Na novi poti

On a New Path

Ne bi rad zvenel preveč dramatično, a naš časopis se je znašel pred novimi izzivi. Enega od njih, digitalizacije, smo se lotili z veliko žlico. Večina znanstvenih revij že ima svojo domačo stran in članke dostopne na spletu. Mi smo se digitalizacije lotili na zadnjem koncu in sicer preko prenosa vsebine na splet v okviru projekta Digitalna knjižnica Slovenije, ki ga vodi Narodna in univerzitetna knjižnica. Na spletu je tako dostopna celotna vsebina Acrocephalusa, na voljo pa je tudi učinkovit iskalnik. Storitev lahko preskusite na naslovu www.dlib.si, oziroma angleško verzijo na www.dlib.si/dlib_eng.asp.

Drugi projekt, ki smo se ga lotili, je sodelovanje z založbo Versita. Založba bo digitalizirala in opremljala z metapodatki (glavnimi podatki o članku) vse glavne članke iz revije, in skrbela za njihovo črpanje v večje baze podatkov. V okviru založbe je postavljena tudi domača stran revije z osnovnimi informacijami, na naslovu www.versita.com/science/lifesciences/acrocephalus/. Citiranje v pomembnejših bazah podatkov (Current Contents, Biological Abstracts itd.) je ključno zaradi večje mednarodne odmevnosti revije.

Aktivno smo se vključili tudi v delo voluntersko zasnovane baze OWL (Ornithological Worldwide Literature). Baza je ambiciozno zasnovan projekt s prispevki s celega sveta, ki jih prispevajo anagažirani prostovoljci. Ključna prednost te baze je, da ne vključuje le najkvalitetnejših revij temveč mnogo večjo maso informacij iz številnih ornitoloških revij. Acrocephalus je v bazo vključen z izvlečki od leta 1999, baza pa je prosto dostopna na naslovu www.birdlit.org/OWL/.

Zadnji kamenček v tem mozaiku je lastna domača stran revije, ta projekt pa bo uresničen do konca letošnjega leta.

Kot ste verjetno že opazili, je z letnikom 29 spremenjena tudi podoba rubrike »Iz ornitološke beležnice«. Literatura je citirana posebej, kar bistveno pripomore k preglednosti, vključeno pa je tudi več slikovnega materiala. Večkrat ob podatku obstaja tudi slika (še posebej po razvoju digiskopije in digitalne fotografije nasploh), za katero bi bilo zaradi dokumentarne vrednosti škoda, da ne bi bila objavljena. K novemu konceptu rubrike je bistveno prispeval sourednik revije Dare Šere. Ukinjena je tudi barvna priloga, saj je zaradi tehničnih sprememb v tisku barvne slike mogoče objavljati tudi znotraj revije.

Na kratko, mnogo sprememb, ki že nakazujejo, da bo najverjetneje potrebno dopolniti srednjeročni načrt revije. Treba bo sprejeti odločitev, ali nadaljevati pot proti še večji znanstveni kvaliteti revije in citiranju na seznamih SCI ali pa nadaljevati kot kvalitetna nacionalna in regionalna revija.

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I don't wish to sound overdramatic, but the fact is that our journal is facing new challenges. One of them, digitalization, has been tackled very ambitiously. Most scientific journals already have their own home pages and articles available on the net. We embarked on digitalization at the other end, to wit, through the transfer of contents to the web within the Digital Library of Slovenia project, led by the National and University Library in Ljubljana. On the net, the entire contents of Acrocephalus are thus accessible, for which an effective browser is available as well. The service can be put to the test at www.dlib.si for the Slovenian version and at www.dlib.si/dlib_eng.asp for the English version.

The second project we have already tackled is collaboration with Versita publishing house, which is to digitize and equip with metadata (major data on an article) all main articles from Acrocephalus, and take care for their transfer to the larger databases. Within the framework of Versita, the journal's home page with basic information has also been set up at www.versita.com/science/lifesciences/acrocephalus/. Citation in more pertinent databases (Current Contents, Biological Abstracts, etc.) is crucial for greater international recognition of the journal.

We have also decided to take an active part in the work of OWL (Ornithological Worldwide Literature), the voluntarily conceived base, which is an ambitiously planned project with contributions by volunteers from all over the world. The key advantage of this database lies in the fact that it includes not only the highest quality journals but a much greater mass of information from numerous ornithological journals as well. Acrocephalus has been included in the base with its abstracts since 1999, with the base freely accessible at www.birdlit.org/OWL/.

The last stone in this mosaic is the journal's own home page – a project that is to be realized by the end of this year.

As you have probably noticed, the form of the section »From the ornithological notebook« has been changed with Volume 29. Literature is cited separately, which is a key contribution to the section's greater transparency. More pictorial material has also been included. With data, photographs are often provided (especially after the development of digiscopy and digital photography in general), as owing to their documentary value it would be a pity not to publish them at all. Dare Šere, journal's associate editor, substantially contributed to this new concept of the section. The colour supplement has been discontinued, given that colour photographs can be published within the journal due to the technical alterations in its print.

In short, numerous changes have taken place that are already beginning to indicate that the journal's medium-term plan will most probably have to be supplemented. A decision will have to be made whether to continue the path towards a greater scientific quality of the journal and citings on SCI lists, or to carry on as a quality national and regional journal.

Primož Kmecl

Acrocephalus 30 (140): 3–15, 2009

Vpliv načinov gospodarjenja s travišči na ptice gnezdilke Ljubljanskega barja (osrednja Slovenija)

Effects of meadow management practices on the breeding birds of Ljubljansko barje (central Slovenia)

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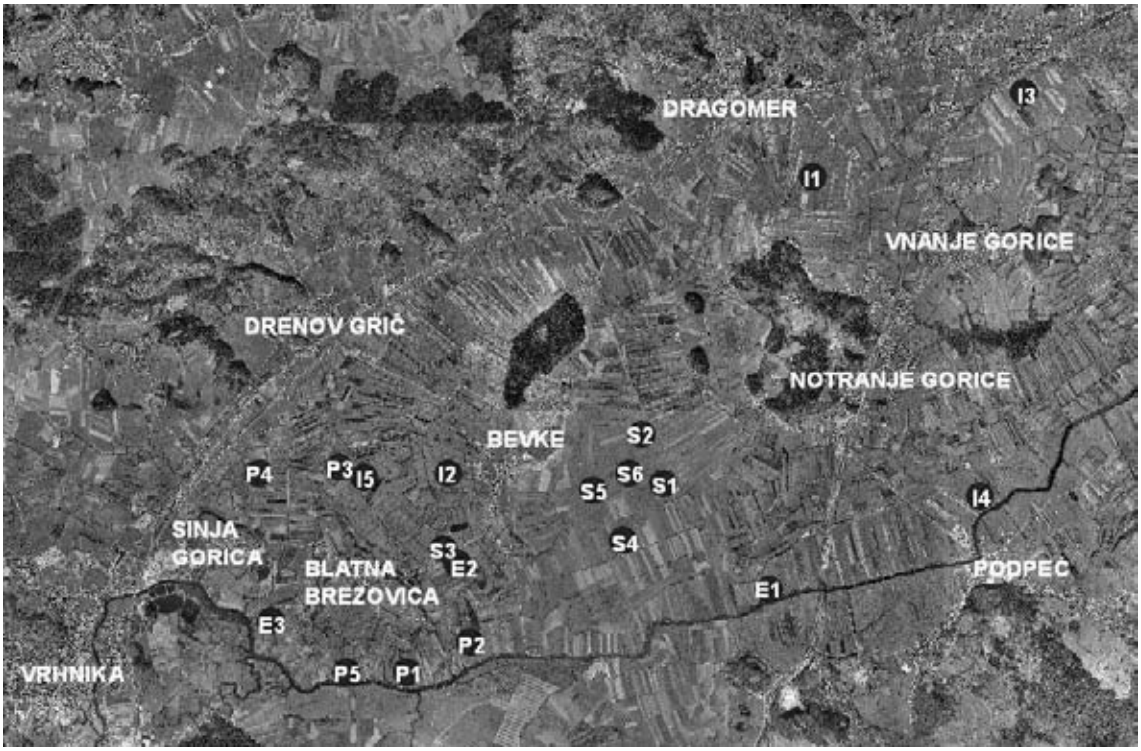
In spite of the extensive drainage works carried out in the bogs of Ljubljansko barje, the area is still important for breeding birds, particularly wet meadow species. Existence of these meadows nowadays depends very much on human management, which can be more or less intensive. Lately, more and more wet meadows are being transformed into pastures. The aim of this research was to find out how different grassland management regimes affect breeding birds at Ljubljansko barje. Intensively managed meadows, extensively managed meadows, pastures and litter meadows were compared. As birds were counted by a method adapted to pastures, counts were made from the edge of the plots. From the end of April till mid June 2003, every plot was visited four times in the morning and once during the night. Management intensity of the plot was determined by the beginning and extent of the area being mown or grazed, speed of mowing progress, number of irrigation ditches and proportion of area fertilized. The largest numbers of breeding birds were recorded in litter meadows, slightly fewer in extensively managed meadows and the least in intensively managed meadows. Considering the numbers of breeding birds, pastures were more similar to intensively than to extensively managed meadows. The beginning of mowing, extent of area mown and proportion of fertilised area were in significant negative correlation with density of nesting birds. It turned out that grazing, as practiced in the year of the research, is not suitable for maintaining wet meadows as habitats for grassland birds. The question remains, however, would less intensive grazing be a suitable alternative solution for maintaining conservationally very important wet grasslands at Ljubljansko barje, which would otherwise be abandoned.

Keywords: breeding birds, wet meadows, management, Ljubljansko barje, mowing, fertilizing, grazing
Ključne besede: gnezdilke, vlažna travišča, gospodarjenje, Ljubljansko barje, košnja, gnojenje, paša

1. Uvod

Številčnost in razširjenost travniških gnezdilk se je v Evropi v zadnjih letih močno zmanjšala, kar je posledica povečane intenzivnosti gospodarjenja s travišči, še posebej povečanega vnosa gnojil in osuševalnih del (Beintema 1988, McLaughlin & Mineau 1995, Beintema *et al.* 1997, Tucker & Dixon 1997). Na število travniških ptic lahko negativno vpliva več dejavnikov. Med njimi zgodnji pričetek košnje, hitrejša strojna košnja ter povečane gostote živine na pašnikih pripeljejo do direktnega uničenja zaroda (Andrews & Rebane 1994, Trontelj 1996, Tucker & Dixon 1997, Tomovčík *et al.* 1999, Tome 2001, Tome 2002b, Fondell & Ball 2004). Drugi, kot npr. gnojenje, izsuševanje in pogostejša košnja, posredno prek sprememb travniške vegetacije in učinkov na nevretenčarje zmanjšajo razpoložljivost ustreznih gnezdišč in hrane (Andrews & Rebane 1994, Tucker & Dixon 1997, Šeffer *et al.* 1999, McCracken & Tallowin 2004, Britschgi *et al.* 2006).



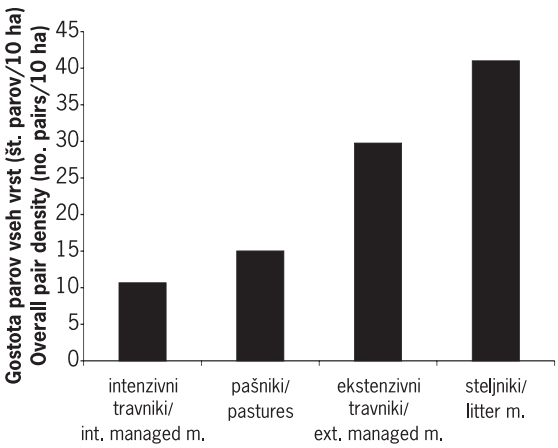
Slika 1: Ortofoto posnetek JZ dela Ljubljanskega barja z označenimi popisnimi ploskvami; I1 do I5 – intenzivni travniki, P1 do P5 – pašniki, E1 do E3 – ekstenzivni travniki, S1 do S6 – steljniki; podlaga: DOF5, © Geodetska uprava Republike Slovenije, 2002

Figure 1: Orthophoto of SW part of Ljubljansko barje, with census plots shown; I1 to I5 – intensively managed meadows, P1 to P5 – pastures, E1 to E3 – extensively managed meadows, S1 to S6 – litter meadows; map source: DOF5, © Geodetska uprava Republike Slovenije, 2002

Ljubljansko barje je zelo pomembno za travniške ptice, saj so tu še ohranjena obsežna mokrotna travišča, kjer gnezdijo (Trontelj 1994 & 1996, Tome 2000a & 2002b). Zaradi izsuševanja barja v preteklosti se travišča neprimerno hitreje zaraščajo v gozd saj ni več zmanjšane močvirnosti, ki zaraščanje upočasnjuje. Tako je danes obstoj travišč na Ljubljanskem barju odvisen od človekove dejavnosti. Gospodarjenje s travišči pa je lahko različno intenzivno. Tu najdemo intenzivno in ekstenzivno obdelovane travnike kot tudi travnike, ki se kosijo za steljo. Poleg tega je v zadnjem času vedno več vlažnih travnikov spremenjenih v pašnike.

Na Ljubljanskem barju je bilo opravljenih že kar nekaj raziskav o vplivu gospodarjenja na posamezne vrste ptic. Tako se npr. priba *Vanellus vanellus* zaradi bolj intenzivne obdelave močvirnih travišč prilagaja na gnezdenje na njivah, kjer pa je njen zarod pogosto uničen (Aleš 2004). Upad števila koscev *Crex crex* je povezan z zmanjševanjem deleža ekstenzivnih travnikov oz. njihovem spreminjanjem v intenzivne travnike (Božič 2005). Ohranjanje ekstenzivnih travišč je pomembno tudi za gnezdenje velikega škurha *Numenius arquata* (Remec 2007). Podrobneje je raziskan vpliv gospodarjenja na gnezdenje repaljščice *Saxicola rubetra.* Na preživetje njenih zarodov najpomembneje vplivata datum košnje in obtežba z živino (Denac 2007). Opredeljeno je obdobje največje občutljivosti gnezd repaljščice na košnjo, predstavljeni pa so tudi možni ukrepi za varstvo vrste (Tome 2000b). Posledica ekstenzivnega gospodarjenja je tudi rast visokih steblik. Kadar so gnezdišča obdana z njimi, repaljščice lovijo hrano bliže gnezda in krmijo mladiče bolj pogosto (Pangerc 2005).

Namen tega dela je bil ugotoviti, kako različni načini gospodarjenja s travišči na Ljubljanskem barju vplivajo na gnezdeče ptice. Zanimalo me je predvsem, kakšne so razlike v številčnosti in vrstni pestrosti gnezdilk na površinah z različnimi intenzitetami gospodarjenja, kako posamezne komponente gospodarjenja (košnja, gnojenje...) vplivajo na gostote ptic ter kakšen je vpliv paše na ptice vlažnih travišč.



Slika 2: Gnezditvena gostota vseh vrst na popisnih ploskvah z različnimi načini gospodarjenja (intenzivni travniki, pašniki, ekstenzivni travniki, steljniki) na Ljubljanskem barju v letu 2003

Figure 2: Overall breeding density on census plots with different grassland management (intensively managed meadows, pastures, extensively managed meadows, litter meadows) at Ljubljansko barje in 2003

2. Opis območja in metode

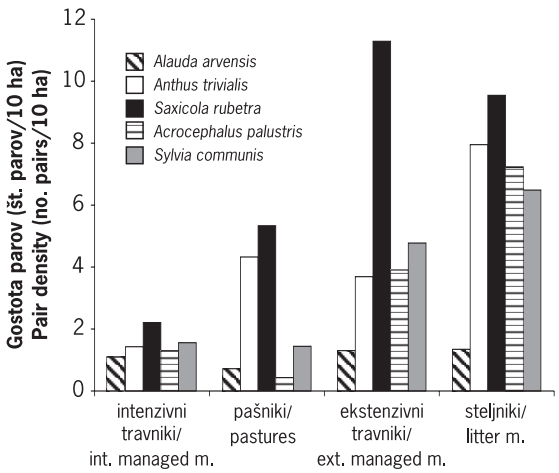
2.1. Opis območja

Za Ljubljansko barje (koordinate centroida: 46°00'N, 14°27'E) je značilno obsežno naplavljeno dno (Lovrenčak & Orožen Adamič 2001). Največji delež površin zavzemajo intenzivno gojeni travniki (40%), sledijo njive (21%). Osrednji predeli Ljubljanskega barja so pogosteje poplavljeni in niso tako primerni za kmetijstvo, zato tam najdemo tradicionalne, redko gnojene in pozno košene travnike (12%) (Kotarac & Grobelnik 1999, Tome 2002a). Površine vseh travnikov, še posebej pa ekstenzivnih travnikov in steljnikov, se hitro zmanjšujejo (Božič 2005, Tome *et al.* 2005). Do pred kratkim je prevladovala košna raba travišč, dandanes pa se predvsem na zahodnem delu Ljubljanskega barja vse bolj uveljavlja paša (Vidrih 2002).

