Numbers of migrating waders in south-east Kazakhstan assessed by standardised monitoring

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The abundance of migratory waders in spring and autumn 1990 and 1991 was monitored at two sites in south-east Kazakhstan. Estimates of abundance were made by transect counts and standardised mist-netting. A total of 28 species of waders were recorded in the spring and 37 in the autumn at Korjinkol and Alakol lakes. The highest numbers of Temminck's Stint Calidris temminckii were recorded in both migration seasons, whereas Whimbrel Numenius phaeopus were commonest in the spring, and Redshank Tringa totanus in the autumn. During separate years, the most abundant species were Little Stint Calidris minuta, Kentish Plover Charadrius alexandrinus, Little Ringed Plover Charadrius dubius, Curlew Sandpiper Calidris ferruginea, Lapwing Vanellus vanellus, Terek Sandpiper Xenus cinereus, Common Snipe Gallinago gallinago and Black-tailed Godwit Limosa limosa.

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Гаврилов, А. Е., Придатко, В. И., Гаврилов, Е. И. и Ерохов, С. Н. 1998. Численность мигрирующих куликов на юго-востоке Казахстана, оцененная стандартизованным мониторингом. *International Wader Studies* 10: 417-424.

Был проведен мониторинг обилия перелетных куликов весной и осенью 1990 и 1991 гг. в двух местах на юго-востоке Казахстана. Обилие было оценено маршрутными учетами и стандартизованным отловом птиц паутинными сетями. Было зарегистрировано в целом 28 видов куликов весной и 37 видов осенью на озерах Коржинколь и Алаколь. Максимальная численность белохвостого песочника Calidris temminckii была отмечена в оба миграционных сезона, тогда как средние кроншнепы Numenius phaeopus были наиболее многочисленными весной и травник Tringa totanus осенью. В отдельные годы самыми обильными видами являлись кулик-воробей Calidris minuta, морской зуек Charadrius alexandrinus, малый зуек Charadrius dubius, краснозобик Calidris ferruginea, чибис Vanellus vanellus, мородунка Xenus сіпетеия, обыкновенный бекас Gallinago gallinago и большой веретенник Limosa limosa.

Introduction and methods

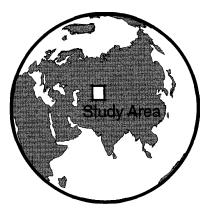
Observations of migrating waders in Kazakhstan were made from 29 April - 12 July 1990 on Korjynkol lake (2 km from the north-east extremity of Sasykkol), from 16 July - 9 September 1990 and from 13 May - 8 August 1991 on the western coast of Lake Alakol, Kazakhstan.

The numbers of waders were determined in two ways: by transect counts and trapping in mist nets. Data were standardised according to survey effort. In the analyses of transect data, numbers of birds recorded were expressed in relation to the length of lake shore (numbers/km shore). Numbers caught,

were expressed as the total for 100 net/days (the standard net length was 10 m).

Results and discussion

Summary data for wader abundance as expressed by shoreline counts and standardised between count periods as a mean value per km of the shore of Lake Alakol for 1990 are presented in Table 1 and for 1991 in Table 2. Total numbers observed in each month of these years are given in Table 3. Table 4 summarises the monthly totals of waders caught at Lake Alakol in mist-nets in both 1990 and 1991. The data are standardised for effort (numbers per 100 net/days) in Table 5 (1990) and Table 6 (1991)



to show seasonal changes in abundance.

Twenty-eight species of wader were recorded during the spring migration period (May - beginning of June). Green Sandpiper Tringa ochropus, Wood Sandpiper Tringa glareola, Ruff Philomachus pugnax, Broad-billed Sandpiper Limicola falcinellus and Bar-tailed Godwit Limosa lapponica were recorded during transect counts only. Calculations revealed that the most abundant waders in 1990 were Grey Plover Pluvialis squatarola, Kentish Plover Charadrius alexandrinus, Little Stint Calidris minuta, Temminck's Stint Calidis temminckii and Whimbrel Numenius phaeopus and, in 1991, Grey Plover, Redshank Tringa totanus and Temminck's Stint

Among the trapped birds, the most numerous were Kentish Plover, Little Stint and Temminck's Stint in 1990 and Redshank, Temminck's Stint and Terek Sandpiper Xenus cinereus in 1991 (Table 4). There were some reasons for these marked differences: in 1991, we began our observations 14 days later than in 1990, which meant we missed the end of the Kentish Plover migration and the beginning of the Whimbrel migration. In addition, in 1990 Kentish Plovers bred on the neighbouring salines, increasing the probability of recording these birds on transects and capturing them. The lower number of Little Stint and higher number of Redshank recorded in 1991 was a result of sampling in different habitats, as observations were made on silty and sandy shoals in 1990 and in marshy areas in 1991. The relative numbers of Grey Plover, Whimbrel, Blackwinged Stilt Himantopus himantopus and other large waders were high on transect counts (Tables 1-3) in comparison to the trapping data (Tables 4-6) where the medium-sized waders (e.g. Redshank and Terek Sandpiper) and small waders (Little Stint, Temminck's Stint and others) were more abundant. During the period of autumn migration (the second half of June - September), we ringed 37 species of waders. Curlew Numenius arquata and Whimbrel were recorded during the transects and Pacific Golden Plover Pluvialis fulva, Ringed Plover Charadrius hiaticula, Least Sandpiper Calidris minutilla and Pintail Snipe Gallinago stenura were caught in the mist nets. Whimbrel were recorded in high flying flocks. The numbers of other mentioned species were very small, so the probabilities of their

