Pro-Coast socio-environmental research on squirrels in Arne Parish and Purbeck

Summary

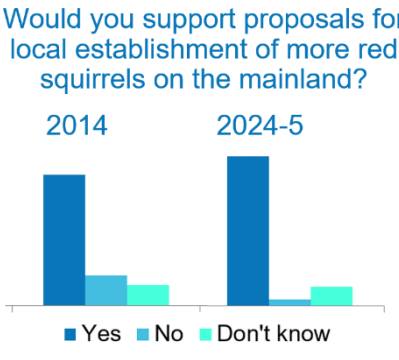
This EU-UK project is researching nature conservation projects that need to be sustained socially. The study in Arne Parish is investigating whether red squirrels might be restored. Surveys in 2014-2025 and more recent meetings indicate strong social approval for such restoration. However, a major obstacle to the restoration of red squirrels is the local presence of the Squirrel Pox Virus (SQPV) which is carried by grey squirrels and harmless to them, but fatal to reds. In the area of Purbeck, only four of forty-six grey squirrels caught at two sites during April-July 2025 had not been exposed to the Squirrel Pox Virus (SQPV). Because the majority of grey squirrels in Purbeck appear to have been infected already with the virus, it is important to ascertain whether these squirrels are effectively immunised, and hence safe for red squirrels, and how large a 'cordon sanitaire' would prevent immigration of squirrels from elsewhere while still infectious.

Project infrastructure (please see the website for more details of squirrel ecology)

The Pro-Coast project is part of the Horizon science programme of the European Union, co-funded by Innovate UK (UKRI). Twenty partners in 14 countries run 10 case studies, in which 'community transition' issues, with both an environmental and a social dimension, are being addressed by local teams of researchers instructed by social scientists. The project is building a Community Sustainability Platform to provide guidance and tools for solving socio-environmental issues across and beyond Europe, based on concepts from during earlier work in Arne Parish that launched multilingual networking software. The current work in Arne Parish, and more widely in Purbeck, is investigating whether there is enough public support to restore native red squirrels, by removing invasive North American grey squirrels as a mainly voluntary engagement.

Social science results: survey in Arne Parish

A survey was conducted in Arne Parish to assess local support for red squirrel restoration and to explore the social factors driving nature positivity. An important finding of this initial survey was that lack of co-development creates problems. All three previous Arne Parish surveys (2002, 2010 and 2014) were co-evolved with Parish Council (for Agenda-21, FP7-TESS and Neighbourhood Plan) and the 326-357 responses (50-60% of households) were collected by hand. Teams for Pro-Coast case studies were required to use a set of standard questions, which were agreed by the project's social scientists but not approved by Arne Parish Council. Without APC approval, 97% of the 86 survey responses had to be completed online. The responses represented 15% of households.



Nevertheless, an important social science result for the project on squirrels came from the survey, during 22.12.2024 to 9.2.2025, which repeated a question from 2014 that asked about support for local establishment of more red squirrels on the mainland (and also for other plant and animal restorations). In 2014, the most popular species for restoration were wildflowers, followed by rare birds of prey, with 50 (20%) of 253 respondents saying "No" to red squirrels. However, in the survey last winter red squirrels had become almost as popular as wildflowers, with only 3 (4%) saying "No" in 75 responses.

As well as talking individually to major landowners and the main group representing local hunters, invitations to two meetings of all major local conservation groups were accepted. All expressed enthusiasm and it was also noted that pine martens, a major predator of grey squirrels, were now being recorded in Purbeck. Moreover, volunteer time given by hunters has enabled substantial sampling of grey squirrels for SQPV.

Ecological results: along Tollbar Stream

After 10 days of pre-baiting in Stoborough, six female and eight male squirrels were caught in woodland within 100 m of the Tollbar Stream during 29 April to 3 May 2025. Two males, both in breeding condition, were caught in eight traps north of Holme Lane, in an area where squirrels had been culled throughout the winter. There was feeding sign from two more squirrels in the area. Six males and six females were caught in six traps on the south side of the road, where there had been no culling, with all males in breeding condition and no females showing signs of recent breeding.

It was concluded that the absence of an acorn crop in the previous winter had prevented spring litters but that, with males in breeding condition, summer litters might still occur. It was also concluded that culling some 30 squirrels overwinter north of the road had effectively suppressed the population there. However, tests at Moredun showed that all squirrels had experienced an SQPV infection, with ELISA scores of 0.90-2.52.

Ecological results: in the Goathorn area

During the same period, eleven traps were operated in about 15 ha dominated by Scots pines at Goathorn Peninsula. There was feeding sign at three traps and male squirrels were shot and sampled close to two of them, with ELISA scores of 1.14 and 1.58. One other male squirrel was killed but not sampled and one other squirrel was known to have survived in the area. Again, it was concluded that squirrel control had been effective but that this had not resulted in squirrels without experience of SQPV infection, albeit probably contracted before they colonised the low-density area at Goathorn.

A live-capture trap for grey squirrels, set where many cones had been eaten on the north-west shore of Goathorn Peninsula (Photo: Perline Bastid).

Following 10 days of pre-baiting, five traps were then set during 15-18 June in an area of mixed woodland with feeding of game and poultry southeast of Goathorn Peninsula. The main area was about 1.5 km from the nearest Goathorn trap sites and separated from Goathorn woodland by several hundred metres of heathland and farmland, but two traps were in a belt of Scots and Corsican pines extending towards this relatively treeless zone.

Seven female and thirteen male squirrels were caught, including one male from a spring litter and one female that had lactated, both in (different) traps in the strip of pines close to Goathorn. The young male and three other squirrels from this strip, including a small male and female probably from litters in autumn 2024 but also an adult male, had ELISA scores below 0.18, which is consistent with no exposure to SQPV infection. Three of four uninfected squirrels were among six trapped in Corsican pines closest to Goathorn, with one of four in a strip of Scots pines linking to the main area, where all seven tested squirrels were infected (three others of the twenty could not be tested). Trapping is continuing, with another ten samples sent already to Moredun, in a more extensive belt of Corsican pine to the southwest of Goathorn.

Some general conclusions

There remains much analysis of social data to complete. However, the level of volunteer effort together with favourable response from stakeholders indicates that removal of grey squirrels in the Purbeck peninsula, at least to the east of the heathland corridor of the Lulworth military ranges, would be adequately supported by the human population. However, more information is needed on the epidemiology of SQPV before red squirrels can be released on the mainland. It is encouraging that squirrels without prior infection with SQPV were sampled in habitat that has low grey squirrel density. Average density was up to about 1 squirrel per hectare in Corsican pines during local work in the 1990s, compared with 2-3/ha (and up to 9/ha) in deciduous woodland. Density of grey squirrels on Goathorn was well below 1/ha. It therefore seems likely that those sampled there with SQPV had been infected in areas of higher density before colonising an area that had been intensively culled. However, are squirrels with prior SQPV infection effectively immunised (hence unable to infect red squirrels) and, if so, how large a 'cordon sanitaire' would be required to avoid immigration of squirrels from elsewhere while still infectious?

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