2.2. Metode

Popisne ploskve (N = 19) ležijo v JZ delu Ljubljanskega barja (slika 1). V povprečju merijo 7.2 ha (3.7 – 12.3 ha). Ploskve sem izbrala na podlagi karte habitatnih tipov Ljubljanskega barja (Kotarac & Grobelnik 1999) in terenskega ogleda. Glede na način gospodarjenja sem jih razdelila v štiri skupine: intenzivno obdelovani travniki (N = 5), ekstenzivno obdelovani travniki (N = 3), pašniki (N = 5) in steljniki (N = 6). V zadnjo skupino sem uvrstila travnike, ki so košeni zelo pozno, večinoma za steljo, kakšno leto lahko ostanejo tudi nepokošeni.

V obdobju od 21.4. do 17.6.2003 sem vsako ploskev obiskala 4-krat v jutranjih urah in enkrat ponoči. Ptice sem popisovala z roba ploskev, saj so bili nekateri pašniki zaradi živine in ograj teže dostopni. Ob vsakem popisu sem opažene osebke vrisala na zemljevid, kot pri kartiranju (Bibby *et al.* 2000). Za gnezdeči par sem upoštevala par, pojočega samca, družino z mladiči, gnezdo z jajci ali mladiči. Za osebke, ki sem jih v različnih popisih zabeležila na istem mestu, sem sklepala, da pripadajo istemu paru. Da bi izločila morebitne preletnike, sem pri vrstah, ki



Slika 3: Gnezditvena gostota posameznih vrst travniških ptic na popisnih ploskvah z različnimi načini gospodarjenja na Ljubljanskem barju v letu 2003

Figure 3: Breeding density of meadow birds on census plots with different grassland management at Ljubljansko barje in 2003

se na gnezdišča vračajo kasneje v sezoni, upoštevala le registracije v zadnjih dveh popisih. Pare, ki sem jih zabeležila na meji ploskve, sem štela kot 0.5 para.

Na ploskvah sem poleg tega ugotavljala intenzivnost gospodarjenja: gostoto osuševalnih jarkov (dolžina jarkov na hektar travnika), delež pognojenosti ploskve, obtežbo pašnika z živino (št. glav živine/ha), datum začetka paše in/ali košnje, hitrost napredovanja košnje (delež pokošene površine posamezne ploskve/dan) ter delež ploskve, ki je bil pokošen ali popasen do konca popisa. Z namenom, da bi ovrednotila skupno intenzivnost gospodarjenja in glede na to med seboj

Tabela 1: Vrstna sestava in gostote na 10 ha posameznih vrst travniških ptic na popisnih ploskvah z različnimi načini gospodarjenja na Ljubljanskem barju v letu 2003

Table 1: Species composition and densities per 10 ha of meadow birds on census plots with different grassland management at Ljubljansko barje in 2003

	Intenzivni travniki / Int. managed m.	Pašniki/ Pastures	Ekstenzivni travniki / Ext. managed m.	Steljniki/ Litter m.	Vse ploskve/ All plots
Coturnix coturnix	0.5	-	0.4	0.5	0.4
Crex crex	-	-	-	1.3	0.4
Vanellus vanellus	0.8	0.6	-	1.0	0.7
Numenius arquata	-	-	-	0.2	0.1
Alauda arvensis	1.2	0.7	1.3	1.3	1.1
Anthus trivialis	1.4	4.3	3.7	8.0	4.5
Saxicola rubetra	2.2	5.3	11.3	9.5	6.7
Saxicola torquata	0.5	0.7	0.7	0.4	0.5
Locustella fluviatilis	-	-	-	0.5	0.1
Locustella naevia	-	-	0.9	0.6	0.3
Acrocephalus palustris	1.3	0.4	3.9	7.2	3.3
Acrocephalus schoenobaenus	0.3	-	-	0.2	0.1
Sylvia communis	1.6	1.4	4.8	6.5	3.5
Lanius collurio	-	0.6	-	0.1	0.2
Carduelis cannabina	-	0.1	1.3	2.0	0.8
Carpodacus erythrinus	-	-	-	0.1	0.0
Emberiza schoeniclus	-	-	0.2	0.4	0.1
Emberiza citrinella	0.4	0.4	0.2	0.5	0.4
Miliaria calandra	0.5	0.3	1.1	0.6	0.6
gostota parov vseh vrst / overall density	10.7	15.0	29.7	41.0	24.0
število vrst / no. species	11	11	12	19	19

primerjala različne popisne ploskve, sem intenzivnost posameznih komponent gospodarjenja (košnje, paše, jarkov in gnojenja) prikazala s pomočjo indeksov (Waite 2000), intenzivnost gospodarjenja pa nato prikazala kot vsoto teh indeksov. Indeksi in njihove vrednosti so predstavljeni v dodatku (tabele 3, 4 & 5).

Vrstno pestrost sem prikazala s številom vrst in vrstno sestavo gnezdečih ptic. Za testiranje razlik v številu gnezdečih ptic med skupinami ploskev z različnimi načini gospodarjenja sem uporabila χ^2 test. Posebej sem analizirala vrste, ki so dosegale povprečne gostote vsaj 1 par/10 ha. Za ugotavljanje korelacij med intenzivnostjo posameznih komponent gospodarjenja in številom gnezdečih ptic sem uporabila Spearmanov koeficient korelacije (Fowler *et al.* 1998).

3. Rezultati

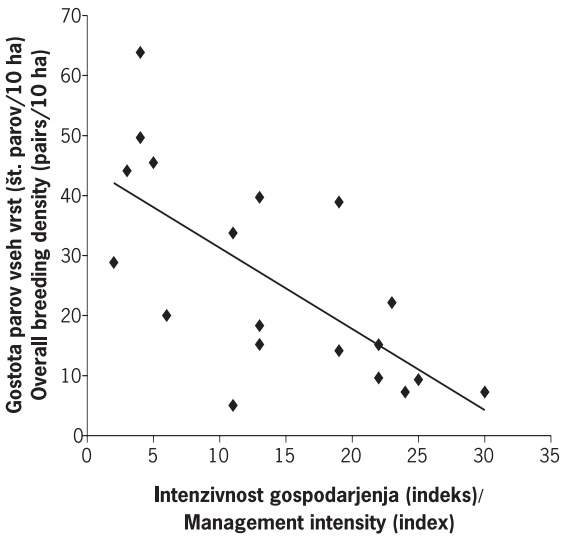
3.1. Vrstna sestava in številčnost ptic na ploskvah z različnimi načini gospodarjenja

Največje gostote parov travniških ptic sem zabeležila na steljnikih, nekoliko manj sem jih našla na ekstenzivnih travnikih, najmanj pa na intenzivnih. Pašniki so bili glede na gostoto gnezdečih parov bolj podobni intenzivnim kot ekstenzivnim travnikom in steljnikom (slika 2). Razlike v številu gnezdečih parov vseh vrst ptic med ploskvami z različnimi načini gospodarjenja so bile statistično značilne (χ^2 = 92.57, d.f. = 3, $p < 0.001$). Tudi največ vrst sem našla na steljnikih (19), vendar razlika v številu vrst med različnimi tipi ploskev ni bila statistično značilna (χ^2 = 3.17, d.f. = 3, ns). Na steljnikih so se pojavljale vse vrste, opažene v času raziskave (tabela 1). Vrste, ki so gnezdile le na tem tipu travnikov, so bile kosec, veliki škurh, rečni cvrčalec *Locustella fluviatilis* in škrlatec *Carpodacus erythrinus*. Na ekstenzivnih travnikih sem zabeležila 12 vrst, na pašnikih in intenzivnih travnikih pa 11 vrst. Med njimi ni bilo nobene, ki ne bi bila zabeležena že na steljnikih. Vrste, kot so poljski škrjanec *Alauda arvensis*, prosnik *Saxicola torquata*, rumeni *Emberiza citrinella* in veliki strnad *Miliaria calandra*, sem našla na vseh tipih travišč, povsod so bile maloštevilčne. Vrste, kot so drevesna cipa *Anthus trivialis*, repaljščica, močvirska trstnica *Acrocephalus*

Tabela 2: Korelacija gnezditvene gostote vseh vrst, števila vrst in gnezditvenih gostot petih najštevilčnejših vrst s posameznimi komponentami gospodarjenja s travišči površino ploskev in nadmorsko višino na Ljubljanskem barju v letu 2003 (N = 19; r_s – Spearmanov koeficient korelacije; * $p < 0.05$, dvostransko testiranje, ** $p < 0.01$, dvostransko testiranje)

Table 2: Correlation of overall breeding density, number of bird species and breeding densities of five most abundant species with separate management components, plot area and altitude at Ljubljansko barje in 2003 (N = 19; r_s – Spearman rank; * $p < 0.05$, two-tailed test, ** $p < 0.01$, two-tailed test)

	Število vrst/ No. Species		Gnezditvena gostota vseh vrst/ Overall breeding density		*Alauda arvensis*		*Anthus trivialis*		*Saxicola rubetra*		*Acrocephalus palustris*		*Sylvia communis*	
	r_s	sig.	r_s	sig.	r_s	sig.	r_s	sig.	r_s	sig.	r_s	sig.	r_s	sig.
začetek košnje / start of mowing	-0.429	ns	-0.604	**	0.303	ns	-0.766	**	-0.541	*	-0.299	ns	-0.514	*
hitrost košnje / speed of mowing	-0.412	ns	-0.437	ns	-0.203	ns	-0.595	**	-0.311	ns	-0.096	ns	-0.216	ns
delež pokošenega 17.6./ mowed by 17 Jun	-0.544	*	-0.721	**	0.073	ns	-0.806	**	-0.661	**	-0.310	ns	-0.527	*
intenzivnost košnje/ mowing intensity	-0.522	*	-0.693	**	0.036	ns	-0.782	**	-0.628	**	-0.295	ns	-0.490	*
delež gnojenega/ proportion of area fertilised	-0.288	ns	-0.527	*	-0.063	ns	-0.437	ns	-0.385	ns	-0.518	*	-0.626	**
gostota jarkov/ density of irrigation ditches	-0.128	ns	-0.325	ns	-0.09	ns	-0.374	ns	-0.296	ns	-0.072	ns	-0.281	ns
intenzivnost gospodarjenja/ management intensity	-0.409	ns	-0.693	**	-0.032	ns	-0.701	**	-0.517	*	-0.572	*	-0.784	**
nadmorska višina / altitude	-0.573	*	-0.649	**	0.074	ns	-0.633	**	-0.491	*	-0.657	**	-0.625	**
površina ploskve/ plot area	-0.042	ns	-0.263	ns	0.563	*	-0.397	ns	-0.147	ns	-0.304	ns	-0.342	ns



Slika 4: Korelacija skupne gnezditvene gostote z intenzivnostjo gospodarjenja s travišči (prikazano z indeksom) na Ljubljanskem barju v letu 2003 (N = 19; r_s = –0.693; p = 0.001)

Figure 4: Correlation of overall breeding density of meadow birds with management intensity (index) on Ljubljansko barje in 2003 (N = 19; r_s = –0.693; p = 0.001)

palustris in rjava penica *Sylvia communis*, so se prav tako pojavljale na vseh tipih travišč, a so bile njihove gostote na steljnikih in ekstenzivnih travnikih precej višje kot na intenzivnih travnikih in pašnikih.

Primerjava števila gnezdečih parov petih najpogostejših vrst je pokazala da na intenzivnih travnikih nobena izmed njih ni bila prav številčna. Poljski škrjanec se je na vseh tipih travišč pojavljal v manjšem številu, razlike niso bile statistično značilne (χ^2 = 0.75, d.f. = 3, ns). Pri drevesni cipi, repaljščici, močvirski trstnici in rjavi penici so bile razlike v številu gnezdečih parov med ploskvami z različnimi načini gospodarjenja statistično značilne. Repaljščica (χ^2 = 24.67, d.f. = 3, p < 0.001) je bila na vseh tipih ploskev najštevilčnejša vrsta. Pogosta je bila tudi na pašnikih, največje gostote pa je dosegala na ekstenzivnih travnikih. Drevesna cipa (χ^2 = 19.30, d.f. = 3, p < 0.001) je bila najštevilčnejša na steljnikih, precej jih je bilo tudi na pašnikih. Močvirska trstnica (χ^2 = 32.75, d.f. = 3, p < 0.001) in rjava penica (χ^2 = 19.59, d.f. = 3, p < 0.001) sta bili redki na intenzivnih travnikih in pašnikih, več jih je bilo na ekstenzivnih travnikih, najbolj številčni pa sta bili na steljnikih (slika 3).

3.2. Povezava med intenzivnostjo gospodarjenja in gostoto gnezdečih ptic

Ugotovila sem značilno negativno korelacijo skupne gostote gnezdečih parov z datumom začetka košnje, deležem pokošene površine, v manjši meri pa tudi z deležem pognojenih površin, medtem ko korelacije s hitrostjo napredovanja pokošene površine in gostoto osuševalnih jarkov niso bile značilne. Najmočneje sta bili z gostoto gnezdečih parov povezani intenzivnost košnje in skupna intenzivnost gospodarjenja (slika 4). Korelacije med posameznimi komponentami gospodarjenja in številom vrst so bile manj očitne. Število vrst je značilno upadalo ob povečevanju deleža pokošene površine, intenzivnosti košnje in naraščanju nadmorske višine. Živina se je v času raziskave pasla na štirih ploskvah. Zaradi majhnega števila podatkov nisem ugotavljala korelacij med intenzivnostjo paše (pričetkom paše, gostoto živine in deležem pašnika) in gostoto gnezdečih ptic, sem pa podatke o intenzivnosti paše vključila v skupni indeks intenzivnosti gospodarjenja (tabela 2).

Pri analizi gostot petih najštevilčnejših vrst se je izkazalo, da je bila intenzivnost košnje značilno negativno povezana z gostoto drevesne cipe, repaljščice in rjave penice. Značilno negativna korelacija je bila predvsem z deležem pokošene površine in zgodnejšim začetkom košnje. Gostote močvirskih trstnic in rjavih penic so bile značilno negativno povezane z deležem pognojene površine. Gostota jarkov ni bila značilno povezana z gostoto nobene izmed izbranih vrst. Z izjemo poljskega škrjanca je gostota vseh izbranih vrst značilno naraščala ob zmanjševanju nadmorske višine in zmanjševanju intenzivnosti gospodarjenja. Gostota poljskih škrjancev je bila od vseh upoštevanih komponent pozitivno povezana zgolj s površino ploskev (tabela 2).

4. Diskusija

Na intenzivnih ploskvah sem zabeležila manj gnezdečih ptic, kar se v veliki meri ujema s podatki iz literature. Verjetno je glavni vzrok večja intenzivnost košnje na teh površinah, vsaj tako kažejo rezultati korelacij. Pašniki so se izkazali za revnejše s pticami, kot sem sprva pričakovala, čeprav so bili večinoma urejeni na površinah nekdanjih ekstenzivnih travnikov in steljnikov. Indeksi intenzivnosti gospodarjenja kažejo, da so bili pašniki v primerjavi z drugimi ploskvami precej intenzivni. Predvsem obtežbe z živino so bile visoke, ponekod je bilo v posamezni ogradi tudi do 14 glav živine/ha. Pri tako velikih obtežbah je verjetnost, da živina potepta gnezda talnih gnezdilk zelo velika

(Andrews & Rebane 1994, Tucker & Dixon 1997, Fondell & Ball 2004).

Korelacije kažejo, da je na gostoto gnezdečih parov najbolj negativno vplivala intenzivnost košnje, predvsem delež pokošenega na ploskvah v sredini junija ter zgodnejši začetek košnje. Domnevam, da je manjša gostota ptic posledica vsakoletne zgodnje košnje, saj to vpliva tudi na strukturo in vrstno sestavo vegetacije ter zmanjša številčnost in pestrost nevretenčarskega plena (Tucker & Dixon 1997, Kobal *et al.* 1999, McCracken & Tallowin 2004, Britschgi *et al.* 2006). Poleg tega se ptice lahko izogibajo predelov, kjer jim zarod zaradi zgodnje košnje ali paše večkrat zapored propade (Müller *et al.* 2005). Na Ljubljanskem barju je obsežna zgodnja košnja verjetno glavni razlog za zmanjševanje števila koscev (Božič 2005).

Gostota gnezdečih parov je bila nižja tudi na ploskvah, ki so bile v večji meri pognojene. Lahko je šlo za dolgoročen negativni vpliv gnojenja na ptice zaradi spremenjene strukture vegetacije in s tem zmanjšane količine in dostopnosti plena (Beintema 1991, Andrews & Rebane 1994, Beintema *et al.* 1997, Tucker & Dixon 1997, Šeffer *et al.* 1999, McCracken & Tallowin 2004). Verjetno pa je večji delež pognojene površine vplival tudi na zgodnejši začetek košnje, saj na pognojenih površinah trava raste hitreje in je prej primerna za košnjo. Več o tem bi lahko sklepala, če bi poznala zgodovino košnje in gnojenja na ploskvah, tako pa sem ugotavljala le stanje v eni sezoni. Gostota parov in število vrst sta značilno upadala s povečevanjem nadmorske višine. Verjetno zaradi dejstva, da je na nižjih delih Ljubljanskega barja nivo talne vode višji, obseg in pogostost poplav pa večja, kar posredno vpliva tako na intenzivnost gospodarjenja kot na vegetacijo, s tem pa tudi na ustreznost travišč za gnezdenje ptic (Beintema 1988, Trontelj 1994, Tucker & Dixon 1997, Tomovčík *et al.* 1999, Kuczyński *et al.* 2000, Tome 2002a, Kleijn & van Zuijlen 2004).

