

Golden plover - *harnessing modern technology*

A characteristic and appealing bird of the Welsh uplands, the golden plover is in trouble.

Finding out what changes in the environment may be responsible for this decline, and understanding more about the behaviour and needs of a very mobile species, is far from easy. However, new technology, allied to old-fashioned fieldwork, may provide some answers, as MICK GREEN, HEATHER CRUMP, TONY CROSS and PAUL LEAFE explain.

Golden plover (*Pluvialis apricaria* - Cornllod aur) in the Cambrian mountain uplands

Golden plover *Pluvialis apricaria* are one of those species whose presence signifies a sense of place – in their case the rolling uplands – and they were once relatively abundant in areas such as the Elan Valley, high in the Cambrian Mountains in mid-Wales. Since baseline surveys were undertaken by the Nature Conservancy Council (NCC) in the 1980s, breeding golden plover populations have reduced by over 80%, and just 36 breeding pairs were found in Wales in 2007. Reasons for the decline are unclear, and causes that have been put forward include afforestation in the uplands, unsuitable grazing pressures (both over- and under-grazing), changes in wintering habitats or locations, and changing climate. The likelihood is that it is a combination of reasons, making it very difficult to tease out and to suggest viable conservation action.



The lack of historical data, both ornithological and especially botanical, makes the reasons and timing of this contraction hard to identify accurately. Although we have

enough breeding bird data to show declines since the 1980s we do not have a detailed time series to show if it was a gradual decline or a sudden drop sometime along the way. Anecdotal evidence does suggest a fairly sudden drop in the 1990s, though this is not backed up by clear data. Likewise, we have very little historical data to show changes in vegetation, wetness and other environmental parameters.

Changes to wintering birds are even harder to understand. Whilst research and surveys have been undertaken on the breeding grounds, there appears to be little research into the needs of wintering birds across Wales. Birds wintering on sites such as estuaries are monitored by Wetland Bird Survey (WEBs) counts, but inland wintering birds using farmland are not generally monitored. Monitoring of these flocks is very difficult as they are constantly moving and their habitat requirements are not well known. Plovers wintering in Wales are known to have originated, at least in part, from Northern and Eastern Europe, although ringing recoveries are few. It is also not known where Wales's breeding birds winter and although the general UK wintering population appears to have moved east during a series of mild winters, recent cold winters may have reversed that trend.

Technology to the rescue

Two new studies are underway in Wales which hope to throw light on the plight of the golden plover. Both use a combination of new technology, state-of-the-art computer analysis and old-fashioned fieldwork.

Study 1 – Assessing the vegetation

This study involves new remote sensing and Geographical Information System (GIS) technologies that can help make the best of the limited information we have on past vegetation and other environmental conditions, initially focussed on the breeding grounds. It is possible to assess the past environment and use this information to help understand landscape changes in relation to golden plover numbers.

Using a combination of traditional bird surveys and remote sensing, the study aims to see if subtle land-



Golden plover *Pluvialis apricaria*

use changes are likely to be one of the causes of declines. Two study areas were chosen where we had data from the 1980s NCC surveys – Plynlimon SSSI and parts of the Elenydd SSSI. As both of these sites are SSSIs, they have not been subjected to significant drainage and agricultural improvement, and any afforestation is on the outside edge of the SSSI boundary. Regular monitoring visits to the sites, over many years, suggest that the vegetation of these areas has not changed.

Both sites were re-surveyed for breeding birds in the Spring of 2011 and 2012, using the same transect survey methods used in the original surveys, and the results showed the populations of golden plover on both sites has dramatically reduced over the last 30 years. Populations on the Plynlimon SSSI are close to local extinction.

Table 1: Changes to golden plover populations between original NCC surveys (Elenydd 1982; Plynlimon 1984) and repeat surveys (Elenydd 2012; Plynlimon 2011).

Site	1982/1984	2011/2012	Change (%)
Elenydd (Trumau)	14	4	- 71
Plynlimon SSSI	13	1	- 92

The study looked at environmental change which could help us to understand the declines. Remotely sensed satellite images reveal aspects of the

environment and smaller changes that may not have been identified by eye. In addition, it is possible to create a time-series of imagery to look at vegetation over the sites, as satellite imagery is available back to the late 1970s. This enables us to assess past conditions of the sites in relation to their current condition. In effect, the new technology allows us to undertake vegetation surveys in the past. It is also possible to look at more detailed environmental conditions, such as wetness and productivity of the sites. Any alterations to these conditions could highlight reasons for changes in golden plover populations.

Initial results from Plynlimon appear to confirm our feeling that there haven't been any major vegetation changes over the site. Work on classifying the Elenydd sites continues, concentrating on whether or not *Molinia* has spread and become more dominant. There have been concerns that the area is now undergrazed and this may be making habitat unsuitable for plovers. However, given that the plovers declined before the grazing levels dropped, this may not be the case and we hope this study will shed more light on the long term trends across the site and help inform future management strategies.

Study 2 - Tracking golden plovers

The second project also involves satellites, but uses them to track golden plover themselves, rather than their habitat. Again, it also involves good natural history fieldwork to locate birds in the first place, with traditional catching and ringing techniques to colour-ring birds, and finally fitting satellite transmitters.