trapping or visual detection were approximately equal. The prevalence of Lapwing Vanellus vanellus and Black-winged Stilt on the transects only was defined by their low capture probability in comparison with the medium and small wader species. The relatively high numbers of Kentish Plover, Little Plover and Terek Sandpiper caught compared to count data was probably a consequence of the activity of these species at twilight, while the counts were made mainly in the morning when their activity was less.

In summary, a total of 28 species of waders were recorded in the spring and 37 in the autumn at Korjinkol and Alakol lakes. The highest numbers of Temminck's Stint were recorded in both migration seasons, whereas Whimbrel were commonest in the spring, and Redshank in the autumn. During separate years, the most abundant species were Little Stint, Kentish Plover, Little Ringed Plover, Curlew Sandpiper, Lapwing, Terek Sandpiper, Common Snipe Gallinago gallinago and Black-tailed Godwit. The increase of species and their numbers during the period of autumn migration was caused by the different nature of their migration in this

This analysis, based on counting and trapping, showed the dynamic character of seasonal migratory abundance. In order to estimate objectively the abundance of migratory waders, it is necessary to use two complimentary methods (trapping and counts), as waders of different sizes have unequal capture probability whereas the probability of visual detection of scarce and rare species is equal.

Table 1. Densities (mean number of birds per 1 km of coastline) of waders on Lake Alakol in 1990. L-total transect length; N-number of counts.

Date	BO And I L (km); N	7 May 4.2; 6	6.2; 10	21 May 6.4; 10	28 May 7.5; 13	4-June 5.7; 9	11 June 2.6; 4	144 une 5; 8	25 June 5.6; 103; 3
Species									
Grey Plover Pluvialis squatarola		2.9±2.1	13.6±4.7	17.5±6.3	4.3±1.6	1.1±0.7	0.4±0.2	0.4±0.2	
Little Ringed Plover Charadrius dubius	3.6 ± 3.0	0.8 ± 0.5		0.5 ± 0.3	1.2±1.1		1.0±1.0	1.1±1.0	1.0±0.6
Greater Sandplover Charadrius leschenaultii				0.4 ± 0.3		0.4 ± 0.4		0.2 ± 0.1	
Caspian Plover Charadrius asiaticus		0.3 ± 0.4		0.1 ± 0.1	0.7±0.9	0.4 ± 0.4		26.8±14.8	6.3±6.3
Kentish Plover Charadrius alexandrinus	1.2±1.2	1.9±1.2	5.9 ± 4.1	5.3±1.7	4.4±1.5		4.8±2.7	23.0±8.5	13.0±1.0
Lapwing Vanellus vanellus					0.3 ± 0.3	0.4 ± 0.5	0.4 ± 0.5	1.1±0.6	2.0±2.0
Turnstone Arenaria interpres					6.3±4.9	5.8±5.4			
Black-winged Stilt Himantopus himantopus		2.4±3.0	0.5 ± 0.4	2.0±1.7	4.4±2.3	6.9±6.4	8.6±5.3	1.4±1.6	
Oystercatcher Haematopus ostralegus		0.2 ± 0.2		0.1 ± 0.1			0.6 ± 0.5		
Green Sandpiper Tringa ochropus		0.5 ± 0.4		0.1 ± 0.2				1.4 ± 0.8	
Wood Sandpiper Tringa glareola									0.3 ± 0.3
Greenshank Tringa nebularia	0.2 ± 0.2	1.6±1.3		0.1 ± 0.2			0.4 ± 0.3	0.4 ± 0.4	7.3±7.3
Redshank Tringa totanus	0.7 ± 0.5	0.8 ± 0.5	0.5 ± 0.3	0.7 ± 0.6	3.5 ± 1.3	8.8±6.8	66.3±26.0	50.2±20.2	42.7±28.8
Spotted Redshank Tringa erythropus								0.4 ± 0.4	1.0±0.6
Marsh Sandpiper Tringa stagnatilis							1.2±1.1	0.4 ± 0.3	
Common Sandpiper Actitis hypoleucos	4.0 ± 4.0	0.3 ± 0.4	0.3 ± 0.3		1.7±1.6				4.3±3.3
Terek Sandpiper Xenus cinereus			0.8 ± 0.4	0.9 ± 0.5	1.0±0.7		3.2±1.7	1.1±0.5	1.0±1.0
Ruff Philomachus pugnax								1.4±1.2	
Red-necked Phalarope Phalaropus lobatus		0.3 ± 0.4	0.6 ± 0.6						
Little Stint Calidris minuta	9.0±4.3	15.5±7.4	10.6±5.2	6.1±2.7	5.8±3.4	1.5±1.43			
Temminck's Stint Calidris temminckii		8.4 ± 6.1	15.0±9.0	2.3±0.9	10.5±4.9	1.2±1.5		0.2 ± 0.2	
Curlew Sandpiper Calidris ferruginea			2.5±2.3	1.5±0.7					
Dunlin Calidris alpina	3.3±3.1	1.6±1.4	0.3 ± 0.3	0.7±0.8		0.4 ± 0.4			
Curlew Numenius arquata	0.2 ± 0.2	0.2±0.14				0.8±0.4	5.4±4.0	2.3±1.3	1.0±0.6
Whimbrel Numenius phaeopus	2	245.3±149.4	4 15.9±8.0	1.2±0.8					
Black-tailed Godwit Limosa limosa							3.8±4.5		
Collared Pratincole Glareola pratincola	0.2±0.2				0.9±0.58			0.9±0.7	

