

# **COORDINATED WATERBIRD COUNTS (CWAC)**

## **ELEVENTH ANNUAL REPORT: April 2001 - March 2002**

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## OBJECTIVES

The primary objectives of the project are to:

- 1) monitor populations of waterbirds by carrying out regular summer and winter counts at as many of South Africa's major wetlands as possible, on an ongoing basis (The concept "wetlands" includes pans, vleis, marshes, lakes, impoundments, rivers, estuaries and lagoons.);
- 2) identify and document the threats to waterbird populations and wetlands;
- 3) co-ordinate the efforts of amateur volunteers and professional conservators in achieving (1) and (2);
- 4) collate and computerize the results of each count and maintain, manage and update a database on an ongoing basis;
- 5) develop computer-based approaches to the analysis of the data and the generation of easily interpretable indices and computer-generated reports, both for each count and for comparisons of counts between years;
- 6) communicate by means of a regular newsletter which informs and encourages participants and presents interim results;
- 7) liaise with and provide copies of data and reports to the state Department of Environmental Affairs & Tourism (DEA&T) and also Wetlands International at Wageningen, Netherlands, as a contribution to their African Waterbird Census programme, and to make data available to researchers working in South Africa;
- 8) use the data from CWAC to generate regular reports and publications relevant to conservation planning and the management of South Africa's wetland systems.

Key questions which will direct the collection of data are:

- a) Which species are to be found at a particular wetland and in what numbers?
- b) Are there significant and consistent differences between summer and winter counts of a species at a particular wetland?
- c) Do patterns of species abundance and seasonality vary in different parts of the country?
- d) What is the range of fluctuations in abundance at particular sites and in different regions of the country?
- e) Is there evidence for long term trends in the abundance of particular waterbird species? If so, what are the features of the trend?
- f) How do the South African indices relate to those obtained for the same species in other parts of Africa and in Europe or Asia?

Further questions directing the application of the data to the solving of specific problems could be:

- Which wetland sites have special significance for the conservation of waterbirds?
- What are the implications of the findings for the setting of hunting seasons and quotas?
- How sensitive are waterbirds to various environmental factors such as water quality?
- What is the potential of the data in monitoring long-term environmental change resulting from changes in land use and/or climatic change?
- Does comparison of statistics from different wetlands suggest that a given phenomenon is the result of factors operating locally or factors operating on a regional, continental or even global level?
- Does a particular change in an index of abundance suggest a crisis in the environment which requires further investigation and action?
- How do CWAC results relate to the distributional and relative abundance information collected by the Southern African Bird Atlas Project?

The scientific value of monitoring increases the longer that monitoring is continued, hence the need for long-term investment in this project needs to be appreciated, but useful site and species-specific information will also emerge within a relatively short time.

In addition to these objectives it is envisaged that many research publications will result from access to the CWAC data bank as it is used by ornithologists, conservation planners, environmental consultants and ecologists.

### **SUMMARY – ELEVENTH REPORT (April 2001 to March 2002)**

WWF-SA, BirdLife South Africa, The Tony Lisette Lewis Foundation South Africa and the Mazda Wildlife Fund confirmed financial and logistical support for the project.

Counts were carried out in Winter 2001 (288 sites and 303 613 waterbirds) and Summer 2002 (to date, 256 sites and 292 055 waterbirds). Twenty-five and two new sites were registered in the winter and summer counts respectively.

Breeding data continues to be collected from most sites. The summer 2002 count saw the launch of a project to catalogue the location and status of all active heronries and other colonial breeding sites in South Africa. The CWAC network was used to kick-start the project and all compilers and counters were sent a heronry/colony card in December 2001 for use at their sites.

Two new regional organisers were established during the year - Ken Gordon for KZN and Craig Whittington-Jones for Gauteng.

