Red Kite

Figure 1: Red Kite chick in Perthshire in 2019 (Photo: Chris Baker, Tayside & Fife RSG).

Red Kite is monitored widely across Scotland by SRMS data contributors.

Red Kite has also been subject to national survey via The Statutory Conservation Agency/RSPB Annual Breeding Bird Scheme (SCARABBS) programme. There has been just one survey in 2000 (Wotton *et al*. 2000) and this estimated a population of 40 pairs 'in Scotland', although numbers have increased considerably since, aided by the release of birds elsewhere in Scotland (North Scotland, Dumfries & Galloway, Central Scotland and Aberdeen). Red Kite is no longer on the SCARABBS list due to huge increases in England and Wales.

Our latest analysis of SRMS Red Kite data for the period 2009-2018 has produced no national trends in breeding number or productivity, but has produced trends for five of the eight SRMS regions (Table 1) and for six of the 13 NHZ regions (Table 2).

Users of the published trends should be aware that Red Kite received comprehensive monitoring up to the last few years of the trend period, when survey effort in many areas decreased. The continued expansion of Scottish populations probably means little or no monitoring is ongoing in some areas where the population is growing rapidly. Productivity information is drawn from the majority of the Scottish breeding population, but productivity parameters for unmonitored birds (being on the frontiers of an expanding range) may differ systematically from those of most monitored pairs. Consultation with data contributors has shown that variation in trends between different areas coupled with limited available monitoring effort could lead to a misleading regional trend (e.g.

there are variable population trajectories and monitoring coverage/effort for Red Kites within Angus).

National trends

No trends in breeding numbers or breeding productivity are available for Red Kite at a national level.

SRMS regional trends

Breeding numbers of Red Kite in Highland decreased, while those in Dumfries & Galloway increased. Breeding numbers in Tayside & Fife showed non-linear variation, while those in Central and North East Scotland did not change significantly (Table 1, Figure 2).

Breeding success of Red Kite did not change significantly in Central, Dumfries & Galloway, Highland, North East Scotland and Tayside & Fife (Table 1, Figure 3).

Clutch size, brood size and number of fledglings did not change significantly for North East Scotland (Table 1, Figures 4-6). Number of fledglings decreased in Dumfries & Galloway but did not change significantly in Central, Highland and Tayside & Fife (Table 1, Figure 6).

Trends are not yet available for Lothian & Borders or South Strathclyde.

NHZ regional trends

Breeding numbers of Red Kite increased in NHZ 19, but did not change significantly in NHZs 07, 09, 15 and 16 (Table 2, Figure 7).

Breeding success of Red Kite did not change significantly in NHZs 09, 15, 16, 19 or 21) for which trends could be produced (Table 2, Figure 8).

No trends in clutch size or brood size are available for any region (Table 2). Number of fledglings decreased in NHZ 19 and did not change significantly in the remaining three regions (NHZs 15, 16 and 21) (Table 2, Figure 9).

Trends are not yet available for NHZs 05, 10-12, 17-18 and 20.

Details of contributing records

3,044 (232 to 390 per year, mean: 304 records) from 2009-2018 contributed to this trends analysis (Table 5).

References

S.R. Wotton, I. Carter, A.V. Cross, B. Etheridge, N. Snell, K. Duffy, R. Thorpe & R.D. Gregory (2002) Breeding status of the Red Kite *Milvus milvus* in Britain in 2000, Bird Study, 49:3, 278-286, DOI: 10.1080/00063650209461276

Table 1: Summary of SRMS regional trends for Red Kite 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.

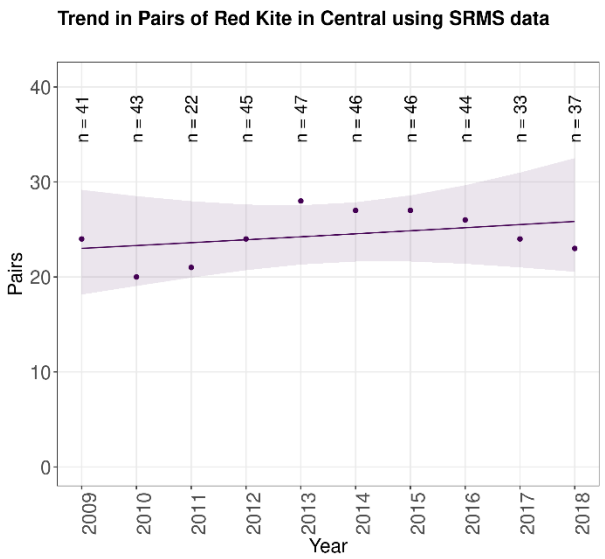
SRMS Region	Pairs	Success	Clutch size	Brood size	Number of fledglings
Argyll	No SRMS data	No SRMS data	No SRMS data	No SRMS data	No SRMS data
Central	Not significant [x]	Not significant [x]	—	—	Not significant [s]
Dumfries & Galloway	**Increase [x] (4%)**	Not significant [x]	—	—	**Decrease (-5.4%)**
Highland	**Decrease (-10.8%)**	Not significant [x]	—	—	Not significant
Lewis & Harris	Absent	Absent	Absent	Absent	Absent
Lothian & Borders	—	—	—	—	—
North East Scotland	Not significant [sx]	Not significant [sx]	Not significant [s]	Not significant [s]	Not significant [s]
Orkney	Absent	Absent	Absent	Absent	Absent
Shetland	Absent	Absent	Absent	Absent	Absent
South Strathclyde	—	—	—	—	—
Tayside & Fife	Non-linear	Not significant [x]	—	—	Not significant
Uist	Absent	Absent	Absent	Absent	Absent

[s] Sample sizes small, [x] Expanding population.

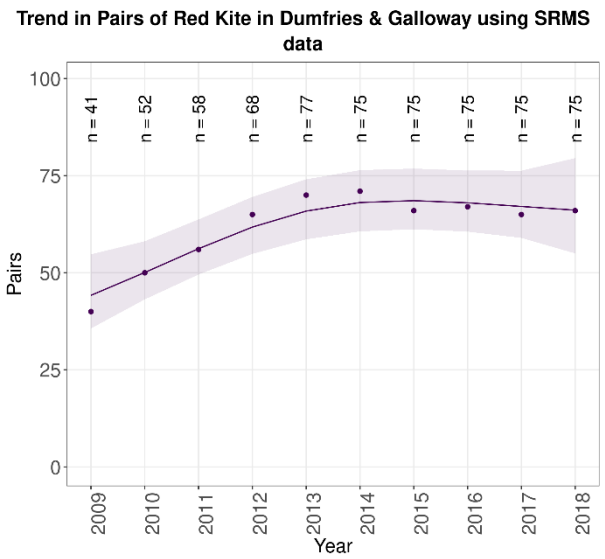
Table 2: Summary of NHZ regional trends for Red Kite during 2009-2018. Figures in parentheses indicate the annual change, with significant increases highlighted in green, significant decreases highlighted in blue and non-significant changes highlighted in grey. '—' indicates where the species occurs 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.