Date	9 July	16 July	30 July	6 Aug.	AMERICAN PROPERTY.			THE RESERVE OF THE PARTY OF THE	10 Sept.
Species	L (km); N	3;3	2; 1	8.2; 11	6.1; 2	2.3; 2	2;1	7;4	6; 41.5; 1
Grey Plover Pluvialis squatarola		No.	0.8±0.5	0.5±0.26	S. C. S.		1.6±2.5	0.8±0.6	电影型图像图像图像图像图像图像图像图像图像图像图像图像图像图像图像图像图像图像图像
Little Ringed Plover Charadrius dubius		2.5	6.9±2.9		23.9+8.1	6.0		1.5±0.6	
Greater Sandplover Charadrius leschenaultii			0.711.7	7.722.2	_0.710.1	0.0	0.7 10.2	1.010.0	
Caspian Plover Charadrius asiaticus	6.0±6.0								
Kentish Ployer Charadrius alexandrinus	0.020.0		19.1+6.8	24.6±17.6	3.0±1.8		1.7±1.6	0.8±0.6	
Lapwing Vanellus vanellus	7.7±7.7			17.2±6.2		1.5		1.3±0.47	
Turnstone Arenaria interpres				6.2±4.4				1.0+0.2	
Black-winged Stilt Himantopus himantopus	4.0±4.0	11.0	16.8±4.7		16.1±0.1	2.5	1.0±0.6	0.7±0.4	
Oystercatcher Haematopus ostralegus	7.7±7.0	20.0					1.0±1.5	***	
Green Sandpiper Tringa ochropus			0.6±0.46						
Wood Sandpiper Tringa glareola		0.5		1.0±0.5	0.4±0.4	0.5	0.9±0.32	1.3±1.2	
Greenshank Tringa nebularia			0.1±0.1	0.2±0.2					
Redshank Tringa totanus	5.3±5.3	7.5	17.2±6.9	10.3±5.8	14.8±5.2		3.3±0.5	1.0±0.6	1.3
Spotted Redshank Tringa erythropus			0.1±0.1	0.8±0.4	0.9±0.1	0.5	0.4±0.3	0.2±0.2	
Marsh Sandpiper Tringa stagnatilis			0.7±0.4	0.8±0.38			5.8±4.9	0.3±0.2	
Common Sandpiper Actitis hypoleucos		1.0	0.2±0.2	2.0±2.5					
Terek Sandpiper Xenus cinereus			6.3±3.0	0.3±0.3	12.2±6.1		0.4 ± 0.2	0.3±0.3	
Red-necked Phalarope Phalaropus lobatus	12.7±7.5		0.1±0.1	1.8±1.3			8.6±10.0	6.5±3.8	
Ruff Philomachus pugnax			2.9±1.1	2.6±3.3	3.0±2.6	6.0	0.6 ± 0.4	0.5 ± 0.5	
Little Stirit Calidris minuta	3.3±3.3		3.9±1.9	30.3±26.4	33.9±4.5	1.5		0.3±0.3	
Temminck's Stint Calidris temminckii		3.0	82.2±29.7	22.8±10.3	35.6±6.6	24.5	20.0±3.1	6.3±2.3	
Curlew Sandpiper Calidris ferruginea	22.3±11.4	64.5	16.0±4.9	12.1±12.6	;	135.2±27.	5 25.0	10.7±6.5	2.7±2.2
Sharp-tailed Sandpiper Calidris acuminata			0.1±0.1						
Dunlin Calidris alpina									
Broad-billed Sandpiper Limicola falcinellus				0.2±0.3	1.7±1.1	0.5	0.4 ± 0.4		
Common Snipe Gallinago gallinago			0.1±0.6	7.9±2.9	51.7±30.1	0.51.9±0.4	1.8±0.7	2.0	
Jack Snipe Lymnocryptes minimus								0.7±0.2	
Curlew Numenius arquata									
Whimbrel Numenius phaeopus				0.5±0.63				2.0±2.0	
Black-tailed Godwit Limosa limosa		915.0	2.8±1.1	2.2±1.6	19.3±10.4	<u>.</u>		19.8±12.3	
Bar-tailed Godwit Limosa lapponica			0.2 ± 0.1						
Collared Pratincole Glareola pratincola									

Table 2. Densities (mean number of birds per 1 km of coastline) of waders on Lake Alakol in 1991. L - total transect length; N - number of counts.

