Barn Owl

Figure 1: Barn Owl (Photo: Zul Bhatia, South Strathclyde RSG).

Barn Owl monitoring is concentrated within a relatively small number of discrete study areas across Scotland.

Our latest analysis of SRMS Barn Owl data for the period 2009-2018 produced no national trends in breeding number or productivity. Trends were produced for five of the eight SRMS regions (Table 1) and for six of the 20 NHZ regions (Table 2) for which the SRMS holds Barn Owl records.

Users of the published trends users should be aware that Barn Owl trends for both breeding numbers and productivity are under-represented by records in the east and north of its range, particularly in Highland, North East Scotland, Tayside & Fife, Scottish Borders and Argyll (Figure 12). Nearly all monitored pairs are based in nest boxes. Trends for cyclically varying metrics like Barn Owl productivity can, especially over short periods, be sensitive to where in the cycle the trend period starts and ends. Breeding success in South Strathclyde is much higher here than in other regions (at or near 100% in many years) and is probably an artefact due to lack of early visits.

National trends

No trends in breeding numbers or breeding productivity are available for Barn Owl at a national level.

SRMS regional trends

Breeding numbers of Barn Owl decreased in Central and Dumfries & Galloway, but showed no significant change in South Strathclyde (Table 1, Figure 2).

Breeding success of Barn Owl decreased in Central and Dumfries & Galloway, and showed no

significant change in three regions (Argyll, Lothian & Borders and South Strathclyde) (Table 1, Figure 3).

Clutch size, brood size and number of fledglings showed no significant change in Dumfries & Galloway (Table 1, Figures 4-6). Brood size decreased in Central (Table 1, Figure 4), but clutch size and number of fledglings showed no significant change (Table 1, Figure 4, Figure 6).

Trends for this species are not yet available for Highland, North East Scotland or Tayside & Fife.

NHZ regional trends

Breeding numbers of Barn Owl decreased in NHZs 16 and 18 (Table 2, Figure 7).

Breeding success of Barn Owl decreased in NHZ 16, did not change significantly in four regions (NHZs 14, 17 and 19-20) and showed non-linear variation in NHZ 18 (Table 2, Figure 8).

Clutch size, brood size and number of fledglings showed no significant change in NHZs 18-19 (Table 2, Figures 9-11). Clutch size in NHZ 20 and brood size in NHZ 16 both also showed no significant change (Table 2, Figure 9, Figure 90). Number of fledglings increased in NHZ 14, decreased in NHZs 17 and 20, and showed no significant change in NHZ 16 (Table 2, Figure 11).

Trends are not yet available for NHZs 02, 04-13, 15 and 21.

Details of contributing records

6,580 (462 to 756 per year, mean: 658 records) from 2009-2018 contributed to this trends analysis (Table 5).

Table 1: Summary of SRMS regional trends for Barn Owl during 2009-2018. Figures in parentheses indicate the annual change, with significant increases highlighted in green, significant decreases highlighted in blue and non-significant changes highlighted in grey. '—' indicates where the species occurs but no trend is available. 'No SRMS data' indicates where the SRMS does not hold any records for the region of interest. 'Absent' indicates where the species is not known to breed.

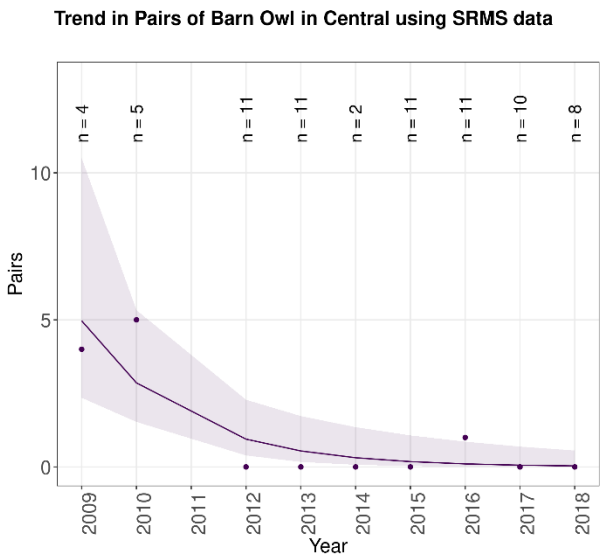
SRMS Region	Pairs	Success	Clutch size	Brood size	Number of fledglings
Argyll	—	Not significant [n]	—	—	**Increase (3.5%)**
Central	**Decrease [ns] (-42.5%)**	**Decrease [n] (-0.7%)**	Not significant	**Decrease (-2.4%)**	Not significant
Dumfries & Galloway	**Decrease [n] (-5.9%)**	**Decrease [n] (-0.8%)**	Not significant	Not significant	Not significant
Highland	—	—	—	—	—
Lewis & Harris	Absent	Absent	Absent	Absent	Absent
Lothian & Borders	—	Not significant [n]	—	—	**Decrease (-3.4%)**
North East Scotland	—	—	—	—	—
Orkney	Absent	Absent	Absent	Absent	Absent
Shetland	Absent	Absent	Absent	Absent	Absent
South Strathclyde	Not significant [ns]	Not significant [nrs]	—	—	Not significant [s]
Tayside & Fife	—	—	—	—	—
Uist	Absent	Absent	Absent	Absent	Absent

[n] Nestbox based, [r] No home range random effect, [s] Sample sizes small.

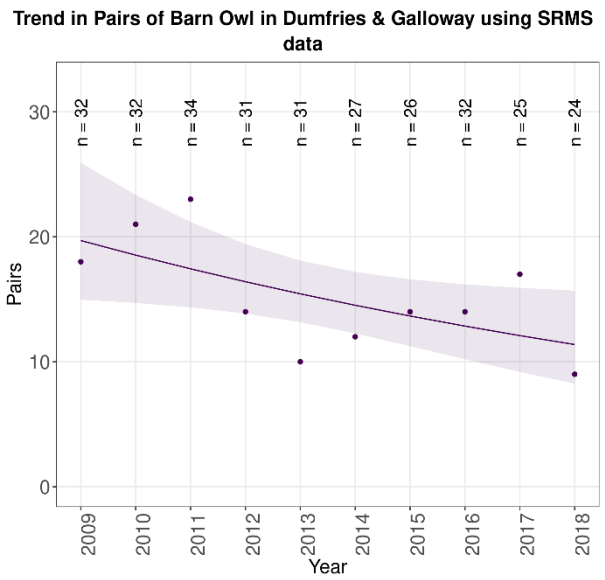
Table 2: Summary of NHZ regional trends for Barn Owl during 2009-2018. Figures in parentheses indicate the annual change, with significant increases highlighted in green, significant decreases highlighted in blue and non-significant changes highlighted in grey. 'Non-linear' indicates non-linear trends. '—' indicates where the species occurs but no trend is available. 'No SRMS data' indicates where the SRMS does not hold any records for the region of interest. 'Absent' indicates where the species is not known to breed.

NHZ Region	Pairs	Success	Clutch size	Brood size	Number of fledglings
01. Shetland	Absent	Absent	Absent	Absent	Absent
02. North Caithness and Orkney	—	—	—	—	—
03. Coll, Tiree and the Western Isles	Absent	Absent	Absent	Absent	Absent
04. North West Seaboard	—	—	—	—	—
05. The Peatlands of Caithness and Sutherland	—	—	—	—	—
06. Western Seaboard	—	—	—	—	—
07. Northern Highlands	—	—	—	—	—
08. Western Highlands	—	—	—	—	—
09. North East Coastal Plain	—	—	—	—	—
10. Central Highlands	—	—	—	—	—
11. Cairngorm Massif	—	—	—	—	—
12. North East Glens	—	—	—	—	—
13. East Lochaber	—	—	—	—	—
14. Argyll West and Islands	—	Not significant [nr]	—	—	**Increase [nr] (3.6%)**
15. Loch Lomond, The Trossachs and Breadalbane	—	—	—	—	—
16. Eastern Lowlands	**Decrease [s] (-42.5%)**	**Decrease [nv] (-0.5%)**	—	Not significant [nr]	Not significant [nr]
17. West Central Belt	—	Not significant [nv]	—	—	**Decrease [nr] (-3%)**
18. Wigtown Machairs and Outer Solway Coast	**Decrease (-5.9%)**	Non-linear	Not significant [nr]	Not significant [nr]	Not significant [nr]
19. Western Southern Uplands and Inner Solway	—	Not significant [n]	Not significant [nr]	Not significant [nr]	Not significant [n]
20. Border Hills	—	Not significant [n]	Not significant [nrs]	—	**Decrease [nr] (-3%)**
21. Moray Firth	—	—	—	—	—

