

Habitat distribution and diet of Lapwings *Vanellus vanellus* in the Kurgal'dzhinskiy Nature Reserve, Central Kazakhstan

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Censuses of Lapwings *Vanellus vanellus* were made at the Kurgal'dzhinskiy Nature Reserve, central Kazakhstan, in 1969-1972 and in 1977. Lapwings arrive there in spring from 20 March to 4 April, and migration lasts until the end of April - beginning of May. The largest numbers were counted on open lake shores with salines and mud-flats (39.4%) and in dry steppe (35.5%). The temporary water-bodies formed during floods are important for waders during both spring passage and post-breeding movements. Autumn migration takes place between the second half of July and late October - beginning of November, the main bulk of waders migrating in August-September. Analysis of the contents of 61 Lapwing stomachs showed that they fed mostly on insects and their larvae (98.4% of items), of which most were terrestrial (95.5% of items) and preferably on beetles and their larvae (85.6% of all insects). Currently, Lapwings are only shot incidentally by game-hunters, although we expect that in Kazakhstan their treatment as a quarry species will increase.

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С 1969 по 1972 гг. были проведены количественные учеты чибисов *Vanellus vanellus* в Кургальджинском заповеднике (Центральный Казахстан). Первые чибисы прилетают туда весной с 20 марта по 4 апреля, и пролет продолжается до конца апреля - начала мая. Чибисы были наиболее многочисленны на открытых солончаковых берегах озер, на илистых обнажениях (39,4%) и в сухой степи (35,5%). Временные водоемы, формирующиеся во время наводнений, играют большую роль как во время весеннего пролета, так и в послегнездовых кочевках куликов. Осенний пролет проходит с середины июля до конца октября - начала ноября, достигая наибольшего размаха в августе - сентябре. Анализом содержания 61 желудка чибисов было установлено, что они питались преимущественно насекомыми и их личинками (98,4% всех объектов), большинство которых было наземными (95,5% объектов), и, главным образом, жуками и их личинками (85,6% всех насекомых). В настоящее время чибисы отстреливаются охотниками лишь случайно, хотя мы ожидаем, что в Казахстане значение вида как объекта охоты повысится.

Introduction

Lapwing *Vanellus vanellus* occur everywhere in Kazakhstan except the Kysylkum, Ustyurt and Mangyshlak deserts (Dolgushin 1962).

Unfortunately, no special studies on the biology of the species have yet been carried out in this region. Our studies were carried out between 1969-1972 and in 1977 within the Kurgal'dzhinskiy Nature Reserve, which is located in the central part of Kazakhstan (Figure 1). Lapwings are common during the breeding period, when it nests on the

shores of the Kurgal'dzhin Lakes, on the flood-plains of the Nura, Kon and Kulan-Utpes rivers and on the nearby upland steppes, and also during the post-breeding period (Table 1).

Single or repeat wader counts were carried out in the most typical habitats. Birds were censused on 100 m wide transects along the shoreline, by foot or from a motor-cycle moving at 10-20 km hr⁻¹. The total length of routes covered was 573 km. Densities were calculated later for a one hectare standard unit.

