Ring Ouzel Glen Clunie update 2019

Innes Sim, Anthony Wetherhill & Graham Rebecca

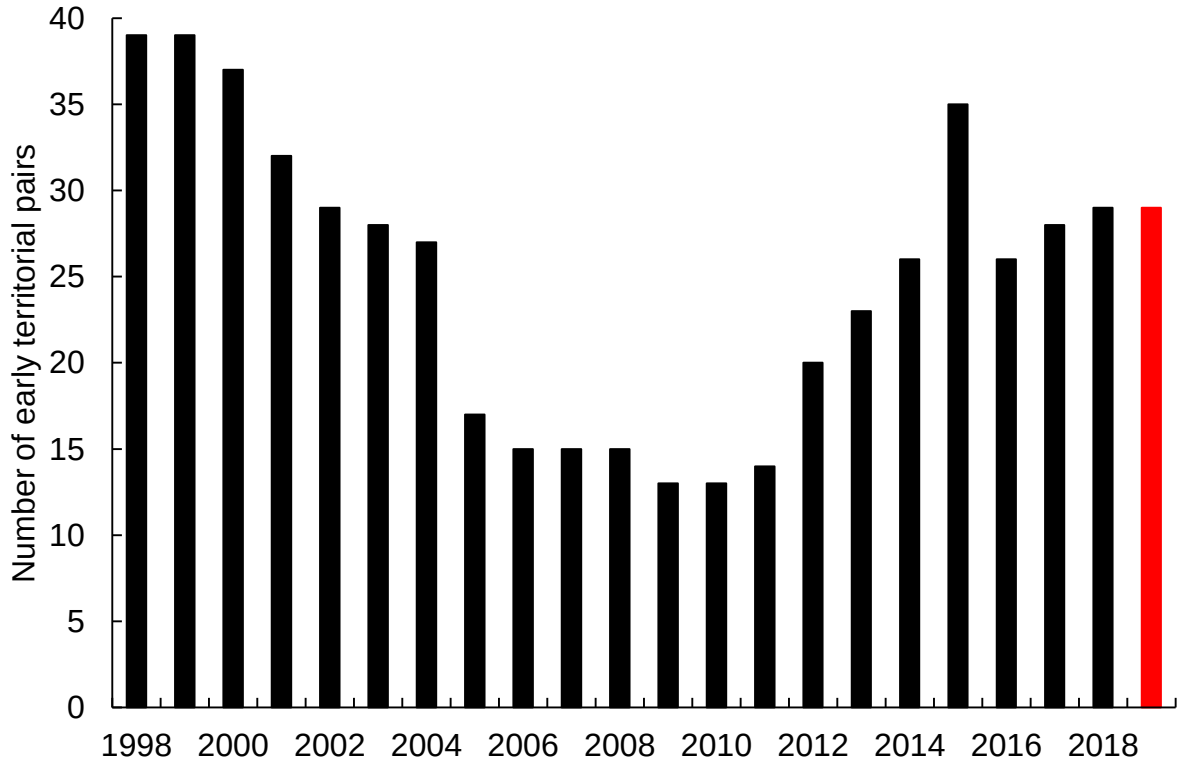
Monitoring work 1998-2019

- Assess number of breeding pairs by surveying all areas at 1-2 week intervals during April to July
- Attempt to find as many nests as possible, and monitor their contents at weekly intervals
- Individually colour ring all chicks, plus as many adults as possible
- Attempt to re-sight all returning birds in subsequent years

Monitoring in 2019

- 2019 was our 21st year of full monitoring during 1998-2019
- In 2017 we monitored only 1st breeding attempts and metal rings only were fitted
- Anthony was employed from April to July 2019 to help us trap GPS-tagged adults from 2018, and to fit more tags to breeding adults

