

Tawny Owl



Figure 1: Tawny Owl in a hollow tree in 2020 (Photo: Keith Brockie, Tayside & Fife RSG).

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

Our latest analysis of SRMS Tawny Owl data for the period 2009-2018 produced no national trends in breeding number or productivity. Trends were produced for four of the eight SRMS regions (Table 1) and for two of the 16 NHZ regions (Table 2) for which the SRMS holds Tawny Owl records.

Users of the published trends should be aware that suitable records for production of trends in breeding numbers are limited to a single nest box study in Highland (Figure 12). This sample, and the area it is drawn from, are too small to be able to generalise from these data to the rest of Scotland. Nearly all monitored pairs are nest box-based. Productivity records are drawn from a reasonably wide spread of areas, but much of the Scottish range is unrepresented (e.g. there are almost no data from eastern areas, the southwest, and most of

Highland). Consultation with data contributors has highlighted that the apparent decline of Tawny Owl in L&B, though probably real, could be contributed to by a decrease in monitoring effort.

National trends

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

SRMS regional trends

Breeding numbers of Tawny Owl did not change significantly in Dumfries & Galloway or Highland (Table 1, Figure 2).

Breeding success of Tawny Owl increased in Central and Lothian & Borders and showed no significant change in Dumfries & Galloway and Highland (Table 1, Figure 3).

Clutch size, brood size and number of fledglings of Tawny Owl did not change significantly in Highland (Table 1, Figures 4-5).

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

NHZ regional trends

Breeding numbers of Tawny Owl in NHZ 21 did not change significantly (Table 2, Figure 6).

Breeding success of Tawny Owl did not change significantly in NHZ 21 and showed non-linear variation in NHZ 20 (Table 2, Figure 7).

Clutch size, brood size and number of fledglings did not change significantly in either NHZ 20 or NHZ 21 (Table 2, Figures 8-10).

Trends for this species are not yet available for NHZs 04-07, 09-12 and 14-19.

Details of contributing records

2,635 (121 to 415 per year, mean: 264 records) from 2009-2018 contributed to this trends analysis (Table 5).

Table 1: Summary of SRMS regional trends for Tawny Owl during 2009-2018. Figures in parentheses indicate the annual change, with significant increases highlighted in green 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	—	—	—	—	—
Central	—	Increase ⁿ (5.3%)	—	—	—
Dumfries & Galloway	Not significant	Not significant ^{ns}	Not significant	—	—
Highland	Not significant ^{ns}	Not significant ⁿ	Not significant	Not significant ^s	Not significant ^s
Lewis & Harris	Absent	Absent	Absent	Absent	Absent
Lothian & Borders	—	Increase ^{ns} (6.2%)	Not significant	—	—
North East Scotland	—	—	—	—	—
Orkney	Absent	Absent	Absent	Absent	Absent
Shetland	Absent	Absent	Absent	Absent	Absent
South Strathclyde	—	—	—	—	—
Tayside & Fife	—	—	—	—	—
Uist	Absent	Absent	Absent	Absent	Absent

ⁿ Nestbox based, ^s Sample sizes small.

Table 2: Summary of NHZ regional trends for Tawny Owl during 2009-2018. 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	—	—	—	—	—
15. Loch Lomond, The Trossachs and Breadalbane	—	—	—	—	—
16. Eastern Lowlands	—	—	—	—	—
17. West Central Belt	—	—	—	—	—
18. Wigtown Machairs and Outer Solway Coast	—	—	—	—	—
19. Western Southern Uplands and Inner Solway	—	—	—	—	—
20. Border Hills	—	Non-linear	Not significant ^{nrs}	Not significant ^{nrs}	Not significant ^{ns}
21. Moray Firth	Not significant	Not significant ⁿ	Not significant ^{nrs}	Not significant ^{nrs}	Not significant ^{ns}