Date	13 May	20 May	27 May	20 June	1 July	8 July	4 Aug.	8 Aug.
L (km); N Species	6.7; 9	3.2; 5	2.2; 3	2.8; 5	4; 4	3.3	1; 1	2; 1
Grey Plover Pluvialis squatarola	7.2±3.7	5.6±2.6	20.4±0.7		or transfer persons			
Little Ringed Plover Charadrius dubius	0.4±0.4	0.6±0.3			0.7±0.7		9	2.5
Kentish Plover Charadrius alexandrinus			3.6±1.9		0.70.7		1	2
Lapwing Vanellus vanellus	0.9±0.5	0.6±0.6	1.8±1.9	2.1±0.5	3.0±1.1		18	14.5
Turnstone Arenaria interpres		2.8±1.3	8.2±2.0					0.5
Black-winged Stilt Himantopus himantopus	3.3±3.3	0.6±0.4	0.4±0.3	7.5±3.1	9.5±4.9		15	14.5
Avocet Recurvirostra avosetta	0.4 ± 0.4	0.3±0.4	0.9±0.6	-				
Oystercatcher Haematopus ostralegus	0.6±0.5	1.6±1.0	3.6±4.5	4.3±3.8	3.7±3.7			
Wood Sandpiper Tringa glareola							1	
Greenshank Tringa nebularia					1.5±1.5		1	
Redshank Tringa totanus	3.0±1.6	2.8±1.6	9.1±5.3	34.3±9.1	12.5±5.2	4.0±4.0	11	5
Spotted Redshank Tringa erythropus				0.4 ± 0.4	0.7±0.5			-
Marsh Sandpiper Tringa stagnatilis		1.9±2.4			0.2±0.2			
Terek Sandpiper Xenus cinereus	0.1 ± 0.1	4.1±2.9	0.4 ± 0.3				1	
Ruff Philomachus pugnax	0.1±0.2				1.2±1.2		2	0.5
Little Stint Calidris minuta	0.7±0.6							
Temminck's Stint Calidris temminckii	16.6±9.4	28.7±17.9					21	13
Common Snipe Gallinago gallinago				0.4 ± 0.3	2.0±0.7	0.3 ± 0.3	13	5
Curlew Numenius arquata				0.7 ± 0.4				
Whimbrel Numenius phaeopus	2.4±1.2	8.1 ± 4.8	0.4 ± 0.3					
Numenius sp.					15.2±15.2	36.6±36.7		
Black-tailed Godwit Limosa limosa					0.2 ± 0.2		15	60
Bar-tailed Godwit Limosa lapponica			0.4 ± 0.3					
Collared Pratincole Glareola pratincola	0.6±0.9	0.6 ± 0.8	0.4 ± 0.3		0.2±0.2			

Table 2. continued.

Date	9 July	16 July	30 July	6 Aug.	13 Aug.	20 Aug.	27 Aug.	3 Sept.	10 Sept.
L (km); N	3;3	2;1	8.2;11	6.1;2	2.3;2	2;1	7;4	6;4	1.5;1
Species									
Grey Plover Pluvialis squatarola			0.8±0.5	0.5±0.26		ALL LAND DE SERVICIO	1.6±2.5	0.8±0.6	
Little Ringed Plover Charadrius dubius		2.5	6.9±2.9	7.9 ± 4.2	23.9±8.1	6.0	0.7 ± 0.2	1.5 ± 0.6	
Greater Sandplover Charadrius leschenaultii									
Caspian Plover Charadrius asiaticus	6.0 ± 6.0								
Kentish Plover Charadrius alexandrinus			19.1±6.8	24.6±17.6	3.0±1.8		1.7±1.6	0.8 ± 0.6	
Lapwing Vanellus vanellus	7.7±7.7		16.5±5.3	17.2±6.2	12.2±5.5	1.5	1.0±0.71	1.3±0.47	
Turnstone Arenaria interpres			17.1±12.2	6.2±4.4	2.2±0.2			1.0±0.2	
Black-winged Stilt Himantopus himantopus	4.0 ± 4.0	11.0	16.8±4.7	8.8±3.4	16.1±0.1	2.5	1.0±0.6	0.7 ± 0.4	
Oystercatcher Haematopus ostralegus	7.7±7.0	20.0					1.0±1.5		
Green Sandpiper Tringa ochropus			0.6±0.46						
Wood Sandpiper Tringa glareola		0.5		1.0 ± 0.5	0.4±0.4	0.5	0.9±0.32	1.3±1.2	
Greenshank Tringa nebularia			0.1 ± 0.1	0.2±0.2					
Redshank Tringa totanus	5.3±5.3	7 .5	17.2±6.9	10.3±5.8	14.8±5.2		3.3±0.5	1.0±0.6	1.3
Spotted Redshank Tringa erythropus			0.1 ± 0.1	0.8±0.4	0.9±0.1	0.5	0.4±0.3	0.2±0.2	
Marsh Sandpiper Tringa stagnatilis			0.7±0.4	0.8±0.38			5.8±4.9	0.3±0.2	
Common Sandpiper Actitis hypoleucos		1.0	0.2±0.2	2.0±2.5					
Terek Sandpiper Xenus cinereus			6.3±3.0	0.3±0.3	12.2±6.1		0.4±0.2	0.3±0.3	
Red-necked Phalarope Phalaropus lobatus	12.7±7.5		0.1±0.1	1.8±1.3			8.6±10.0	6.5±3.8	
Ruff Philomachus pugnax			2.9±1.1	2.6±3.3	3.0±2.6	6.0	0.6±0.4	0.5±0.5	
Little Stint Calidris minuta	3.3±3.3		3.9±1.9	30.3±26.4	33.9±4.5	1.5		0.3±0.3	
Temminck's Stint Calidris temminckii		3.0	82.2±29.7	22.8±10.3	35.6±6.6	24.5	20.0±3.1	6.3±2.3	
Curlew Sandpiper Calidris ferruginea	22.3±11.4	64.5	16.0±4.9	12.1±12.6		135.2±27.5	25.0	10.7±6.5	2.7±2.2
Sharp-tailed Sandpiper Calidris acuminata			0.1 ± 0.1						
Dunlin Calidris alpina									
Broad-billed Sandpiper Limicola falcinellus				0.2±0.3	1.7±1.1	0.5	0.4±0.4		
Common Snipe Gallinago gallinago			0.1±0.6		51.7±30.1		1.9±0.4	1.8±0.7	2.0
ack Snipe Lymnocryptes minimus					•		•	0.7±0.2	
Curlew Numenius arquata									
Whimbrel Numenius phaeopus				0.5±0.63				2.0±2.0	
Black-tailed Godwit Limosa limosa		915.0	2.8±1.1		19.3±10.4	Į.		19.8±12.3	
Bar-tailed Godwit Limosa lapponica			0.2±0.1			-			
Collared Pratincole Glareola pratincola									

