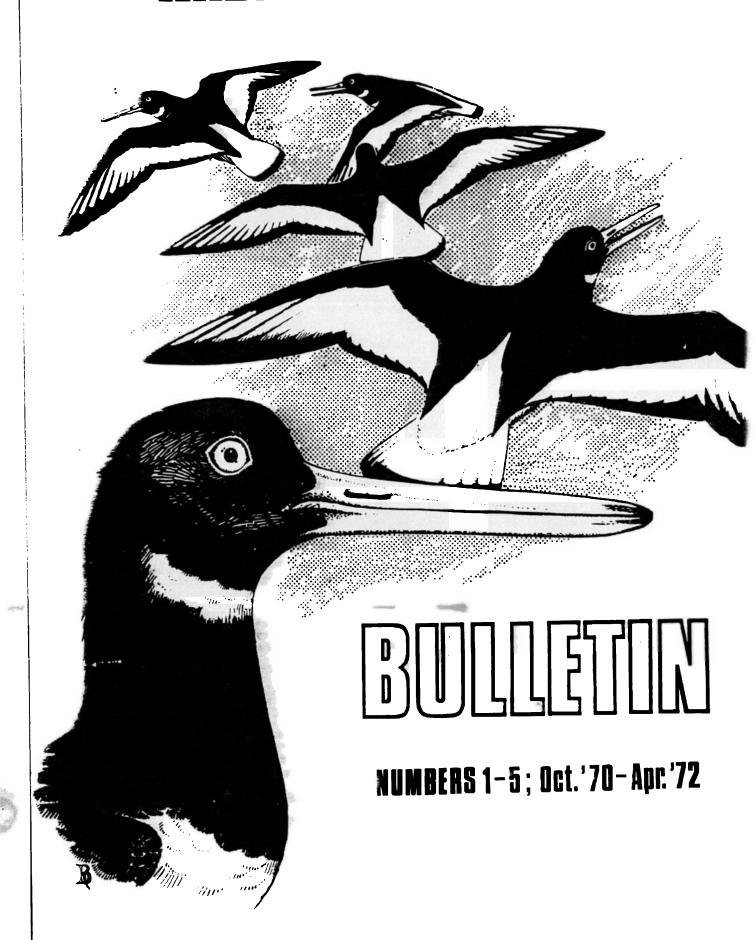
# WADER STUDY GROUP



### WADER STUDY GROUP

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### CORRESPONDENCE

All general enquiries, applications for membership, initial subscriptions and renewals, changes of address, completed WSG data forms, matters relating to the circulation of the Bulletin, etc. should be sent to the Administrative Secretary (G.F. Appleton).

Matters and proposals concerning co-operative research projects and objectives should be sent to the Co-ordinator (W.J.A. Dick).

All material for the Bulletin and enquiries about this should be sent to one of the Editors (M.W. Pienkowski & G.H. Green).

In America, membership applications, etc. may be sent to Dr E.H. Miller and material for the Bulletin to Dr R.I.G. Morrison.

# PAYMENTS

All cheques should be payable to "Wader Study Group".

Payments sent to the N. American Membership Secretary may be in Canadian or U.S. dollars. All other payments should be sent to the Administrative Secretary. These must be in British currency and sent by cheques, drafts or orders drawn on a UK bank or the British Post Office.

# DEADLINES

For inclusion in the issue indicated: APRIL AUGUST DECEMBER

articles, notices, etc. must be received by: 1 February 1 June 1 October

(If correspondence between editors and author(s) is likely to be necessary, articles must be received well before these dates if they are to be included in the next issue.)

Ringing totals nust be received by 20 February 20 June 20 October

(It may also be possible to include short notices received by MWP by these dates.)

# RE-ISSUE OF BACK NUMBERS OF WADER STUDY GROUP BULLETIN

We have reprinted WSG Bulletin numbers 1-20 in four volumes. They are facsimile reproductions and any errors in the first issue are still present.

Numbers 1-4 were originally produced on foolscap size paper and have been retyped on A4 to conform with later issues. The original pagination is indicated and should be used when citing references. Similarly bulletins should be referred to by number, not by re-issue volume.