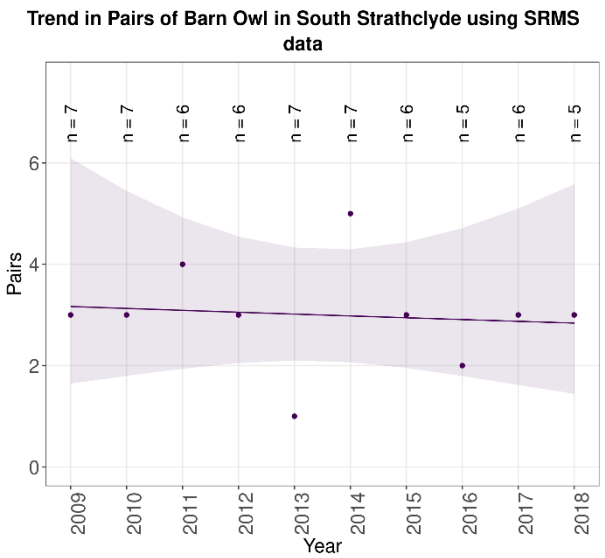
[n] Nestbox based, [r] No home range random effect, [s] Sample sizes small, [v] Variable effort.



Central trend: Decrease (caveats: Sample sizes small, Nestbox based)

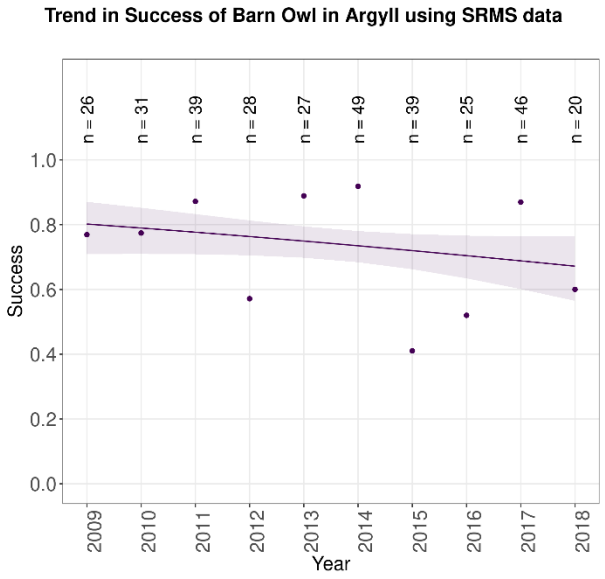


Dumfries & Galloway trend: Decrease (caveats: Nestbox based)

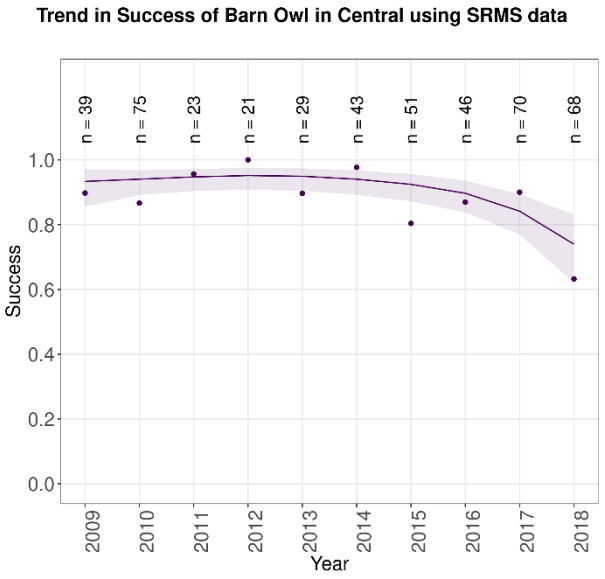


South Strathclyde trend: Not significant (caveats: Sample sizes small, Nestbox based)

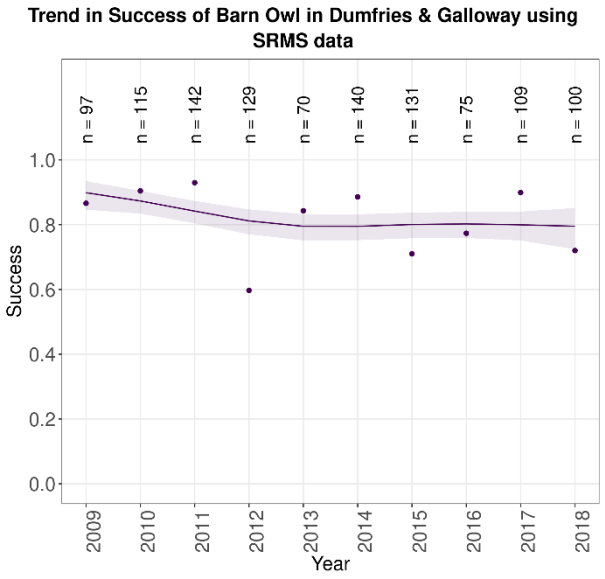
Figure 2: Trends in numbers of breeding pairs of Barn Owl by SRMS region during 2009-2018.



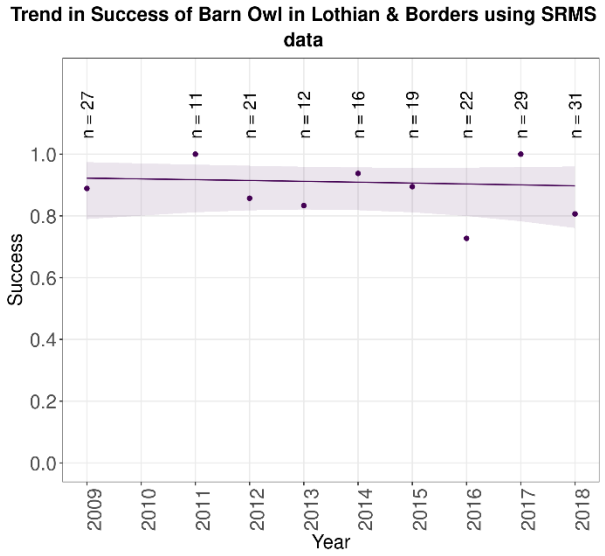
Argyll trend: Not significant (caveats: Nestbox based)



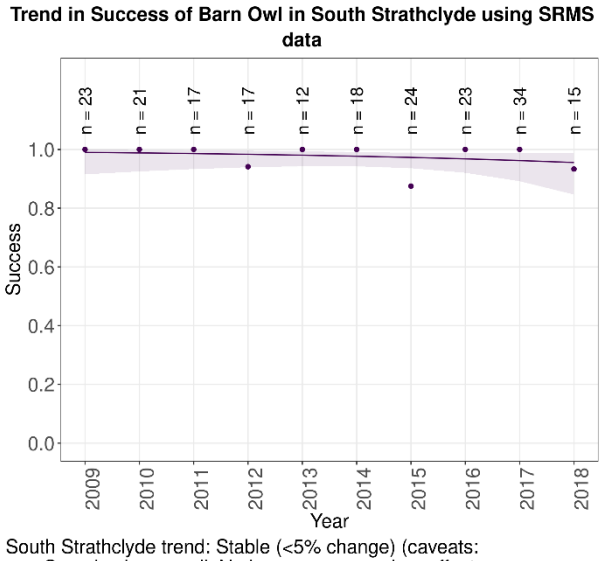
Central trend: Decrease (caveats: Nestbox based)



Dumfries & Galloway trend: Decrease (caveats: Nestbox based)



Lothian & Borders trend: Not significant (caveats: Nestbox based)



South Strathclyde trend: Stable (<5% change) (caveats: Sample sizes small, No home range random effect; Nestbox based)

Figure 3: Trends in breeding success of Barn Owl by SRMS region during 2009-2018.