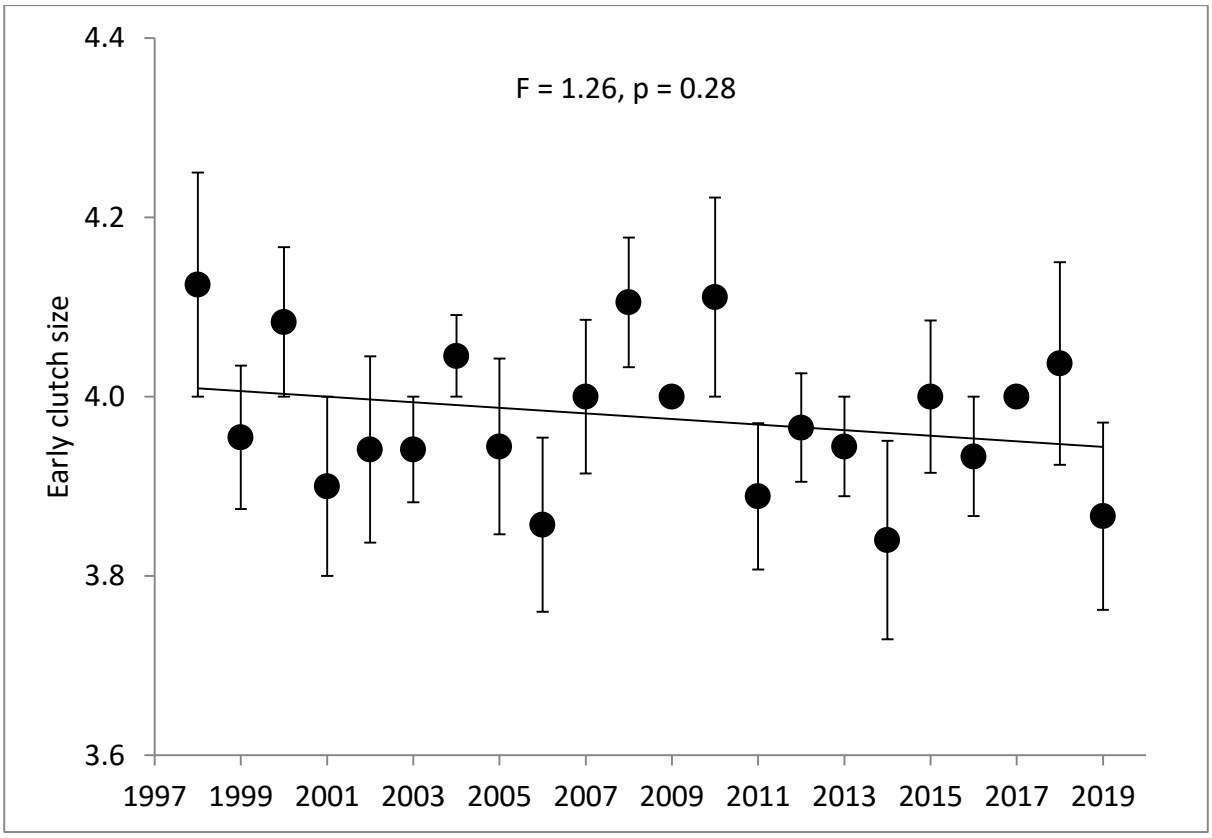
Population has declined by 26% during 1998-2019



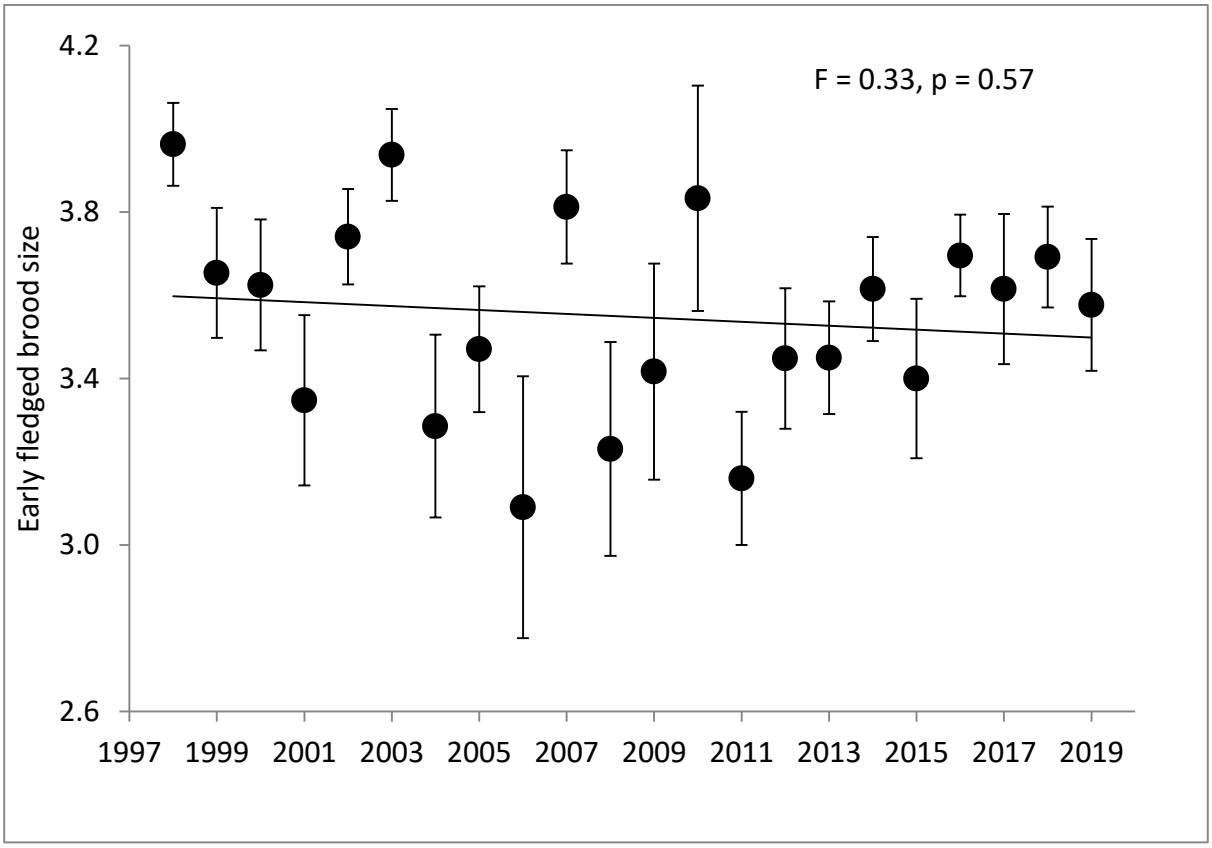
Are there any trends in breeding parameters?

