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Raptor Journal 2023, 17: 15–23. DOI:10.2478/srj-2023-0002
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Diet composition of White-tailed Eagles inhabiting two adjacent inland lakes in Northern Greece

Zloženie potravy orliakov morských obývajúcich dve priľahlé vnútrozemské jazerá v severnom Grécku

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Abstract: In territorial raptors, breeding performance and foraging behaviour are affected by territory characteristics as the abundance and availability of different prey species varies between habitats. In this study, we examined the diet of two White-tailed Eagle pairs, occupying neighbouring territories in two adjacent inland lakes in Northern Greece. We assess the diet composition of the species in the southernmost part of its European range and evaluate any intraspecific differences in the diet that may reflect resource and/or niche partitioning between territories. We found that birds and specifically waterbirds comprise the largest and quantitatively most important part of the White-tailed Eagle´s diet, with fish being the second most important prey group that was only found in the nest remains from one territory. There was high diet overlap between the two territories and when considering only avian prey our results suggest that the species predates on heavier (and the most common) waterbird species. A main factor that could be driving differences in the abundance and availability of different prey species between territories could be lake physiography, as our results point to a segregation and a subsequent resource partitioning between territories, with each pair utilizing an adjacent lake and its associated habitats. Competition and territoriality therefore seem to be important intraspecific interactions that along with prey availability could promote changes in territory size and ultimately affect individual fitness.

Abstrakt: U teritoriálnych dravcov sú hniezdna produktivita a lovné správanie ovplyvnené charakteristikami teritória ako je početnosť a dostupnosť jednotlivých druhov koristi. Tieto charakteristiky sa však medzi habitatmy odlišujú. V tejto štúdii sme skúmali potravu dvoch párov orliaka morského, ktoré osídlili susedné teritóriá dvoch priľahlých vnútrozemských jazier v severnom Grécku. Hodnotíme zloženie potravy v najjužnejšej časti jeho európskeho areálu a vyhodnocujeme všetky vnútro druhové rozdiely v potrave, ktoré môžu odrážať rozdelenie zdrojov a/alebo ník medzi teritóriami. Zistili sme, že vtáky, konkrétne vodné vtáky tvoria najväčšiu a kvantitatívne najdôležitejšiu časť potravy orliaka morského, pričom ryby sú druhou najdôležitejšou skupinou koristi, ktorá sa našla len v potravných zvyškoch v hniezde z jedného územia. Medzi oboma teritóriami došlo k vysokému prekrytiu zloženia potravy a hodnotiac iba vtáčiu korisť, naše výsledky naznačujú, že druh loví ťažšie (a najbežnejšie) druhy vodného vtáctva. Hlavným faktorom, vedúcim k rozdielom v početnosti a dostupnosti jednotlivých druhov koristi medzi územiami, tak môže byť fyzická geografia jazera, keďže naše výsledky poukazujú na segregáciu a následné rozdelenie zdrojov medzi teritóriami pričom každý pár využíva priľahlé jazero a jeho pridružené biotopy. Konkurencia a teritorialita sa preto zdajú byť dôležitými vnútro druhovými interakciami, ktoré sa spolu s dostupnosťou koristi podporujú zmeny veľkosti teritória a v konečnom dôsledku ovplyvňujú individuálnu kondíciu.

Key words: *Haliaeetus albicilla*, intraspecific competition, foraging ecology, niche partitioning, prey remains

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Acknowledgements: We are grateful to the staff of the Central Macedonia Management Unit for their support during the project. Also, many thanks to the staff of ECOSTUDIES PC.

Introduction

Apex predators play an important role in ecosystems, directly affecting prey densities through the entire food web (Ripple et al. 2014). Understanding the spatial and temporal variation in diet and foraging strategies of top predators, such as raptors, is a critical issue in ecology and conservation (Newton 2010). Prey abundance is an important factor shaping reproductive performance, and because of their position in the food chain raptors are often used as indicators of ecosystem health (Sergio et al. 2008, Newton 2010).