Doug travelled to England, the Netherlands and Germany during August and September 2001 where he met with coordinators and gained exposure to northern-hemisphere waterbird monitoring programmes. He also attended and gave presentations at two conferences, The European Ornithologist's Union conference and the International Wader Study Group's Annual General Meeting.

During November/December 2001, Doug accompanied visiting Belgian ornithologist, Willem van den Bossche, on a roadshow around South Africa. Sixteen bird clubs in eight provinces were visited and provided Doug the opportunity to promote CWAC (and other ADU projects), make contact with various compilers and counters and visit some CWAC sites.

In March 2002, Doug attended the KwaZulu-Natal Regional Projects Committee (RPC) meeting at Midmar Dam. At the meeting Doug provided feedback on the status of CWAC and presented a list of priority sites for the province. He also discussed strategies to ensure consistent and regular coverage of sites. The RPC kindly sponsored Doug's trip to attend the meeting.

CWAC data was regularly requested during the year and included use in EIAs (Seaplane contract), reports (CSIR Environmental Indicators Report, CAR Report, Ramsar Report), biodiversity and conservation projects (Rio Tinto initiative) and lobbying initiatives (Bitou River developments).

Doug published an article in the 50<sup>th</sup> anniversary issue of *Promerops*, the magazine of the Cape Bird Club, entitled "CWAC in the Western Cape – 10 years on" as part of the 10-year anniversary of the project since its launch in January 1992.

## PROGRESS

### Eleventh report: April 2001 – March 2002

#### Counts

##### *Winter 2001*

A total of 303 613 waterbirds was counted from 288 sites during July and is almost a 25% increase from the winter 2000 count of 243 873 waterbirds. This was due primarily to some high counts at a number of sites and to a large number of new sites some of which held more than 2000 birds (see table below).

The following 36 sites recorded more than 2000 birds (sites in *italics* indicate new sites):

<b>Name</b>	<b>Province</b>	<b>Total count</b>
Barberspan	North West	19311
Krugersdrift Dam	Free State	16545
Strandfontein Sewage Works	Western Cape	13350
Lower Berg River	Western Cape	12363
Bloemhof Dam	Free State	11404
Kamfers Dam	Northern Cape	9466
Wilderness Lakes - Swartvlei System	Western Cape	9369
<i>Den Staat Irrigation Dams</i>	Northern Province	8950
Wilderness Lakes - Touw System	Western Cape	7870
Langebaan Lagoon	Western Cape	7621
Erfenis Dam	Free State	6340
Orange River Mouth	Northern Cape	5632
Blood River Vlei	KwaZulu-Natal	4896
<i>Parkhaven Pan – North</i>	Gauteng	3906
De Hoop Vlei	Western Cape	3737
Marievale Bird Sanctuary	Gauteng	3710
Leeupan	North West	3684
Allemanskraal Dam	Free State	3483
<i>Varkfontein Pans</i>	Gauteng	3264
Kalkfontein Dam	Free State	3115
Lake St Lucia	KwaZulu-Natal	2889
Elandsvlei	Gauteng	2879
Pongolapoort Dam	KwaZulu-Natal	2804
Thulazihleka Pan	KwaZulu-Natal	2699
Verlorenvlei	Western Cape	2688
Roodeplaat Dam	Gauteng	2547
Jakkalsvlei	Western Cape	2474
Vaalharts Weir	Northern Cape	2277
Kabeljous River Estuary	Eastern Cape	2243
Witbank Dam	Mpumalanga	2240
Knysna Lagoon	Western Cape	2208
Grootpan	Mpumalanga	2139
Malandeni Sewage Works	KwaZulu-Natal	2118
Paarl Bird Sanctuary	Western Cape	2114
Chatty Saltpans	Eastern Cape	2077
Koppies Dam	Free State	2061