Small numbers are still available and enquiries should be sent to G.F. Appleton, Administrative Secretary whose address appears on the inside cover.

Bulletin No. 1 October 1970

The main purpose of this bulletin is to keep all those interested in waders informed of what is happening elsewhere in the country. To this end it will contain regular summaries of the numbers of waders ringed, the recoveries reported and reports of unusual numbers of any species. In addition this bulletin includes a short account of two netting trips to Iceland and a short article on the analysis of a catch. It is hoped that similar, and perhaps longer, articles will be submitted for future bulletins. One of the purposes of this publication is to bring together and widely circulate small analyses that would not normally be placed in journals but are of interest to all observers or ringers of waders.

Two requests were made at the first meeting of the W.S.G. for

- (1) Short accounts about the <u>techniques</u> of mist-netting waders. It is desirable to produce a manual of techniques in the near future so that others can benefit from the experience already gained.
- (2) Ringed Plover measurements, weight and moult. I would like to thank those who have already contributed to these requests. However there are still very many who could help with both of them. I am making another plea for more data to be made available as soon as possible.

The W.S.G. can play an important part in the co-ordination of ringing effort. To help this, would those persons or groups wishing to assist elsewhere and those groups needing help please contact Tony Prater, who will put the parties in touch with each other.

May I remind all readers that the next bulletin will be circulated in March 1971, and could I please have ringing totals, articles, etc. by the end of February 1971.

I would like to include here a reminder that the next meeting of the Wader Study Group will be during the Ringers Conference (January 8th-10th). It is hoped that as many groups or individuals as possible will be able to send representatives so that all views can be heard. Please do your best to attend.

### A.J. Prater.

# Wader Ringing during Autumn 1970

The totals ringed are in the table below. The autumn has been characterised by low catches. On two occasions the wind has freshened as the new moon approached only to drop as the full moon appeared. Thus mist net catches have been unusually low although Farlington R.G. have managed to catch good numbers. Cannon net catches have also been quite low with a series of factors operating against success in many cases. However it is hoped that this will lead to a more determined effort from now on and result in better luck during the winter months.

# Ringing totals for June - September

		FRG	LRG	MBWG	MRG	NKRG	TRG	WWRG
	Oystercatcher	_	4	500	2		32	563
	Lapwing	2	_	_	7		158	-
	Ringed Plover	46	_	50	5		6	36
	Little Ringed Plover	_	10	-	_		-	-
	Grey Plover	_	_	-	_		_	30
	Golden Plover	_	_	2	_		2	_
	Turnstone	-	_	241	_		_	73
	Snipe	4	13	1	1		_	-
	Jack Snipe	2	3		_		-	-
	Woodcock	_	_	=	_		6	-
	Curlew	-	_	-	1		45	82
2	Whimbrel	-	_	-	-		-	2
	Bar-tailed Godwit	_	-	2	1		3	3
	Green Sandpiper	_	1	-	1		-	-
	Common Sandpiper	21	2	-	2		3	_
	Redshank	34	_	156	12		28	2
	Greenshank	10	-	-	1		-	-
	Knot	-	2		-		1	150
	Dunlin	369	24	746	174		57	498
	Curlew Sandpiper	-	_	_	-		1	-
	Little Stint	4	-	_	-		1	1
	Sanderling	-	12	13	155		_	474
	'							
	_			•				

492 71 1837 390 343 1914

# Recent Recoveries

The increase in wader ringing in the past few years is now beginning to show in the increase in the number of recoveries notified. The most noticeable impact has been caused by the two cannon-netting trips to Iceland but those apart many interesting movements were reported.

Oystercatcher. 52 recoveries were reported from the breeding grounds with a further 4 passage birds from Holland and France.