NHZ Region	Pairs	Success	Clutch size	Brood size	Number of fledglings
01. Shetland	Absent	Absent	Absent	Absent	Absent
02. North Caithness and Orkney	Absent	Absent	Absent	Absent	Absent
03. Coll, Tiree and the Western Isles	Absent	Absent	Absent	Absent	Absent
04. North West Seaboard	Absent	Absent	Absent	Absent	Absent
05. The Peatlands of Caithness and Sutherland	—	—	—	—	—
06. Western Seaboard	Absent	Absent	Absent	Absent	Absent
07. Northern Highlands	Not significant [svx]	—	—	—	—
08. Western Highlands	Absent	Absent	Absent	Absent	Absent
09. North East Coastal Plain	Not significant [sx]	Not significant [rsvx]	—	—	—
10. Central Highlands	—	—	—	—	—
11. Cairngorm Massif	—	—	—	—	—
12. North East Glens	—	—	—	—	—
13. East Lochaber	Absent	Absent	Absent	Absent	Absent
14. Argyll West and Islands	Absent	Absent	Absent	Absent	Absent
15. Loch Lomond, The Trossachs and Breadalbane	Not significant	Not significant [svx]	—	—	Not significant [sx]
16. Eastern Lowlands	Not significant	Not significant [vx]	—	—	Not significant [rx]
17. West Central Belt	—	—	—	—	—
18. Wigtown Machairs and Outer Solway Coast	—	—	—	—	—
19. Western Southern Uplands and Inner Solway	**Increase (3.8%)**	Not significant [vx]	—	—	**Decrease [rx] (-5.4%)**
20. Border Hills	—	—	—	—	—
21. Moray Firth	—	Not significant [vx]	—	—	Not significant [rx]

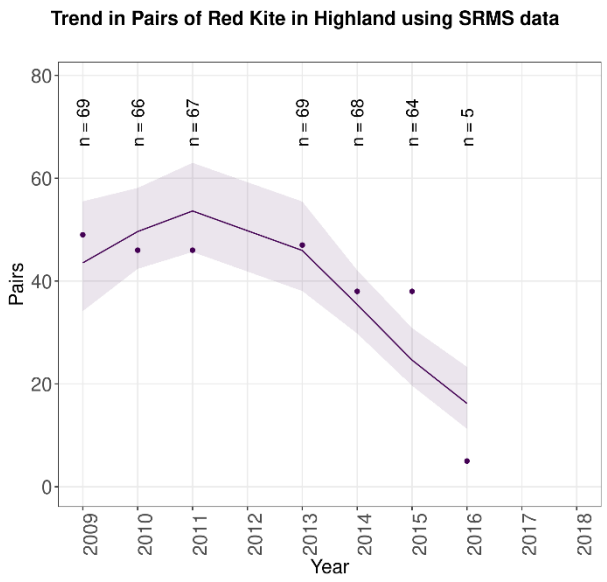
[r] No home range random effect, [s] Sample sizes small, [v] Variable effort, [x] Expanding population.



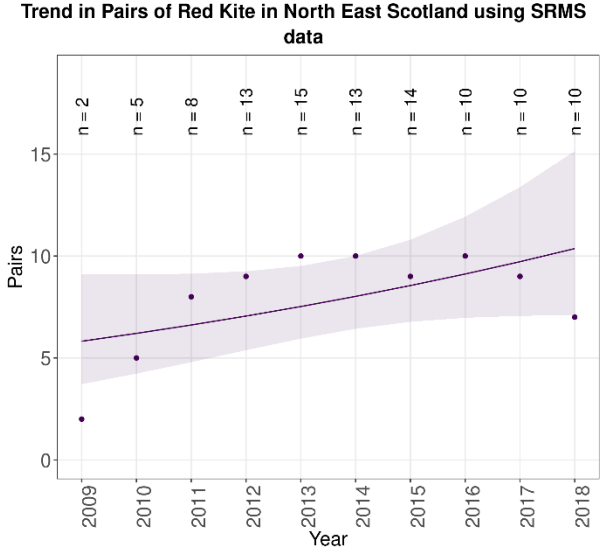
Central trend: Not significant (caveats: Expanding population)



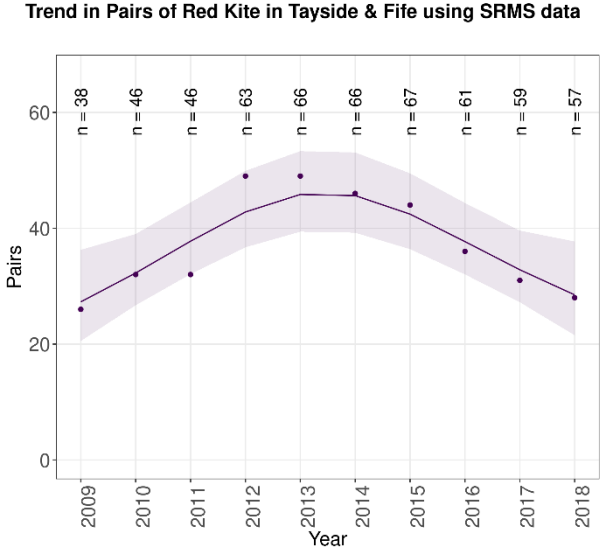
Dumfries & Galloway trend: Increase (caveats: Expanding population)



Highland trend: Decrease

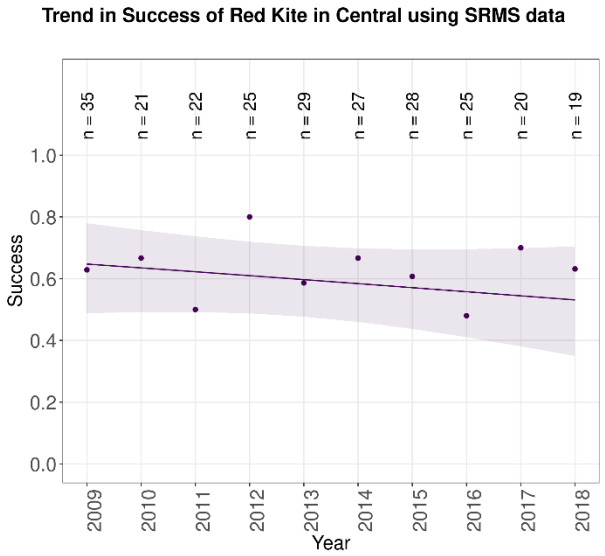


North East Scotland trend: Not significant (caveats: Sample sizes small, Expanding population)