- No significant linear temporal trends in early (4.0) or late (3.9) clutch size
- No trends in early (3.6) or late (3.6) fledged brood size in successful nests
- No trends in early (0.71) or late (0.65) nest survival rates
- No trends in mean laying dates, although they may be getting later

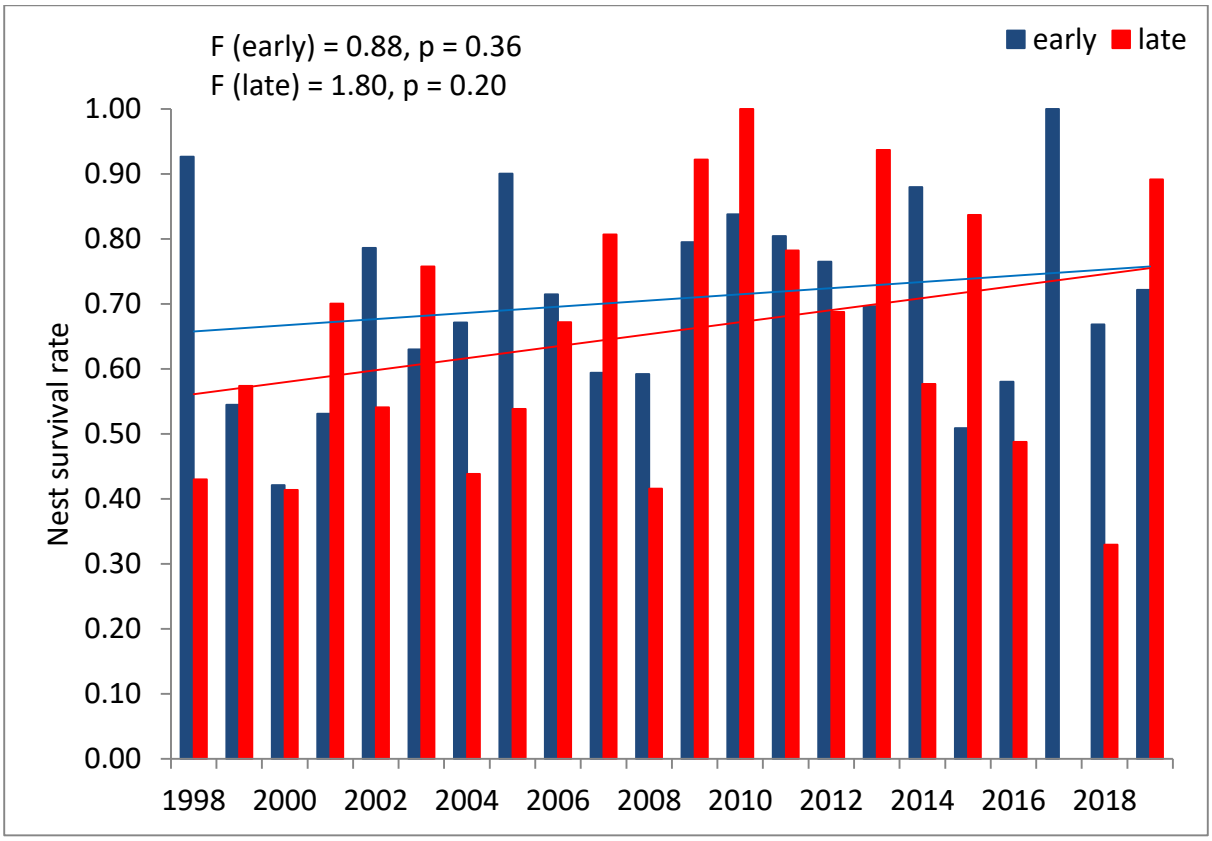
Mean (± S.E.) early clutch size 1998-2019



