.* The preponderance of Chaffinches may be due to there being a large winter roost near cave D (ASC & REA unpublished data); likewise the frequently predated Blackcaps *Sylvia atricapilla* are very common on migration, and frequent as winter visitors, sometimes also aggregating in the vicinity of the owl roosts (Cheke & Ashcroft 2016).

There have been several other published studies of Barn Owl diet in Greece, only two of which involved a small island, Antikythira (Alivizatos *et al.* 2005) and Milos (Alivizatos & Andriopoulos 2016). Antikythira, off the southern Peloponnese, famous for quantity and variety of migratory birds (e.g. Dimaki *et al.* 2006), is less than half the size of Amorgos and has only two species of rodent (*Rattus rattus* & *Mus musculus*; *ibid.*), yet only about 9–10 species of birds were found in Barn Owl diet (Alivizatos *et al.* 2005, 2+ species not identified; Table 6), though the presence of a rail *Porzana* sp., Barn Swallow *Hirundo rustica,* flycatchers *Ficedula* sp. and shrikes *Lanius* sp. suggests migrants were targeted, though the owls also took a young Chukar partridge *Alectoris chukar* and even a Scops Owl *Otus scops.* Milos, at 151 km^2, is a bit larger than Amorgos, and here also the owls at two sites took some larger species than on Amorgos (fledgling kestrel, 2 species of pigeon; Table 6), and also targetted resident species more than in Amorgos, though migrants were captured in autumn (Alivizatos & Andriopoulos 2016); bird numbers, at 6% of mammals, were lower than in Amorgos. The study was said to be ongoing, although no further data have been published.

Of mainland Greek sites, birds averaged 4% by number and less in biomass, but were 39.6% (winter) to 43.4% (summer) of diet as biomass at Mitrikou, a wetland site in northeastern Greece (Goutner & Alivizatos 2003). Although only 11–13% in number – the birds were not identified to species but the number/biomass ratio suggests largish species, probably non-passerines (waders?) were targetted at this site. Obuch & Benda (2009) reported 14 bird species total from two sites in the Peloponnese (Greek mainland) and 15 from five sites in Crete (Table 6), while Alivizatos *et al.* (2005) recorded only 2–7 species each in six mainland sites, and Bontzorlos *et al.* (2005) only two species in three sites, though up to 9% of items in winter at one of them.

Table 3: Chi-square test comparing proportions of prey species in loose bones and pellets from the Dhri Cave, testing an expectation of equal proportions (calculated 'expected' figures in italics). $\chi^2 = 79.6$, df = 5, $p << 0.0001$. The individual χ^2 in bold indicate major departures from the expected result that both loose bones and pellets would have the same proportions of prey. For loose bones the counts are for the most frequent bones by taxa: mammal jaws and bird humeri.

Tabela 3: Hi-kvadrat primerjave razmerja vrst plena v izbljuvkih in njihovih ostankih (posamezne kosti) iz jame Dhri, test pričakovanih enakomernih razmerij (izračunane pričakovane vrednosti v ležeči pisavi). $\chi^2 = 79.6$, df = 5, $p << 0.0001$. Posamezen χ^2 v krepki pisavi prikazuje velike odklone od pričakovanja, da so razmerja vrst plena v izbljuvkih in njihovih ostankih (posamezne kosti) enaka. Pri posameznih kosteh so podane vrednosti za najpogostejše kosti iz taksona: čeljusti sesalcev in nadlahtnice ptic.

Taxa / Takson	***Rattus rattus***	***Apodemus mystacinus***	***Apodemus* cf. *sylvaticus***	***Mus musculus***	***Crocidura suaveolens***	**Birds / Ptice**	Totals / Skupaj
Loose bones / posamezne kosti	186 *165.1* (2.67)	35 *35.7* (0.01)	101 *122.8* (3.87)	9 *19.1* (**5.34**)	40 *39.8* (0.00)	86 *74.6* (1.74)	**457**
Pellets / Izbljuvki	13 *33.9* (**12.88**)	8 *7.3* (0.07)	47 *25.2* (**18.86**)	14 *3.9* (**26.16**)	8 *8.2* (0.00)	4 *15.4* (**8.43**)	**94**
Totals / Skupaj	**199**	**43**	**148**	**23**	**48**	**90**	**551**

The only report we have found that appears comparable to the Amorgos situation is from the Balearic islands at the other end of the Mediterranean. Guerra *et al.* (2014) looked at the diet of Barn Owls on Formentera and islets adjacent to neighbouring Eivissa (Ibiza), finding a rich combined haul of nearly 30 species, mostly migrants: individually, more than 21 on the small islet of s'Espalmador and more than 16 combining two sites on Formentera (Table 6; numbers include some species identified only to genus). The species range here was wider than on Amorgos, embracing Storm-petrel *Hydrobates pelagicus* (local breeding seabird), Common Quail, waders *Charadrius alexandrinus, Calidris ferruginea* and *Tringa* sp., a marsh tern *Chlidonias* sp. and Common Bee-eater *Merops apiaster*, reflecting in part the greater range of habitats available – Amorgos has only tiny token wetlands. Comparative results from an inland site in Ibiza are added from Sommer *et al.* (2005) in Table 6. As in Greece, on these islands the bulk of the prey was rodents.

We were unable to study seasonal variation in catch, but as with Alivizatos & Andriopoulos on Milos, Bosé & Guidali (2001) in north Italy found an increase in birds taken in summer/

Table 4: Numbers of loose complete bird bones on Dhri cave floor, by collection date [excluding radiuses or scapulas as too few to be worth listing], compared with Denys *et al.*'s percentages (2017). Note that the collecting dates in 2015–2018 are sampling from the same initial bone 'population' as there was no new input in the intervals; the return of owls in 2018 may have added a few bones before the 2019 collection. Humerus heads, although identifiable, excluded to retain comparability with other bones. The low figures in 2019 reflect diminishing returns as the site is worked out. *Abbreviations:* CMC – carpometacarpus, TbT – Tibiotarsus, TMT – Tarsometatarsus.

Tabela 4: Število posameznih celih kosti ptic na tleh jame Dhri, glede na čas zbiranja [brez koželjnic in lopatic, ki jih je v vzorcu premalo] in v primerjavi z odstotki, navedenimi v Denys et al. (2017). Kosti, nabrane v obdobju 2015–2018, predstavljajo vzorec iz istega začetnega vzorca, saj v obdobju ni bilo najdenega novega, svežega materiala. Vrnitev sov v letu 2018 je prispevalo nekaj novih kosti pred vzorčenjem v letu 2019. Glave nadlahtnice, čeprav določene, so bile izločene zaradi zagotavljanja ustreznosti z drugimi kostmi. Majhne vrednosti v letu 2019 kažejo na zmanjševanje kosti v začetnem vzorcu. Okrajšave: CMC – karpometakarpus, TbT – golenično-nartna kost, TMT – Tarzusmetatarzus.

	Date / Datum							
Bone / kost	May 2015	March 2016	October 2017	April 2018	April 2019	TOTALS/ SKUPAJ	% post-cranial/ % brez lobanje	Denys et al (2017)
coracoid / krokarnica	3	11	7	13	2	36	9.2	14.3
humerus / nadlahtnica	34	39	17	26	11	127	32.6	10.7
ulna / komolčnica	11	29	14	23	10	87	22.4	10.7
CMC	5	12	4	8	3	32	8.2	8.9
femur / stegnenica	11	17	10	11	1	50	12.9	19.6
TbT	6	7	4	2	-	19	4.9	17.9
TMT	13	6	7	8	4	38	9.8	17.9
Total post-cranial / skupaj brez lobanje						389		56
skull (cranium+bill) / skupaj (lobanja+kljun)	1	1	1 (partial / delna)		2	5		
cranium (no bill) / lobanja (brez kljuna)	1					1		
upper mandible / zgornja čeljust	4	9	1 (partial / delna)		2	20		
lower mandible / spodnja čeljust	5	7	3			15		

Table 5: Avian prey of Barn Owls & their status in Amorgos, from loose bones on floor of Dhri cave (site D), listed by size of humerus. Conventions & Codes: n[x/y] – total [left/right] + h [head of humerus only]; under status: PM – passage migrant, R – resident, SV – summer visitor, WV – winter visitor, qualified by a = abundant, c – common, f – frequent/fairly common, s – scarce, r – rare. > refers across to comment column. Weight data from Snow & Perrins (1998), except, due to an obvious printing error, Greenfinch from Perrins (1987); status data: ASC, REA & Apostolos Cristopoulos (pers. obs. 2007–19 in Cheke *et al.* 2020). '+X' in bold in column 7 indicates additional specimens in pellets, not included in total.

Humerus sample Ref./ Oznaka vzorca nadlahtnice	Size of samples (mm)/ Velikost vzorca (v mm)	Weight range (g)/ razpon teže (g)	English name / Angleško ime	Scientific name / Znanstveno ime	Status
1b	12	6–10	Chiffchaff	*Phylloscopus collybita*	PMc, WVc
1c	12.5	7–12	Willow Warbler	*P.trochilus*	PMc
25,25a	13	8–13	Subalpine Warbler	*Sylvia cantillans*	SVc
33	13.5	9–15	Sedge Warbler	*Acrocephalus schoenobaenus*	PMs
24	13.5	10–15	Sardinian Warbler	*Sylvia melanocephala*	Ra
31	14–14.5	11–18	Siskin	*Carduelis (Spinus) spinus*	WV*
32	14.5–15	13–18	Whitethroat	*Sylvia communis*	PMf, SVr
2,2b	15	10–16	Pied / Collared Flycatcher	*Ficedula hypoleuca / albicollis*	both PMc
20,20a	15	13–17	Stonechat	*Saxicola (torquata) rubicola*	Rs, WVf
13	15	16–22	House Martin	*Delichon urbicum*	PMa
4	16	14–19	Goldfinch	*Carduelis carduelis*	Rs,WVf
14	16	11–14	Serin	*Serinus serinus*	WVs
28	16	14–20	Spotted Flycatcher	*Muscicapa striata*	PMa
3abcefgh	16–17	14–19	Whinchat	*Saxicola rubetra*	PMc
23	16.5		Robin	*Erithacus rubecula*	WVc
5,5abcde	16–18	16–25	Blackcap / Garden Warbler	*Sylvia atricapilla / borin*	PMa, WVf / PMr
30	[15–17]	16–25	Dunnock	*Prunella modularis*	WVr
4a	17	15–22	Linnet	*Carduelis (Linaria) cannabina*	Rc, WVc
7,7a	18	13–19	Black Redstart	*Phoenicurus ochruros*	WVc
8	18	24–38	House Sparrow	*Passer domesticus*	Ra
22	18	20–25	Ortolan / Cretzchmar's Bunting	*Emberiza hortulana / caesia*	both PMs
26,26a	18	17–24	Nightingale	*Luscinia megarhynchos*	SVf
6,6a	18–19	25–34	Greenfinch	*Carduelis (Chloris) chloris*	WVs
9,9abcdef	18–20.5	18–29	Chaffinch / Brambling	*Fringilla coelebs / montifringilla*	Rs,WVa / WVs
10	18.5	16–25	Orphean Warbler	*Sylvia hortensis (S. crassirostris)*	SVf
21	19	14–23	cf. Olive-tree Warbler	*Hippolais* cf. *olivetorum*	PMr
29	19+	35–50	Crossbill	*Loxia curvirostra*	WVr
11,11abc	20	25–35	Red-backed Shrike	*Lanius collurio*	PMc
12,12a	22–22.5	30–40	Woodchat Shrike	*L. senator*	SVf
27,27a	24	30–45	Wryneck	*Jynx torquilla*	PMs
18	24	46–70	Hawfinch	*Coccothraustes coccothraustes*	WVs
31	26	37–55	Crested Lark	*Galerida cristata*	Rc
16	26	65–100	Song Thrush	*Turdus philomelos*	WVc
17	27–28	50–90	Starling	*Sturnus vulgaris*	WVs
15,15abc	29–30	80–125	Blackbird	*Turdus merula*	WVc
19	31	56–79	Golden Oriole	*Oriolus oriolus*	PMc
Total humeri / Skupaj nadlhatnice					
Additional species identified from other bones / Dodatne vrste, določene na podlagi drugih kosti:					
2018 ulnas		26–50	Skylark	*Alauda arvensis*	WVf
TBT31		18–29	Tree Pipit	*Anthus trivialis*	PMc
Bill 6		22–36	Spanish Sparrow	*Passer hispaniolensis*	PMf

Tabela 5: Ptice kot plen pegaste sove in njihov status na otoku Amorgos iz vzorca posameznih kosti na tleh jame Dhri (lokaliteta D), navedene po velikosti nadlahtnice. Oznake: n[x/y]–skupaj [leva/desna] + h[le glava nadlahtnice], PM – selivka, R – stalnica, SV – polenta obiskovalka, WV – prezimovalka, a – zelo pogosta, c – pogosta, f – manj pogosta, s – redka, r – zelo redka. Podatki o teži iz Snow & Perins (1998), le zelenec zaradi napake v tisku iz Perris (1987). Podatki o status vrste: ASC, REA in Apostolos Cristopoulos (osebno opazovanje 2007–2019 in Cheke in sod. v 2020). +X krepko označuje dodatne osebke v izbljuvkih, ki niso vključeni v seštevek.

Min. No. of birds / Min. št. ptic	No. whole humeri [L/R] or heads only h[L/R] / Št. celih ali samo glav nadlahtnic	Additional comments [additional bones noted where identified - mostly only from larger species] / Dodatni komentarji
1+**1**>	1>[1/-]	confirmed against pellet sample UL3 & NHM collections
2	2[-/2]	consistent differences from Chiffchaff
2	4[2/2]	
1	1[-/1]	
1	1[1/-]	
0+**1**	2 [1/1]	[from pellet UL3] *irruptive; rare visitor, but common when arrives
2	2 [1/1] + h[-/1]	
4+**3**>	5[3/2] + h[1/-]	not separable; both common; close to Stonechat; *F.semitorquata* also possible] [also pellets D3, D12, D16]
3+**1**>	2[2/-] +h[1/-]	[>also pellet D28]
1	2 [1/1]	
1	2[1/1]	
1	1[-/1]	
1	1[1/-]	very close to Whinchat & similar also to Redstart *Phoenicurus phoenicurus*
8	15[8/7]	close to Spotted Flycatcher
1	1[1/-]	
11+**1**>	15[5/10] +h[1/1]	not separable, but Garden Warbler is very scarce [>also pellet sample AT4]
1	h[1/-]	head of bone only
1	2[1/1]	
2	3[2/1]	
2	2[1/1] + h[-/1]	
2	2[2/-]	not separable; both scarce
1	2[1/1]	
2	2[1/1] + h[-/1]	
12+**3**>	22[12/10]	not separable, but Brambling is scarce; [>also pellet samples A1, UL3, D-partial 2017]
1	[1/-]	
1	1[-/1]	not confirmed to species as no comparative material available, but *H.olivetorum* is the only member of the genus in the size range
1	1[-/1]	more robust than Greenfinch/sparrow
5	9[5/4]	also an ulna in floor samples
1+**1**>	2[1/1]	also 2 ulnas in floor samples [>also pellet AT1]
2	2[1/1] + h [1/-]	similar to shrike/lark
1>	2[1/1] –	also 2 skulls & coracoids in floor samples
1	1[1/-]	also ulnas & upper mandible in floor samples
2	3[1/2]	also most other long-bones in floor samples
2	2[1/1] +h[1/-]	
5+**1**>	6[5/1] + h[-/2]	also most other long-bones in floor samples [>also pellet sample A1]
1	1[1/-] + h[-/1]	also 2 ulnas, a coracoid & a carpometacarpus in floor samples
86+12		
1		ulna
1+		tibiotarsus
1		upper mandible

Table 6. Avian prey on Mediterranean islands compared (see text for references). Crete is included to compare a large island on the same migration route as Antikythera and the Cyclades (Milos, Amorgos). Code: dno – does not occur (on specified island). NB: 2 more species in the Ibiza islands were unidentified – these could overlap with identified species (different bones?) or could add a further 2+ species to the combined list. Equally in Amorgos there are probably unidentified further species amongst harder-to-identify bones not checked in detail (ulna, femur etc). References: A – this paper, B – Obuch & Benda 2009, C – Alivizatos & Andriopoulos 2016, D – Guerra ***et al.*** (2014), E – Sommer ***et al.*** (2005). Notes: 1 – ***Lanius*** sp., 2 – ***Turdus/Sturnus,*** 3 – ***Sylvia*** sp., 4 – ***Ficedula*** sp. in Antikythera, as 'Muscicapidae small size' in Ibiza, 5 – ***Turdus*** sp. (large size), 6 – ***Emberiza*** sp. (uncertain), 7 – At San Carlos there were also numerous unidentified bird remains, but they were not sorted by bone type, 8 – fledgling, 9 – ***Phylloscopus*** sp., 10 – 28 is combined total for s'Espalmador & Formentera.

Tabela 6: Primerjava ptic kot plena na sredozemskih otokih. Kreta je vključena kot primerjava velikega otoka na isti selitveni poti kot otoki Antikitera in Kikladi (Milos, Amorgos). Oznake: dno – vrsta se ne pojavlja. Dve vrsti ptic na Ibizi nista bili določeni, kar se lahko prekriva z že določenimi vrstami (različne kosti) ali pa predstavljata dve dodatni vrsti. Podobno velja za Amorgos, kjer bi med težko določljivi kostmi verjetno našli še kakšno dodatno vrsto. Viri: A – ta raziskava, B – Obuch & Benda (2009), C – Alivizatos & Andriopoulos (2016), D – Guerra ***et al.*** (2014), E – Sommer ***et al.*** (2005). Opombe: 1 – ***Lanius sp.***, 2 – ***Turdus/Sturnus sp.***, 3 – Sylvia sp., 4 – ***Ficedula sp.*** na Antikiteri in majhna Muscicapidae na Ibizi, 5 – večja vrsta ***Turdus sp.***, 6 – ***Emberiza sp.*** (negotovo); 7 – v San Carlosu so bili številni nedoločeni ostanki ptic, ki pa niso bili razvrščeni po tipu kosti, 8 – mladič., 9 – ***Phylloscopus sp.***, 10 – 28 je skupno število vrst v Espalmador & Formentera.

