# Falkland Islands Seabird Monitoring

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FALKLANDS CONSERVATION

# Main Components

- Falklands Islands Seabird Monitoring Programme (FISMP)
- Island-wide Census (IWC)
- Black-browed Albatross Demographic

# Falkland Island Seabird Monitoring Programme

- Study in 1986/1988
- Falkland Islands Foundation
- Fisheries conflicts
- Six candidate species
- Three locations
- Diet and population trends

# Changes - Species

93

06

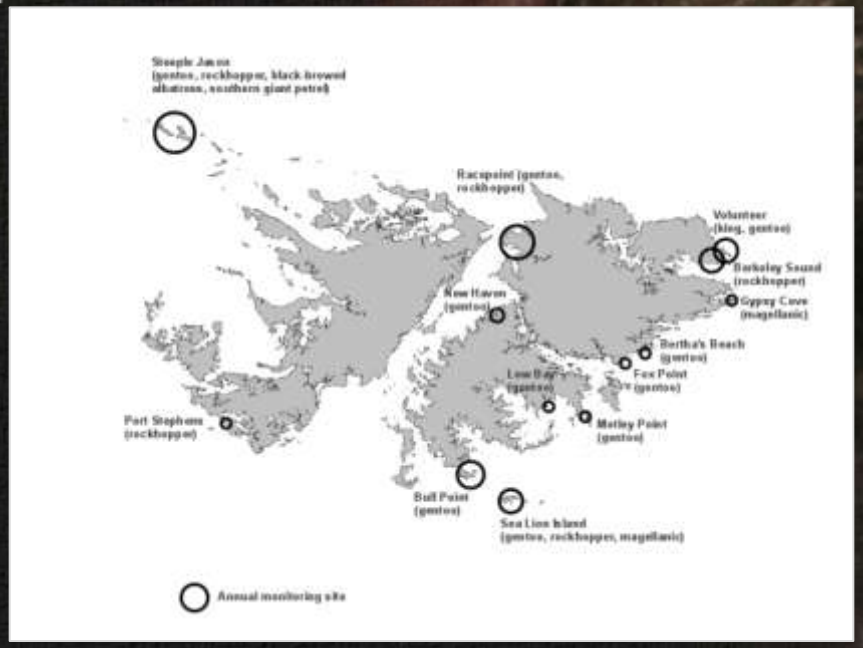
13

94

95

# Changes – ‘Sites’

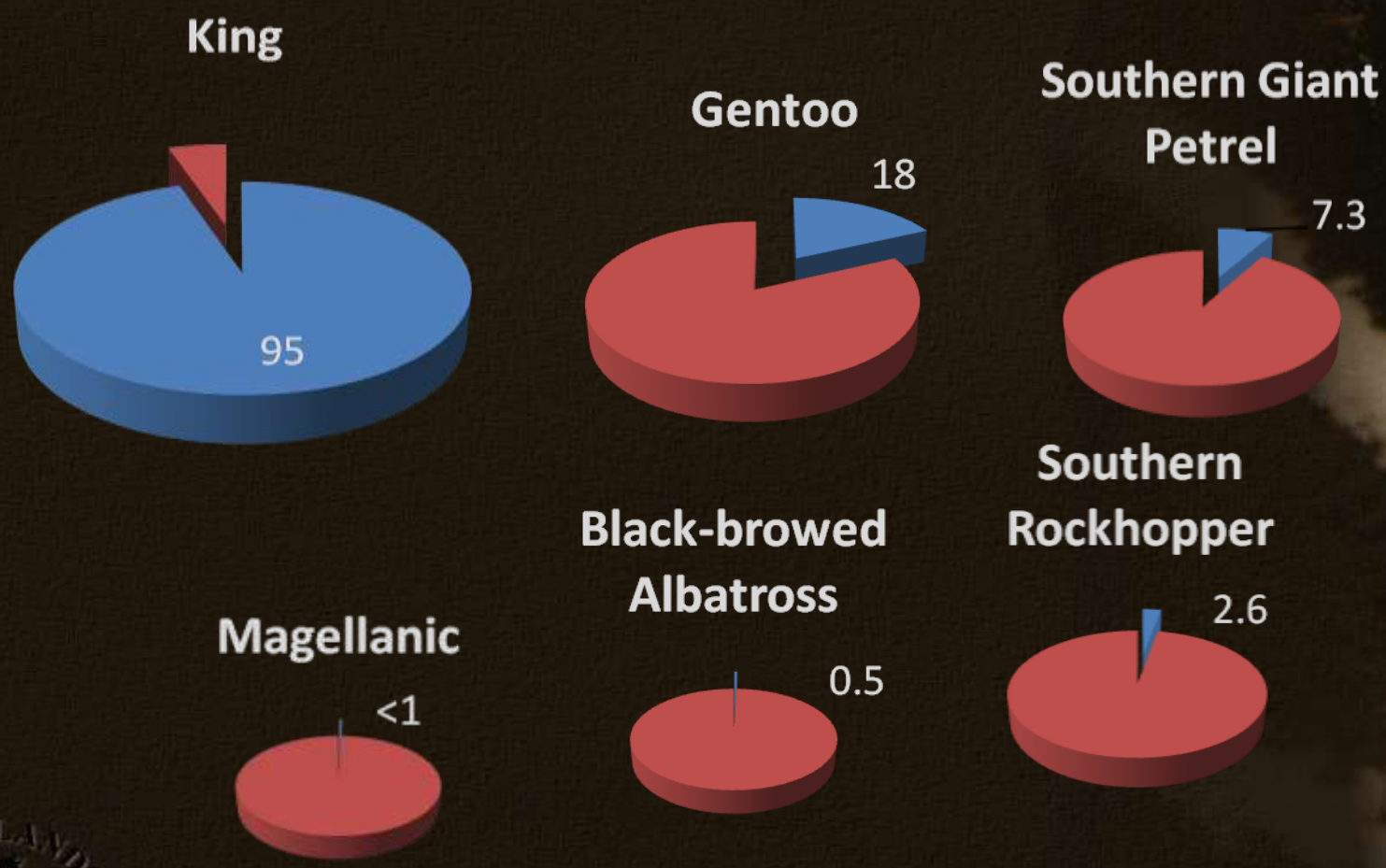
Gentoo - 11 (16)
Rockhopper - 5 (13)
King - 1 (1)
Southern Giant Petrel - 1 (2)
Black-browed albatross - 1 (5)
King Shag - 2



