Wetland Bird Survey (Low Tide Counts)

Title
Wetland Bird Survey (WeBS) Low Tide Counts 1992/93 to present

Description and Summary of Results
Despite involving only a relatively small number of sites, estuaries collectively represent the most important habitat for wintering waterbirds in the UK. They are also inherently different from the thousands of inland sites counted for WeBS (Core Counts), with the influence of the tide meaning that the birds have to be much more mobile, both within and between sites.
WeBS Core Counts on estuaries have, in general, been based around high tide roosts but, although important in themselves and by far the best way of producing figures for the total numbers present, such roost sites are only used part of the time and in particular are usually only of secondary importance to the manner in which waterbirds make use of a site for feeding. Therefore, information gathered about these sites at high tide will only provide part of the picture. The WeBS Low Tide Counts scheme aims to monitor, assess and regularly update information on the relative importance of intertidal feeding areas of UK estuaries for wintering waterbirds and thus to complement the information gathered by WeBS Core Counts on estuaries.
WeBS Low Tide Counts provide the information needed to assess the potential effects on waterbird populations of a variety of human activities which affect the extent or value of intertidal habitats, eg dock developments, proposals for recreational activities, tidal power barrages, marinas and housing schemes. The data gathered also contribute greatly by providing supporting information for the establishment and management of the UK network of Ramsar sites and Special Protection Areas (SPAs), other site designations and whole estuary conservation plans. In addition, the counts enhance our knowledge of the low water distribution of waterbirds and provide the data that highlight regional variations in habitat use. In particular, the counts help to understand, predict and possibly plan for compensation for the effects of sea-level rise on the UK's internationally important estuarine waterbird populations.
When they were originally planned, the aim was to 'systematically census each of the 59 main UK estuaries (defined as those supporting more than 5000 wintering waders) on a five-year rotational basis using standardised methods'. However, this initial plan was modified in subsequent years for a number of reasons. The waders-only emphasis was removed and monitoring of all waterbirds (notably including ducks and Brent Geese) was considered equally important. Also, as well as the main sites initially chosen, a number of smaller sites were also covered, due to local enthusiasm by counters, local management plans and/or development pressures on those sites leading to a requirement for data. The five-year rotation was extended to a seven-year cycle, to permit coverage of several sites where there were logistical difficulties in establishing a new counting scheme within the

original time allocation and to cover an increased number of sites. Conversely, at a number of sites repeat counts were carried out on the initiative of the local counters, some even instigating Low Tide Counts on an annual basis.
It was always recognised that several very large sites (notably the Wash and Morecambe Bay) would be difficult to count. The problem with large estuaries, or any wide expanses of intertidal habitat, is that birds may be present at very great distances from accessible counting stations, thus reducing an observer's ability to accurately determine the number and identity of birds present. Safety is paramount and so counters are discouraged from venturing out on to potentially dangerous intertidal habitats to record more distant birds. Covering large sites usually requires the recruitment and co-ordination of large numbers of volunteers. However this is not always a problem. For example, excellent counts have been made on the Moray Firth and Firth of Forth, both of which are large but relatively linear in shape.
The potential of using aerial counts for counting waterbirds on estuaries like the Wash at low tide has been investigated. However, it was concluded that any attempts to count large estuaries from the air were likely to lead to results which were not comparable with shore-based counts, owing to the possibility of missing a very large proportion of the numbers of some species. The WeBS partners are reviewing how to tackle Low Tide Counts of large intertidal areas, including reconsideration of aerial survey techniques.
Counters are usually experienced and skilled local birdwatchers and include many individuals possessing the most in depth knowledge of the birds using UK estuaries. The Low Tide Counts appears to be a generally popular survey, partly because the local counters can see the obvious value of the counts and partly because the plan is to count each site at low tide only on a periodic basis, thereby timelimiting the substantial commitment required.

Methods of Data Capture

Counts of feeding and roosting waterbirds are made by volunteers each month between November and February on pre-established subdivisions of the intertidal habitat in the period two hours either side of low tide. Often the same counters are involved as do the Core Counts on the site, and a counter often takes responsibility for a number of count sections, depending on the amount of time they have available. Additionally, at low tide some estuarine species, such as grebes and diving ducks, are present on the water below the Low Water Mark. Counters are encouraged to record these species and to assign such counts to the nearest section. In general, the subdivision of a site into sections is determined by local geography, identifiable features (natural and man-made), accessibility, ease of counting and existing Core Count sections, with a broad stipulation that sections should be relatively similar in size to one another. Sections are generally selected by the local organiser and counters themselves, and it is stressed that the same count sections should be used in subsequent count years. However, in a few cases, the experience gained from the first winter's survey led to the splitting of larger sections into several smaller ones, or vice versa, or sometimes to the addition of new count sections.
As with Core Counts the principal groups of waterbirds of interest are waders and wildfowl, along with additional species characteristic of wetland habitats such as divers, grebes,

cormorants, herons, rails, gulls, terns and Kingfisher *Alcedo atthis*. As well as recording at the species level, separation at subspecific level is requested for Brent Goose *Branta bernicla* and White-fronted Goose *Anser albifrons*. Recording the presence or absence of raptors is also requested, although it is treated as a category of 'activity/disturbance' rather than a bird count. Data collection for all waterbird species is encouraged, but recording of gulls and terns is optional, as they are not priority species for the survey. This is because the counting and identification of gulls can be very time-consuming and consequently may compromise the quality of counts of the priority species. Also numbers of gulls on most estuaries vary more with the time of the day than with the state of the tide and many estuaries support important night-time roosts. Since the survey takes place from November to February very few terns are recorded.

