**Estimates of survival of African penguins at Dassen and Robben islands, 1993−2007**

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Annual estimates of adult survival (S) of African penguins at Dassen and Robben islands for 1993−2007 are collated in the table below. Sources of the estimates are indicated. The estimate of 0.750 for Robben Island in 1994 is omitted because it was influenced by mortality caused by oil spilt by the *Apollo Sea* in that year. The estimates of Wolfaardt et al. (2008) are for de-oiled breeding African penguins; the authors also provide estimates for non-breeding birds. Other estimates below pool information for all adult penguins.

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| --- | --- | --- |
| Year | Dassen | Robben |
|   | S | Source | S | Source |
| 1993 |   |   | 0.820 | Crawford et al. 1999 |
| 1994 |   |   |   |   |
| 1995 | 0.922 | Wolfaardt et al 2008 |   |   |
| 1996 | 0.891 | Wolfaardt et al 2008 |   |   |
| 1997 | 0.799 | Wolfaardt et al 2008 |   |   |
| 1998 | 0.860 | Wolfaardt et al 2008 |   |   |
| 1999 | 0.886 | Wolfaardt et al 2008 |   |   |
| 2000 | 0.817 | Wolfaardt et al 2008 |   |   |
| 2001 | 0.776 | Wolfaardt et al 2008 |   |   |
| 2002 | 0.861 | Wolfaardt et al 2008 |   |   |
| 2003 | 0.697 | Altwegg 2009 | 0.765 | Altwegg 2009 |
| 2004 | 0.682 | Altwegg 2009 | 0.752 | Altwegg 2009 |
| 2005 | 0.561 | Altwegg 2009 | 0.644 | Altwegg 2009 |
| 2006 | 0.535 | Altwegg 2009 | 0.620 | Altwegg 2009 |
| 2007 | 0.462 | Altwegg 2009 | 0.548 | Altwegg 2009 |

Barham et al. (2008) provide estimates of survival in the wild of hand-reared, orphaned chicks for 2000−2004. The chicks were orphaned as a result of the *Treasure* spill. Annual survival of these birds was between 0.4 and 0.5 in 2000 and 2001, when the birds were immature, and increased to > 0.8 in 2002 and 2003.

Altwegg R 2009. Survival of African penguins at Robben and Dassen islands from 2002 to 2006. *MCM/2009/SWG-PEL*/16: 11–17.

Barham PJ, Underhill LG, Crawford RJM, Altwegg R, Leshoro TM, Bolton D, Dyer BM, Upfold L 2008. Hand-reared African penguin chicks orphaned in the *Treasure* oil spill in 2000: survival, age at first breeding and breeding productivity. *Bird Conservation International* 18: 1–9.

Crawford RJM, Shannon LJ, Whittington PA 1999. Population dynamics of the African penguin at Robben Island. *Marine Ornithology* 27: 135–143.

Wolfaardt AC, Underhill LG, Altwegg R, Visagie J 2008. Restoration of oiled African penguins a decade after the *Apollo Sea* spill. *African Journal of Marine Science* 30: 421–426.

Figure (from W. Robinson): Annual penguin survival rate at Robben Island. The Bayesian 90% probability envelope (solid lines) and the joint posterior modes (dashed line) from Figure 14 in document MARAM IWS/DEC10/PA/P6 are shown, with the addition of the Altwegg tag analysis estimates (diamonds).