Species / Vrsta	Lokaliteta	Amorgos	Antikythera	Milos	Crete	Ibiza s'Espalmador	Ibiza Formentera	Ibiza San Carlos
	Reference / Vir	A	B	C	B	D	D	E
Storm-petrel	*Hydrobates pelagicus*	dno	dno	dno	dno	*		
Common Kestrel	*Falco tinnununculus*			*8				
Chukar Partridge	*Alectoris chukar*, chick		*					
Common Quail	*Coturnix coturnix*					*		
Rail sp.	*Porzana* sp.	dno	*					
Kentish Plover	*Charadrius alexandrinus*	dno				*		
Scops Owl	*Otus scops*		*					
Curlew sandpiper	*Calidris ferruginea*	dno				*		
'shank'	*Tringa* sp.					*		
marsh tern	*Chlidonias sp.*	dno				*		
Rock Dove	*Columba livia*			*				
Turtle-dove	*Streptopelia turtur*				*			
Collared-dove	*Streptopelia decaocto*			*				
Bee-eater	*Merops apiaster*						*	
Wryneck	*Jynx torquilla*	*				*	*	
Crested Lark	*Galerida cristata*	*		*	*			
Skylark	*Alauda arvensis*	*					*	
Short-toed Lark	*Calandrella brachdacryla*					*	*	
Barn Swallow	*Hirundo rustica*		*				*	
House Martin	*Delichon urbica*	*						
Tree Pipit	*Anthus trivialis*	*						

Continuation of Table 6 / Nadaljevanje tabele 6

Species / Vrsta	Lokaliteta	Amorgos	Antikythera	Milos	Crete	Ibiza s'Espalmador	Ibiza Formentera	Ibiza San Carlos
	Reference / Vir	A	B	C	B	D	D	E
Meadow Pipit	*Anthus pratensis*					*		
Wren	*Troglodytes troglodytes*					*		
Woodchat Shrike	*Lanius senator*	*	(*1)	(*1)			*	
Red-backed Shrike	*Lanius collurio*	*	(*1)	(*1)		*		
Golden Oriole	*Oriolus oriolus*	*						
Starling	*Sturnus vulgaris*	*				*2		
Great Tit	*Parus major*	dno		dno	*			
Dunnock	*Prunella modularis*	*						
Blackcap / Garden Warbler	*Sylvia atricapilla / borin*	*		*3	*3	*	*3	*3
Whitethroat	*Sylvia communis*	*						
Subalpine Warbler	*Sylvia cantillans*	*						
Orphean Warbler	*Sylvia hortensis (S. crassirostris)*	*						
Sardinian Warbler	*Sylvia melanocephala*	*		*				
Sedge Warbler	*Acrocephalus schoenobaenus*	*						
cf. Olive-tree Warbler	*Hippolais olivetorum*	*				dno	dno	dno
Chiffchaff	*Phylloscopus collybita*	*		*			(*9)	
Willow Warbler	*Phylloscopus trochilus*	*		*9			(*9)	
Gold- / Firecrest	*Regulus sp.*				*			
Pied / Collared Flycatcher	*Ficedula hypoleuca / albicollis*	*	*4			*	*	
Spotted Flycatcher	*Muscicapa striata*	*		*				
Whinchat	*Saxicola rubetra*	*						
Stonechat	*Saxicola torquata (S.rubicola)*	*						
Wheatear sp.	*Oenanthe sp.*				*			
Black Redstart	*Phoenicurus ochrurus*	*			*	*	*	
Robin	*Erithacus rubecula*	*		*	*	*	*	*
Nightingale	*Luscinia megarhynchos*	*						
Blue Rock-thrush	*Monticola solitarius*			*				
Blackbird	*Turdus merula*	*			*	(*5)	*	
Songthrush	*Turdus philomelos*	*		*				
House Sparrow	*Passer domesticus*	*		*	*	*	*	*
Spanish Sparrow	*Passer hispaniolensis*	*						
Tree Sparrow	*Passer montanus*	dno		dno	*			
Chaffinch / Brambling	*Fringilla coelebs / montifringilla*	*			*	*		*

Continuation of Table 6 / Nadaljevanje tabele 6

Species / Vrsta	Lokaliteta	Amorgos	Antikythera	Milos	Crete	Ibiza s'Espalmador	Ibiza Formentera	Ibiza San Carlos
	Reference / Vir	A	B	C	B	D	D	E
Hawfinch	*Coccothraustes coccothraustes*	*						
Crossbill	*Loxia curvirostra*	*						
Serin	*Serinus serinus*	*						*
Greenfinch	*Carduelis (Chloris) chloris*	*			*	*		*
Goldfinch	*Carduelis carduelis*	*					*	*
Linnet	*Carduelis (Linaria) cannabina*	*			*	*	*	
Siskin	*Carduelis (Spinus) spinus*	*						
Corn Bunting	*Emberiza calandra*		*		*			
Ortolan / Cretzschmar's Bunting	*Emberiza hortulana / caesia*	*					*6	
No. of species / Št. vrst		***39***	***7***	***14***	***15***	***21*** *>28* *<(10)*	***16***	*7 (7)*

autumn. However more striking were the differences between two pairs (roosts & nest sites) only a few kilometres apart in agricultural habitat. One caught only 3.7% birds, the other 16.5%; in both case sparrows *Passer* spp. (mostly *P. domesticus*) were the major component (54–58%), but other species were not fully identified so the diversity is not known, though a total of 11 species are mentioned. Given that sparrows (*P. domesticus, P. montanus, P. hispaniolensis*) are the avian group that features most commonly in Barn Owl diet studies, it is interesting that the Amorgos owls make so little use of this abundant resource, presumably avoiding hunting in and around the village despite the proximity of the caves to Langada.

4.2. Other taxa

Rodents and shrews are normal components of Barn Owl diet (e.g. Romano *et al.* 2020) and will not be discussed further here, although some data of taphonomic interest may be extracted from the material at a later date (but see below).

Lizards are rarely an important constituent of the diet (*ibid.*), though geckos are a known if infrequent component of Barn Owl prey (Roulin & Dubey 2012), notably in Greece on Antikythera and Milos islands (Alizivatos *et al.* 2005, Alizivatos & Andriopoulos 2016), but no lacertids were recorded for Greece by Roulin & Dubey (2012). However Obuch & Benda reported unidentified lacertids from Crete, and *Lacerta trilineata* was found in pellets on Milos by Alizivatos & Andriopoulos (2016); our *Podarcis* appear to be the first confirmed wall lizards found in Greek Barn Owl pellets.

Dung beetles, which are nocturnal, feature quite regularly (e.g. Denys *et al.* 2017), though their total contribution is small.

4.3. Prey proportions and bone survival

It is clear from the data that the cave floor held far more rat and bird bones, and fewer Wood Mice and House Mice, than would be expected from the ratios in the complete pellets found in the same cave (Table 3). While changes in hunting behaviour over time cannot be ruled out, we think the explanation largely lies in the relative robustness of bones of different species. Rat bones, even the frequent juve-

niles, are bulky, so slower to degrade (though many are eroded), while the bird bones found are noticeably better preserved overall in this environment than their rodent equivalents, hence both these taxa will have above-expected proportions. House Mice bones seem particularly degradable (few jaws are intact) while Wood Mice are intermediate, but many more are found damaged than those of the larger Rock Mice, as previously noted (Cheke & Ashcroft 2017). Shrew jaws seem robust and are generally in good condition, though the proportion in pellets and loose is the same, as it is with Rock Mice. In the circumstances of this particular cave, trampling by goats would seem to be the main agent of bone deterioration, followed by the action of goat urine and faeces, aided by rainwater blown in during winter, which probably explains the lack of bones below the surface. Surface bones would rapidly dry out, those below would presumably remain wet and decay.

In addition to chemical erosion post-ejection, Denys *et al* (2017) found that small mammal bones were more likely to be more damaged by digestion prior to ejection than bird bones, another indication of their greater susceptibility to forces of degradation. However they did not separate rodents and shrews in their analysis; our data show shrew bones as being as resistant as birds, suggesting contrast with rodents is sharper than Denys *et al.*'s results imply. They also looked at which bones were most likely to survive 'processing' by Barn Owls (and other raptors) and, albeit on a much smaller sample than ours, came up with quite different proportions (Table 4). However they were sampling at nest sites, where Barn Owls dismember prey before feeding it to their young, whereas adults feeding themselves, as in our Amorgos sites, swallow most prey whole (Bunn *et al.* 1982, Taylor 1989). In their study, leg bones were more likely to survive than wing bones, in contrast to our data where humeri and ulnae were much more frequent than femur and tarsus elements amongst the loose bones. Hence in abandoned sites or zooarchaeological collections these different proportions may indicate whether the site was a roosting or nesting area.

In a similar pellet vs sediment study from Ibiza (Sommer *et al.* 2005), no such differences were found in the proportion of bird bones, and the reverse effect in rat and mouse bones – proportionately far fewer rat bones in the sediment than in pellets, and far more *Mus* bones (of two species in both genera). The authors did not discuss the compositional discrepancies, nor did they publish the proportions of different bone types within totals of mammal and bird taxa.

5. Conclusion

Our data set of 39 species appears to be the most diverse range of birds for a single site recorded for Barn Owls anywhere, 51% of the total diversity of small passerines (and Wryneck) recorded for the island (77 species; Cheke *et al.* 2020). While eating mainly rodents as elsewhere, Barn Owls on north-eastern Amorgos also target an unusually wide range of passerine migrants to the island, 19% of individual vertebrate prey items in Dhri Cave D), although the percentage in fresh pellets in the cave was only 4%; for all local pellets it was 9% (Table 1). Apart from the case discussed in Ibiza/Formentera, this breadth of avian prey does not seem to occur elsewhere in Europe; indeed in most of mainland Europe birds hardly feature. For example, the massive study in France by Guérin (1928) found only a handful of birds (Chaffinch, sparrows *Passer* sp.) in hundreds of rodent and shrew items, though one exceptional site, out of 19 studied, in the French Pyrenees has yielded a high percentage of birds (77.6%; Libois 1983), but the birds were apparently not fully identified to species, though 77% of them were sparrows *Passer* spp. A big survey in Britain only 2% by number of prey was birds (Glue 1974); in central Italy Zagoršek (2018) found no birds at all, though up to 3% were recorded in the Rome area by Salvati et al. (2002). A meta-analysis in Ireland found birds ranged from 0.2% in areas with both invasive shrews *Crocidura russula* and voles *Myodes* (ex-*Clethrionomys*) *glareolus,* to 3.5% in areas yet to be reached by these animals (Smiddy *et al.* 2018); 22 bird species were recorded from 29 studies. Further east in mainland Europe, Obuch *et al.*'s meta-analysis of 215 16th century to modern sites in Slovakia found 53 bird species overall, but with low percentages and diversity per site, and in Bulgaria Milchev *et al.* (2006) recorded 40 species over 28 sites.

Overall the low proportion of birds per site is true throughout the world range (Romano *et al.* 2020), however in North Africa, the Middle East and Pakistan birds can form much of the diet, with 100% taken in one study in Tunisia (see discussion in Bunn *et al.* 1982: 90). While in Pakistan birds can make up 30% (Nadeem *et al.* 2012), only four species were taken and one (Common Mynah *Acridotheres tristis*) predominated; in Algeria up to 36 species can be involved (over 19 sites, Rihane 2003, 2004), though House Sparrows made up 71% of the avian catch, and 100% in another study (Hadjoudj *et al.* 2012). Studies by Obuch & Benda (2009) yielded 64 avian prey species spread over 27 sites in several countries in southern Europe, Israel and Egypt, the maximum numbers at one site being 20 (perhaps up to 25) in Israel; Obuch (2018) found site maxima of 16 and 19 in sites in Jordan, though the total over 10 sites in that country was 43 species. We have not been able to review the whole enormous literature on Barn Owl diet (see Romano *et al.* 2020), but have attempted to find studies where birds have featured significantly to compare with ours.

Clearly Barn Owls are adaptable and opportunistic, and have been recorded elsewhere targeting wintering thrushes in communal roosts, and roosting or urban aggregations of sparrows, hirundines, starlings, finches, larks, buntings and mynas (Milchev *et al.* 2006, Rahine 2003, 2004, Nadeem 2012). Chaffinches and possibly thrushes and Corn Buntings appear to have such roosts in Amorgos (ASC pers. obs.), but most of the species taken do not roost communally. It would appear that in Amorgos the owls find many migrants an easy target, though the variety remains unexplained; however the accumulation on the cave floor may represent a longer time series, and thus more opportunity, than in other reported studies.

Our study, and likewise those of others cited with high bird catches, shows that Barn Owl pellets should be included when investigating bird distribution and potentially also abundance, in addition to being a well-established method of sampling mammals. Furthermore, and to facilitate similar studies in the future, it is hoped that the photos of humeri will aid others in identifying birds in European owl pellets – many previous researchers have simply left avian remains as 'birds' with little or no further identification.

In analysing bones found loose on the floor of a roosting site of any pellet producing predator, it is important to take into account the relative deterioration rate of bones from different species, as our data shows. In our case there is a very significant bias in favour the avian bones and the largest rodent, and this may well be the case elsewhere. The proportion of different skeletal elements recovered, the 'taphonomic signature' (Pokines & Peterhans 1997), rarely looked at, may also be significant for understanding the status of sites, abandoned or ancient, no longer in use (Denys *et al.* 2017).

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Postscript

Since this paper was submitted, reviewed and accepted, an important paper with direct bearing on our results has been published. In a meta-analysis covering Mediterranean islands from Sardinia down to tiny Espartar (0.2 ha, Balearics) Janžekovič & Klenovšek (2020) found that, in addition to a general trend of birds and reptiles being taken more than on mainland Europe, "diet diversity was greater on the larger Mediterranean islands. However, a more diverse diet did not mean a higher number of taxa, but a wider range of abundant and evenly represented taxa. The smaller the islands, the more birds and reptiles were consumed, compared to higher proportions of mammals on the larger islands. These findings support the idea of barn owls' feeding flexibility and opportunistic predator

behaviour". The results were largely independent of human urbanisation and island isolation. Our results emphasize this pattern, and as Tina Klenovšek commented to ASC (email 21.09.2020) "What a coincidence. I am really sorry we could not use your results in our meta-analysis. They would fit so well into our findings".

6. Povzetek

Raziskani so bili izbljuvki pegaste sove *Tyto alba* in njihovi ostanki (posamezne kosti) na jamskih tleh otoka Amorgos (Kikladi, Grčija). Sove so uplenile vsaj 39 vrst ptic, kot je bilo ugotovljeno na podlagi najdenih nadlahtnic. Poleg njihove glavne prehrane (podgan *Rattus rattus*, miši *Apodemus spp.* in hišnih miši *Mus musculus*) so sove ulovile še vrtne rovke *Crocidura suaveolens*, nekaj kuščaric in hroščev. Med pticami so bile z nekaj izjemami prav selivke tiste, ki so bile najpogostejši plen pegaste sove, medtem ko so bile ptice stalnice zastopane v manjšem delu. V primerjavi s podobnimi raziskavami je slednja razkrila verjetno največji razpon različnih vrst ptic v izbljuvkih pegaste sove na posamezni lokaliteti. Ugotovljene so bile znatne razlike v deležu vrst v taksonih med izbljuvki in njihovimi ostanki (posamezne kosti), najverjetneje zaradi razlik v njihovem razkroju. V pomoč pri drugih raziskavah so v članek vključene vse fotografije nadlahtnic.

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The Goosander *Mergus merganser* range expansion on the Balkan Peninsula and a new breeding population in Bulgaria

Širjenje populacije velikega žagarja *Mergus merganser* na Balkanskem polotoku in nova gnezdeča populacija v Bolgariji

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The Goosander *Mergus merganser* was not recorded breeding in Bulgaria till recently. We present herewith the very first record of the species breeding in the country and estimate the size of its breeding population in Bulgaria. Thus, we propose a change in its status in the country with more effort to be invested in the survey of this small, isolated population.
Key-words: waterfowl, breeding, locality, Eastern Rhodopes

Introduction

The Goosander *Mergus merganser* is a polytypic, Holarctic species that has an extremely large range across Europe, Asia and North America (Voos 1961, Scott & Rose 1996, Birdlife International 2018). The European population is estimated at 66.800–103.000 pairs or 134.000–206.000 mature individuals (Wetlands International 2018). The Goosander is a year-round breeder in central Asia, in northern Europe and North America. In Europe, it is usually wintering further south reaching the coastal areas of the Middle East, Turkey and Greece (Scott & Rose 1996, Birdlife International 2018). Five species populations are recognized: two small resident populations in Iceland and in the Balkans, and three main wintering groups (northwest and central Europe, the Black Sea and Southwest Asia) (Scott & Rose 1996). The North-east Europe/Black Sea species wintering population that includes Bulgaria is poorly studied and estimated at 1000 individuals recently with unknown trend (Scott & Rose 1996, BirdLife International & Wetlands International 2020). In Bulgaria, the Goosander could have been usually observed in small numbers during winter along the Black Sea coastal area, the Danube River valley and, to a lesser extent, in the inner part of the country (Bunarco 2009, Nankinov *et al.* 1997). The origin of these wintering birds is probably from western Siberia (Scott & Rose 1996). European southernmost breeding population of the Goosander is found in the Balkans. This isolated resident population with 11–32 pairs (Scott & Rose 1996) breeds at Lake Prespa, Greece and North Macedonia (Catsadorakis *et al.* 2016). It was found in the 1930s and is presumed to be isolated from other populations of the species in central Europe (Handrinos & Akriotis 1997, Catsadorakis *et al.* 2016). However, there has been no published confirmed data on the Goosander breeding in Bulgaria so far. According to the European atlas of breeding birds, the species is breeding in tiny isolated populations in Albania and Greece in the Balkans. In the 20th century, however, breeding of the species was recorded in central and eastern Bosnia and Herzegovina, in northern Montenegro and southeastern Romania. In Serbia, the species was first recorded in the 1980s; later it expanded to several lakes in the western part of the country along the border with Bosnia and Herzegovina (Marinković *et al.* 2008). In Slovenia, the Goosander population increased from about 4 breeding pairs in 1995 to 85–110 in 2017, marking apparent population increase in this country as well (Basle 2019). Despite this, Bulgaria was not included in the breeding range within this region (Scott & Rose 1996, Marti & Lammi 1997). An expansion of the Goosander started in

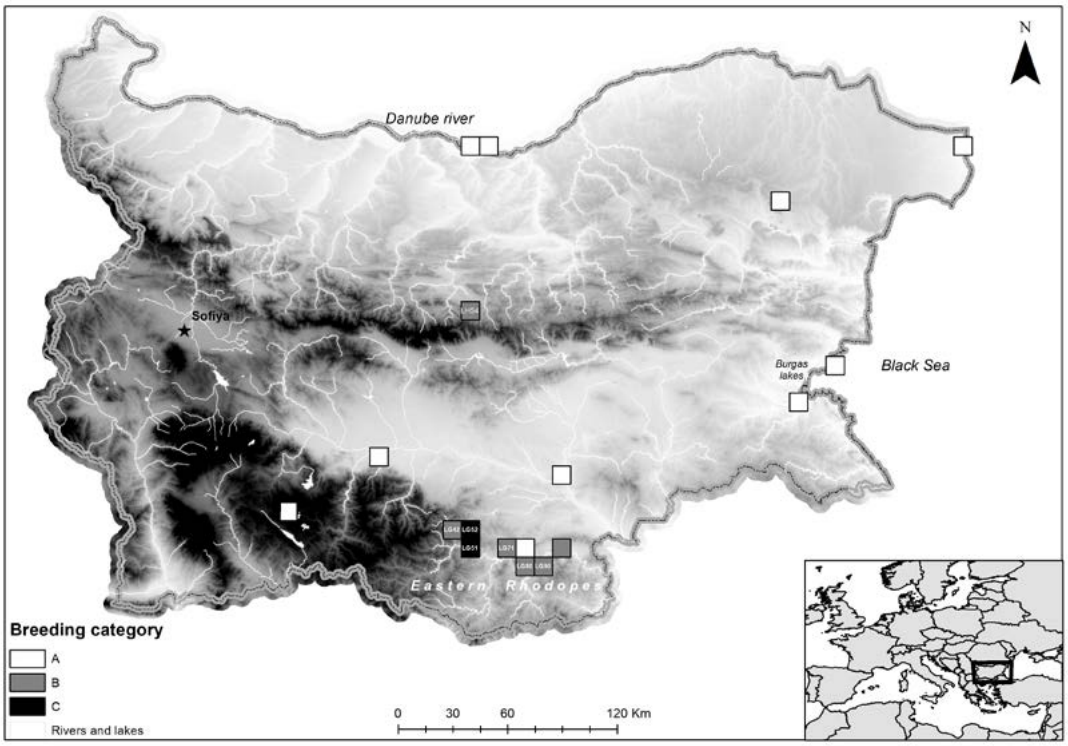

Figure 1: Distribution of the Goosander observations in Bulgaria within the breeding season

Slika 1: Razširjenost opazovanj velikega žagarja v Bolgariji v času gnezditvene sezone

the neighbouring region of the Carpathians at the same time. The species was found breeding in several countries in the region – Poland, Slovakia, Ukraine and Romania (Kajtoch & Bobrek 2014).