The White-tailed Eagle (*Haliaeetus albicilla*, hereafter WTE) is an apex predator closely associated with the aquatic environment. The species is an opportunistic generalist in terms of food, with fish, waterbirds, medium sized mammals and, locally, reptiles making up the main diet components (Cramp & Simmons 1980). However, the relative importance of these components in the diet may vary locally (Ekblad et al. 2016, Nadjafzadeh et al. 2016). In Greece, one of the southernmost limits of the species' distribution, the WTE was widespread and locally common during the 19th and 20th centuries. However, the last decades the species suffered a steep decline and even reached the verge of extinction in the country with an estimated population of 1-4 pairs in the 1990s (Handrinos & Akriotis 1997). Today, following the general recovery of the species in Europe and the Balkans, and possibly as a result of the relatively more effective protection of wetlands, the population shows an increasing trend and has recovered to about 13 pairs, with a presence in all the large wetlands of Northern Greece, even in artificial lakes (Vavylis et al. 2021; Westrip & BirdLife International 2022). Due to the small size of the population, however, the species is still classified as Endangered (EN) in the Mediterranean and as Critically Endangered (CR) in Greece according to IUCN (Legakis & Maragou 2009; Westrip & BirdLife International 2022).

In territorial bird species, such as most raptors, breeding performance and foraging behaviour are intertwined and are affected by territory characteristics as the abundance and availability of different prey species varies between habitats (Steenhof & Newton 2007). Indeed, food availability is considered as the main limiting factor affecting annual reproduction in raptors (Newton 2010), however, it can also be influenced by weather, habitat quality, predation and finally competition (Hakkarainen & Korpimaki 1996, Steenhof et al. 1997, Newton 1998, Krüger 2004). Raptors have few predators and are thus more likely to be influenced by competition but evaluating its relative importance in shaping diet patterns and territoriality is a challenging task (Martínez-Hesterkamp et al. 2018). According to theoretical expectations, larger predators should compete more strongly than smaller ones (Schoener 1983), diet overlap should be lower during prey shortage and diet similarity should be especially reduced in neighbouring pairs (Korpimäki 1987). This overlap may be reduced through resource partitioning (both in terms of species and biomass) and/or spatial segregation of feeding areas (Pianka 1974, Steenhof & Kochert 1985, Cecere et al. 2018).

In the present study, we examined the diet of two White-tailed Eagle pairs, occupying neighbouring territories in two adjacent inland lakes in Northern Greece. Specifically, the aims of this study were (a) to report the diet composition of the species in the southernmost part of its European range and (b) to evaluate any intraspecific differences in the diet that may reflect resource and/or niche partitioning between territories.

Methods

Study site

Our study took place in the Koroneia and Volvi National Park located in Northern Greece (Fig. 1). The National Park is covered mainly by agricultural areas, followed by forests and semi-natural areas as well as wetlands and two main water bodies. The two lakes, Koroneia and Volvi, are sites of international importance as part of the Ramsar Convention and the Habitats Directive and are designated as Special Protected Areas for birds (Natura 2000 sites GR1220001 and GR1220009). Lake Koroneia is a shallow, highly eutrophic lake with a surface area of approximately 35 km^2 and a maximum depth of less than 3 m. Through the course of the years, the lake's surface area and water quantity and quality has declined dramatically (Mitraki et al. 2004, Gantidis et al. 2007), ultimately leading to die-offs of fish and bird populations and periodic droughts resulting even in the complete disappearance of surface water. In 2005 a restoration plan was implemented and since 2014 the lake has an almost stable depth thus favouring the re-establishment of fish populations (Ntonou et al. 2017). On the other hand, Lake Volvi is the second largest lake of Greece with a surface area of 68 km^2 and is a deep, eutrophic lake of tectonic origin. The lake is impacted by run-off from agricultural activities and animal husbandry, however it is regarded as less impacted by anthropogenic pressures than Lake Koroneia (Zacharias et al. 2002, Gantidis et al. 2007). Each lake holds a White-tailed Eagle territory (estimated by direct observation at 103.8 and 58.3 km^2 for Koroneia and Volvi respectively, distance between nests ~20km) and preliminary population monitoring and territory mapping show some level of