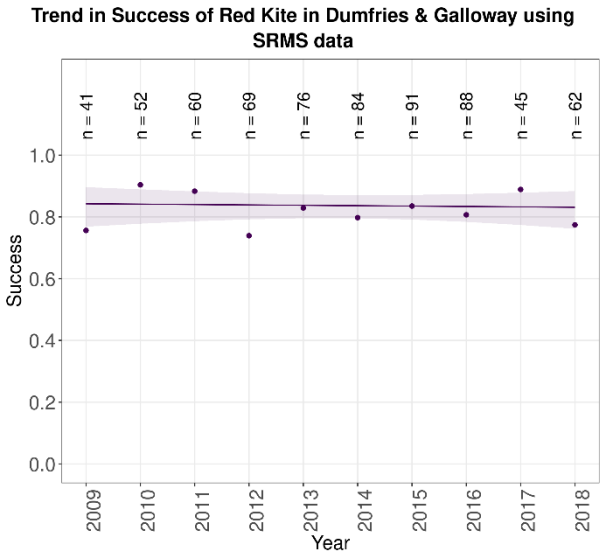


Tayside & Fife trend: Non-linear (caveats: Expanding population)

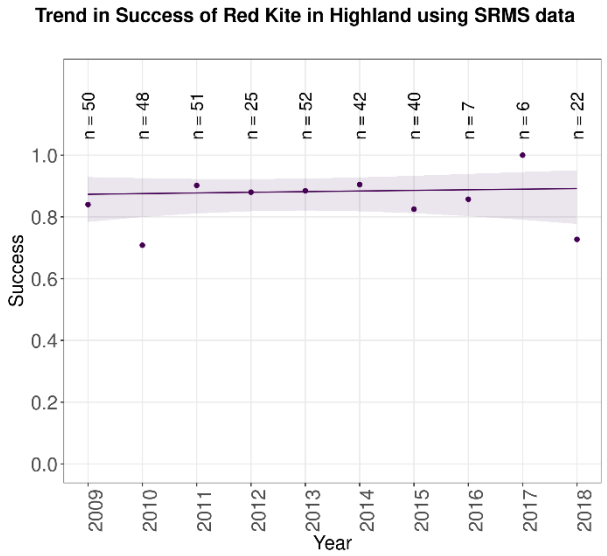
Figure 2: Trends in numbers of breeding pairs of Red Kite by SRMS region during 2009-2018.



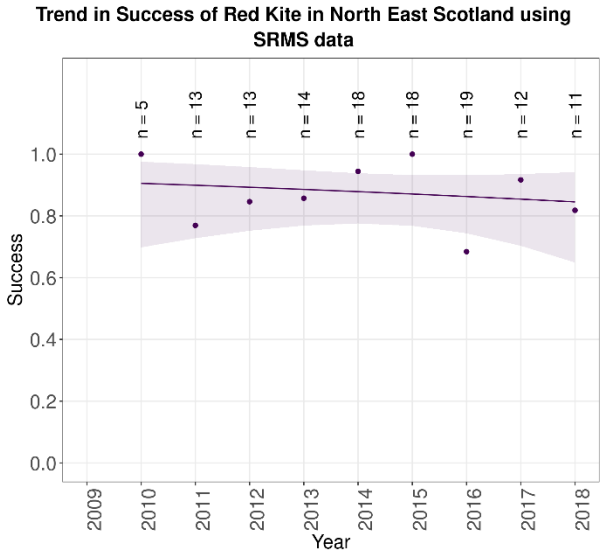
Central trend: Not significant (caveats: Expanding population)



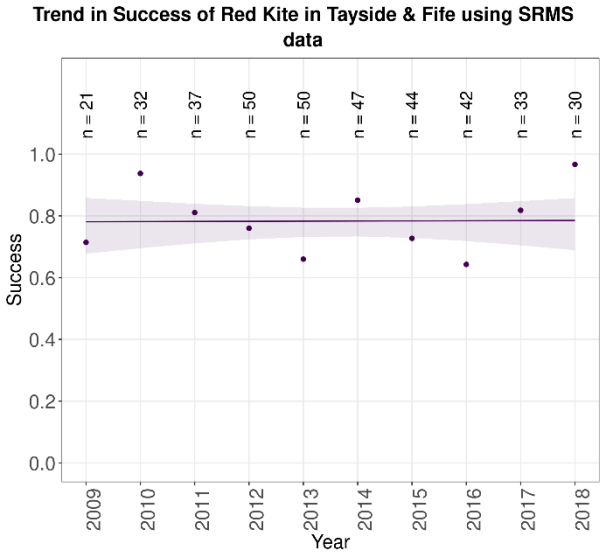
Dumfries & Galloway trend: Not significant (caveats: Expanding population)



Highland trend: Not significant (caveats: Expanding population)



North East Scotland trend: Not significant (caveats: Sample sizes small; Expanding population)



Tayside & Fife trend: Not significant (caveats: Expanding population)

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

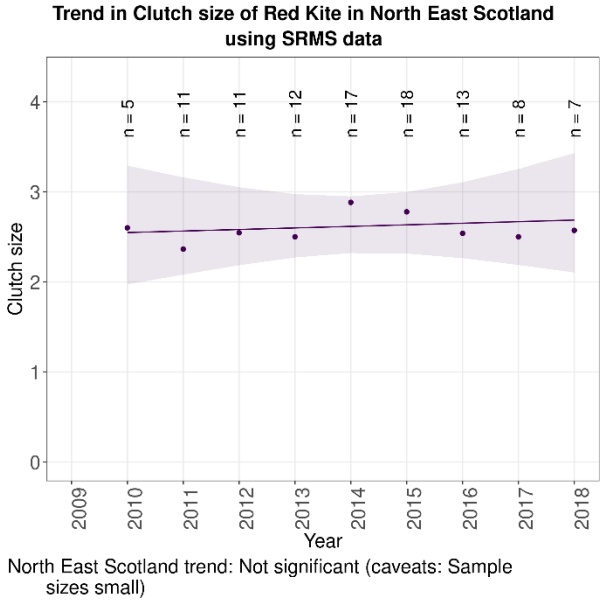


Figure 4: Trends in clutch size of Red Kite by SRMS region during 2009-2018.