We present herewith the first breeding record of the Goosander in Bulgaria from an isolated site in the Eastern Rhodopes. We also review the breeding occurrences in Bulgaria and assess the species' national population size and range.

Methods

The Goosander breeding season covers variable periods in the different populations and thus migratory and breeding cycles along the range may overlap (Keller 2009). However, in southern Europe the incubation starts in the last 10 days of March and the breeding season is presumed to last until July (Catsadorakis *et al.* 2016). Based on this information we reviewed the species records in Bulgaria between 1990 and 2020 at the online database of the Bulgarian Society for the Protection of Birds (Popgeorgiev *et al.* 2015) and non-published sources of information. We then categorized each observation based on the classification of Hagemejer & Blair (1997). We used UTM grid 10x10 km using the MGRS naming of cells (UTM zone 35N, datum WGS 1984) to mark the breeding distribution of the species according to the criteria in Bulgaria (Figure 1).

Results and discussion

In this period, we made 42 records of the species occurrence during the breeding season (Figure 1, Table 1). In total, 33 out of them were from the Eastern Rhodopes and the rest from the Danube River, the Black Sea coast and the inner part of the country. The first record of breeding Goosander in Bulgaria dates back to 1999, when a female

Figure 2: The nest found in 2020, marked by red arrow

Slika 2: Gnezdo, najdeno v letu 2020, označeno z rdečo puščico

with a brood of 9 chicks was observed at Kardzhali dam (LG51) in the Eastern Rhodopes. Three years later, 12 juveniles were recorded again at the same location. Between 1999 and 2020 we registered 5 broods of chicks in total in the Eastern Rhodopes. The last observation of a brood of chicks in the area was made in June 2017, when at least 8 juveniles were observed (Table 1). We assume the birds were nesting in the numerous cavities and crevices along the vertical cliffs and brinks of the Borovitsa River and/or Kardzhali dam. In 2020, a nest was found in this kind of habitat along the Borovitsa River estuary at Kardzhali dam (LG52) (Figures 2 & 3). The breeding pairs in Bulgaria are most likely related to the Balkan breeding population of the species. The breeding cluster in our study area probably resulted from an expansion of this population in the 90s. The distance to the nearest neighbouring breeding cluster of this population from Lake Prespa is more than 350 km.

In 2019, at least one pair at Studen kladenets dam (some 30–40 km easterly) was suspected to breed in this new territory (Figure 1).

Furthermore, we made few observations in the breeding season at the Black Sea coast, the Danube River and in inland Bulgaria (Table 1, Figure 1). However, all these observations remained sole; they were registered within the north-east Europe/Black Sea population wintering range of the species (Scott & Rose 1996, BirdLife International & Wetlands International 2020) and were recorded only in March. We thus presume that the breeding there is unlikely. For example, the area of Burgas Lakes and the Black Sea coast is extensively monitored within the framework of different biodiversity conservation projects and tens of birdwatchers visit it yearly. Moreover, the typical breeding Balkan flyway population exhibits completely different breeding pattern by occupying inland lakes and water bodies, rather than rivers and coasts (Scott & Rose 1996). Therefore, we consider the breeding of the species would not have remained unnoticed there and we suggest the breeding in these squares is unlikely. We do not exclude incidental or sporadic breeding of single pairs in those or other suitable areas in Bulgaria, but additional monitoring effort is needed. For example, a pair of Goosanders was observed at Smirnenski dam and unsuccessful breeding attempt was suspected (Shurulinkov *et al.* 2018). However, the data up to now shows that the breeding records with the highest degree of certainty (criteria "C") (Hagemejer & Blair 1997) are restricted to the Eastern Rhodopes only (Figure 1). Hence, our data is similar to other countries in the region where the species breeding populations are located in mountainous regions as glacial relicts. We believe that the species is expanding in suitable inland mountainous water habitats, as already revealed by other studies (Marinković *et al.* 2008, Keller 2009, Catsadorakis *et al.* 2016).

Based on our data, we conclude that at least 4–7 pairs breed in LG51, LG52 and LG42 and possibly 2–3 pairs in the Studen kladenets area in LG71, LG80 and LG90. We presume that the national breeding population is currently restricted to the Eastern Rhodopes with a size of 6–10 pairs. To our knowledge, these are the first proven cases of the species breeding according to the highest degree of certainty in Bulgaria. Considering that the observations of pairs in the Studen kladenets area have been made only in the last two years, this may indicate a further expansion of the species range in the Eastern Rhodopes in recent years. The first breeding record in Bulgaria accords with the registered increase of the Goosander population in the neighbouring regions (Kajtoch & Bobrek 2014). However, this expansion most probably concerns the Central Europe flyway population of the species that is sedentary and most likely does

Table 1: Goosander observations in Bulgaria during the 1990–2020 period

Tabela 1: Opazovanja velikih žagarjev v Bolgariji med letoma 1990 in 2020

Month/ Mesec	Year/ Leto	Number of indivuduals or pairs/ Število osebkov ali parov	Region / Regija
July	1999	1 female + 9 chicks / 1 samica + 9 mladičev	Eastern Rhodopes / Vzhodni Rodopi
September	2002	12 chicks / 12 mladičev	Eastern Rhodopes / Vzhodni Rodopi
June	2007	2 males + 2 females / 2samca + 2 samici	Eastern Rhodopes / Vzhodni Rodopi
March	2008	1 bird / 1 ptica	Inland Bulgaria / osrednja Bolgarija
March	2008	1 male / 1 samec	Inland Bulgaria / osrednja Bolgarija
June	2008	1 bird / 1 ptica	Danube River / reka Donava
May	2009	17 birds / 17 ptic	Danube River / reka Donava
March	2010	1 bird / 1 ptica	Black Sea Coast / obala Črnega morja
April	2011	2 birds / 2 ptici	Inland Bulgaria / osrednja Bolgarija
May	2014	1 female + 5 chicks / 1 samica + 5 mladičev	Eastern Rhodopes / Vzhodni Rodopi
March	2014	1 female / 1 samica	Black Sea Coast / obala Črnega morja
April	2015	1 pair / 1 par	Eastern Rhodopes / Vzhodni Rodopi
April	2015	1 pair / 1 par	Eastern Rhodopes / Vzhodni Rodopi
March	2015	1 bird / 1 ptica	Black Sea Coast / obala Črnega morja
April	2012	1 pair / 1 par	Inland Bulgaria / osrednja Bolgarija
May	2017	1 male / 1 par	Eastern Rhodopes / Vzhodni Rodopi
April	2017	2 birds / 2 ptici	Eastern Rhodopes / Vzhodni Rodopi
June	2017	9 birds / 9 ptic	Eastern Rhodopes / Vzhodni Rodopi
June	2017	3 birds / 3 ptice	Eastern Rhodopes / Vzhodni Rodopi
May	2017	1 male / 1 samec	Eastern Rhodopes / Vzhodni Rodopi
May	2017	1 bird / 1 ptica	Eastern Rhodopes / Vzhodni Rodopi
April	2017	3 females / 3 samice	Eastern Rhodopes / Vzhodni Rodopi
April	2017	1 male / 1 samec	Eastern Rhodopes / Vzhodni Rodopi
June	2017	1 female + 2 chicks / 1 samica + 2 mladiča	Eastern Rhodopes / Vzhodni Rodopi
June	2017	1 female + 8 chicks / 1 samica + 8 mladičev	Eastern Rhodopes / Vzhodni Rodopi
May	2017	1 bird / 1 ptica	Eastern Rhodopes / Vzhodni Rodopi
April	2018	1 female / 1 samica	Eastern Rhodopes / Vzhodni Rodopi
April	2018	2 pairs / 2 para	Eastern Rhodopes / Vzhodni Rodopi
May	2018	3 birds / 3 ptice	Eastern Rhodopes / Vzhodni Rodopi
May	2018	1 bird / 1 ptica	Eastern Rhodopes / Vzhodni Rodopi
April	2019	1 female / 1 samica	Eastern Rhodopes / Vzhodni Rodopi
March	2019	1 male / 1 samec	Eastern Rhodopes / Vzhodni Rodopi
May	2019	1 female / 1 samica	Eastern Rhodopes / Vzhodni Rodopi
March	2019	1 male / 1 samec	Eastern Rhodopes / Vzhodni Rodopi
March	2019	2 birds / 2 ptici	Eastern Rhodopes / Vzhodni Rodopi

Continuation of Table 1 / Nadaljevanje tabele 1

Month/ Mesec	Year/ Leto	Number of indivuduals or pairs/ Število osebkov ali parov	Region / Regija
May	2019	2 birds / 2 ptici	Eastern Rhodopes / Vzhodni Rodopi
April	2019	2 females / 2 samici	Eastern Rhodopes / Vzhodni Rodopi
April	2019	1 male / 1 samec	Eastern Rhodopes / Vzhodni Rodopi
March	2020	1 female / 1 samica	Eastern Rhodopes / Vzhodni Rodopi
March	2020	3 pairs / 3 pari	Eastern Rhodopes / Vzhodni Rodopi
March	2020	3 females / 3 samice	Eastern Rhodopes / Vzhodni Rodopi
April	2020	2 females + 1 male / 2 samici + 1 samec	Eastern Rhodopes / Vzhodni Rodopi

not occur as south as in the Eastern Rhodopes. Therefore, the species could have settled in the Eastern Rhodopes as a result of the Goosander's Balkan population range expansion in the 90s. The Goosander Balkan population numbers only 11–32 breeding pairs (Scott & Rose 1996). Therefore, the population breeding in the Eastern Rhodopes forms a significant part of this tiny flyway population and it should be treated as part of the Balkan flyway management unit. Consequently, a special monitoring effort has to be conducted in order to better estimate its size. Thus, all breeding pairs should be recorded, and details on species ecology and phenology will be revealed entirely. Furthermore, the monitoring counts have to be performed exclusively in the breeding season in April–July and in a wider range, so that double counts of males and non-breeding individuals are avoided. Based on the 1% threshold level of the C6 Criteria for designation of Ramsar Sites, the breeding population in the Eastern Rhodopes forms a significant part of the Balkan flyway management unit and protection measures to secure species and its habitats persistence should be conducted at a place. In respect to the survey efforts, it is well documented that males from the Alpine and Northern European populations tend to move hundreds of kilometres to moult (Little & Furness 1985, Keller 2009) and thus more precise monitoring on this issue is also required. In conclusion to our observations, we propose BUNARCO to include the Goosander in the list of the breeding bird species in Bulgaria and to update it according to this new information. Considering that the breeding population in the Eastern Rhodopes forms 1% or more of the Balkan flyway population, we recommend an update

Figure 3. Two male and three female birds on the bank of the reservoir in LG51 in March 2013

Slika 3: Dva samca in tri samice na nabrežju zadrževalnika v LG51, marca 2013

of the Natura 2000 standard data forms for the following SPAs (special protected areas): Dobrostan (BG0002073), Studen kladenets (BG0002013) and Most Arda (BG00020171). Inclusion of the species within the list of priority species for conservation in these SPAs will ensure legal protection of the Goosander and its habitats at these sites.

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Povzetek

Gnezdenje velikega žagarja *Mergus merganser* v Bolgariji ni bilo zabeleženo vse do pred kratkim. S člankom predstavljamo prvo potrjeno gnezdenje te vrste v državi in podajamo oceno njene gnezdeče populacije. Predlagamo spremembo statusa vrste v državi ob hkratnem povečanju naporov pri raziskovanju te male, izolirane populacije.

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Wilson's Phalarope *Phalaropus tricolor* – a new species for avifauna of Serbia

Tribarvni liskonožec *Phalaropus tricolor* – nova vrsta za avifavno Srbije

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Wilson's Phalarope *Phalaropus tricolor* is a swimming sandpiper species of the New World. It is the largest and most terrestrial of the three phalarope species (Hayman *et al*. 1986), which are broadly known for their reversed sex-role mating system (Colwell & Jehl 2020). Wilson's Phalarope distribution range is entirely continental. It typically breeds in open habitats adjacent to inland wetlands on prairies and agricultural lands in western parts of the United States and southwestern and central Canada (Hayman *et al*. 1986, Colwell & Jehl 2020). On migration, this species occurs on a wide variety of freshwater lakes, ponds and small pools showing a preference for alkaline waters. Wilson's Phalarope winters in the October–April period across altiplano from Bolivia to Argentina and returns to the breeding grounds in late April and early May (Hayman *et al*. 1986, Colwell & Jehl 2020). The species is a rare, but regular vagrant in Western Palearctic with most observations reported from British Isles (Alström & Colston 1991). Here, we report on the first observation of Wilson's Phalarope in the territory of Serbia.

In the early morning of 22 September 2019, whilst birdwatching on the northern shore of alkaline lake Rusanda close to the village of Melenci (Banat District, Northern Serbia), the first author spotted one individual of Wilson's Phalarope approximately 20 m from the lakeshore (coordinates 45.525952 N, 20.302900 E), foraging together with 12 Dunlins *Calidris alpina* and three Little Ringed Plovers *Charadrius dubius*. At first glance, the observer had an impression that it was Marsh Sandpiper *Tringa stagnatilis* – a regular, but scarce autumn migrant through northern Serbia. Yet, the general structure of the observed bird was pretty different. The observed specimen was notably smaller, short-legged with a thinner and finer bill than Marsh Sandpiper. Besides, the feeding habit significantly differed from that of Marsh Sandpiper. During a short period of observation, the bird was actively feeding in shallow water (1–3 cm deep), making jerky, vigorous darting left-right movements with its head and bill. After five minutes of observation, all the birds flew together to the opposite side of the lake. Before flying off, the observed bird was photographed (Figure 1).

Later in the same day, photographs of an unusual bird were displayed by few Internet birding groups, where numerous birdwatchers identified it as Wilson's Phalarope. Indeed, the additional analysis of photographs by both authors reaffirmed the identification. The observed and photographed specimen was distinguished from similar Grey Phalarope *Phalaropus fulicarius* and Red-necked Phalarope *Phalaropus lobatus* by its greyer (paler) plumage, distinctly longer bill, lack of bold black eye-patch and bright yellow colour of legs. Other somewhat similar wader species like Lesser Yellowlegs *Tringa flavipes* are characterized by their significantly different proportions, behaviour and not so pure whitish colour below. The next day, Vukas Vučković re-found the bird and took several photos of it in flight. The white rump patch, plain dark grey wings and lack of prom-

Figure 1: Wilson's Phalarope *Phalaropus tricolor*, lake Rusanda near the village of Melenci, N Serbia, 22 September 2019 (photo: Miroslav Mareš)

Slika 1: Tribarvni liskonožec *Phalaropus tricolor,* jezero Rusanda, Melenci, S Srbija, 22 september 2019 (foto: Miroslav Mareš)

Figure 2: Wilson's Phalarope *Phalaropus tricolor* in flight, lake Rusanda near the village of Melenci, N Serbia, 23 September 2019 (photo: Vukas Vučković)

Slika 2: Tribarvni liskonožec *Phalaropus tricolor* v letu, jezero Rusanda, Melenci, S Srbija, 23 september 2019 (foto: Vukas Vučković)

inent white wing bars confirmed once again that it was an individual of Wilson's Phalarope (Figure 2).

The general characteristics and colouration of its upperpart, wing coverts and head pattern suggest that the bird was in first-winter plumage (Hayman *et al*. 1986, Message & Taylor 2005, Svensson *et al*. 2009).

So far, the Wilson's Phalarope has not been listed neither in the checklist of the bird species recorded in Serbia (Šćiban *et al*. 2015) nor in the National Rulebook on the Designation and Protection of Strictly Protected Wild Flora, Fauna and Fungi (Official Gazette of the Republic of Serbia No. 5/2010, 47/2011, 32/2016, 98/2016). This species is a somewhat regular visitor throughout western Europe with few records annually (Alström & Colston 1991). However, confirmed sightings of Wilson's Phalarope in southeastern Europe are scarce and single individuals were registered sporadically. According to the published literature, there are only six records including the one described here. Wilson's Phalarope was recorded once in Romania (Daroczi *et al*. 2015), three times in Greece (HRC 2007, 2017) and once in Bulgaria (IVANOV *et al*. 2014). Elsewhere on the Balkan Peninsula, we could not have found any published data on this species. The described observation of Wilson's Phalarope amply confirms the conservation importance of the IBA Okanj and Rusanda (RS 038) as a stopover station for a wide variety of waterbirds including sandpipers and their allies.

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Povzetek

Septembra 2019 je bil na jezeru Rusanda (severna Srbija) opazovan tribarvni liskonožec *Phalaropus tricolor*. Vrsta gnezdi v Severni Ameriki, na selitvi pa se občasno pojavlja tudi v Evropi. Opisano opazovanje je prvi podatek za to vrsto na območju Srbije in le šesti za območje jugovzhodne Evrope. Doslej je bila opazovana še v Romuniji, Grčiji in Bolgariji.