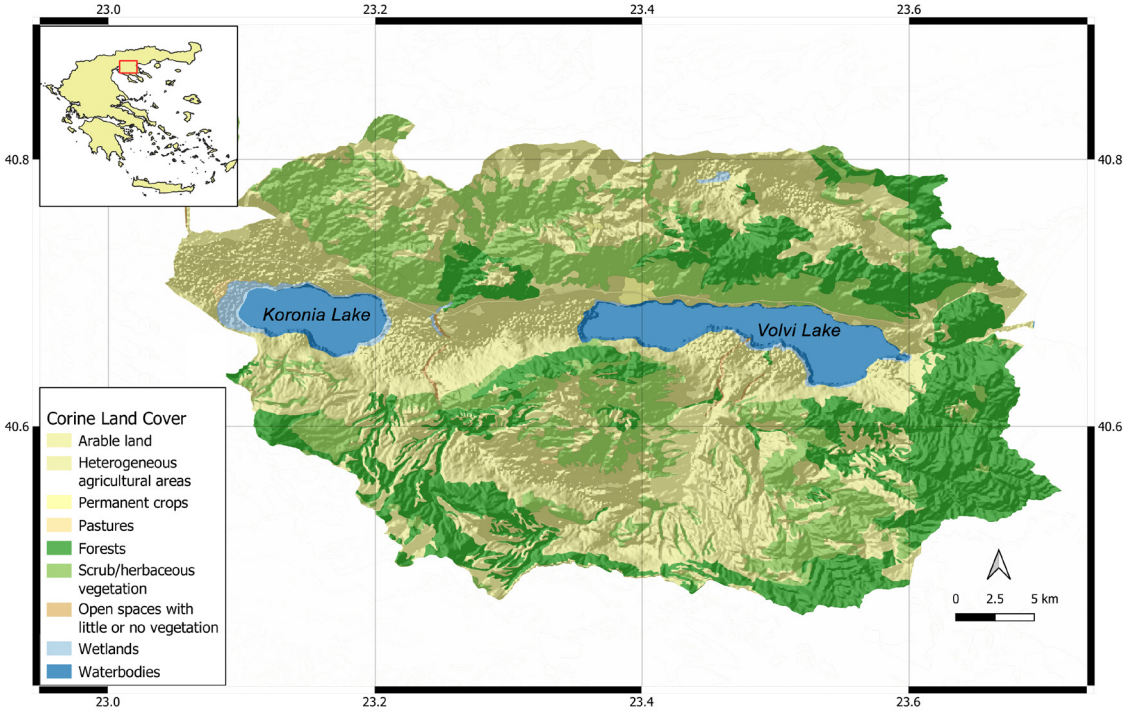


Fig 1. Map of the study area - Koroneia and Volvi National Park along with main land cover classes according to Corine classification. The two lakes correspond to the two territories.
Obr. 1. Mapa skúmanej oblasti - Koroneia a Volvi národný park spolu s hlavnými triedami krajinnej pokrývky podľa klasifikácie Corine. Dve jazerá zodpovedajú dvom teritóriám.

segregation, with birds using the lake and the surrounding area for perching/hunting and roosting, whereas they have also been seen hunting in the mountainous areas around the lakes (Sidiropoulos et al. 2022).