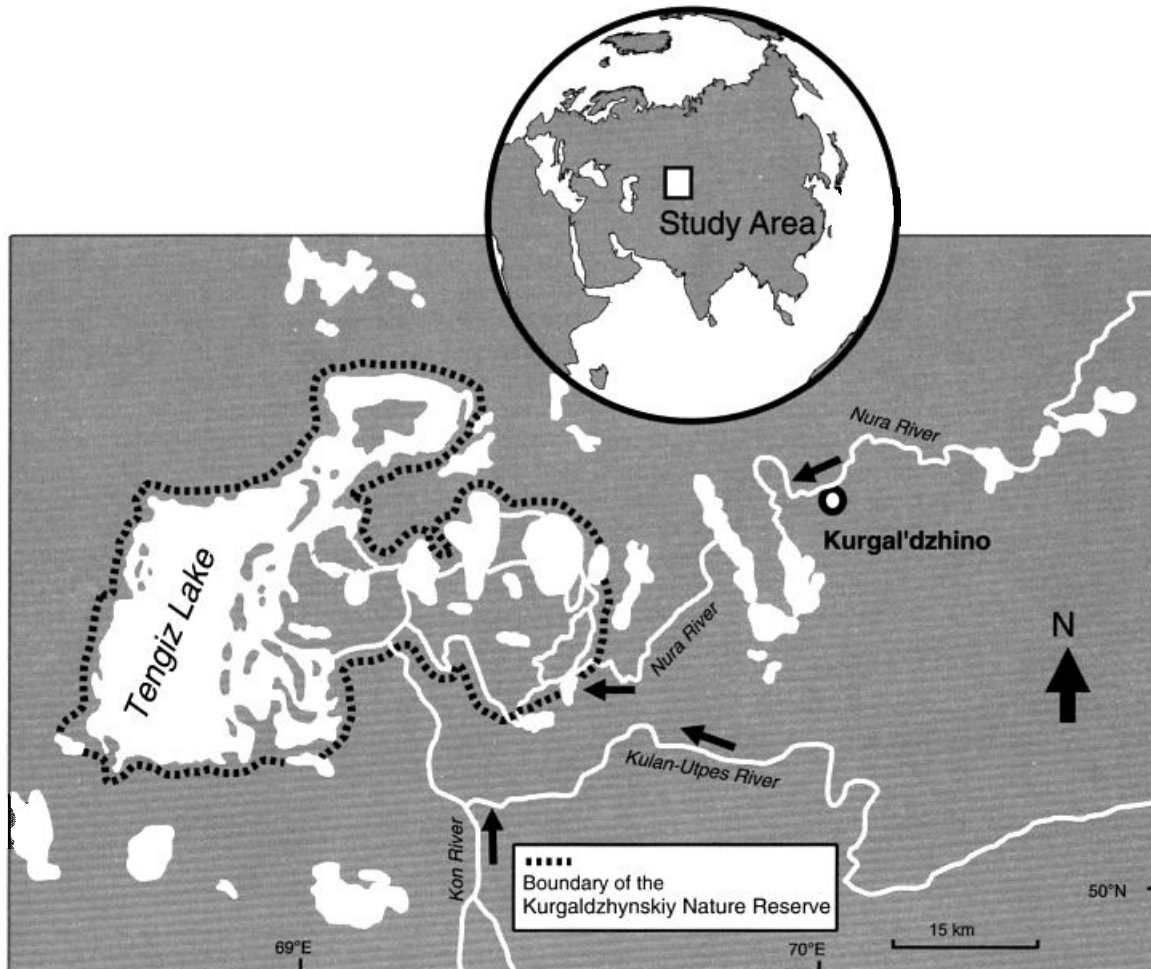


Figure 1. Study area.

Table 1. Average densities (ind. ha⁻¹) of Lapwings *Vanellus vanellus* in different habitats of Kurgal'dzhynskiy Nature Reserve.

Observation	Shores with salines	Grassy shores	Temporary water bodies	Steppe
Total area of habitat (ha)	54,438	2,293	1,000	39,652
Spring migration	1.0	0.4	0.4	-
Breeding	4.6	3.2	-	0.6
Postbreeding movements	10.2	2.1	70.0	0.3
Autumn migration	44.5	5.1	1.2	0.5

Annual Phenology

Lapwings spend a total of about eight months a year at the Kurgal'dzhynskiy Reserve. Spring arrival coincides with the appearance of snow-free patches of ground on the steppe and puddles on the roads. In different years, first individuals were recorded between 20 March - 4 April. Peak migration, which usually occurred over two to three days, was always observed within the same two-week period. Migration lasts until the end of April - beginning of May. At the end of May and beginning of June, failed breeders gathered in flocks on the steppe and the shores of water bodies. These were probably moulting flocks which were later joined by fledged young. Post-breeding movements gradually give way to autumn migration, which starts in the