##### *New sites*

A total of 25 new sites were registered with CWAC after this count and included **eight each from Gauteng** (Con Joubert Bird Sanctuary, De Pan, Lakefield Pan, Mooiriver Loop 1, Mooirivier Loop 2, Parkhaven Pan-North, Parkhaven Pan-South and Varkfontein Pans) **and Kwazulu-Natal** (Goedetrouw Dam, Kudu Pan, Lake Nhlabane, Lake Msingazi, Lake Nsezi, Lake Cubhu, Mtwalume River estuary and Nseleni River), **three each from the Western Cape** (Marina Da Gama, Mossgas Dams and Westlake Wetlands) **and Northern Cape** (Kraankuil Dam Weir, Kraankuil Dam and Rooifontein Pan), **two from the Eastern Cape** (Malangskraal Dam and Retreat Farm Dam), and **one from the Northern Province** (Den Staat Irrigation Dams).

### ***Summer 2002***

Although not all data had been received at the time of writing, data for 256 sites have been received totaling 292 055 birds.

#### *New sites*

Five new sites have been registered, to date, for this count and include **two each from the Northern Cape** (Kraankuils Dam – Saaidam & Pedro's Kloof Dam) and **Gauteng** (Blaauwpan & Bullfrog Pan) and **one from KwaZulu-Natal** (Lenjani Wetland).

### ***Breeding data***

The collection of breeding information during counts is continuing with just over half of all sites containing breeding data. Observers are continually encouraged to be aware of breeding activity during counts and to make a note of as many active nests (i.e., with eggs or chicks) as possible.

The summer 2002 count saw the introduction of a project to catalogue the location and status of all active heronries and other colonial waterbird breeding sites in South Africa. The CWAC site network provided an ideal opportunity to launch this venture as many heronries and/or colonies occur at CWAC sites. To encourage involvement with this project, all CWAC counters were sent a heronry nest record card with the December 2001 CWAC newsletter. The heronry nest record card forms part of the national Nest Record Card Scheme (NERCS) that is also coordinated by the ADU. To date many counters have completed and submitted heronry cards to the ADU. It is envisaged that the project will extend to include non-CWAC sites and the eventual inclusion of these sites (if viable) into CWAC.

### **Travels**

#### *August - September 2001*

Doug undertook a three-week visit to the UK and Europe from 19 August to 4 September 2001. The primary purpose of the trip was to gain insight into the *modus operandi* of northern hemisphere waterbird monitoring programmes and to share ideas and expertise with the relevant programme coordinators.

His first week was spent in the UK where he visited the Wildfowl & Wetlands Trust (WWT) in Slimbridge and the British Trust for Ornithology (BTO) in Thetford. Both organisations share responsibility for the coordination of WeBS (Wetland Bird Survey), the UK equivalent of CWAC, and I was able to meet with numerous people to discuss the day to day running of the programme and look at the databases and applications used to curate and store the data collected. WeBS has been in operation for nearly 30 years, and it was interesting to discover that the programme experiences similar problems associated with volunteer-based monitoring programmes. The week ended with a three-day visit to The Wash, a large bay in the north-east of England, where Doug gained some valuable experience in catching and ringing waders with The Wash Wader Ringing Group.

The next two and a half weeks were spent in the Netherlands. For the first part of this period Doug attended the European Ornithological Conference in Groningen, and visited Wetlands

International's head office in Wageningen. CWAC forms part of the International Waterbird Census (IWC) programme of Wetlands International and he spent valuable time with the programme's database coordinator looking at the curation and storage of waterbird data from participating countries in the IWC. The final week was spent at the International Wader Study Group AGM in Kollermerpomp, where Doug presented a paper on the abundance and distribution of waders in South Africa based on CWAC data. The trip ended with a four-day visit to Husum, a coastal town in northern Germany, where Doug arranged to spend time with Klaus Günther from the local WWF office. Klaus is coordinator of spring high-tide counts of shorebirds along this part of the Wadden Sea, an internationally important wintering and staging area for many species of shorebirds, particularly waders. During his time there, Doug assisted Klaus with various counts and gained insight into the methods of data collection and database applications used to analyse this data.