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

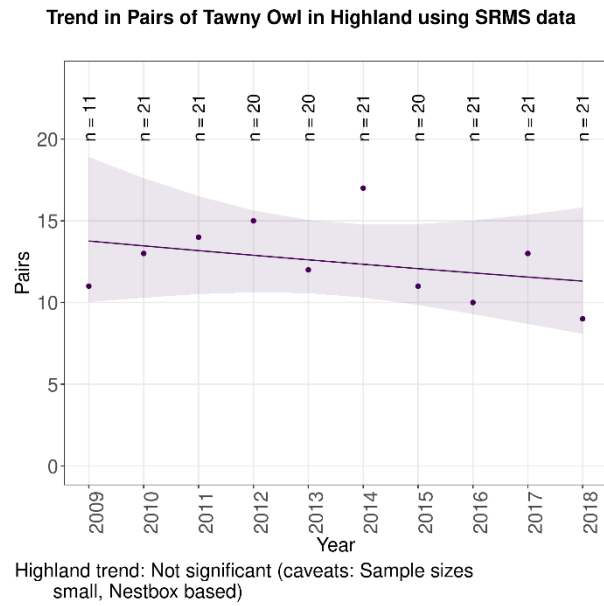
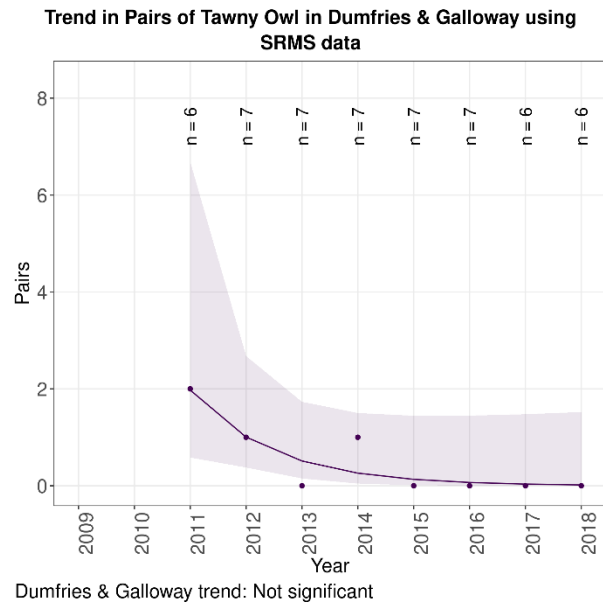


Figure 2: Trends in numbers of breeding pairs of Tawny Owl by SRMS region during 2009-2018.

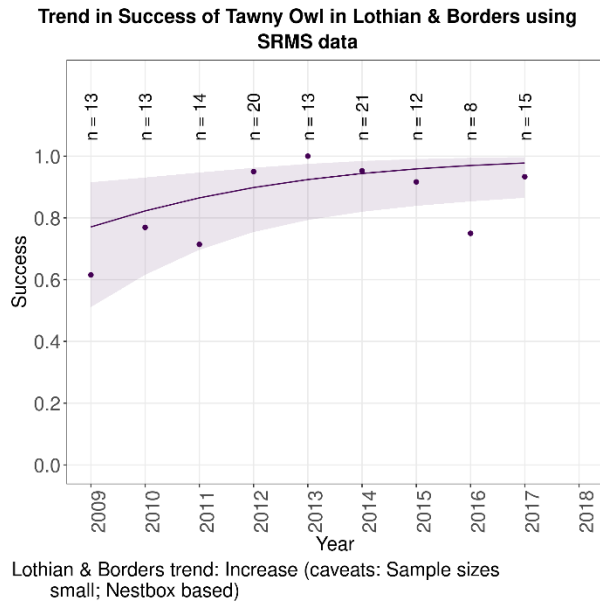
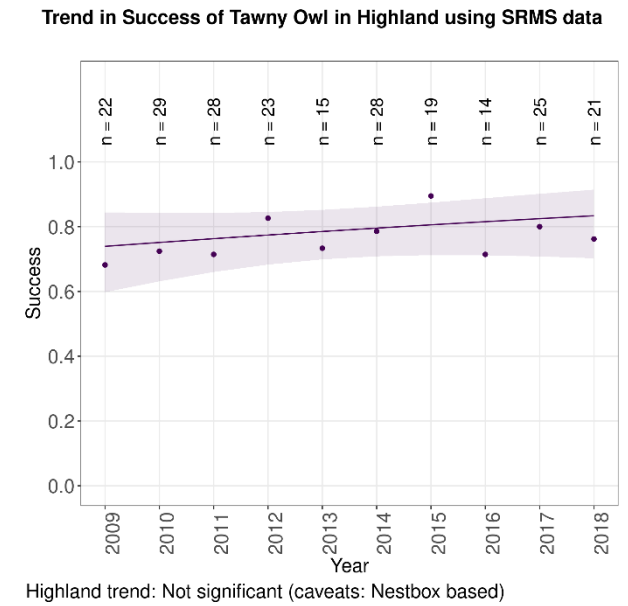
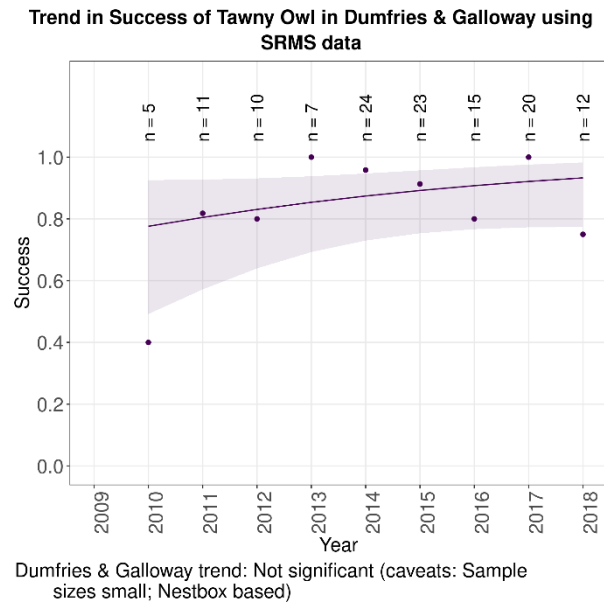
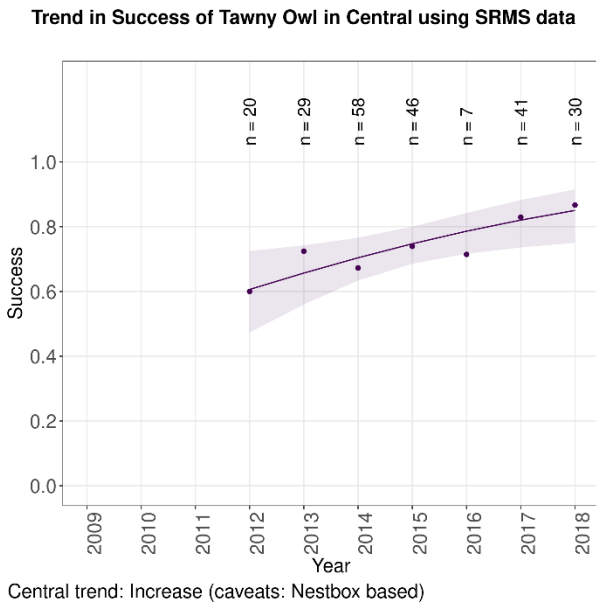