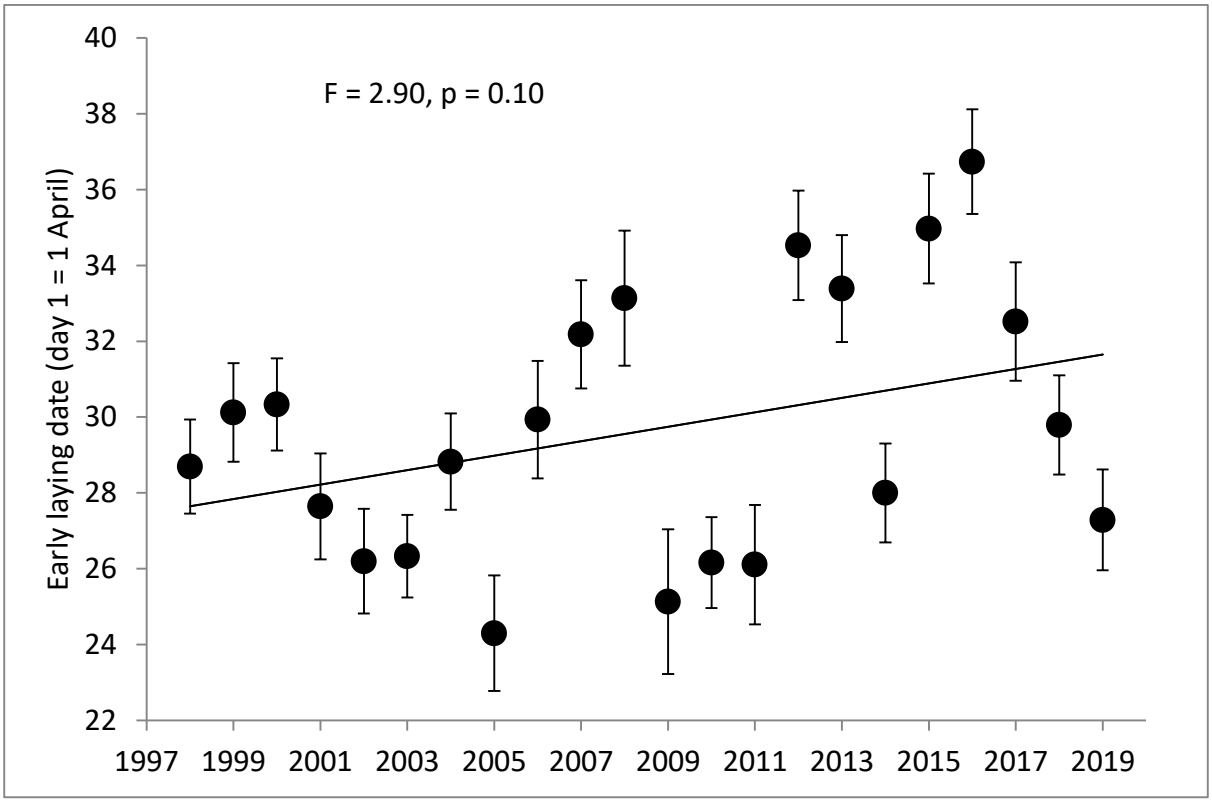
Mean (± S.E.) early fledged brood size 1998-2019



Mean nest survival rates 1998-2019



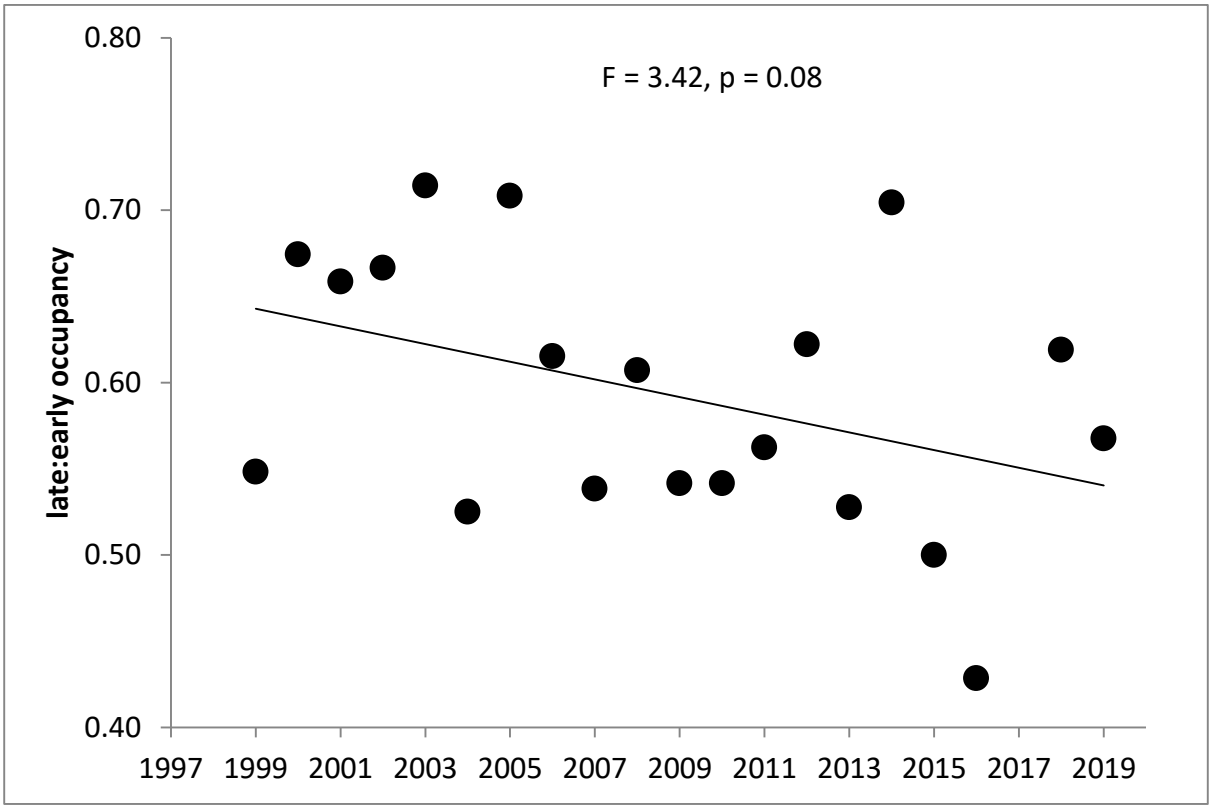
Mean (± S.E.) early nest laying dates 1998-2019



Could later laying dates be a problem?

