Squirrel & Pine Marten Survey Report 2024





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Contents

Su	immary	4			
1.	Introduction	4			
2.	Methodology	6			
3.	Results	8			
	3.1 Survey Sites	8			
	3.2 2024 Survey Results	10			
4.	Discussion	15			
5.	Presence/absence data and sightings data	17			
6.	Future Work and Conclusions	19			
7.	References	20			
APPENDIX 122					

Summary

The 2024 Squirrel and Pine Marten Survey covered **221** woodlands across Northern Ireland, reaching 67% of all 10km² grid squares. Red squirrels were recorded in **70** woodlands and in all six counties, with stable core populations as well as some new detections. Grey squirrels appeared in **39** sites, but notably none were detected in County Tyrone, suggesting a continued decline possibly linked to growing pine marten populations, although lack of coverage in urban areas calls for viewing this with cautious optimism. Pine martens were the most frequently recorded species, found in **97** woodlands and showing an increased presence in the North West. Survey coverage maintained strong despite reduced volunteer capacity in some areas, and a concerted effort was made in counites with previously poor coverage, with County Armagh benefiting the most. Presence/absence data remains more reliable than sightings alone, for identifying long-term trends.

1. Introduction

The Eurasian red squirrel (*Sciurus vulgaris*) is a Northern Ireland Priority Species (<u>www.habitas.org.uk/priority/species.asp?item=5108</u>) and is the only native species of squirrel found on the island of Ireland. It is a well-loved and familiar species which is encountered in many woodlands across all six local counties. However, the species has been displaced from considerable areas of suitable habitat across Northern Ireland by the invasive non-native Eastern grey squirrel (*Sciurus carolinensis*). Introduced to Co. Longford from Britain in 1911, the presence of this North American species potentially threatens the long-term viability of Irish red squirrel populations through disease and competition. Grey squirrels can outcompete red squirrels for food, and they can adapt to a variety of habitats; they can also carry the Squirrelpox virus which can be fatal when passed to reds but causes grey squirrels no harm. Small, fragmented populations of red squirrels can be completely wiped out by Squirrelpox. In **Figure 1** you can see that this pattern was repeated throughout Great Britain and the island of Ireland.

4



Figure 1. UK Squirrel accord red and grey squirrel distribution 2010 & 2017-22.

*This is a visual representation of the recorded presence of both species, though it may not fully reflect true populations. To produce the map, alpha hulls were used to draw polygons around the sighting records. A buffer of 5-10 km was applied to each polygon based on the requirements of the respective data providers: Data provided by CEDaR, Clocaenog Red Squirrels Trust, Colin Lawton, Mammal Society, Mid-Wales Red Squirrels Partnership, National Biodiversity Data Centre, National Parks and Wildlife Service, Red Squirrels Northern England, Saving Scotland's Red Squirrels, Trees for Life, Ulster Wildlife, University of Galway and Vincent Wildlife Trust.

The distribution across Britian and the Republic of Ireland is largely clear cut in terms of squirrel distribution; either there are considerable areas that are just grey squirrels, just red squirrels or both. Whereas Northern Ireland has many pockets of different squirrel populations interspersed across the landscape (**Figure 1**).

Regular monitoring of the distribution of both squirrel species and pine marten is critical to the effective implementation of red squirrel conservation measures and the evaluation of their success. Volunteer red squirrel groups play an important part in monitoring. Ulster Wildlife are committed to the long-term monitoring of these three species in Northern Ireland. This will provide data to support the Red Squirrel Conservation Strategy for Northern Ireland to help inform and focus conservation efforts - <u>Ulster Wildlife - Squirrel</u> <u>Strategy FINAL 8.4.22_0.pdf</u>

This survey records the presence of pine marten as well as red and grey squirrel. In recent studies, it has been suggested that the pine marten may influence the abundance and density of grey squirrels. Sheehy and Lawton (2014) suggested that the recovery and subsequent population increase of pine marten (*Martes martes*) has depressed or removed grey squirrels in certain parts of Ireland. Sheehy *et al.* (2018) demonstrated a similar process in parts of Scotland. A more recent paper by Twinning *et al.* (2020) highlighted the role of pine marten recovery in grey squirrel decline and the positive impact on red squirrels in NI. Due to this apparent relationship between pine martens, grey squirrels and red squirrels, the presence and absence of pine marten was deemed to be important and was monitored in addition to the two squirrel species in recent surveys. Raising awareness of pine marten and encouraging their recovery is also a key element to red squirrel conservation.

