



Dublin Mountains Visitor Centre
Red Squirrel (*Sciurus vulgaris*) Conservation
Management Plan

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October 2017
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Dublin Mountains Visitor Centre

Red Squirrel Conservation Management Plan

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1. INTRODUCTION

1.1 Background

Roughan & O'Donovan (ROD) Environmental was commissioned by South Dublin County Council to prepare this Red Squirrel Conservation Management Plan for the Montpelier Hill and Massy's Wood area as part of the planning application for the Dublin Mountains Visitor Centre.

The proposed Dublin Mountains Visitor Centre ("the Project") will be located at the northern gateway into the Dublin and Wicklow Mountains from Dublin City. In broad terms, the site location is in the valley of the largest tributary of the River Dodder, the Owendoher River, to the south of Rathfarnham. There are several blocks of state-owned land (Coillte conifer plantations) in and around this valley and the proposal focuses on the development of the tourism facility in the area of Hell Fire Wood on Montpelier Hill and Massey's Wood, which already provide extensive public access and walking routes linking into the higher mountains above 300 m altitude.

A population of Red Squirrel (*Sciurus vulgaris*) is present on Montpelier Hill and in Massy's Wood. In order to inform the Environmental Impact Assessment Report (EIAR) for the Project, squirrel surveys were conducted in November 2016, February 2017 and June 2017 within the site, including a 50 m buffer, where applicable. The purpose of the surveys was to identify and record the status of Red Squirrel in the site and to assess the impact of the Project on the species' population in accordance with the Transport Infrastructure Ireland (TII)/National Roads Authority (NRA) publication *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (2009).

The EIAR identified "medium-term likely significant impacts" on Red Squirrel as a result of construction and operation of the Project, mainly through the conversion of conifer plantation to broadleaved woodland, increased disturbance and potentially increased pressure from the invasive Grey Squirrel (*Sciurus carolinensis*).

This document provides a plan for the maintenance and enhancement of the Red Squirrel population in the Montpelier Hill and Massy's Wood area, including providing targets and actions required. The following documents have been used for reference and guidance in the production of this plan:

- All-Ireland Species Action Plan: Red Squirrel (NPWS & EHS, 2008).
- *Guidelines for Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (TII/NRA, 2008).
- Tonkin, J.H. (2008) Activity patterns of the red squirrel (*Sciurus vulgaris*). *Mammal Review* 13(2-4):99-111.
- Scottish Strategy for Red Squirrel Conservation (Scottish Squirrel Group, 2015).
- Guidelines for Woodland Creation where Red Squirrel are Present (Natural Resources Wales, 2015).

1.2 Site Description

The area to which this management plan applies is located in the Montpelier Hill and Massy's Estate area of South County Dublin. Hell Fire Wood is located on Montpelier Hill, which rises to 388 m and is the most north-westerly hill of the Dublin Mountains.

The slopes around Montpelier Hill are under agricultural grasslands on the north side and under conifer plantation on the remaining sides.

Hell Fire Wood is a working commercial forest and will remain so into the future. With a new visitor facility and enhanced amenity function there would be a need for some localised changes in land use and management to ensure the commercial forest and the planned amenity can coexist. Some mature trees have been retained adjacent to the car park both for aesthetic reasons and to screen of the car park. However, their retention will not be feasible in the long term due to the conifers' potential to become over-tall and prone to wind throw. The eastern side of Montpelier Hill within the site was clearfelled in 2016 and has not been replanted. A number of middle-aged broadleaved trees are found at Hell Fire Wood, as well as some mature trees which pre-date the forest and clearly grew in open ground in the past.

In contrast to Hell Fire Wood, Massy's Wood is a predominantly broadleaved woodland. There are some areas of coniferous plantation and specimen trees from the original Killakee Demesne. Mature specimen trees are found throughout the woodland. It is principally a recreational forest, though woodland management works are ongoing with the thinning of areas of Beech (*Fagus sylvatica*). It is expected that the management of the woodland can be adapted to accommodate the amenity value that may be required. Stone bridges and an area consisting of a walled garden originally part of the Killakee Demesne are located at the eastern extremity of the site. Glendoo Brook flows in a south-north direction along the eastern boundary of the Massy's Wood section of the site, with one tributary flowing east through Massy's Wood into Glendoo Brook, which is a tributary of the Owendoher River, which joins the River Dodder approximately 6 km downstream.