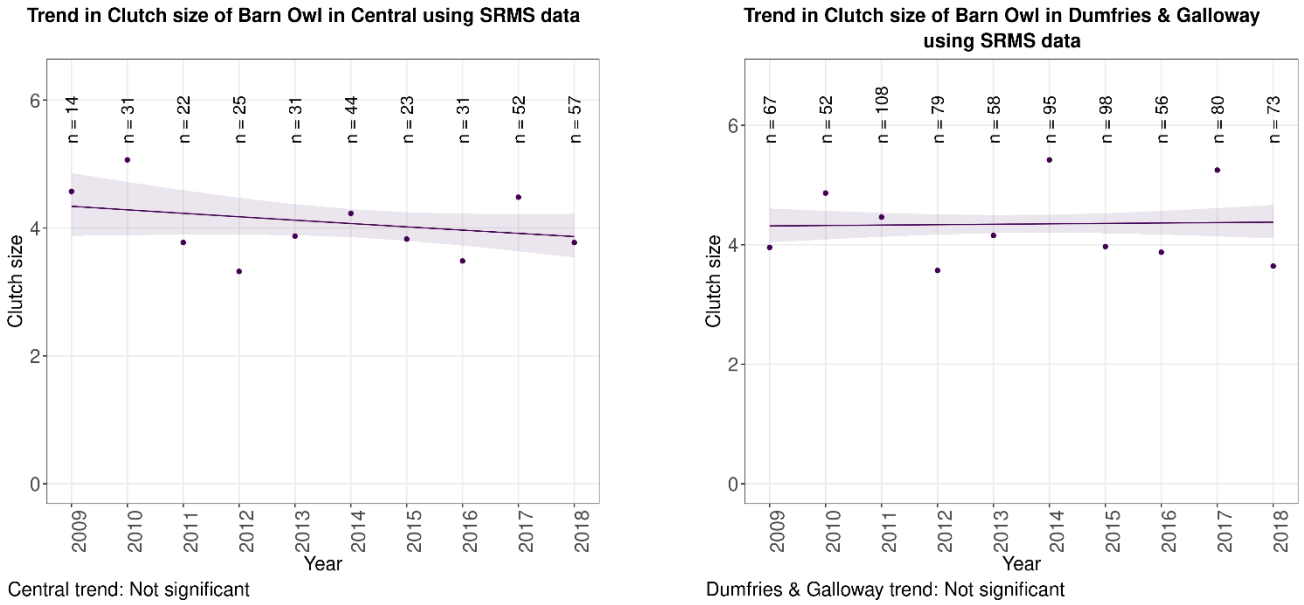


Figure 4: Trends in clutch size of Barn Owl by SRMS region during 2009-2018.

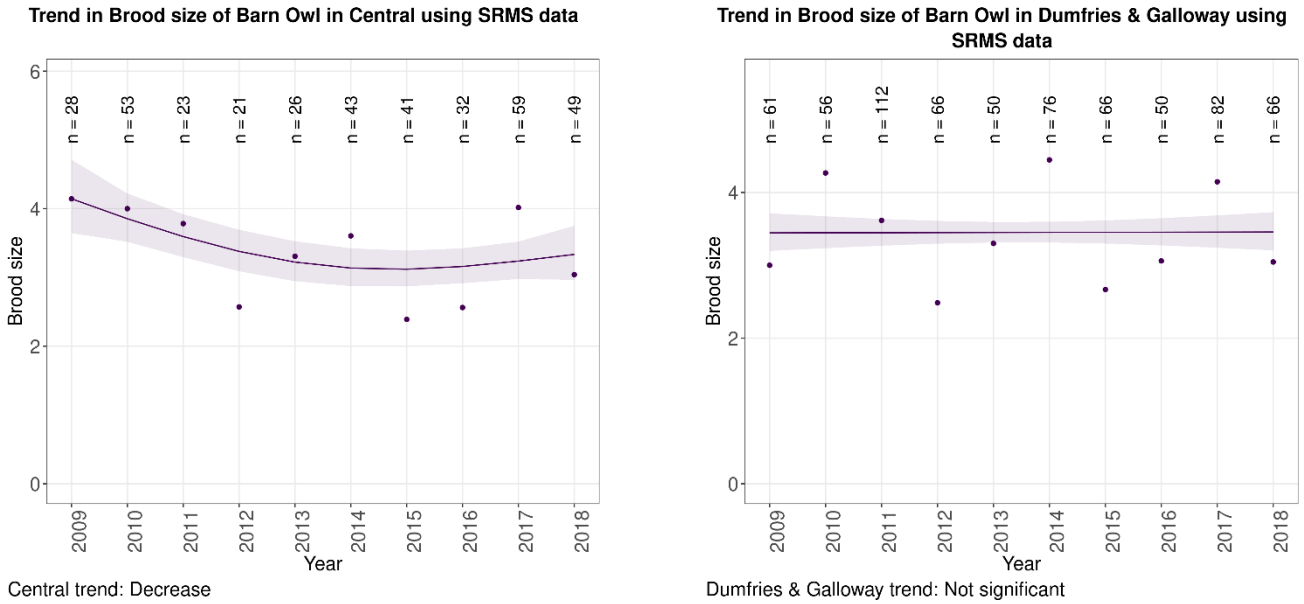
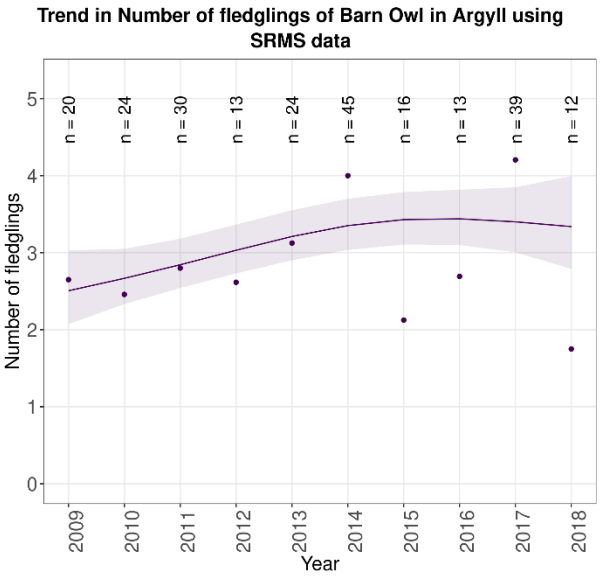
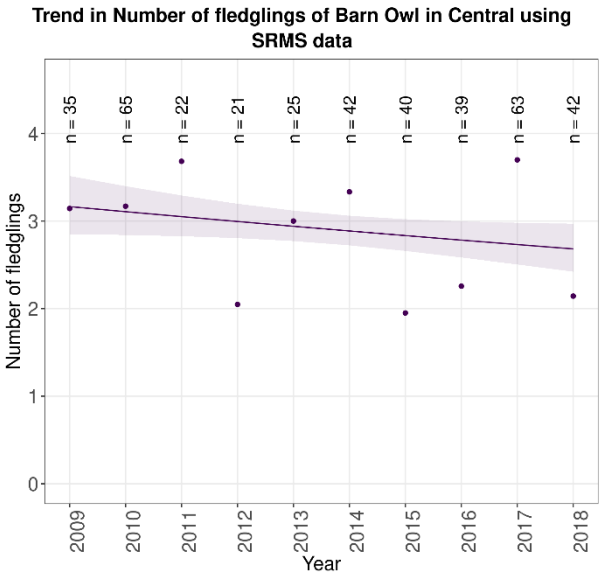


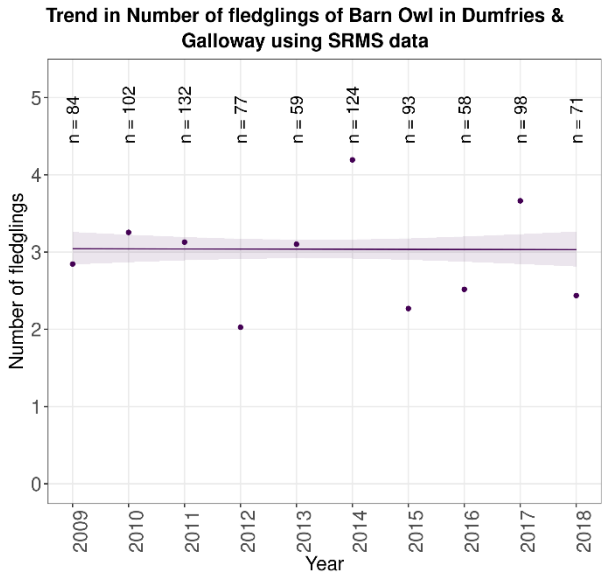
Figure 5: Trends in brood size of Barn Owl by SRMS region during 2009-2018.