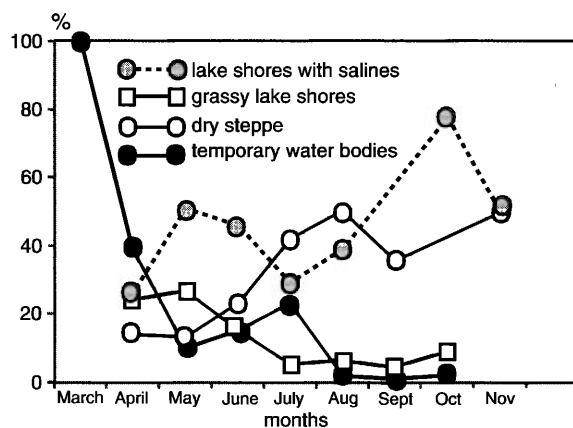


Figure 2. Changes in distribution of Lapwings between March and November.

second half of July and is most obvious during August and September. The last birds to leave do so very late in the season, when the average day temperatures have fallen below 0°C, the shallow water bodies had frozen and snow cover had already formed. In different years, the latest records varied between 20 October and 14 November.

At the Kurgal'dzhinskiy Reserve Lapwings use several habitat types (Figure 2), the most important being the open lake shores with salines and mudflats. Just after arrival, the birds also occur at the numerous shallow floods and puddles that appear after the snow melts, where food availability is probably greatest. In July, during post-breeding movements, these temporary habitats become important once again as they become partly overgrown with grasses and thus provide better food and protection for broods.

Nest-sites are located mostly on the salines and grassy shores of the lakes. Later, the areas of the shores with grass-cover are scarcely used, while the importance of shores with salines increases from July until the departure of birds, which usually occurs in October (79.3% of records). In the steppe habitats, Lapwings occur from April until autumn departure, although this habitat is preferred only during early and late autumn migration. From the end of August to early September foraging flights are often observed: Lapwings often fly together with Ruffs *Philomachus pugnax*, ducks and Greylag Geese *Anser anser* from the shores of water bodies to feed on harvested fields.

Food and Feeding

Lapwing diet was investigated by analysing the stomach contents of 61 birds (Table 2). Insects and

Table 2. Food composition of Lapwing at the Kurgal'dzhin Lakes .

Foods	No. of stomachs with food			% Occurrence	No. of items
	March-April	May-July	August-Oct		
Animal food	16	24	21	100	787
<i>Mollusca</i>	3	4	7	22.9	30
<i>Planorbidae</i>					
<i>Planorbis planorbis</i>	-	2	3	8.2	18
Mollusca (not identified)	4	2	5	16.4	12
<i>Insecta</i>	16	24	20	98.4	752
<i>Orthoptera</i>					
Gryllidae (not identified)	-	-	-	1.6	1
<i>Gryllotalpa gryllotalpa</i> L.	-	1	-	1.6	1
Acrididae (not identified)	-	5	2	11.5	17
<i>Hemiptera</i>					
Pentatomidae, <i>Aelia</i> sp.	1	-	-	1.6	1
<i>Corixidae</i>					
<i>Corixa</i> sp.	-	1	-	1.6	1
<i>Sigara</i> sp.	-	1	-	1.6	1
<i>Coleoptera</i>	16	22	19	93.4	644
<i>Carabidae</i> (not identified)	5	7	6	28.0	33
<i>Carabidae</i> , larvae	-	1	-	1.6	4
<i>Bembidion</i> sp.	1	-	1	3.3	13
<i>Pogonus</i> sp.	-	-	1	1.6	2
<i>Agonum</i> sp.	1	-	-	1.6	2
<i>Amara</i> sp.	-	1	1	3.3	8
<i>Ophonus</i> sp.	1	-	-	1.6	1
<i>Pseudophonus pubescens</i> M.	-	1	-	1.6	6
<i>Harpalus</i> sp.	1	-	-	1.6	1
<i>Pterostichus</i> sp.	1	-	1	3.3	2
<i>Dytiscidae</i> (not identified)	-	1	1	3.3	2
<i>Dytiscidae</i> , larvae	-	-	3	5.0	26
<i>Dytiscus</i> sp., larvae	-	1	-	1.6	2
<i>Ilybius</i> sp.	1	-	-	1.6	2
<i>Staphylinidae</i> (not identified)	-	-	1	1.6	2
<i>Silphidae</i> (not identified)	1	-	-	1.6	4
<i>Elateridae</i> , larvae	4	2	-	9.8	173
<i>Agriotes</i> sp.	1	-	-	1.6	1
<i>Dermestidae</i> , larvae	1	-	-	1.6	2
<i>Dermestes</i> sp.	1	-	-	1.6	1