- Around 60% of ouzels make 2 breeding attempts per year
- If their early nests are getting later, they may have less time to have a 2nd attempt
- Relatively few colour-ringed females marked at early nests
- Thus, used the ratio of late:early territories occupied as a surrogate measure of double brooding (r = 0.58)

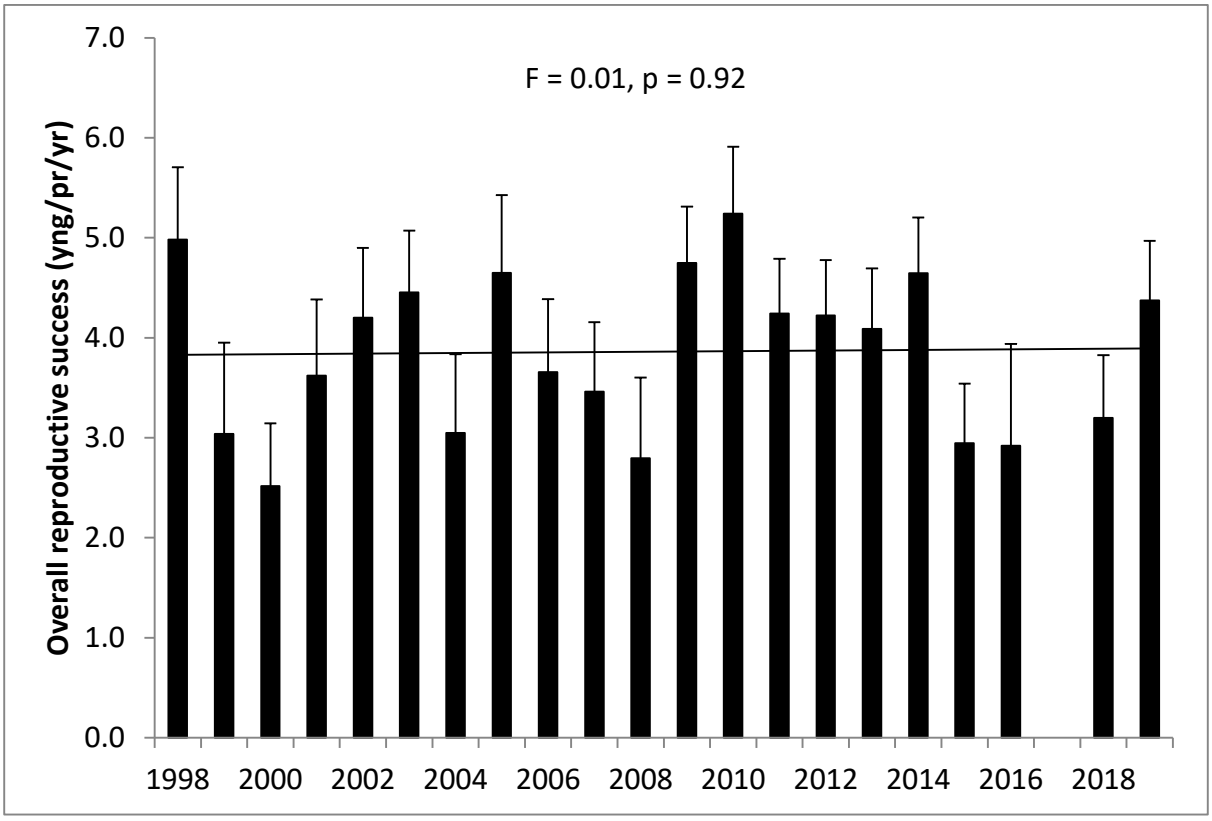
Ratio of late:early territories occupied 1999-2019



Are rates of double brooding declining?