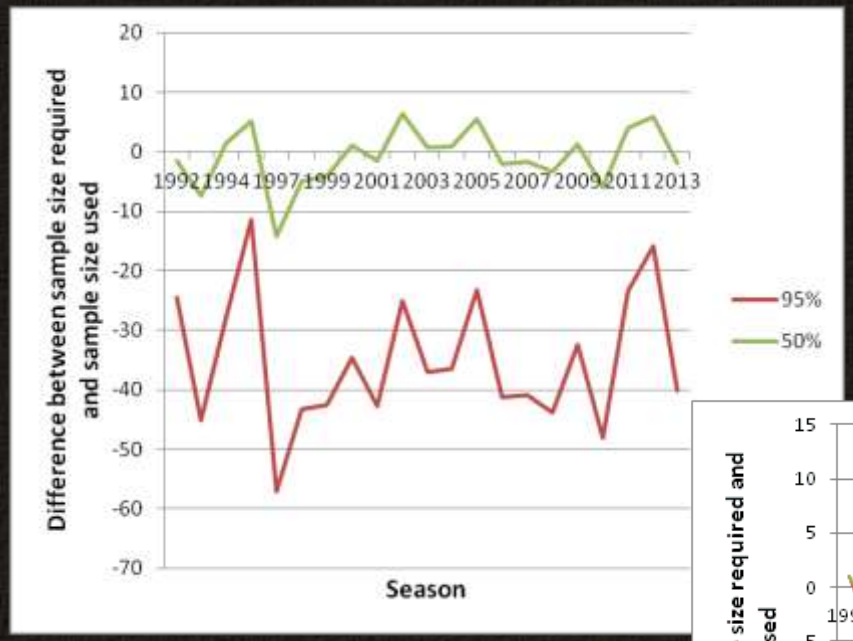
# Logistics

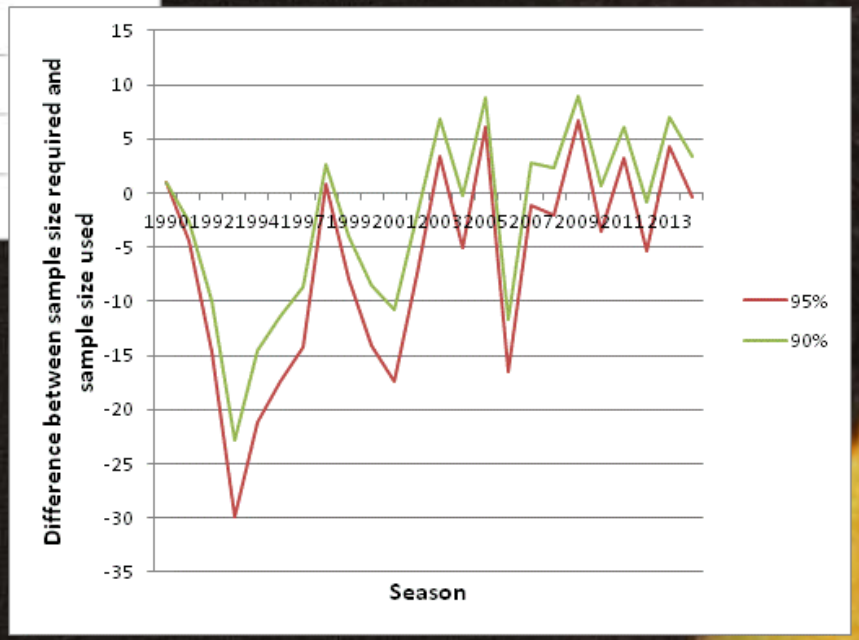
- 7 weeks
- 11 locations
- 270 km boat
- 2,000 km 4 x 4
- 2,450 km plane
- 71,000 seabirds