Vpliv intenzivnosti gospodarjenja na izbrane vrste je bil različen. Na poljskega škrjanca v obsegu, kot sem jo zajela v tej raziskavi, verjetno ni imela pomembnega vpliva. Poljski škrjanec je bil pogostejši le na večjih ploskvah, kar je mogoče pojasniti s tem, da raje gnezdi na večjih odprtih površinah, izogiba pa se površinam z mejicami in osamljenimi drevesi, ki so v severozahodnem delu Ljubljanskega barja zelo pogoste (Tucker & Dixon 1997, Cramp 1998, Chamberlain & Gregory 1999, Schifferli *et al.* 1999, Mason & Macdonald 2000, Tome *et al.* 2005).

Drevesna cipa je bila izmed vseh vrst najbolj občutljiva za intenzivnost košnje, njeno število je znatno upadalo tudi ob večji intenzivnosti gospodarjenja. Podobno so ugotovili tudi Schifferli *et al.* (1999), ki imajo drevesno cipo za odličnega indikatorja ekstenzivnega kmetijstva. Zanimivo je, da je bila skupaj z repaljščico relativno pogosta tudi na pašnikih. Določen vpliv na njuno pojavljanje bi lahko imeli količki, na katerih so nameščene elektroograje pašnikov. Obe vrsti sta te strukture pogosto uporabljali kot pevsko in lovno mesto in se tako pojavljali tudi tam, kjer na sicer uniformnih traviščih ni bilo drugih izpostavljenih mest, npr. dreves, grmov ali posameznih visokih steblik. Takšne strukture so pomemben del habitata obeh vrst (Oppermann 1990, Cramp 1998, Kus Veenvliet 2002, Kumstátová *et al.* 2004, Pangerc 2005). Ker gnezd nisem načrtno iskala, je možno, da dejanska gnezditvena gostota repaljščice in drevesne cipe na pašnikih ni bila tako visoka, kot kažejo rezultati. Malo je namreč vrst, ki jim nizka ali redka vegetacija na pašnikih ustreza tudi kot gnezdišče. Večina jih za gnezdenje izbira druge biotope ter se na pašnikih le hrani (Hopkins 1991, Leroux 1991, Tucker & Dixon 1997, Hart *et al.* 2002). Repaljščice na pašnikih gnezdijo le, če v obdobju izbora gnezdišča na njih ni živine, sicer so gnezditvene gostote na pašnikih neprimerno nižje kot na košenih traviščih (Denac 2007). Višje gostote repaljščice in drevesne cipe na pašnikih tako lahko razložimo s tem, da na popisnih ploskvah v začetku gnezditvene sezone še ni bilo živine. Kasneje je bila zaradi visokih obtežb z živino verjetno večina gnezd poteptanih (Andrews & Rebane 1994, Denac 2007).

Rezultati kažejo, da je repaljščici ustrezala določena mera gospodarjenja, saj jih je bilo največ na ploskvah, ki so bile sredi junija vsaj deloma pokošene (20–30%), na tistih, ki sploh niso bile pokošene, pa sem zabeležila manjše gostote. Veliko repaljščic se je zadrževalo na ploskvah, kjer so se izmenjevale prejšnjo sezono pokošene in nepokošene parcele. Na slednjih je bilo še vedno zaslediti posamezna stebla kobulnic (Apiaceae), močvirskega osata *Cirsium palustre* in brestovolistnega oslada *Filipendula ulmaria* iz prejšnjega leta, gostota takšnih izpostavljenih prež pa pomembno vpliva na ustreznost habitata za repaljščico (Opperman 1990, Kus Veenvliet 2002, Pangerc 2005). Nepokošene ploskve z nekoliko manjšimi gostotami so bili navadno steljniki z osladom, ki za repaljščice niso optimalno gnezdišče, čeprav se v njih pogosto zadržujejo (Oppermann 1990, Tome 2001).

Močvirska trstnica in rjava penica sta imeli podoben vzorec pojavljanja glede na način gospodarjenja s travišči. Kot vrstama poznejših sukcesijskih stadijev jima ustreza višja in gostejša zeliščna vegetacija, kakršna se na primer pojavlja ob jarkih in mejicah, ter mozaik travišč in grmišč (Cramp 1998, Mason & Macdonald 2000, Bonte *et al.* 2001, Stoate & Szczur 2001,

Surmacki 2005). Na Ljubljanskem barju sta številčni na neredno košenih ali zaraščajočih se močvirnih travnikih (Tome *et al.* 2005). Zato ni presenetljivo, da sta bili na intenzivnih travnikih in pašnikih maloštevilčni, najdeni le v mejicah in ob jarkih, na steljnikih, kjer je bilo prek cele gnezditvene sezone moč najti visoko, nepokošeno zelnato vegetacijo, pa sta naseljevali celotno površino ploskev. Na pašnikih je bilo njuno število še posebej nizko, morda tudi zato, ker tam živina v nasprotju s kosilnico odstrani pritalni zeliščni sloj tudi v mejicah in ob jarkih (Stoate & Szczur 2001).

Intenzivno gospodarjenje s travišči na Ljubljanskem barju ima močan negativen vpliv na številčnost in vrstno pestrost gnezdečih ptic. Rezultati raziskave so nakazali, da trenutni režim in intenzivnost (obtežba) paše na vlažnih traviščih zahodnega Ljubljanskega barja travniškim pticam ne omogoča uspešnega gnezdenja. Po tujih izkušnjah je za talne gnezdilke sprejemljiva obtežba vlažnih travišč okrog 1 glave živine/ha, kar je bistveno manj kakor na Ljubljanskem barju (Nairn 1991, Andrews & Rebane 1994, Söderström *et al.* 2000, Vulink 2001, Hart *et al.*, 2002, Fondell & Ball 2004). Poleg tega je priporočljivo, da so območja z največjimi gostotami gnezdečih travniških ptic v času gnezditvene sezone izključena iz paše (Hart *et al.* 2002). Marsikje velja kombinacija pozne košnje in po tem sledeče paše za idealen način izkoriščanja poplavnih travnikov, ki ne škoduje tam gnezdečim pticam (Andrews & Rebane 1994, Tucker & Dixon 1997, Tomovčík *et al.* 1999, Hellström & Berg 2001). Še vedno pa ostaja vprašanje, ali bi paša ob ustrezno nižjih gostotah živine ter kasnejšemu začetku paše lahko bila primeren način izrabe za travniške ptice zelo pomembnih površin Ljubljanskega barja, ki pa so manj primerne za kmetovanje in bi bile sicer opuščene.

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5. Povzetek

Ljubljansko barje je kljub obsežnim osuševalnim posegom še vedno pomembno območje za gnezdenje ptic, predvsem vrst vlažnih travišč. Gospodarjenje s temi travišči je lahko različno intenzivno. V zadnjem času vedno več vlažnih travnikov uporabljajo kot pašnike. Namen raziskave je bil ugotoviti, kako različni načini gospodarjenja s travišči na Ljubljanskem barju vplivajo na tamkajšnje gnezdilke. Podana je primerjava intenzivnih travnikov, ekstenzivnih travnikov, pašnikov ter travnikov, košenih za steljo. Popisi so bil napravljeni po metodi, prilagojeni pašnikom, zato so potekali z roba ploskev. V obdobju od konca aprila do sredine junija 2003 je bila vsaka ploskev popisana štirikrat v jutranjih urah in enkrat ponoči. Intenzivnost gospodarjenja na ploskvah je bila opredeljena z gostoto osuševalnih jarkov, deležem pognojenih površin ter datumom začetka in deležem pokošene oz. popasene površine. Največ gnezdečih ptic je bilo zabeleženih na travnikih, košenih za steljo, nekoliko manj na ekstenzivno obdelanih travnikih, najmanj pa jih je gnezdilo na intenzivno obdelanih travnikih. Pašniki so bili po številu gnezdečih ptic bolj podobni intenzivnim kot pa ekstenzivnim travnikom. Gostote gnezdečih ptic so v statistično značilni negativni korelaciji s pričetkom košnje in deležem pokošene površine ter deležem pognojenih površin. Paša v razmerah, kakršne so vladale v letu raziskave, ni primeren način za ohranjanje močvirnih travnikov kot habitatov travniških ptic. V nadaljnjih raziskavah je treba še razjasniti, ali bi bilo takšno gospodarjenje ob ustrezno nižjih gostotah živine ter kasnejšemu pričetku paše primeren način izrabe za travniške ptice zelo pomembnih površin, ki pa so manj ugodne za kmetovanje in bi bile sicer opuščene.

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APPENDIX / DODATEK

Tabela 3: Pregled posameznih parametrov gospodarjenja in iz njih izpeljanih indeksov. V oklepaju so možne vrednosti indeksov.

Table 3: An overview of management parameters and their indices. In parentheses possible index values are shown.

Parameter gospodarjenja/ Management parameter	Oznaka/ Tag	Index	Skupni indeksi / Joint indices		
datum začetka košnje / start of mowing	A	začetek košnje (0–4)/ mowing start (0–4)	intenzivnost košnje (0–12) = A + B + C mowing intensity (0–12) = A + B + C	skupni indeks košnje in paše (0–12) = delež travnika × intenzivnost košnje + delež pašnika × intenzivnost paše joint index of mowing and grazing (0–12) = proportion of meadows x mowing intensity + proportion of pasture x grazing intensity	intenzivnost gospodarjenja (0–36) = skupni indeks košnje in paše + G + H management intensity (0–36) = joint index of mowing and grazing + G + H
hitrost napredovanja košnje (delež pokošene površine posamezne ploskve/dan)/ speed of mowing (proportion of area/day)	B	hitrost košnje (0–4)/ mowing speed (0–4)			
delež pokošene ploskve do 17.6.2003/ proportion of area mown by 17 Jun 2003	C	delež pokošenega (0–4)/ proportion mowed (0–4)			
datum začetka paše / start of grazing	D	začetek paše (0–4)/ grazing start (0–4)	intenzivnost paše (0–12) = D + E + F grazing intensity (0–12) = D+ E + F		
obtežba pašnika z živino (št. glav živine/ha)/ no. of animals per ha	E	gostota živine (0–4)/ density of animals (0–4)			
delež popasene ploskve do 17.6.2003/ proportion of area grazed by 17 Jun 2003	F	delež popasenega (0–4)/ proportion grazed (0–4)			
gostota osuševalnih jarkov (m/ha)/ density of irrigation ditches (m/ha)	G	gostota jarkov (0–12) / density of ditches (0–12)			
delež pognojenosti ploskve/ proportion of area fertilized	H	delež pognojenega (0–12) / proportion fertilized (0–12)			

Tabela 4: Kategorije indeksov gospodarjenja

Table 4: Categories of management indices

Hitrost košnje / Mowing speed	Gostota živine / Density of animals	Točke / Points
0.0500–0.0625	6.27–7.84	4
0.0375–0.0500	4.70–6.27	3
0.0250–0.0375	3.13–4.70	2
0.0125–0.0250	1.57–3.13	1
0.0000–0.0125	0.00–1.57	0
Začetek košje / Mowing start	Delež pokošenega / Proportion mowed	Točke / Points
do 13.5. / by 13 May	0.801–1.000	4
do 25.5. / by 25 May	0.601–0.800	3
do 11.6. / by 11 Jun	0.401–0.600	2
do 17.6. / by 17 Jun	0.201–0.400	1
po 17.6. / after 17 Jun	0.000–0.200	0
Delež pognojenega/ Proportion fertilized	Gostota jarkov / Density of ditches	Točke / Points
0.923–1.000	766–830	12
0.846–0.923	702–766	11
0.769–0.846	638–702	10
0.692–0.769	575–638	9
0.615–0.692	511–575	8
0.539–0.615	447–511	7
0.462–0.539	383–447	6
0.385–0.462	319–383	5
0.308–0.385	255–319	4
0.231–0.308	192–255	3
0.154–0.231	128–192	2
0.077–0.154	64–128	1
0.000–0.077	0–64	0

Tabela 5: Intenzivnost gospodarjenja s travišči na posameznih tipih ploskev na Ljubljanskem barju v letu 2003. Podani so povprečni indeksi ali povprečne izmerjene vrednosti posameznih komponent gospodarjenja; SD – standardna deviacija, mean – povprečje.

Table 5: Management intensity on different plot types at Ljubljansko barje in 2003. Mean indices or measured values are shown; SD – standard deviation.

Parameter gospodarjenja/ Management parameter		Intenzivni travniki/ Intensively managed meadows		Pašniki / Pastures		Ekstenzivni travniki/ Extensively managed meadows		Steljniki/ Litter meadows	
	Enota/ Unit	mean	SD	mean	SD	mean	SD	mean	SD
začetek košnje/ mowing start	index	3.2	0.8	1.4	1.3	2.0	1.0	0.7	1.2
hitrost košnje/ mowing speed	%/dan; %/day	3.2	1.8	1.6	1.5	3.2	0.7	0.4	0.7
delež pokošenega/ proportion mowed (17.6.)	%	97.0	4.0	40.0	40.0	66.0	34.0	7.0	11.0
intenzivnost košnje/ mowing intensity	index	9.2	0.4	4.2	3.9	7.0	1.7	1.2	1.8
začetek paše/ grazing start	index	0.0	0.0	1.8	1.8	0.0	0.0	0.5	1.2
delež popasenega/ proportion grazed (17.6.)	%	0.0	0.0	38.0	42.0	0.0	0.0	5.0	13.0
gostota živine/ density of animals	št./ha; no./ha	0.0	0.0	2.7	2.7	0.0	0.0	1.3	3.2
intenzivnost paše/ grazing intensity	index	0.0	0.0	4.6	4.4	0.0	0.0	1.3	3.3
delež pognojenega/ proportion fertilized	%	25.0	27.0	86.0	31.0	15.0	21.0	7.0	18.0
gostota jarkov/ density of ditches	m/ha	494	336	211	108	458	257	178	75
intenzivnost gospodarjenja/ management intensity	index	19.4	7.8	19.6	7.7	15.0	3.5	4.8	3.2

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Interactions between fish resources and Cormorants *Phalacrocorax carbo* in the Grado and Marano lagoon (NE Italy)

Interakcije med ribogojništvom in kormorani *Phalacrocorax carbo* v lagunah Grado in Marano (SV Italija)

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The aim of this study was to determine the importance of different environments for Cormorant *Phalacrocorax carbo* biology in the Grado and Marano lagoon (Friuli Venezia Giulia, NE Italy, Upper Adriatic Sea), and to estimate the levels of fish removal within such areas. Data were collected on Cormorant abundance and the amount of fish consumed in two fishing valli (Valle Noghera and Valle Artalina) and in three tidal areas (Goppion, Cavanata sea, Grado and Marano lagoon). The number of Cormorants per 100 ha was relatively low in all the study areas. The highest density of feeding cormorants in November (24 birds/100 ha) was in Valle Noghera. The latter is ascribed to an isolated event of 50 birds in social fishing activity. During the rest of the November survey time (72% of the total), lower densities were noted (2.5 birds/100 ha). Fish consumption was also relatively low. In Valle Artalina the maximum was 6.8 kg/100 ha in December. The highest fish consumption was estimated in Valle Noghera in November (41.9 kg/100 ha) and in the Grado and Marano lagoon in January (7.6 kg/100 ha). In fish farms, the highest fish consumption is recorded in November and December, exclusively within wintering basins and canals. So these areas should be covered with wire nets. Furthermore, considering the high variability and irregularity of fish removal, the use of active deterring methods (e.g. gas cannons) can give good results, especially if applied during social fishing events.

Key words: interactions, fisheries, Cormorant, *Phalacrocorax carbo*, Grado, Marano, lagoon
Ključne besede: interakcije, ribogojništvo, kormoran, *Phalacrocorax carbo*, Grado, Gradež, Marano, laguna

1. Introduction

The fish ponds (fishing »valli«) system of Grado and Marano lagoon (NE Italy, Upper Adriatic Sea) covers a total surface of about 1720 hectares, of a total area of 20,000 ha of coastal wetlands (Giorda 1990). Within Grado lagoon there are 38 fishing valli (1,400 ha), and in Marano 17 (320 ha; Scarelli & Venturi 2001). In Marano they are small and intensively managed. Grado fishing valli are larger and extensively managed, so water occupies on average 80% of the total surface. The most important species reared are European seabass *Dicentrarchus labrax*, the Gilthead seabream *Sparus aurata*, the Big-scale sand smelt *Atherina boyeri*, Mullets Mugilidae and the European eel *Anguilla anguilla*.

In recent decades an important decline of this activity has been observed, in terms of productivity (50 kg of fish/ha), compared to the production by the fishing valli in Caorle lagoon (80 kg/ha) and, especially, the valli in Venice lagoon (100–150 kg/ha) (Giorda 1990). This decline could be associated both to the increase of more rewarding activities (i.e. Mollusc culture) and to the depredation of stocked fish by fish-eating birds (Lanari & Ballestrazzi 1988, Giorda 1992).