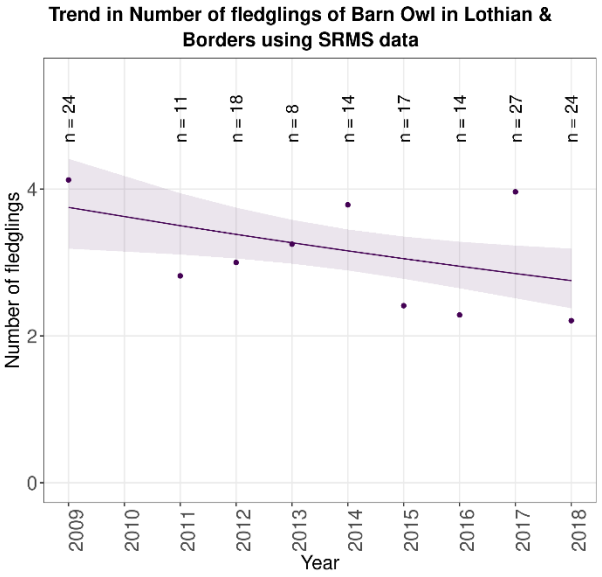
Argyll trend: Increase



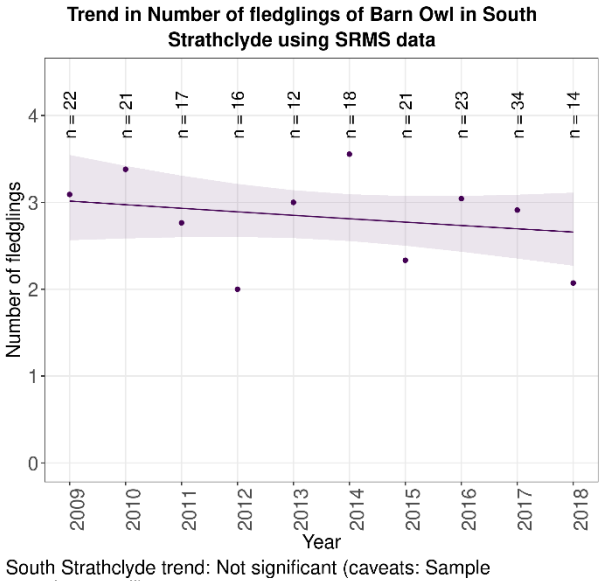
Central trend: Not significant



Dumfries & Galloway trend: Not significant

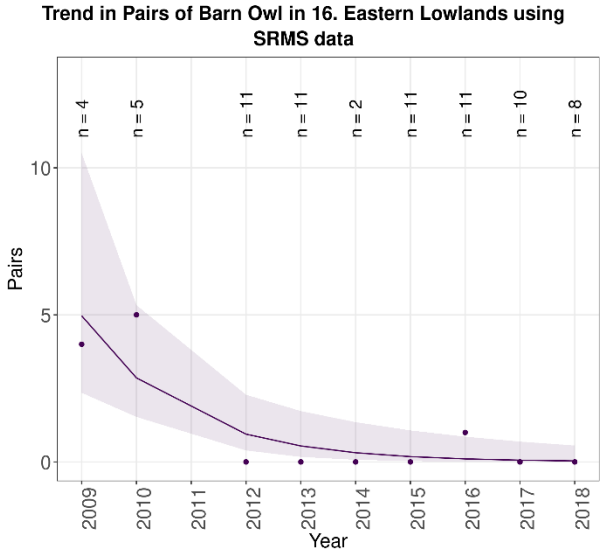


Lothian & Borders trend: Decrease

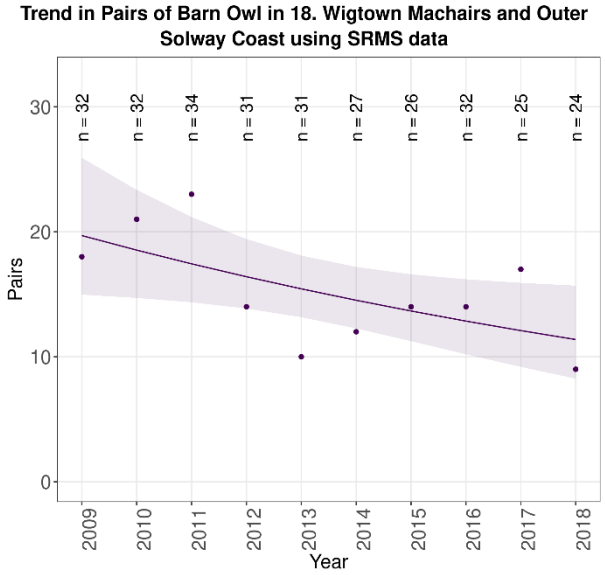


South Strathclyde trend: Not significant (caveats: Sample sizes small)

Figure 6: Trends in number of fledglings of Barn Owl by SRMS region during 2009-2018.

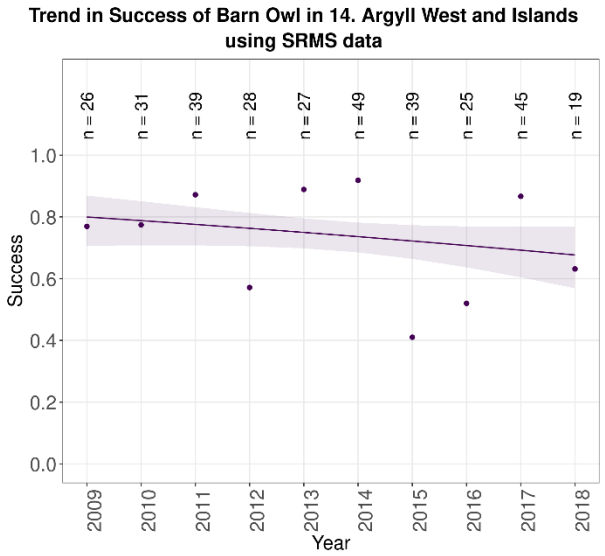


16. Eastern Lowlands trend: Decrease (caveats: Sample sizes small)

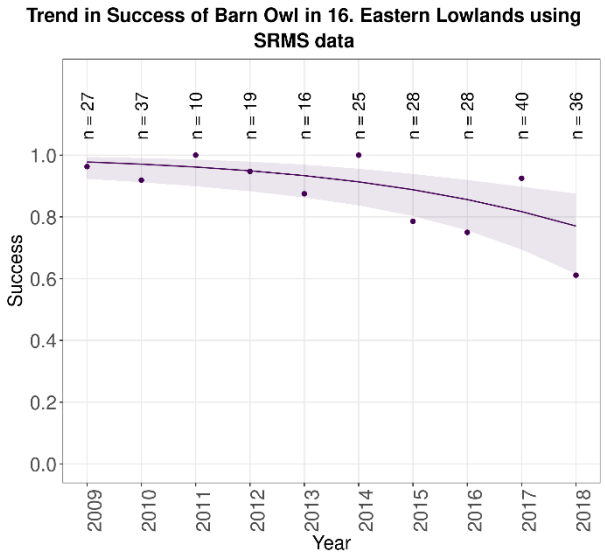


18. Wigtown Machairs and Outer Solway Coast trend: Decrease

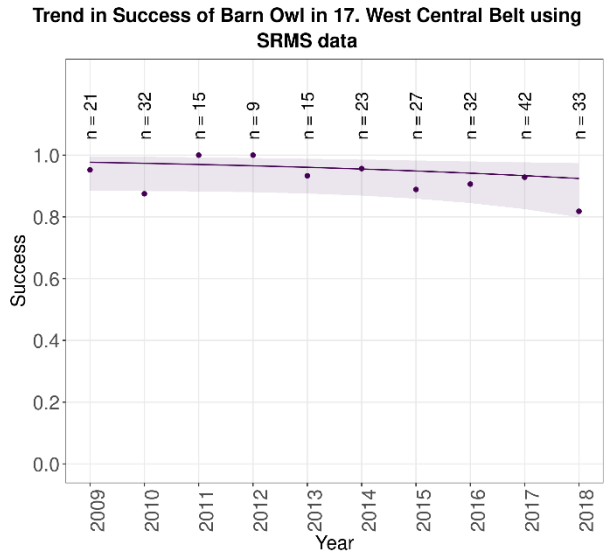
Figure 7: Trends in breeding pairs of Barn Owl by NHZ region during 2009-2018.