Diet data

White-tailed Eagle nesting territories were visited, and prey remains were collected two to four times per season in April-October between 2013 and 2021. In total we gathered prey remains from 18 samples from the Koroneia territory and seven samples from the Volvi territory. In Koroneia, the samples consisted of 4-37 prey items, whereas the number of prey items per sample in Volvi was 4-20. Collection event frequency and number of prey items for each territory and year can be found in Table 1. All prey material from the nest was collected in each visit to avoid finding remains from the same prey in subsequent visits. All collections were stored individually and analysed separately. The contents of each pellet were determined when possible, however since most pellets were fragmented, we did not calculate the number of individuals per pellet (in such cases, a single individual of a prey species was assumed). Remains were identified to the lowest identifiable taxonomic level (most of the times we reached species-level identification using the hairs of mammals, the feathers, humeri, tarsometatarsi, legs and bills of birds, species-specific bones of fish and scales and scutes of reptiles). Remains were identified using personal reference collections and/or field identification guides (Arnold et al. 1978, Brown et al. 1987, Teerink 1991). The number of items of each species was determined as the minimum number of individuals (MNI) at each collection i.e., if more than one part of the same species were found they were considered to originate from one individual, unless they differed in size and anatomical position thus indicating that they come from different individuals (Marti et al. 2007). Each territory final sample consisted of the sum of the MNIs of each collection.

Diet composition

Prey remains from each territory were combined to calculate the proportion of each prey group in the diet by dividing the number of individuals of a specific taxon by the total number of prey individuals. We also calculated the relative importance in biomass (%) defined as the number of individuals multiplied by the average body

Tab 1. Number of collection events and prey items for each White-tailed eagle territory and year in Northern Greece.
Tab 1. Počet zberov a položiek koristi pre každé teritórium a rok orliaka morského v severnom Grécku.

Year	Koroneia territory		Volvi territory	
	n collections	n prey items	n collections	n prey items
2013	1	4	-	-
2014	2	18	-	-
2016	2	9	-	-
2017	2	29	-	-
2018	2	37	-	-
2019	2	14	-	-
2020	2	25	4	20
2021	4	20	2	8
2022	1	11	1	4

mass of each prey species reported in the literature (Cramp & Simmons 1980 for birds, Bobori et al. 2010 for fish and Jackson 1980 for reptiles). Body mass values for species not included in the previous references were retrieved from Encyclopaedia of Life (EOL; available from (Encyclopaedia of Life, 2022). Dietary niche breadth was calculated using the standardised Levin's (Bsta) and diversity of trophic spectrum was estimated using the Shannon (H′) index (Krebs 1999). The Levin's index ranges from 0 (lowest niche breadth) to 1 (highest niche breadth). For the Shannon index higher values indicate higher diet diversity. Diet overlap between habitats was assessed by means of Pianka's (O) index (Pianka 1973) that ranges between 0 (total separation) and 1 (total overlap). Since there was an uneven sampling effort between territories that could bias our comparison of diet composition between them, we employed a rarefied sample analysis to mitigate the problem. We drew a random subset of seven collections from Koroneia and recalculated the diet breadth, diet diversity and diet overlap indices. We followed this procedure five times to evaluate differences between territories. Differences in diet composition between territories were tested using a Welch t-test, whereas to visualise and aid the interpretation of these differences between territories, we summarized the composition data using non-metric multidimensional scaling (NMDS), for all years and both sites using Euclidean distance. The ordination analysis relied on Bray–Curtis dissimilarity and it was performed in the "*vegan*" R package (Oksanen et al. 2013). All statistical analyses were performed in R 4.2 (R Core Team 2022), plots were prepared using the R package "*ggplot2*" (Wickham & Chang 2015) and maps were designed with QGIS (v. 3.22).