The number of fish-eating bird species in Friuli Venezia Giulia wetlands, either throughout the year or during part of it, is 67 (Cosolo *et al.* 2006). In particular, in the fishing valli there is a total of 41 species, of which 27 are regularly present. The gradual increase of these species' populations has led to a growing number of conflicts with commercial fisheries all across Europe (EIFAC 1989, Marquiss & Carss 1994, Feltham *et al.* 1999).

The Cormorant *Phalacrocorax carbo* is regarded as the one with the highest impact, in terms of fish removal and of indirect effects, such as death of fish caused by thermal shock due to birds' incursions in wintering tanks and consequent injuries incurred by fish (WWF Italia 2000). The Cormorant population wintering in Friuli Venezia Giulia wetlands increased steadily from 1989 until the maximum observed in January 2001 (2,366 birds). Thereafter, the numbers decreased and, during the subsequent four winters, stabilized at about 1,700 birds (data from the IWC census, Ufficio Studi Faunistici, Friuli Venezia Giulia Region). The gradual increase of the species and claims from stakeholders have led the regional administration to authorize some abatements, after checking the ineffectiveness of ecological damage prevention systems and following approval by the National Institute for Wild Fauna (INFS). In the winter 2005/2006 a total of 198 shots were authorized, 142 in 2006/2007 and 103 in 2007/2008 (Zanetti *et al*. 2007).

The presence of Cormorants in the fishing valli could be affected both by environmental characteristics and by the structure of ponds. The most important factors appear to be the location, size and water depth of fishing basins. Stocking density and behaviour of reared fish could also play an important role (Boldreghini *et al*. 1991, Perco *et al*. 1994, McKay *et al*. 2003). Diet analysis in the Grado lagoon (Privileggi 2000) has highlighted that the main prey are, in terms of biomass, the Mullets (52.4%) and the Flounder *Platichthys flesus* (17.2%). The consumption of more important commercial species, such as European seabass and Gilthead seabream, is limited to 5.9% and 4.1% respectively of the total biomass.

In this study we have aimed to estimate the fish consumption by the Cormorant on fishing valli and tidal areas of the Grado and Marano lagoon.

2. Methods

In order to highlight the seasonal Cormorant population, we monitored monthly all 12 roosts in the coastal wetlands of Friuli Venezia Giulia between August 2006 and July 2007 (Figure 1). Censuses were carried out at dusk on a single day or, if not possible, on consecutive days, in order to avoid overestimation of the population.

We also collected data on Cormorant presence and abundance in four focal areas, namely 1) the inshore area in front of Valle Cavanata (»Cavanata sea«, 164 ha), 2) a sector of the Grado lagoon (»Goppion«, 161 ha), 3) a part of a low-production fishing valli (»Valle Artalina«, 27 ha) and 4) a high-production fishing valli (»Valle Noghera«, 65 ha). These areas were chosen in order to have an ecological gradient, from areas with natural presence of fish species to areas characterised by semi-intensive fish farming. From September 2004 to April 2005 dawn to dusk surveys were carried out once a month in each study area. During each census 1 to 3 surveyors recorded, every 30 min, all Cormorants resting and foraging in the area.

Moreover, we performed monthly surveys along a fifth area, the »Grado and Marano lagoon«, along a transect (»lagoon transect«), carried out from Grado to Lignano (Figure 1). Along the transect we monitored, twice a day (at high and low tide), 10 sites (total area of 1,346 ha), chosen as their ecological features were representative of the entire lagoon area (about 16,000 ha). At each site two observers recorded for 10 minutes all birds resting and foraging. Monitoring was performed using either a telescope 20–60x or a binocular 8–10x. The evaluation of fish consumption (kg/100 ha) in the five study areas was obtained by integrating the following data:

a) Cormorant density. In the four focal areas (Cavanata sea, Goppion, Valle Artalina and Valle Noghera) we calculated, every 30 min, the density (D_1) of foraging Cormorants, dividing the number of birds by the surface area (ha). At each site of the Grado and Marano lagoon we calculated the density of foraging Cormorants on the basis of 10 min surveys (D_2).

b) Mean weight of a potential prey. These data were obtained by the analysis of 459 pellets (Volponi 1994, Privileggi 2000), collected monthly (2006/2007) in the most important night roosts. We divided the monthly biomass by the number of prey items. For Grado and Marano lagoon, Cavanata sea and Goppion (W_1) we considered Flounder, Gobiidae species, Mullets, Gilthead seabream and European seabass to be the most important prey species (83.1% of the total biomass) (Cosolo *et al.* 2007). For the fishing valli (Noghera and Artalina) (W_2) we analysed only the data of the reared species: Mullets, Gilthead seabream and European seabass.

c) Capture rate (no. of prey/min). From the video recording of 230 foraging Cormorants (Cosolo

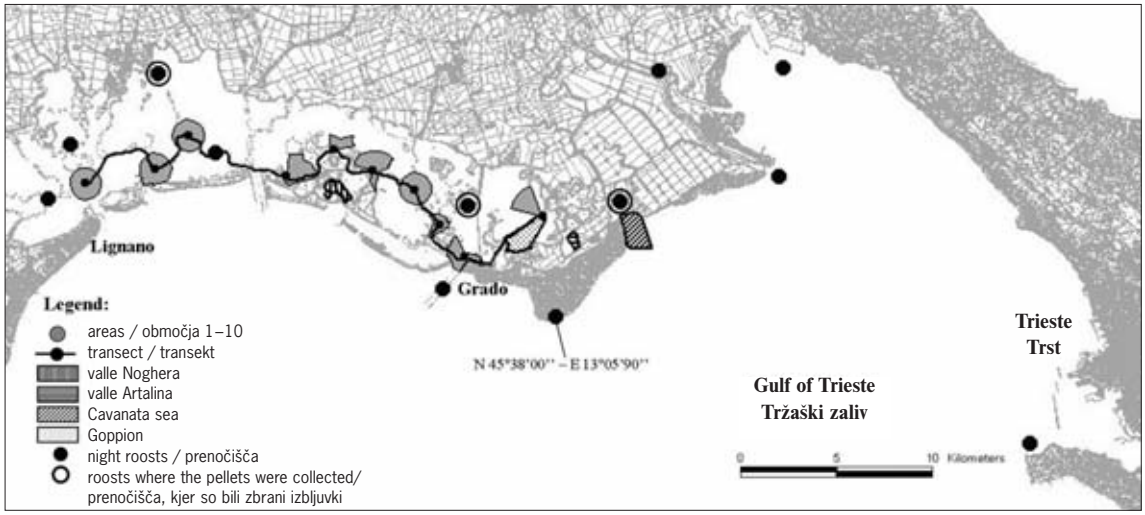

Figure 1: Study area

Slika 1: Območje raziskave

2006), we calculated a value of 0.19 prey/min for Flounders, a »benthic« prey, and 0.07 prey/min for Mullets, a »pelagic« prey. Flounders and Mullets are the most important prey species in the coastal wetlands of Friuli Venezia Giulia (Cosolo *et al.* 2007). We assigned the value of 0.07 prey/min also to Gilthead seabream and European seabass, given their similar ecology and behaviour to those of Mullets, whereas the value of 0.19 prey/min was similarly assigned to Gobiidae species (»benthic« like Flounders). The monthly mean predation rate for the Grado and Marano lagoon, Cavanata sea and Goppion (P_1) was determined by the sum of the predation rate of each prey species weighted by the frequency of the species in the pellets. In fishing valli (Noghera and Artalina), given the exclusive presence of "pelagic" species, we applied always the value of 0.07 prey/min (P_2).

For each area we then calculated the fish consumption (kg/100 ha) for every half hour in the Cavanata sea (C_1), Goppion (C_1), Valle Artalina (C_2), Valle Noghera (C_2) and for every 10 min in the Grado and Marano lagoon sites (C_3) using the formulas:

Goppion and Cavanata sea:

$$C_1 = D_1 \times [(P_1 \times 30) \times W_1]$$

Valle Artalina and Valle Noghera:

$$C_2 = D_1 \times [(P_2 \times 30) \times W_2]$$

Grado and Marano lagoon:

$$C_3 = D_2 \times [(P_1 \times 10) \times W_1]$$

Finally the "daily fish consumption" (kg/100 ha) for each month in the Cavanata sea, Goppion, Valle Artalina, and Valle Noghera was obtained from the sum of C_1 and C_2, considering that the number of half hours varied through the season, and in the Grado and Marano lagoon from the sum of C_3 values multiplied by a conversion factor to reach the daily consumption.

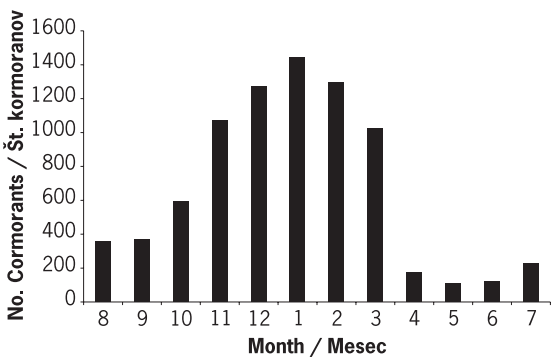

Figure 2: Number of Cormorants *Phalacrocorax carbo* in the coastal wetlands of Friuli Venezia Giulia (NE Italy) in the years 2006/2007

Slika 2: Število kormoranov *Phalacrocorax carbo* v obalnih mokriščih Furlanije Julijske krajine (SV Italija) v letih 2006/2007

3. Results

More Cormorants on roosts were recorded from December to February. In August and September numbers were stable. The population increased from October, with a peak in January. The subsequent

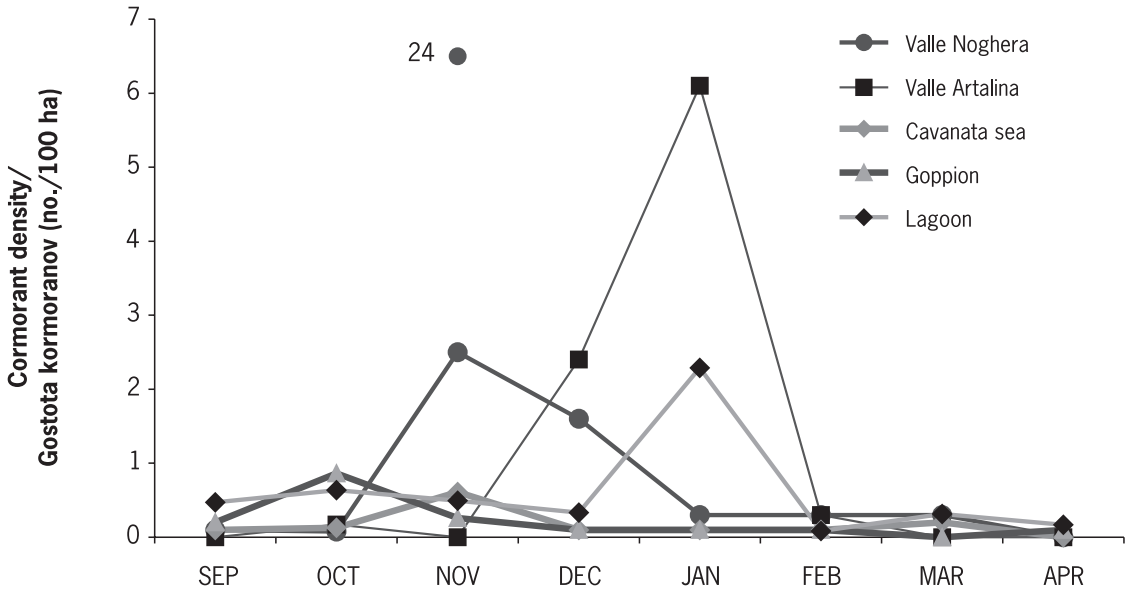

Figure 3: Monthly density of foraging Cormorants *Phalacrocorax carbo* in the five study areas

Slika 3: Mesečna gostota prehranjujočih se kormoranov *Phalacrocorax carbo* v petih območjih raziskave

progressive decrease, due to reproductive migration, resulted in the lowest numbers in May and June (Figure 2).

The number of foraging Cormorants/100 ha was relatively low in all the study areas (Figure 3). Valle Noghera was characterized by the highest density of feeding cormorants in November (24 birds/100 ha). This figure resulted from an isolated event of 50 birds in social fishing activity, that lasted less than 2 hours. During the rest of the survey time (72% of the total) lower densities (2.5 birds/100 ha), were noted, in accord with the other months (Figure 3). In January we observed an increase in Valle Artalina and in the Grado and Marano lagoon. In September–October and March–April the highest densities were observed in the lagoon areas.

Fish consumption was relatively low every month in all the study areas (Figure 4), and depended on bird densities. In September, October and April the highest values were observed in the lagoon areas. In Valle Artalina the maximum was 6.8 kg/100 ha in December. The highest fish consumption was estimated in Valle Noghera in November (41.9 kg/100 ha) and in the Grado and Marano lagoon in January (7.6 kg/100 ha) (Figure 4). The highest values in November in Valle Noghera and January in Grado and Marano lagoon are ascribed to a temporary social foraging activity, with the lowest values corresponding to the values registered during the rest of the survey time (Figure 4).

4. Discussion

The Cormorant population in the coastal area of Friuli Venezia Giulia reached a peak in January 2007. In previous winter seasons (2004/2005 and 2005/2006), we observed a maximum in February (Cosolo *et al.* 2006). Probably the high mean temperatures recorded during winter 2006/2007 favoured their presence and possibly advanced the reproductive migration to the northern European nesting areas. Moreover, the mean temperature of air and sea water was higher than in the previous 10 years (METEO FVG 2007). Nearly all the Cormorants utilised a single roost in the Grado lagoon (Valle Gorgo) for summering.

The presence of foraging individuals at the fishing valli was not constant throughout the winter. Long periods of relatively low presence or even absence were recorded, alternating with periods marked by episodic incursions of large numbers of birds. The densities of Cormorants observed in this study (nearly always less than 6 birds/100 ha) are in agreement with previous studies carried out in Friuli Venezia Giulia and Veneto Regions (Cherubini *et al.* 1993, Perco *et al.* 1994, WWF Italia 2000). These are, to our knowledge, the smallest density values when compared with other Italian wetlands, where the species reached mean values of 1.2 birds/ha (Baccetti & Corbi 1988). Fish consumption was also quite low, given that in the fishing valli of Venice lagoon fish removal of 8.2

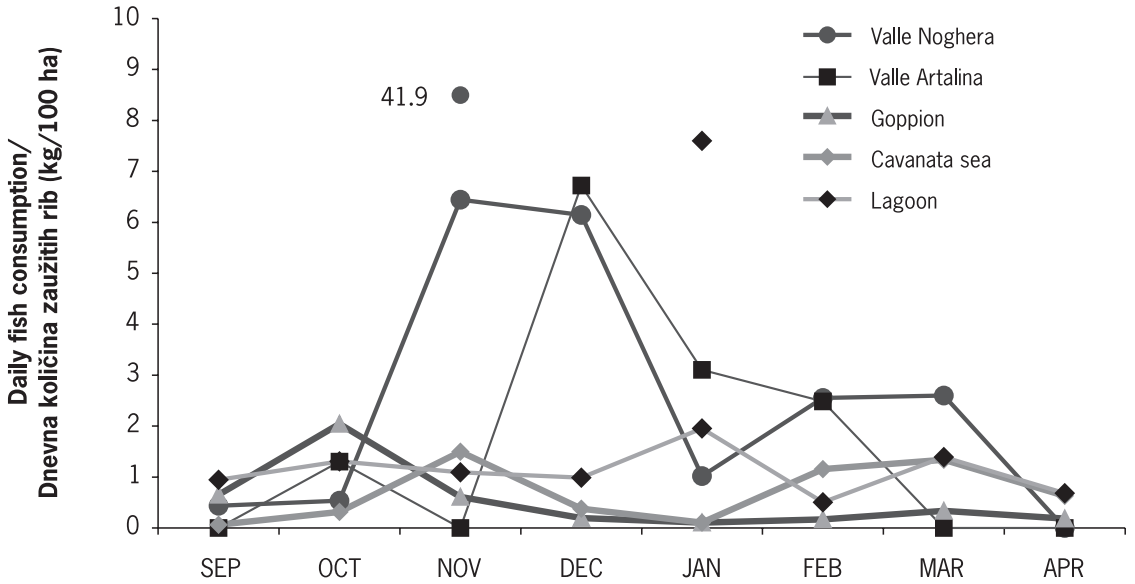

Figure 4: Daily fish consumption estimates by Cormorants *Phalacrocorax carbo* (kg/100 ha) in the 5 study areas

Slika 4: Ocena dnevne količine zaužitih rib za kormorane *Phalacrocorax carbo* v petih območjih raziskave (kg/100 ha)

kg/ha was calculated (by a different methodology) (Cherubini 1996). In our study the highest value (41.9 kg/100 ha) was recorded in November in Valle Noghera, where up to 50 birds were involved in social fishing activity. We suggest that this behaviour is linked to farm management procedures. Usually, during autumn, farmed fish are moved into wintering tanks and collection basins, in this way creating water bodies with unusually high densities of fish. If these tanks are not properly protected, Cormorants can cause huge damage in terms of fish removal (Draulans 1988, Melotti *et al.* 1993, Donati *et al.* 1995, Dieperink 1995, Melotti *et al.* 1996, Donati *et al.* 1997, Feltham *et al.* 1999). We believe that the impact could be drastically reduced if tanks used for intensive fish farming were properly protected. At present, the most effective system of protection is to cover water bodies with wire nets (Carss 2003). Furthermore, the use of active deterrent methods, like fires in salvoes and gas cannons, can give good results (Im & Hafner 1985), since the impact is irregular. The action could be maximized when social foraging occurs (Volponi & Rossi 1998). Moreover, the focused abatements should be planned only in November and December, the most critical period, and only within impacted fish farms. Nevertheless, the low efficacy of this mitigation measure (abatements) has been demonstrated (Marquiss & Carss 1994, Mellin & Mirowska-Ibron 1997, McKay *et al.* 1999, Marion 2003). Our results suggest that, in the early autumn (September and October) and spring (April), when climatic conditions are better, the most important feeding grounds are the lagoon areas (Goppion, Cavanata sea and Grado and Marano lagoon).