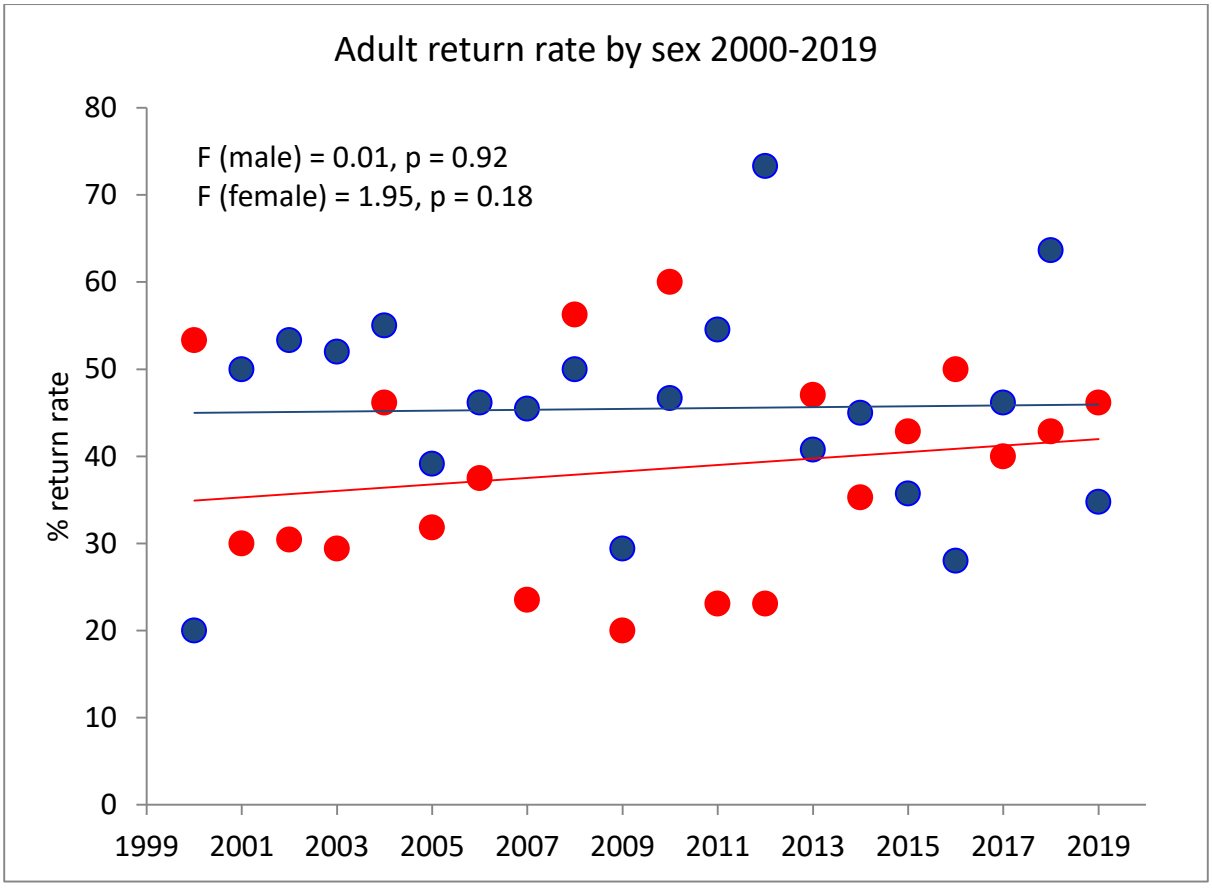
- So, the proportion of pairs double brooding *may* be declining
- Does this influence overall reproductive success (ORS)?
- ORS = (early NSR * early Fledged Brood Size) + (late NSR * late Fledged Brood Size * DB rate)

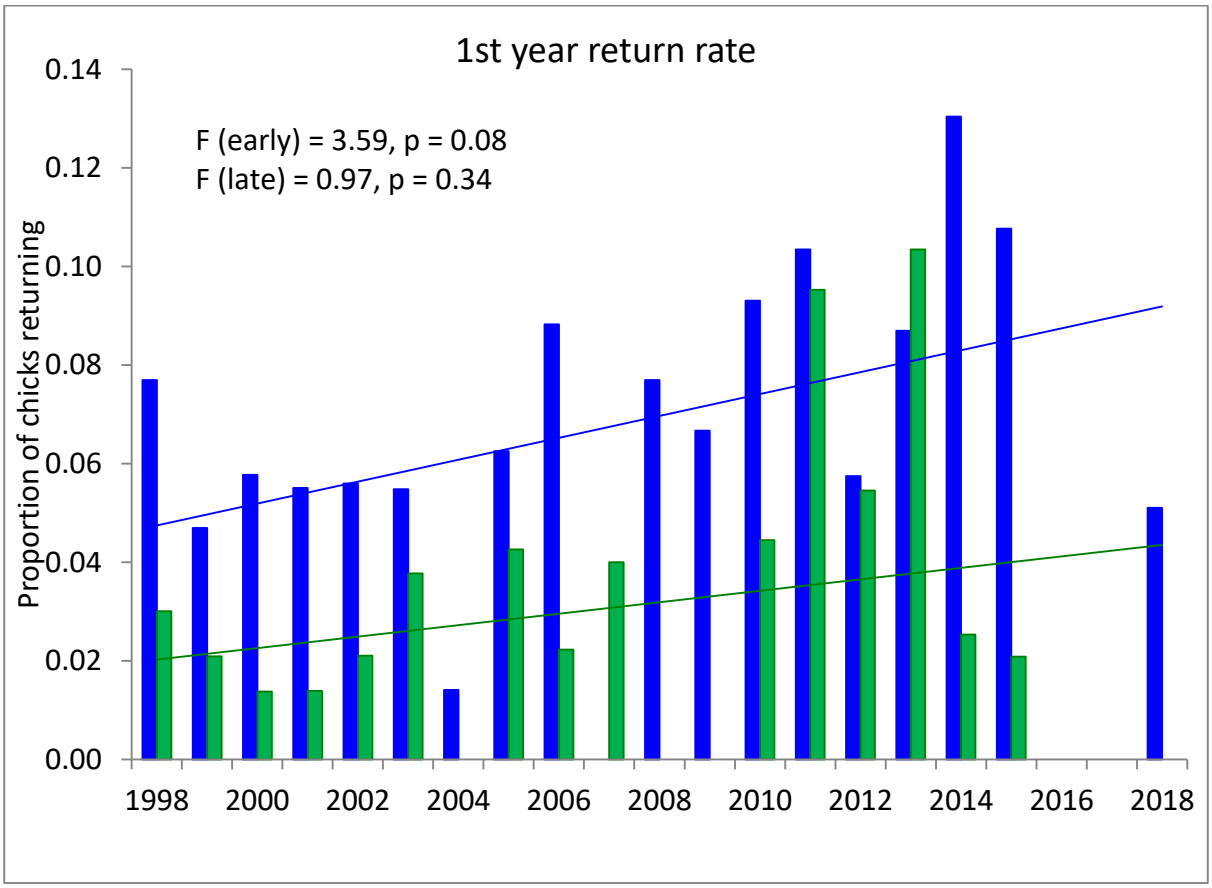
Overall Reproductive Success 1999-2019



Are there any trends in return rates?