Figure 3: Trends in breeding success of Tawny Owl by SRMS region during 2009-2018.

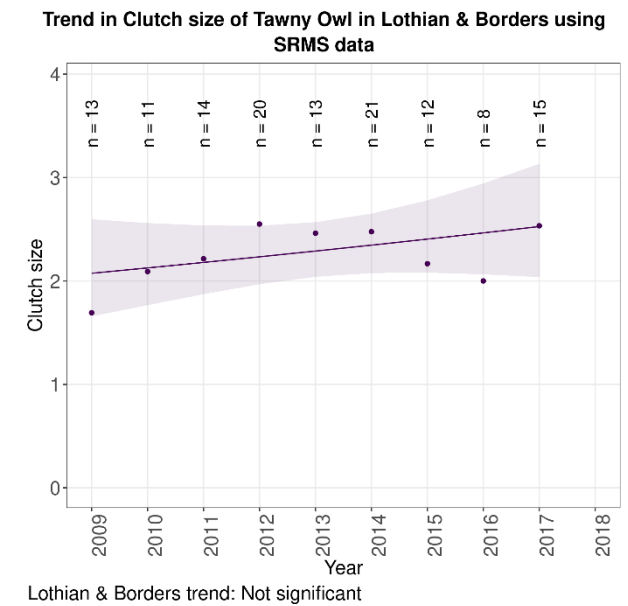
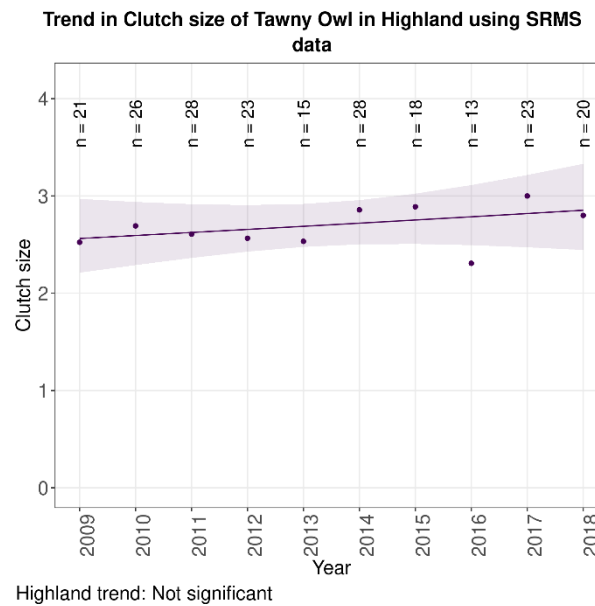
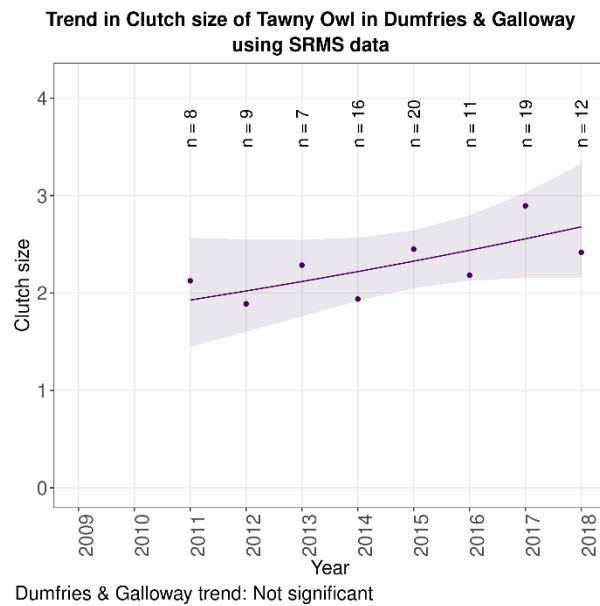