Results

A total of 199 prey items belonging to at least 30 prey taxa were identified from 25 collection events from two nests. Overall, birds were the most common prey consisting 70.9% of the diet, followed by fish (15.1%) and to a smaller extent by reptiles and mammals consisting 10.6% and 3.5% of the diet (Table 2). Mammals such as sheep and wild boar were apparently consumed mainly as carrion, reflecting at least occasional scavenging of the species. Altogether, 17 bird species were identified in the diet, most of them waterbirds (they use wetlands as their main habitat). The most common prey species were the Coot (*Fulica atra*) and the Great Crested Grebe (*Podiceps cristatus*) making up more than 40% of consumed birds. Other important bird species were the Black-headed Gull (*Chroicocephalus ridibundus*), Shelduck (*Tadorna tadorna*) and Moorhen (*Gallinula chloropus*). Regarding fish remains, the Carp (*Cyprinus carpio*) and the Perch (*Perca fluviatilis*) were the most common species found in the remains. The reptile component consisted mainly of chelonians (tortoises and turtles). When examining each territory separately, in Volvi, diet was found to consist exclusively of birds whereas the other categories were only identified in the Koroneia territory. That is further reflected by both niche-breadth (B) and prey diversity (H′) indices that were found to be 1 and 0 for the Volvi territory whereas B = 2.1 and H = 0.43 for Koroneia. However, considering only avian prey, the distribution of the body mass of consumed birds did not significantly differ between territories (Fig. 2; Kolmogorov-Smirnov test D = 0.16, p-value = 0.28),

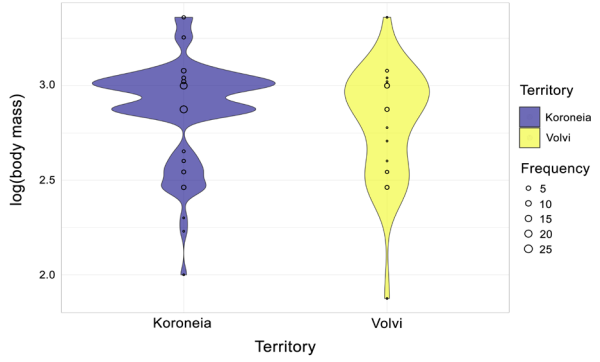


Fig. 2. Distribution of biomass (log body mass) of avian prey consumed in Koroneia and Volvi territorries. Circles are proportional to the number of prey observations.
Obr. 2. Distribúcia biomasy (log hmotnosti) vtáčej koristi skonzumovanej v teritóriách Koroneia a Volvi. Kruhy sú úmerné počtu pozorovaní koristi.

Tab 2. Diet composition of White-tailed eagle territories in Northern Greece. Main prey taxa are presented as numbers of prey individuals, proportion in the diet (number of individuals of a specific taxon/total prey items) and proportion of each prey taxon in the diet in terms of biomass.
Tab 2. Zloženie potravy orliaka morského v teritóriách severného Grécka. Hlavné taxóny koristi sú uvedené v počtoch jedincov koristi, proporcii v potrave (počet jedincov konkrétneho taxónu/celkové položky koristi) a podiel každého taxónu koristi v potrave z hľadiska biomasy.