# Representation



# Representation - Gentoo

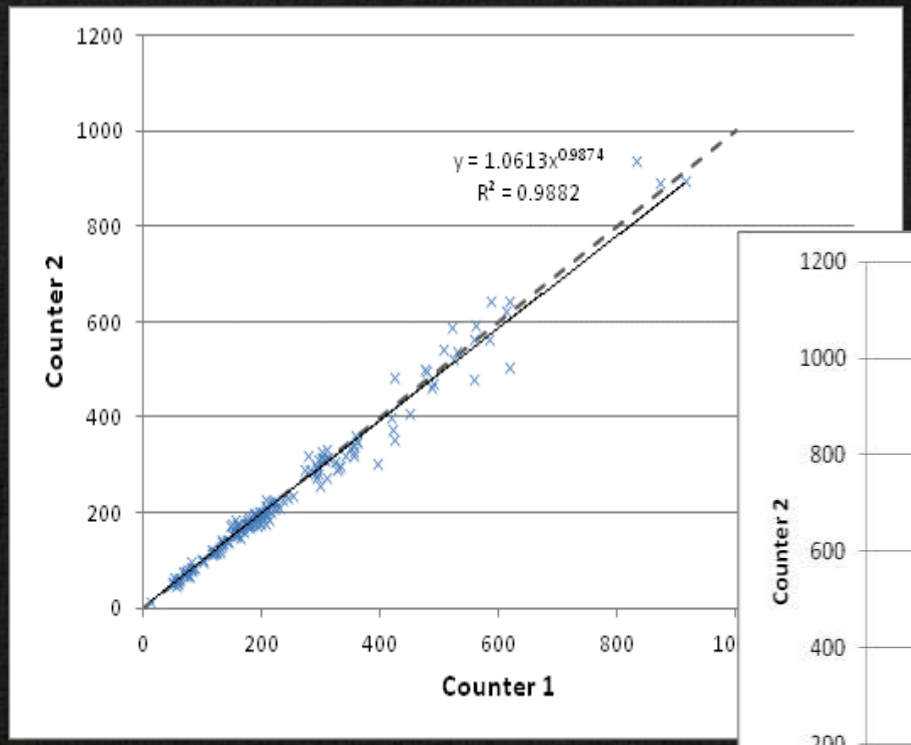


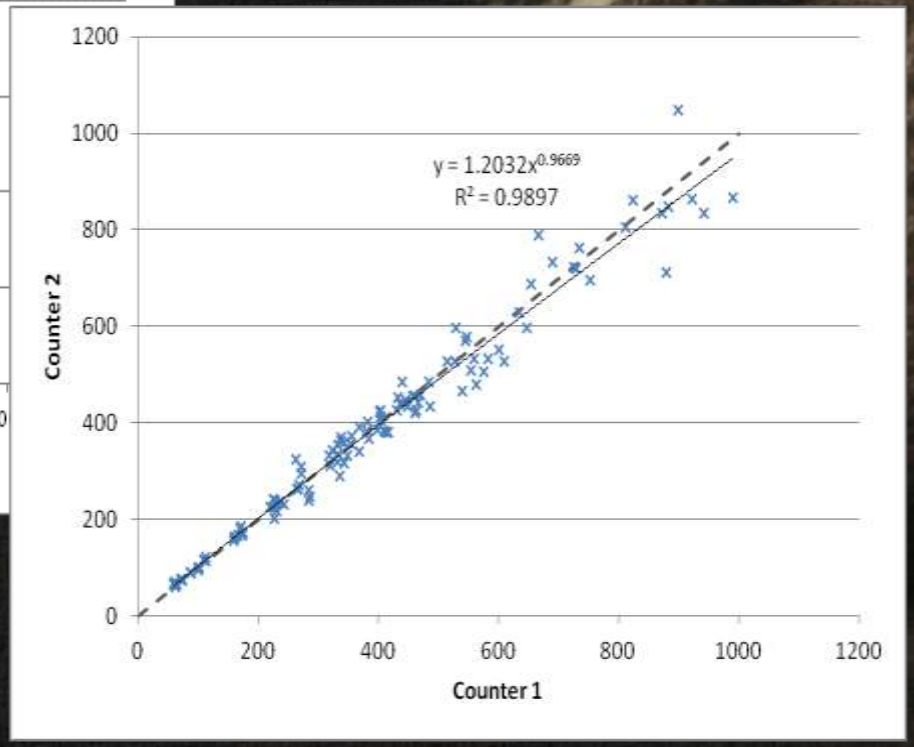



# Methods – Tally Counts

- Simple
- Low equipment costs
- Time consuming
- Adjustable
- Variable - counters
- Variable – vantage point