Figure 4: Trends in clutch size of Tawny Owl by SRMS region during 2009-2018.

Trend in Brood size of Tawny Owl in Highland using SRMS data

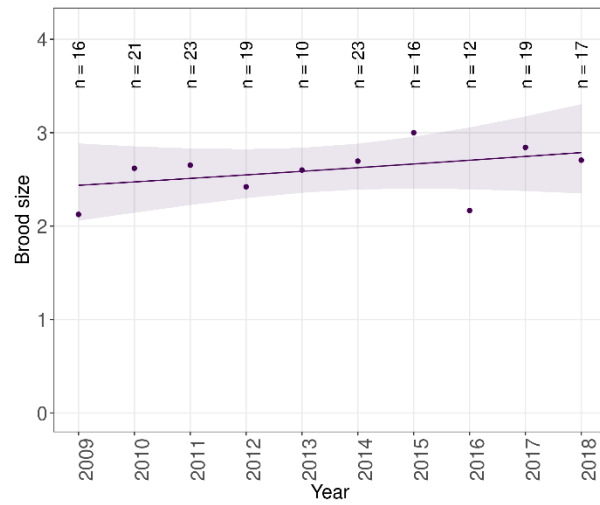
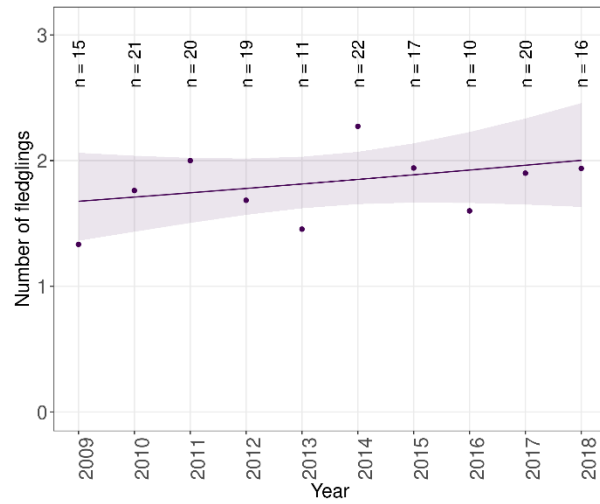


Figure 5: Trends in brood size of Tawny Owl by SRMS region during 2009-2018.

Trend in Number of fledglings of Tawny Owl in Highland using SRMS data



Highland trend: Not significant (caveats: Sample sizes small)

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

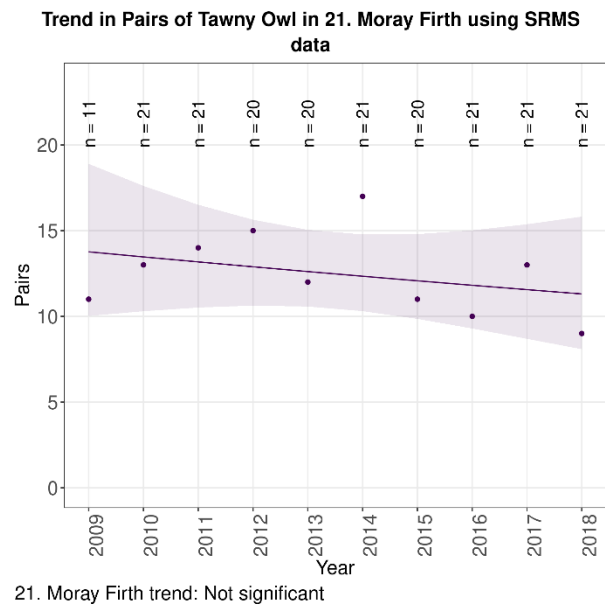
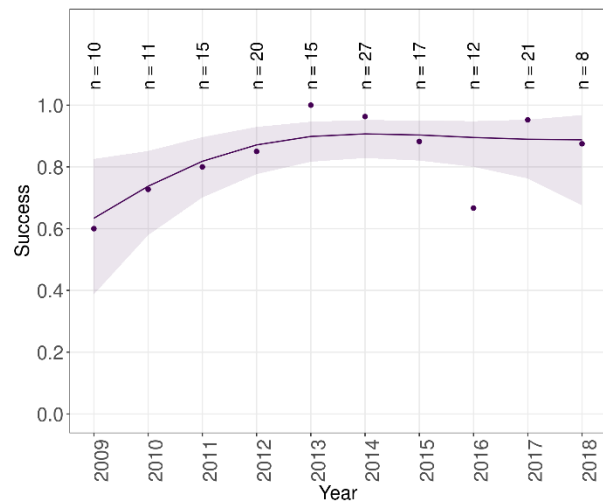