2. Methodology

This survey directly follows on from the survey conducted by Dr Dave Tosh in 2014/2015. The sites chosen were based on repeating core sites and sites previously surveyed, as well as filling in gaps in areas previously not surveyed. In 2024, the aim of this survey was to cover a minimum of 150 woodlands over the six counties of Northern Ireland, with an initial focus on repeating core sites which have been surveyed previously. Armagh, Banbridge and Craigavon Council (ABC Council), An Creagán, Binevenagh Red Squirrel Group, Belfast Hills Partnership, Heart of Down Red Squirrel Group, Glens Red Squirrel Group, Mid-Ulster Red Squirrel Group, National Trust, Newry, Mourne, and Down Council (NMD Council), North Down Red Squirrel and Pine Marten Group, North West Red Squirrel Group, Ulster Wildlife staff members and volunteers, Wildfowl and Wetlands Trust and Woodland Trust Northern

6

Ireland completed a total of **221** survey sites in 2024 in 112 x 10km² (**Figure 2**). See **APPENDIX 1** for full list of participating partners.



Figure 2. 2024 survey coverage and the partners involved.

Each volunteer got a copy of the <u>Survey Methodology</u>, <u>Recording Form</u> and <u>Risk Assessment</u>. Sightings which were gathered by camera trapping in 2024, followed the protocol used during the previous surveying. Volunteer fieldworkers were asked to place camera traps and squirrel feeders in forests for at least 14 days using the following protocol:

- **1.** Find two trees that are no more than 3m apart (3 to 4 paces).
- 2. Attach feeder to SOUTH facing side of tree approximately 2 to 4m from the ground.
- **3.** Fill the feeder (not all the way to the top) once it is attached. Ensure there are peanuts / sunflower mix on the ledge of squirrel feeder, on the roof and on the ground around the feeder. This should help attract animals to the feeder.

- **4.** Attach camera to tree opposite of feeder between **2 3m** from the ground. Ensure that **camera** is **NORTH** facing to stop sunlight from obscuring any images.
- 5. Attach camera to tree using webbing first. Ensure this is tight before attaching any locks.
- 6. Ensure feeder can be seen by camera, that there are no obstructions to the view, and no objects (i.e. leaves in between camera and feeder) likely to trigger the camera.
- 7. Once the camera is attached to a tree securely, switch the camera on.
- 8. Record the time, date and location on the recording sheet.
- **9.** After 2 weeks (14 days) minimum, retrieve camera and feeder. Keep SD card safe, return all photos to Katy / Ross. Fill in recording sheet with what you found and submit your results.

The bait used were peanuts or a mix of sunflower seeds and peanuts. The surveyors were asked to not use any additional bait and to note the bait being used. Browning camera traps were used, and the camera settings are as follows:

- 1. Set the correct date and time.
- 2. Ensure the camera is set to **photo mode**, (sometimes known as **TRAIL** mode).
- 3. Set 1 second delay between photos, (sometimes known as interval).
- 4. Picture size set to **Medium 4MP**. A medium photo quality allows lots of photos to be taken without the risk of running out of memory.
- 5. Multi-shot 3. Camera will take 3 photos as standard per trigger.
- 6. Time stamp or Information strip should be set to **ON.**
- 7. If the camera has **Night mode** turn **ON** and ensure shutter speed is high, increasing chance of detecting species and getting un-blurred images.
- 8. If there is a field scan mode it should be turned off (Fieldscan -> Off) as this wastes battery.

3. Results

3.1 Survey sites

The 2024 survey was a collaborative effort between Ulster Wildlife Staff, red squirrel volunteer groups and partner organisations. In total **221** sites were surveyed. These were a mix of woodlands owned by Forest Service, private landowners and Ulster Wildlife reserves. A total of **112** x 10km squares were covered in Northern Ireland: 67% of all 10km squares covering Northern Ireland. This an increase on survey coverage from the previous survey in 2022 (63%). **Figure 3** shows the 10km squares covered during the survey.



Figure 3. 2024 survey coverage (10km squares).

In general, there is good survey coverage across NI, however the 2022 survey highlighted that counties Tyrone and Armagh were not as well covered in comparison with the other counties. In 2024 we aimed to increase recording in these counties whilst maintaining good coverage elsewhere. Increased collaboration with ABC council, An Creagán and volunteers locally in those counties lead to more sites surveyed. In Co. Tyrone, forestry operations and other constraints meant that an increase in the number of surveys was not possible there, however the number of sites surveyed were similar to 2022. In Co. Armagh the number of sites surveyed in the county doubled (**Table 1**). Although due to expansion of coverage, the proportion of sites with squirrel presence declined, which may indicate that the areas with higher densities of squirrels were already being covered. Sites surveyed in 2024. However, core areas were still surveyed, and coverage remained strong on a 10km² square level.