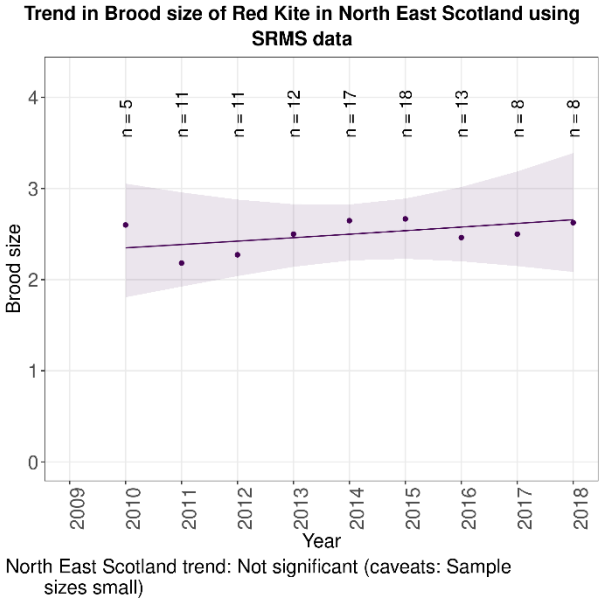
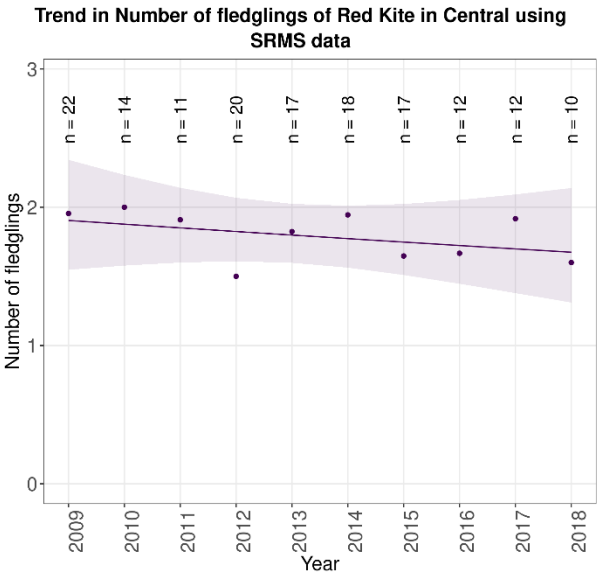
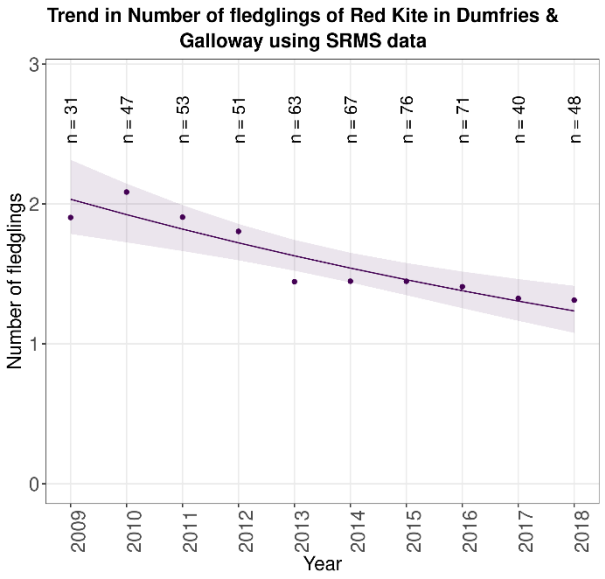


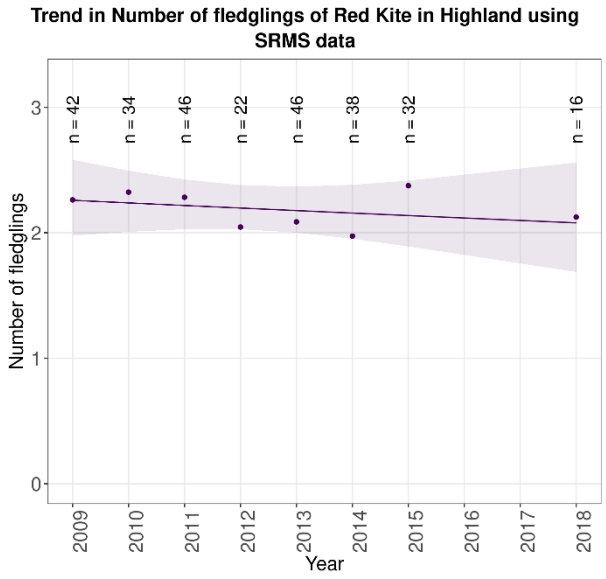
Figure 5: Trends in brood size of Red Kite by SRMS region during 2009-2018.



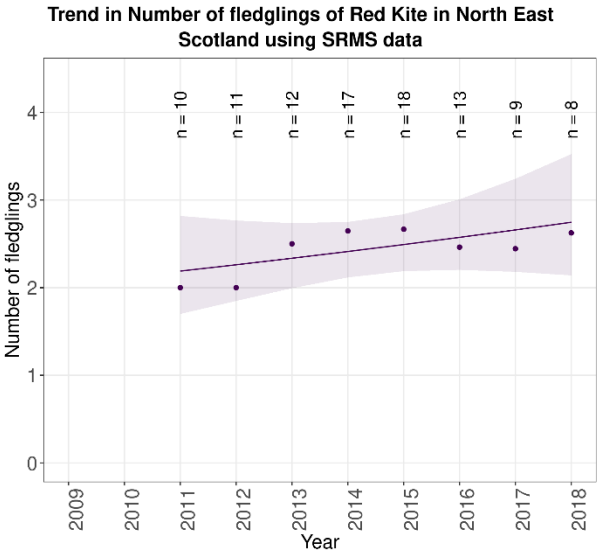
Central trend: Not significant (caveats: Sample sizes small)



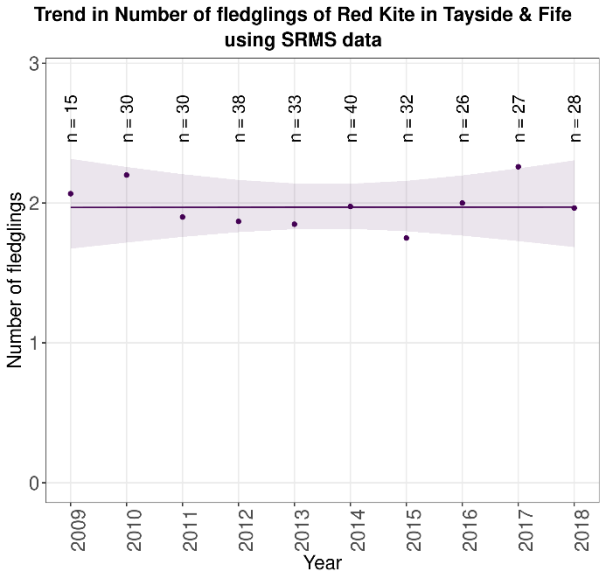
Dumfries & Galloway trend: Decrease



Highland trend: Not significant

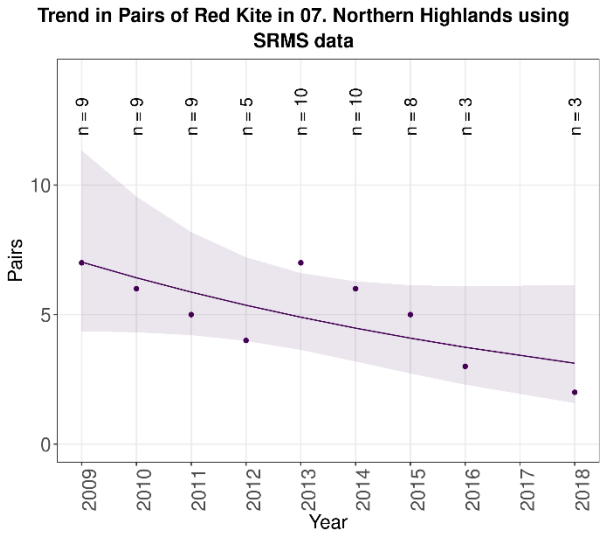


North East Scotland trend: Not significant (caveats: Sample sizes small)