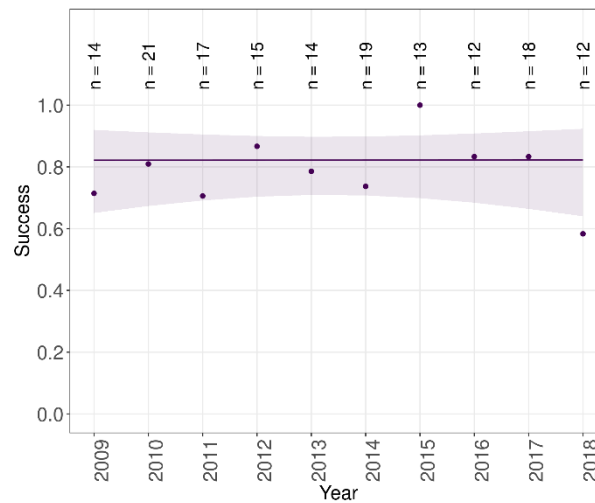
Figure 7: Trends in breeding pairs of Tawny Owl by NHZ region during 2009-2018.

Trend in Success of Tawny Owl in 20. Border Hills using SRMS data



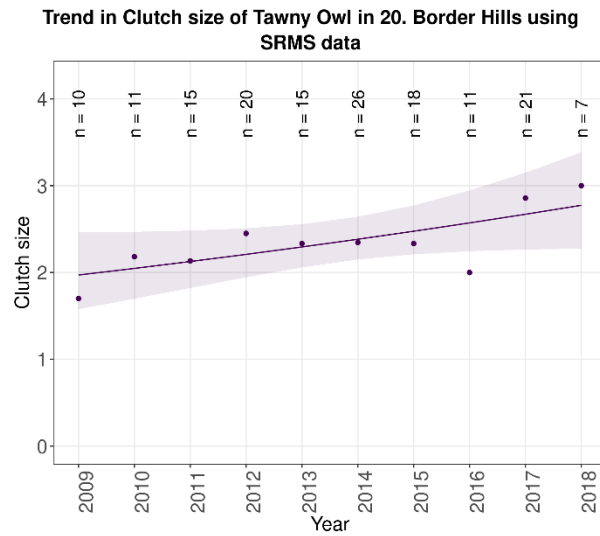
20. Border Hills trend: Non-linear (caveats: Sample-size small; Nestbox based;)

