

## **8 Recommendations**

### **8.1 Summary of project recommendations**

This section details the main recommendations of the project team for managing grey squirrels and minimizing tree damage, together with conserving the red squirrel in the future. Where appropriate, each recommendation contains a cross-reference for subsequent sections, which further elucidate the reasons, and/or proposed implementation methods for each suggestion.

- Trapping and shooting should be used for managing grey squirrel populations in Ireland – See Sections 8.5 and 8.6.
- Warfarin has too many logistical complications to be used on a widespread scale and cannot therefore be recommended for use in Ireland – See Section 8.4.
- Red squirrels should be protected using a multi-disciplinary approach by several stakeholders attempting to achieve the objectives of the All-Ireland Red Squirrel Species Action Plan – See Section 8.2
- A trap loan scheme presents the most efficient method of encouraging landowners to control any grey squirrel populations found in their respective woodlands – See Section 8.7
- Gun clubs should be encouraged to participate in regional grey squirrel control – See Section 8.6
- Landowners should be given access to educational material (printed or otherwise) on how to monitor their woodlands for damage and how to respond efficiently should any such damage be detected – See Section 8.3
- Relevant workers within the field of forestry should be educated about how to recognize the symptoms of pox virus in red squirrels and be informed of whom to alert in cases of such outbreaks. This also applies to the wider public – See Section 3.9.

- Relevant forestry workers also need to be informed in regard to the possible predation of grey squirrels by pine martens; more evidence supporting this hypothesis needs to be gathered – See Section 3.8
- Public awareness of the threat grey squirrels pose to young woodlands and to red squirrels needs to be maintained; the publication of an Education Pack for Irish schools will help to achieve this – See Section 8.8
- Some aspects of current forest policy relating to planting, management and/or harvesting may need to be altered to support attempts to protect native Irish wildlife such as the red squirrel, whilst reducing the risk of lost revenue due to grey squirrel damage – See Section 8.2
- Contact with other relevant bodies in the forestry, conservation and research sectors needs to be maintained, and if possible, funding should be made available for directly related research. Specific work may include pox virus monitoring, immuno-contraception and ecology studies of squirrels and pine martens. Awareness of research and lobbying work carried out by the European Squirrel Initiative should also be maintained
- The Forest Service should advise all woodland owners on the danger posed by grey squirrels and how to take appropriate action. Payment of annual premiums for broadleaves should be conditional on woodland owners taking responsibility for instigating appropriate action where the need arises ensuring that their woods are not damaged by grey squirrels
- A Red Squirrel Conservation Advisory Group (RSCAG) should be established along the lines of the CRISIS Advisory Group. This should be chaired by the Forest Service and include representatives from NPWS, Coillte, COFORD, third level institutions, Teagasc and woodland owners. The Forest Service and the EHS Northern Ireland should also be invited to participate in the RSCAG. The Group should initially meet once a year and its role would include: monitoring the follow on to the CRISIS project; agreeing priorities and making recommendations for further work related to the conservation of the red squirrel and the protection of the broadleaf estate against the grey squirrel. Funding, when the need arises, should be provided jointly by the Forest Service and the NPWS.

- The Irish Squirrel Survey carried out in 2007 should be repeated again in 2012. Responsibility for this should rest jointly with NPWS, the Forest Service and COFORD.
- Squirrel damage through bark stripping should be recorded in all future forest inventories. In addition the Forest Service should implement a bark stripping return form enabling all forestry stakeholders to record instances of bark stripping by squirrels. Returns should be collated by the Forest Service.
- The Forest Service should set about compiling a list of individuals and companies that are able to provide a pest control service to landowners. This list should be published annually in publications such as the ITGA Forestry and Timber yearbook.

## **8.2 Red squirrel conservation**

The conservation of red squirrels in Ireland requires a multi-disciplinary approach. Many of the components that may combine to achieve this are detailed in the All-Ireland Red Squirrel Species Action Plan. Several of the recommendations in Section 5 of the SAP (reproduced in Section 11.1) relate directly to the Forest Service. Supporting the SAP provides an excellent opportunity for positive public relations because of the public's attitude towards the species but implementing the SAP will have financial implications.