		From	Burry	Menai	Dee	Morecambe Bay	Wash
То	Holland		-	-	-	-	1
	France		_	_	_	-	2
	Germany		-	_	-	1	_
	Norway		6	_	-	2	5
	Iceland		-	_	-	1	-
	Faeroes		1	4	_	2	-
	Shetland		-	_	1	4	1
	Orkney		-	-	1	-	_
	Scotland		6	2	6	2	1

Only two pulli were recovered.

ringed Angus 21.6.69 x Fishguard, Pembs. 8.3.70 ringed Fair Isle 29.6.66 x Whitehaven, Cumb. 28.2.70

Ringed Plover only 4 distant recoveries were noted.

Pullus	Ravenglass, Cumberland.	16.5.67	С	Morecambe Bay. 28.1.70
Pullus	Foulness, Essex	23.5.70	С	Farlington, Hants 9.8.70
Juv.	Minsmere	6.9.66	$\mathbf{x}$	Mauche, France 12. 8.70
P.J.	Swale, Kent	4.9.66	С	Denmark 12.8.70
Grey P1	over			

3.3.68 x Jutland, Denmark 14.8.70 P.J. Dee

# Turnstone

Juv.	Morecambe Bay	9.10.69	$\mathbf{x}$	Ribble	1.2.70
P.J.	Hilbre, Dee	17.2.68	С	Walney	20.8.70

# Curlew

Ad.	Humber	30.8.69	$\mathbf{x}$	Denmark	16.4.70
P.J.	Fair Isle	16.3.69	x	Norway	10.5.70

Redshank 5 foreign and 8 long distance British recoveries were reported. Of the foreign recoveries two were on breeding grounds and three in wintering grounds.

Ad.	Wash	1.8.69	$\mathbf{x}$	Iceland 20.6.70
Ad.	Swale	16.8.69	$\mathbf{x}$	Flensburg, Germany 13.5.70
FG.	Tay	14.7.69	$\mathbf{x}$	Scheveningen, Holland 2.1.70
IY	Lydd, Kent	25.7.69	$\mathbf{x}$	Somme, France 30.3.70
Ad.	Alnwick, Northum	berland.	4.9	.69 x Essaouira, Morocco 25.4.70

3 Knot All recoveries of birds which were on or near breeding grounds referred to the Greenland race, a total of 47 were controlled in Iceland and a further 2 were shot in Greenland. All recoveries apart from the total of 19 movements between the Dee, Morecambe Bay and the Wash and the Icelandic controls are listed below.

Juv.	Wash	3.9.63	$\mathbf{x}$	Vendee, France	14.1.70
Ad.	Wash	3.9.67	$\mathbf{x}$	Thorney Is., Hants	18.1.70
FG	Dee	22.11.65	$\mathbf{x}$	Frisian Is., Germany	4.6.70
Ad	Wash	5.5.69	x	Jutland, Denmark	2.8.70
$\mathbf{Ad}$	Morecambe Bay	15.10.69	$\mathbf{x}$	West Greenland	30.5.70
Ad	Morecambe Bay	8.2.70	$\mathbf{x}$	West Greenland	7.7.70
IY	Dungeness	30.8.69	$\mathbf{x}$	Mozambique	10.10.70

Dunlin 21 long distance British and 28 foreign recoveries have been reported. The foreign recoveries are summarised below.

	to	Eire	Sweden	Denmark	Germany	France	Portugal	Morocco
From					-			
Dee				1				
Morecambe	Bay		1	2				
Medway			3	1				
Wash		1	Ō	2	4	3	2	1

In addition there was one interesting British pullus recovery ringed Fetlar, Shetland 14.6.68 x Walney 23.5.70

Curlew Sandpiper A single recovery has resulted from the autumn 1969 invasion.

PJ Lydd, Kent 30.8.69 x Casablanca, Morocco 7.3.70

<u>Sanderling</u> Surprisingly no movements within Britain were recorded although 5 foreign recoveries were reported.

$\mathbf{Ad}$	Dee	26.7.68	$\mathbf{x}$	Dakar, Senegal	20.1.70
$\mathbf{FG}$	Hilbre, Dee	3 <b>.5.</b> 69	$\mathbf{x}$	Casablanca, Morocco	7.5.70
$\mathbf{Ad}$	Wash	31.7.69	$\mathbf{x}$	Casablanca, Morocco	3.3.70
PJ	Wash	13.7.68	$\mathbf{x}$	Safi, Morocco	5.5.70
J	Wash	20.8.67	$\mathbf{x}$	Somme, France	21.7.70
$\mathbf{Ad}$	Wash	13.4.68	x	nr. Murmansk	19.6.70

In addition a French ringed Sanderling was controlled on the Dee in August.