- No linear trend in adult male (46%) or female (37%) return rate
- No linear trend in early (6.8%) or late (3.1%) brood return rates

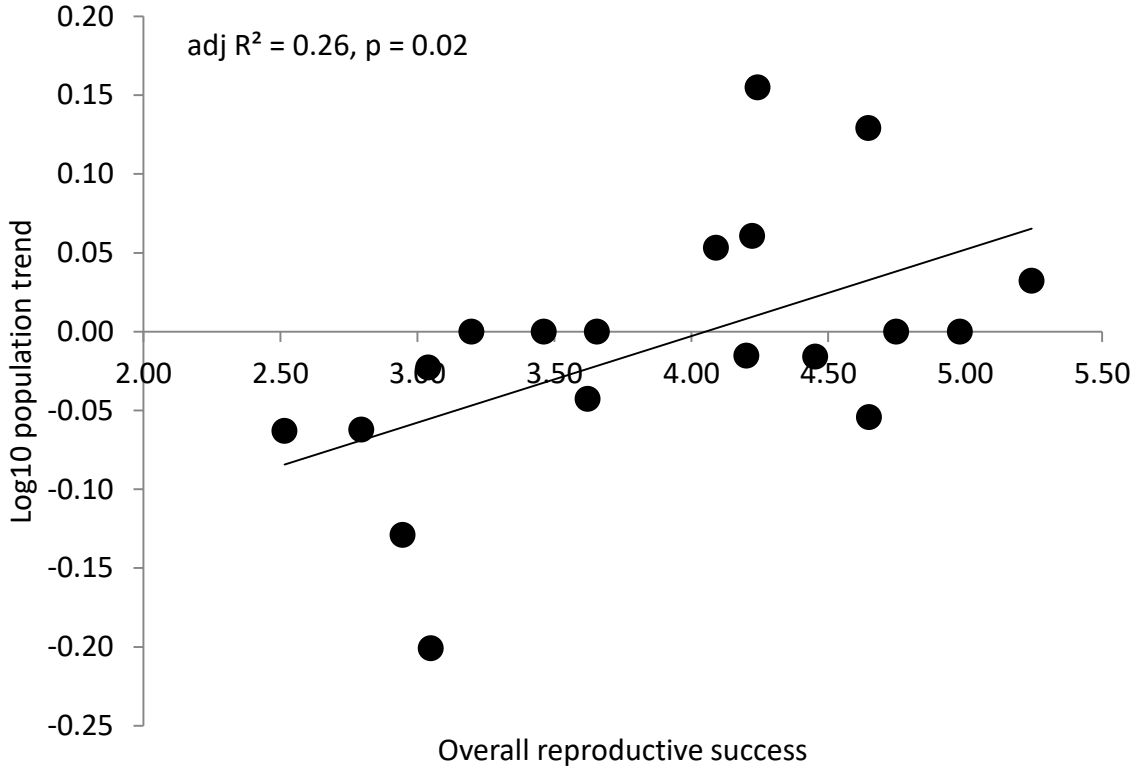

Adult return rate by sex 2000-2019
F (male) = 0.01, p = 0.92
F (female) = 1.95, p = 0.18
% return rate
80
70
60
50
40
30
20
10
0
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019


1st year return rate
F (early) = 3.59, p = 0.08
F (late) = 0.97, p = 0.34
Proportion of chicks returning
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018