County	Area (Km2)	Sites Surveyed	Sites surveyed per 10km2 (Effort)	No. of sites with Red squirrel (%)	No. of sites with Grey squirrel (%)	No. of sites with Pine Marten (%)
Antrim	3095.63	45	0.15	24(53%)	9(20%)	17(38%)
Armagh	1325.86	18	0.14	2(11%)	2(11%)	9(50%)
Down	2498.76	42	0.17	14(31%)	12(29%)	13(31%)
Fermanagh	1850.59	40	0.22	18(45%)	0	29(73%)
L/Derry	2121.13	45	0.21	6(13%)	16(35%)	13(29%)
Tyrone	3264.88	26	0.08	6(23%)	0	16(62%)

Table 1. The number of 2024 survey sites per 10km square for each county of Northern Ireland and the number of these sites that had recorded target species as present (Area figures and sites surveyed per 10km square used from Ulster Wildlife Red Squirrel report 2017 for consistency).

3.2 2024 Survey Results

Red Squirrel

During the 2024 survey, red squirrels were recorded in every county, in a total of **70** woodlands and 45 x 10km squares. (**Figure 3**).

Comparing 2022 and 2024 surveys would indicate the core red squirrel populations remain present. The southern counties possibly show more connectivity on a landscape scale, between the stronghold population in Fermanagh, Armagh and bordering Monaghan, into the Ring of Gullion and the Mournes.

In the northern counties, the Mid-Ulster Red Squirrel Group found red squirrels present in the Sperrin mountains for the first time since 2018. There are infrequent sightings from the Sperrins, but these populations appear to be difficult to pick up on our survey, possibly indicating low densities of squirrels. Also, of note are new red 10km squares in Mid Antrim. Infrequent sightings have come from this area since the presence/absence survey began, but this is the first time they have been picked up on this survey.



Figure 3. The 10km squares which contain at least one record of a red squirrel during the 2024 survey.



Figure 4. Side by side comparison of 2022 and 2024 survey red squirrel results.

Grey Squirrel

Grey squirrels were recorded in a total of **39** of the woodlands surveyed and 25 x 10km squares (**Figure 5**).

Grey squirrels also show a similar distribution on a landscape scale. For the first time on our survey, no grey squirrels were present in any survey woodlands in Co. Tyrone. Survey coverage is not comprehensive in Co. Tyrone and many urban areas with grey squirrel sightings are not picked up, for e.g. Castlederg, Strabane, Omagh, Cookstown and Dungannon. However, there are anecdotal reports of and many confirmed sightings of red squirrels in and around these urban centres so it is possible that red squirrels could be attempting to reclaim their former range in central Tyrone, with grey squirrels being apparently largely absent from rural areas. A focus of the 2026 survey will be to ground truth these anecdotal reports.





survey period.



Figure 6. Side by side comparison of 2022 and 2024 survey grey squirrel results.

Pine Marten

Pine marten were again recorded in every county in Northern Ireland. They are now clearly a very widespread species across the country. They were recorded in a total of **97** woodlands across 65 x 10km squares (**Figure 7**), making them the most frequently recorded species picked up during the survey.

Pine marten were recorded in a very similar number of 10km squares between the 2022 and 2024 surveys. An observation would be that there was a significant number of pine martens recorded in the North West in 2024 with the North West Red Squirrel Group recording them more frequently in their operational area than in any presence/absence survey previously. Continuation in pine marten recovery is really positive for red squirrel conservation, given the negative impact pine martens have upon grey squirrels, Sheehy, E. & Lawton, C. (2014).



Figure 7. The 10km squares which contain at least one record of pine marten during the 2024 survey period.



Figure 8. Side by side comparison of 2022 and 2024 survey red squirrel results.

4. Discussion

Individual sites may see changes from year to year, but the objective of this survey is to review populations presence or absence on a landscape scale over a longer time period. When comparing results between the 2022 and 2024 surveys, it is clear to see that on a landscape scale the distribution of the 3 species all remain relatively similar, with no significant increases or decreases in presence or absence.



Figure 9. Proportion of species presence in surveyed woodlands 2017-2024.

Crucially the decline in the % presence, seen in 2022 from the 2020 survey, of red squirrels has begun to level off. If this had continued in as dramatic a fashion as the decline from 2020 to 2022 it would have been a cause for concern, but this decline was possibly due to variable environmental factors, as all three species saw a spike in proportion present between 2018 and 2020, and then a decline between 2020 and 2022. Therefore, the factors affecting this change in red squirrels was probably shared by all three species. This highlights the importance of long-term monitoring.