# Methods - Tally Counts



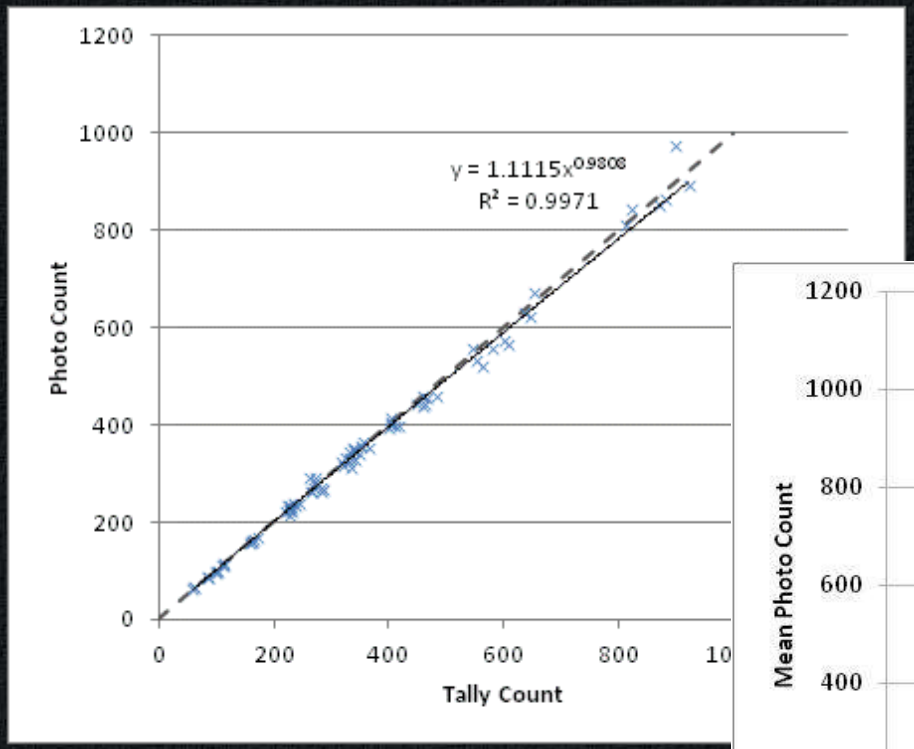

Within 27 and 43 pairs at 1000

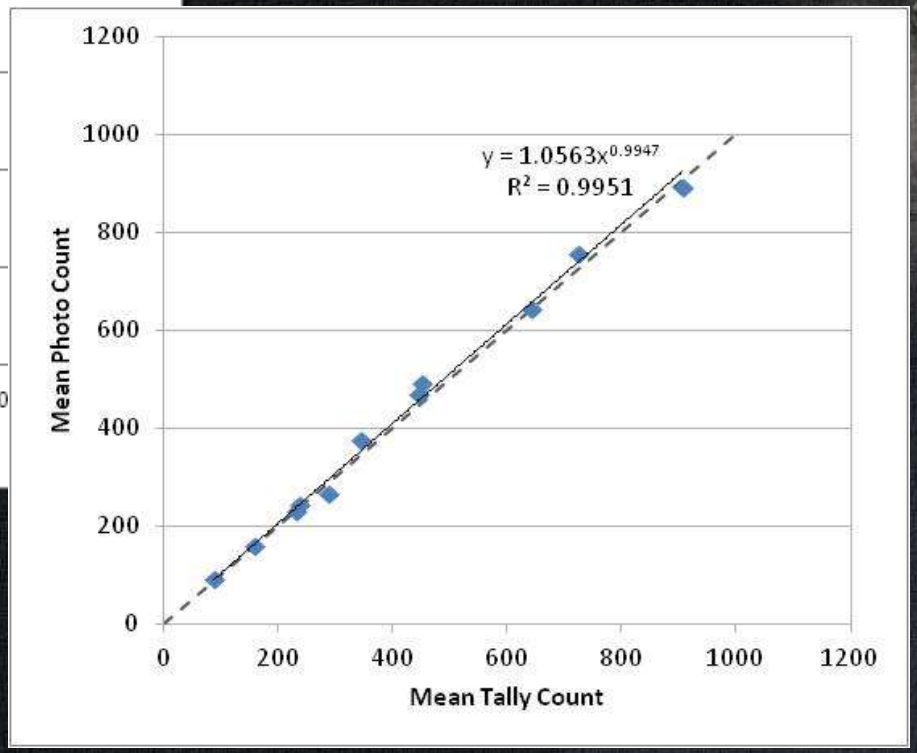
Equivalence Tests significant at 0.025 for an Equivalence Margin of 10 and 25 respectively

# Methods – Photo Counts

- More complex
- Higher costs
- Quick
- Fixed view
- Weather issues
- Variable – counting
- Permanent record
- Other data

# Methods – Tally vs. Photo

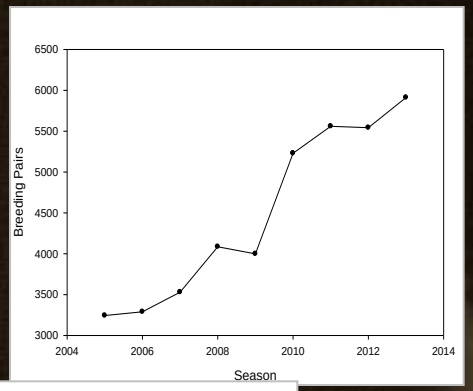


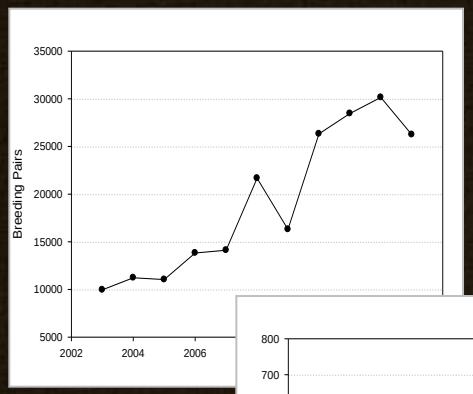

Within 55 and 27 pairs at 1000
Equivalence Tests significant at 0.025 for an Equivalence Margin of 15