Table 3. Total numbers of waders counted on the Lake Alakol in 1990 and 1991. L - total transect length; N - number of counts.

		1990				1991	
Date	30 April-	4 June-	9 July-	6 Aug	3 Sept	13 May-	1 July-
	28 May	25 June	30 July	27 Aug.	10 Sept.	20 June	8 Aug.
L (km); N	30; 48	16.2; 25	13.3; 15	17.4; 15	7.5; 5	14.9; 22	10; 9
Species							
Grey Plover Pluvialis squatarola	263	7	7	22	5	111	
Little Ringed Plover Charadrius dubius	31	14	62	120	9	5	17
Greater Sandplover Charadrius leschenaulti	i 3	2				121112	
Caspian Plover Charadrius asiaticus	3	170	18				
Kentish Plover Charadrius alexandrinus	120	192	157	169	5	8	5
Lapwing Vanellus vanellus	2	15	158	143	8	18	59
Turnstone Arenaria interpres	36	15	140	43	6	27	1
Black-winged Stilt Himantopus himantopus	58	69	172	103	4	46	82
Avocet Recurvirostra avosetta						6	
Oystercatcher Haematopus ostralegus	2	3	61	7		29	15
Green Sandpiper Tringa ochropus	4	8	5				
Wood Sandpiper Tringa glareola		1	1	16	8		2
Greenshank Tringa nebularia	12	26	1	1			7
Redshank Tringa totanus	33	777	172	120	8	145	83
Spotted Redshank Tringa erythropus		5	1	11	1	1	3
Marsh Sandpiper Tringa stagnatilis		8	6	40	2	6	1
Common Sandpiper Actitis hypoleucos	31	13	4	12		2	
Terek Sandpiper Xenus cinereus	18	25	52	33	2	15	2
Ruff Philomachus pugnax		8	24	39	3	1	8
Red-necked Phalarope Phalaropus lobatus	6		39	71	39		8
Little Stint Calidris minuta	283	4	42	266	2	5	
Temminck's Stint Calidris temminckii	225	4	680	410	38	203	47
Curlew Sandpiper Calidris ferruginea	27		327	510	16		6
Sharp-tailed Sandpiper Calidris acuminata			1				
Dunlin Calidris alpina	31	1				CONTRACTOR OF THE	
Broad-billed Sandpiper Limicola falcinellus		-		9			
Common Snipe Gallinago gallinago			8	182	13	1	32
Jack Snipe Lymnocryptes minimus					1		
Numenius sp.					•	Contraction of the last	171
Curlew Numenius arquata	2	45				2	AND STREET, ST
Whimbrel Numenius phaeopus	1,632			3	12	43	
Black-tailed Godwit Limosa limosa	-/00	19	1,853	140	119		136
Bar-tailed Godwit Limosa lapponica		•	2		•••	1	2
Collared Pratincole Glareola pratincola	6	5	-			7	1
TOTAL	2,832	1,436	3,993	2,470	301	682	686

Table 4. Total number of waders captured at Lake Alakol in 1990 and 1991.