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5. Povzetek

Pričujočo raziskavo so avtorji prispevka opravili z namenom, da ugotovijo pomen različnih okolij za biologijo velikega kormorana *Phalacrocorax carbo* v območju lagun Grado in Marano (Benečija Julijska krajina, SV Italija, zgornji Jadran) in ocenijo količino

rib, ki jih tu pojedo te ribojede ptice. V petih območjih, in sicer dveh ribogojnicah (Valle Noghera in Valle Artalina) in treh bibavičnih območjih (Goppion, Cavanata, lagunah Grado in Marano), so bili zbrani podatki o številčnosti velikih kormoranov in količini zaužitih rib. Število kormoranov na 100 ha je bilo v preučevanih območjih razmeroma nizko. Značilnost Valle Noghera je bila, da je bila najvišja gostota prehranjujočih se kormoranov dosežena v mesecu novembru (24 osebkov/100 ha), kar gre pripisati posameznim dogodkom, ko je kakih 50 osebkov sodelovalo v skupnem ribolovu. V preostalem času popisa v novembru (72% skupnega časa) so avtorji zabeležili manjše gostote kormoranov (2.5 osebka/100 ha). Tudi količina pojedenih rib je bila razmeroma nizka. V Valle Artalina je bil maksimum (6.8 kg rib/100 ha) dosežen meseca decembra, v Valle Noghera (41.9 kg/100 ha) novembra, in v lagunah Grado in Marano (7.6 kg/100 ha) pa meseca januarja. V ribnikih pojedo veliki kormorani največ rib novembra in decembra, pri čemer niso upoštevani bazeni, v katerih kormorani prezimujejo, in kanali. Ribogojnice bi tako morale biti prekrite z žičnatimi mrežami. Upoštevaje veliko spremenljivost in nerednost glede odvzema rib avtorji zato menijo, da bi lahko bile učinkovite aktivne metode plašenja (npr. plinski topovi), še posebno med skupinskim ribolovom.

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Insects in the White Stork *Ciconia ciconia* diet as indicators of its feeding conditions: the first diet study in Slovenia

Žuželke v prehrani bele štorklje *Ciconia ciconia* kot indikatorji njenih prehranskih razmer: prva raziskava prehrane vrste v Sloveniji

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Prey remains found in the pellets of the White Stork *Ciconia ciconia* are known not to reveal the actual prey intake by the White Storks. The exceptions are the chitinous remains of insects that are quite well preserved in the pellets, and thus potentially good indicators of the actual intake of White Storks. Since insects are selected by White Storks in proportion to their abundance in the environment, they can be used as indicators of the quality of the bird foraging habitat. A preliminary test of this was carried out at three nests in NE Slovenia differing in their breeding success in 1997. In contrast to habitat analysis around the nest the proportions of Orthoptera and Coleoptera in the pellets corresponded well to the breeding success. Orthoptera species were dominant in high success, and Coleoptera (especially Carrion beetles Silphidae) in low success nests. In this paper the value of insects in White Stork pellets as indicators of the quality of the bird foraging microhabitat patches is set out. However, the indicative power of these insects needs to be tested further.

Key words: White Stork, *Ciconia ciconia,* diet, Slovenia, insects, indicators
Ključne besede: bela štorklja, *Ciconia ciconia,* prehrana, Slovenija, žuželke, indikatorji

1. Introduction

The diet of the White Stork *Ciconia ciconia* is relatively well known all over its distributional range in Europe (e.g. Pinowska & Pinowski 1985, Sackl 1987, Dziewiaty 1992, Mužinić & Rašajski 1992, Rékási 2000, Antczak *et al.* 2002, Tsachalidis & Goutner 2002). Most diet studies used pellet analysis, although it was established that prey remains found in pellets do not reveal the only prey intake by the Storks (Pinowski *et al.* 1991, Mužinić & Rašajski 1992). For example, earthworms Lumbricidae and amphibians Amphibia are mostly missing in the pellets since this prey is almost entirely digested, and other vertebrate prey e.g. mammals, birds and fish, are usually underestimated. On the other hand, chitinous remains of insects are quite well preserved in pellets (e.g. Pinowski *et al.* 1991), probably resembling well also the actual intake by White Storks. Almost all diet studies in Europe have confirmed that insects are, besides small mammals, the most important prey taken by White Storks, and that their proportion increases towards southern regions (e.g. Pinowski *et al.* 1986, Sackl 1987, Mužinić & Rašajski 1992, Rékási 2000, Tsachalidis & Goutner 2002).

Food availability strongly influences White Stork breeding success (Tryjanowski & Kuzniak 2002, Tortosa *et al.* 2003, Massemin-Challet *et al.* 2006), and breeding birds usually actively select areas with higher food abundance (Alonso *et al.* 1991, Johst *et al.* 2001, Tortosa *et al.* 2002, Jerzak *et al.* 2006). Since the White Stork is generally not a sit and wait predator, but takes prey while walking (Cramp 1994), invertebrates, i.e. insects, are selected in proportion to their abundance in the environment (Sackl 1987). Therefore a detailed analysis of insect prey in the White Stork pellets could be useful indicator of the White Stork feeding conditions, since insects are usually habitat specific and can reveal what kind and quality of habitat type the White Stork used for foraging. The

above cited references support the suggestion that White Stork forages at the best and most productive habitat patches available in the vicinity of its nest. The quality of foraging habitat can be estimated from the insect prey taken. This preliminary study was aimed to provide more insight into this problem, and to test if the specific insect prey composition in White Stork pellets corresponds to its breeding success better than a general analysis of the habitat surrounding the nest site. This study is also the first report on the White Stork diet from Slovenia.

2. Study area and methods

Three White Stork nests were selected in NE Slovenia, where the bulk of the Slovene White Stork population lives (Denac 2001): (1) Trnovska vas (46°31'13"N, 15°53'13"E), (2) Lovrenc na Dravskem polju (46°22'26"N, 15°46'41"E), (3) Spodnja Gorica (46°25'5"N, 15°41'31"E). In 1997 the brood size and number of fledged young were determined for each nest, and the breeding success was expressed as the proportion of successfully fledged young.

Table 1: Comparison of breeding success (proportion of fledged young to total number of young), diet composition (summarised data are marked in bold) and structure of surrounding habitat (categorized according to optimality of land-use types as foraging grounds) between three White Stork *Ciconia ciconia* nests in NE Slovenia in 1997 (+ indicates just the presence of plant material)

Tabela 1: Primerjava gnezditvenega uspeha (delež speljanih mladičev glede na velikost zalege), prehrane (zbirni podatki so označeni z mastnim tiskom) in strukture okoliškega habitata (kategorije so bile določene glede na optimalnost tipov rabe tal kot prehranjevališč) med tremi gnezdi bele štorklje *Ciconia ciconia* v SV Sloveniji leta 1997 (+ označuje zgolj prisotnost rastlinskega materiala)

	Locality / Lokaliteta	Trnovska vas	Lovrenc na Dravskem polju	Spodnja Gorica	Total/ Skupno
Breeding success/ Gnezditveni uspeh	No. of young / Št. mladičev	4	3	3	10
	Proportion of fledged young (%)/ Delež speljanih mladičev (%)	100.0	33.3	33.3	60.0
Diet/ Prehrana (%)	Plantae	+	+	+	+
	Talpa europaea	0.0	2.7	2.6	2.2
	Arvicolidae	4.2	2.7	2.6	2.9
	Mammalia, indet.	0.0	2.7	0.0	1.5
	Mammalia, total	4.2	8.2	5.1	6.6
	Pisces	4.2	0.0	0.0	0.7
	Vertebrata, total	8.3	8.2	5.1	7.3
	Carabus cancellatus	0.0	2.7	0.0	1.5
	Carabus granulatus	8.3	4.1	0.0	3.7
	Carabidae, other / ostalo	0.0	0.0	7.7	2.2
	Carabidae, total	8.3	6.8	7.7	7.4
	Nicrophorus sp.	0.0	1.4	0.0	0.7
	Silphidae, other / ostalo	0.0	30.1	28.2	24.3
	Silphidae, total	0.0	31.5	28.2	25.0
	Melolonthinae	0.0	8.2	10.3	7.4
	Scarabaeidae, other / ostalo	0.0	4.1	2.6	2.9
	Scarabaeidae, total	0.0	12.3	12.8	10.3
	Coleoptera, other / ostalo	16.7	32.9	35.9	30.9
	Coleoptera, total	25.0	83.6	84.6	73.5
	Gryllotalpa gryllotalpa	12.5	2.7	5.1	5.1
	Orthoptera, other / ostalo	54.2	5.5	5.1	14.0
	Orthoptera, total	66.7	8.2	10.2	19.1
	Insecta, total	91.7	91.8	94.9	92.6
	No. prey items / Št. plena	24	73	39	136
Surrounding habitat / Okoliški habitat (%)	Optimal / Optimalen	0.6	3.5	0.5	1.5
	Suboptimal / Suboptimalen	67.6	87.4	77.5	77.5
	Unsuitable / Neprimeren	31.8	9.1	22.0	21.0

Table 2: Test of differences between the three nests (TV – Trnovska vas, LDP – Lovrenc na Dravskem polju, SG – Spodnja Gorica) of the White Stork *Ciconia ciconia* in terms of the structure of the surrounding habitat (proportion of optimal, suboptimal and unsuitable foraging habitats) and of the insect part of the diet (ratio of Coleoptera to Orthoptera in the diet)

Tabela 2: Testiranje razlik v strukturi okoliškega habitata (delež optimalnega, suboptimalnega in neprimernega prehranjevalnega habitata) in v razmerju hroščev Coleoptera in kobilic Orthoptera v prehrani bele štorklje *Ciconia ciconia* med tremi obravnavanimi gnezdi v SV Sloveniji (TV – Trnovska vas, LDP – Lovrenc na Dravskem polju, SG – Spodnja Gorica)

Comparison/ Primerjava	Surrounding habitat/ Okoliški habitat	Ratio of Coleoptera to Orthoptera in the diet / Razmerje hroščev in kobilic v prehrani
TV : LDP	$\chi^2 = 17.18$, $p < 0.001$	$\chi^2 = 36.19$, $p < 0.00001$
TV : SG	$\chi^2 = 2.49$, ns	$\chi^2 = 23.60$, $p < 0.00001$
LDP : SG	$\chi^2 = 8.04$, $p < 0.05$	$\chi^2 = 0.09$, ns

Between 5 and 12 Jul 1997, pellets under each nest were collected at the time of intensive growth of the young. Pellets were examined in the laboratory and prey items were identified using reference books and collections. Only the presence of plant material was recorded while, in animal prey items, we estimated the number of individuals by bone remains (vertebrate prey), mandibles (Orthoptera) or elytron remains (Coleoptera). Analysis of the surrounding habitat was carried out in a circle of 1500 metres radius around the nest, using the Corinne land use map (MKGP 2002) and GIS tool (Arc View 3.1). This is the distance covered by the majority of foraging flights (Alonso *et al.* 1991), Based on published data (Pinowski *et al.* 1991, Tsachalidis & Goutner 2002, Denac 2006a) we classified different land use types into three classes according to their suitability for the White Stork as foraging habitat: (1) optimal (extensive meadows, water bodies), (2) suboptimal (fields, extensive orchards, intensive meadows, bushy areas and areas in succession forest stage), and (3) unsuitable habitat (hop fields, vineyards, intensive orchards, forest and urban areas). In the analysis we made pair comparisons of the proportion of habitat types (3 classes) and the proportion of Orthoptera and Coleoptera in the diet (2 classes) with the χ^2 test, and compared the results with the differences in breeding success between the observed nests.

3. Results and discussion

Insects were the most numerous White Stork prey since they constituted more than 90% of prey items in all three searched nests (Table 1). This was according to expectations since the White Stork population in Slovenia is in the species' southern distributional range in Europe (Araújo & Biber 1997), where the proportion of insect prey in diet is relatively high (Mužinić & Rašajski 1992, Rékási 2000, Tsachalidis & Goutner 2002). The proportion of vertebrate prey was low, but this can be underestimated, for the reasons discussed in the introduction. When comparing the three nests significant differences were found in the habitat structure or optimality around the nest (Table 2). The nest at Lovrenc na Dravskem polju (LDP) had the highest proportion of optimal habitats and the lowest of unsuitable ones, while there was no statistically significant difference between the nests in Trnovska vas (TV) and Spodnja Gorica (SG) – the proportion of optimal foraging habitats in the nest vicinity was low in both. However, there was no correlation with breeding success since it was high at TV and not at LDP (Table 1).

Further, we tested whether the composition of insect prey items from White Stork pellets – which should resemble relatively well the prey species proportions taken by feeding White Storks – corresponded to breeding success. In the more successful nest (TV) Orthoptera species were dominant, while in the less successful nests (LDP, SG) Coleoptera species prevailed significantly (Tables 1 & 2). Thus the insect prey structure in the diet appears to correspond very well to the actual breeding success of the White Stork. When considering only the beetle prey species, we found that in the less successful nests the most abundant were Carrion beetles Silphidae, otherwise completely absent from the more successful nest. Two possible explanations may account for this in terms of the general ecology of Carrion beetles (Koch 1989): (1) the White Storks were feeding predominantly on carcasses where carrion beetles can be very numerous or (2) that the White Storks used mainly dry areas for foraging, where Carrion beetles are more abundant than Carabid beetles Carabidae, which are also an abundant beetle prey group. We speculate that the higher proportion of Carrion beetles in the diet indicates that White Storks were feeding either in less favourable dry areas or in areas with lower amounts of suitable prey, and were therefore forced to take carrion to a greater extent.

In general White Storks select specific habitats or even microhabitat patches for foraging (Alonso *et al.* 1991, Johst *et al.* 2001), and these can vary in

optimality. However, individual birds have individual foraging strategies influenced for example by competition, quality of individuals or environmental factors (Denac 2006a & b), and they can also feed quite far away from the nest (Johst *et al.* 2001).

It is therefore almost impossible to identify in which way foraging areas influence the breeding success of White Storks. I therefore propose the use of insect prey remains, which are relatively well preserved in the White Stork pellets, as indicators of the quality of foraging microhabitat patches. To estimate the indicator power of insects in the White Stork diet more studies are needed with larger nest samples included.

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4. Povzetek

V predhodnih raziskavah je bilo ugotovljeno, da ostanki plena, najdenega v izbljuvkih bele štorklje *Ciconia ciconia*, ne odsevajo dejanske strukture plena, kot ga je ptica zaužila. Izjemna so le hitinski ostanki žuželk, ki so v izbljuvkih dobro ohranjeni in naj bi dejansko odsevali tudi število živali, ki jih je štorklja uplenila. Upoštevaje dejstvo, da štorklja pleni žuželke glede na njihovo dejansko številčnost v okolju, bi bilo mogoče uporabiti žuželke kot indikatorje kakovosti prehranjevalnega habitata bele štorklje. To hipotezo smo preliminarno testirali na primeru treh gnezd v SV Sloveniji z različnim gnezditvenim uspehom v letu 1997. V nasprotju z analizo habitata okoli gnezda se je analiza deleža kobilic Orthoptera proti hroščem Coleoptera v izbljuvkih dobro ujemala z ugotovljenim gnezditvenim uspehom preučevanih štorkelj. Kobilice so bile pogostejše v izbljuvkih ob zelo uspešnem gnezdu, hrošči (zlasti mrharji Silphidae) pa v manj uspešnih gnezdih. V prispevku je na podlagi tega predstavljen pomen žuželk v izbljuvkih bele štorklje kot indikatorjev kakovosti prehranjevalnega mikrohabitata vrste. Za oceno indikatorske moči žuželk pa bi bile potrebne dodatne raziskave v prihodnosti.

5. References

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Status of the Gannet *Morus bassanus* in the Black Sea region (E Bulgaria)

Status strmoglavca *Morus bassanus* v Črnomorski regiji (V Bolgarija)

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The Gannet *Morus bassanus* is a rare vagrant species in the Black Sea region (E Bulgaria). There are altogether 9 records of Gannet in Bulgaria over the last 100 years, all on the Black Sea coast. This paper describes the three most recent records. On 29–31 July 2008 6 individuals were observed in the vicinity of St. Constantine and Elena Resort (12 km north of the town of Varna, Varna Region, NE Bulgaria). Gannets were fishing by numerous (typical) dives, accompanied by a flock of Cormorants *Phalacrocorax carbo* and Yellow-legged Gulls *Larus michahellis*. A review of all the species' records in Bulgaria, as well as the subfossil records in the Black Sea region is given.