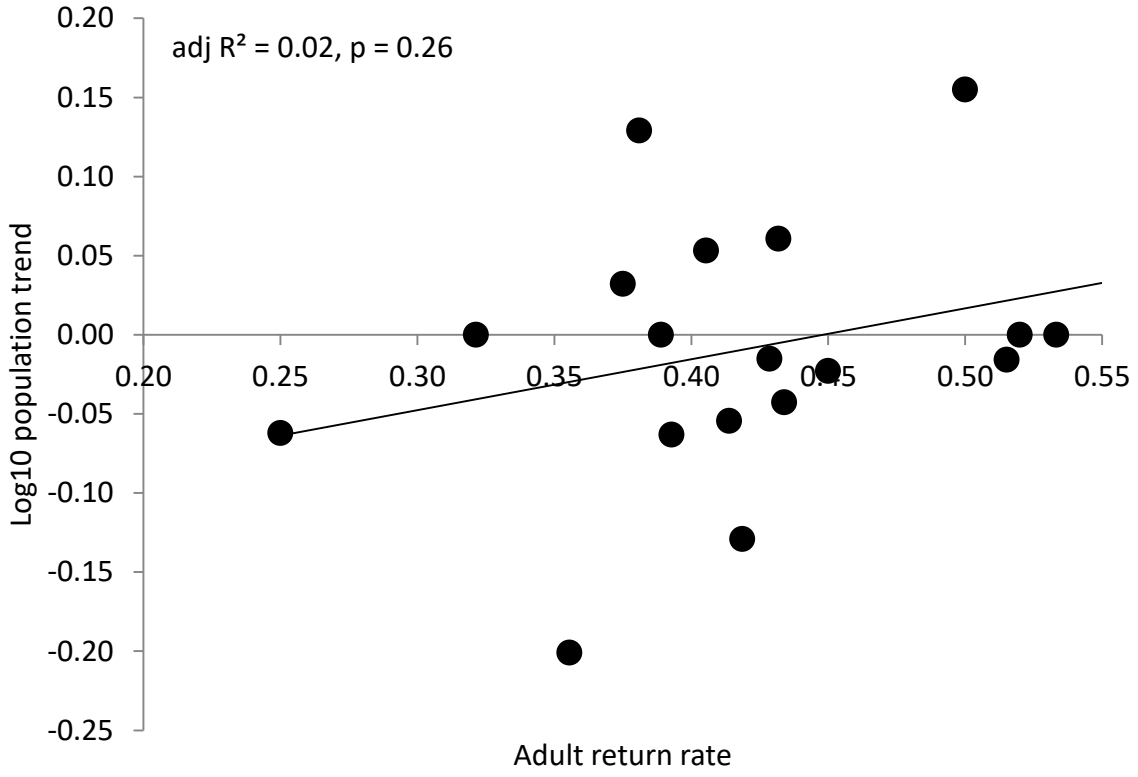
Can we explain change in breeding numbers?

- Examined annual change in breeding numbers in relation to:
- Overall Reproductive Success (ORS) in the previous year
- Adult return rates
- 1st year return rates

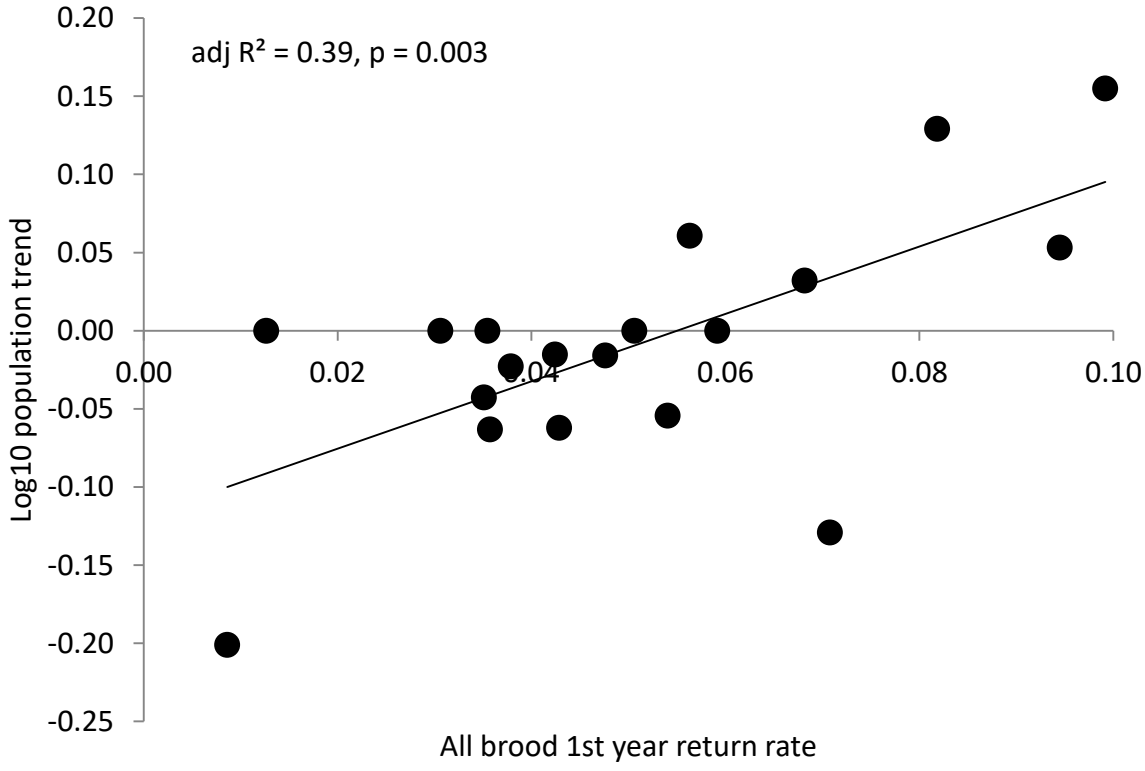
ORS predicts population change reasonably well



Adult return rate does not predict population change



1st year return rate predicts population change most accurately



Conclusions

- Some evidence that laying dates are getting later
- As a result, double brooding may be becoming less common
- However, ORS has shown no decline through time
- ORS in the previous year explains annual population change with reasonable accuracy
- However, 1st year return rate explains annual population change most accurately