# Outputs

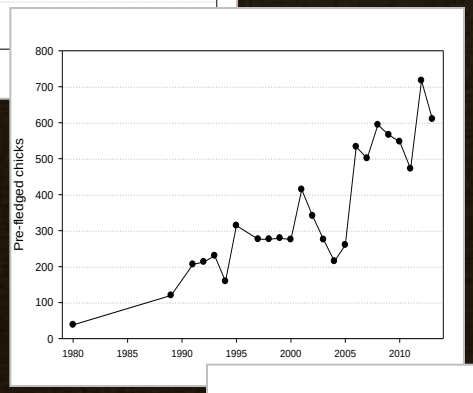
Rockhopper

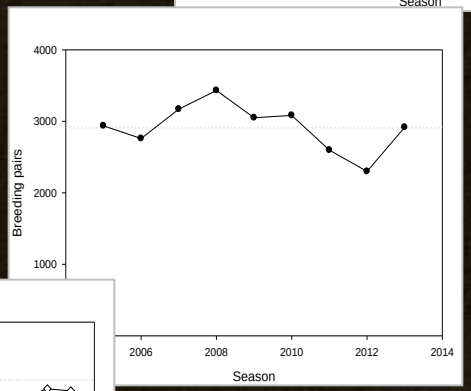



Gentoo



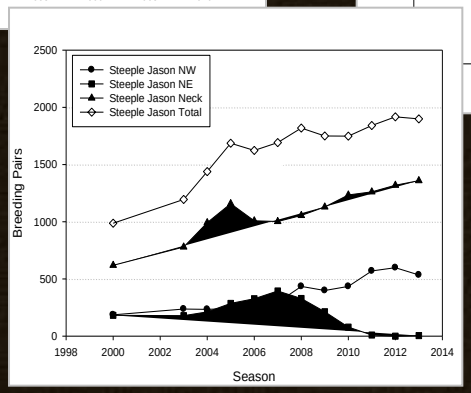

King




Black-browed albatross

Southern Giant Petrel



# Considerations

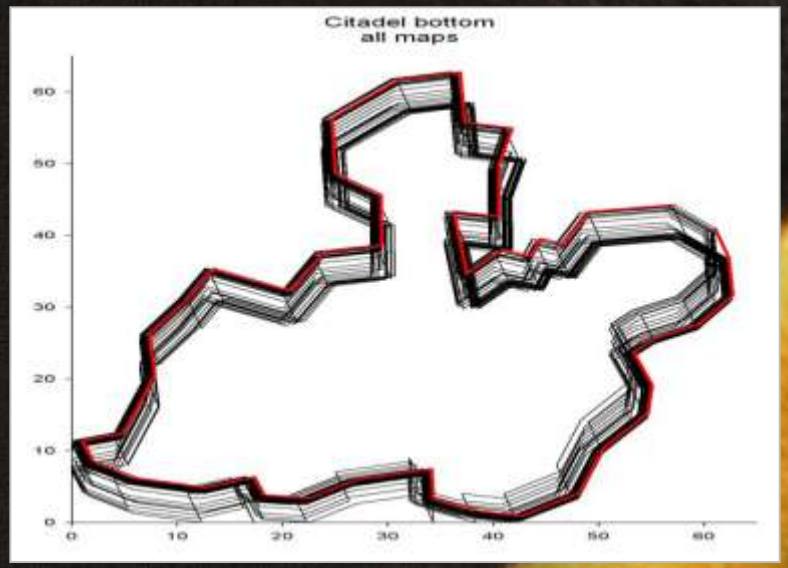
- Purpose of programme
- Representation
- Advancing technology
- Method comparability
- Increased logistics
- Funding and resource

# Island-wide Census (IWC)

- Combined Gentoo, Rockhopper, BBA since 1995, every 5 years
- Funds raised by Falklands Conservation
- Sites: Gentoo - 88, Rockhopper - 31, BBA – 12.
- SGP every 10 years (once 2004) – 38 sites
- King (2005) – 16 sites
- Volunteer involvement

# IWC - Methods

- Gentoo – as per FISMP
- Rockhopper and BBA
  - smaller colonies as per FISMP.
  - larger colonies area/density (transect)
- Southern Giant Petrel
  - smaller colonies as per FISMP.
  - larger colonies by photo
- -