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Grassland bird species in mountain pastures Zaprikraj and Zapleč in the southern Julian Alps, Slovenia

Travniške gnezdilke na planinah Zaprikraj in Zapleč v južnih Julijskih Alpah

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Grassland birds were surveyed in two mountain pastures (Zaprikraj and Zapleč) in the southern part of the Julian Alps, Slovenia. The survey was carried out during the mornings between 26 and 30 June 2005. Due to the incomplete survey (only one visit, no nocturnal or targeted surveys and late season survey), the surveyed birds' breeding density is only a rough estimate. 167 pairs belonging to 12 species were counted, with Tree (average density of 1.64 p/10 ha) and Water Pipit (average density of 1.60 p / 10 ha) being the most abundant. Both were observed in all altitudinal belts. The highest density in individual altitudinal belt was calculated for Red-backed Shrike *Lanius collurio* (3.78 p/10 ha) and Water Pipit (3.61 p/10 ha). In well preserved grasslands in the study area, most species reached high breeding densities compared to other parts of Slovenia and all were recorded higher than during the 1992 survey, although still mostly within limits of the elevations elsewhere in Slovenia. Breeding density of Skylark *Alauda arvensis* decreased with the elevation. Whinchat *Saxicola rubetra*, Skylark and Red-backed Shrike used significantly gentler slopes, while Pipits showed no preference for particular slopes.

Introduction

Many physical characteristics of the environment are changing with the elevation (Hodkinson 2005). Along with these changes the bird species composition and richness (Newton 1998) as well as breeding biology of individual species, e.g.: breeding success, start of breeding, the number of replacement and second broods (Gil-Delgado *et al.* 1992; Lessig 2008; Bordjan 2013a; Bordjan 2013b) are also changing. Although species richness rises with the temperature, each species has its own temperature range within which its breeding is optimal (Newton 1998). With increasing elevation, the number of breeding pairs decreases in most bird species, but in some, mainly mountain species, it increases (Mihelič 2019).

The terrain in Slovenia is mostly hilly (Ogrin & Plut 2012) and the altitudinal distribution, especially in breeding birds, is relatively well studied (Mihelič *et al.* 2019). Most data are available for owls (Tome 1996; Božič & Vrezec 2000; Mihelič *et al.* 2000; Ambrožič 2002; Krofel 2008). While the influence of elevation on breeding biology was studied in detail only for Great Tit *Parus major* (Bordjan 2013a; Bordjan 2013b; Bordjan & Tome 2013), the breeding distribution in correlation with elevation was reported for Marsh *Poecile palustris* and Willow Tit *P. montanus* (Vogrin 1992), White-tailed Eagle *Haliaeetus albicilla* (Vrezec *et al.* 2009) Common Kestrel *Falco tinnunculus* (Šumrada & Hanžel 2012), Jackdaw *Corvus monedula* (Božič 2016), Black Kite *Milvus migrans* (Bordjan 2018) and Mallard *Anas platyrhynchos* (Bordjan *in lit*). As part of more general data on elevational distribution gathered for the Atlas of Breeding Birds of Triglav National Park (Jančar 1997), the elevational breeding range for several species in mountain pastures Zaprikraj and Zapleč was reported by Čelik & Polak (1992). On the other hand, studies on breeding bird species richness and density in relation to elevation in Slovenia are few (e.g. Bordjan 2013b). What's more, bird studies in relation to the slope steepness are lacking altogether.

In this paper, I wish to present data on distribution of grassland species in two mountain pastures Zaprikraj and Zapleč in correlation with elevation and slope steepness. I also compare the present data on altitudinal breeding range with those gathered 13 years earlier in the same locality.

Study area and methods

The study was carried out between 26 and 30 June 2005 in mountain pastures Zaprikraj and Zapleč above Drežniške Ravne (W Slovenia). Altitudinal distribution of breeding bird species in the area had already been surveyed 13 years earlier and a more detailed overview of habitat was given (Čelik & Polak 1992). The study area (176.6 ha) comprises mostly meadows and pastures and lies between 1,200 in 1,870 metres above sea level. The area also includes a small patch of young beech stand *Fagus sylvatica* (it was excluded from the survey plot) and scree. Abandonment of grazing is common in most areas of the Julian Alps (Perko & Oražen Adamič 1998) and this is also evident in parts of the study area. Although both mountain pastures are active, there are some signs of early stages of overgrowth. Both mountain pastures were visited only once. Breeding grassland bird species were counted by walking on predetermined path that approached every point of the area to around 50 m. The visits took place in the mornings between 6 and 11 am. Weather was mostly sunny with temperatures of 11.7 to 22°C and average daily wind speed from 0 to 2.3 m/s at a weather station 15 km away (ARSO 2020). All birds were mapped on orto-photo of the area at the scale of 1:5000. Due to only one visit to the area, I calculated only rough breeding density for the area and for separate 100m altitudinal belts for each recorded species (Figure 1). When calculating the surface area, the slope was taken into consideration. I corrected the calculated surface area for each elevation belt. I multiplied surface with quotient between square root of sum of squared average width and height of the belt's elevation and average width. The steeper belts thus had larger surface areas then measured from above. Even if the species moved between the belts, we mapped

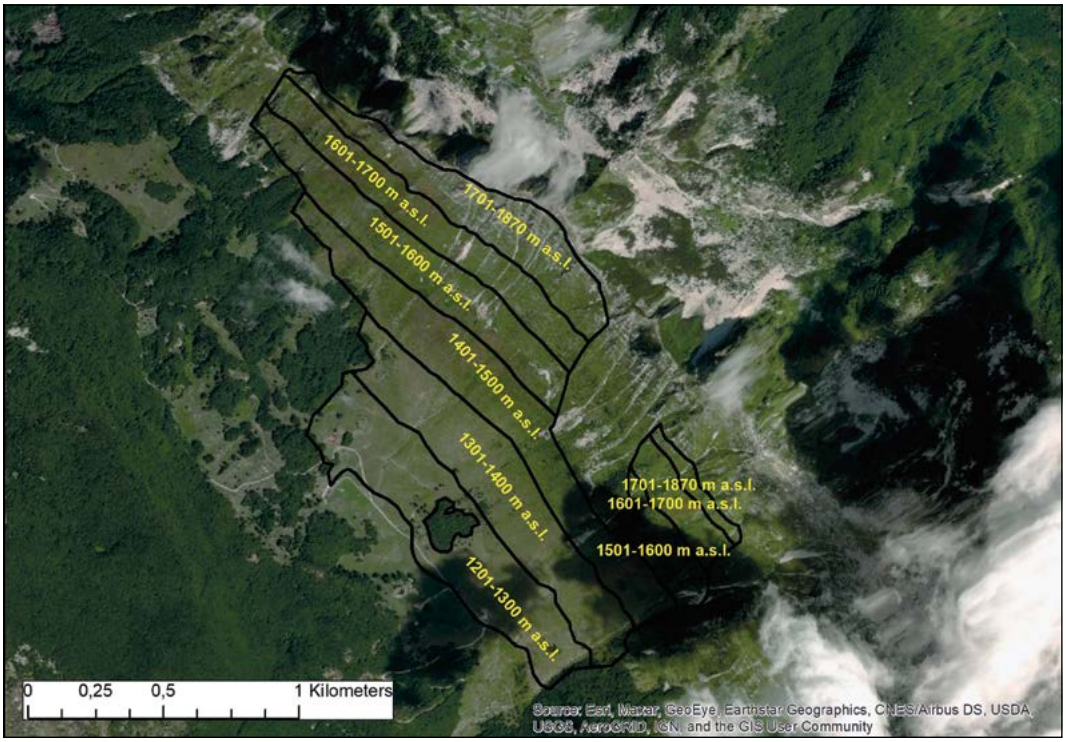

Figure 1: Study area with 100m altitudinal belts

Slika 1: Območje raziskave in višinski pasovi (100 m).

only the first sighting of an individual. While this may show a distorted picture for individual pair, I considered the error for each belt and slope to be the same and hence comparable. For spatial analyses I used the ArcMap (ESRI 2015) program. Due to the small size of the upper belt (1801–1870 m a.s.l.), I combined it with the one below at 1701–1870 m a.s.l. I calculated average slope of individual altitudinal belts from tangent between width and height (100m) of elevation belt. For every mapped pair, I determined altitude and slope. I calculated the slope for each breeding pair from the height (the number of contours) in 50m in both directions (up and down) from the mapped location. I used the non-parametric Spearman's correlation to study the correlation between altitude and distribution of species. I used the Wilcoxon test to compare random slope of the area and slope of individual species. For both tests I used the R (R Core Team 2017) program. I tested for statistical significance only for species with more than the suggested minimum of 10 records (Fay & Gerow 2018).

Results

We counted 167 pairs belonging to 12 species. The highest overall number of pairs was counted for Tree Pipit *Anthus trivialis* (with average density of 1.64 p/10 ha) and Water Pipit *A. spinoletta* (with average density of 1.60 p/10 ha) (Table 2). The highest density in individual altitudinal belt was calculated for Red-backed Shrike *Lanius collurio* (3.78 p/10 ha; 1201–1300 m a.s.l.) and Water Pipit (3.61 p/10 ha; 1701–1870 m a.s.l.). Slope was steeper with higher elevation, while the density of species did not change (Table 1). Only Tree and Water Pipits were observed in all altitudinal belts, whereas Skylark *Alauda arvensis* and Whinchat *Saxicola rubetra* were recorded in five and Quail *Coturnix coturnix*, Common Rock Thrush *Monticola saxatilis* and Red-backed Shrike were recorded in four belts. With higher elevation, the breeding density was higher for both Pipits and smaller for Red-backed Shrike, Skylark and Whinchat, but this was significant only for Water Pipit and Skylark (Table 3). Whinchat, Skylark and Red-backed Shrike used gentler slopes within the area (Table 3), while the slope of both Pipits was similar.

Discussion

The biggest drawback to this survey is the method used. To cover all present species and to register most territories up to ten visits are expected in a season, two in the night (Bibby *et al.* 2000). Since only one visit was made to the area, the resulting number of pairs gives only a very rough estimate of a breeding population. Although breeding season in the Alps is much shorter than lower down, several visit would still be needed. Additional problem is the lateness of the survey season. At the end of June, most species in temporal zones of

Table 1: Separate altitudinal belts with size, average slope, number of species and density of breeding pairs of birds

Tabela 1: Posamezni višinski pasovi in njihova površina, povprečen naklon, število vrst in gostota gnezdečih parov ptic

Altitudinal belt (m. a. s. l)	Area (Ha)*	Average slope (°)	No. of species per 10 ha	Density of pairs per 10 ha
1200–1300	34.4	21.2	2.0	8.4
1301–1400	34.6	26.1	2.0	7.2
1401–1500	37.2	29.0	2.4	8.6
1501–1600	35.3	32.5	2.5	7.9
1601–1700	32.6	38.0	2.5	8.0
1701–1870	38.8	42.5	1.3	7.0
1200–1870	213.0	33.2	0.6	7.8

* - surface accounting for a slope

Europe are already at the end of breeding season (Billerman *et al.* 2020). With the exception of Buntings and Skylarks that start to nest earlier in the season and have already finished with their first nesting attempt, all studied species start to nest in May and, considering the average nesting period of approximately month and a half (Billerman *et al.* 2020), most were probably in

Table 2: Number of pairs, altitudinal range, breeding density and slope for individual species recorded in mountain pastures Zaprikraj and Zapleč in 2005

Tabela 2: Število parov, višinski razpon, gnezditvena gostota in naklon posamezne vrste zabeležene na travnikih planin Zaprikraj in Zapleč v letu 2005.

		Altitude (m)			Density			Slope		
Bird species	No. of pairs	Min	Average	Max	Average	Highest	Elevation belt (m) with highest density	No. of belts	Min	Average	Max
Coturnix coturnix	7	1340	1460	1680	0.33	0.87	1301–1400	4	22	27	39
Alectoris graeca	5	1640	1675	1740	0.23	1.23	1601–1700	2	35	37	39
Crex crex	7	1370	1580	1487	0.33	0.85	1501–1600	3	24	31	39
Lanius collurio	27	1200	1325	1620	1.27	3.78	1201–1300	4	11	26	39
Alauda arvensis	12	1220	1383	1630	0.56	1.16	1201–1300	5	19	26	35
Monticola saxatilis	5	1420	1620	1750	0.23	0.52	1701–1900	4	27	29	31
Saxicola rubetra	27	1200	1424	1690	1.27	2.96	1401–1500	5	11	27	39
Oenanthe oenathe	6	1200	1607	1860	0.28	0.77	1701–1870	3	6	29	45
Anthus trivialis	35	1220	1521	1860	1.64	2.27	1701–1870	6	22	33	45
Anthus spinoletta	34	1280	1630	1850	1.60	3.61	1701–1870	6	22	35	48
Emberiza cia	1		1470		0.05	0.27		1		31	
Emberiza citrinella	1		1215		0.05	0.29		1		6	

Table 3: Statistical significance of correlation between elevation and breeding density and the relation between slope steepness and breeding densities of grassland birds surveyed in mountain pastures Zaprikraj in Zapleč in 2005.

Tabela 3: Statistična značilnost korelacije med nadmorsko višino in gnezditveno gostoto in relacija med naklonom in gnezditveno gostoto travniških ptic, raziskovanih na travnikih planin Zaprikraj in Zapleč v letu 2005

	Elevation		Slope	
Bird species	Spearman's R	p	Wilcox U	p
Lanius collurio	–0.78	0.066	**467**	**0.001**
Alauda arvensis	**–0.88**	**0.033**	**194**	**0.011**
Saxicola rubetra	–0.37	0.497	**407**	**0.023**
Anthus trivialis	0.6	0.242	384	0.786
Anthus spinoletta	**1**	**0.003**	323	0.560

the last stages of breeding and some may have already finished. Also, in the early summer birds are most active in the early hours, so at the end of survey (at 11 am), the activity would be rather low. Method of the survey underestimates nocturnal (Corncrake *Crex crex*, Quail) and cryptic species (Rock Partridge *Alectoris graeca*) that would need additional nocturnal visits or targeted visits with eliciting responses (Bibby *et al.* 2000). While more numerous visits eliminate possible migrants or stragglers in the area, most other drawbacks (single survey, no night surveys, late season and late end of daily survey) underestimate the size of a population. Considering this, I only discuss density of species with relatively high densities compared to other areas.

Nevertheless, some conclusions may be drawn from the present survey. The breeding density lowers with the elevation for lowland species like Skylark. They also tend to stay in areas with gentler slope. On the other hand, the species of high mountain biome like Water Pipit, the breeding density increases with altitude and they show no preference for a gentler slope.

In general, the number of bird species decreases with the altitude (Newton 1998). The lowest number of species in this study was indeed recorded in the highest altitudinal belt, but overall trend does not support the general rule. This may be a result of low altitude difference in this study of only 700m that just reaches a tree line at higher elevations. To get a clearer picture we should expand the altitudinal range of survey to at least above the treeline. Since the number of species remained similar up to 1700 m a.s.l. and then dropped substantially, there may be additional reasons besides elevation. Lower heterogeneity of vegetation structure in upper altitudinal belts may be one reason. This would explain the absence of Red-backed Shrike and Whinchat that both can nest at higher elevations and both need higher plants for hunting (Collar & Garcia 2020; Yosef *et al.* 2020). The other reason may be a much steeper slope in upper altitudinal belts, which would explain the absence of Skylark, Whinchat, Red-backed Shrike, Quail and Corncrake that are more common in less steeper terrain (Billerman *et al.* 2020).

For most studied species, the highest recorded elevations are similar to those reported for our ornithological atlas (Mihelič *et al.* 2019), with the exception of Quail. Highest elevation of Quails' territorial calls was recorded in the mountain pasture Zaprikraj, at Breginjski stol and Planja, but in a lower altitudinal belt 1400–1600m a.s.l. (Trilar & Šumrada 2019). On the other hand, all studied species were recorded at higher elevations then in the 1992 survey (Čelik & Polak 1992). The reasons behind this are not very clear. The overall habitat remained roughly the same with only some overgrowth at the middle and upper elevations, although the availability of hunting structures higher up may explain presence of Tree Pipit, Whinchat and Red-backed Shrike. In both surveys, the methods have not been suitable for nocturnal species, so higher elevation of Quail may be due to chance. Many species move up the mountains due to climate change (Scridel *et al.* 2018), but this may not be the main reason in this case, since all species have been recorded breeding at higher elevations in other parts of the Alps (Luder *et al.* 1998). Climate change may partly explain higher elevation in at least three species, Tree Pipit, Corncrake and Quail, that were recorded higher than during the census of the entire Triglav National Park (Jančar 1997). The biggest difference between the 1992 and 2005 surveys concern Rock Partridge and Rock Thrush. In 1992, they were recorded considerably lower than in 2005 (Rock Partridge: below 1460; Rock Thrush below 1400 m a.s.l.). This is interesting since the optimal habitat for both species, i.e. rocky open meadows (Collar & Bonan 2020; McGowan & Kirwan 2020) at a site in 2005 started above 1400 m a.s.l.. It is possible that due to more grazing in 1992, the suitable habitat was also present below 1400m a.s.l. and both species were overlooked higher up.

The results indicate that in well preserved grasslands in the study area most recorded species seem to reach high breeding densities compared to other parts of Slovenia (Mihelič *et al.* 2019). For Corncrake (Božič 2019), Rock Partridge (Mihelič 2019) and Water Pipit (Polak 2019), the recorded densities are among the highest in Slovenia. Breeding densities of Whinchat are similar to average densities in Slovenia and comparable to those at Ljubljansko barje (Tome 2019).

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Povzetek

Med 26. in 30. junijem 2005 smo na dveh planinah (Zaprikraj in Zapleč) v južnem delu Julijskih Alp, Slovenija, popisovali travniške ptice. Zaradi nepopolnega popisa (samo en obisk ploskve pozno v sezoni in brez nočnih popisov) je zabeležena gnezditvena gostota le groba ocena. Skupaj smo tako zabeležili 167 parov 12 vrst. Najštevilčnejši gnezdilki sta bili drevesna cipa *Anthus trivialis* (povprečna gostota 1,64 p/10 ha) in vriskarica *A. spinoletta* (1,60 /10 ha). Obe vrsti sta bili zabeleženi v vseh šestih višinskih pasovih. Najvišjo gnezditveno gostoto v posameznem višinskem pasu smo zabeležili pri rjavem srakoperju *Lanius collurio* (3,78 p/10 ha) in vriskarici (3,61 p/10 ha). Gnezditvena gostota večine vrst je bila na dobro ohranjenih traviščih omenjenih planin visoka v primerjavi z gostotami drugod po Sloveniji. Vse vrste so bile zabeležene na višjih nadmorskih višinah kot leta 1992 na istem območju, vendar še vedno v mejah višin drugod po Sloveniji. Gnezditvena gostota poljskega škrjanca *Alauda arvensis* se je nižala z nadmorsko višino. Medtem ko so bili repaljščica *Saxicola rubetra*, poljski škrjanec in rjavi srakoper pogostejši na bolj položnih pobočjih, sta obe vrsti cip izbirali različne strmine enako pogosto.

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Rezultati januarskega štetja vodnih ptic leta 2020 v Sloveniji

Results of the January 2020 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, 2018, 2019). K temu sta pripomogla predvsem dobra organizacija in veliko število sodelujočih prostovoljnih popisovalcev. V poročilu so predstavljeni rezultati januarskega štetja vodnih ptic leta 2020, ki je v podobnem obsegu potekalo že štiriindvajsetič zapored.