			1990						1991		
-	April - May	June	July	Aug.	Sept.	Total	May	June	July	Aug.	Tota
Grey Plover Pluvialis squatarola	3	5		1		9	9	1			11
American Golden Plover Pluvialis dominica	_	Ü		3		3		Acceptance of the second			
Ringed Plover Charadrius hiaticula	•			1		1					
Little Ringed Plover Charadrius dubius	6	3	102	137	4	252	1	1	28	8	31
Greater Sandplover Charadrius leschenaulti	-	5	102	107	_	6	1				
Caspian Plover Charadrius asiaticus	-	33	50			83					
Kentish Plover Charadrius alexandrinus	45	66	84	299	4	498	5	7	60	23	9
Lapwing Vanellus vanellus	••	•	1	6	-	7					
Turnstone Arenaria interpres	1	2	-	5	1	9					
Black-winged Stilt Himantopus himantopus	_	_	5	15	1	21	2	1	14	7	2
Oystercatcher Haematopus ostralegus			Ū		•			3	1	AND RES	
Green Sandpiper Tringa ochropus			1	5	1	7			8	2	1
Wood Sandpiper Tringa glareola		1	3	14	2	20	1		8		
Greenshank Tringa nebularia		•	Ū	1	_	1					
Redshank Tringa totanus	13	275	313	128	2	731	42	189	307	28	56
Spotted Redshank Tringa erythropus	10	2,0	010	1	_	1				20	
Marsh Sandpiper Tringa stagnatilis		3	4	17	1	25		1	4	4	
Common Sandpiper Actitis hypoleucos	4	4	33	15	•	56	1	1	19	3	2
Terek Sandpiper Xenus cinereus	13	10	78	149	2	252	24		1		2
Red-necked Phalarope Phalaropus lobatus	10	10	11	134	47	192	A STATE OF THE STA		3	1	
Ruff Philomachus pugnax		1	16	70	5	92		4	18	4	2
Little Stint Calidris minuta	188	13	30	267	1	499	3	5.5	2	2	TOTAL CO
Long-toed Stint Calidris subminuta	100	10	3	16	•	19			2	United States	
Temminck's Stint Calidris temminckii	125	3	132	464	8	732	61		53	23	13
Curlew Sandpiper Calidris ferruginea	2	J	36	508	25	571	1		11	6	1
Broad-billed Sandpiper Limicola falcinellus			1	12	1	15			THE WORLD		
Dunlin Calidris alpina	1	1	-	4	2	8	Marine Marine				
Common Snipe Gallinago gallinago	-	-	19	172	9	200	PROPERTY OF	1	54	21	7
Pin-tailed Snipe Gallinago stenura				1		1	Salata de la companya				
Whimbrel Numenius phaeopus	11			•		11	5				
Black-tailed Godwit Limosa limosa			5	6		11	The large	2	5		
Collared Pratincole Glareola pratincola		1	20	J		21			4		
Total	414	426	947	2451	116	4354	156	211	602	133	110

Table 5. Changes in numbers of waders caught through summer 1990 at Lake Alakol on the basis of standardised mist-netting (numbers of waders caught per 100 net/days).