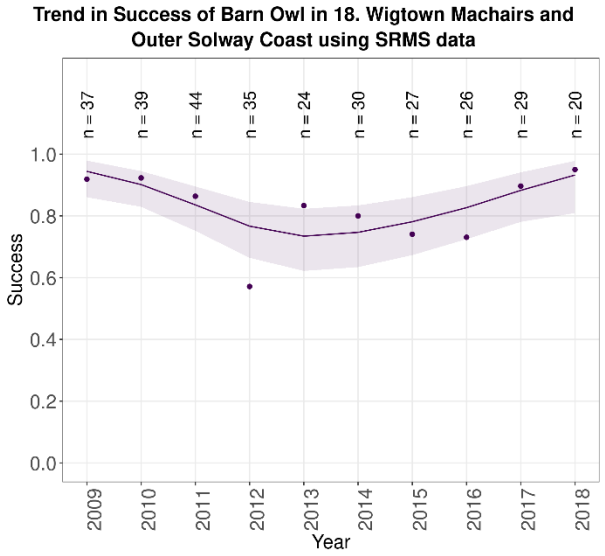
14. Argyll West and Islands trend: Not significant (caveats: Nestbox based; No home range random effect;)



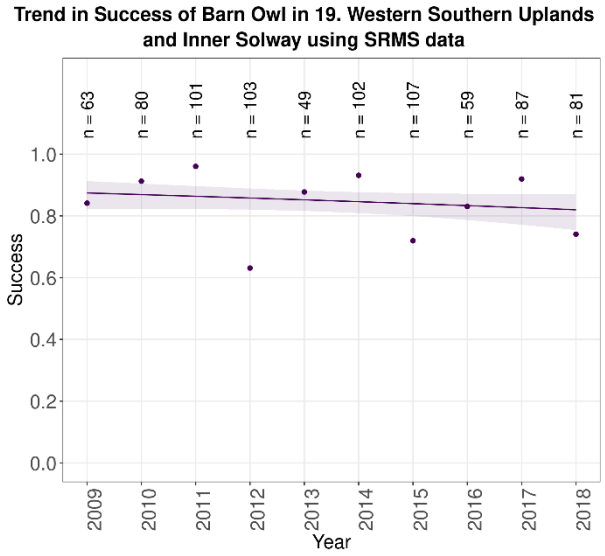
16. Eastern Lowlands trend: Decrease (caveats: Nestbox based; Variable effort;)



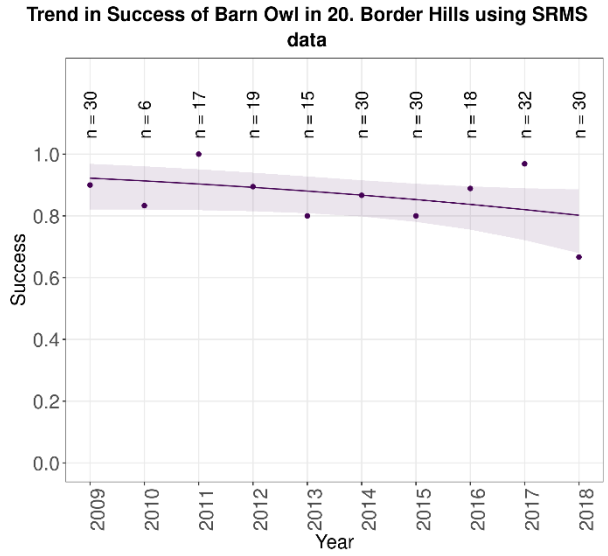
17. West Central Belt trend: Not significant (caveats: Nestbox based; Variable effort;)



18. Wigtown Machairs and Outer Solway Coast trend: Non-linear (caveats: Nestbox based;)

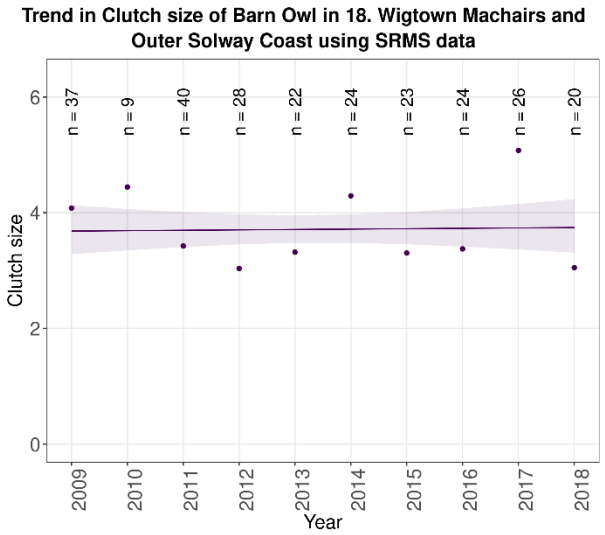


19. Western Southern Uplands and Inner Solway trend: Not significant (caveats: Nestbox based;)

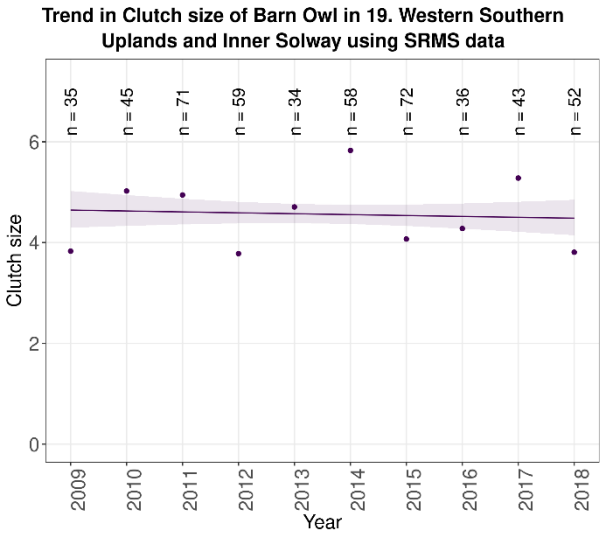


20. Border Hills trend: Not significant (caveats: Nestbox based;)

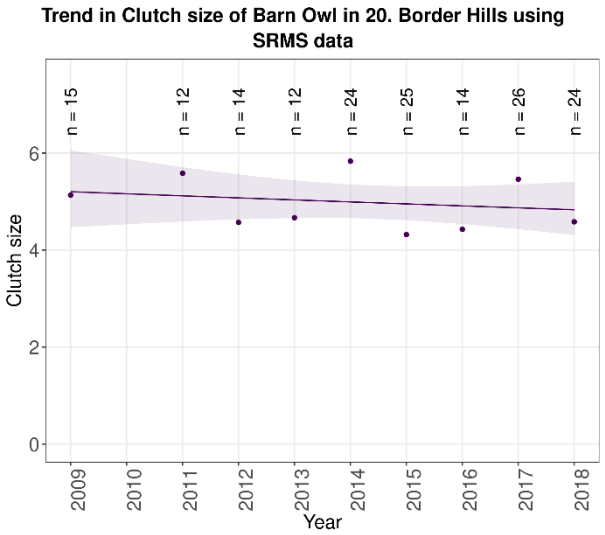
Figure 8: Trends in breeding success of Barn Owl by NHZ region during 2009-2018.