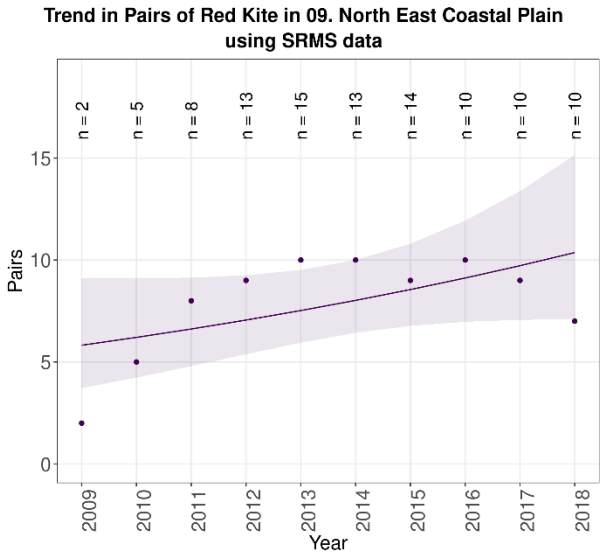


Tayside & Fife trend: Not significant

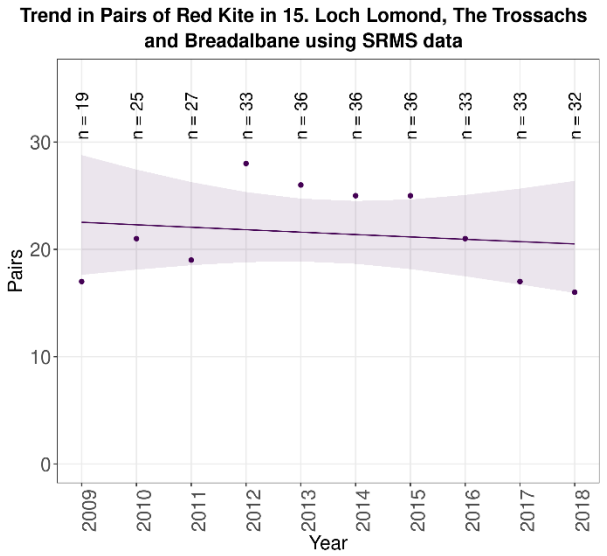
Figure 6: Trends in number of fledglings of Red Kite by SRMS region during 2009-2018.



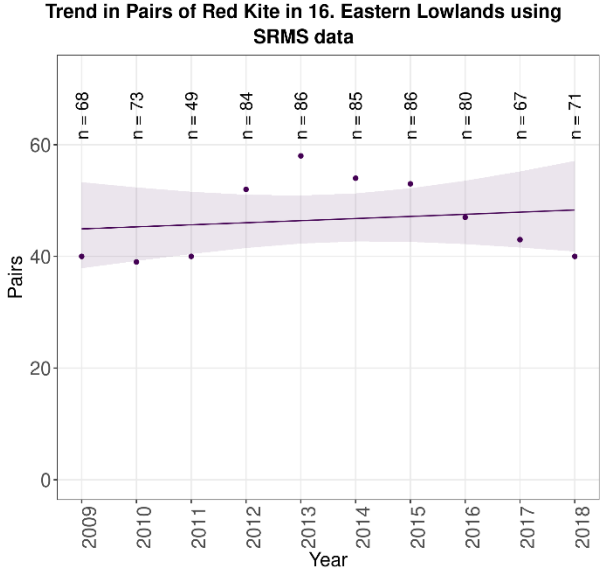
07. Northern Highlands trend: Not significant (caveats: Expanding population, Sample sizes small, Variable effort)



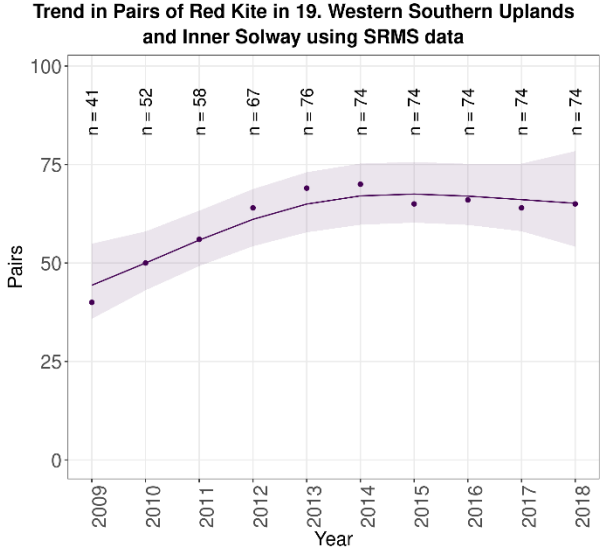
09. North East Coastal Plain trend: Not significant (caveats: Expanding population, Sample sizes small)