# IWC – BBA and SGP

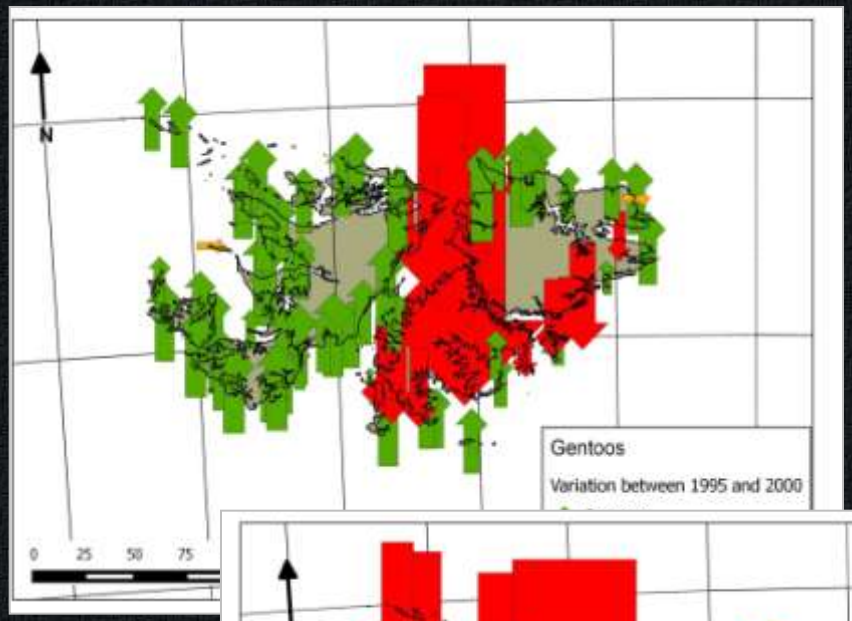
BBA

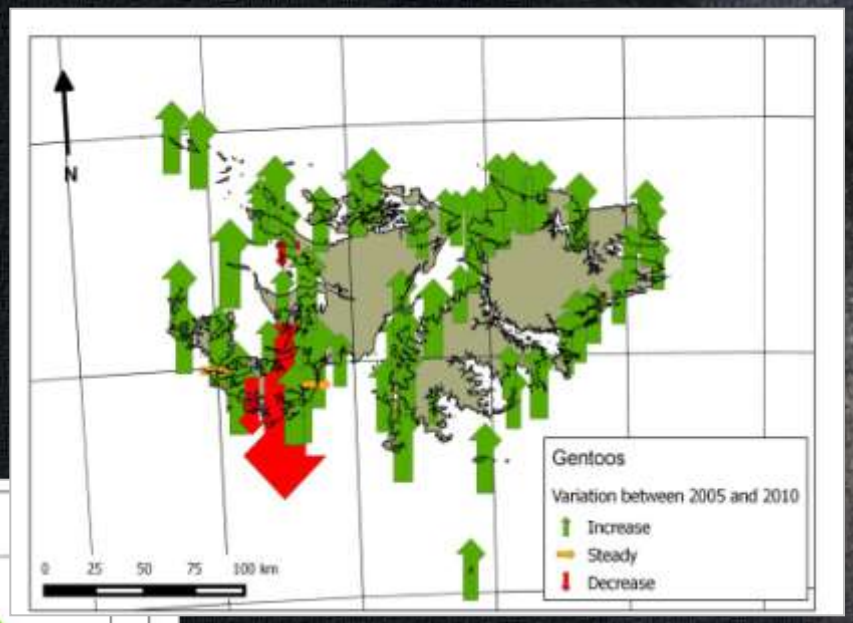
- Wolfaardt : aerial vs. ground counts – time, disturbance, accuracy
- Error – timing, state uncertainty (calibration), stitching photos
- EN to NT