	Koroneia territory			Volvi territory			Overall		
	n	%	biomass (%)	n	%	biomass (%)	n	%	biomass (%)
Birds	**109**	**65.3**	**69.6**	**32**	**100**	**100**	**141**	**70.9**	**74.7**
Shelduck (*Tadorna tadorna*)	8	4.8	7.9	2	6.3	9.8	10	5	8.2
Mallard (*Anas platyrhynchos*)	4	2.4	3.6	1	3.1	4.5	5	2.5	3.8
Great Crested Grebe (*Podiceps cristatus*)	22	13.2	18.1	9	28.1	36.8	31	15.6	21.3
Great Cormorant (*Phalacrocorax carbo*)	3	1.8	5.7	1	3.1	9.4	4	2	6.3
Glossy Ibis (*Plegadis falcinellus*)	0	0	0	1	3.1	2.5	1	0.5	0.4
Grey Heron (*Ardea cinerea*)	3	1.8	4.5	0	0	0	3	1.5	3.7
Little Egret (*Egretta garzetta*)	2	1.2	0.7	0	0	0	2	1	0.6
Moorhen (*Gallinula chloropus*)	5	3	1.4	3	9.4	4.3	8	4	1.9
Coot (*Fulica atra*)	25	15	15.5	6	18.8	18.4	31	15.6	16
Unidentified Rallidae	1	0.6	0.5	0	0	0	1	0.5	0.4
Tringa sp.	1	0.6	0.1	0	0	0	1	0.5	0.1
Unidentified Charadriiformes	1	0.6	0.1	0	0	0	1	0.5	0.1
Black-headed Gull (*Chroicocephalus ridibundus*)	7	4.2	1.7	5	15.6	5.9	12	6	2.4
Yellow-legged Gull (*Larus michahellis*)	6	3.6	5.2	1	3.1	4.3	7	3.5	5
Domestic Pigeon (*Columba livia domestica*)	3	1.8	1	1	3.1	1.6	4	2	1.1
Collared Dove (*Streptopelia decaocto*)	1	0.6	0.2	0	0	0	1	0.5	0.1
Syrian Woodpecker (*Dendrocopos syriacus*)	0	0	0	1	3.1	0.3	1	0.5	0.1
Hooded Crow (*Corvus cornix*)	0	0	0	1	3.1	2.1	1	0.5	0.4
Unidentified Passeriformes	1	0.6	0	0	0	0	1	0.5	0
Unidentified Birds	13	7.8	3.2	0	0	0	13	6.5	2.7
Fish	**30**	**18**	**13.4**	**0**	**0**	**0**	**30**	**15.1**	**11.1**
Carp (*Cyprinus carpio*)	21	12.6	11.1	0	0	0	21	10.6	9.2
Unidentified Cyprinidae	2	1.2	0.7	0	0	0	2	1	0.5
Pike (*Esox lucius*)	1	0.6	0.4	0	0	0	1	0.5	0.3
Perch (*Perca fluviatilis*)	5	3	0.9	0	0	0	5	2.5	0.7
Unidentified Fish	1	0.6	0.3	0	0	0	1	0.5	0.3
Reptiles	**21**	**12.6**	**12**	**0**	**0**	**0**	**21**	**10.6**	**10**
Balkan Pond Turtle (*Mauremys rivulata*)	5	3	1.8	0	0	0	5	2.5	1.5
Hermann's Tortoise (*Eurotestudo hermanni*)	8	4.8	5.9	0	0	0	8	4	4.9
Greek Tortoise (*Testudo graeca*)	5	3	2.9	0	0	0	5	2.5	2.4
Unidentified Testudinidae	2	1.2	1.3	0	0	0	2	1	1.1
European Green Lizard (*Lacerta viridis*)	1	0.6	0	0	0	0	1	0.5	<0.1
Mammals	**7**	**4.2**	**5.1**	**0**	**0**	**0**	**7**	**3.5**	**4.3**
Northern White-breasted Hedgehog (*Erinaceus roumanicus*)	2	1.2	1	0	0	0	2	1	0.8
Wild boar (*Sus scrofa*)	3	1.8	2.5	0	0	0	3	1.5	2.1
Sheep (*Ovis aries*)	2	1.2	1.6	0	0	0	2	1	1.4
Shannon index (H´)		0.43			0			0.38	
Diet breadth (B)		2.1			1			1.86	
Diet overlap (O)								0.95	