15. Loch Lomond, The Trossachs and Breadalbane trend: Not significant

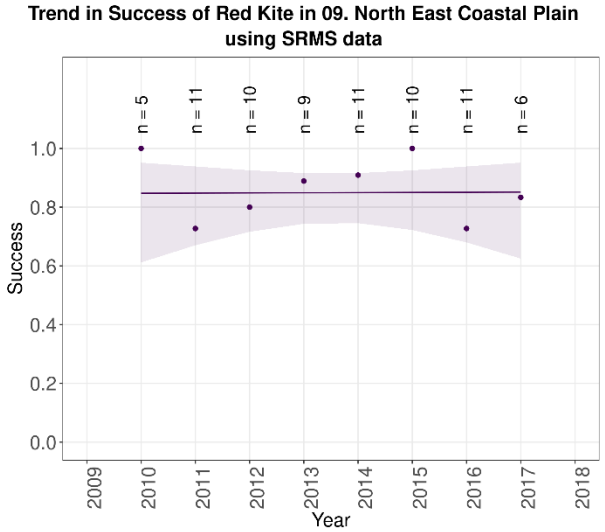


16. Eastern Lowlands trend: Not significant

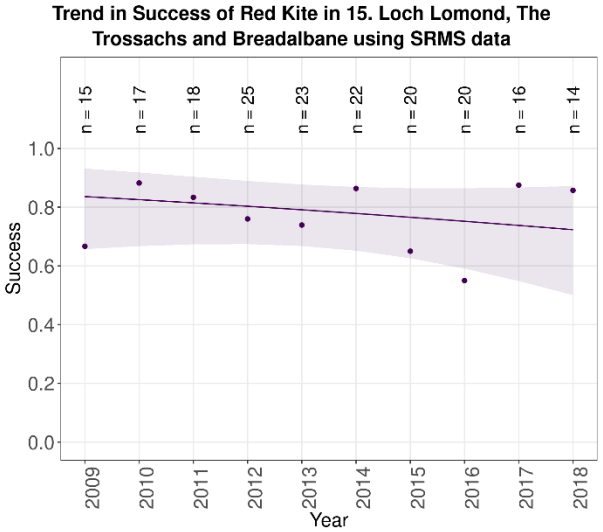


19. Western Southern Uplands and Inner Solway trend: Increase

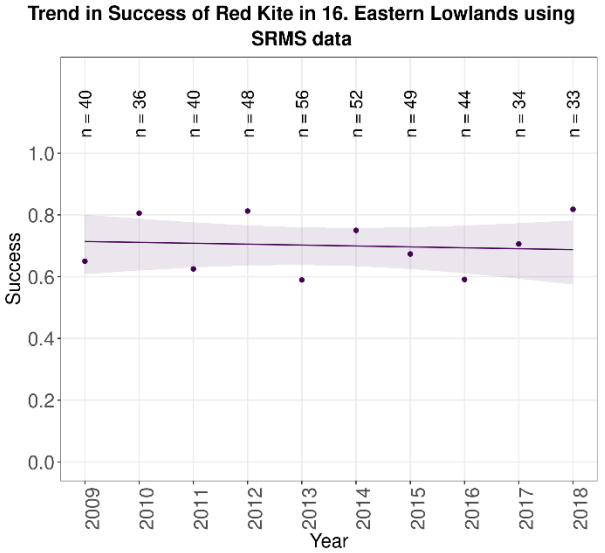
Figure 7: Trends in numbers of breeding pairs of Red Kite by NHZ region during 2009-2018.



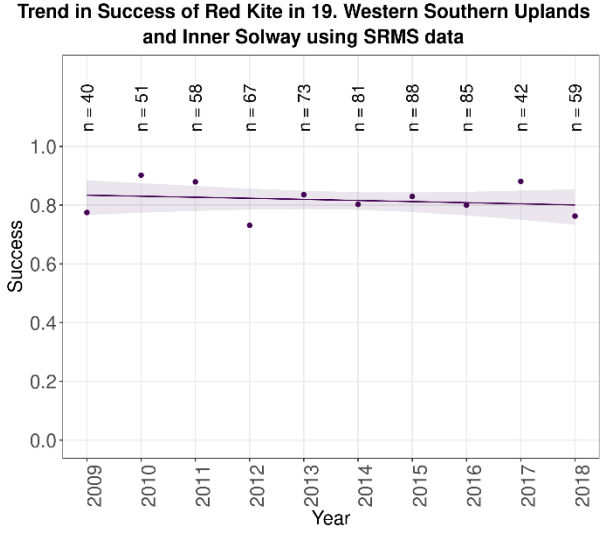
09. North East Coastal Plain trend: Not significant (caveats: Sample sizes small; Variable effort; Expanding population; No home range random effect)



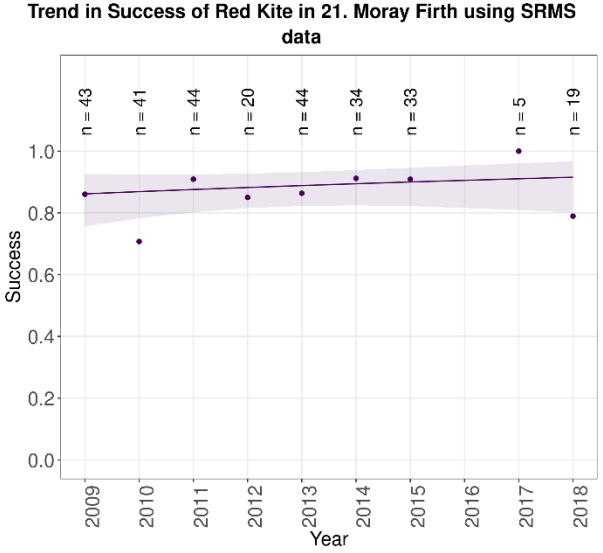
15. Loch Lomond, The Trossachs and Breadalbane trend: Not significant (caveats: Sample sizes small; Variable effort; Expanding population)