18. Wigtown Machairs and Outer Solway Coast trend: Not significant (caveats: Nestbox based; No home range random effect;)

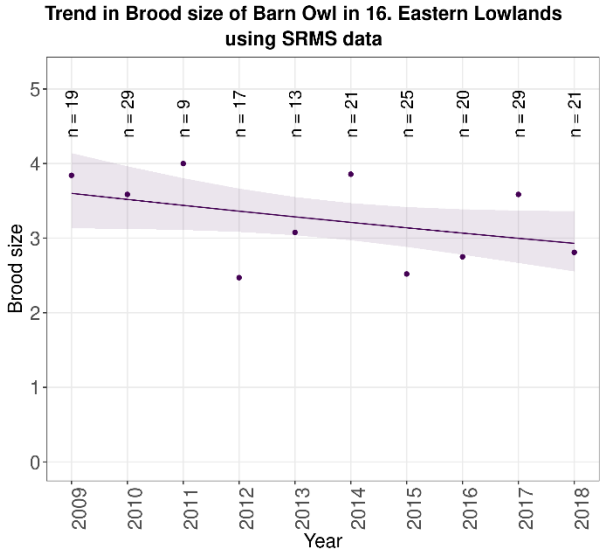


19. Western Southern Uplands and Inner Solway trend: Not significant (caveats: Nestbox based; No home range random effect;)

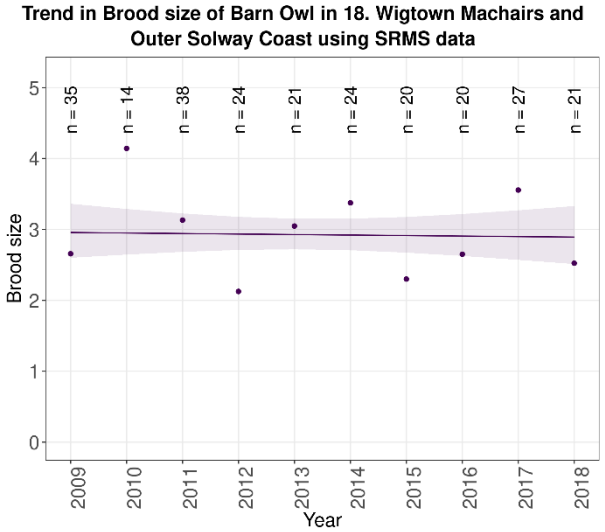


20. Border Hills trend: Not significant (caveats: Nestbox based; Sample sizes small; No home range random effect;)

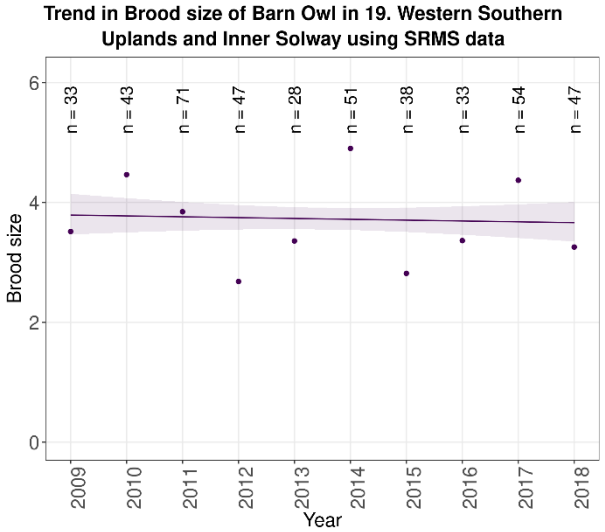
Figure 9: Trends in clutch size of Barn Owl by NHZ region during 2009-2018.



16. Eastern Lowlands trend: Not significant (caveats: Nestbox based; No home range random effect;)

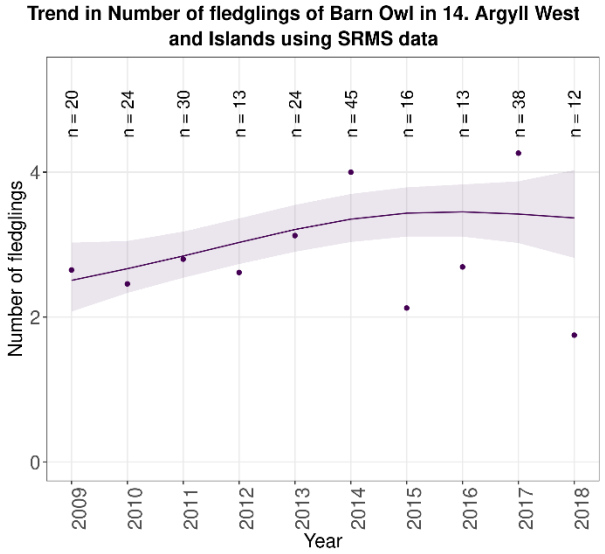


18. Wigtown Machairs and Outer Solway Coast trend: Not significant (caveats: Nestbox based; No home range random effect;)

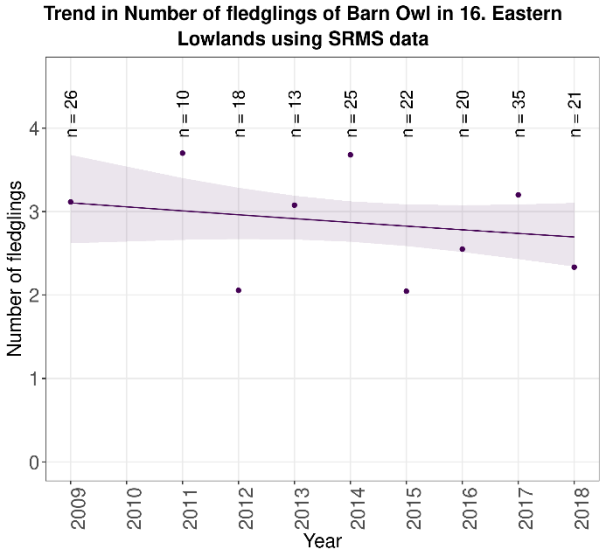


19. Western Southern Uplands and Inner Solway trend: Not significant (caveats: Nestbox based; No home range random effect;)

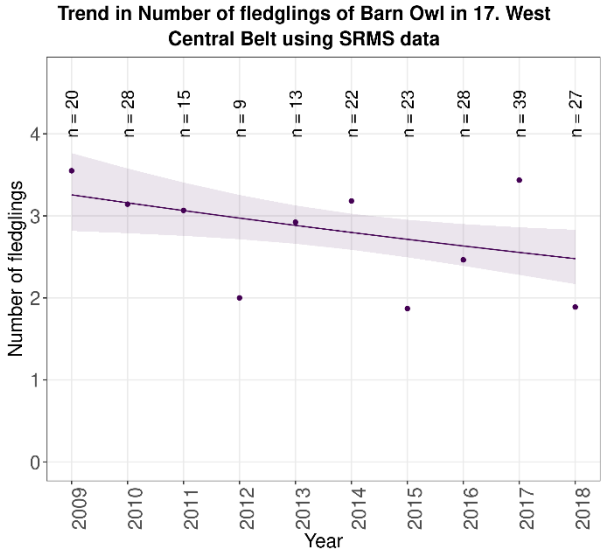
Figure 10: Trends in brood size of Barn Owl by NHZ region during 2009-2018.