Table 2 (continued) Food composition of Lapwing at the Kurgal'dzhin Lakes .

Foods	No. of stomachs with food			% Occurrence	No. of items
	March-April	May-July	August-Oct		
Byrrhidae					
<i>Pelochares versicolor</i> Waltl.	-	-	1	1.6	1
Hydrophilidae (not identified)	-	1	-	1.6	1
Hydrophilidae, larvae	-	-	2	3.3	35
<i>Hydrobius fuscipes</i> L.	1	-	-	1.6	3
Tenebrionidae (not identified)	-	1	1	3.3	2
Tenebrionidae, larvae	2	-	3	8.2	24
<i>Tentyria nomas</i> Pall.	-	-	2	3.3	2
<i>Blaps</i> sp.	2	-	1	5.0	4
<i>Opatrum</i> sp.	6	1	-	11.5	88
<i>Opatrum sabulosum</i> L.	4	1	1	9.8	17
<i>Gonocephalum</i> sp.	3	-	1	6.6	7
<i>Penthicus dilectans</i> T.	1	1	-	3.3	3
Cerambycidae (not identified)	1	-	-	1.6	1
Cerambycidae, larvae	-	-	1	1.6	9
<i>Dorcadion</i> sp.	1	-	-	1.6	1
Chrysomelidae (not identified)	-	-	1	1.6	1
<i>Chrysomela</i> sp.	1	-	-	1.6	1
<i>Cassida</i> sp.	-	1	-	1.6	1
<i>Cassida</i> sp., larvae	-	1	-	1.6	5
Curculionidae (not identified)	3	4	3	16.4	28
<i>Otiorrhynchus</i> sp.	-	1	2	5.0	8
<i>Conorrhynchus</i> sp.	-	1	-	1.6	7
<i>Cleonus</i> sp.	1	-	-	1.6	2
<i>Bothynoderes</i> sp.	2	2	1	8.2	19
<i>Stephanophorus strabus</i> Gyll	-	1	1	3.3	6
<i>Phytonomus</i> sp.	-	2	-	3.3	2
<i>Ceuthorrhynchus</i> sp.	-	1	-	1.6	1
<i>Baris</i> sp.	-	-	1	1.6	1
<i>Sphenophorus</i> sp.	2	-	1	5.0	4
<i>Tychius</i> sp.	1	-	-	1.6	1
<i>Stephanocleonus</i> sp.	2	1	1	6.6	6
Scarabaeidae, larvae	-	1	-	1.6	3
<i>Aphodius</i> sp.	-	-	1	1.6	2
<i>Onthophagus</i> sp.	-	-	1	1.6	3
Coleoptera spp. (not identified)	6	7	7	34.4	58
Diptera					
Stratiomyidae, larvae	-	1	-	1.6	17
Hymenoptera					
Tenthredinidae (not identified)	1	1	-	3.3	many
Tenthredinidae, larvae	1	-	-	1.6	4
Sphecidae (not identified)	-	1	-	1.6	2
Formicidae (not identified)	1	-	-	1.6	1
Myrmicinae (not identified)	-	1	-	1.6	42
Lepidoptera, larvae	1	3	-	6.6	19
Insecta spp. (not identified)	-	-	1	1.6	1
Arachnida (not identified)	1	1	1	5.0	5
Plant material	-	2	1	5.0	+
wheat grains	-	1	-	1.6	62
Cyperaceae,					
<i>Carex</i> spp., seeds	-	-	1	1.6	1
<i>Potamogeton</i> spp.,					
vegetative parts	-	1	-	1.6	many
Gastrolites	16	20	14	82.0	350