Key words: Gannet, *Morus bassanus*, Bulgaria, Black Sea
Ključne besede: strmoglavec, *Morus bassanus*, Bolgarija, Črno morje

1. Introduction

The present breeding distribution of Gannet *Morus bassanus* can be described as North Atlantic. The range outside the breeding season also includes the whole Mediterranean, except the Sea of Marmara (Carboneras 1992). The species has been described as an accidental visitor in the former Yugoslavia, Greece, Turkey, Lebanon, Syria and Cyprus (Cramp & Simmons 1977), some of these countries being neighbours of Bulgaria. Wanless (1997) states that the Gannet's distribution away from the colonies is relatively well known and that the breeding birds are partial migrants dispersing south to the Bay of Biscay or into the Mediterranean. Its status in the Mediterranean has been studied much more exhaustively than that in the Black Sea (Paterson 1993). In this work I present existing data on Gannet in the Bulgarian Black sea region, together with some recent observations.

2. Literature data

According to Michev (1990), the only two Bulgarian records of the species are from the Black Sea coast. The first, in 1912, is that of Varbanov (1912) in the vicinity of the town of Burgas, and the second (1 immature bird), by K. Warnke (published by Königstedt & Robel 1978) on 10 Aug 1969 in the vicinity of Slanchev Bryag resort (32 km north of Burgas). Boev (1962) specified that record of Varbanov (1912) rests on proofs that cannot be accepted, but Nankinov & Todorov (2006) comment that this specimen was actually observed during the winter in 1912 in the suburbs of Burgas. The latter authors report the record of an immature individual Gannet on 9 Jun 2005, flying over the sea in the vicinity of Shabla Lake, accompanied by a mixed flock of Yellow-legged Gulls *Larus michahellis* and Mediterranean Gulls *Larus melanocephalus*. In addition, two records are listed in the database of the Bulgarian National Rarities Committee (BUNARCO): (1) on 28 Sep 1985 in the Atanasovsko Lake Nature Reserve near Burgas (Schimkart 1992, cited in Nankinov & Todorov 2006), and (2) on 8 Aug 1995 in the Uzungeren Protected Locality (Mandra Lake) of Kiril Bedev. Nankinov (1992) asserted the status of Gannet in Bulgaria as accidental visitor. Kostadinova & Gramatikov (2007) included Gannet in the list of bird species occurring in Bulgaria. Recently Gannet was listed as a vagrant in Bulgaria (BirdLife International 2008). In addition, Christophers (2007) observed,

Figure 1: One of the Gannets *Morus bassanus* observed on 30 Jul 2008, 12 km north of town of Varna (NE Bulgaria). Photo: Z. Boev

Slika 1: Eden izmed strmoglavcev *Morus bassanus*, opaženih 30.7.2008 12 km severno od mesta Varna (SV Bolgarija). Foto: Z. Boev

on 18 Jun 2007, an adult Gannet flying from north to south along the edge of the sea, above the beach of Shabla (Dobrich Region, NE Bulgaria). Thus, the Gannet is a very rarely observed species in the 120-year long history of Bulgarian ornithology.

3. Recent observations

On 29–31 Jul 2008 we observed up to 6 Gannets in the region of the St. Constantine and Elena Resort (12 km north of town of Varna, Varna Region, NE Bulgaria). Each day the weather was sunny, calm and warm with daily temperatures up to 28°C. The observations lasted from 20 seconds up to 2–3 minutes.

On 29 Jul 2008 at about 11.00 h an adult bird was seen in flight in a north-easterly direction over the sea at approx. 200 m from the shore in the region of the Hotel Complex Slanchev Den (in the northern part of the St. Constantine and Elena Resort). It flew at approx. 30 m above the sea surface with slow wing beats. The wings were sharp, very long and with bright black tips. All other parts were white. The rear profile had the characteristic bends in the middle of the wings. Compared to the otherwise common Yellow-legged Gull *Larus michahellis* and to 3 Cormorants *Phalacrocorax carbo*, flying at that time in the region, the observed bird appeared very large.

On 30 Jul 2008 between 11.30 and 12.00, 5–6 adult birds were observed in flight over the sea from a small touristic motor-boat about 350–500 m from the shore (Figure 1). All birds were fishing and constantly made the specific dives into the water from 10–12 m height. The Gannets were fishing, together with a flock of Cormorants, and landing on the sea surface.

On 31 Jul 2008 at about 11.45 we saw 2 adult Gannets fishing about 350 m from the coast. They dived quite impressively, and were accompanied by a group of Yellow-legged Gulls, later staying on the water surface. The Yellow-legged Gulls rested on the sea surface beside the Gannets, apparently unaffected by them. At about 12.00 2 Gannets were spotted in the air, again at about 300–400 m from the shore. One of them appeared to have dark plumage (juvenile?), but we could not see the bird well enough. Christophers (2007) writes that the Gannet's flight is level and strong, with steady shallow wingbeats interspersed with short glides. Precisely the same can be said for all the birds observed in the region of the St. Constantine and Elena Resort. Some terns (Sternidae) also dive in the sea, and most of them also have white body plumage and black wing tips, but their size is very much smaller, while the wing beats are much more frequent. The specific diagnostic field features of Gannet and its particular fishing behaviour exclude any false identification. These records were accepted by the National Rarities Committee (BUNARCO).

4. Discussion

The former distribution (in Antiquity and later) of Gannet is well documented by a series of bone remains in the Northern part of the Black Sea. Burchak-Abramovic & Tsalkin (1971 & 1974) reported on 3 subfossil bones of 2 adult individuals of Gannet, found in 1969 in a Skithian settlement of Crimea (the Ukraine), dated 2000 B.C. Antipina (1981) states that the remains of Gannet are found regularly in the ancient archaeological sites of the North-West Crimea (cited in Panteleyev 2001). In addition, in the Eastern part of Crimea, he reported on 6 bones (4 individuals) from Nymphaea (4th–2nd century B.C. and 1st–2nd century A.D.) and 1 bone (1 individual) each from Pantikapea (4th century B.C. – 2nd century A.D.) and Mirmekia (probably 14th–15th century A.D.). Thus, the Ukrainian records prove the Holocene distribution of Gannet in the Black Sea.

Present records (numbered 7th to 9th) of Gannet in Bulgaria possibly confirm its actual recent dispersion eastwards, encompassing the Black Sea region, but they could also be simply the result of the more elaborated avifaunal explorations in the recent years. The seasonal distribution of the records covers 3 seasons: winter (1 record – Jan-Feb 1912); spring (2 records – 9 Jun 1969; 18 June 2007); summer

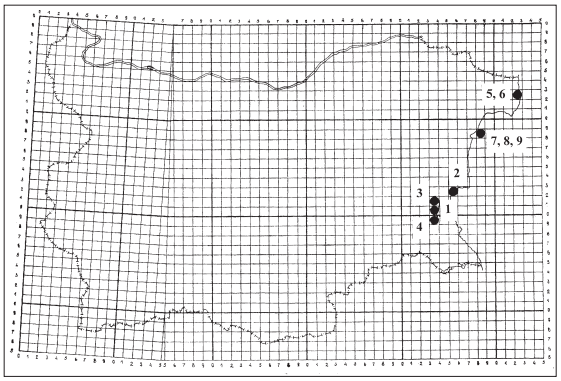

Figure 2: The occurrence of Gannet *Morus bassanus* in Bulgaria: 1 – Burgas (1912); 2 – Slanchev Bryag (1969); 3 – Atanasovsko Lake (1985); 4 – Uzungeren (Mandra Lake) (1995); 5, 6 – Shabla Lake (2006, 2007); 7, 8, 9 – St. Constantine and Elena (2008)

Slika 2: Pojavljanje strmoglavca *Morus bassanus* v Bolgariji: 1 – Burgas (1912); 2 – Slanchev Bryag (1969); 3 – Atanasovsko jezero (1985); 4 – Uzungeren (jezero Mandra) (1995); 5, 6 – jezero Shabla (2006, 2007); 7, 8, 9 – St. Constantine in Elena (2008)

(5 records – 29–31 Jul 2008; 8 Aug 1995; 10 Aug 1969); autumn (1 record – 28 Sep 1985). Neglecting the dubious record in the winter of 1912, all the remaining observations fall in the summer period, i.e. 9 Jun – 28 Sep. Only 2 of the 15 observed individuals of Gannet were immature. All the other individuals were adults with mature plumage. All the birds were observed in flight over the sea and none landed on the coast. All records are concentrated along the Bulgarian Black Sea coast (Figure 2). Obviously, the records of the Gannet along the western Black Sea (Bulgarian) coast in the last decade have become more frequent, but it is still premature to state that a change of the species' status has occurred.

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5. Povzetek

Strmoglavec *Morus bassanus* je naključni gost v Črnomorski regiji (V Bolgarija). Skupno je znanih 9 zapisov za strmoglavca v Bolgariji, vsi v tej regiji. V članku so predstavljeni trije najnovejši zapisi. V dneh med 29. in 31.7.2008 je bilo opazovanih največ 6 osebkov na območju naselij St. Constantine in Elena (12 km severno od Varne, SV Bolgarija). Strmoglavci so lovili ribe, se večkrat značilno potopili, skupaj z njimi pa je bila tudi jata kormoranov *Phalacrocorax carbo* in rumenonogih galebov *Larus cachinnans*. Avtor podaja pregled vseh zapisov strmoglavca v Bolgariji in tudi pregled subfosilnih ostankov vrste v Črnomorski regiji.

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First record of Richard's Pipit *Anthus richardi* in Slovenia

Prvi zapis za ostrožno cipo *Anthus richardi* za Slovenijo

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An individual of Richard's Pipit *Anthus richardi* was observed on the 10 Apr 2008 in the countryside near Dane pri Divači (Sežana, SW Slovenia). The bird flew by a small migratory group (6–7 specimens) of Meadow Pipit *Anthus pratensis* that were resting in a cultivated field near the Kal v Lasatkah pond, 500 metres from the village. The Richard's Pipit, like the *A. pratensis*, made short flights in the fields, often coming close to the small waterhole. After about 40 minutes the migratory group left the area.

The group of Meadow Pipits was observed with 10x42 binoculars, and the remarkable conditions, – short distance, absence of wind and low grassy vegetation – allowed the observer to detect all the diagnostic morphological characters of the Richard's Pipit – large size, brown above, streaked, dark buff breast, and flanks, also streaked dark, long yellow-brownish legs with long and straight hindclaw, long tail with white outer-feathers, strong bill, strongly marked face with pale lores and eyebrow, dark eyestripe and malar streak. The distinguishing undulating flight and the typical contact vocalization was also recorded.

Further, on 8 and 9 Apr 2008, 3–4 individuals of Richard's Pipit were observed in some grasslands in the Valle delle Noghere (Muggia, Trieste, Friuli-Venezia Giulia / Milje, Trst, Furlanija Julijska Krajina), a locality about 15 km from the Slovenian site. This record is the first for Trieste province (E. Benussi, *pers. comm.*).

Richard's Pipit breeds in southern Siberia, Mongolia, parts of Central Asia and northern, central and eastern China. It winters mainly in the Indian sub-continent, South-east Asia and southern China, with records as far south as the Indochinese region (Cramp 1988, Snow & Perrins 1997).

In the Western Paleartic the species is considered to be a scarce or rare, but regular, migrant, especially in autumn (Cramp 1988, Simms 1992, Snow & Perrins 1997). Recently, the regular wintering of individuals or small groups (and also of large groups) of birds has been confirmed in southern European regions (in order of records: Italy, Spain, mainland France, Portugal and Morocco). Occasional single wintering individuals have been recorded also for Belgium, Canary Islands, Corsica, Cyprus, Norway and the UK (Cramp 1988, Simms 1992, Snow & Perrins 1997, Grussu & Biondi 2004).

The species had never previously been recorded in Slovenia (Božič 2001). In the countries surrounding Slovenia, Richard's Pipit has been confirmed from Austria (irregular visitor), the Italian mainland (regular migrant), Croatia (rare visitor) and Hungary (occasional presence) (Snow & Perrins 1997, MME NB 1998, Magyar *et al.* 1998, Lukač 2007, Ranger 2008). In north-eastern Italy (Veneto and Friuli-Venezia Giulia) the species is an irregular migrant (Sighele *et al.* 2004, Grussu & Biondi 2004, Parodi 2006).

According to available distributional data, the observation of an individual of Richard's Pipit in southern Slovenia is not surprising, because it is quite reasonable that at least some of the individuals wintering in southern Europe cross central Europe, Slovenia included. Further field research is needed to clarify the migratory relations of the Richard's Pipit with the Slovenian territory.

The record was confirmed by the National Rarities Committee – KRED (1st record for Slovenia after 1 Jan 1950 – A1).

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Povzetek

Dne 10.4.2008 je bil opazovan 1 osebek ostrožne cipe *Anthus richardi* pri vasi Dane pri Divači (JZ Slovenija), skupaj s skupino 6–7 travniških cip. To je prvo opazovanje te vrste v Sloveniji in sovpada z opazovanji 3–4 osebkov 8. in 9.4.2008 pri Miljah v Italiji, približno 15 km od opazovanja v Sloveniji in ki so obenem prva za Tržaško provinco. Podatek je potrdila Nacionalna komisija za redkosti – KRED (1. zapis za Slovenijo po 1.1.1950 – A1).

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Iz ornitološke beležnice

From the ornithological notebook

Slovenija / Slovenia

Siva čaplja *Ardea cinerea*

Grey Heron – the first Grey Heron colony nesting on the Krka River (UTM WL38, Cerklje ob Krki, SE Slovenia), recorded on 20 Mar and 1 Apr 2008; Grey Herons nested in White Willows *Salix alba*, where 15 nests were counted

Dne 20.3. in 1.4.2008 sem ob spodnjem toku reke Krke pri Cerkljah ob Krki (UTM WL38) opazoval kolonijsko gnezdenje sivih čapelj. Ptice so si gnezda zgradila v krošnjah treh visokoraslih belih vrb *Salix alba* na otoku pod lesenim mostom. Naštel sem 15 aktivnih gnezd. Poleg nekaj gnezd, ki so bila lani zabeležena pri Dvoru (R. Rožaj *osebno*), je to prvo večje kolonijsko gnezdenje vrste ob reki Krki.

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Bela štorklja *Ciconia ciconia*

White Stork – two observed roosting on 30 Apr 2008 on the roof of a block of flats in Ljubljana (UTM VL59, central Slovenia)

Bil je večer 30.4.2008, ob 8.10 h, ko sem s kotičkom očesa skozi okno opazil, da na sosednji stolpnici čepita dve večji ptici (UTM VL59, Ljubljana-Vič). Naslednji trenutek sem že stal na balkonu z daljnogledom v rokah. Ptici sta bili beli štorklji. Medtem ko sta si urejali perje, je v meni rastel optimizem in razmišljal sem, ali si bodo morda v bližini spletle gnezdo. Optimizem je bil prenagljen, saj sta štorklji nato na sosednji stolpnici vendarle samo prenočili.

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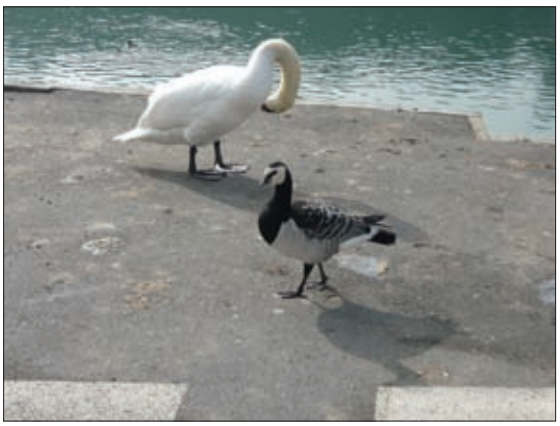
Belolična gos *Branta leucopsis*

Barnacle Goose – one individual, most probably an escapee, observed on 23 Feb 2009 on the Drava River at Lent in Maribor (UTM WM55, NE Slovenia); the record was confirmed by the National Rarities Committee – KRED (2nd record for Slovenia as an escapee – E2)



Slika 1 / Figure 1: Belolična gos / Barnacle Goose *Branta leucopsis*, 23.2.2009, Maribor – Lent. Foto: M. Marinček

Dne 23.2.2009 sem v Mariboru na Lentu ob reki Dravi opazila nenavadno gosko, ki je dotlej tam še nisem videla. Stala je na pločniku v družbi labodov grbcev *Cygnus olor*, in ko sem jo začela fotografirati, se mi ni zdela prav nič plašna, temveč se mi je z labodi vred približala na meter razdalje in me radovedno opazovala (slika 1). Ta nenavadna goska je bila belolična gos. Ugotovitev me je presenetila, saj gre za izjemno redko vrsto pri nas, ki naj bi po doslej znanih podatkih bila pri nas opazovana le enkrat (Božič 2001). Na sliki je tudi videti, da je ptica obročkana z zelenim plastičnim obročkom, iz česar je mogoče sklepati, še posebej zaradi njene neplašnosti, da gre verjetno za pobeglo gojeno ptico. Podatek je potrdila Nacionalna komisija za redkosti – KRED (2. zapis za Slovenijo kot ubežnica – E2).