Trend in Success of Tawny Owl in 21. Moray Firth using SRMS data

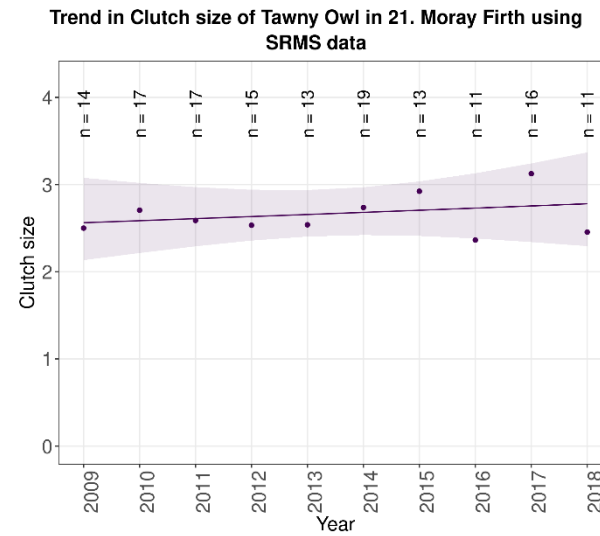


21. Moray Firth trend: Not significant (caveats: Sample-size small; Nestbox based;)

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

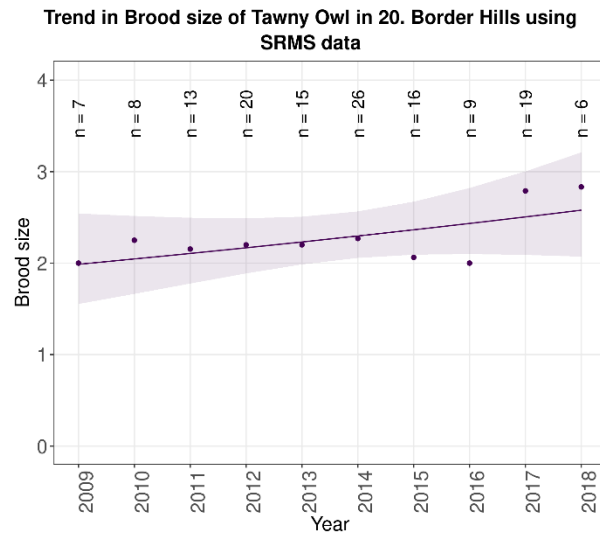


20. Border Hills trend: Not significant (caveats: Nestbox based; Sample sizes small; No home range random effect;)

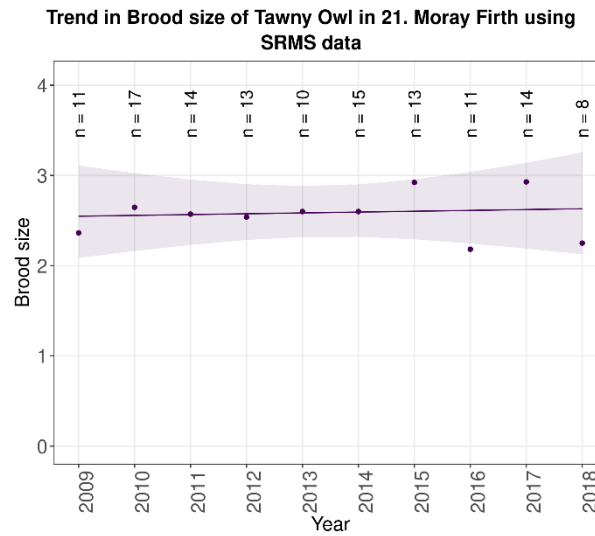


21. Moray Firth trend: Not significant (caveats: Nestbox based; Sample sizes small; No home range random effect;)

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

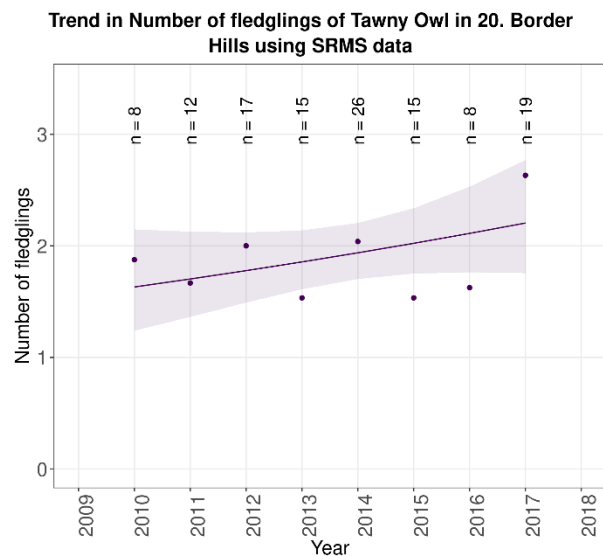


20. Border Hills trend: Not significant (caveats: Nestbox based; Sample sizes small; No home range random effect;)

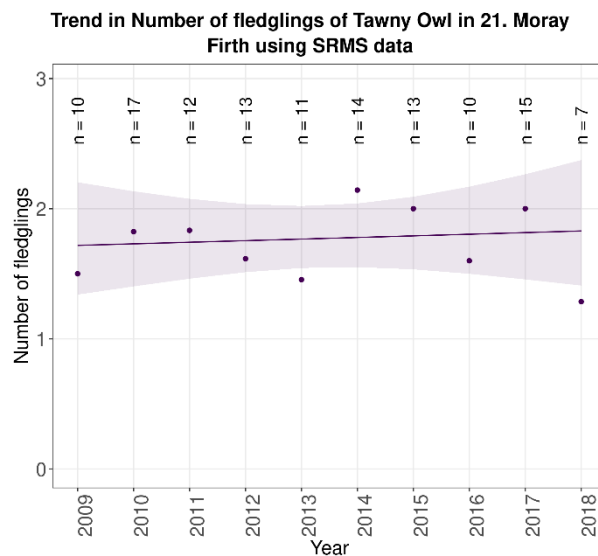


21. Moray Firth trend: Not significant (caveats: Nestbox based; Sample sizes small; No home range random effect;)

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



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



21. Moray Firth trend: Not significant (caveats: Nestbox based; Sample sizes small)

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

Table 3: Details of SRMS Regional trends for Tawny 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	Dumfries & Galloway	2011	2018	8	6.6	0.5 (-0.1 to 1.1)	Not significant		-49.1 (-75.4 to 5.2)
	Highland	2009	2018	10	19.7	12.5 (10.8 to 14.2)	Not significant	Sample sizes small, Nestbox based	-2.2 (-8.0 to 4.0)
Success	Central	2012	2018	7	33.0	0.7 (0.7 to 0.8)	Increase	Nestbox based	5.3 (1.2 to 9.2)
	Dumfries & Galloway	2010	2018	9	14.1	0.9 (0.8 to 0.9)	Not significant	Sample sizes small; Nestbox based	3.2 (-1.2 to 7.0)
	Highland	2009	2018	10	22.4	0.8 (0.7 to 0.8)	Not significant	Nestbox based	1.2 (-1.1 to 3.5)