# Wader Catching in Iceland, Summer 1970

### M. Pienkowski and P. Stanley

In May and July/August this year two expeditions to Iceland were organised in order to catch waders, particularly Knot on migration to and from the Greenland breeding grounds. During the last few years considerable data have been collected on this species in Britain. The expedition's aim was to complement this work by helping to determine the status of the Greenland breeding population amongst the birds on the west European coasts in autumn and winter. In view of the difficulties involved in catching Knot widely dispersed on the Greenland breeding grounds, Iceland presents an excellent location for catching as, while the waders are still concentrated in flocks, it seems safe to assume that they form part of the Greenland breeding population. Secondary aims of the expeditio particularly the second phase, were the catching of samples of other wader species and the taking of blood smears for a parasite study by Dr. A.E. Williams (University of Birmingham).

In view of the lack of darkness in Iceland during the summer, mistnetting was ruled out for most of the time and cannon-netting was
adopted as the principle catching technique, two net sets being loane
by the Wash Wader Ringing Group. The Cambridge/London Iceland Expedit
1970 was officially recognised by Cambridge University and
University College, London, personnel coming from these and from
King's and Chelsea Colleges, London and the University of East Anglia
The Icelandic Ministry of Education gave permission for the
expedition to work and the Museum of Natural History, Reykjavik
supplied rings.

4 The first party was in Iceland during the peak of the Knot migration in the last two weeks of May, when flocks of several thousand were continually passing through the fjords in the west coast bays of Breidafjordur and Faxafloi. 878 Knot were caught including 37 controls (15 Wash; 13 Morecambe Bay; 7 Mersey-side R.G.; 1 Leigh R.G. 1 Vendee, France). A large sample was weighed and measured.

The second party visited Iceland for four weeks at the end of July and beginning of August. The autumn Knot migration is spread over two months with smaller numbers than in May present on the west coast fjords at any one time. Flocks of 150 to 400 were seen and 204 caught and processed, including 15 controls (3 Wash; 5 Morecambe Bay; 1 Merseyside; 1 Heligoland; 5 Iceland, ringed by the first party). Other species caught by the second phase included 46 Oystercatchers (including one control from Morecambe Bay), 1 Ringed Plover, 4 Golden Plover, 15 Redshank, 1 Purple Sandpiper, 67 Dunlin and 2 Red-necked Phalaropes.

A full report of the expedition is in preparation and it is hoped to publish this within the ne t few months. As a result of the two expeditions to Iceland more than 1000 Knot are currently carrying Icelandic rings and all wader ringers in this country (and Western Europe) are urged to try to catch this species this autumn and winter. The value of any wader caught - not only controls - will, of course, be greatly increased if wing and bill length and weight are measured. A similar expedition to Morocco in autumn 1971 under the auspices of the University of East Anglia and the WWRG is being organised to continue this work on several wader species.

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# How Many Dunlin must be Processed to Obtain Useful Results?

### by A. J. Prater

This question is frequently asked when considering the balance between the need to gather information and the necessity of releasing the birds as soon as possible after catching them. In recent years large catches of Dunlin have been made with both mist nets and cannon-nets and it is now a question of some importance.

On the 2nd February 1970 an opportunity arose which enabled some answers to be obtained. On this date a catch of 556 adult Dunlin was made on East Plain Marsh, Morecambe Bay. As the day was fine and sufficient personnel (13) were present the whole catch was processed. At this time of the year only the northern race of the Dunlin, Calidris alpina alpina is present and hence we were dealing with a single population. The sex ratio of Dunlin is approximately unity (Prater in prep.) and hence the averages obtained should not be biased unduly by an uneven sex ratio.