While the project team appreciates that several of the above targets may be difficult to achieve without contravening other areas of forest policy, it is hereby recommended that as many as possible are implemented.

Other recommendations were forwarded to the Forest Service in February 2008 in regard to improving habitat for red squirrels resulting from planting under the FEPS scheme. These are also reproduced in Table 8.1. Again, the feasibility of applying such recommendations is difficult to gauge, but it is recommended that the Forest Service consider at least some of them.

## **Table 8.1 - Recommendations made to Forest Service in relation to FEPS planting schemes**

### **Annex 1 - GPC 3**

In reference to the inter-planting of Japanese Larch or hybrid larch with broadleaf species, the paragraph could also promote Scots pine and Norway spruce.

### **Annex 2 - Rule 1**

In areas where red squirrel conservation is to be actively promoted, small-seeded broadleaves such as Ash and Alder should be recommended, as these provide grey squirrels with the least competitive advantage. In the same areas, large-seeded species such as oak and hazel should be avoided in particular. Certain regions (e.g. the west) could be treated differently re: broadleaf planting schemes. In certain cases where red squirrel populations are found near to the proposed plantation, consideration could be given to planting 15% Scots pine instead of broadleaves.

### **Annex 3 - Optional measures**

Wildlife corridors – It should be noted that where new planting of conifers takes place near sites with established red squirrel populations (e.g. existing Coillte plantations), corridors will assist red squirrel gene flow. However, the creation of corridors around new broadleaf plantations in regions where grey squirrels are established may increase risk of damage therein.

### **Annex 3 - Optional measures**

The Forest Service may consider adding pine marten den boxes to the list of wildlife boxes that may be installed in plantations. In relation to the augmentation of wildlife food supplies - Hazel planting good for reds in isolation, but bad for reds where greys are found, as greys benefit more from this food source.

### **Overall point to note:**

Nowhere does the document state (i.e. admit) that grey squirrels can be responsible for damage to young broadleaf woodlands.

## **8.3 Monitoring of broadleaf plantations for damage**

Regular monitoring of broadleaf woodland for squirrel damage from bark stripping is a critically important element in any protection strategy. Woodland owners need to be alerted of its importance and should be encouraged to walk several transects through their woodlands at least once annually for evidence of bark stripping and the presence of grey squirrels. Damage may easily be located during the winter months as it will not be hidden by foliage, while late summer assessments may also be useful for locating trees that have been freshly killed, as these will be very obvious as dead crowns amongst the rest of the green canopy. Bark stripping is easily seen and if fresh damage is evident, then it can be assumed that there are significant numbers of squirrels present prompting action. It is strongly recommended that all literature on forestry schemes include reference to the need for constant monitoring, together

with photographs of typical damage so that such symptoms may be easily recognized by landowners. A systematic method for monitoring damage is described in Section 5.2

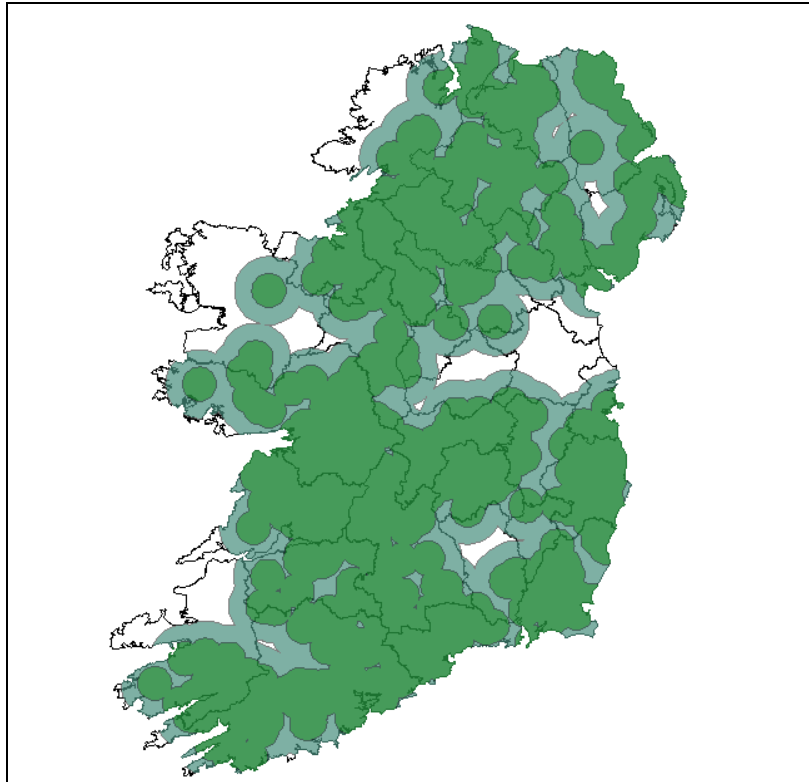
## **8.4 Grey squirrel control using warfarin**