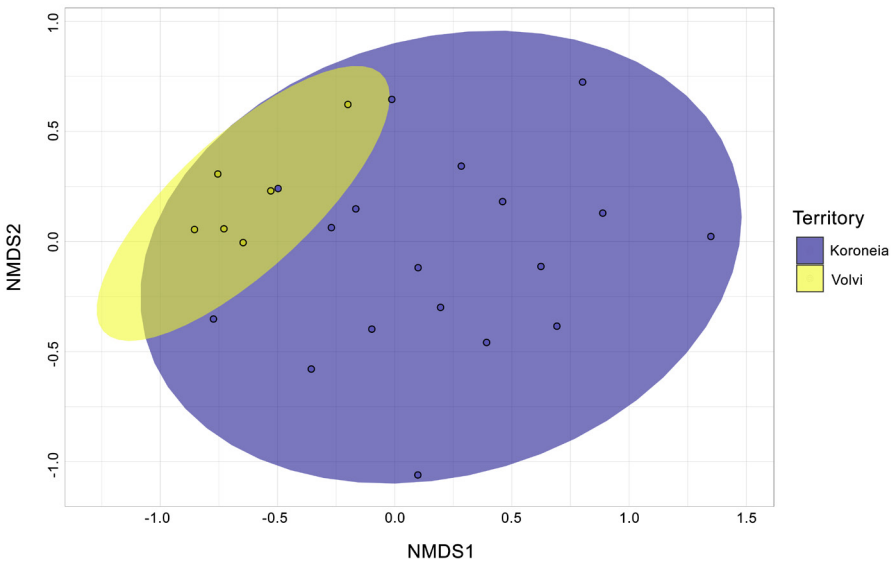


Fig. 3. NMDS ordination of diet composition in pre remains of White-tailed Eagles nests for Koroneia (purple) and Volvi (yellow) territories. Points indicate sampling events, and ellipses represent standard deviation for territory centroids.
Obr. 3. NMDS ordinácia zloženia potravy orliaka morského v teritóriách Koroneia (fialová) and Volvi (žltá). Body označujú jednotlivé zbery vzoriek a elipsy štandardnú odchýlku centroidov teritórií.

suggesting that the species preys on the heavier (and the most common) waterbird species in both territories. The NMDS plot based on species level indicated a degree of overlap in consumption of prey families between territories (Fig. 3; stress = 0.18, k = 2), showing that Volvi territory diet composition comprises only a fraction of the more diverse Koroneia territory diet. That result further reflects the high diet overlap index of the two territories (Pianka's O = 0.95). When analysing the five rarefied subsamples from Koroneia, results were found to be consistent with the full data analysis, thus showing a reduced bias rising from uneven sampling. Levin's niche breadth index ranged from 1.89 to 2.26 (mean B = 2.15), whereas Shannon diversity index ranged from 0.38 to 0.43 (mean H′ = 0.41). The diet overlap index of the two territories was found to be >0.9 in all random subsamples and ranged from 0.9 to 0.97 (mean O = 0.93).

Discussion

We found that birds and specifically waterbirds comprise the largest and quantitatively most important part of the WTE diet, with the Great Crested Grebe and Eurasian coot being the most important food source in both lake habitats. Fish were the second most important prey group, found only in nest remains from the Koroneia territory. Our results on diet composition are in line with other studies on the species' diet that report those two groups as the main prey, however at different proportions depending on the cover of water versus land in surrounding habitat (Helander 1983, Ekblad et al. 2016). The fact that the diet consists mostly of birds is typical for WTE populations living in coastal habitats, often in northern latitudes, with similar results reported from Scandinavia (Sulkava et al. 1997, Ekblad et al. 2016) and Scotland (Watson et al. 1992, Whitfield et al. 2013).On the other hand, WTEs breeding in inland areas seem to prefer fish prey, for example in Lapland in Northern Finland (Sulkava et al. 1997, Ekblad et al. 2020), Lithuania (Dementavičius et al. 2020) and Germany (Nadjafzadeh et al. 2013), whereas fish were also found to represent a high contribution to the diet in Greenland (Wille & Kampp 1983). However, higher bird consumption has also been reported for inland populations, such as in our case, and our results are more similar to the species' diet in Hungary and Romania (Horváth 2003, Sandor et al. 2015), where birds prey mainly on Eurasian coot and wildfowl. It has been found that also in Lake Baikal nearly 80% of WTE prey consisted of waterfowl (Mlíkovský 2009). An important aspect of raptor feeding ecology is foraging strategy and prey choice. The most frequent bird species identified in the prey remains are species commonly found in great numbers in the area suggesting that the species relies on locally abundant resources (Handrinos et al. 2015). Specifically, for the WTE, it has been suggested that when prey was abundant, eagles preferred large over small fish and slow over agile waterfowl species (Nadjafzadeh et al. 2016) which is further reflected in our results regarding biomass contribution and species