The measurements were obtained by the methods outlined by the first meeting of the Wader Study Group, i.e. maximum wing, bill to feathers, and weight to the nearest gram. Two persons only measured, it was already known that both were consistent in measuring. The whole catch was processed within two hours and little change in weight could have occurred in that time, especially as the weights were taken to the nearest gram.

The mean and standard deviations of the whole sample was determined., Table 1, and then subsamples of 200 (2), 100 (5), 50 (11), 25 (22) and 10 (10) were taken and the means of each subsample compared with the true mean. The comparison was made by considering the percentage variation of each subsample from the true mean.

The results are set out in Table 11, together with the percentage of subsamples which deviated more than 1% and 2% from the mean.

As expected there is a decrease in variability with increasing size of subsample. The low variability of wing length and weight and the relatively high variability of bill length were all rather unexpected. The bill length is generally assumed to be a more consistent measurement but it is clear that although it has a small size difference when measured in millimetres, when compared by % difference the measurement has greater variability, a probable result of the small number of size classes of the measurement.

5 The variation in weight were quite small when sample sizes of 50 or more were considered but increased considerably in smaller samples.

# SUMMARY

There is a decrease in variability of the sample with increasing sample size. However it is possible to give broad outlines of the number which should be processed.

<u>Wing</u> - samples as low as 10, but preferably 50, should give a close approximation to the mean.

Bill and Weight - if possible the sample size should be at least 50 but preferably 100.

Where large catches can be made and sufficient time is available a sample of 100 should be measured. However catches of 10 - 25 can also provide much information.

A <u>Warning</u> must be given and this is that the number recommended only refers to a winter population of a single subspecies. It is most probable that during the spring (March - May) and autumn (July - September or later) passage periods when other races may be present a much higher number is needed; then approximately twice the recommended numbers should be processed.

When taking a sample from a catch both new, retrap and controls should be treated alike otherwise a biased sample may result.

N.B. In order to increase the chances of a bird subsequently recovered having known measurements the larger the number of birds which can be processed the better.

### WADER NETS

by C. J. Mead

Wader nets have been sold by the B.T.O. for about twelve years. They are of a heavier material and larger mesh  $(1\frac{1}{2})$  knot to knot) than the other mist nets sold and are fitted with stronger shelf

strings. They can therefore be used to catch larger birds or large numbers of smaller birds. They can be used in windy conditions when ordinary nets billow into a solid wall and so much tension can be put on the shelf strings without fear of their parting that they can also be used over mud and water where ordinary nets might drag and dampen birds in the bottom shelf.

The large mesh size of wader nets means that most birds get one or both carpals through a mesh (or meshes) and sometimes, as they struggle in the net, the rather rough thread of the netting cuts into the flesh of the carpal. Under windy and damp conditions this can happen to relatively docile birds. Although such injuries bleed the vast majority of injured birds can fly on release. A minority are more seriously injured and cannot fly on release. I do not suggest that this type of injury invariably happens when wader nets are used but it is characteristic of these nets that it can happen.

Waders are often badly tangled, relative to passerines, in standard mesh nets and the problems involved in releasing a small wader from a wader net are probably beyond even experienced inland mist-netters. I have seen a competent netter start extracting a Ringed Plover, flushed into a wader net about 1 minute earlier, spend some 15 minutes without success on it. Even netters experienced in the use of wader nets would not like to catch too many small waders at once in them since, even using the special techniques like passing wings through meshes etc., extraction still takes a lot longer than with standard mesh nets.

Relatively few of the many waders ringed in Great Britain are taken with wader nets. Most are from cannon-nets. However, I am taking this opportunity of putting these points before all wader group members and asking whether wader nets should <u>ever</u> be used in circumstances where numbers of small or medium sized waders are possibly going to be caught. They are probably the only nets for catching really large waders, the larger gulls and ducks. I seldom have the opportunity of catching waders nowadays but would certainly not use my wader nets unless I was pretty certain that they were only going to catch Gulls, Oystercatchers or Curlew. Normal material small mesh nets are not so satisfactory as standard mesh  $(1\frac{1}{2})$  stretched nets as the birds tend to bounce from the smaller mesh. The ideal net, I am sure, is the standard mesh  $(1\frac{1}{2})$ , 3-shelf net with the shelf strings replaced by the wader-net shelf string material.