Overall, Doug had a successful trip and gained enormous experience and ideas from waterbird monitoring schemes in the northern hemisphere. The trip was funded entirely by the ADU, although sponsorship was sought from the Joint Nature Conservation Committee (JNCC). Photo essays of Doug's visits to The Wash and Husum are available on the ADU website at [www.aviandemographyunit.org](http://www.aviandemographyunit.org).

#### *November-December 2001*

From 17 November to 4 December 2001, Doug accompanied Belgian ornithologist, Willem van den Bossche, on a whistle-stop "White Stork" tour around South Africa. Although the tour was primarily aimed at allowing Willem the opportunity to share his research on White Stork satellite telemetry, it also gave Doug the opportunity to promote CWAC, liaise with bird clubs and participants and a chance to visit some of the wetlands registered with the programme.

#### *March 2002*

From 3-4 March 2002, Doug attended the KwaZulu-Natal Regional Projects Committee meeting at Midmar Dam. The committee comprises the chairman (or representatives) from all KZN bird clubs and people involved with or interested in bird conservation projects in the province.

At the meeting Doug provided feedback on the progress and current status of CWAC in KwaZulu-Natal and presented a list of priority and potential sites for monitoring. He suggested possible mechanisms to ensure continued coverage at priority sites and to expand coverage into poorly censused areas.

#### **Regional Organisers**

Two new regional organisers were established during the year - Ken Gordon for KZN and Craig Whittington-Jones for Gauteng. This will ensure a more coordinated approach to maintaining and improving CWAC activities in these provinces and will assist the overall coordination of the programme on a national basis.

#### **Use of data**

An important aspect of the ADU's functions is the dissemination of information particularly when it has conservation relevance and relates directly to sites monitored. During the past year, CWAC information has been supplied to varying roleplayers in support of conservation initiatives:

### Seaplane contract: Kleinriviersvlei

In May 2001, Doug was contracted by Enviro-Dinamik, environmental consultants, to conduct a survey of the responses of waterbirds to seaplane landings on Kleinriviersvlei (Hermanus Lagoon). This was part of an EIA to assess the viability of landing a seaplane (or amphibious aircraft), on a regular basis, at various coastal waterbodies in the Western Cape. Reference to CWAC data was made in the final report.

### Rio Tinto Projects

Rio Tinto, a global mining magnate, has set up a partnership programme with BirdLife International to create birding conservation and tourism areas at specific sites around the world. This forms part of Rio Tinto's biodiversity initiative under their environmental management programme. Two sites have been identified in South Africa, Richards Bay and Phalaborwa, both centred around two of South Africa's leading mining companies, namely Richard's Bay Minerals and Palabora Mining Company, both members of the Rio Tinto group.

BirdLife South Africa (BLSA), the BirdLife partner in South Africa, is drawing up proposals for these two areas to send to BirdLife International, which, if successful, will mean a huge investment from Rio Tinto to develop these areas into major birding destinations. David Allan from the Durban Natural Science Museum, and research associate of the ADU, and John Swards, chairman of the Phalaborwa Bird Club, both made use of CWAC data in their reports to BLSA on the status and abundance of the avifauna in their respective areas. The Richard's Bay site is of greater importance to CWAC as it is one of, if not, the richest and most abundant waterbird sites in the country.

### Bitou River developments

The Plettenberg Bay Bird Club requested waterbird data for the Bitou River (a CWAC site) for use in a motivation to the local town council regarding their objection to an application by one of the riparian landowners to the building of a weir across the river.

### CSIR: Environmental Indicators Project

Based on the Dept of Environmental Affairs and Tourism's State of the Environment report, the CSIR has been commissioned with drafting a report on Environmental Indicators. CWAC data was supplied to them for inclusion in a first report as an illustrative example of how waterbird trends can be used as environmental indicators for wetlands.