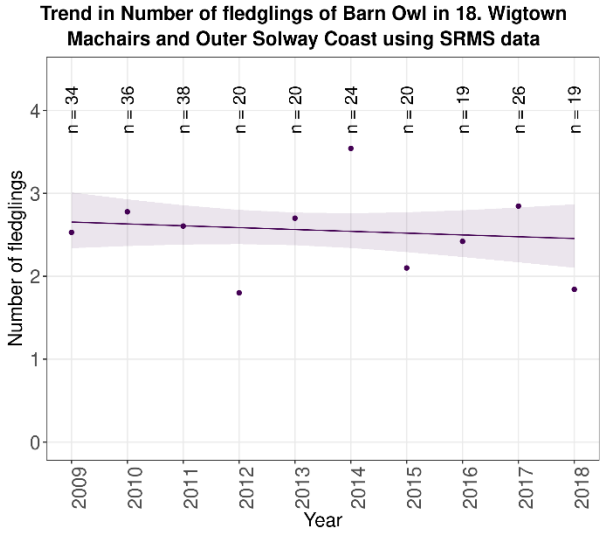
14. Argyll West and Islands trend: Increase (caveats: Nestbox based; No home range random effect;)



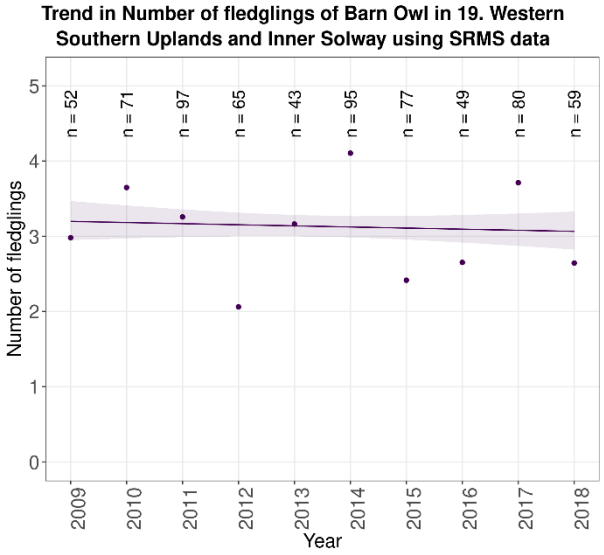
16. Eastern Lowlands trend: Not significant (caveats: Nestbox based; No home range random effect;)



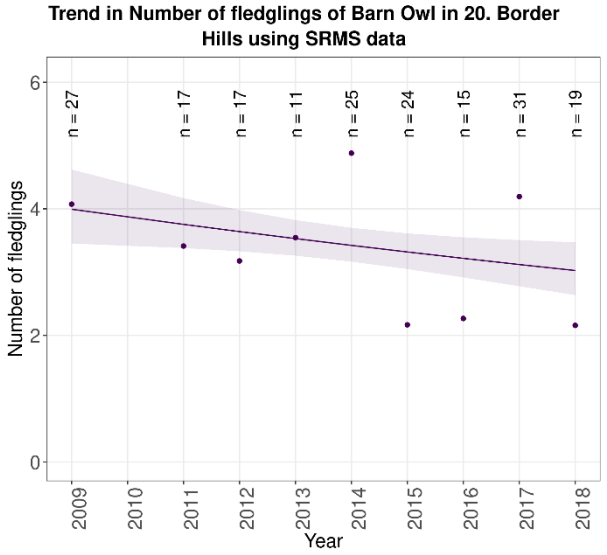
17. West Central Belt trend: Decrease (caveats: Nestbox based; No home range random effect;)



18. Wigtown Machairs and Outer Solway Coast trend: Not significant (caveats: Nestbox based; No home range random effect;)



19. Western Southern Uplands and Inner Solway trend: Not significant (caveats: Nestbox based;)



20. Border Hills trend: Decrease (caveats: Nestbox based; No home range random effect;)

Figure 11: Trends in number of fledglings of Barn Owl by NHZ region during 2009-2018.

Table 3: Details of SRMS Regional trends for Barn Owl.

Parameter	Region	First year of trend	Last year of trend	Number of years	Mean number of home ranges across years	Mean parameter value (and 95% confidence limits)	Trend during the period	Caveats	Estimated % annual change (and 95% confidence limits)
Pairs	Central	2009	2018	9	8.1	1.1 (-0.4 to 2.6)	Decrease	Sample sizes small, Nestbox based	-42.5 (-59.5 to -18.5)
	Dumfries & Galloway	2009	2018	10	29.4	15.2 (12.0 to 18.4)	Decrease	Nestbox based	-5.9 (-11.0 to -0.5)
	South Strathclyde	2009	2018	10	6.2	3.0 (2.2 to 3.8)	Not significant	Sample sizes small, Nestbox based	-1.2 (-12.8 to 11.9)
Success	Argyll	2009	2018	10	33.0	0.7 (0.7 to 0.8)	Not significant	Nestbox based	-1.2 (-2.7 to 0.2)
	Central	2009	2018	10	46.5	0.9 (0.8 to 0.9)	Decrease	Nestbox based	-0.7 (-1.1 to -0.3)
	Dumfries & Galloway	2009	2018	10	110.8	0.8 (0.8 to 0.8)	Decrease	Nestbox based	-0.8 (-1.5 to -0.2)
	Lothian & Borders	2009	2018	9	20.9	0.9 (0.8 to 0.9)	Not significant	Nestbox based	-0.2 (-1.5 to 0.8)
	South Strathclyde	2009	2018	10	20.4	1.0 (0.9 to 1.0)	Stable (<5% change)	Sample sizes small, No home range random effect; Nestbox based	-0.2 (-0.6 to 0.1)
Clutch size	Central	2009	2018	10	33.0	4.1 (3.9 to 4.2)	Not significant		-1.3 (-3.1 to 0.6)
	Dumfries & Galloway	2009	2018	10	76.6	4.3 (4.2 to 4.5)	Not significant		0.2 (-1.1 to 1.4)
Brood size	Central	2009	2018	10	37.5	3.4 (3.3 to 3.6)	Decrease		-2.4 (-4.1 to -0.6)
	Dumfries & Galloway	2009	2018	10	68.5	3.5 (3.3 to 3.6)	Not significant		0.0 (-1.4 to 1.5)
Number of fledglings	Argyll	2009	2018	10	23.6	3.1 (2.9 to 3.3)	Increase		3.5 (0.8 to 6.2)
	Central	2009	2018	10	39.4	2.9 (2.8 to 3.0)	Not significant		-1.8 (-3.7 to 0.1)
	Dumfries & Galloway	2009	2018	10	89.8	3.0 (2.9 to 3.1)	Not significant		0.0 (-1.4 to 1.3)
	Lothian & Borders	2009	2018	9	17.4	3.2 (2.9 to 3.4)	Decrease		-3.4 (-6.1 to -0.6)
	South Strathclyde	2009	2018	10	19.8	2.9 (2.7 to 3.0)	Not significant	Sample sizes small	-1.4 (-4.2 to 1.5)

Table 4: Details of NHZ Regional trends for Barn Owl.

Parameter	Region	First year of trend	Last year of trend	Number of years	Mean number of home ranges across years	Mean parameter value (and 95% confidence limits)	Trend during the period	Caveats	Estimated % annual change (and 95% confidence limits)
Pairs	16. Eastern Lowlands	2009	2018	9	8.1111	1.1 (-0.4 to 2.6)	Decrease	Sample sizes small	-42.5 (-59.5 to -18.5)
	18. Wigtown Machairs and Outer Solway Coast	2009	2018	10	29.4	15.2 (12.0 to 18.4)	Decrease		-5.9 (-11.0 to -0.5)
Success	14. Argyll West and Islands	2009	2018	10	32.8	0.7 (0.7 to 0.8)	Not significant	Nestbox based; No home range random effect;	-1.1 (-2.6 to 0.3)
	16. Eastern Lowlands	2009	2018	10	26.6	0.9 (0.8 to 0.9)	Decrease	Nestbox based; Variable effort;	-0.5 (-0.9 to -0.2)
	17. West Central Belt	2009	2018	10	24.9	0.9 (0.9 to 0.9)	Not significant	Nestbox based; Variable effort;	-0.3 (-0.7 to 0.1)
	18. Wigtown Machairs and Outer Solway Coast	2009	2018	10	31.1	0.8 (0.8 to 0.9)	Non-linear	Nestbox based;	Non-linear
	19. Western Southern Uplands and Inner Solway	2009	2018	10	83.2	0.8 (0.8 to 0.9)	Not significant	Nestbox based;	-0.5 (-1.3 to 0.2)
Success	20. Border Hills	2009	2018	10	22.7	0.9 (0.8 to 0.9)	Not significant	Nestbox based;	-0.8 (-1.9 to 0.1)
Clutch size	18. Wigtown Machairs and Outer Solway Coast	2009	2018	10	25.3	3.7 (3.5 to 3.9)	Not significant	Nestbox based; No home range random effect;	0.2 (-2.0 to 2.4)
	19. Western Southern Uplands and Inner Solway	2009	2018	10	50.5	4.6 (4.4 to 4.7)	Not significant	Nestbox based; No home range random effect;	-0.4 (-1.9 to 1.1)
	20. Border Hills	2009	2018	9	18.444	5.0 (4.8 to 5.2)	Not significant	Nestbox based; Sample sizes small; No home range random effect;	-0.8 (-3.3 to 1.7)
Brood size	16. Eastern Lowlands	2009	2018	10	20.3	3.2 (3.1 to 3.4)	Not significant	Nestbox based; No home range random effect;	-2.3 (-4.7 to 0.3)