	Lothian & Borders	2009	2017	9	14.3	0.9 (0.8 to 0.9)	Increase	Sample sizes small; Nestbox based	6.2 (1.0 to 10.7)
Clutch size	Dumfries & Galloway	2011	2018	8	12.8	2.3 (2.2 to 2.5)	Not significant		4.8 (-1.5 to 11.5)
	Highland	2009	2018	10	21.5	2.7 (2.6 to 2.8)	Not significant		1.2 (-1.6 to 4.1)
	Lothian & Borders	2009	2017	9	14.1	2.3 (2.2 to 2.4)	Not significant		2.5 (-2.2 to 7.4)
Brood size	Highland	2009	2018	10	17.6	2.6 (2.5 to 2.7)	Not significant	Sample sizes small	1.5 (-1.7 to 4.8)
Number of fledglings	Highland	2009	2018	10	17.1	1.8 (1.7 to 1.9)	Not significant	Sample sizes small	2.0 (-1.9 to 6.0)

Table 4: Details of NHZ Regional trends for Tawny 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	21. Moray Firth	2009	2018	10	19.7	12.5 (10.8 to 14.2)	Not significant		-2.2 (-8.0 to 4.0)
Success	20. Border Hills	2009	2018	10	15.6	0.9 (0.8 to 0.9)	Non-linear	Sample-size small; Nestbox based;	Non-linear
	21. Moray Firth	2009	2018	10	15.5	0.8 (0.7 to 0.8)	Not significant	Sample-size small; Nestbox based;	0.0 (-2.3 to 2.1)
Clutch size	20. Border Hills	2009	2018	10	15.4	2.4 (2.2 to 2.5)	Not significant	Nestbox based; Sample sizes small; No home range random effect;	3.9 (-0.3 to 8.2)
	21. Moray Firth	2009	2018	10	14.6	2.7 (2.5 to 2.8)	Not significant	Nestbox based; Sample sizes small; No home range random effect;	0.9 (-2.6 to 4.5)
Brood size	20. Border Hills	2009	2018	10	13.9	2.3 (2.2 to 2.4)	Not significant	Nestbox based; Sample sizes small; No home range random effect;	2.9 (-1.6 to 7.7)
	21. Moray Firth	2009	2018	10	12.6	2.6 (2.4 to 2.7)	Not significant	Nestbox based; Sample sizes small; No home range random effect;	0.4 (-3.5 to 4.3)
Number of fledglings	20. Border Hills	2010	2017	8	15	1.9 (1.8 to 2.1)	Not significant	Nestbox based; Sample sizes small	4.4 (-1.8 to 11.0)
	21. Moray Firth	2009	2018	10	12.2	1.8 (1.6 to 1.9)	Not significant	Nestbox based; Sample sizes small	0.7 (-4.0 to 5.7)