12 0.4 14.4 9.8 12.6 16.1 13.1 5.7 5.0 4.5 32.8 31.8 26.4 15.3 1.1 12 1.4 2.4 0.6 0.8 0.7 0.8 0.3 0.4 0.8 0.4 0.8 1.6 1.5 0.8 1.1 2.0 1.6 0.8 2.2 4.9 1.1 2.0 1.6 0.8 2.2 4.9 1.1 2.0 1.6 0.8 2.1 3.2 12.2 29.0 4 1.7 12 3.2 15.7 39.2 30.9 1.7 12 3.2 15.7 39.2 30.9 36.1 23.3 29.6 16.9 37.7 80.6 5.5 2.9 4.7 26.6 89.0 43.9 2 4.4 3.7 5.8 19.3 26.1 6.1 1.7 82 0.4 0.8 0.3 0.8	Handing Hand	Species	30 April	7 May	14 May	21 May	28 May	4 June	ll e	18 June J	25 June J	E 2 1	9 July J	16 luly J	23 Tely J	30 July A	9 Aug. A	13 Aug. A	20 Aug. A	28 Aug. S	3 Sept.
1	12 13 14 14 14 14 15 15 15 15	Grey Plover Pluvialis squatarola				1.2	1.2	8.0											9.4		
1	spanielisi 63 1.54	American Golden Plover Pluvialis dominica															1.2				
$ \begin{tabular}{ l l l l l l l l l l l l l l l l l l l$	1	Ringed Plover Charadrius hiaticula																	0.4		
$ \begin{tabular}{ l l l l l l l l l l l l l l l l l l l$	$ \begin{tablematrix} \label{eq:high-like} \begin{tablematrix} \line{1.5cm} \end{tablematrix} \end{tablematrix} \begin{tablematrix} \line{1.5cm} \end{tablematrix} \end{tablematrix} \begin{tablematrix} \line{1.5cm} \end{tablematrix} \end{tablematrix} \begin{tablematrix} \line{1.5cm} \end{tablematrix} tab$	Little Ringed Plover Charadrius dubius	5.9	0.5			8.0		0.4		0.3	6.4	12.4	14.4	8.6	12.6	16.1	13.1	5.7	4.8	1.5
15	149	Greater Sandplover Charadrius leschenaultii				9.4		8.0	8.0	4.0											
triputes 1.9 1.4 0.	tripuls	Kentish Plover Charadrius alexandrinus	6.3	1.9	3.9	7.3	2.4	4.8	8.4	8.9	5.9	5.4	19.7	5.0	4.5	32.8	31.8	26.4	15.3	2.4	3.1
tropuls $ \begin{array}{ccccccccccccccccccccccccccccccccccc$	tropuls	Lapwing Vanellus vanellus														1.8	0.4				
tropus 4. 1.9	topus	Turnstone Arenaria interpres				0.4	0.4	0.4								0.4	8.0	0.3	0.4		8.0
** The state of t	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	Black-winged Stilt Himantopus himantopus												1.1	1.2	1.4	2.4	9.0	8.0	9.0	8.0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		Green Sandpiper Tringa ochropus														0.7	8.0	0.3	0.4		
1.9		Wood Sandpiper Tringa glareola								4.0			0.4		8.0	0.4	8.0	1.6	1.5	1.2	8.0
*** **** *****************************	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Greenshank Tringa nebularia														0.4					
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	84 0.8 0.9 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	Redshank Tringa totanus		1.9		2.4	3.6	3.6	26.8	30.0	43.5	18.8	24.0	63.3	27.0	26.0	14.1	7.5	2.7		1.5
Secondary Seco	9.8 0.9 0.4 0.7 0.2 4.9 1.1 2.0 0.4 1.1 2.0 0.4 1.2 4.9 1.1 2.0 1.2 4.9 1.1 2.0 1.2 4.9 1.1 2.0 1.2 4.9 1.1 2.0 1.2 2.0 9.4 1.2 4.9 1.1 2.0 1.2 2.0 9.4 1.2	Spotted Redshank Tringa erythropus																0.3			
ss 0.8 0.9 0.4 0.4 0.4 0.4 0.4 1.0 1.7 5.1 2.2 4.9 1.1 2.0 9.0 9.4 1.2 1.2 1.3 187 103 atus 2.4 2.8 2.4 2.0 0.4 1.1 2.0 9.4 1.2 4.5 1.2 4.5 1.2 1.2 1.2 2.0 9.4 1.2 2.2 4.5 0.7 6.8 6.8 6.8 8.8 9.0 2.4 13.2 21.5 22.9 14.4 1.2 2.4 1.7 1.2 2.2 4.5 0.7 6.8 6.8 8.8 8.8 9.4 13.2 23.2 13.4 12.2 2.6 9.4 1.7 1.2 2.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1<	ss 0.8 0.9 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 1.0 1.0 1.7 5.1 2.2 4.9 1.1 2.0 9.0 9.4 1.2 1.2 1.2 1.2 1.2 1.2 3.9 1.2 1.2 1.2 3.0 0.4 1.1 1.2 3.2 1.2 1.2 1.2 3.2 4.5 1.2	Marsh Sandpiper Tringa stagnatilis						0.4	0.4	9.4			0.4		8.0	1.1	0.4	2.8	1.9	9.0	
atus $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	attus	Common Sandpiper Actitis hypoleucos	8.0	6.0		0.4	9.4				1.0	1.7	5.1	2.2	4.9	1.1	2.0	1.6	8.0		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	athus 2.4 13.2 21.5 3.2 14.4 1.2 0.4 2.2 4.5 0.7 6.8 6.8 9.4 13.2 21.5 32.9 14.4 1.2 0.3 0.7 1.7 1.2 3.2 1.5 39.2 9.4 2.9 1.3 2.8 3.4 1.7 1.2 3.2 1.5 39.2 0.5 0.4 0.4 0.4 0.4 0.4 0.5 <	Terek Sandpiper Xenus cinereus			0.4	2.8	2.4	2.0	0.4	1.1		2.0	0.6	9.4	12.7	12.6	11.3	18.7	10.3	1.2	1.5
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Red-necked Phalarope Phalaropus lobatus										0.7	3.9			0.4	3.2	1.2	29.0	42.6	16.0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Ruff Philomachus pugnax								0.4			0.4	2.2	4.5	0.7	8.9	8.9	8.8	3.6	3.8
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	9.4 29.2 13.4 2.8 0.9 6.3 6.1 2.3 2.9 6.1 2.3 2.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1	Little Stint Calidris minuta	2.4	13.2	21.5	32.9	14.4	1.2				0.7	9.4	1.7	1.2	3.2	15.7	39.2	30.9	7.8	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	9.4 29.2 13.4 2.8 0.9 36.1 23.3 29.6 16.9 37.7 0.8 0.9 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	Long-toed Stint Calidris subminutilla									0.3				8.0	0.7	2.0	1.9	1.1		
0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Temminck's Stint Calidris temminckii		9.4	29.2	13.4	2.8						6.0	36.1	23.3	29.6	16.9	37.7	9.08	9.6	5.3
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.9 0.9 0.4 0.8 0.3 1.7 0.8 1.3 1.3 5.7 1.4 1.4 1.3 5.7 1.4 1.4 1.3 5.7 1.4 1.4 1.3 5.7 1.4 1.4 1.3 5.7 1.4 1.4 1.3 5.7 1.4 1.4 1.3 5.7 1.4 1.4 1.4 1.5 1.5 1.4 1.4 1.5 1.5 1.4 1.4 1.5 1.5 1.4 1.4 1.5 1.5 1.4 1.4 1.5 1.5 1.4 1.5 1.5 1.4 1.5 1.5 1.4 1.5 1.5 1.5 1.4 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5	Curlew Sandpiper Calidris ferruginea		0.5		0.4						2.3	5.1	5.5	2.9	4.7	26.6	89.0	43.9	23.4	10.7
1.7 0.4 0.4 0.4 0.9 1.5 4.4 3.7 5.8 19.3 26.1 6.1 5.3 1.7 0.8 1.7 8.2 0.4 0.8 0.3 0.8	2.3 1.7 0.8 2.3 1.7 0.8 1.3 2.7 2.8 1.9.3 26.1 1.7 8.2 0.4 0.8 0.3 1.3 5.7 1.4 0.8 0.3	Dunlin Calidris alpina				9.4		0.4											0.4	1.8	1.5
2.3 1.7 0.8 1.7 8.2 0.4 0.8 0.3 0.8	2.3 1.7 0.8 4.4 3.7 5.8 19.3 26.1 1.7 0.8 1.3 20.4 0.8 0.3 1.3 1.3 1.3 1.4 1.4 1.3 1.4 1.4 1.3 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	Broad-billed Sandpiper Limicola falcinellus					0.4								0.4	0.4	0.4	6.0	1.5	1.8	8.0
2.3 1.7 0.8 1.7 8.2 0.4 0.8 0.3 0.8	2.3 1.7 0.8 1.7 8.2 0.4 0.8 0.3 cola 1.3 5.7 1.4	Common Snipe Gallinago gallinago												4.4	3.7	5.8	19.3	26.1	6.1	0.6	3.1
1.7 8.2 0.4 0.8 0.3	1.7 8.2 0.4 0.8 0.3 1.3 5.7 1.4	Whimbrel Numenius phaeopus		2.3	1.7	8.0														9.0	
	1.3 5.7	Black-tailed Godwit Limosa limosa												1.7	8.2	0.4	8.0	0.3	8.0		
1.3 5.7		Collared Pratincole Glareola pratincola											1.3		5.7	1.4					