Parameter	Region	First year of trend	Last year of trend	Number of years	Mean number of home ranges across years	Mean parameter value (and 95% confidence limits)	Trend during the period	Caveats	Estimated % annual change (and 95% confidence limits)
	18. Wigtown Machairs and Outer Solway Coast	2009	2018	10	24.4	2.9 (2.8 to 3.1)	Not significant	Nestbox based; No home range random effect;	-0.2 (-2.7 to 2.3)
Brood size	19. Western Southern Uplands and Inner Solway	2009	2018	10	44.5	3.7 (3.6 to 3.9)	Not significant	Nestbox based; No home range random effect;	-0.4 (-2.0 to 1.3)
Number of fledglings	14. Argyll West and Islands	2009	2018	10	23.5	3.1 (2.9 to 3.3)	Increase	Nestbox based; No home range random effect;	3.6 (0.8 to 6.3)
	16. Eastern Lowlands	2009	2018	10	21.111	2.9 (2.7 to 3.0)	Not significant	Nestbox based; No home range random effect;	-1.6 (-4.4 to 1.3)
	17. West Central Belt	2009	2018	10	22.4	2.8 (2.6 to 3.0)	Decrease	Nestbox based; No home range random effect;	-3.0 (-5.4 to -0.5)
	18. Wigtown Machairs and Outer Solway Coast	2009	2018	10	25.6	2.6 (2.4 to 2.7)	Not significant	Nestbox based; No home range random effect;	-0.9 (-3.4 to 1.8)
	19. Western Southern Uplands and Inner Solway	2009	2018	10	68.8	3.1 (3.0 to 3.2)	Not significant	Nestbox based;	-0.5 (-2.0 to 1.1)
Number of fledglings	20. Border Hills	2009	2018	9	20.667	3.4 (3.2 to 3.7)	Decrease	Nestbox based; No home range random effect;	-3.0 (-5.6 to -0.5)

Table 5: Number of Barn Owl home range checks for occupancy reported to the SRMS during 2009-2018, in each of the 12 SRMS Regions, with approximate proportion of estimated population monitored. At the bottom of the table, row A is the mean number of home range checks over the most recent five years. Row B gives the estimated proportion of the national population in each region, based on Bird Atlas Timed Tetrad Visit (TTV) data. The depth of red shading indicates the relative importance of each region for this species. If survey effort was spread evenly across the whole population, the ratio of A:B would not vary much between regions.

Year	ARGYLL	CENTRAL SCOTLAND	DUMFRIES & GALLOWAY	HIGHLAND	LEWIS & HARRIS	LOTHIAN & BORDERS	NORTH EAST SCOTLAND	ORKNEY	SHETLAND	SOUTH STRATHCLYDE	TAYSIDE & FIFE	UIST	Total
2009	46	50	236	36		136	36			90	22		652
2010	62	81	231	11		0	0			66	11		462
2011	78	31	277	10		53	1			76	4		530
2012	75	127	254	15		146	25			53	6		701
2013	78	145	249	11		54	22			54	4		617
2014	78	86	310	23		55	25			70	12		659
2015	81	160	279	27		48	24			59	19		697
2016	98	156	303	24		72	24			63	16		756
2017	118	177	273	29		74	1			59	21		752
2018	127	176	248	59		81	0			42	21		754
A: Mean home range checks	**100.4**	**151.0**	**282.6**	**32.4**	**Absent**	**66.0**	**14.8**	**Absent**	**Absent**	**58.6**	**17.8**	**Absent**	**723.6**
B: Proportion of estimated Scottish population	13	1	28	26	0	8	10	0	0	14	2	0	100

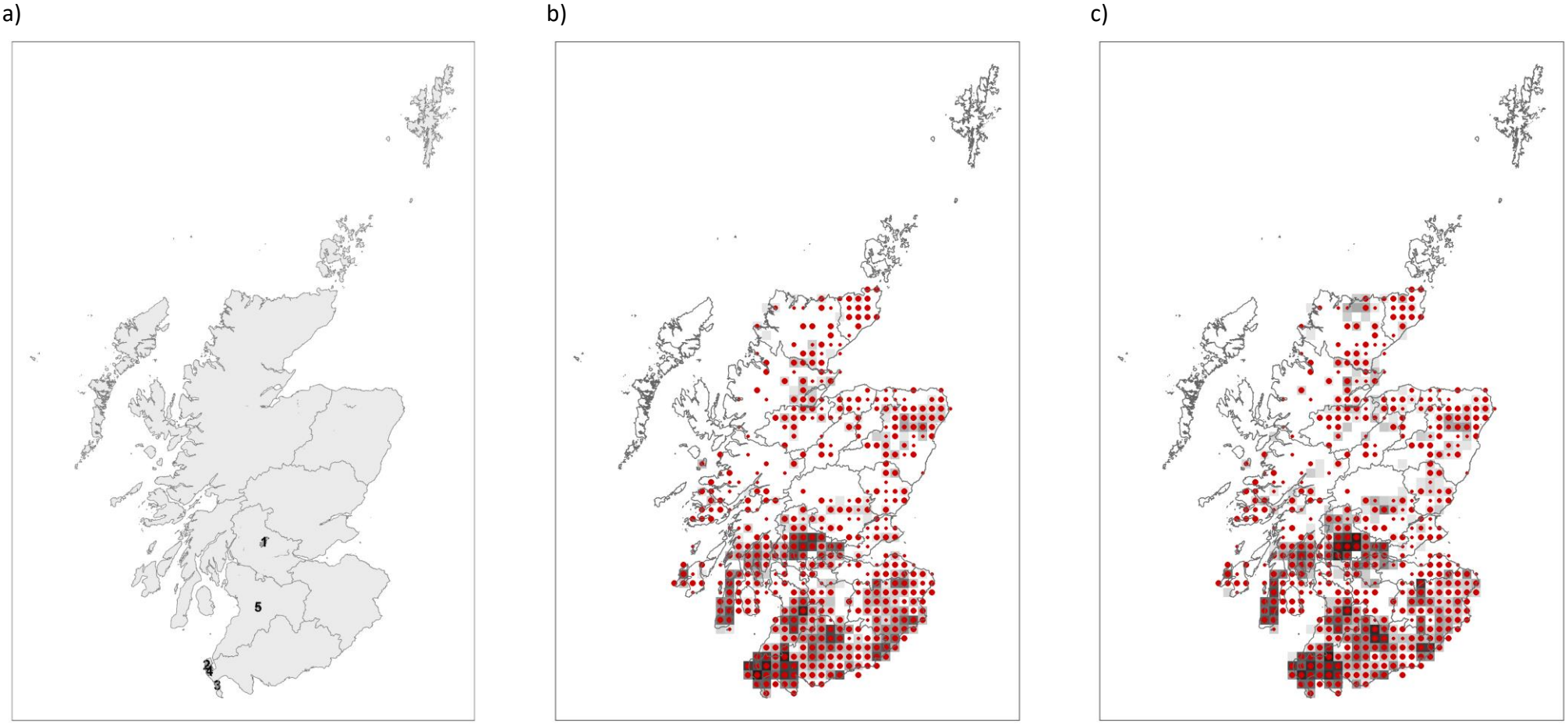


Figure 12: Areas corresponding to the clusters of home ranges from which sufficient data were reported to attempt to derive population trends for Barn Owl between 2009 and 2018 (a) together with maps showing variation in the number of Barn Owl records reported to SRMS during 2009-2013 (b) and 2014-2018 (c), in the context of the known Barn Owl breeding distribution taken from the 2007-2011 Bird Atlas. SRMS data are depicted as grey squares with darker shading indicating more records while Bird Atlas data are depicted as red dots with the size of dot positively related to probability of breeding.