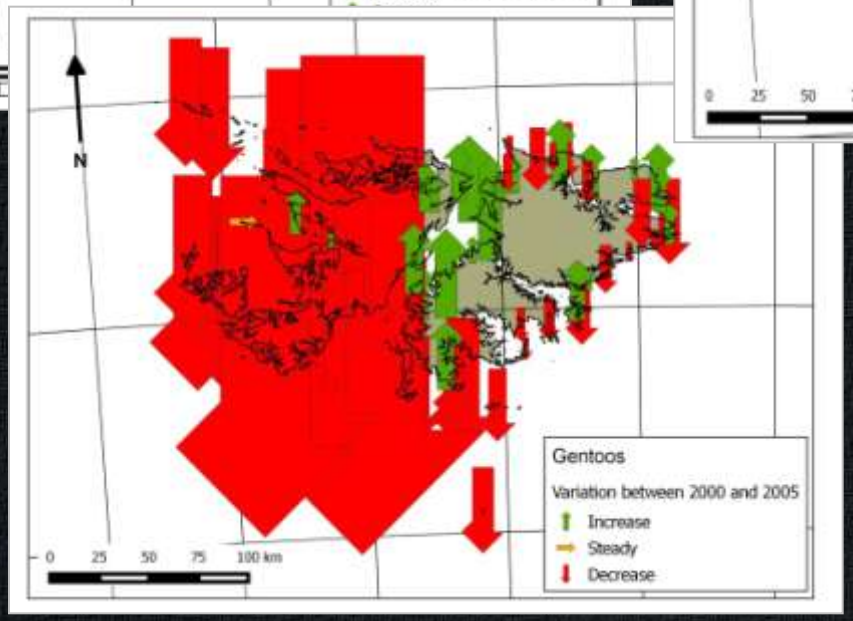
SGP

- Aerial and ground counts
- VU to LC

# IWC - Gentoo

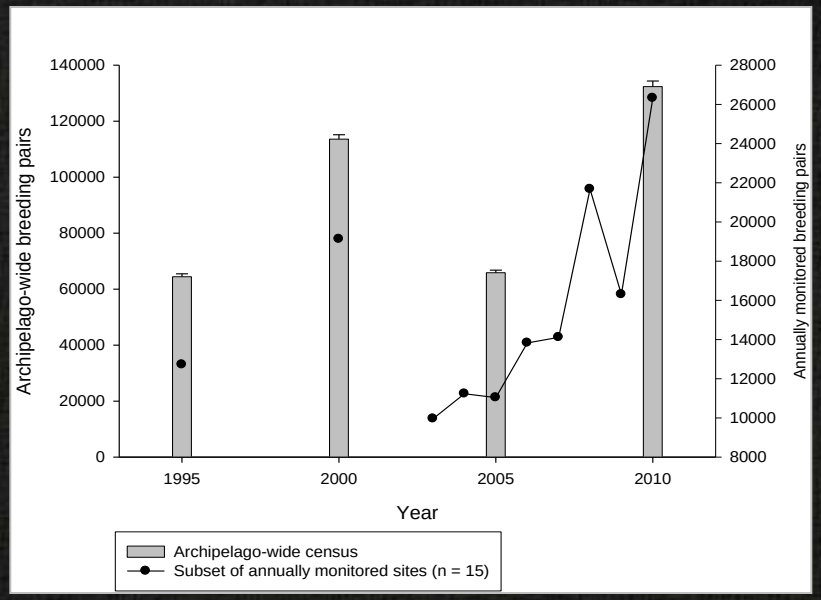


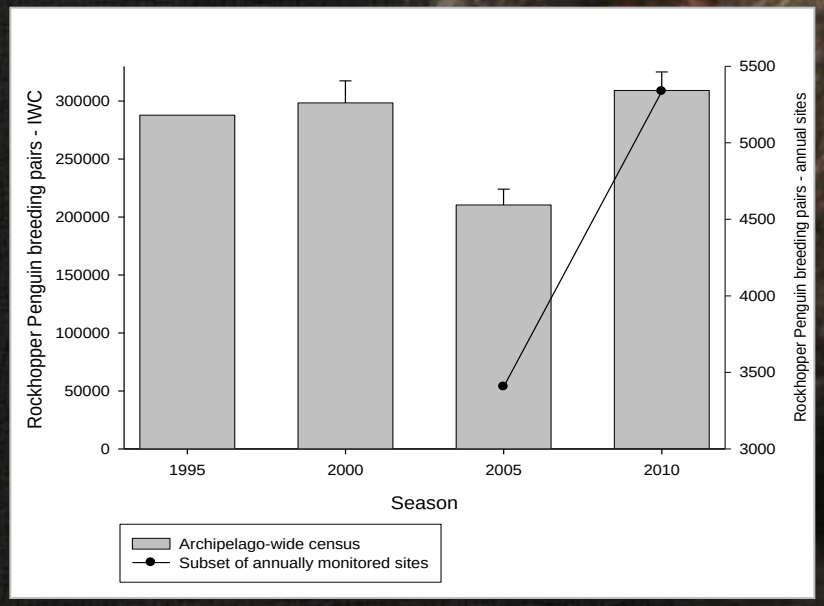




1995: 64,426
2000: 113,571
2005: 65,857
2010: 132,321

# IWC – FISMP comparisons



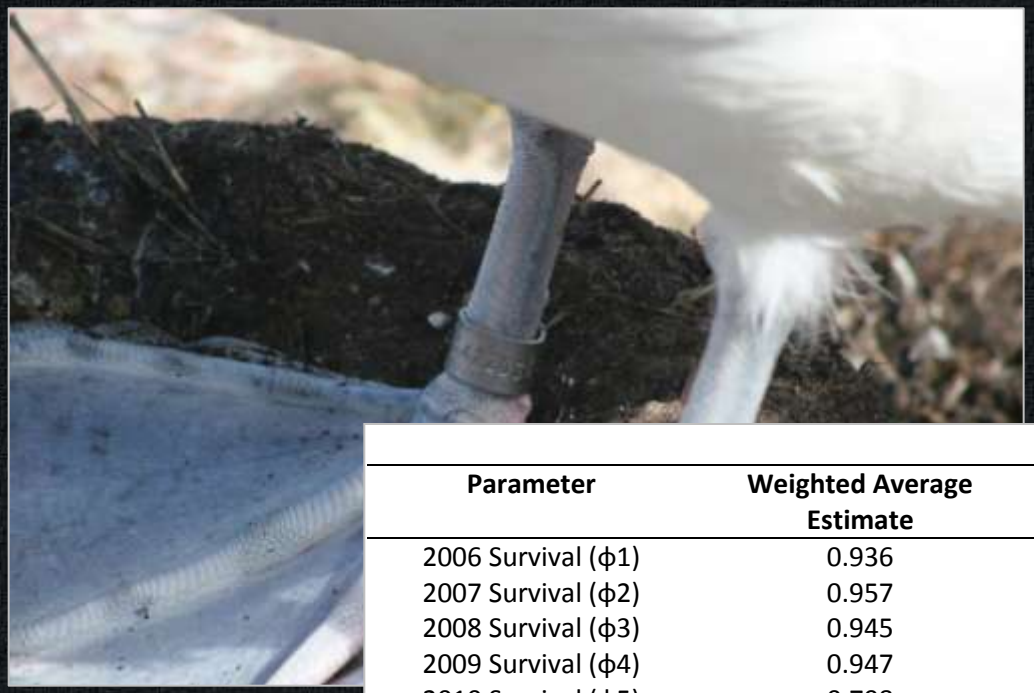




- 1995: 287,799
- 2000: 298,496
- 2005: 210,418
- 2010: 319,163

# Considerations

- Timing - interval
- Timing  - seasonal optimum
- Advancing technology
- Calibration
- Funding