The results from CRISIS indicate that warfarin can be successful in reducing grey squirrel numbers, and consequently tree damage. Although the method is widely used in Britain, and is also currently practiced by some private individuals in the Republic of Ireland, CRISIS has concluded that there are too many negative issues associated with its widespread use.

The operational trials with warfarin-dispensing hoppers showed that in dry weather, hoppers worked within acceptable parameters with a subsequent reduction in numbers of grey squirrels. However, such weather conditions are rare given the average Irish climate, especially during the ideal control window (February to May). During periods of wet weather, hoppers became regularly clogged and any control bait inside was rapidly rendered useless. Pursuance of such ineffective control measures would result in a significant waste of funds.

The effect of warfarin on non-target species is difficult to assess; currently red squirrels cannot be excluded from hoppers and no study has been carried out on possible secondary poisoning of protected predator species such as the pine marten. Given the findings of The Irish Squirrel Survey, the geographical area that red squirrels and pine martens have been found in, the area of 'safe' application of warfarin therefore becomes severely restricted.

Figure 8.1 shows both 10km and 20km radius buffer zones around known red squirrel populations in Ireland. It can be seen that the areas outside these zones where warfarin for grey squirrel control could be used without risk to red squirrels are clearly limited to only a small part of Leinster. If buffer zones around pine marten populations were also to be taken into account, this area would become even more restricted.



**Figure 8.1 10km (dark green) and 20km (light green) buffer zones around Irish red squirrel populations**

Furthermore, the use of poison in the agricultural and forestry sectors is coming under increasing pressure from the EU. Availability of warfarin for sale as a concentrate has already been withdrawn; it may now only be purchased as a pre-mixed bait. This suggests that the future availability of the product may be uncertain, with any possible local manufacturers unlikely to invest in production from a commercial standpoint. If warfarin forms part of a Forest Service control scheme, licensing for its use would need to be put in place. According to representatives of the Department of Agriculture, Fisheries and Food's Pesticide Control Service, such an application may take two to three years to process.

Average warfarin uptake was found to be extremely variable from one control season to another. This is most likely related to natural food availability during these periods. Given that repeated exposure to warfarin over several sequential days is required for grey squirrel control to be successful using this method, poor bait uptake may represent a waste of funds on both labour and bait. This should be considered in the context of other control options such as trapping, where only one 'exposure' (i.e. catch) is required to remove an animal from the population.

In any consideration on the use of warfarin cognisance must also be taken of the situation regarding the spreading population of pine martens in Ireland. The country is unique in its

degree of overlap of red squirrels, grey squirrels and pine martens, and some anecdotal evidence from The Irish Squirrel Survey suggests that pine martens may be controlling grey squirrel populations in parts of the midlands. The high degree of protection afforded to the pine marten in Irish legislation and the risk of accidentally poisoning the species, however slight, needs to be taken into account.

For these reasons the CRISIS team recommends that warfarin poisoning should not be encouraged as a control option.

## **8.5 Grey squirrel control via trapping**

Given the situation regarding warfarin being generally unsuitable for use in Ireland, the project team therefore advocates trapping and shooting as the most suitable methods for localized management of grey squirrel populations.

As can be seen in Table 6.2, trapping initially appears to be the most expensive option. However, this discrepancy is reduced after the first year, as the initial outlay for traps is not repeated. Other benefits shown in Table 6.3 combine to make trapping a reliable and efficient method for controlling grey squirrels with minimal effects on other wildlife or public safety.