consumption frequency (Fig. 2). Particularly notable is the importance of reptiles in the diet, since these seldom appear in the diet of the WTE (Cramp & Simmons 1980). However, in Northern Greece tortoises are an important part of the diet of some large raptors, in particular the Golden Eagle (*Aquila chrysaetos*), the Egyptian Vulture (*Neophron percnopterus*) and even the Cinereous Vulture (*Aegypius monachus*) (Skartsi et al 2015, Dobrev et al. 2015, Sidiropoulos et al 2022). A significant fact may be that all the shells of the tortoises were broken, while those of the turtles were found whole. This may indicate that the former may have been scavenged after been killed by traffic or by kleptoparasitism from Golden Eagles, while the latter were actually captured by the WTE.

In this study, we used the number of prey items as units. A potential shortcoming of such an approach is that large prey remains tend to be better preserved than small remains such as those of waterbird fledglings, so small-sized prey could be under-represented (Mersmann et al. 1992, Redpath et al. 2001, Marti et al. 2007). Furthermore, fish remains can be underrepresented in prey remains as they are soft, thus biasing the estimates of the proportion of fish in the diet (Mersmann et al. 1992, Sulkava et al. 1997). Additionally, mammalian scavengers such as wild boars (*Sus scrofa*) or foxes (*Vulpes vulpes*) might have removed fallen items from under the nests (Ekblad et al. 2016). However, as the data are assumed to be similarly affected over both territories it allows us to examine their differences regarding prey composition. Furthermore, we had a relatively small sample (a total of 25 sampling events with two to four events per year for nine years), and especially for Volvi territory with only seven collection events, that could at some level prevent us from drawing concrete conclusions. The small number of prey items collected in Volvi also precludes us from identifying rare prey. Despite the abovementioned potential biases in the data, our results still can provide some evidence on the variation in diet composition between territories as a result of differences in the availability of prey in the feeding habitats of each territory.

A main factor that could be driving differences in the abundance and availability of different prey species between territories could be lake physiography. Volvi is a deep lake compared to the very shallow Koroneia, the latter being a more suitable fishing ground. The WTE uses a ‘‘sit-and-wait’’ hunting mode to capture profitable prey (Nadjafzadeh et al. 2016) and rarely captures flying birds whereas only fish that occur close to the surface are preyed upon (Helander 1983, Ekblad et al. 2016). This strategy is therefore reflected in the diet composition of the two territories, so the consumption of fish in Volvi would be expected to be rare as the lake’s depth would pose a hunting limitation. Furthermore, fish in deep lakes could perform diel movements as a response to the daily light cycle thus ascending to shallower depths after dusk and descending deeper after dawn (Mehner 2012). Such behaviour would be incompatible with the hunting activity of a diurnal raptor such as the WTE. In any case, diet composition data point to a segregation and a subsequent resource partitioning between territories, with each pair utilizing an adjacent lake and its associated habitats. Competition and territoriality therefore seem to be important intraspecific interactions that along with prey availability could promote changes in territory size and ultimately affect individual fitness (Schoener 1968, Adams 2001, Martínez-Hesterkamp et al. 2018). In our case these processes could shape territory stability; Volvi territory has been occupied more erratically in the past 10 years whilst showing very low productivity (Sidiropoulos et al. 2022). However future monitoring efforts need to continue in order to shed light to such hypothesis.

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Recieved: 10.12.2022
Accepted:2.3.2023