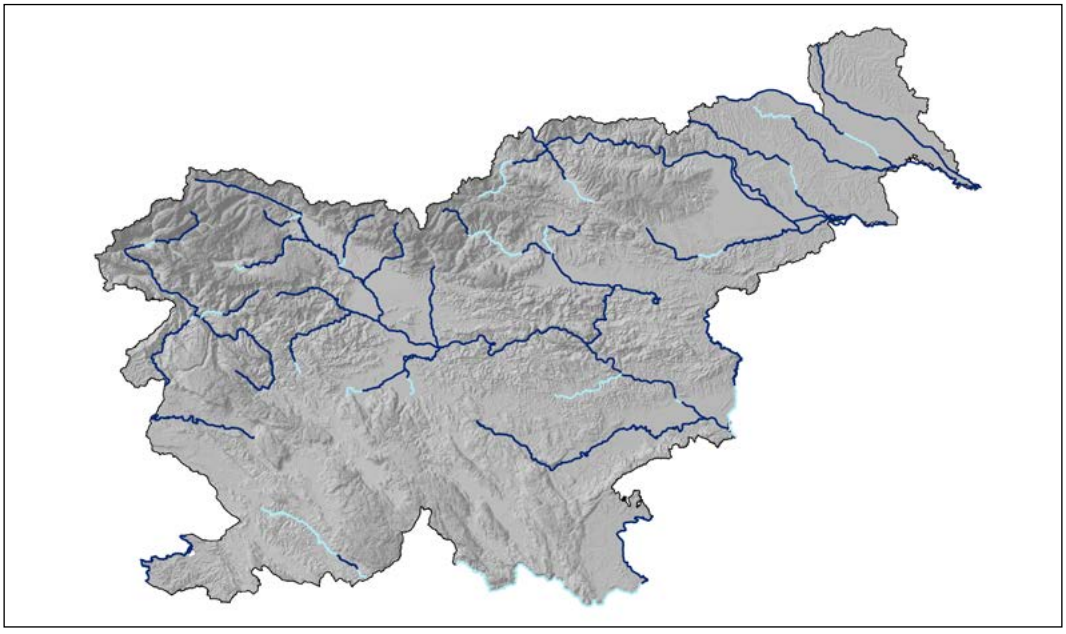
Leta 2020 smo vodne ptice šteli 11. in 12. januarja. Organizacija, potek, uporabljena metoda štetja in popisni obrazci so bili takšni kot leta 1997 (Štumberger 1997). Pri obdelavi in predstavitvi rezultatov smo upoštevali tudi nekatere podatke, zbrane zunaj organiziranega štetja, nekaj dni pred ali po koncu tedna, predvidenega za štetje. Kormorane *Phalacrocorax carbo* smo na številnem območju Mure ter na panonskem delu Drave in zgornji Savi posebej šteli na znanih skupinskih prenočiščih. Na skupinskih prenočiščih smo šteli tudi pritlikave kormorane *M. pygmeus*, zvonce *Bucephala clangula*, velike žagarje *Mergus merganser* in galebe Laridae na številnem območju Drave ter velike žagarje na številnem območju Savinje. Mokože *Rallus aquaticus* smo na ptujskih studenčnicah in potoku Črnec (Murska ravan) sočasno s štetjem drugih vodnih ptic popisali s pomočjo predvajanja posnetkov 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 2020 je bil v Sloveniji za 2,1 °C toplejši kot v dolgoletnem povprečju, vendar je bilo z izjemo visokogorja najhladneje ravno v prvi tretjini meseca, torej neposredno pred štetjem, ko so bile povprečne dnevne temperature marsikje nižje od običajnih. Odklon je bil najmanjši na SV in JV delu države ter na Obali, v Vipavski dolini in Ljubljanski kotlini. Padavine so povsod opazno zaostajale za dolgoletnim povprečjem, saj je na veliki večini ozemlja padlo manj kot 40 %, v velikem delu južnega dela države pa celo manj kot 20 % običajnih januarskih padavin. Povprečna mesečna temperatura je bila decembra 2019 povsod višja od dolgoletnega povprečja, največji presežek je bil v SV Sloveniji, kjer je odklon presegel 3 °C, najmanjši pa na skrajnem SZ delu države (< 2 °C). Padavine so povsod presegle dolgoletno povprečje, na nivoju države je padlo 32 % več padavin kot običajno (Cegnar 2019, 2020). Januar 2020 je bil v celoti za 40 % manj vodnat kot v dolgoletnem primerjalnem obdobju, le Drava in Mura sta imeli pretoke nekoliko večje od povprečnih (Sušnik 2020). Decembra 2019 je bila vodnatost rek za polovico večja od običajne, v drugi polovici meseca so se reke ponekod razlivale (Strojan 2019). V času štetja je iznad JZ Evrope nad Alpe segalo območje visokega zračnega tlaka. V višinah je nad naše kraje s severnimi do severovzhodnimi vetrovi pritekal razmeroma suh zrak. Prevladovalo je pretežno jasno vreme z jutranjo meglo ali nizko oblačnostjo ponekod po nižinah. Na Primorskem je pihala šibka burja. Prvi dan so bile najvišje dnevne temperature od 5 do 11, na Primorskem od 12 do 17 °C, drugi dan pa je bilo malo hladneje. Jutranje temperature so bile v večjem delu države, z izjemo Obale, pod ledištem (Markošek 2020). Med štetjem 2020 so bili delno zaledeneli (1/4) krajši deli rek Mure, panonske Drave, Iščice, Kokre in zgornje Save, nekaj zgornjih odsekov Pesnice pa je bilo zaledenelih do 3/4. Od rečnih akumulacij so bili

delno zaledeneli Ledavsko jezero (3/4), Gajševsko jezero na Ščavnici (3/4), jezero Pristava na Pesnici (3/4) in Dravograjsko jezero na alpski Dravi (1/4), Perniško jezero pa je bilo zaledenelo v celoti. Delno zaledeneli so bili tudi nekateri potoki in manjše reke, npr. na območju Drave, Savinje, Ljubljanskem barju, Notranjskem in Vipavski dolini (1/4–3/4). Stoječa vodna telesa na številnih območjih Mure, Drave, Savinje in spodnje Save so bila večinoma zaledenela 3/4 ali v celoti, na območju zgornje Save pa so bila delno zaledenela (1/4–3/4) samo nekatera izmed njih. Večje in globlje gramoznice v Pomurju so bile nezaledenele. Škalsko jezero je bilo zaledenelo 1/4, Šoštanjsko jezero 3/4, Vonarsko jezero 3/4, nezaledeneli pa so bili Velenjsko jezero, vzhodno Teharsko jezero, Bohinjsko in Blejsko jezero, gramoznica Stari Grad pri Krškem in Rudniško jezero. Delno (1/4–3/4) ali v celoti so bila zaledenela tudi stoječa vodna telesa na območju Notranjske in Primorske, vključno s Cerkniškim jezerom (1/2). Sečoveljske soline (Fontanigge) in Škocjanski zatok so bili zaledeneli 1/4.

Sodelovalo je 246 popisovalcev. Pregledali smo 423 popisnih odsekov na rekah in obalnem morju v skupni dolžini 1497,4 km (tabela 1), kar je 81,9 % celotne dolžine odsekov, vključenih v popis. Poleg tega smo pregledali tudi 208 lokalitet (170 stoječih in 38 tekočih voda) od skupno 338 (tabela 2), kar je 61,5 % vseh lokalitet, evidentiranih v bazi januarskega štetja vodnih ptic do vključno leta 2020. Popisne odseke, pregledane v štetju leta 2020, prikazuje slika 1, razširjenost pregledanih lokalitet pa slika 2.

Skupaj smo prešteli 52.698 vodnih ptic, pripadajočih 63 vrstam. Poleg tega smo zabeležili še štiri druge taksone (križanca med kanadsko in sivo gosjo, domačo gos, domačo raco in en vrstno nedoločen takson). Skupno število vodnih ptic je bilo nadpovprečno, tako kot tudi število zabeleženih vrst (51.362 / 60). Skupno število zabeleženih vodnih ptic je bilo največje po letu 2013. Tako kot v vseh štetjih doslej smo tudi leta 2020 največ vodnih ptic prešteli na številnem območju reke Drave, in sicer 21.954. To je 41,7 % vseh vodnih ptic, preštetih v Sloveniji, kar je podobno kot v prejšnjem štetju.



Slika 1: Popisni odseki januarskega štetja vodnih ptic (IWC) na rekah in obalnem morju v Sloveniji leta 2020; temno modre označujejo popisane, svetlo modre pa nepopisane odseke.

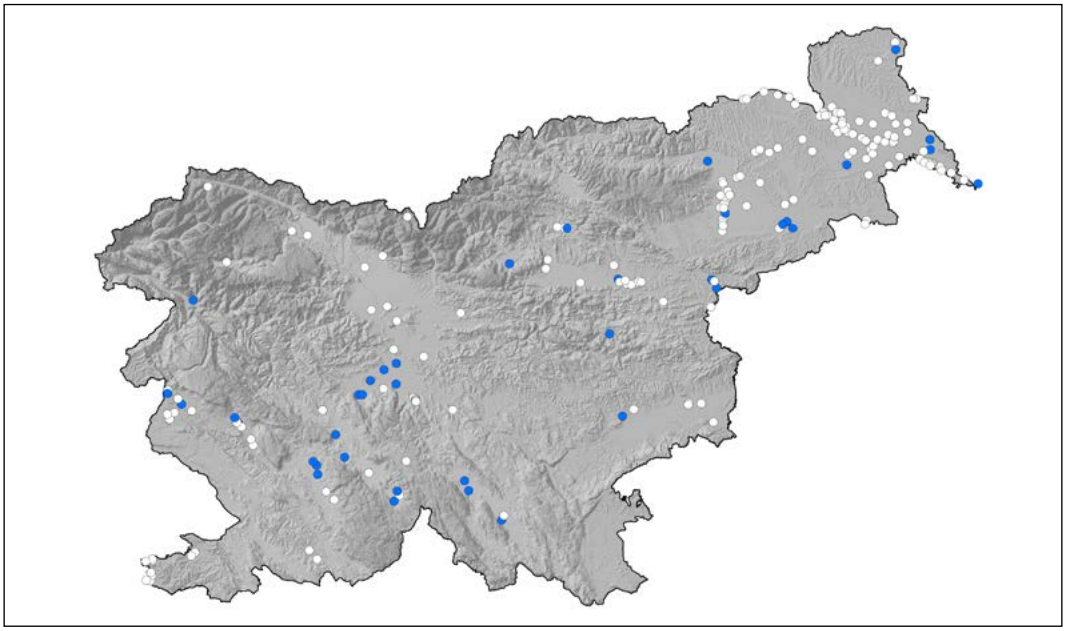
Figure 1: Survey sections of the January 2020 waterbird census (IWC) on the rivers and coastal sea in Slovenia, with dark blue lines denoting examined and pale blue lines unexamined sections

S tem je bil odstotek vodnih ptic na tem številnem območju znova nekoliko manjši od povprečnega (43,1 %). Tako kot v večini štetij doslej število 10.000 preštetih vodnih ptic nismo presegli na nobenem drugem številnem območju. Na območjih Drave in Savinje je bilo število vodnih ptic blizu povprečnemu (±1–2 % povprečja), na območjih Mure (+17 %), spodnje Save (+11 %), Kolpe (+14 %) ter Notranjske in Primorske (+78 %) nadpovprečno, na območjih zgornje Save (–16 %) in Obale (–20 %) pa manjše od povprečnega. Leta 2020 na nobenem številnem območju nismo prešteli največjega ali najmanjšega števila vodnih ptic v dosedanjih januarskih štetjih. Med največjimi doslej je bilo število vodnih ptic na območju Notranjske in Primorske (večje samo leta 2001 in 2011), k čemur je bistveno prispevalo največ preštetih vodnih ptic na Cerkniškem jezeru (3411 os.) v dosedanjih januarskih štetjih.

Mlakarica *Anas platyrhynchos* je bila leta 2020, tako kot med vsemi štetji doslej, daleč najštevilnejša vrsta (22.965 os., 43,6 % vseh vodnih ptic). Po številu preštetih osebkov sledijo kormoran (2928 os., 5,6 % vseh vodnih ptic), beločela gos *Anser albifrons* (2690 os., 5,1 %), rečni galeb *Chroicocephalus ridibundus* (2687 os., 5,1 % vseh vodnih ptic) in čopasta črnica *Aythya fuligula* (2573 os., 4,9 % vseh vodnih ptic). Beločela gos še nikoli ni bila tako visoko na seznamu najštevilnejših vrst, je pa bila tokrat drugič zapored po številu osebkov med prvimi petimi vrstami. Prvič doslej se je zgodilo, da med temi ni bilo liske *Fulica atra*. Število 1000 preštetih osebkov so leta 2020 presegli še liska, kreheljc *Anas crecca*, labod grbec *Cygnus olor*, rumenonogi galeb *Larus michahellis*, siva gos *Anser anser* in siva čaplja *Ardea cinerea*.

Rezultati januarskega štetja vodnih ptic leta 2020 po shemi razdelitve na osem številnih območij (Božič 2007, 2008a, 2008b, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019) so predstavljeni v tabeli 3. V dodatku 1 so številna območja podrobneje razčlenjena na posamezne reke in manjša območja z večjim številom lokalitet, kot so poplavne ravnice, doline, ravnine ipd.

Leta 2020 smo prvič med januarskim štetjem vodnih ptic zabeležili sabljarko *Recurvirostra*



Slika 2: Lokalitete, popisane med januarskim štetjem vodnih ptic (IWC) v Sloveniji leta 2020; beli krogi označujejo stoječe vode, modri krogi pa potoke in manjše reke.

Figure 2: Localities surveyed during the January 2020 waterbird census (IWC) in Slovenia, with white circles denoting standing waters, and blue circles designating smaller rivers and streams

avosetta (Sečoveljske soline). Opazovanja iz zime 2019/2020 so prvi podatki o zimskem pojavljanju in prezimovanju te vrste v Sloveniji (Škornik 2012, 2020, I. Škornik *osebno*). Sabljarka sicer v zadnjih letih redno prezimuje na severnojadranskih mokriščih italijanske dežele Furlanije - Julijske krajine (Brichetti & Fracasso 2018). Od drugih redkejših vrst smo popisali belolično gos *Branta leucopsis* (zadrževalnik Medvedce; tretje opazovanje v januarskem štetju vodnih ptic, drugo iz kategorije A), nilsko gos *Alopochen aegyptiacus* (Bakovska kamenšnica, Murska Sobota; peto

Tabela 1: Število vseh in pregledanih popisnih odsekov na rekah in obalnem morju ter njihova skupna dolžina na posameznem štev nem območju in v celotni državi med januarskim štetjem vodnih ptic (IWC) leta 2020 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 2020 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	53	190,7
Drava	138	374,4	127	322,0
Savinja	38	141,5	31	107,6
Zgornja Sava / Upper Sava	113	387,1	105	353,4
Spodnja Sava / Lower Sava	71	272,7	57	226,5
Kolpa	14	118,0	5	36,8
Notranjska in Primorska	44	272,9	33	217,8
Obala / Coastland	12	42,6	12	42,6
Skupaj / Total	491	1829,4	423	1497,4

Tabela 2: Število vseh in pregledanih lokalitet (stoječih voda, potokov in manjših rek) na posameznem štev nem območju in v celotni državi med januarskim štetjem vodnih ptic (IWC) leta 2020 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 2020 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	68	5
Drava	59	24	30	5
Savinja	19	6	16	4
Zgornja Sava / Upper Sava	26	15	20	6
Spodnja Sava / Lower Sava	12	10	7	3
Kolpa	1	4	1	3
Notranjska in Primorska	21	33	18	12
Obala / Coastland	14	3	10	0
Skupaj / Total	233	105	170	38

opazovanje v januarskem štetju vodnih ptic), žerjava *Grus grus* (Cerkniško jezero; šesto opazovanje v januarskem štetju vodnih ptic, prvo po letu 2013) in rjavega galeba *Larus fuscus* (Ptujsko jezero; šesto opazovanje med januarskim štetjem vodnih ptic). Izmed vrst, ki se pojavljajo redno, smo leta 2020 prešteli največ duplinskih kozark *Tadorna tadorna*, moškatnih bleščavk *Cairina moschata*, mandarink *Aix galericulata*, velikih žagarjev *Mergus merganser*, belih štorkelj *Ciconia ciconia*, belorepcev *Haliaeetus albicilla* (skupaj z letoma 2004 in 2019), kozic *Gallinago gallinago* in zelenonogih martincev

Tabela 3: Števila preštetih vodnih ptic na posameznem štev nem območju in v celotni Sloveniji med januarskim štetjem vodnih ptic (IWC) leta 2020 (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 2020 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	476	821	71	96	108		30	107	1709
Anser fabalis	3								3
Anser albifrons	33	2655						2	2690
Anser anser	2	1187					48	14	1251
Branta leucopsis		1							1
Branta canadensis × *A. anser*		1							1
domača gos / domestic goose		7							7
Alopochen aegyptiaca	1								1
Tadorna tadorna		5						245	250
Aix galericulata		2	1	2	2		2		9
Cairina moschata		17	8	19	1		1		46
Mareca penelope	16	259	4	8	9		26	234	556
Mareca strepera	2	191	5		16	4	2	18	238
Anas crecca	210	863	75	103	53	57	78	647	2086
Anas platyrhynchos	3686	7388	1587	2856	1975	687	4101	685	22965
Anas acuta	2	39	2	1			6		50
Spatula clypeata		1		1	4			58	64
Netta rufina	2			1					3
Aythya ferina	16	663	33	67	186	1	1	3	970
Aythya fuligula	20	2054	123	352	18	3	3		2573
Aythya marila		3							3
Melanitta fusca		1						4	5
Bucephala clangula		727	3	8	23		33	1	795
Mergellus albellus		44					5		49
Mergus serrator					6			76	82
Mergus merganser	105	126	84	377	112	56	114		974
domača raca / domestic duck	10	3	2						15
Gavia stellata								6	6
Gavia arctica					1			21	22