### CAR report: Spurwinged Goose

Doug has authored the Spurwinged Goose account for the upcoming Coordinated Avifaunal Roadcount (CAR) seven-year report. CAR is another ongoing, long-term project of the ADU that monitors populations and distribution of large terrestrial birds. Doug used Spurwinged Goose data from CWAC to substantiate findings from the CAR data and to provide any additional information on changes in abundance and population trends not available from the CAR data.

### Langebaan data for Ramsar report

CWAC data for Langebaan Lagoon was requested by Dr Rod Randall of South African National Parks, for use in their three-year Ramsar report for this site.

### **Other PR initiatives**

As part of the 10<sup>th</sup> anniversary of CWAC during 2001, Doug published an article entitled "CWAC in the Western Cape – 10 years on" in the 50<sup>th</sup> anniversary issue of *Promerops*, the magazine of the Cape Bird Club (CBC). A large proportion of compilers and counters are based in the Western Cape and it seemed fitting to provide a brief history and progress of the project since its inception in January 1992 for the members of the CBC.

## PUBLICATIONS

*This section lists waterbird related publications by members of the ADU. It includes papers which are beyond southern Africa in scope; these should be viewed as part of capacity-building and as international recognition of the skills at the ADU in this field.*

New publications for this reporting period (2001/2002) are indicated with an asterisk

(i) Refereed papers

- Allan, D.G. & Jenkins, A.R.** 1993. A count of waterbirds along a section of the lower Orange River. *Bontebok* 6: 33-34.
- Allan, D.G., Seaman, M. & Kalejta, B.** 1995. The endorheic pans of South Africa. In: Cowan, G.I. (Ed.). *Wetlands of South Africa*. Pretoria: Department of Environmental Affairs and Tourism: 163-177.
- Balachandran, S., Hussein, S.A. & Underhill, L.G.** 2000. Primary moult, biometrics and mass of Grey Plovers *Pluvialis squatarola* in southeast India. *Bird Study* 47: 82-90.
- Gromadska, J. & Serra, L.** 1998. Differential migration of juvenile and adult Grey Plovers *Pluvialis squatarola* at the mouth of the Vistula River, Poland. *Ornis Fennica* 75: 193-199.
- Herremans, M.** 1999. Waterbird diversity, densities, communities and seasonality in the Kalahari Basin, Botswana. *Journal of Arid Environments* 43: 319-350.
- Hockey, P.A.R., Navarro, R.A., Kalejta, B. & Velasquez, C.R.** 1992. The riddle of the sands: why are shorebird densities so high in southern estuaries? *American Naturalist* 140: 961-979.
- \***Kalejta-Summers, B., Allan, D.G. & Longrigg, T.D.** 2001. Long term trends, seasonal abundance and energy consumption of waterbirds at Rietvlei, Western Cape, South Africa, 1950-1997. *Ostrich* 72: 63-79.
- \***Kalejta-Summers, B., McCarthy, M. & Underhill, L.G.** 2001. Long term trends, seasonal abundance and energy consumption of waterbirds at Rietvlei, Western Cape, South Africa, 1950-1997. *Ostrich* 72: 80-95
- Marks, J.S. & Underhill, L.G.** 1994. Moulting, migration and mass of a handicapped Bristle-thighed Curlew *Numenius tahitiensis*. *Ardea* 82: 153-156.
- Prys-Jones, R.P., Underhill, L.G. & Waters, R.J.** 1994. Index numbers for waterbird populations II: coastal wintering waders in the United Kingdom, 1970/71-1990/91. *Journal of Applied Ecology* 31: 481-492.
- Schekkerman, H., van Roomen, M.W.J. & Underhill, L.G.** 1998. Growth, behaviour of broods, and breeding productivity of Curlew Sandpipers *Calidris ferruginea*. *Ardea* 86: 153-168.
- Serra, L.** 1998. The adaptation of primary moult to migration and wintering in the Grey Plover (*Pluvialis squatarola*): a preliminary outlook. In Spina, F. & Grattarola, A. (Eds) *Proceedings of the first meeting of the European Ornithologists' Union*. *Biologia e Conservazione della Fauna* 102: 123-127.
- Serra, L. & Rusticali, R.** 1998. Biometrics and moult of Grey Plover (*Pluvialis squatarola*) in northeastern Italy. *Vogelwarte* 39: 281-292.
- Serra, L., Whitelaw, D.A., Tree, A.J. & Underhill, L.G.** 1999. Moulting and migration of Grey Plovers *Pluvialis squatarola* wintering in South Africa. *Ardea* 87: 71-81.
- \***Serra, L., Whitelaw, D.A., Tree, A.J. & Underhill, L.G.** 2001. Biometrics, possible breeding origins and migration routes of South African Grey Plovers, *Pluvialis squatarola*. *Ostrich* 72: 140-144.
- Summers, R.W., Underhill, L.G. & Syroechkovski, E.E. jr.** 1998. The breeding productivity of Dark-bellied Brent Geese and Curlew Sandpipers in relation to changes in the numbers of Arctic Foxes and lemmings on the Taimyr Peninsula, Siberia. *Ecography* 21: 573-580.
- Summers, R.W. & Underhill, L.G.** 1991. The relationship between body size and time of breeding in Icelandic Redshanks *Tringa totanus*. *Ibis* 133: 134-139.