16. Eastern Lowlands trend: Not significant (caveats: Variable effort; Expanding population)

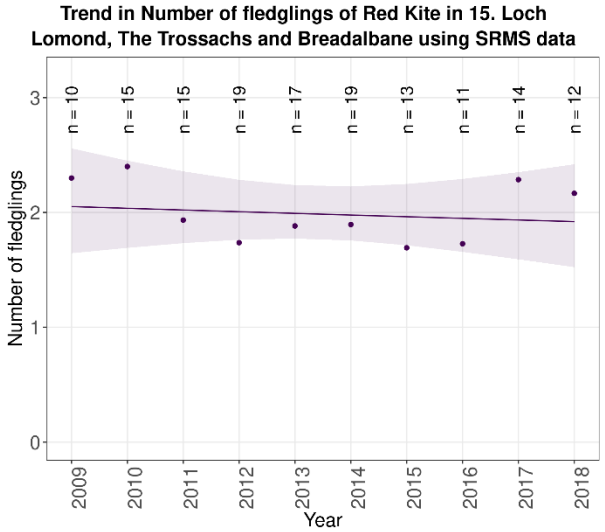


19. Western Southern Uplands and Inner Solway trend: Not significant (caveats: Variable effort; Expanding population)

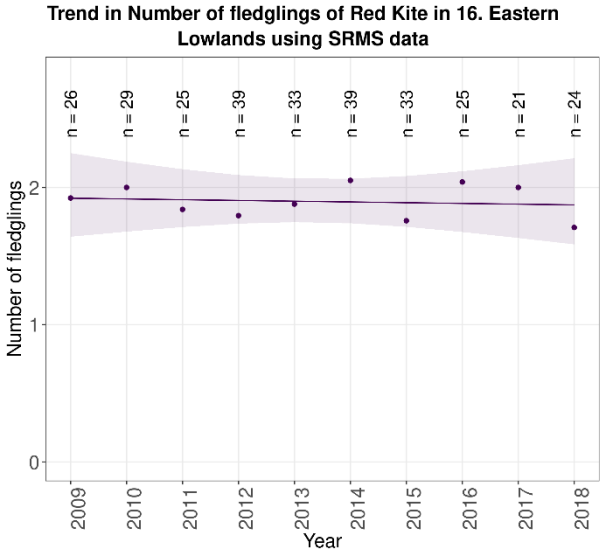


21. Moray Firth trend: Not significant (caveats: Variable effort; Expanding population)

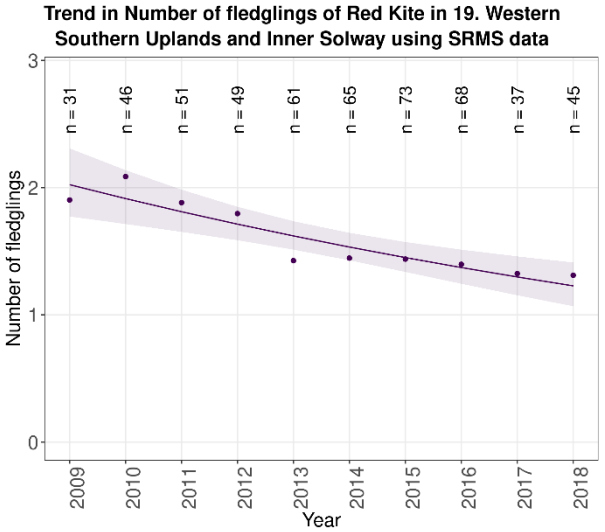
Figure 8: Trends in breeding success of Red Kite by NHZ region during 2009-2018.



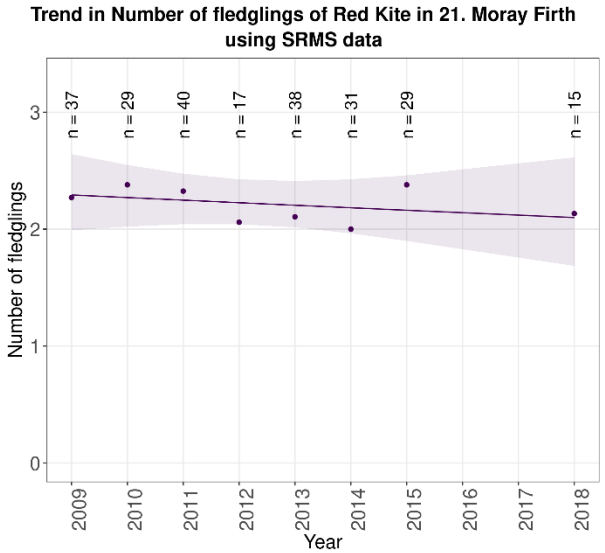
15. Loch Lomond, The Trossachs and Breadalbane trend: Not significant (caveats: Expanding population; Sample sizes small)



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



19. Western Southern Uplands and Inner Solway trend: Decrease (caveats: Expanding population; No home range random effect)



21. Moray Firth trend: Not significant (caveats: Expanding population; No home range random effect)

Figure 9: Trends in number of fledglings of Red Kite by NHZ region during 2009-2018.

Table 3: Details of SRMS Regional trends for Red Kite.

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	10	40.4	24.4 (22.5 to 26.3)	Not significant	Expanding population	1.3 (-3.0 to 5.8)
	Dumfries & Galloway	2009	2018	10	67.1	61.6 (54.5 to 68.7)	Increase	Expanding population	4.0 (1.2 to 6.9)
	Highland	2009	2016	7	58.3	38.4 (24.2 to 52.6)	Decrease		-10.8 (-15.1 to -6.2)
	North East Scotland	2009	2018	10	10.0	7.9 (6.0 to 9.8)	Not significant	Sample sizes small, Expanding population	6.6 (-1.3 to 15.2)
	Tayside & Fife	2009	2018	10	56.9	37.3 (31.0 to 43.6)	Non-linear	Expanding population	Non-linear
Success	Central	2009	2018	10	25.1	0.6 (0.6 to 0.7)	Not significant	Expanding population	-1.2 (-3.8 to 1.3)
	Dumfries & Galloway	2009	2018	10	66.8	0.8 (0.8 to 0.8)	Not significant	Expanding population	-0.1 (-1.2 to 0.9)
	Highland	2009	2018	10	34.3	0.8 (0.8 to 0.9)	Not significant	Expanding population	0.2 (-1.2 to 1.6)
	North East Scotland	2010	2018	9	13.7	0.9 (0.8 to 0.9)	Not significant	Sample sizes small; Expanding population	-0.6 (-3.0 to 1.4)
	Tayside & Fife	2009	2018	10	38.6	0.8 (0.7 to 0.8)	Not significant	Expanding population	0.0 (-1.7 to 1.7)
Clutch size	North East Scotland	2010	2018	9	11.3	2.6 (2.5 to 2.8)	Not significant	Sample sizes small	0.7 (-4.7 to 6.3)
Brood size	North East Scotland	2010	2018	9	11.4	2.5 (2.4 to 2.7)	Not significant	Sample sizes small	1.6 (-3.9 to 7.3)
Number of fledglings	Central	2009	2018	10	15.3	1.8 (1.7 to 1.9)	Not significant	Sample sizes small	-1.4 (-5.5 to 2.9)
	Dumfries & Galloway	2009	2018	10	54.7	1.6 (1.5 to 1.6)	Decrease		-5.4 (-7.8 to -2.9)
	Highland	2009	2018	8	34.5	2.2 (2.1 to 2.3)	Not significant		-0.9 (-4.2 to 2.4)
	North East Scotland	2011	2018	8	12.3	2.4 (2.3 to 2.6)	Not significant	Sample sizes small	3.3 (-2.9 to 9.9)
	Tayside & Fife	2009	2018	10	29.9	2.0 (1.9 to 2.0)	Not significant		0.0 (-3.0 to 3.1)

Table 4: Details of NHZ Regional trends for Red Kite.