Table 6. Changes in numbers of waders caught through summer 1991 at Lake Alakol on the basis of standardised mist-netting (numbers of waders caught per 100 net/days).

Grey Plover Pluvialis squatarola	1.5	1.3	1.8										
Little Ringed Plover Charadrius dubius			0.4		4.0			1.9	2.7	4.9	2.2	4.0	4.2
Greater Sandplover Charactus leschenaultii			0.4										
Kentish Plover Charadrius alexandrinus	0.5	1.8		6.0	6.0	0.4	1.0	6.3	4.9	6.7	7.6	11.6	8.3
Lapwing Vanellus vanellus	0.5		1.8			7.0	0.5		1.3	6.0	0.4	6.0	2.1
Turnstone Arenaria interpres		9.4											
Black-winged Stilt Himantopus himantopus		6:0			0.4			9.0	6.0	1.3	6.0	5.4	2.1
Oystercatcher Haematopus ostralegus			0.4		6.0			9.0					
Green Sandpiper Tringa ochropus								9.0			3.1	0.4	2.1
Wood Sandpiper Tringa glareola	0.5									3.1	3.1	6.0	
Redshank Tringa totanus	5.9	8.9	6.2	5.4	16.5	40.1	24.0	35.5	26.8	41.1	27.7	23.2	27.1
Marsh Sandpiper Tringa stagnatilis										6.0		1.8	4.2
Common Sandpiper Actitis hypoleucos		0.4		0.4			0.5		1.3	2.7	2.7	3.1	
Terek Sandpiper Xenus cinercus	1.5	5.4	4.0							9.4			
Red-necked Phalarope Phalaropus lobatus								9.0			6:0		2.1
Ruff Philomachus pugnax					6:0		1.0	9.0	0.4	1.3	4.0	3.1	2.1
Little Stint Calidris minuta	1.0		0.4							0.4	0.4	0.4	2.1
Long-toed Stint Calidris subminutilla											0.4	0.4	
Temminck's Stint Calidris temminckii	18.3	8.0	2.7							2.2	19.6	8.5	16.7
Curlew Sandpiper Calidris ferruginea	0.5								6.0	2.2	1.8	2.2	2.1
Sharp-tailed Sandpiper Calidris acuminata													
Dunlin Calidris alpina													1000
Common Snipe Gallingso gallinago							0.5		1.3	9./	11.2	8.5	22.9
Whimbrel Numenius phaeopus	0.5	1.8											
Black-tailed Godwit Limosa limosa							0.5	9.0	0.4	9.0	4.0	0.4	
Collared Pratincole Glareola pratincola					4.0				1.3	4.0			