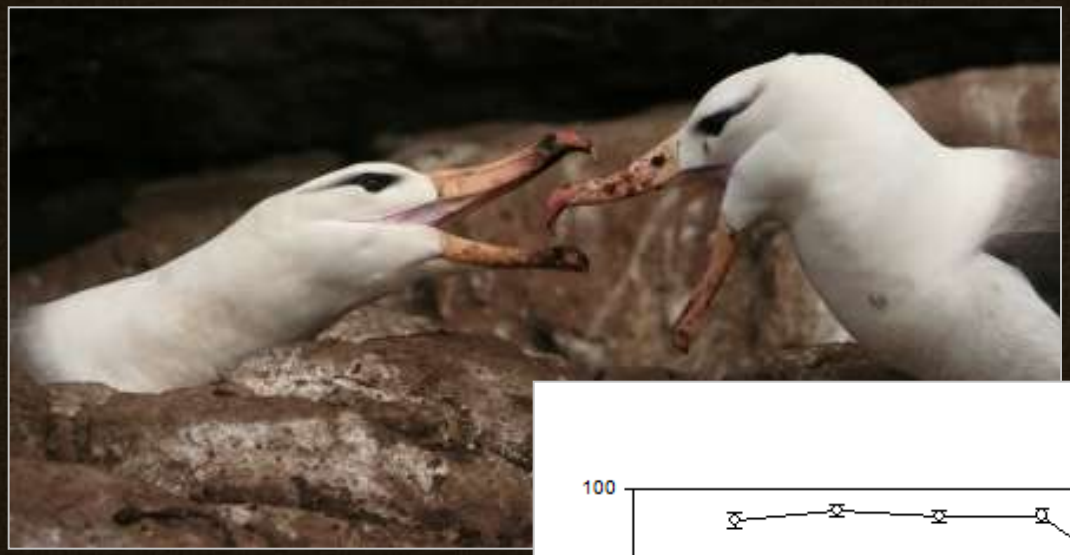
# BBA - Demographic

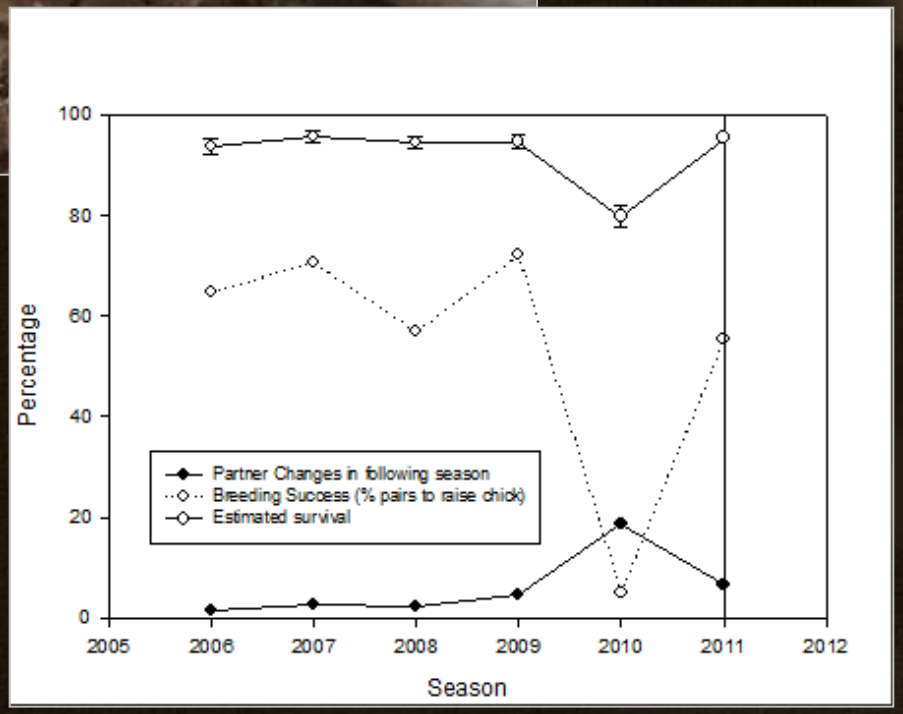


| Parameter | Weighted Average Estimate | Standard Error | 95% Confidence Interval |
|---|---|---|---|
| 2006 Survival (ϕ1) | 0.936 | 0.016 | 0.898 - 0.961 |
| 2007 Survival (ϕ2) | 0.957 | 0.012 | 0.927 - 0.975 |
| 2008 Survival (ϕ3) | 0.945 | 0.013 | 0.914 - 0.965 |
| 2009 Survival (ϕ4) | 0.947 | 0.014 | 0.910 - 0.969 |
| 2010 Survival (ϕ5) | 0.798 | 0.021 | 0.753 - 0.836 |
| 2011 Survival (ϕ6) | 0.954 | 12.520 | 0.000 - 1.000 |
| 2006 recapture (p1) | 0.899 | 0.018 | 0.858 - 0.930 |
| 2007 recapture (p2) | 0.892 | 0.014 | 0.862 - 0.916 |
| 2008 recapture (p3) | 0.885 | 0.012 | 0.859 - 0.907 |
| 2009 recapture (p4) | 0.886 | 0.012 | 0.860 - 0.907 |
| 2010 recapture (p5) | 0.883 | 0.015 | 0.850 - 0.909 |
| 2011 recapture (p6) | 0.895 | 12.490 | 0.000 - 1.000 |

**Table 5:** Parameter estimate for survival and recapture based on weighted averages.

# BBA - Demographic





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