Nadaljevanje tabele 3 / Continuation of Table 3

Vrsta / Species	1	2	3	4	5	6	7	8	Skupaj / Total
Phalacrocorax carbo	322	648	216	189	1152	41	89	271	2928
Phalacrocorax aristotelis								60	60
Microcarbo pygmeus		856						2	858
Egretta garzetta		1					1	82	84
Ardea alba	165	313	4	52	77	3	50	30	694
Ardea cinerea	167	311	113	224	183	14	89	60	1161
Ciconia ciconia		5	1						6
Tachybaptus ruficollis	32	303	21	110	232	38	40	45	821
Podiceps cristatus	13	46	40	14	106	2	2	124	347
Podiceps grisegena					2			2	4
Podiceps auritus			1	1				1	3
Podiceps nigricollis		2			4			77	83
Haliaeetus albicilla	2	5	1		2		1		11
Rallus aquaticus	20	51	1	8	2		2	6	90
Gallinula chloropus	25	30	16	26	14	8	6	7	132
Fulica atra	253	874	225	166	79	2	4	743	2346
Grus grus							100		100
Recurvirostra avosetta								4	4
Pluvialis squatarola								3	3
Calidris alpina								26	26
Lymnocryptes minimus			7			2			9
Gallinago gallinago	6	8	2	9	8		77	4	114
Scolopax rusticola							2		2
Numenius arquata								14	14
Actitis hypoleucos	2	1	2	2	1			9	17
Tringa ochropus	29	13	2	1					45
Tringa nebularia	1	1						25	27
Chroicocephalus ridibundus		1182	6	1	14			1484	2687
Ichthyaetus melanocephalus								5	5
Larus canus		15		3				1	19
Larus fuscus		1							1
Larus argentatus		2							2
Larus michahellis		83	4	8			349	1122	1566
Larus cachinnans		97							97
Larus michahellis / cachinnans	2	4	2	18	131				157
Thalasseus sandvicensis								27	27
Alcedo atthis	14	21	35	25	22	4	14	10	145
Cinclus cinclus	4	23	35	277	16		224		579
Skupaj / Total	5641	21954	2732	5025	4559	922	5500	6365	52698

Tringa nebularia v okviru januarskih štetij vodnih ptic doslej. Razen tega je bilo beločelih gosi več le med štetjem leta 2019 (vrsta je tokrat drugič presegla število 2000 os.), sivih gosi leta 2018 (drugič več kot 1000 os.), konopnic *Mareca strepera* leta 2019, dolgorepih rac *Aanas acuta* leta 2019, čopastih črnic leta 2018, mokožev *Rallus aquaticus* leta 2000 in 2001, mali martincev *Actitis hypoleucos* leta 2015, vodomcev *Alcedo atthis* leta 2019 ter povodnih kosov *Cinclus cinclus* leta 2010 in 2019. Najmanjše število v štiriindvajsetih letih januarskih štetij vodnih ptic smo leta 2020 zabeležili pri liski in sivem galebu *Larus canus*. Števila naslednjih vrst so bila med najmanjšimi doslej: polarni slapnik *Gavia arctica* (manjše le 2004 in 2019), rečni galeb (manjše le 2005) in rumenonogi galeb (manjše štirikrat pred tem). Število žvižgavk *Mareca penelope* je bilo največje po letu 2001 (do takrat so bila podobna ali večja števila običajna), čopastih ponirkov *Podiceps cristatus* po letu 2010 in srednjih žagarjev *M. serrator* po letu 2008. Po dveh letih brez podatka smo leta 2020 znova zabeležili nekoč dokaj številno njivsko gos *Anser fabalis* (šele tretjič v zadnjih sedmih štetjih), prvič v zadnjih petnajstih pa med preštetimi vodnimi pticami ni bilo kostanjevke *Ay. nyroca*.

Pri več vrstah z največjimi in velikimi zabeleženimi števili (beločela gos, siva gos, duplinska kozarka, konopnica, dolgorepa raca, veliki žagar, pritlikavi kormoran) so rezultati štetja leta 2020 nadaljevanje dolgoročnih pozitivnih populacijskih trendov njihovih januarskih populacij v Sloveniji (Božič 2014, 2015, 2016, 2017, 2018, 2019). Med temi so tudi vse tri vrste, ki trenutno na posameznih območjih v Sloveniji z zimskimi populacijami dosegajo mejno vrednost 1 % za opredeljevanje mokrišč mednarodnega pomena (Wetlands International 2020a). Videti je, da se je silovito povečevanje števila pritlikavih kormoranov v zadnjih letih stabiliziralo okoli 1 % populacije Črnega morja in Sredozemlja, medtem ko je pri obeh vrstah gosi odstotek njunih regionalnih populacij še nekoliko večji. Pojavljanje pomembnega števila je pri vseh omenjenih vrstah omejeno na eno samo območje (panonska Drava) oz. lokaliteto (zadrževalnik Medvedce z okolico) v državi. Med varstveno pomembne vrste spada tudi veliki žagar, ki mejno vrednost za opredelitev mednarodno pomembnih območij za ptice (IBA), določeno Denac *et al.* (2011), v zadnjih letih dosega na več rekah (leta 2020 na Muri, Dravi, Savinji, zgornji Savi z nekaterimi pritoki, spodnji Savi in Vipavi). Za to vrsto ni znano, kateri regionalni populaciji pripadajo osebki, ki prezimujejo na posameznih delih ozemlja Slovenije, zato odstotkov ni mogoče zanesljivo izračunati. Domneva se, da je pri nas stičišče arealov treh različnih biogeografskih populacij (Wetlands International 2020b). Za vse navedene vrste z naraščajočimi januarskimi populacijami v Sloveniji, z izjemo velikega žagarja, ki ni bil vključen zaradi omenjene dileme, je bil dolgoročni trend njihovih regionalnih biogeografskih populacij v najnovejši analizi opredeljen kot zmeren ali močen porast, pri večini pa je enak tudi kratkoročen desetletni trend v obdobju 2009–2018 (Wetlands International 2020c). Podobno velja za negativne populacijske trende nekaterih vrst z najmanjšimi in majhnimi zabeleženimi števili v letošnjem štetju, npr. lisko in sivega galeba, za katera je značilen zmeren upad populacije Črnega morja in Sredozemlja v desetletnem obdobju oz. celotne populacije evropske podvrste *L. c. canus* v obdobju 1994–2018 (Wetlands International 2020c).

Streljanje vodnih ptic v času štetja je bilo zabeleženo na posameznih odsekih zgornje Save in Krke ter na Radenskem polju. Plašenje kormoranov s strani ribičev je potekalo na nekaterih odsekih Save Bohinjke in Save soteska.

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.

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Summary

In 2020, the International Waterbird Census (IWC) was carried out in Slovenia on 11 and 12 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, 423 sections of the rivers and coastal sea with a total length of 1497.4 km and 208 other localities (170 standing waters and 38 streams) were surveyed. Altogether, 52,698 waterbirds of 63 species were counted. Thus, the number of waterbirds and the number of species recorded were above the 24-year average, with the latter figure highest after the census in 2013. The average number of waterbirds was exceeded most (+78%) in the Notranjska & Primorska count areas. The highest numbers of waterbirds were counted in the Drava count area, i.e. 21,954 individuals (41.7% of all waterbirds in Slovenia). By far the most numerous species was Mallard *Anas platyrhynchos* (43.6% of all waterbirds), followed by Cormorant *Phalacrocorax carbo* (5.6% of all waterbirds), White-fronted Goose *Anser albifrons* (5.1% of all waterbirds), Black-headed Gull *Chroicocephalus*

ridibundus (5.1% of all waterbirds), and Tufted Duck *Aythya fuligula* (4.9% of all waterbirds). The number of 1,000 counted individuals was also surpassed by Coot *Fulica atra*, Teal *An. crecca*, Mute Swan *Cygnus olor*, Yellow-legged Gull *Larus michahellis*, Greylag goose *A. anser*, and Grey Heron *Ardea cinerea*. Among the rarer recorded species, the Avocet *Recurvirostra avosetta* (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: Shelduck *Tadorna tadorna*, Muscovy Duck *Cairina moschata*, Mandarin Duck *Aix galericulata*, Goosander *Mergus merganser*, White Stork *Ciconia ciconia*, White-tailed Eagle *Haliaeetus albicilla*, and Greenshank *Tringa nebularia*. The numbers of Coots and Common Gulls *Larus canus* were the lowest recorded during the IWC so far.

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DODATEK / APPENDIX 1

Število preštetih vodnih ptic v januarskem štetju leta 2020 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 in Šoštanjsko 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, SRS – srednja Sava: zgornja Sava (Kranj)–Breg pri Litiji, SOR – Selška Sora, Poljanska Sora in Sora, 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, RE – Reka, O – Obala: slovensko obalno morje, OS – Obala soline: Sečoveljske in Strunjanske soline, OZ – Obala zatok: Škocjanski zatok, OR – Obala razno: stoječe vode v Koprskih brdih. Število vodnih ptic, ki so bile v celoti preštete na prenočiščih, je označeno s krepkim tiskom.

	Mura					Drava							Savinja				Zgornja Sava / Upper Sava							
Vrsta / Species	M	ŠČ	LD	MR	Skupaj/ Total	DA	MM	D	DV	P	DPP	Skupaj/ Total	S	ŠAL	SR	Skupaj/ Total	ZGS	SRS	SOR	KBI	LB	SAR	LBA	Skupaj/ Total
Cygnus olor	27	35	206	208	476	83		377	2	162	197	821	2	46	23	71	3	71		1	12	5	4	96
Anser fabalis			3		3																			
Anser albifrons	15	18			33			119			2536	2655												
Anser anser				2	2			1			1186	1187												
Branta leucopsis											1	1												
Branta canadensis × *A. anser*								1				1												
domača gos / domestic goose								7				7												
Alopochen aegyptiaca				1	1																			
Tadorna tadorna								4			1	5												
Aix galericulata								2				2	1			1				1		1		2
Cairina moschata						1					16	17	1		7	8					19			19
Mareca penelope				16	16			232			27	259	2		2	4		8						8
Mareca strepera				2	2			190			1	191			5	5								
Anas crecca	137		7	66	210	4		843	2	11	3	863	47		28	75	2	83		4	8	4	2	103
Anas platyrhynchos	693	673	258	2062	3686	274	120	4683	344	341	1626	7388	1017	148	422	1587	585	723	199	343	703	186	117	2856
Anas acuta	1	1			2			27			12	39	2			2	1							1
Spatula clypeata								1				1						1						1
Netta rufina				2	2																	1		1
Aythya ferina				16	16			652			11	663		33		33	58	9						67
Aythya fuligula				20	20			2054				2054		123		123	27	324			1			352
Aythya marila								3				3												
Melanitta fusca								1				1												
Bucephala clangula						2		723			2	727		3		3		8						8
Mergellus albellus								44				44												
Mergus serrator																								
Mergus merganser	105				105	18		100			8	126			84	84	45	252	55	19	6			377
domača raca / domestic duck				10	10			1	2			3			2	2								

The number of waterbirds counted during the January 2020 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 polje and in their immediate vicinity, S – Savinja (including Paka and Voglajna), ŠAL – Šalek Lakes: Škalsko, Velenjsko and Šoštanjsko 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, SRS – Middle Sava: from Gornja Sava (Kranj) to Breg pri Litiji, SOR – Selška Sora, Poljanska Sora and Sora, 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), RE – Reka, O – Slovene coastal sea, OS – Coastal saltpans: Sečovlje and Strunjan saltpans, OZ –Škocjanski zatok, OR – other localities on the coastland: standing waters in Koprska brda. The number of waterbirds counted entirely at their roosting places is denoted in bold.

	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	RE	Skupaj/ Total	O	OS	OZ	OR	Skupaj/ Total	Skupaj vse/ Total overall
C. olo.		13	84		11	108				2				28		30	11	94	2		107	1709
A. fab.																						3
A. alb.																			2		2	2690
A. ans.													45	3		48			14		14	1251
B. leu.																						1
																						1
																						7
A. aeg.																						1
T. tad.																		245			245	250
A. gal		1	1			2					1		1			2						9
C. mos.	1					1						1				1						46
M. pen.		9				9								26		26		207	27		234	556
M. str.		16				16	4		4					2		2		12	6		18	238
A. cre.		36	17			53	3	54	57			3		75		78		498	149		647	2086
A. pla.	79	455	1091	321	29	1975	530	157	687	183	110	214	223	3368	3	4101	97	448	131	9	685	22965
A. acu.														6		6						50
S. cly.		4				4												16	42		58	64
N. ruf.																						3
A. fer.		186				186	1		1	1						1		3			3	970
A. ful.		18				18	3		3					3		3						2573
A. mar.																						3
M. fus																	4				4	5
B. cla.		23				23								33		33	1				1	795
M. alb.														5		5						49
M. ser.		6				6											76				76	82
M. mer.	26	86				112	56		56	26	17	64	7			114						974
																						15

Nadaljevanje dodatka 1 / Continuation of Appendix 1

	Mura					Drava							Savinja				Zgornja Sava / Upper Sava							
Vrsta / Species	M	ŠČ	LD	MR	Skupaj/ Total	DA	MM	D	DV	P	DPP	Skupaj/ Total	S	ŠAL	SR	Skupaj/ Total	ZGS	SRS	SOR	KBI	LB	SAR	LBA	Skupaj/ Total
Gavia stellata																								
Gavia arctica																								
Phalacrocorax carbo	215	27	80		322	28		567	53			648	140	68	8	216	107	51	3		20	6	2	189
Phalacrocorax aristotelis																								
Microcarbo pygmeus								854			2	856												
Egretta garzetta								1				1												
Ardea alba	21	20	45	79	165			93	1	35	184	313			4	4	2	6		9	13	7	15	52
Ardea cinerea	30	37	54	46	167	8	5	125	27	66	80	311	77	11	25	113	56	37	48	22	26	25	10	224
Ciconia ciconia										1	4	5	1			1								
Tachybaptus ruficollis		12	9	11	32	22		279	1		1	303	2	18	1	21	16	51	3	2	27	8	3	110
Podiceps cristatus			1	12	13	2		44				46		38	2	40		14						14
Podiceps grisegena																								
Podiceps auritus														1		1	1							1
Podiceps nigricollis								2				2												
Haliaeetus albicilla	2				2			3			2	5		1		1								
Rallus aquaticus	1	1		18	20			51				51		1		1					2	6		8
Gallinula chloropus			7	18	25			29			1	30	2	14		16			2		12	5	7	26
Fulica atra		23		230	253	4		781			89	874		218	7	225	17	141			6		2	166
Grus grus																								
Recurvirostra avosetta																								
Pluvialis squatarola																								
Calidris alpina																								
Lymnocryptes minimus															7	7								
Gallinago gallinago		1	4	1	6			7			1	8			2	2	1	1	1				6	9
Scolopax rusticola																								
Numenius arquata																								
Actitis hypoleucos	2				2			1				1	2			2	1	1						2
Tringa ochropus	29				29			12		1		13	2			2		1						1
Tringa nebularia	1				1						1	1												
Chroicocephalus ridibundus						1		1180			1	1182	6			6					1			1
Ichthyaetus melanocephalus																								
Larus canus								13			2	15						3						3
Larus fuscus								1				1												
Larus argentatus								1			1	2												
Larus michahellis								43			40	83	4			4	2	6						8
Larus cachinnans								96			1	97												
Larus michahellis / cachinnans	2				2	4						4			2	2	1	14			2		1	18
Thalasseus sandvicensis																								
Alcedo atthis	7	2	2	3	14			16	2	1	2	21	25	2	8	35	1	4	9		8		3	25
Cinclus cinclus	4				4	4	18	1				23	35			35	148	34	79	14		1	1	277
Skupaj / Total	1292	850	676	2823	5641	455	143	14265	434	618	6039	21954	1368	725	639	2732	1074	1843	399	415	866	255	173	5025

Nadaljevanje dodatka 1 / Continuation of Appendix 1

	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	RE	Skupaj/ Total	O	OS	OZ	OR	Skupaj/ Total	Skupaj vse/ Total overall
G. ste.																	6				6	6
G. arc.		1				1											21				21	22
P. car.	32	977	58	66	19	1152	36	5	41	15	4	4	20	41	5	89	227	34	10		271	2928
P. ari.																	60				60	60
M. pyg.																	1	1			2	858
E. gar.												1				1	8	69	5		82	84
A. alb.		48	23	3	3	77	3		3	2		6	7	34	1	50	2	27	1		30	694
A. cin.	10	89	62	10	12	183	12	2	14	13	10	14	14	36	2	89	17	33	10		60	1161
C. cic																						6
T. ruf.		47	175		10	232	31	7	38	30		3	1	6		40	20	8	17		45	821
P. cri.		106				106	2		2				2			2	123	1			124	347
P. gri.		2				2											2				2	4
P. aur.																	1				1	3
P. nig.		4				4											77				77	83
H. alb.		2				2								1		1						11
R. aqu.			1		1	2								2		2		1	5		6	90
G. chl.			12		2	14		8	8			2	4			6	1	2	1	3	7	132
F. atr.		5	39		35	79	2		2					4		4	17	7	714	5	743	2346
G. gru.														100		100						100
R. avo.																		4			4	4
P. squ.																		3			3	3
C. alp.																	2	24			26	26
L. min.							2		2													9
G. gal.			6		2	8						2	13	62		77		4			4	114
S. rus.														1	1	2						2
N. arq.																	8	2	4		14	14
A. hyp.					1	1											8	1			9	17
T. och.																						45
T. neb.																	5		20		25	27
C. rid.		13	1			14											954	442	84	4	1484	2687
I. mel.																	3			2	5	5
L. can.																	1				1	19
L. fus.																						1
L. arg.																						2
L. mic.										8		131	210			349	722	343	48	9	1122	1566
L. cac.																						97
L. mic. / cac.		124	7			131																157
T. san.																	27				27	27
A. att.	2	8	8	3	1	22	1	3	4	5	4	1	1	3		14	4	3	3		10	145
C. cin.	3		12	1		16				130	76	5	13			224						579
	153	2279	1597	404	126	4559	686	236	922	415	222	451	561	3839	12	5500	2506	2532	1295	32	6365	52698

Iz ornitološke beležnice

From the ornithological notebook

Slovenija / Slovenia

Srednji žagar *Mergus serrator*

Red-breasted Merganser – one male observed on 4 Nov 2019 on the Ljubljanica River near Špica in Ljubljana (UTM VM60, C Slovenia); exceptional record for Ljubljana

Dne 4. 11. 2019, ko sem se ob Ljubljanici vračal s sprehoda in se ustavil na Špici, sem začel oprezati za morebitnimi neobičajnimi vrstami ptic na nasprotnem bregu Gruberjevega kanala. Prav v tistem trenutku, ob 14.50, pa sem v kanalu opazil večjo raco s svetlimi boki, ki se je tik zatem potopila. Ko se je ponovno dvignila na površje, sem opazil še dolg koničast rdeč kljun in živo rdeče oči. Vedel sem, da to ptico vidim prvič, vendar sem sklepal, da gre za vrsto žagarja. Kar nekaj časa sem jo opazoval, medtem ko je plavala na gladini, se potapljala, iskala hrano ter nekajkrat celo razprla peruti. Ves čas mojega opazovanja (13 minut) se je gibala med Hladnikovo brvjo in Špico. Ptico sem večkrat tudi fotografiral. Takoj ko sem prišel domov, sem pogledal v priročnik ter ugotovil, da ima glavo kot samica srednjega žagarja, telo pa je bolj podobno samcu – posumil sem, da gre za mladostnega samca in se o tem prepričal na spletu. Točnost podatka sem pozneje preveril še pri ornitologih. Na območju Ljubljane in njene okolice se vrsta sicer pojavlja le izjemoma (Tome *et al*. 2013).