The recommended methodology for trapping grey squirrel populations that may be applied by affected or interested woodland owners is covered in Section 9.1.

## **8.6 Grey squirrel control via shooting**

Shooting is recommended as an acceptable alternative to trapping (though the two control schemes are not mutually exclusive, and may be applied in combination with each other). Shooting, like trapping is somewhat more expensive from a labour perspective than poisoning. However, for some individuals, it may be the most suitable option. Many landowners will already have access to a shotgun or rifle, and in cases where they live close to woodlands, they may be in a position to carry out control personally. Shooting may also be done in conjunction with regular monitoring of a woodland for tree damage; regular observation on foot or from a vehicle in woodlands with good access will allow a landowner to study the condition of their plantation whilst simultaneously dispatching any squirrels encountered during such checks.

Where landowners are not in a position to dedicate themselves to such direct control, other options may be more suitable. For instance, estates that already run pheasant shoots may have focal areas at feeders that squirrels are drawn to. These provide excellent opportunities for dispatching squirrels with minimal labour. Landowners in such situations are likely to have already established contact with local gun clubs who may be encouraged to shoot squirrels on a selection of days throughout the year. Given that grey squirrels have recently been added to the NARGC's vermin list, there is now an incentive for gun club members to shoot them, as prizes may be awarded on a regional basis for the highest tallies. For landowners who have no such contacts, they may be encouraged to open up their woodlands for shooting, on the provision that any gun club members taking advantage of this also offer to shoot grey squirrels in the same plantation. Coillte should also explore such possibilities in regard to its game lettings.

The actual methods by which grey squirrels may be controlled using shooting vary greatly; some of the most common are dealt with in Section 9.2

## **8.7 Proposed implementation of project recommendations on grey squirrel control**

One of the key risks associated with any project such as CRISIS is the possibility that the recommendations will not be reviewed and where appropriate implemented. In Ireland the threat the grey squirrel poses to broadleaf growing and the red squirrel population will continue to escalate in the future unless some attempts are made to deal with the problem.

There are widely differing views on how to deal with the squirrel problem. Some have the view that Ireland's objective should be total eradication of the grey squirrel from the island. However the CRISIS team believes this is not possible from a practical point of view at the present time (either financially or logistically); future developments in technology such as immunocontraception may make this more achievable. Nevertheless woodland owners must be made aware of the threat posed by grey squirrels and be in a position to take action when the need arises. Effective action requires awareness of the issues surrounding the threats posed and of the detail surrounding control measures. A focus on managing grey squirrels on a local basis to protect woodlands from damage, whilst attempting to minimise the further spread of the population into as yet uncolonised areas should be an initial priority; this work may progressively include more and more grey squirrel populations, eventually being implemented on a national basis.

Although a case could be made to increase the level of grant aid for broadleaf woodland to cover the costs associated with squirrel control should the need arise, discussions with various affected landowners has led the CRISIS team to conclude that any such action is unlikely to result in effective control measures being adopted.

Accordingly CRISIS strongly recommends that the Forest Service introduce a trap loan scheme in a number of key strategic areas across the country. These include 'frontier zones' at the extremes of the grey squirrel distribution, along the Tipperary-Limerick border and in Wexford, together with 'core zones' in the centre of the grey distribution, in parts of Meath and Westmeath. Parts of Wicklow should also be considered.

The final selection of areas to be targeted would be done in cooperation with the Forestry Inspectors and the Teagasc Farm Forestry Advisors and be influenced by the results from the 2007 squirrel survey and local knowledge on the presence of grey squirrels and vulnerable broadleaf plantations. The FIPS database on broadleaves would also be used as a reference point. Early scoping carried out by the respective Farm Forestry Advisors suggest that at least 15 landowners in each of the regions mentioned above would be interested in becoming involved in such a scheme.

As part of the initiative it is recommended that the Forest Service purchases 500 traps initially and that these are loaned to the selected woodland owners in the areas concerned, with 20-30 traps per landowner probably being sufficient. The scheme would include a training programme. Success of such an approach can be monitored through tail returns or digital photographs of daily catches. Squirrel control would ideally be carried out by landowners themselves or by contracted pest controllers; the current CRISIS team could operate on a part-time basis, providing an advisory service concerning trapping methodology etc, and assessing results where appropriate. The Teagasc Farm Forestry Advisors would also assist in monitoring the application of the scheme.