- Summers, R.W., Underhill, L.G. & Prys-Jones, R.P.** 1995. Does delayed return migration of young waders to their breeding grounds indicate the risk of migration? *Ardea* 83: 351-357.
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- Underhill, L.G.** 1992. Waders (Charadrii) and other shorebirds at Dassen Island, and the Algoa Bay islands, South Africa. *Ostrich* 63: 128-129.
- Underhill, L.G.** 1995. The relationship between breeding and nonbreeding localities of waders: the Curlew Sandpiper *Calidris ferruginea* as an extreme example. *Ostrich* 66: 41-46.
- Underhill, L.G.** 1995. Migratory birds. In: Cowan, G.I. (Ed.). *Wetlands of South Africa*. Pretoria: Department of Environmental Affairs and Tourism: 163-177.
- \*Underhill, L.G., Kirby, J.S., West, R.B., Scott, D.A., Davidson, N.C., Haanstra, L., Piersma, T., Hotker, H. & Stroud, D.A.** 2001. An atlas of wader populations in Africa and western Eurasia. *Ostrich Supplement* 15: 176-177.
- Underhill, L.G. & Summers, R.W.** 1992. Knots in southern Africa. *Wader Study Group Bulletin* 64, Supplement: 182-183.
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- \*Underhill, L.G., Whittington, P.A. & Calf, K.M.** 2001. Shoreline birds of Robben Island, Western Cape, South Africa. *Wader Study Group Bulletin* 96: 37-39.
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- Underhill, L.G., Oatley, T.B. & Harrison, J.A.** 1991. The role of large scale data collection projects in the study of southern African birds. *Ostrich* 62: 124-148.
- Underhill, L.G. & Prys-Jones, R.P.** 1994. Index numbers for waterbird populations I: review and methodology. *Journal of Applied Ecology* 31: 463-480

(ii) Reports

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- Gregory, R.D., Rehfish, M.M., Underhill, L.G., Field, R.H., Atkinson, P.W., Freeman, S.N., Siriwardena, G.M. & Baillie, S.R.** 1999. National and site-based alert systems for UK birds. BTO Research Report 226. British Trust for Ornithology, Thetford.
- Harebottle, D.M.** in press. Setting regional priorities for the African Waterbird Census (AfWC) in southern Africa. Proceedings of the African Waterbird Census Development Workshop, 1-4 September 2000, Kampala, Uganda. Wetlands International, Senegal.
- \*Harebottle, D.M.** 2001. Report on waterbird responses to aircraft disturbance at Kleinriviersvlei, Western Cape province. ADU Research Report 45. ADU, UCT
- Kalejta, B. & Allan, D.G.** 1994. Rietvlei management plan: avifauna specialist study. In: Caltex Rietvlei Wetland Reserve: Appendices Report. Appendix F: avifauna. Pretoria: CSIR.
- Navarro, R.A., Harrison, J.A., Kieswetter, S.L & Underhill, L.G.** 1995. Coordinated Waterbird Counts: Preliminary results 1992-1994. ADU, UCT.