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Pripis urednika:

Belolično gos je opazoval tudi Matej Lipovšek, in sicer že 16.1.2009, medtem ko jo je naslednjega dne, 17.1.2009, med štetjem za IWC opazoval tudi Alen Ploj.

Duplinska kozarka *Tadorna tadorna*

Shelduck – a male observed on 13 Apr 2008 in a flooded meadow between Bevke and Blatna Brezovica, SW of Ljubljana (UTM VL59, central Slovenia); this was the author's second record of this species, for on 26 Dec 2000 he observed 20 individuals at Planinsko polje (UTM VL59, central Slovenia)

V nedeljo, 13.4.2008 sem šel zjutraj gledat poplavljene površine na zahodnem delu Ljubljanskega barja. Okrog 10 h sem z ravnega dela ceste med Blatno Brezovico in Bevkami (UTM VL59) opazil na vodni površini samca duplinske kozarke in ga tudi fotografiral. To je moje drugo srečanje s to ptico. Dne 26.12.2000 sem na Planinskem polju opazoval dve skupini duplinskih kozark, skupaj 20 osebkov.

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Rjavi škarnik *Milvus milvus*

Red Kite – one individual observed on 6 Apr 2008 on migration above Babna gora (UTM VM40, central Slovenia)

Dne 6.4.2008 dopoldne sem nad Babno goro pri Polhovem Gradcu (UTM VM40) opazil tri ujede, ki so krožile na termičnem vzgornjiku. Po natančnejšem ogledu sem ugotovil, da gre za dve kanji *Buteo buteo*, tretjo pa sem prepoznal za rjavega škarnika. Opazoval sem jih še nekaj časa, nato pa je škarnik odletel proti severu.

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Black Vulture *Aegypius monachus*

Rjavi jastreb – dne 1.6.2006 opažen 1 osebek med preletom čez Mavhinje (Italija) in Prečnik v Slovenijo (UTM UL97, Kras); podatek je potrdila Nacionalna komisija za redkosti – KRED (1. zapis za Slovenijo po 1.1.1950 – A1)

On 1 Jun 2006, I had just returned from Rupingrande (Repen) at 15.20 h or so and sat down with a beer in the garden of my house at Malchina / Mavhinje to check for raptors (I'd already seen a Honey Buzzard *Pernis apivorus*, a Short-toed Eagle *Circaetus gallicus* and a Goshawk *Accipiter gentilis* with prey that morning and conditions and visibility were excellent). As I sat down I saw a very large raptor moving NW / SE from the direction of Monte Ermada / Grmada, so I ran to the car and grabbed my binoculars. Seeing that it was a vulture, I sat down to enjoy the spectacle of a Griffon *Gyps fulvus* passing over my head and house at 100 m... not such a rare sight in the Karst at this time of year. I raised my binoculars again, but something wasn't right... this bird seemed completely black underneath!!? A Black Vulture! I called my wife (who knows Griffons well) and she agreed that the bird was not a Griffon. As it moved slightly side on and away I could distinguish a slightly paler head and a dark brownish collar that contrasted with the black underbelly. Another difference from Griffon was that the »arm« of the wing appeared longer and the "hand" shorter when compared to that species, though the overall size seemed similar. At 15.27 h, as the bird drifted SE, I jumped in my car and gave chase. I picked up the bird not too far off as it glided over Precenicco / Prečnik and on into Slovenia (UTM UL97, Kras)! I raced over the Šempolaj / Gorjansko border crossing and got into a position where I could see all around but could not relocate the bird. My guess is that the bird is one of the French birds from the Cevennes project [www.bvcf.org], like »Ophrys« who was in NE Italy in July and August 2005 as far east as the Griffon Project at Forgaria. Hopefully, someone will pick up this bird again as she moves on, perhaps to Kvarner with the Griffons. The record was confirmed by the National Rarities Committee – KRED (1st record for Slovenia after 1 Jan 1950 – A1).

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Stepski lunj *Circus macrourus*

Pallid Harrier – one individual seen in low flight together with a group of passerines on 12 Apr 2006; the observation was made in the village of Kamna gora near Frankolovo, on Konjiška gora (UTM WM23, NE Slovenia); the record was confirmed by the National Rarities Committee – KRED (2nd record for Slovenia after 1 Jan 1950 – A2)

Dne 12.4.2006 sem se po končanem tetradnem popisu za novi atlas gnezdilk v vasi Kamna gora pri Frankolovem na Konjiški gori (UTM WM23, SV Slovenija) približeval avtomobilu. Tam sem zaslišal značilno oglašanje ptic, ki so razburjene, ko je v bližini skobec *Accipiter nisus* ali škrjančar *Falco subbuteo*. Oglašanje se je bližalo in uzrl sem kragulja *Accipiter gentilis* s skupinico spremljajočih ptičev. Vendar s tem kraguljem nekaj ni bilo prav, saj je imel daljša in precej ožja krila, ki jih je držal nekoliko privzdignjeno. Spoznal sem, da imam pred sabo lunja. A preletel me je tako blizu, da nisem mogel uporabiti daljnogleda, in po desetih do petnajstih sekundah je odjadral za hrib proti vzhodu. Svetlobne razmere so bile skoraj idealne, saj je lunj letel v moji višini in tudi sonce sem imel nad seboj. Čeprav je ptica po stasu spominjala na močvirskega lunja *Circus pygargus*, na perutih zgoraj ni imela črne črte, spodaj pa je bila bela.

Po barvi je tako bolj spominjala na pepelastega lunja *Circus cyaneus*, le da je bila bolj svetla in je imela precej manj črnine na primarnih letalnih peresih. Ta črnina je spominjala na polno črko V. V nasprotju s pepelastim tudi ni imel vratu spodaj sive barve, pač pa enake bele barve kot trup. Ker sem se s to ptico srečal že večkrat, mi ni bilo težko prepoznati stepskega lunja. Skoraj šokiran sem se usedel v avtomobil in se odpeljal domov. Podatek je potrdila Nacionalna komisija za redkosti – KRED (2. zapis za Slovenijo po 1.1.1950 – A2).

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Sokolič *Falco columbarius*

Merlin – a male observed on 16 Nov 2008 at Volovja reber (UTM VL44, S Slovenia, 900 m a.s.l.)

Pozimi, ko na Volovji rebri (UTM VL44) ni postovk, je težko zamenjati sokoliča s katerim koli drugim sokolom, saj je manjši od postovke, veliko maha s perutmi, nima izrazitih brkov, samček pa še posebej zbuja pozornost s svojim modrosivim perjem na zgornji strani, rjastim ovratnikom ter rjastorjavim perjem na spodnji strani. Samčka sokoliča sem lahko opazoval v nedeljo 16.11.2008 na pobočju Volovje rebri, na 900 m nm.v.

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Žerjav *Grus grus*

Crane – observation of a flock of about 170 individuals on 6 Mar 2009 on Mt Nanos flying towards Hrušica plateau (UTM VL37, central Slovenia)

Dne 6.3.2009 smo Irena Kavčič, Danijel Borkovič in avtor prispevka iskali medvedko, opremljeno s telemetrijsko ovratnico na zahodnem delu Nanosa (UTM VL37). Ko smo se popoldne ustavili na eni izmed točk in iskali signal, sem zaslišal oddaljeno oglašanje. S pogledom sem ujel večjo jato ptic, ki se je počasi oddaljevala proti Hrušici. Pogled skozi daljnogled mi je razkril, da gre za žerjave. Lotil sem se štetja, a ker se je jata hitro oddaljevala, sem moral nekoliko pohiteti in nisem utegnil prešteti vsake ptice posebej. Ocenil sem, da je bilo v jati okoli 170 žerjavov. Leteli so v smeri proti severovzhodu. Po doslej zbranih podatkih o opaženih jatah žerjavov pri nas (D. Bordjan *osebno*), gre za eno izmed najštevilčnejših jat žerjavov, opaženih v Sloveniji.

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Mala Uharica *Asio otus*

Long-eared Owl – one individual heard on 13 and 28 May 2008 in the eastern part of Snežnik plateau (UTM VL54, S Slovenia) at 1240 m a.s.l., and a feather found in the western part of the plateau (UTM VL45, S Slovenia) at 1000 m a.s.l. in the same month

Zvečer dne 13.5.2008 sem na robu večje jase sredi velikega kompleksa dinarskih gozdov v bližini Klanske police na Snežniški planoti (UTM VL54) na nadmorski višini približno 1240 m nm.v. čakal na rjavega medveda *Ursus arctos*. Medveda tisti večer sicer ni bilo, sem pa kmalu po obisku divjega prašiča *Sus scrofa* ob približno 22.00 h v bližini zaslišal petje male uharice. Na to se je z oglašanjem takoj odzvala samica kozače *Strix uralensis*, ki sem jo sicer skupaj s samcem slišal že tudi prej. Dne 28.5.2008 sem se vrnil na isto mesto in kmalu po polnoči znova zaslišal petje male uharice. Istega meseca sem na Snežniški planoti zabeležil še en podatek za malo uharico, in sicer pod Devinom nad Koritnicami (UTM VL45) na približno 1000 m nm.v., kjer sem našel pero. Čeprav sem ti dve lokaciji v času gnezdenja večkrat obiskal tudi v prejšnjih letih, male uharice na območju Snežniške planote nad 1000 metri dotlej še nisem zabeležil. Mala uharica sicer velja za nižinsko vrsto (Tome 1996), vendar je bila v preteklosti že večkrat najdena na višjih nadmorskih višinah, tako v Dinaridih (Krofel 2005, Berce 2008), kot drugod po Sloveniji (Božič & Vrezec 2000, Mihelič 2000).

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Čuk *Athene noctua*

Little Owl – two individuals observed on 20 Jul 2008 near Prekopa (UTM VM92, Savinja Valley, E Slovenia); the first record of Little Owl in Savinja Valley after 1996

Slika 2 / Figure 2: Čuk / Little Owl *Athene noctua*, 20.7.2008, Prekopa, Savinjska dolina. Foto: J. Figelj

Dne 20.7.2008 sva se s Polonco vračala iz Štajerske v Ljubljano. Med vožnjo proti Prekopi (UTM VM92) po stari cesti se mi je za hip zazdelo, da sem na zidu stare stavbe par sto metrov pred gostilno Aida opazil čuku podobno pojavo (slika 2). Ker sva se mimo peljala malce prehitro, sem takoj obrnil avtomobil z namenom, da preveriva, ali sva res opazila čuka ali pa je tam stal le star dotrajan lesen tram. Izkazalo se je, da gre res za čuka. Veselje je bilo še večje, ko sva opazila, da nimava opraviti le z enim čukom. Za dotrajanim gospodarskim poslopjem stoji sadovnjak v zaraščanju, kjer je bil še drugi čuk. Oba sta se oglašala, verjetno nista bila navdušena nad mojim skakljanjem okrog njihovega gnezdilnega okoliša, nato pa odletela iz mojega vidnega polja. To je prvo opazovanje čuka v Savinjski dolini po letu 1996 (Vogrin 2000).

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Hudournik *Apus apus*

Swift – nesting of 5–10 pairs in the belfry of the Church of Tri Fare at Rosalnice near Metlika; a rare breeder in Dolenjska region (UTM WL25, SE Slovenia)

Dne 5.6.2008 sem ob pregledu netopirjev v romarski cerkvi Tri Fare v Rosalnicah pri Metliki (UTM WL25) zaslišal tudi manjšo skupino črnih hudournikov, ki je ob glasnem vreščanju večkrat obletela cerkev. Po opazovanju sem ugotovil, da na podstrehi zvonika gnezdi 5–10 parov. Pločevina, ki je odstopila, je pticam odprla dostop do varnega gnezdišča. Kolikor vem, je to ena redkih zabeleženih gnezdilnih lokacij vrste na Dolenjskem in v Beli krajini. Geister (1995) navaja zgolj možno gnezditev za semiški kvadrat.

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Srednji detel *Dendrocopos medius*

Middle Spotted Woodpecker – a suitable habitat for the species recorded on a slope between Dolenja Straža and Soteska (UTM WL07, SE Slovenia) in mature oak forest; at a distance of 1 km, playback was performed four times, each time successful

Dne 9. in 24.2.2008 sva z Joaqinom Lopezom prehodila varovalni gozd na strmem južnem pobočju Ajdovske planote nad Stražo (UTM WL07). Hrastove sestoje označuje izjemna ohranjenost gozdnega ekosistema z velikim deležem suhih in odmrlih dreves, saj zaradi velike strmine in skalnatosti tu ne gospodarijo. Najino pozornost so pritegnili predvsem srednji detli, ki so bili ob obeh obiskih teritorialno dejavni. Ob drugem obisku sem na razdalji dobrega kilometra štirikrat preveril njihovo navzočnost s posnetkom, na katerega se je potem vselej odzval par, včasih celo dva. Glede na to, da so podobne habitatske razmere značilne za celotno južno pobočje Ajdovske planote med Sotesko in Dolenjo Stražo na razdalji skoraj osmih kilometrov, v višinskem pasu med 400 in 500 metri, je tu verjetno kar omembe vredna populacija srednjih detlov.

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Calandra Lark *Melanocorypha calandra*

Laški škrjanec – dne 26.6.2005 opažen en pojoči osebek na Banjšicah v bližini Čepovana (UTM VM00, Z Slovenija); podatek je potrdila Nacionalna komisija za redkosti – KRED (2. zapis za Slovenijo po 1.1.1950 – A2)

Slika 3 / Figure 3: Lokacija opazovanja laškega škrjanca *Melanocorypha calandra* / Location of the Calandra Lark observation, 24.6.2005, Banjšice. Foto: P. Tout

On 24 Jun 2005, I visited Banjška planota near Čepovan (UTM VM00, W Slovenia), together with two expert Italian birdwatchers Gigi Felcher and Ignazio Zanutto. Having walked for about half an hour through the flowery meadows with the odd potato patch here and there, at about 7.30 h I became aware of what I thought was a Lesser Whitethroat *Sylvia curruca* singing intermittently, together with snatches of Greenfinch *Carduelis chloris* and Mistle Thrush *Turdus viscivorus* calls against a general background of Skylark *Alauda arvensis* song. When looking for the Lesser Whitethroat, we realised the songs and calls were coming from the sky! Gigi (who had returned from Greece only the previous week) said »You know, Calandra Lark imitates lots of other birds«. At this point we scanned the sky and found the bird singing, holding itself stock still with what appeared to be less effort than a Skylark, the black underwings contrasting strongly with the buff-coloured heavy-looking belly. Also evident was what appeared to be a very narrow tail. Taken together these characters gave the overall impression of a small Sandgrouse (Pteroclididae), but the tail effect realised in retrospect was created by the pale outer under-tail pattern with a dark centre. We watched the bird for about 5 minutes before I returned to the car to take a telescope and attempt to get a digiscoped photo. While I was away, the bird plummeted to earth and the others waited for me to return. When we tried to relocate the bird some 15 minutes later, it could not be found. The location was N46°02.464 / E13°41.564, altitude 756 m a.s.l. (Figure 3). Other birds seen and heard in the course of the morning included Kestrel *Falco tinnunculus*, Honey Buzzard *Pernis apivorus* – 3, including one seen well catching large crickets from a look-out on a large bush like a shrike, Quail *Coturnix coturnix* – many, Skylark, Woodlark *Lullula arborea* – feeding fledged young, Mistle Thrush – a real one!, Red-backed Shrike *Lanius collurio* – breeding, Tree Pipit *Anthus trivialis*, Whinchat *Saxicola rubetra*, and Yellowhammer *Emberiza citrinella*. The record was confirmed by the National Rarities Committee – KRED (2nd record for Slovenia after 1 Jan 1950 – A2).

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Šmarnica *Phoenicurus ochruros*

Black Redstart – one observed on 23 Jan 2009 in Ljubljana (UTM VL59, central Slovenia); a rare winter record for central Slovenia

Dne 23.1.2009 sem okoli 13 h pred domačim blokom v Ljubljani (UTM VL59) opazovala šmarnico, ki je iskala hrano pod balkoni in okni. Najverjetneje je pobirala pajke in drobne žuželke, skrite v grobem ometu. Ko sem se po približno eni uri vrnila s sprehoda, je bila še vedno tam. Zimski podatki iz notranjosti Slovenije so sicer redki, pogosteje pa šmarnice prezimujejo na Primorskem, kamor sega severni rob njihovega zimskega areala (Sovinc 1994).