Low Tide Counts take place during the four months of November to February inclusive and counters are asked to make one visit per month during this period, although some counters do carry out more. In such cases, care is taken, for the formal count, to select one only in an unbiased fashion. In most cases where multiple visits are made to a count section in a particular month, the visit on the date most consistent with the counts on neighbouring sections is taken to be the visit to use for analysis. Unlike the WeBS Core Counts, no pre-determined count dates are set at a national level but are decided upon by local organisers. Additionally, although simultaneous counts of all sections within a site are preferable, they are not compulsory. The principal reason for this is that the primary purpose of the scheme is to investigate relative distribution, averaged over several dates, and not to determine overall population sizes. Secondly, although weather conditions can affect the ease of carrying out any bird monitoring, conditions of fog, rain or strong winds make the counting of birds on distant mudflats particularly difficult and so the flexibility in count dates makes it possible to make best use of suitable counting conditions. Finally, given that most participants also take part in the WeBS Core Counts which do occur on a predetermined date each month, it was thought useful to allow a degree of flexibility to encourage a high level of participation.

Counters are asked to count during the two hours either side of low tide. They are provided with pre-prepared count forms on which to record counts of feeding and roosting birds, along with the date, section code and the start and finish times of the count. Additional details on count accuracy, weather, human activities, raptors and disturbance are also requested.

Purpose of Data Capture

The aim is to monitor, assess and regularly update information on the relative importance of intertidal feeding areas of UK estuaries for wintering waterbirds and thus to complement the information gathered by WeBS Core Counts on estuaries.

Geographic Coverage

The scheme covers all the main estuaries in the UK. Each winter about 20 of these are sampled which means that all UK sites are sampled about every six years although some

sites are covered more often than this. Each estuary is divided into predetermined sections of about 50ha each.

Temporal Coverage
The scheme started in the winter 1992/93 and continues to the present. A count is requested for each month from November to February with counts on the sectors of a site synchronised as far as possible and taking place within two hours either side of low tide.

Other Interested parties
It is a joint survey with the Royal Society for the Protection of Birds and Joint Nature Conservation Committee, both of whom along with BTO provide most of the funding, in association with the Wildfowl & Wetlands Trust.

Organiser(s)
BTO staff member Neil Calbrade on behalf of the WeBS Secretariat has been organiser since 2007.
When the scheme was first set up it was organised by Julianne Evans. Andy Musgrove took over in 1996, Alex Banks in 2004 until he in turn passed it on to Neil Calbrade.

Current Staff Contact
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Publications
The results following the first complete round of the estuaries were published as a separate publication:
Musgrove, A.J., Langston, R.H.W., Baker, H. & Ward, R.M. (eds). 2003. *Estuarine Waterbirds at Low Tide: the WeBS Low Tide Counts 1992-93 to 1998-99*. WSG/BTO/WWT/ RSPB/JNCC, Thetford.
The annual results are reported as part of the annual report on wetland birds
http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report/waterbirds-in-the-uk/wituk-2011-12
A paper version is published under a title such as "Waterbirds in the UK 2007/08: The Wetland Bird Survey", although this was slightly different in many of the earlier years.
There is also at least one article each year published in *BTO News* following this publication, and each year there are a few research papers and reports based wholly or partly on the results of the survey.

Available from NBN?
No.

Computer data -- location
The Oracle database holds the definitive WeBS data (both Low Tide and Core Counts Schemes) at any one time. This database to which many observers submit data directly is synchronised at least annually with all the data submitted on paper forms.

Computer data -- outline contents
The counts of each species on each sector on each date are stored, along with all the habitat and other information.

Computer data -- description of contents

Information held in BTO Archives
About 8000 A3 sheets containing data are stored, although many observers now submit their data directly to the online database and hence do not send in any paper records.

Notes on Access and Use

Other information needed

Notes on Survey Design
The mid-winter period was chosen partly because waterbird numbers on estuaries are at their highest then, partly to minimise between-month variation in counts and partly because this is the time of year when feeding constraints are likely to be at their greatest. Although three dates were initially considered to be satisfactory, it was decided that using four would allow for a certain amount of redundancy for missing counts due to factors such as poor weather.
There were several reasons for low tide being selected as the counting period. A key objective of the scheme is to record feeding distributions and studies have shown that, for many of the specialist estuarine species, a high proportion of birds feed during this period although this proportion does vary between species. Also, since the position of the tideline (and thus the availability of food) is relatively stable during this period, changes in the numbers and distribution of waterbirds are consequently relatively small. Although the Low (and High) Water Mark varies between neap tides and spring tides, the fact that a mean low water (and high water) mark is shown on Ordnance Survey maps means that a

standardised, repeatable measurement of area can be achieved. Finally, it is easiest to assign birds in the field to pre-defined count sections when all the features of the intertidal area are visible.

Specific Issues for Analysis