2. RED SQUIRREL

2.1 Ecology

Red Squirrel is the only squirrel species native to Ireland. It was once widespread but has declined significantly since the mid-20th Century following the first introduction of Grey Squirrel to Ireland in 1913. The current populations of Red and Grey Squirrels in Ireland are estimated at 40,000 and 250,000 respectively (NPWS & EHS, 2008).

Red Squirrel is an exclusively woodland species and is most successful in mixed broadleaved woodland, provided that Grey Squirrel is not present. Red Squirrel primarily eats seeds and exhibits scatter-hoarding behaviour, where food is cached in the ground to be consumed when the natural supply of food is low in late winter and early spring, at which time they will supplement their diet with fungi, flowers, buds and insects.

Squirrels are most active in the morning and late afternoon, having two long periods of active foraging. Red Squirrels breed from January and the first litter of kittens is born in March. If food is plentiful, Red Squirrels may have a second litter. Squirrels shelter in nests known as dreys. A drey is a large, dense ball of twigs, usually against the trunk of a tree or in the fork of two or more branches. Red Squirrels are not territorial, but have home ranges that change in response to food availability.

Where Red Squirrels and Grey Squirrels coexist, Red Squirrels eventually become displaced as a result of competitive disadvantage and, to a lesser extent (at present), the squirrelpox virus.

In recent years, Pine Marten (*Martes martes*) has expanded its range following an historic decline and Red Squirrels have returned to areas where they had previously been displaced by Grey Squirrels. This has been attributed to Pine Marten preying on and stressing Grey Squirrels more effectively as a result of Grey Squirrels being significantly heavier than Red Squirrels and their habit of spending more time on the ground.

2.2 Distribution

There are several populations of Red Squirrel in South Dublin, including small populations on Killiney Hill and Carrigoligan/the Scalp and a larger population in the connected woodlands of Montpelier Hill, Massy's Wood, Tibbradden, Kilmashogue and Ticknock. Other than Massy's Wood, these woodlands are entirely coniferous plantations, where Red Squirrels are better adapted to eating the seeds than Grey Squirrels. Therefore, these areas represent an important resource for Red Squirrels in South Dublin.

The squirrel survey undertaken on Montpelier Hill and in Massy's Wood identified Red Squirrel on the south side of Montpelier Hill and in the stand of mature conifers next to the Hell Fire Club car park. There is anecdotal evidence of both Red and Grey Squirrels in Massy's Wood and it is likely that both species utilise both areas to some extent.

3. CURRENT PRESSURES EFFECTING RED SQUIRRELS

Red Squirrels are currently subject to a number of threats and pressures, which are outlined below.

3.1 Grey Squirrels

It is likely that Grey Squirrels have colonised Massy's Wood from the north-east along Glendoo Brook from the Dublin suburbs. Grey Squirrels are better adapted than Red Squirrels to utilise the food sources in Massy's Wood, predominantly Beech mast. This reduces the food availability for Red Squirrels, which may in turn reduce the habitat connectivity between Montpelier Hill and Tibbradden. The presence of Grey Squirrels also has the potential to introduce squirrelpox virus to the local Red Squirrel population. Red Squirrel fatalities from squirrelpox have been recorded in Counties Dublin and Wicklow.

3.2 Habitat Fragmentation

Montpelier Hill is owned by Coillte and is a commercial forest. As such, areas that reach a threshold size are routinely clearfelled. This has occurred in recent years on the eastern side of Montpelier Hill, close to the Hell Fire Wood car park. A small area of conifer woodland has been retained as screening and Red Squirrel has been recorded here. Although it is not of sufficient size to sustain a breeding population, it forms part of a patchwork of mature woodland and provides connectivity between Montpelier Hill and Massy's Wood. Clearfelling results in Red Squirrels having to travel over open or exposed ground to reach other areas of woodland making them vulnerable to predation from foxes, dogs, Pine Martens and raptors.

3.3 Disturbance

The Montpelier Hill and Massey's Wood area is currently used as an amenity for some 100,000 visitors per year. The main activity undertaken is walking. However, the area is also used for cycling and horse-riding. The presence of people and dogs in the area can result in increased disturbance to Red Squirrels especially in open areas and along paths and woodland edges.