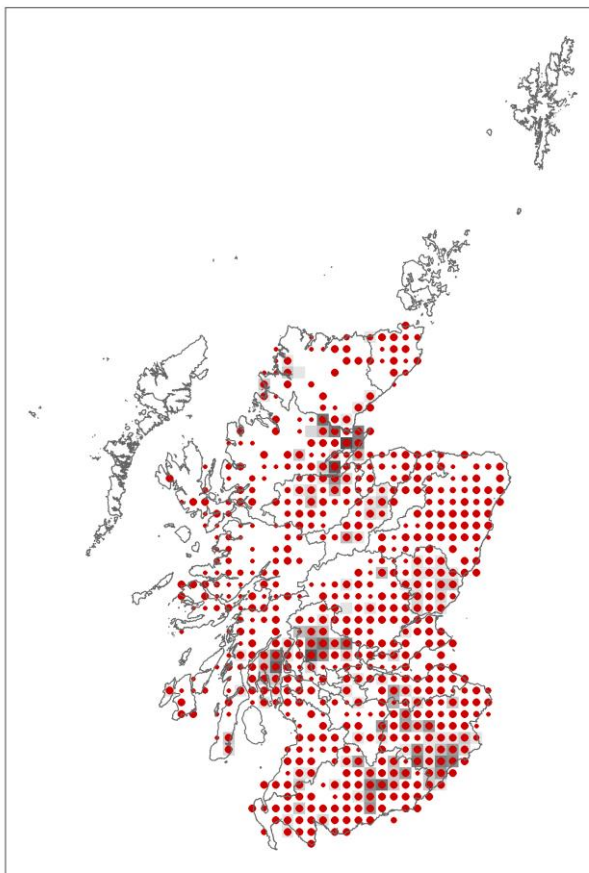
Table 5: Number of Tawny Owl home range checks for occupancy reported to the SRMS during 2009-2018, in each of the 12 SRMS Regions, with approximate proportion of estimated population monitored. At the bottom of the table, row A is the mean number of home range checks over the most recent five years. 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.

		ARGYLL	CENTRAL SCOTLAND	DUMFRIES & GALLOWAY	HIGHLAND	LEWIS & HARRIS	LOTHIAN & BORDERS	NORTH EAST SCOTLAND	ORKNEY	SHETLAND	SOUTH STRATHCLYDE	TAYSIDE & FIFE	UIST	Total
Year														
2009		34	0	0	45		26	0			2	14		121
2010		0	3	8	73		28	0			3	19		134
2011		44	0	34	72		45	0			2	31		228
2012		3	66	37	41		71	0			0	16		234
2013		3	84	38	38		43	0			0	13		219
2014		9	110	59	40		50	0			1	21		290
2015		61	111	56	45		26	0			1	18		318
2016		61	113	58	43		19	2			4	14		314
2017		91	121	62	50		60	1			1	29		415
2018		71	100	63	52		55	0			1	20		362
A: Mean home range checks		58.6	111.0	59.6	46.0	Absent	42.0	0.6	Absent	Absent	1.6	20.4	Absent	339.8
B: Proportion of estimated Scottish population		13	4	13	24	0	11	19	0	0	6	10	0	100

a)



b)



c)

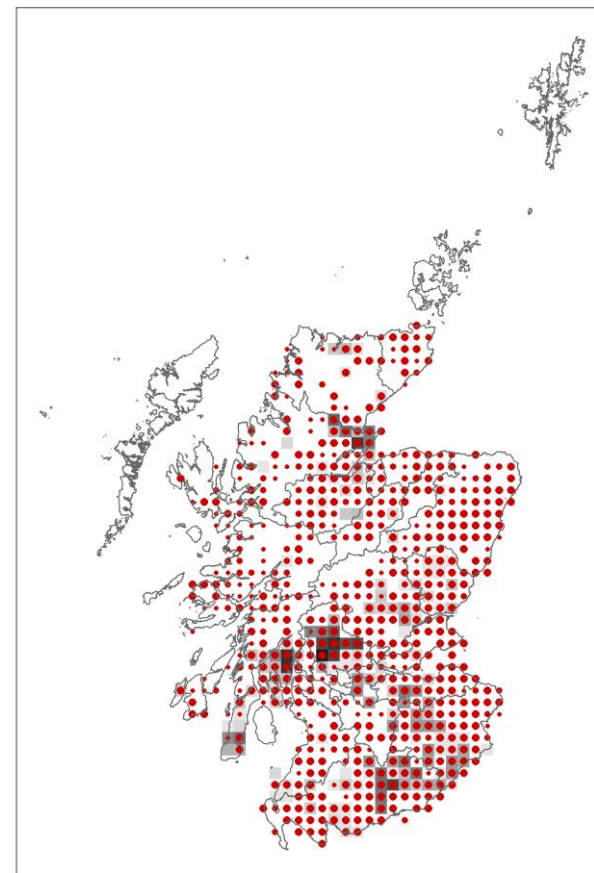


Figure 12: Areas corresponding to the clusters of home ranges from which sufficient data were reported to attempt to derive population trends for Tawny Owl between 2009 and 2018 (a) together with maps showing variation in the number of Tawny Owl records reported to SRMS during 2009-2013 (b) and 2014-2018 (c), in the context of the known Tawny 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.