7 Jeremy Sorensen, in <u>Ringers' Bulletin</u> Vol. 3, No. 3, outlined a quick method for pulling through the new shelf strong by welding it to the old. Conversion of a 60' net takes about an hour (including re-tethering). It is possible that we will stock a heavy shelf-stringed standard 60' net in the future, if demand is high enough. Please let the Ringing Office know if you would be interested in such nets - provided they cost relatively little more than 60' nets with ordinary shelf strings. As some of you will know prices of nets have increased dramatically - you will all be getting a price list in the near future - Wader nets will be £4.10.0d. and 60' standards £5. 5. 0d.

TABLE 1. Size range and mean size of a sample of wintering Dunlin in Morecambe Bay

	Wing	Bil1	Weight
Size range	112 - 131	27 - 39	41 - 63
mean	121.24	32.37	50.48
S.D.	3.217	1.899	3.837
n.	555	556	552

TABLE 11. Percent variation of subsamples from true sample mean

	<del>-</del>			BILL	WEIGHT				
Sample Size			% of subsample mean which deviates from the mean by more than			% of subsawhich devi- from the m by more th			
		1%	2%		1%	2%		1%	2%
200	.02	-	-	.60	_	-	. 32	-	-
100	.27	O	0	. 82	40	0	.47	20%	O
50	•33	0	0	1.39	73%	18%	.96	45%	0
25	.44	9%	0	1.44	73%	27%	1.34	59%	27%
10	.57	10%	0	1.70	60%	10%	1.91	80%	50%

# 7 Reports of Rarer Waders in August and September

Large numbers of both eastern and American waders have been reported during this period. Two <u>Lesser Yellowlegs</u> were the first American arrivals, appearing in Kent on 1st August and Sussex on 3rd. These were followed by two south-eastern birds, both <u>Black-winged Stilts</u> in Leicestershire and Fingringhoe (Essex) between the 3rd and 7th.

Little was then reported, apart from a White-rumped Sandpiper at Wisbech (Norfolk/Cambs.) on the 10th - 12th until after the westerly gales which started on 15th August. These brought a second White-rumped Sandpiper to Wisbech on the 23rd, a Spotted Sandpiper to St. Ives (Cornwall) on 17th, a Solitary Sandpiper to Radipole (Dorset), a Baird's Sandpiper to Welwyn (Herts.) on 23rd, a Lesser Golden Plover to Cork, a Semipalmated Sandpiper to Aberthaw (Glam) on 25th, and the first Pectoral Sandpiper to Wisbech on the 23rd.

With the resumption of easterly weather towards the end of August further arrivals of eastern birds were reported. Temminck's Stints were recorded in nine localities mainly on the east and south coasts, whilst a Marsh Sandpiper was at Hartlepool (Co. Durham) and a Broad-billed Sandpiper was trapped at Harty (Kent) on the 31st. Three further individuals of this species were found in September, one at each of Minsmere (Suffolk), 13th; Aberlady Bay (E.Lothian), 20th; and St. Just (Corwall), 25th.

The large September fall of American waders began with Buff-breasted Sandpipers at Ballycotton (Cork) and St. Marys (Scilly) on the 2nd, building up at the latter site to 7 on the 19th. Others were recorded at Sidlesham (Sussex) on 5th, St. Just 21st, Frodsham (Cheshire) on 25th; one was present at Salthouse (Norfolk) on 3rd October. At least 28 Pectoral Sandpipers were recorded between the 5th and 22nd September, with peaks of 4 at Teesmouth on 5th and 3 at Stithians Reservoir (Cornwall); two were trapped on Lundy Island (Devon) on 17th. Dowitchers were found at Frodsham on 19th, and Keyhaven (Hants.); at the latter site another White-rumped Sandpiper was present on 12th; yet another of this species was reported from the Tamar (Cornwall) on 1st September. Further Baird's Sandpipers were present at Ballycotton 11-18th and Salthouse 18th-20th. Wilsons Phalaropes were found at Sandbach (Cheshire) on 6th-12th, possibly the same bird was on the Ribble (Lancs.) on the 19th, on Guernsey 9-17th and at Ballycotton 11-18th.