3.4 Road Mortality

Red Squirrels currently have to cross the Military Road between Montpelier Hill and Massy's Wood. Squirrels are occasionally killed by passing cars which may result in increased pressure on the population.

4. POTENTIAL IMPACTS OF THE PROJECT

The EIAR that was prepared in respect of the Project identified several potential impacts of its construction and operation on the local Red Squirrel population. These impacts are described below.

4.1 Increased Disturbance

Following the completion of the Project, the number of visitors to the site is expected to increase three-fold. This will inevitably lead to increase instances of disturbance and thus an overall reduction in habitat quality.

4.2 Habitat Loss and Fragmentation

Direct impacts include the loss and conversion of woodland as part of the project. This includes 2.5 ha of mature conifer woodland adjacent to the existing car park and approximately 4.5 ha on Montpelier Hill, which will be converted over time to mixed broadleaved woodland. Disturbance during construction and as a result of the increase in the number of visitors will also result in habitat loss and fragmentation. A total of 26 ha of existing woodland, clearfell and scrub will be converted to native broadleaved woodland. A licence has been sought from NPWS to remove one drey to allow for the construction of the car park.

4.3 Direct Mortality

There is the potential for accidental direct mortality of Red Squirrel to occur during tree-felling operations and increased traffic on Military Road.

4.4 Increased Presence of Grey Squirrel

The conversion of areas of clearfell, coniferous woodland and scrub to broadleaved woodland will make the area more attractive to Grey Squirrels, which will compete directly with Red Squirrels for food and may transmit squirrelpox virus to the Red Squirrel population. The increased numbers of visitors and the associated availability of food may also lead to an increase in Grey Squirrels.

5. MITIGATION PROPOSED IN THE EIAR

A range of measures were detailed in the EIAR to prevent, minimise and compensate for the impacts on Red Squirrels arising from the Project, as described in Sections 3 and 4, of this report. These measures included the following:

1. A derogation licence is being sought under Section 23 of the Wildlife Acts, 1976 to 2012 to destroy one red squirrel drey. It will include mitigation to reduce the significance of this impact.
2. Prior to any works being carried out, a pre-construction Red Squirrel survey will be undertaken 2 to 3 weeks prior to works to ensure no new dreys are present within 50 m of the works.
3. To compensate for the destruction of the drey, three artificial dreys will be erected in areas of suitable habitat. Suitable placement and installation of the artificial dreys will be supervised by a suitably qualified ecologist on the ground at least three weeks prior to the destruction of the drey under licence from NPWS.
4. Rope bridges will be constructed to allow safe passage for Red Squirrel across the R115 and areas where woodland and treelines have been removed. The positioning and installation of the rope bridges will be directed by a suitably qualified ecologist.
5. Planting should seek to establish new links and connections at the landscape scale, and the planting mix should maximise foraging opportunities for Red Squirrels and minimise those for Grey Squirrels.
6. Compensation should focus on the creation of woodland habitat, incorporating a diverse range of native tree and shrub species and enhancement of Pine Marten habitat.
7. Biodiversity-related signage should include a notice to deter members of the public from feeding Grey Squirrels.
8. Red Squirrel will be monitored on a yearly basis for an initial period of five years. Monitoring should include surveys, notes on habitat quality, condition of mitigation and any further actions required.

6. TARGETS AND ACTIONS

This Red Squirrel Conservation Management Plan is important to ensure the long-term viability of the Red Squirrel population in the area. The map in Appendix B of this report illustrates the proposed Landscape Plan for the area and also gives indicative locations for the placement of artificial dreys and Pine Marten nest boxes. The following is a list of targets to protect and enhance the Red Squirrel population:

1. To reduce the impacts on Red Squirrel during construction of the Project.
2. To enhance the existing and new habitats for Red Squirrel.
3. To ensure habitat connectivity between the conifer plantations on Montpelier Hill and Massey's through the retentions of treelines and hedgerows.
4. To prevent Grey Squirrel from establishing on Montpelier Hill.
5. To control Grey Squirrel in Massy's Wood including enhancements of Pine Marten habitat.
6. To monitor the population of Red Squirrel.

Table 1. Specific actions, corresponding targets and responsible parties.