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Polarni slapnik *Gavia arctica*

Black-throated Diver – one individual observed on 24 Apr 2020 migrating over Suha Mountain Pass (1438 m a. s. l.), Karavanke Mts. (UTM VM24, NW Slovenia)

Ko so nas sredi marca zaprli v posamezne občine zaradi epidemije koronavirusa, smo komaj čakali na skupen pobeg v hribe, kjer bi lahko spremljali selitev ujed. Na sedlu Suha (1438 m n. v.) smo selitev spremljali že jeseni 2019 in izkazalo se je, da je to odlična točka za opazovanje selitve ptic. Na sončen dan, 24. aprila ob 10.00 uri zjutraj, je sedlo na nizki višini preletel osebek polarnega slapnika *Gavia artica*, ki se je selil v smeri J–S. Gre za prvo zabeleženo opazovanje omenjene vrste med selitvijo čez Alpe. Znano je, da se veliko vrst ptic seli čez Alpe, kjer pogosto prečkajo gorske prelaze (Hohl 2019). V tem dnevu smo na 200 m dolgem

Slika 1 / Figure 1: Srednji žagar / Red-breasted Merganser *Mergus serrator,* Ljubljana, 4. 11. 2019 (foto: M. Gaberšek, www.Nalzletu.Si™)

Slika 2 / Figure 2: Polarni slapnik / Black-throated Diver *Gavia arctica*, sedlo Suha, 24. 4. 2020 (foto: M. Sešlar)

sedlu Suha v štirih urah zabeležili prelet 135 osebkov, ki so pripadali 25 vrstam ptic. Zabeležene številke nam nakazujejo pomembnost lokacije kot potencialnega ozkega grla za selitev ptic.

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Northern Gannet *Morus bassanus*

Strmoglavec – en osebek opazovan 27. 4. 2020 v laguni NR Škocjanski zatok; redko opazovanje za območje in okolico

On 27 April 2020 at 6.52 am, while monitoring the NR Škocjanski zatok's brackish lagoon from tower 14, I came across a Northern Gannet *Morus bassanus* resting on an island 200 metres away. Only the head was visible, hence I could not determine the age. It moved its head back and forth several times. At 6.56, I took my eyes off the spotter for a few seconds, but when I returned to look again the bird was not there anymore. Efforts to find it in the lagoon proved fruitless. *Morus bassanus* is a regular visitor to the Northern Adriatic in winter (Hanžel 2008). It should be noted that during April an adult had been reported around Grado, Italy. To my knowledge, this is the first inland record of *Morus bassanus* for Slovenia.

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Slika 3 / Figure 3: Northern Gannet / Strmoglavec *Morus bassanus*, NR Škocjanski zatok, 27. 4. 2020 (photo: D. Bosch Ibáñez)

Bobnarica *Botaurus stellaris*

Bittern – territorial singing by a male bird recorded between 11 Mar and 20 Apr 2020 in reeds of Lake Pernica in the Pesnica valley (UTM WM56, NE Slovenia)

V času moje spomladanske obročkovalne dejavnosti v trstišču in rogozišču Perniškega jezera sem od 11. marca do 20. aprila 2020 poslušal oglašanje samca bobnarice. Z daljšimi presledki se je oglašal zjutraj pred svitom, ko sem prišel na jezero, pa vse do 9.00 ure. Verjetno se je oglašal tudi ponoči. Bil sem ne malo presenečen nad močjo glasu, kajti bobnarica je bila oddaljena približno 50–60 m od mene. Najprej se sliši nekakšno »zajemanje sape« in nato močan večkratni in zamolkli »gvamp«, kot bi vrgel velik kamen v vodo. Zgornji del Perniškega jezera, kjer se stekata Jareninski in Vukovski potok, se je v zadnjih letih močno zamuljil in zarasel z rogozom in trstiko. Nivo vode na tem delu je nizek, zato ustreza gnezditvenim potrebam bobnarice, pri nas dokaj maloštevilne in skrivnostne ptice. Na tej lokaliteti sem jo doslej nasploh prvič zabeležil. Podatek je pomemben tudi s fenološkega vidika, kajti njeno »bobnanje« sem prvič poslušal že 11. marca. Žal 26. aprila bobnarice ni bilo več slišati. Kot gnezdilko bližnjega Komarnika pri Črnem lesu bobnarico predstavlja prvi Atlas gnezdilk Slovenije (Geister 1995). V NOAGS-u pa Perniško jezero za to vrsto ni omenjeno (Blažič 2019).

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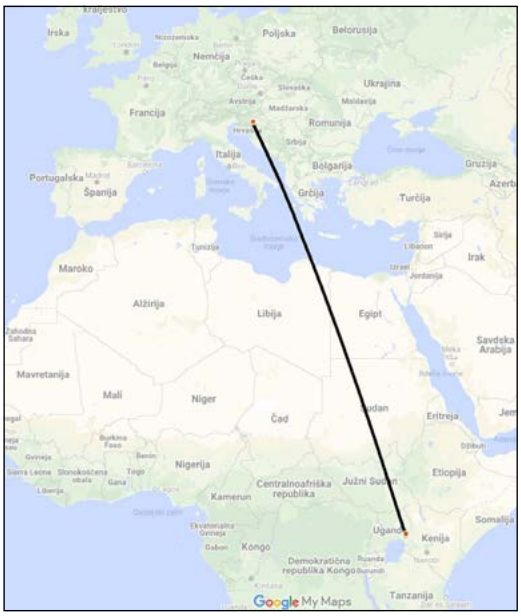
Bela štorklja *Ciconia ciconia*

White Stork – a 9 year old individual, ringed in Slovenia, illegally killed in Mbale, Uganda in 2015

Na območju Sredozemlja je problematika nezakonitega ubijanja ptic resen naravovarstveni problem. Po podatkih organizacije za varstvo ptic BirdLife International iz leta 2016 (Brochet *et al.* 2016) je na območju Sredozemlja vsako leto ubitih 24 milijonov ptic. Razlogi so različni, od športa, zabave in tudi za hrano. Januarja 2020 je Društvo za opazovanje in proučevanje ptic Slovenije kontaktirala turistična vodnica Constantine iz Kenije (vzhodna Afrika), ki vodi turistične oglede tudi po zahodni sosednji državi Ugandi. V elektronskem sporočilu nas je obvestila, da je pred petimi leti na območju kraja Mbale (1°04'50.0"N, 34°10'30.0"E) v Ugandi bila priča, kako so domačini



Slika 4 / Figure 4: Lokacija obročkanja in smrti bele štorklje / Location of ringing and death of the White Stork.

pobili kar nekaj belih štorkelj. Med pobiti belimi štorkljami pa je opazila tudi eno, ki je nosila oznako na nogi. Sklepala je, da je ta bela štorklja vključena v poseben program spremljanja. In kar nekaj časa je porabila, da nas je našla. Ta posebna bela štorklja je nosila slovenski obroček z oznako Ljubljana Slovenija Z621. Obročkana je bila 5. 7. 2006 v Dolenji Stari vasi pri Šentjerneju kot mladič v gnezdu. Njena potovanja v Afriko in nazaj so potekala najmanj osem let, preden so jo 25. 3. 2015 pobili domačini. Razlog, zakaj so jo domačini ubili, je prehranski. Kot nam je povedala Constantine, domačini belim štorkljam najprej nastavijo zastrupljena semena, da ptice postanejo omotične in jih je tako laže ulovijo. Notranje organe zavržejo, ostale dele ptice pa pojedo. V nasprotju z nekaterimi evropskimi narodi, ki ptice pobijajo za kulinarične užitke, bi za Afričane lahko rekli, da (vsaj do neke mere) ptice pobijajo za preživetje. Ampak, ali je res tako, zelo težko sodimo, ker natančne situacije ne poznamo.

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Beloglavi jastreb *Gyps fulvus*

Griffon Vulture – a group of 21 individuals observed on 23 Jun 2018 below the summit of Mt. Brana, 2253 m a. s. l., in the Kamniško-Savinjske Alps (UTM VM63, N Slovenia); a rare observation of an unusually high number of individuals outside the area of the species' usual occurrence in Slovenia

Dne 23. junija 2018 smo se Luka in Jon Poljanec, Gal Golob ter avtor teh vrstic odpravili na Brano v Kamniško-Savinjskih Alpah. Čeprav je bilo vreme cel dan sončno, pa še zdaleč ni bilo toplo, saj je v višjih legah ves dan pihal močan vzhodnik, pa tudi temperature so se zaradi prehoda hladne fronte spustile do le nekaj stopinj nad lediščem. Na kakšnih 2100 m n. m. v. smo v smeri Kamniškega sedla zagledali skrajno nenavaden prizor – jato 21 beloglavih jastrebov, ki je približno v višini Turske gore letela v smeri proti zahodu (slika 5). Beloglavi jastreb se v Sloveniji redno pojavlja predvsem v zahodnem delu Julijskih Alp ter v JZ Sloveniji, medtem ko je zunaj Julijskih Alp ter SV od linije Tolmin-Idrija-Snežnik obravnavan kot redkost (Mihelič & Genero 2005, Komisija za redkosti 2020). Takšnih opazovanj je relativno malo, običajno 1–2 na leto, in so razkropljena po celotni Sloveniji, vselej pa gre za posamezne osebke (izjema 6 os. na Cerkniškem jezeru 30. 4. 2014) (Hanžel 2014, 2015, 2016). Tudi znotraj območja rednega pojavljanja je največ opazovanj posameznih osebkov ali manjših skupin. V raziskavi med letoma 1980 in 2005 je bilo na primer ugotovljeno, da le 5 % opazovanj zadeva skupine

Slika 5 / Figure 5: Beloglavi jastreb / Griffon Vulture *Gyps fulvus*, Brana, Kamniško-Savinjske Alpe, 23. 6. 2018 (foto: M. Denac)

večje od osmih osebkov, največja opazovana skupina pa je štela 24 osebkov (Mihelič & Genero 2005). Na Breginjskem Stolu, kjer se beloglavi jastreb pojavlja v največjem številu v Sloveniji, so bila leta 2010 opravljena sistematična štetja ujed in največja skupina jastrebov je štela 35 osebkov (Denac 2010). Iz tega lahko sklepamo, da je naše opazovanje skupine 21 osebkov zanimivo ne le zaradi lokacije, temveč je takšno število jastrebov izjemno opazovanje tudi znotraj območja rednega pojavljanja vrste.

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Stepski lunj *Circus macrourus*

Pallid Harrier – adult male observed in the fields near the village of Podova (UTM WM54, NE Slovenia)

Dne 24. 3. 2020 sem se vračal z običajnega terena v okolici zadrževalnika Medvedce. Kot običajno me je pot proti domu vodila v smeri vasi Podova. Njive v okolici vasi so med selitvijo vedno privlačne za marsikatero ujedo ali kakšno drugo zanimivo vrsto. Ta dan pa me je presenetila bela silhueta v daljavi, ob kateri sem takoj pomislil na lunja. Glede na čas sta obstajali samo dve možnosti – pepelasti ali stepski. Ko sem se varno ustavil, sem ugotovil, da gre za čudovitega samca stepskega lunja *Circus macrourus*, ki sem ga imel možnost opazovati tako, kot še nikoli prej.

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Slika 6 / Figure 6: Stepski lunj / Pallid Harrier *Circus macrourus*, Podova, 23. 3. 2020 (foto: J. Novak)

Dular *Charadrius morinellus*

Dotterel – 10 individuals recorded on 1 Apr 2020 near Medvedce reservoir (UTM WM53, NE Slovenia), 1 individual on 16 Apr 2020 near Beka (UTM VL15, SW Slovenia) and flock of 11 individuals spotted flying over Rogla on 20 Apr 2020 (UTM WM24, NE Slovenia)

Leto 2020 je bilo dobro za opazovanje dularjev na selitvi. Sam sem v tem letu doživel tri srečanja s tem severnim gostom. Prvo srečanje je bilo 1. 4. 2020, ko sem na njivah S od zadrževalnika Medvedce opazoval 10 osebkov. Dularje sem opazoval z varne razdalje, nakar so se po cca. 20 minutah opazovanja dvignili in odleteli v smeri SV. Naslednje opazovanje je bilo 16. 4., ko sem v kraju Beka popisoval transekt študije za 2. tir. Sredi gradbišča sem zagledal že zelo svatovsko obarvanega dularja, ki je dobesedno tekal med tovornjaki in delovnimi stroji. Tretjič sem dularje opazoval 20. 4. na Rogli, kjer je jata 11 osebkov letela v smeri zadrževalnika Medvedce, ki se ga iz stolpa na Pesku, od koder sem dularje opazoval, tudi vidi (SZ).

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Slika 7 / Figure 7: Dular / Dotterel *Charadrius morinellus*, Beka, 16. 4. 2020 (foto: A. Ploj)

Čoketa *Gallinago media*

Great Snipe – one individual flushed from grasslands near Bevke, Ljubljansko barje (UTM VL59, C Slovenia) on 10 May 2020; sixth record for the site and twentieth for Slovenia

Dne 10. maja 2020 sem že v mraku začel pohod čez svoj kvadrant za repaljščico *Saxicola rubetra* nekoliko vzhodno od Bevk na Ljubljanskem barju. Na samem začetku popisa sem iz melioracijskega kanala splašil samico čapljice *Ixobrychus minutus*, ki sem jo pred tem na Barju (z izjemno nekaterih ribnikov) videl le dvakrat. Dobro uro pozneje, okrog sedmih, sem skozi mejico stopil na velik vlažen travnik in prepodil nekaj srn, da so stekle proti nasproti ležeči mejici. Pri tem so iz visoke trave splašile srednje velikega pobrežnika, ki je za nekaj metrov poletel tik nad tlemi ter se hitro usedel nazaj v kritje. Že med njegovim pristankom sem bil prepričan, da opazujem čoketo, zaradi enotne obarvanosti ter beline v repu ter perutih (belo obarvani konci krovnih peres). Ptico sem še enkrat splašil, ko sem nadaljeval s popisom, in v letu mi je uspelo narediti dva dokumentarna posnetka (slika 8), na katerih je videti temno podperutje in trebuh, kot tudi izostanek belega zadnjega roba peruti, ki ga opazimo pri kozici. Tudi oglašanje splašene ptice se ni ujemalo z oglašanjem kozice. Čoketa je v Sloveniji redka selivka, ki ni opažena vsako leto. Na Ljubljanskem barju je bila opazovana šestkrat, od tega trikrat spomladi in trikrat jeseni (Hanžel 2014, Hanžel 2016, Hanžel & Denac 2018, Hanžel & Šere 2012, Komisija za redkosti 1993). Opazovanje je potrdila Nacionalna komisija za redkosti (KRED).

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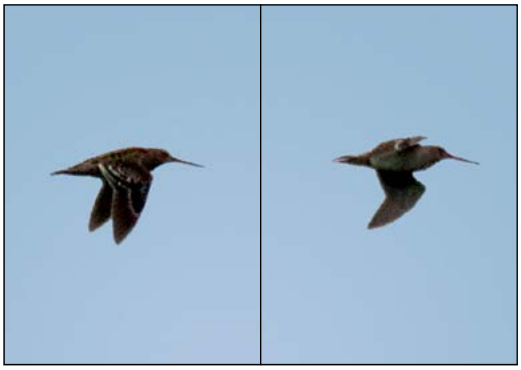

Slika 8/ Figure 8: Čoketa / Great Snipe *Gallinago media*, Bevke, Ljubljansko barje, 10. 5. 2020 (foto: M. Denac)

Črnoglavi galeb *Ichthyaetus melanocephalus*

Mediterranean Gull – 71 individuals observed at Medvedce reservoir (UTM WM53, NE Slovenia) on 26 Jun 2020; the largest number in continental Slovenia

Črnoglavi galeb se v Sloveniji v večjem številu pojavlja samo na Obali, kjer je bilo največ zabeleženih 780 osebkov (Denac *et al*. 2011). V notranjosti Slovenije se črnoglavi galeb redno pojavlja na Ptujskem jezeru, kjer gnezdi (Denac & Božič 2019), ter na zadrževalniku Medvedce (Bordjan & Božič 2009, *lastni podatki*). Na obeh območjih je najvišje zabeleženo število občutno nižje kot na Obali, le nekaj deset osebkov. V juniju in juliju se na Zadrževalniku Medvedce redno pojavlja na selitvi skupaj z rečnimi galebi *Chroicocephalus ridibundus*. 26. 6. 2020 sem v popoldanskem času zabeležil 71 črnoglavih galebov. Med temi sem zasledil le tri spolno nezrele osebke. V več jatah so prileteli iz V, na zadrževalniku za kratek čas pristali in nato odleteli proti JZ. Nekaj osebkov je skupaj z rečnimi galebi tu tudi prenočilo. Gre za največje število opazovanih črnoglavih galebov v notranjosti Slovenije.

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Kozača *Strix uralensis*

Ural Owl – a male heard on 3 May 2020 on the southern slope below Kamniški vrh (UTM VM62, N Slovenia), where the species was first observed on 27 Apr 2020

Kozača je pri nas pogosta sova, z jedrom populacije v južni Sloveniji. V Alpah je še vedno dokaj redka. Tam glavnina populacije živi na planotah Julijcev (Vrezec 2019). 3. 5. 2020 sem se odpravil skozi dolino Korošice proti Kompoteli v Kamniško-Savinjskih Alpah. V temi pred jutranjim mrakom sem v zgornjem delu doline slišal oglašanje treh samcev lesnih sov *Strix aluco*. Ko so potihnili, sem s severnega pobočja Kamniškega vrha zaslišal oglašanje samca kozače. Vrsta na območju Kamniškega vrha v okviru novega Atlasa ptic ni bila zabeležena (Vrezec 2019), je pa bila na podobnem mestu opazovana 27. 3. istega leta (Atlas ptic 2020). Čeprav je bila vrsta med

popisi mnogokje najverjetneje spregledana, se ta tudi prostorsko širi (Vrezec 2019).