Moderate numbers of <u>Curlew Sandpipers</u> have appeared again this autumn; although relatively few records have been received from the east coast, the west coast has had good numbers with peaks of 20 on the Dyfi (Cards.) 27th August, 27 on the Ceint (Anglesey) on 10th September, 16 in Swansea Bay 15th September, 20 Morecambe Bay 16th September and 13 on the Wash on 20th September. Smaller numbers of <u>Little Stint</u> have been reported from very many localities.

### WADER STUDY GROUP

The WADER STUDY GROUP (WSG) is an association of amateur and professional workers on the Charadrii (waders or shore-birds) from all parts of the world. The Group was established in 1970 under the chairmanship of Dr. Clive Minton and the auspices of the British Trust for Ornithology (BTO), but has become an increasingly international organisation. For studies within Britain, the WSG still maintains close links with the BTO, and internationally the WSG works with several regional, national and international bodies in co-operative studies. By 1978 membership of the WSG was over 400 people, about half of members living in countries other than Britain and including some from America, Asia, Africa and Austalasia as well as Europe. North American members have recently formed a distinct section within the WSG. Interests of the Group have diversified from the original concentration on ringing and related studies to include counts, breeding biology, feeding ecology, behaviour, and all aspects of research on waders.

The aims of the WSG are to maintain contact between both amateur and professional individuals and groups studying waders; to help organise co-operative studies; and to provide a vehicle for exchange of information. The main means of achieving these aims is by publication of the Bulletin (see below). The WSG maintains informal contacts with other bodies interested in bird research and conservation. The Group has also been involved in the organisation of expeditions to remote areas to fill gaps in the information on waders. Management of the WSG is vested in the Officers listed on the inside front cover, supported by an Advisory Panel which considers plans and future projects.

MEMBERSHIP of the WSG is open to all individuals or groups interested in waders. For an application form, please write to the Administrative Secretary (or, in America, the N. American Membership Secretary) whose address is on the inside front cover. The subscription is mainly devoted to the cost of production and circulation of the Bulletin. Prospective members in countries from which it is not possible to make overseas payments may write, explaining the difficulty, to the Administrative Secretary, who may be able to help. Publishers of other bulletins or journals wishing to receive WSG Bulletin on an exchange arrangement should contact one of the Editors.

The WADER STUDY GROUP BULLETIN provides a forum for news, notices, recent recoveries and publications, new methods of catching and study, articles and preliminary or interim publication of results from all parts of the world. Items are normally published in the next issue after their receipt. The Editors try to maintain a balance of material ranging from newsletter, informal descriptions of ringing group activities and expeditions to formal presentations of interim results or preliminary analyses and lists of ringing recoveries.

The Bulletin appears three times per year, in April, August and December, deadlines being the first of February, June and October, respectively. Articles must be received well before these dates, and it helps if other items are also (see inside front cover). Articles, notes, papers, notices, obituaries, requests for information, books for review, reprints of papers, lists of recoveries and all other items should be sent to one of the Editors at the addresses on the inside front cover. Articles and notices relating to America may be sent to the Editor of the North American section. Matters relating to the circulation of the Bulletin (including changes of address) should be sent to the Administrative Secretary.

The Editors are always ready to discuss possible contributions with potential authors and to advise on presentation. Manuscripts should be typed or written clearly, well spaced on the page, leaving wide margins, and following the format of recent Bulletins. Line illustrations are welcome and should be produced neatly in black ink on white paper with linear dimensions about  $1\frac{1}{4}$  times intended publication size. These can then be used directly in printing.

Publication of interim results in WSG Bulletin is not intended to pre-empt publication of final results as journal papers. Readers are requested to bear in mind that results and analyses published in WSG Bulletin are generally of a preliminary nature and to take account of this if making reference to these articles in publications of their own. If editors of other publications wish to reprint items from WSG Bulletin with suitable acknowledgement, this can usually be arranged; the persons concerned should contact one of the WSG Editors.