- Taylor, P.B.** 1997. The Status and Conservation of Rallids in South Africa: Results of a Wetland Survey in 1995/96. ADU Research Report 22. ADU, UCT.
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- Underhill, L.G., Tree, A.J., Oschadleus, H.D. & Parker, V.** 1999. Review of ring recoveries of waterbirds in southern Africa. ADU, UCT.

(iii) Popular journals

- Kalejta, B., Underhill, L.G. & Summers, R.W.** 1994 Leaving no stone unturned - the secrets of turnstone migration. *Birding in Southern Africa* 46(1): 23-27.
- Kalejta, B.** 1994. Palearctic shorebird research in South Africa - past, present and future. *Wader Study Group Bulletin* 72: 24-27.
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- Harebottle, D.M. & Delport, M.** 2000. Waterbird responses to management decisions at Botrivierlei, Western Cape Province. *Bird Numbers* 9(2): 39-44
- Harrison, J.A. & Underhill, L.G.** 2000. Blouvillei: development is for the birds. *Africa – Birds & Birding* 5(1): 42-47.
- \*Harebottle, D.M. & Harrison, J.A.** 2001. Changes in distribution and abundance of waterbirds in South Africa. *Bird Numbers* 10: 47-51

(iv) Papers or reports that have acknowledged use of CWAC data.

- Allan, D.G.** 1999. Environmental Impact Assessment – Birds: Port of Durban's helicopter service. Durban Natural Science Museum – Bird Department Research Report 7: 1-58.
- Allan, D.G.** 1999. Waders on the wayne in Durban Bay. *Africa – Birds & Birding* 4(6): 54-62.
- Allan, D.G., Sinclair, J.C. & Rossouw, J.** 1999. The waterbirds (Aves) of Durban Bay: current status and historical trends. *Durban Museum Novitates* 24: 1-21
- Barnes, K.N. (ed.)** 1999. The Important Bird Areas of southern Africa. BirdLife South Africa, Johannesburg
- Barnes, K.N. (ed.)** 2000. Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg
- Oberholster, L.** 2000. The natural integrity of man-made wetlands: a case study. Unpublished BA Honours thesis, University of Stellenbosch, Stellenbosch.

(v) ADU publications

- Harrison, J.A.** 1992. CWAC Information Sheet No. 1: What is a CWAC site? ADU, UCT.
- Harrison, J.A.** 1992. CWAC Information Sheet No. 2: Counters compilers and coordinators. ADU, UCT.
- Harrison, J.A.** 1992. CWAC Information Sheet No. 3: Basic aims and protocol. ADU, UCT.
- Harrison, J.A. & Allan, D.G.** 1992. CWAC Information Sheet No. 4: Basic counting techniques. ADU, UCT.
- Harrison, J.A. & Allan, D.G.** 1992. CWAC Information Sheet No. 5: Equipment. ADU, UCT.
- Allan, D.G.** 1992. CWAC Information Sheet No. 6: Specialised counting techniques. ADU, UCT.

- Allan, D.G.** 1992. CWAC Information Sheet No. 7: Species identification. ADU, UCT.
- Harebottle, D.M. & Harrison, J.A.** 1999. CWAC Information Sheet No. 9: Guidelines for the completion of the Census Form. ADU, UCT.

(vi) CWAC Newsletters

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## **SIGNATURE**

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