A colour-ringing project, developed by Tony Cross and Paul Leafe in winter 2011/12, showed that it was practical to catch and mark significant numbers of birds by 'lamping' at night. However, re-sightings of birds were few, partly because funding did not allow us to spend a significant amount of time in the field, and also because of the mobile nature of the flocks.

The colour-ringing continued through winter 2012/13. In order to capitalise on the large numbers of marked birds,

funding was obtained to substantially increase survey effort. A large area of mid Wales was surveyed on a regular basis. Flocks were counted whenever possible, and scanned for colour rings. The location of each flock was recorded along with a description of the habitat used, as well as adjacent habitats. The ringing involved work at night which gave further information on flocks, as it was found they used different fields at night – golden plover tend to feed at night and roost during the day.

In addition, two birds were fitted with harness-mounted, solar-powered satellite tags which sit neatly on the back of the bird and allow daily movements to be plotted. The first bird – 'Ceri' – was tagged in November 2012, followed by 'Hawn' in January 2013.

The winter of 2012/13 turned out to be cold with extensive snowfall across mid Wales. A total of 88 sightings were made during the period September 2012 to the beginning of March 2013. Sighting numbers were low, and most sightings were at night. The area held many fewer birds than in previous winters. Although birds started to arrive in the area at the start of the study, with the onset of cold weather on the 9th December most birds left the area. Although a few returned in early January, a further cold spell resulted in birds once again leaving the area.

Two different stories

The satellite tagging showed exactly how mobile the birds are. Following her tagging on 24th November, Ceri was still in the same field on 5th December, but by 11th December she turned up in Spain, just to the south east of Madrid. She then moved to the Spanish-Portuguese border by 15th January and the last transmission received towards the end of that month was still from the same area.

Hawn meanwhile showed a different reaction to cold weather. Following tagging on 5th January, by the 16th she was on the coast between Pembrey and Carmarthen. On 12th February she returned to her ringing site but did not stay long at all and returned to South Wales, moving between several sites. She returned again to her



Magnus von Wright

IMPORTANT REQUEST:

The colour-ringing project is continuing in Winter 2013-14. Please check any golden plovers you see and report any marked birds. Even if you aren't able to read the colour combination, general records of marked birds are still very valuable. Please note grid reference and if possible size of flock containing the ringed bird, along with the habitat. Please send records to: plovers@ecologymatters.co.uk or 01970 832491 – Thank You.

ringing area on 10th April and we stopped receiving signals soon afterwards. We have also received records of other colour-ringed birds and will be looking at all movements in due course.

The satellite tracking shows two very different reactions to cold weather – either leave the Country completely or make shorter movements for a temporary respite. That Hawn seemed to want to return to the ringing area indicates that conditions there, in warmer weather, must be attractive. All the movements highlight the very mobile nature of golden plover flocks and the difficulty in protecting their habitat. The traditional method of designating key sites will obviously not work if these sites depend on current weather conditions. We need to know a lot more about how these birds use the wider landscape and if there are key sites that can be protected to provide enough areas for safe overwintering, or if new strategies are required.

One ringed bird has just been recovered from Cornwall – it was shot dead. This highlights the absurd situation where golden plovers are on the 'Red List' of birds of Conservation Concern in Wales (Amber list, UK) but are still on the legal quarry list.

These studies, in very different ways, show how new technologies can complement traditional fieldwork to try to help us to understand why golden plover and other species are in such dire straits. Both studies are continuing, and more results should be available over the next year. However, it is important that new scientific finds are quickly incorporated into action on the ground so that we can reclaim that sense of



Colour-ringed golden plover

place. Unless we have some real action then we are all wasting our time!

Mick Green and Tony Cross are Directors of Ecology Matters, Heather Crump is a final year PhD student at Aberystwyth University and Paul Leafe is a ringer based in Montgomeryshire.

Acknowledgments

The breeding season project was funded as part of a KESS studentship at Aberystwyth University with support from Ecology Matters. The winter ringing project was supported by a grant from Ecology Matters, with the satellite tagging and re-sightings surveys supported by a separate grant from the Welsh Government Ecosystem Resilience and Diversity Fund.

Y Cornicyll Aur: defnyddio technoleg newydd

Mae'r cornicyll aur yn rhan annatod o ucheldir Cymru, ond mae eu niferoedd yn disgyn yn gyflym. Mae dwy astudiaeth wedi bod yn ceisio dod o hyd i reswm am y dirywiad. Defnyddiwyd technoleg lloeren yn gyntaf i archwilio newidiadau lleiaf i'r amgylchedd a allai fod wedi effeithio ar lwyddiant bridio, er nad yw'n ymddangos fod newid y cynnelin yn darparu'r ateb. Mae'r ail hefyd wedi defnyddio technoleg lloeren, y tro hwn i ddilyn adar wedi'u marcio yn ystod y gaeaf. Mae hyn wedi datgelu symudiadau unigolion, a pha mor hawdd yw iddynt gael eu saethu. Mae'r gwaith yn parhau, ac fe ofynnir am adroddiadau am adar wedi'u marcio.