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	07. Northern Highlands	2009	2018	9	7.3333	5.0 (3.7 to 6.3)	Not significant	Expanding population, Sample sizes small, Variable effort	-8.6 (-18.1 to 2.0)
	09. North East Coastal Plain	2009	2018	10	10	7.9 (6.0 to 9.8)	Not significant	Expanding population, Sample sizes small	6.6 (-1.3 to 15.2)
	15. Loch Lomond, The Trossachs and Breadalbane	2009	2018	10	31	21.5 (18.4 to 24.6)	Not significant		-1.0 (-5.5 to 3.7)
	16. Eastern Lowlands	2009	2018	10	74.9	46.6 (41.5 to 51.7)	Not significant		0.8 (-2.3 to 4.0)
	19. Western Southern Uplands and Inner Solway	2009	2018	10	66.4	60.9 (54.1 to 67.7)	Increase		3.8 (1.0 to 6.8)
Success	09. North East Coastal Plain	2010	2017	8	9.125	0.8 (0.7 to 0.9)	Not significant	Sample sizes small; Variable effort; Expanding population; No home range random effect	0.1 (-4.3 to 3.6)
Success	15. Loch Lomond, The Trossachs and Breadalbane	2009	2018	10	19	0.8 (0.7 to 0.8)	Not significant	Sample sizes small; Variable effort; Expanding population	-1.0 (-3.4 to 1.1)
	16. Eastern Lowlands	2009	2018	10	43.2	0.7 (0.7 to 0.7)	Not significant	Variable effort; Expanding population	-0.3 (-2.1 to 1.4)
	19. Western Southern Uplands and Inner Solway	2009	2018	10	64.4	0.8 (0.8 to 0.8)	Not significant	Variable effort; Expanding population	-0.3 (-1.4 to 0.7)

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)
	21. Moray Firth	2009	2018	9	31.444	0.9 (0.8 to 0.9)	Not significant	Variable effort; Expanding population	0.7 (-1.1 to 2.4)
Number of fledglings	15. Loch Lomond, The Trossachs and Breadalbane	2009	2018	10	14.5	2.0 (1.9 to 2.1)	Not significant	Expanding population; Sample sizes small	-0.7 (-4.9 to 3.6)
Number of fledglings	16. Eastern Lowlands	2009	2018	10	29.4	1.9 (1.8 to 2.0)	Not significant	Expanding population; No home range random effect	-0.3 (-3.3 to 2.9)
	19. Western Southern Uplands and Inner Solway	2009	2018	10	52.6	1.6 (1.5 to 1.6)	Decrease	Expanding population; No home range random effect	-5.4 (-7.8 to -2.9)
	21. Moray Firth	2009	2018	8	29.5	2.2 (2.1 to 2.3)	Not significant	Expanding population; No home range random effect	-1.0 (-4.4 to 2.5)

Table 5: Number of Red Kite 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		64	42	86		3	5			0	32		232
2010		47	54	81		0	10			0	55		247
2011		26	62	84		0	21			0	56		249
2012		51	73	40		0	23			0	77		264
2013		56	84	90		0	29			0	80		339
2014		54	91	99		0	31			0	83		358
2015		53	105	100		0	36			0	96		390
2016		56	120	11		0	28			0	87		302
2017		41	131	9		2	32			0	85		300
2018		48	139	50		3	32			0	91		363
A: Mean home range checks	**No SRMS data**	**50.4**	**117.2**	**53.8**	**Absent**	**1.0**	**31.8**	**Absent**	**Absent**	**0.0**	**88.4**	**Absent**	**342.6**
B: Proportion of estimated Scottish population	0	17	29	24	0	0	2	0	0	0	27	0	100

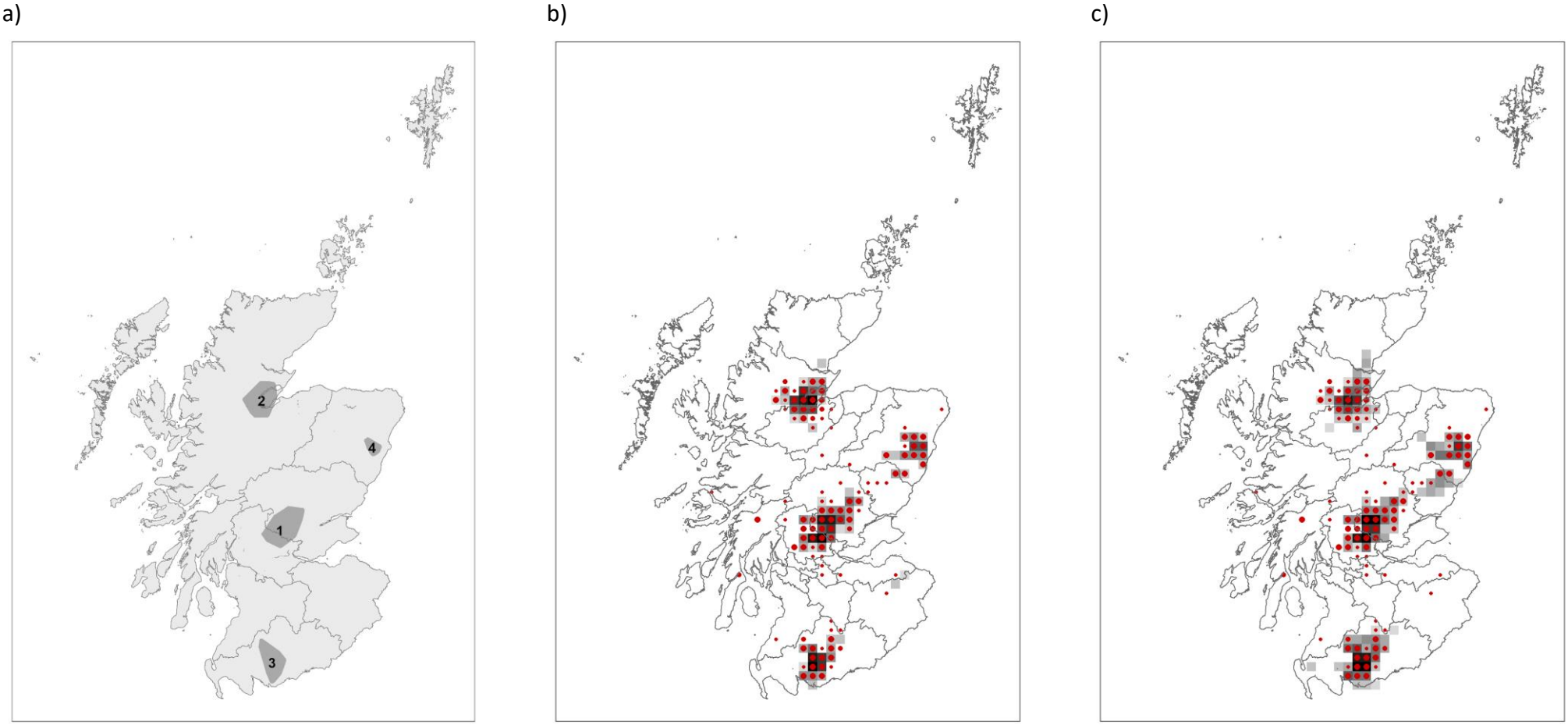


Figure 10: Areas corresponding to the clusters of home ranges from which sufficient data were reported to attempt to derive population trends for Red Kite between 2009 and 2018 (a) together with maps showing variation in the number of Red Kite records reported to SRMS during 2009-2013 (b) and 2014-2018 (c), in the context of the known Red Kite 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.