The objective of the initiative would be to assess the feasibility of a trap loan or trap grant scheme for roll-out on a larger or even nationwide basis. It is recommended that the scheme initially be kept low profile and interested woodland owners could be invited to participate. A proposal to advance this initiative costing some €1,000 (including €7,000 for a School Education Pack) was sent to the Forest Service in May 2008.

Trap loan schemes funded by the British Government have been used successfully in Scotland since 2002. Pox-carrying grey squirrels moving north from England are seen as a major threat to the survival of the region's red squirrels. The trap-loan schemes are targeted at the containment of the grey squirrel spread. A new proposal (costing £578,000) to extend the present scheme for a further 2 years is under consideration and has active government support. The proposal envisages the appointment of a project manager and 4-6 squirrel controllers and an accompanying education and public relations programme. A "bottom up" approach involving woodland owners is seen to as being more effective compared with a "the top down" scenario.

## 8.8 Other recommendations

It is also recommended that an education pack relating to red squirrel conservation and the threat posed by grey squirrels be circulated to all primary and secondary schools in the country. A newly-drafted version of EHSNI's Schools Activity Pack (which was circulated to Northern Irish Schools several years ago) was submitted to the Forest Service for funding approval in March 2008 (see Figure 8.2). If approved, it is recommended that two copies of the document be sent to every school in Ireland.

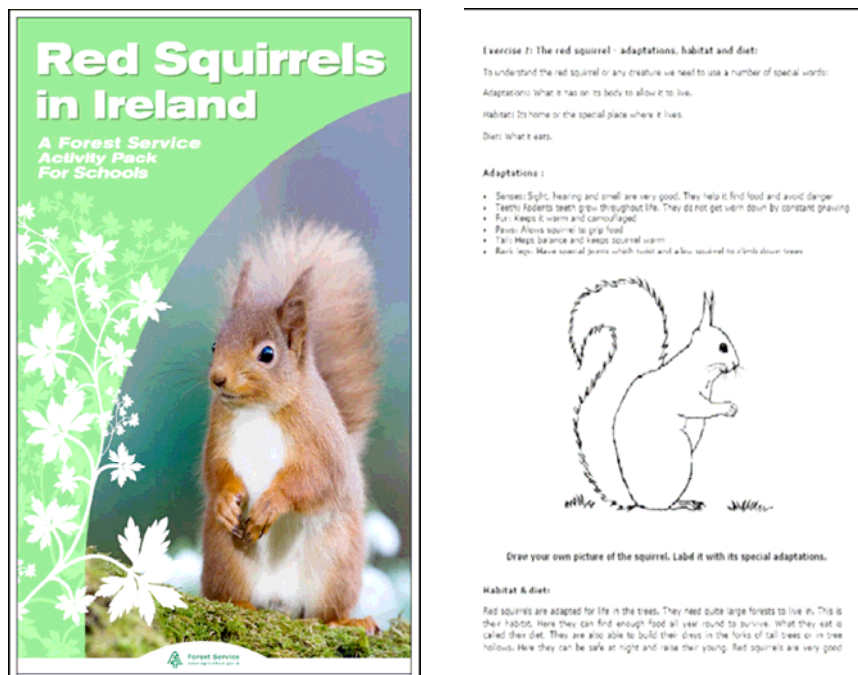


Figure 8.2 - Education pack sample pages

Circulation of the proposed document will ensure that the momentum gained in educating the general public on the squirrel issue over the past 3 years will be more easily maintained.

It is also recommended that the Forest Service stay appraised of the situation regarding any control initiative on grey squirrels in Dublin's Botanic Gardens and the Phoenix Park. Serious bark stripping on broadleaf trees has occurred in the Phoenix Park in recent years and a public safety issue has arisen in the Botanic Gardens arising from tame grey squirrels attacking or injuring visitors, with at least one 'incident' per month being reported.

A number of Irish third level institutions are also engaged in research on various aspects of squirrel ecology. The Forest Service would benefit from retaining contact with these and also with the European Squirrel Initiative.