Grey squirrel presence continues to decline at a similar rate as between 2020 and 2022. Although this is positive, we must be cautiously optimistic about what this shows. Possibly we could be beginning to see grey squirrels being extirpated from rural areas due to increasing pressure from pine martens. As previously discussed, urban centres are difficult to monitor and may not show up in our survey. Sightings unfortunately cannot be used to fill in these gaps accurately as there is a dramatic recorder bias for squirrels. In 2024 Ulster wildlife received 405 squirrel sightings, only 23% of them were grey squirrels. Ulster Wildlife encourage the reporting of grey squirrel sightings across Northern Ireland - <u>Report your</u> <u>wildlife sightings | Ulster Wildlife</u>

Pine Marten are once again the most abundantly recorded species on the survey with a similar distribution across the country. The proportion of pine martens present remains at a very similar level as in 2020. The only observation of note is their continued increase of presence in woodlands in the North West, particularly in the Faughan Valley.

Figure 1 contains the most recent UK Squirrel accord map released in 2024. It cocorroborates the findings of this and the previous 2022 Ulster Wildlife Squirrel and Pine Marten presence/absence survey, that Co. Fermanagh is free of grey squirrels and that since 2010 grey squirrels have increased their range in the North West. **Figure 1** shows that in the Republic of Ireland grey squirrel range has decreased considerably in the centre of the country, with their remaining distribution being in the east. The most likely reason for this change would be the recovery of the pine marten and the impact it has on the grey squirrel. Continuation of the presence/absence survey in 2026 would allow us to monitor if similar changes continue in Northern Ireland as well.

16

5. Presence/absence data and sightings data

Presence/absence data is vital in discerning long-term trends in populations on a landscapescale. However, some surveys may not pick up individuals due to variable external conditions, and urban areas are not well represented. Sightings data can help us track movement of squirrels and identify when species have turned up in certain areas, however they are incidental recordings of individuals and may indicate anthropogenic or environmental factors. Sightings alone are not a good measure of the distribution of a species. Sightings are proof of presence at a given time, but not necessarily proof of absence. The benefit of using this presence/absence methodology is that, over a longer period of time, it should show core population areas on a landscape scale. With 5 years of data collated together **Figure 10** showcases the core areas with red squirrels.



Figure 10. Core red squirrel presence from 2017-2024 surveys.

The blue squares within **Figure 10** show the sites where red squirrels are reliably recorded as present. Red squares show areas where red squirrels are often recorded, but not always. This could be because red squirrels were absent when the survey began and are now reliably present, or vice versa. Alternatively, there is some evidence to suggest that variation in abundance influences variation in detection of a species within a presence/absence context (Royleand Nichols, 2003).

Of 521 confirmed sightings from 2024, both from the Centre for Environmental Data and Recording (CEDaR) and Ulster Wildlife, appear within 83% of the 10km squares with red squirrels present (**Figure 11**). Most dense clusters of sightings sit within these squares. The new red squirrel squares for 2024 could possibly demonstrate that isolated populations are still being found or that these local populations are beginning to grow in numbers.



Figure 11. Red squirrel sightings in 2024 overlayed with red squirrel presence from this and previous surveys.

Many of the squares where red squirrels are found present are isolated or not readily accessible by the public and therefore there is a lack of sightings in these areas, even if the population is robust. Much gratitude is extended to the red squirrel volunteer groups whose local knowledge is invaluable and contributes greatly to the survey. For example, the Glens of Antrim regularly show as a red squirrel stronghold on these presence/absence surveys, however the squirrels there are not seen or reported by the public as frequently as in other locations. Without the efforts of the Glens Red Squirrel Group protecting and monitoring these populations, their distribution in the Glens would not be as well known.

In 2024 there were 11 x 10km squares with red squirrels recorded present that did not have a public red squirrel sighting accepted in 2024. Squirrels occupying less accessible, or private woodlands often don't get picked up by sightings.

Over time presence/absence should show the true locations of red squirrel populations and account for variable factors. Together this data can give us a fuller picture of what is going on with these 3 species across Northern Ireland. Ulster Wildlife work alongside NIEA and CEDaR to collect sightings data.

6. Future Work

Late 2024 and early 2025 brought some of the worst storms in a century to Northern Ireland. The result of which has seen loss of both plantation forests and mature broadleaf trees on a large scale. Ulster Wildlife hope to work closely with public bodies and eNGOS to strive towards having more robust and resilient woodland habitats across the landscape.

In 2026 Ulster Wildlife hopes to work with NUI Galway on an All-Ireland Squirrel and Pine Marten Survey, 7 years after the previous survey in 2019. This will help to better understand the distribution and the relationships between these 3 species on an all-Ireland level.

Ulster Wildlife will continue to support red squirrel volunteer groups and work with councils and stakeholders to continue to protect and preserve red squirrels in Northern Ireland.

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APPENDIX 1: Survey Partners



Armagh City Banbridge & Craigavon Borough Council



Binevenagh Red Squirrels Group



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Comhairle Ceantair an Iúir, Mhúrn agus an Dúin

Newry, Mourne and Down District Council









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