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Šoja *Garrulus glandarius*

Jay – a leucistic female observed feeding and copulating on 21 Apr 2009 near Velike Lašče (UTM VL67, central Slovenia); first published record of leucistic Jay in Slovenia

Slika 4 / Figure 4: Šoja / Jay *Garrulus glandarius*, Podstrmec – Velike Lašče, 21.4.2009. Foto: M. Krofel

Dne 21.4.2009 sem čakal na rjavega medveda *Ursus arctos* na enem izmed krmišč pri Podstrmcu v Velikolaščanskem hribovju (UTM VL67) v dinarskem gozdu *Omphalodo-Fagetum* s. lat. Še preden se je stemnilo, sem na krmišču opazoval več ptic, ki so se prišle hranit z nastavljeno koruzo: grivarje *Columba palumbus*, krokarja *Corvus corax* in več šoj. Med slednjimi pa sem opazil, da je ena izmed ptic nenavadno svetlo obarvana. Ko sem si jo natančneje ogledal z daljnogledom, sem ugotovil, da gre za levcistični osebek. Na delih, ki so navadno rjave barve, je bila večinoma bela s posameznimi rjavimi lisami, predvsem po temenu in ramenih. Deli repa in peruti so bili normalno črno obarvani z modro liso v perutih. Tudi okoli glave je imela običajne črne proge na beli podlagi. Opazoval sem jo kar nekaj časa, ko je pobirala koruzo, nato pa se ji je približal normalno obarvan samec in se z njo paril. Po parjenju je levcistična samica v okolici začela nabirati gradivo za gnezdo (slika 4). Kljub veliki oddaljenosti sem se odločil narediti nekaj dokumentarnih posnetkov. Pri pregledu literature nisem našel objavljenega podatka o opažanju levcistične šoje v Sloveniji. Ta vrsta ni navedena niti v nedavno objavljenem pregledu opažanj levcističnih in albinističnih primerkov ptic (Vrezec & Vrh 2005). Zanimivo opažanje je bilo dopolnjeno še z obiskom medvedke z dvema mladičema.

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Siva vrana *Corvus corone cornix*

Hooded Crow – on 17 Jul 2008, on a windless day near Krtina (UTM VM71, central Slovenia), an interesting behaviour of three Hooded Crows was observed; while sitting on a power line, they strongly vibrated the wire up and down, each in their own rhythm

Dne 17.7.2008 sem se peljal po avtocesti iz Ljubljane v Maribor. Nekaj sto metrov pred nekdanjo cestninsko postajo Krtina (UTM VM71) sem na žici daljnovoda opazil tri sive vrane. Nič nenavadnega, ampak zanimivo je bilo to, da so se vse tri pozibavale na žici, vsaka v svojem ritmu, in to zelo močno. Pogledal sem na bližnja drevesa in grmovje, ali morda piha veter, a bilo je mirno. Ena izmed mojih možnih razlag je, da so se vrane kratko malo igrale, kar je opisoval že M. Kerček, ko je vrana visela z žice daljnovoda z glavo navzdol (Kerček 2006).

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Hrvaška / Croatia

Zlatovranka *Coracias garrulus*

Roller – 1 individual observed on Kolansko blato on island Pag (UTM VK93, Dalmatia, Croatia) on 4 May 2009; according to the literature this is the 1st record for island Pag

Slika 5 / Figure 5: Zlatovranka / Roller *Coracias garrulus*, 4.5.2009, Kolansko polje, Pag. Foto: D. Šere

Dne 4.5.2009 sem opazoval ptiče v Kolanskem polju na otoku Pagu (UTM VK93, Dalmacija, Hrvaška). Nenadoma je mimo avtomobila priletela modrikasta ptica, ki se je nato usedla na suho vejo bližnjega drevesa. Pogled prek daljnogleda je pokazal, da imam priložnost videti zlatovranko. Iz avtomobila sem na hitro naredil nekaj dokumentarnih posnetkov, kasneje sem zlatovranko tudi digiskopiral (slika 5). Kmalu nato sta prileteli na to drevo dve divji grlici *Streptopelia turtur* in zlatovranka je takoj odletela. Verjetno je to prvi dokumentirani podatek za otok Pag, zanesljivo pa moj prvi, od kar proučujem ptice tega otoka. Rucner (1998) navaja, da je to redka vrsta obalnega območja Hrvaške, od otokov je omenjen samo Krk.

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Brškinka *Cisticola juncidis*

Zitting Cisticola – three individuals (small flock) was recorded on Kolansko blato on island Pag (UTM VK93, Dalmatia, Croatia) on 11 Dec 2006 and on 12 Dec 2006 four individuals of which one was caught; this is a rare winter data for island Pag; on 22 May 2008 a nest of Zitting Cisticola was found on Kolansko blato

Slika 6 / Figure 6: Brškinka / Zitting Cisticola *Cisticola juncidis*, 12.12.2006, Kolansko blato, Pag. Foto: D. Šere

Slika 7 / Figure 7: Brškinka / Zitting Cisticola *Cisticola juncidis* gnezdo / nest, 22.5.2008, Kolansko blato, Pag. Foto: D. Šere

Dne 11.12.2006 popoldne sem obročkal ptiče v Kolanskem blatu na otoku Pagu (UTM VK93, Dalmacija, Hrvaška). Bilo je jasno in prijetno toplo (13–15°C), ter brez vetra. V bližini mrež sem kar naenkrat opazil tri brškinke, ki so se spreletavale med trstičevjem. Še nikoli v zimskem času jih nisem videl toliko na enem mestu na tem otoku. Za to vrsto je znano, da v zimskem času živi bolj skrito življenje in jo je včasih zelo težko opaziti. Takoj sem predvajal petje brškinke pri mrežah in uspelo mi je eno tudi ujeti in obročkati. Naslednji dan, 12.12.2006 sem nadaljeval z obročkanjem, vendar je bilo zjutraj tako hladno (okoli 0°C), da je bil del mrež celo zamrznjen. Ko se je nekoliko ogrelo, sem opazil kar štiri brškinke, ki so se smukale okoli mrež. Spet sem predvajal njeno petje in uspelo mi je eno ujeti in obročkati. Bil sem zelo vesel, saj je bil to moj prvi zanesljivi zimski podatek (december/januar) o tej vrsti. V roki sem to brškinko tudi slikal in obročkano izpustil (slika 6). V poletnem času sem brškinke večkrat slišal peti, nikoli pa nisem imel priložnosti na otoku Pagu najti njenega gnezda. Dne 22.5.2008 sem spet obročkal ptice v Kolanskem blatu. V bližini mrež je glasno pel v zraku samec brškinke, ki se je občasno tudi oddaljil. Kar naenkrat pa sem opazil, da mimo mene leti brškinka s hrano v kljunu in se izgubi na bližnjem travniku. Ko sem postal bolj pozoren nanjo, sem ugotovil, da je to samica, saj jo je samec večkrat nadletaval in preganjal, ona pa se ni dala motiti in je še naprej prinašala hrano svojim mladičem. Velikokrat sploh nisem videl kdaj je priletela k meni nazaj, saj je v naslednjem trenutku že spet letela v drugo smer s hrano v kljunu. Vzel sem si kar nekaj časa in končno le opazil, od kje je odletela z belim iztrebkom v kljunu. Končno sem našel tudi gnezdo med travo in redkim trstičevjem (slika 7). Zanimivo, da je bilo gnezdo 40 cm nad vodo. V gnezdu so bili štirje mladiči, stari okoli 7–8 dni, ki sem jih tudi obročkal. Kasneje sem obročkal tudi samca, ki je prepeval v bližini mreže in se po naključju vanjo ujel.

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Škrlatec *Carpodacus erythrinus*

Common Rosefinch – one 2y individual was observed singing near Lun on island Pag (UTM VK84, Dalmatia, Croatia)

Slika 8 / Figure 8: Škrlatec / Common Rosefinch *Carpodacus erythrinus*, 2.6.2009, Tovarnele, Pag. Foto: D. Šere

Dne 2.6.2009 sem popisoval ptiče na skrajnem severu otoka Paga (UTM VK84, Dalmacija, Hrvaška) in to v okolici Luna. Kasneje sem se spustil do morja v vas Tovarnele, kjer sem v pristanišču pregledoval drevesa z zrelimi murvami *Morus* sp. Kar naenkrat me je iz bližnjega oleandra presenetilo meni dobro poznano petje škrlatca. Takoj sem njegovo petje posnel na diktafon in s predvajanjem njegovega lastnega petja sem ga tako izzval, da se mi je pokazal na bližnji murvi. Kar verjeti nisem mogel, da se med hišami ob pristanišču lahko srečaš s tako zanimivo in redko vrsto. Vztrajno je nato pel po bližnjih drevesih. Na bližnji hruški mi ga je uspelo tudi digiskopirati in tako narediti dokazni posnetek (slika 8). Po obarvanosti perja (ni bil škrlatne barve) je mogoče sklepati, da je bil v drugoletni (2y) osebek, po datumu (2.6.) pa je bil verjetno še na preletu. Zanimivo, da omenjena vrsta prezimuje v Indiji. To je moje prvo opazovanje te vrste na otoku Pagu.

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Bolgarija / Bulgaria

Great Black-backed Gull *Larus marinus*

Veliki galeb – en osebek opažen dne 17.1.2009 na zbiralniku Iskar (UTM GN10, okrožje Sofija, Z Bolgarija); prvo opazovanje za območje Sofije

On 17 Jan 2009, during the Mid-winter Bird Census, an adult Great Black-backed Gull was recorded at Iskar reservoir (UTM GN10, Sofia district, W Bulgaria). The bird was flying northwards along the south-western coast of the reservoir, in a group of six adult and immature Yellow-legged Gulls *Larus michahellis*. This is the first observation of a Great Black-backed Gull in the region of Sofia (Nankinov 1982). The species is usually recorded along the Black Sea coast in low numbers and mainly in winter, very rarely inland the country (*own data*; Nankinov 2000).

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White-backed Woodpecker *Dendrocopos leucotos*

Belohrbti detel – samec opažen dne 30.4.2005 na gori Maleševska (UTM FM61, JZ Bolgarija)

On 30 Apr 2005, a male White-backed Woodpecker was observed in the Maleshevska Mountain near the state frontier with the Republic of Macedonia (UTM FM61, SW Bulgaria). In this region, the forests are comprised mainly of Beeches *Fagus sylvatica* with age around 80–150 years, younger trees of natural growing Scots Pines *Pinus sylvestris* and scarce Common Silver-firs *Abies alba*. In this frontier region, the good quality old growth forests in Bulgaria are much more fragmented and with smaller area. In comparison with this situation in the nearby Republic of Macedonia, there are vast and much better preserved old growth Beech forests with dashes of pine trees. The region where this observation was made has an altitude of 1,150 m a.s.l. The species has not previously been observed in the Maleshevska Mountain and the neighbouring frontier mountains of south-western Bulgaria with the Republic of Macedonia by Spiridonov (1985), Nankinov (1993) and Spiridonov & Georgiev (2007).

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Redpoll *Carduelis flammea*

Brezovček – trije osebki opaženi dne 20.1.2009 na gori Ossogovo (UTM FM33, JZ Bolgarija)

On 20 Jan 2009, three Redpolls were observed in the region between the chalet of Ossogovo and the chalet of Tri Bouki. The Redpolls were in a mixed flock with over 25 Siskins *Carduelis spinus*. The birds were flying over and perching at short distances in an old Norway Spruce *Picea abies* and Scots Pine *Pinus sylvestris* forest. At the moment of the observation, the snow cover was about 40 cm. The region is located at about 1,700 m a.s.l. (UTM FM33, SW Bulgaria). For the Bulgarian part of the mountain, the species has not yet been observed (Simeonov & Marinov 1994, Zareva 2005). For the part of Ossogovo Mountain, which is located in the Republic of Macedonia, Redpoll has not been mentioned by Dimovski (1957). In the south-west of Bulgaria, the species has been included in the publications of Nankinov (1995) with autumn and winter encounters in the mountains of Rila and Pirin.

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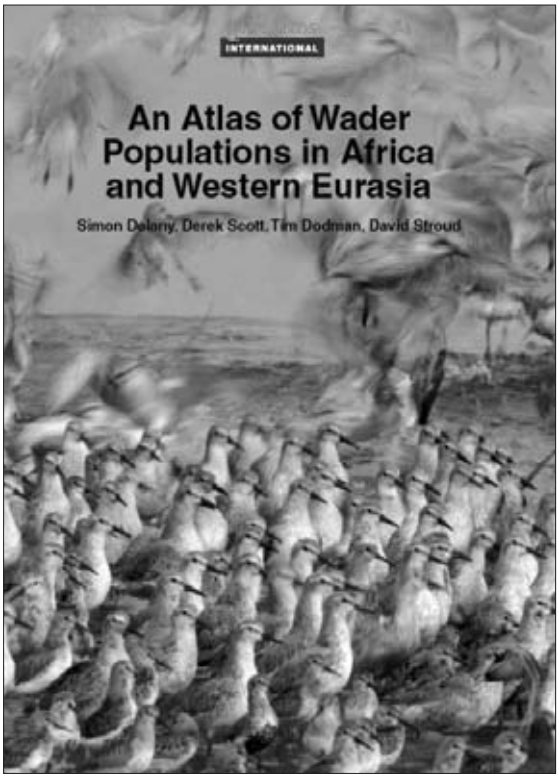
Nove knjige

New books

Delany, S., Scott, D., Dodman, T. & Stroud, D. (2009): An Atlas of Wader Populations in Africa and Western Eurasia. – Wetlands International. pp 524.

»The Wader Atlas« – International cooperation in bird conservation really pays off



A book launched on 20 May 2009 by Wetlands International demonstrates the need for international cooperation if we want to conserve birds, the most mobile of all animals, and shows the effectiveness of this cooperation when it is enthusiastically and effectively implemented.

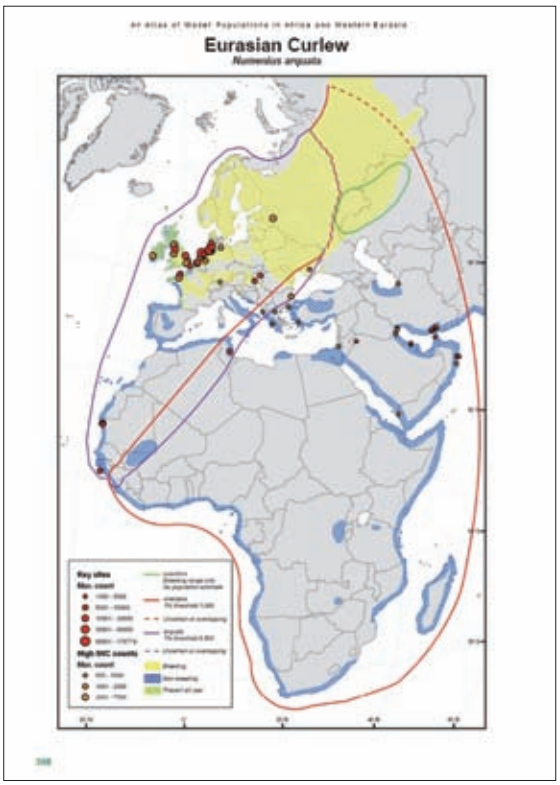
An Atlas of Wader Populations in Africa and Western Eurasia, to give the book its full title, is the result of hundreds of thousands of hours of fieldwork by observers, most of whom are volunteer birdwatchers, who count waterbirds because they find it enjoyable and rewarding, and who send their count data to Wetlands International, who analyse and interpret them in forms such as this beautiful book. The book rewards the observers by putting their local efforts into an international context, but its usefulness goes far beyond that.

Waders are among the most migratory of all birds. This book shows that some species such as the Ruff and the Ringed Plover, may migrate from the furthest eastern extremity of arctic Russia to Southern Africa and back every year. These incredible journeys are very stressful, and in order to survive them, the birds need networks of high-quality sites, which may be thousands of kilometers apart, to rest and refuel undisturbed. Damage to or loss of just one of these critical sites can reduce the survival of the birds in the same way as the damage or destruction of a single link destroys the integrity of a chain.

It has long been recognized that protection of these remarkable birds and their wetland habitats needs an internationally agreed framework, and international treaties such as the Ramsar Convention on Wetlands, and the African-Eurasian Migratory Waterbird Agreement (AEWA) under the United Nations Convention on Migratory Species are used by signatory governments for this purpose. These treaties require scientific information on which to base the policies they implement, and products such as the Wader Atlas are prepared with this need in mind.

One of the principal findings of the book is that the sites needed by these birds have very variable levels of protection in different parts of the region covered. Site and habitat protection in Europe is relatively comprehensive and effective, due to a number of factors including European legislation, under which many sites are protected by the Birds and Habitats Directives. In Africa and the Middle East, protection is much more haphazard and there are fewer protected sites overall.

The Atlas reveals that the site holding the highest number of wader species in internationally important numbers (an officially recognised category under which any site which hosts 1% or more of a population qualifies as being internationally important) is relatively unknown and hitherto unrecognized. This site is Barr-al Hikman in Oman, where 18 wader species have been recorded in internationally important numbers since 1990. The Dutch-German-Danish Wadden Sea, the largest inter-tidal area in Europe, holds the highest number of waders overall – in some seasons more than 4 million – and has recorded 17 species in internationally important numbers. The Sivash Gulf



on the Sea of Azov in Ukraine has also recorded 17 species at this level, the Rhine-Maas-Scheldt delta in The Netherlands 16, and the Banc d'Arguin in Mauritania, 15.

This book puts the conservation of the 90 species of waders found in Africa, the Middle East and Europe on a much firmer footing. Policy makers at national and international level now have a much better idea of which sites and species are most in need of the limited resources available for this work. Nature conservation organizations and site managers are likewise better informed. And the birdwatchers whose efforts form the basis of much of the book know that they are making a difference to the survival of the birds and places that they value so highly.

Nikolai Petkov

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