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Modra taščica *Luscinia svecica cyanecula*

Bluethroat – adult male ringed on 2 Jun 2020 at Lake Pernica (UTM WM56, NE Slovenia); although caught in a suitable breeding habitat, breeding was not confirmed later on

V trstišču zgornjega dela Perniškega jezera sem 2. junija 2020 obročkal ptice in bil nemalo presenečen, ko se je okoli 9. ure v mreži pojavil samec modre taščice, z belo piko na prsih podvrste *cyanecula*. Pojavljanje modre taščice v gnezditvenem času in v primernem habitatu prav gotovo pomeni sum na gnezditev. Pri nas je znanih kar nekaj opazovanj in obročkanih osebkov iz spomladanskega obdobja, ki se nanašajo na selitev v marcu in aprilu (Šere 1982, Šere 1994, Geister 1983, Kazmierczak 1987, Ciglič & Trebar 1998). Tudi NOAGS te vrste kot gnezdilke ali možne gnezdilke ne omenja (Mihelič *et al.* 2019). Celo Reiser (1925) gnezditev modre taščice ni potrdil, čeprav bi naj bila v tistem času opazovana na gnezditvi v mrtvici Črna mlaka na levem bregu Drave v Dupleku. Danes velike dravske mrtvice ni več, nekdanje poplavno območje pa je v celoti pozidano. Vse zgodovinske podatke o modri taščici je pred leti analiziral tudi Geister (1993). Podobna pojavljanja v gnezditvenem času kot v Pernici zasledimo pri naših sosedih na avstrijskem Štajerskem, kjer je teritorialni samec v primernem gnezditvenem habitatu celo pel, a gnezditev kasneje ni bila potrjena (Albegger *et al.* 2015). Najbližje Sloveniji modra taščica gnezdi na Nežiderskem in Blatnem jezeru (Dvorak *et al.* 1993, Magyar *et al.* 1998). Pojav modre taščice v gnezditvenem času me je zelo presenetil, kajti v Sloveniji nima gnezditvenega statusa. Resnici na ljubo, bil sem tudi malo v dvomih glede gnezditve. Kajti, če bi šlo za gnezditev, bi jo prav gotovo ujel že mnogo prej, saj sem v perniškem trstišču pogosto lovil in obročkal tudi spomladi. Da bi vendarle razvozlal uganko, sem 7. in 12. junija znova obiskal trstišče in preverjal morebitno navzočnost modre taščice s predvajanjem njenega petja ter opazovanjem in poslušanjem možnega odziva. Odziva ni bilo. Dne 14. junija sem poskusil znova z lovom z mrežami, ki se v trstičju najbolje obnesejo za preverjanje morebitne navzočnosti skrito živečih vrst. A tudi tokrat in kasneje v juliju o taščici ni bilo sledu. Modra taščica lahko gnezdi tudi nekoliko kasneje, zato pazljivost seveda ni odveč. Tako je pri nas na primer 5. avgusta 1992 na ornitološki postaji Vrhnika bil ujet povsem grahast mladostni osebek, 2 osebka pa še 29. avgusta istega leta na Cerkniškem jezeru (Šere 1994). V perniškem primeru gre verjetno za klateški osebek, dogodek pa je nadvse razburil naše duhove.

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Slika 9 / Figure 9: Modra taščica / Bluethroat *Luscinia svecica cyanecula*, Perniško jezero, 2. junij 2020 (foto: F. Bračko)

Šmarnica *Phoenicurus ochruros* & pogorelček *Phoenicurus phoenicurus*

Black Redstart x Common Redstart – a hybrid between the two species recorded on 23 May 2020 near Rogla (UTM WM24, NE Slovenia)

Med popisi za vetrne elektrarne na Rogli sem 23. 5. 2020 na Jurgovem poslušal petje šmarnice. Ker v tistem trenutku ni bilo preleta, sem v ptico na žici usmeril teleskop. Sprva sem bil začuden, ker ptica ni bila videti kot šmarnica, ampak bolj kot pogorelček. Imela je zelo svetel, bel zgornji del glave, črno grlo in prsi, od prsi navzdol pa je bila oranžna. Po nekajminutnem brskanju po spletu sem prišel do zaključka, da sem opazoval križanca med šmarnico in pogorelčkom.

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Slika 10 / Figure 10: Križanec šmarnice in pogorelčka / Black Redstart *Phoenicurus ochruros* and Common Redstart *Phoenicurus phoenicurus* hybrid, Rogla, 23. 5. 2020 (foto: A. Ploj)

Puščavec *Monticola solitarius*

Blue Rock-thrush – a female observed feeding on a small rodent on 17 May 2019 at Črni Kal quarry (UTM VL14, SW Slovenia); uncommon choice of prey

17. maja 2019 sem bolj po naključju obiskal kamnolom na Črnem Kalu pod Kraškim robom. Ob prihodu sem takoj zaslišal svarilno oglašanje puščavca in opazil samca in samico s hrano v kljunu. V aktivnem delu kamnoloma je bilo slišati tako močno ropotanje in nekakšno razbijanje, da sem nameraval že oditi. Ker je imel samec v kljunu gosenico in se spreletaval okoli mene, sem ga tudi lahko slikal (slika 11). V tistem trenutku sem zagledal tudi samico v skali steni, kako tolče v levo in desno s kljunom, podobno, kot je včasih videti pri vodomcu z ribico v kljunu. Med natančnejšim opazovanjem sem ugotovil, da ima v kljunu nekaj večjega, podobno "kosmati kroglici". Nikakor mi ni uspelo točno videti, za kaj gre, saj je s plenom zelo hitro in spretno udarjala ob tla. Kljub številnim slikam ni bilo ob pregledu na nekaterih videti, kaj ima dejansko v kljunu. Res tudi je, da je spredaj del skale zastiral pogled, saj je plen večkrat za trenutek tudi odložila na tla in nato nadaljevala z udarjanjem plena. Končno mi je uspelo zagledati, da ima "puščavka" v kljunu neke vrste malega glodalca, saj se je dobro videl tudi rep. Kar nekaj časa je trajal še ta "boj" in končno je s tem plenom odletela h gnezdu z mladiči, kar pa mi v letu ni uspelo slikati. Ob pregledu slik se je le pojavila ena (slika 12), na kateri je bilo lepo videti, da ima v kljunu enega izmed malih glodalcev. V različni meni dostopni ornitološki literaturi sem zasledil podatek, da se puščavec v glavnem prehranjuje z večjimi žuželkami, plazilci, majhnimi kačami, različnim jagodičevjem in celo gekoni. Sam pa sem imel priložnost videti v Dalmaciji na Hrvaškem, da sta oba starša konec maja hranila mladiče z zrelimi češnjami, na drugem mestu, kjer češnje ne uspevajo, pa z različnimi vrstami kuščarjev. Znani hrvaški ornitolog Robert Crnković, dober poznavalec puščavca, mi je povedal, da mu ni poznan takšen primer kot ta, je pa že večkrat videl, da lahko puščavec prinese tudi manjše kače.

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Slika 11 / Figure 11: Samec puščavca s hrano v kljunu / Male Blue Rock Trush *Monticola solitarius* with pray, Črni Kal, 17. 5. 2019 (foto: D. Šere)

Slika 12 / Figure 12: Samica puščavca z malim glodalcem v kljunu / Female Blue Rock Trush *Monticola solitarius* with a small rodent pray, Črni Kal, 17. 5. 2019 (foto: D. Šere)

Tamariskovka *Acrocephalus melanopogon* & kratkoperuti vrtnik *Hippolais polyglotta*

Moustached Warbler & Melodious Warbler – first species ringed on 26 Jul 2019 and second on 8 Aug 2019 near Dole pri Lavrici (UTM VL69, C Slovenia); rare and unusual visitor in the area

Trstičevje v Doleh pri Lavrici na Ljubljanskem barju sem odkril leta 2018, ko sem se preselil na Lavrico. V tem trstičevju je najbolj pogosta gnezdilka močvirska trstnica *Acrocephalus palustris*, na obrobju pa gnezdijo kobiličar *Locustella naevia*, trstni cvrčalec *Locustella luscinioides*, trstni strnad *Emberiza schoeniclus* in še druge običajne vrste. Na jesenski selitvi so bile do sedaj ugotovljene številne vrste iz rodu trstnic, kobiličarjev, penic, listnic in drugih.

26. 7. 2019 me je v mreži presenetila tamariskovka *Acrocephalus melanopogon* (slika 13), ki se konec julija na Ljubljanskem barju izredno redko pojavlja. V tem primeru je šlo za prvoletni primerek (1y) s svežim perjem, dolžino peruti 57 mm in maso 10,6 grama. Z obročkom LJUBLJANA SLOVENIJA KT 24925 je bila tamariskovka po obveznem slikanju v roki skupaj z bičjo trstnico *A. schoenobaenus* tudi izpuščena. Slika obeh trstnic v roki ni naključje, saj so takšne slike redkost, ki lepo pokaže podobnost in zamenljivost teh dveh vrst. Običajno se mladiči po zapustitvi gnezda razpršijo naokoli in tako niso več vezani na gnezdišče. To tudi dopolnjuje podatek številnih rakarjev, ki so bili obročkani v gnezdu v Dragi pri Igu in kasneje v tem času z obročki ujeti na Ljubljanskem barju. Ob tem se postavlja vprašanje, ali je tamariskovka to leto v bližini tudi gnezdila. Najbližje možno gnezdišče bi bilo v Dragi pri Igu, kjer sta bila skoraj na isti dan, to je 27. 7. 1983, ujeta dva osebka tamariskovke (Sovinc 1983). Kljub izidu dveh Ornitoloških atlasov Slovenije je gnezdenje te vrste pri nas še zmeraj le napol pojasnjeno. Presenečenje se je kar nadaljevalo, saj sem 8. 8. 2019 v trstičevju v Doleh pri Lavrici ujel še osebek kratkoperutega vrtnika *Hippolais polyglotta* (slika 14), značilnega gnezdilca naše Primorske z okolico. V tem času se lahko mladiči oziroma prvoletni (1y) osebki ujamejo tudi severno od znane gnezditvene razširjenosti. Zbrani so bili naslednji biometrični podatki: dolžina peruti 65 mm, masa 9,9 g in vidni pikici na jeziku. Z obročkom LJUBLJANA SLOVENIJA AX 53020 je bil omenjeni vrtnik po slikanju v roki tudi izpuščen. Podoben primer se je zgodil npr. že davnega leta na

Slika 13 / Figure 13: Tamariskovka *Acrocephalus melanopogon* in bičja trstnica *Acrocephalus schoenobaenus* / Moustached Warbler and Sedge Warbler, Dole, Lavrica, Ljubljansko barje, 26. 7. 2019 (foto: D. Šere)

Slika 14 / Figure 14: Kratkoperuti vrtnik / Melodious Warbler *Hippolais polyglotta*, Dole, Lavrica, Ljubljansko barje, 8. 8. 2019 (foto: D. Šere)

Ornitološki postaji Vrhnika, ko je bil kratkoperuti vrtnik ujet in obročkan 25. 7. 1988 (Gračner 1991).

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Kratkoperuti vrtnik *Hippolais polyglotta*

Melodious Warbler – an adult individual ringed on 14 May 2020 at Dogoše near Maribor (UTM WM55, NE Slovenia); first record for NE Slovenia

Kratkoperuti vrtnik je sredozemska vrsta. Pri nas je lokalno razširjena in redka vrsta zahodne Slovenije, ki ponekod dosega večje gostote (Figelj 2019). Do sedaj se je dokaj redko pojavljal v notranjosti Slovenije. Vzhodna meja pojavljanja je bilo Ljubljansko barje, kjer je bilo doslej ujetih in obročkanih 6 os,. a le eden v spomladanskem času. Ostali so bili mladostni (1y) osebki, ki se po gnezditvi razpršijo in klatijo naokoli (Gračner 1991, Šere 1992, Šere 1996, Tome *et al.* 2005). Dne 14. 5. 2020 se je v Dogošah pri Mariboru ob 8.45 uri v mrežo ujel manjši vrtnik, ki sem ga kasneje določil za kratkoperutega: izmerjena perut 63 mm, teža 10,5 g, 1. LP presega PC za 4 mm, posneto 5. in 6. LP, dolžina 2. LP enaka 7. LP. Po vrhu telesa enotno olivno siv, spodaj rumen, noge svetle, rob zunanjih RP z bledim svetlim robom. Vrtnik je bil obročkan, fotografiran, izmerjenih je bilo še nekaj drugih parametrov, in izpuščen. Pri pregledu razpoložljive ornitološke literature nisem našel nobenega podatka o tej mediteranski vrsti za SV Slovenijo, kar pomeni, da gre za prvi spomladanski in prvi podatek nasploh za to območje.

Slika 15 / Figure 15: Kratkoperuti vrtnik / Melodious Warbler *Hippolais polyglotta*, Dogoše, 14. 5. 2020 (foto: F. Bračko)

Slika 16 / Figure 16: Perut kratkoperutega vrtnika / Wing of Melodious Warbler *Hippolais polyglotta*, Dogoše, 14. 5. 2020 (foto: F. Bračko)

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Črnočeli srakoper *Lanius minor*

Lesser Grey Shrike – one individual recorded on 24 May 2020 near NR Iški morost (UTM VL59, C Slovenia)

24. 5. 2020 sva avtor beležnice in Jure Novak fotografirala ptice v naravnem rezervatu Iški morost. Najino pozornost je pritegnila bela ptica vrh kola, kakšnih 100 metrov S od meje rezervata. Pogled skozi daljnogled je takoj razkril, da gre za črnočelega srakoperja. Ves čas opazovanja je lovil in se celo približeval. Posedal je po vrhovih grmovja ter količkih. Po nekaj minutah opazovanja je zletel za grm in izginil iz najinega vidnega polja.

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Rjavoglavi srakoper *Lanius senator*

Woodchat Shrike – a male recorded on 6 May 2020 at Lake Cerknica (UTM VL56, C Slovenia)

6. 5. 2020 sem popisoval ptice na Cerkniškem jezeru. Zelo razočaran nad kupi posekanega grmovja, v katerem je še lani prepevala pisana penica *Sylvia nisoria*, sem kljub vsemu nekaj pozornosti namenil pticam, ki so se zadrževale na vrhovih. Poleg drevesne cipe *Anthus trivialis* sem na enem izmed kupov za hip zelo od blizu

videl ptico s čokoladno rjavo glavo; ko je vzletela, pa se je videl črno-beli kontrast v njenih perutih. Ni mi bilo težko prepoznati, da sem opazoval samca rjavoglavega srakoperja.

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Brezovček *Acanthis cabaret* in skalni plezavček *Tichodroma muraria*

Lesser Redpoll and Wallcreeper – one Wallcreeper and four Lesser Redpolls observed on the southern slope below Kamniški vrh (UTM VM62, N Slovenia) on 8 Feb 2020; first observation of both species in this area and a rare winter observation in the Alps

8. 2. 2020 sem se povzpel na Kamniški vrh. Ob sestopu sem na krušljivem, skalnatem žlebu, ki poteka po sredini pobočja, opazil premikanje, za katero se je zelo hitro izkazalo, da gre za skalnega plezalčka. Nekaj časa sem ga spremljal med hranjenjem, nato pa se je spreletel više po žlebu. Niže sem ob sestopu naletel še na štiri brezovčke, ki so se premikali po zaraščajočem pobočju. Za obe vrsti je to bilo verjetno prvo opazovanje na območju Kamniškega vrha (Atlas ptic 2020). Gre tudi za redek zimski podatek. Med začetkom novembra in koncem februarja so v spletni bazi zbrani le trije podatki (2. 11. 2017 okolica Vajneža v Karavankah; 10. 11. 2018 v okolici Tosca; 6. 12. 2015 pod Storžičem) o pojavljanju brezovčka v Alpah. V bazi je za območje Alp nekoliko več zimskih podatkov skalnega plezalčka (sedem), med katerimi je le eden februarski.

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Črnoglavi strnad *Emberiza melanocephala*

Black-headed Bunting – a male observed on 10 May 2020 near Martinjak, Lake Cerknica (UTM VL56, C Slovenia)

Dne 10. maja 2020 sem se zjutraj odpravil proti Cerkniškem jezeru, in to iz smeri Martinjaka. Ob prihodu na rob jezera so me z oglašanjem ali petjem pozdravile predvsem številne rumene pastirice *Motacila*

Slika 17 / Figure 17: Črnoglavi strnad / Black-headed Bunting *Emberiza melanocephala,* Martinjak, Cerkniško jezero, 10. 5. 2020 (foto: D. Šere)

f. cinereocapilla, v daljavi pa je bilo slišati bičje trstnice *Acrocephalus schoenobaenus* ter enega pojočega kosca *Crex crex.* Presenetili so me tudi številni razžagani topoli, pripravljeni za odvoz, ter cvetoči veliki poletni zvončki *Leucojum aestivum*. Med številnimi vrbovimi grmički ob travniku so se spreletavale rumene pastirice in na enem od teh sem zagledal rumeno pastirico s črno glavo, misleč, da je črnoglava pastirica *Motacilla f. feldegg*. Z vrbove veje je ta "pastirica" zletela na tla in pogled skozi daljnogled mi je povedal vse. Na tleh je skakajoč iskal hrano samec črnoglavega strnada *Emberiza melanocephala*. Seveda sem imel pri roki tudi fotoaparat in takoj so sledili dokumentacijski posnetki. Občasno se mi je tudi skril med travo, in ko sem se mu malo bolj približal, je zletel na grm. Tokrat sem naredil boljše posnetke, saj ga je bilo tu več videti kot na tleh. Imam občutek, da se je v zadnjem času povečalo število spomladanskih opazovanih osebkov v Sloveniji, kakor tudi možnosti za kasnejše gnezdenje (FotoNarava 2021). Več razlag obstaja, zakaj se spomladi nekatere vrste pojavijo severno od svojih gnezdišč, zato jih ne bom omenjal. Po drugi strani pa me preseneča dejstvo, da je v zadnjih petih letih na otoku Pagu črnoglavi strnad praktično izginil. Na Kolanskem blatu sem še v letih 2010–2015 zabeležil 15–20 pojočih samcev.

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Srbija / Serbia

White Stork *Ciconia ciconia*

Bela štorklja – v mestu Sombor (UTM CR57 22, S Srbija) so bila do nedavnega poznana tri aktivna gnezda bele štorklje; leta 2020 ni bilo aktivno nobeno gnezdo več

The White Stork breeds usually near and in human settlements, building a nest from large sticks on barren trees, electric pylons, buildings, or on purpose-built man-made platforms (Tryjanowski *et al*. 2009). The location of nests is usually closely related to the feeding opportunities in its surroundings. Because White Storks prefer feeding in wetlands, they construct their nests near open farmland areas with wet grasslands, or near to marshy wetlands (Tryjanowski *et al*. 2006). If wetlands provide less suitable feeding opportunity, White Storks hunt for prey in dry grassland, even collecting carrion remains (Hiraldo *et al*. 1991). White Storks in Sombor (NW Serbia) have been monitored over four decades. Mérő & Žuljević (2010) report on three active nests for the period between 2000 and 2010. In the nesting season 2020, we did not observe active nesting of White Storks in Sombor. During spring migration and the nesting season we occasionally saw foraging and individuals in flight. We assume that the constant decrease of groundwater level and the drought in the past years have caused the aridification of many wetlands in the region, which resulted in absence of breeding. First, the nest on the western periphery of the town became inactive at the end of the 2000s. Second, in 2014, the nest on the northern periphery of the town fell off a high voltage electric pylon. Later, White Storks build a new nest on a chimney of a taller house, but until now no nesting has been recorded. Third, the nest on the south-eastern periphery of the town became inactive in 2020. In 2019 and 2020, the region was hit by extreme drought. The wetlands used by White Storks to feed in were completely dry. The earlier rich amphibian fauna in these habitats was completely absent. Although BirdLife International (2020) reports on increasing population trends, our long term observations in the region do not support this fact. Moreover, we believe that these past dry years are the result of the global climate change.

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