their larvae were found in 98.4% of stomachs. The birds fed mostly on beetles (85.6% of all recorded insects), predominantly the larvae of Elateridae, and adult Tenebrionidae, Curculionidae, Carabidae,

Dytiscidae and Hydrophilidae. Terrestrial invertebrates formed the highest proportion of the diet (95.1% of items) and aquatic invertebrates were found in 36% of stomachs. In some stomachs, both

terrestrial and aquatic invertebrates were recorded, which indicates that the birds fed in several habitats each day. Plant materials were found in only three stomachs (5%), and included wheat grains, the seeds of sedges *Carex* spp. and numerous pieces of pondweed *Potamogeton* spp. Unfortunately, a lack of materials meant we were unable to analyse seasonal variation in food composition.

At the Kurgal'dzhin Lakes and in other areas of central Kazakhstan, the larvae of Empididae, Tabanidae, Odonata, other invertebrates, and the bones of frogs *Rana* spp. have also been recorded as Lapwing food items (Vladimirskaia & Mezheny 1952; Dolgushin 1962). In northern Kazakhstan, in the Naurzum Nature Reserve, Lapwings fed on Carabidae, Curculionidae, Dytiscidae, and the larvae of Coleoptera (Dolgushin 1962). In the Chu river valley (south-eastern Kazakhstan) and in the steppes of Orenburg region, an area of Russia near the southern Urals, Lapwings have been recorded as taking Orthoptera, mostly Acrididae (Zarudny 1888; Shnitnikov 1949).

The fresh weight of food in each stomach, excluding gastrolites, ranged from 0.2-3.3 g (mean = 1.41 ± 0.27 g, n = 59, 82.3% of total weight of contents).

Most of the stomachs analysed contained gastrolites (82%), with 1 to 27 in each. They varied in size (0.5 to 7 mm measured at their longest dimension), form (rounded, flat, multi-angular, and origin quartz and granite-gneiss). There were also sometimes pieces of mollusc shells present, which may also be used for grinding food items in the stomach. The total weight of gastrolites in a single stomach ranged from 0.06 - 1.03 g (mean = 0.30 ± 0.11 g, n = 32).

Lapwings forage throughout the day, and have been observed foraging at night during full moons (Spencer 1972). Many of the species of ground-beetle Carabidae that were found in the stomachs analysed are also active at night (Gladkov 1951).

Usually the birds feed close to the water's edge and sometimes they move into the water up to tarsus depth. Food items are taken from the surface or while probing into the mud and algae mats, when at times, the bill is inserted up to its full length. Its feeding behaviour is typical of plovers: one to three quick steps - stop - peck. On average a bird makes 14.4 ± 3 pecks per minute (n=13, range 9 - 20), 71.3% of them from the surface and 28.7% whilst probing.

Weights

The heaviest adult male was collected on 20 August (300 g, compared with an average for the whole season of 212.2 g), the heaviest adult female on 5 May (243 g, compared with an average of 208.2 g), and the heaviest juvenile on 22 October (251 g, compared with an average of 204.3 g). Statistical analysis (according to Plokhinsky 1970, 1981) of

monthly changes in weight of adult and juvenile Lapwings did not reveal significant differences between any of the samples. This is probably due to the small sample size (31 adult males, 18 adult females, 12 juveniles) and the use of data collected in different years.

For a long time now, Lapwings have been incidentally shot by wildfowlers. It is quite possible that if the decline in the population of other waterfowl continues, this wader will be of greater interest as a quarry species (Drobovtsev & Khrokov 1981).

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