Action	Target	Party Responsible
A suitably qualified Ecological Clerk of Works (ECoW) will be employed during the construction phase.	1, 2	SDCC
A pre-construction survey will be undertaken to update the results of previous surveys and inform updates to any granted licence to account for alterations to existing dreys or record the presence of dreys which have been constructed since the November 2016 drey survey.	1	SDCC, ECoW
Tree felling during site clearance and phased tree felling should be supervised by a suitably qualified ecologist to ensure squirrels have time to leave the areas being felled.	1, 2, 3	SDCC, ECoW
The phased conversion of existing conifer woodland to broadleaf woodland should be supervised by a suitably qualified ecologist to ensure that habitat connectivity remains between patches of mature woodland.	1, 2, 3	SDCC, ECoW
Phased conversion of conifer woodland to broadleaf woodland should contain trees of mixed ages to ensure a continuous food source.	1, 2	SDCC, ECoW
The Construction Management Plan should identify and protect selected linear features.	1,3	SDCC, ECoW
Rope bridges should be installed across the Military Road to minimise road mortality of Red Squirrels. This should be determined prior to construction by the ECoW.	2, 3	SDCC, ECoW
Artificial dreys (see Appendix A) will be erected in suitable locations throughout Montpelier Hill and Massy's Wood. These locations will be determined prior to construction by the ECoW and will depend on tree age, woodland management and construction activities.	1, 2, 3	SDCC, ECoW
Artificial dreys will be monitored yearly through direct observation for presence/absence as part of the five year monitoring program.	6	SDCC
Public signage should be used to deter members of the public from feeding Grey Squirrels, promoting Red Squirrel ecology	2, 3, 5, 6	SDCC, Public

Action	Target	Party Responsible
and to encourage reporting of Red and Grey Squirrels.		
A Grey Squirrel survey of Massy's Wood should be undertaken to estimate the population and distribution.	4, 5	SDCC
Pine Marten should be encouraged in the area as a form of Grey Squirrel control through the provision of artificial nesting boxes (see Appendix A). Nest box locations will be determined prior to construction by the ECoW.	2, 4, 5	SDCC, ECoW
A control program should be employed to reduce the numbers of Grey Squirrel.	2, 4, 5	SDCC
Long-term records should be made in relation to direct observations or evidence of the presence of Red and Grey Squirrels and any instances, either suspected or confirmed, of squirrelpox.	2, 4, 5, 6	SDCC, Public
The number of Grey Squirrels controlled should be communicated to the ECoW undertaking the monitoring.	2, 4, 6	SDCC
This management plan should be updated annually following monitoring of Red and Grey Squirrels at the site.	1, 2, 3, 4, 5, 6	SDCC

7. REFERENCES

NPWS & EHS (2008) All-Ireland Species Action Plan: Red Squirrel.

(TII/NRA, 2008). *Guidelines for Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*. Transport Infrastructure Ireland, Dublin.

Tonkin, J.H. (2008) Activity patterns of the red squirrel (*Sciurus vulgaris*). *Mammal Review* 13(2-4):99-111.

Scottish Squirrel Group (2015) *Scottish Strategy for Red Squirrel Conservation*.

Natural Resources Wales (2015) *Guidelines for Woodland Creation where Red Squirrel are Present*.

Wildlife Act, 1976, No. 39 of 1976.

Wildlife Act, 1976 (Protection of Wild Animals) Regulations, 1990, SI No. 112/1990.

Wildlife (Amendment) Act, 2000, No. 38 of 2000.

Wildlife (Amendment) Act, 2012, No 29 of 2012.

APPENDIX A

Nest Box Specification

Installation of Artificial Dreys

Artificial dreys shall be erected as follows:

- A suitably qualified ecologist, i.e. an Ecological Clerk of Works (ECoW), will direct the installation of artificial dreys;
- Artificial dreys will be installed in suitable areas of Red Squirrel woodland habitat;
- The artificial drey should have dimensions c. 450 mm × 350 mm × 350 mm and should be similar in form to the example shown in Plate 1 below (available from <http://www.wildcare.com>).



Plate 1. Artificial drey.

Installation of Artificial Pine Marten Nest Box

Artificial Pine Marten nest boxes shall be erected as follows:

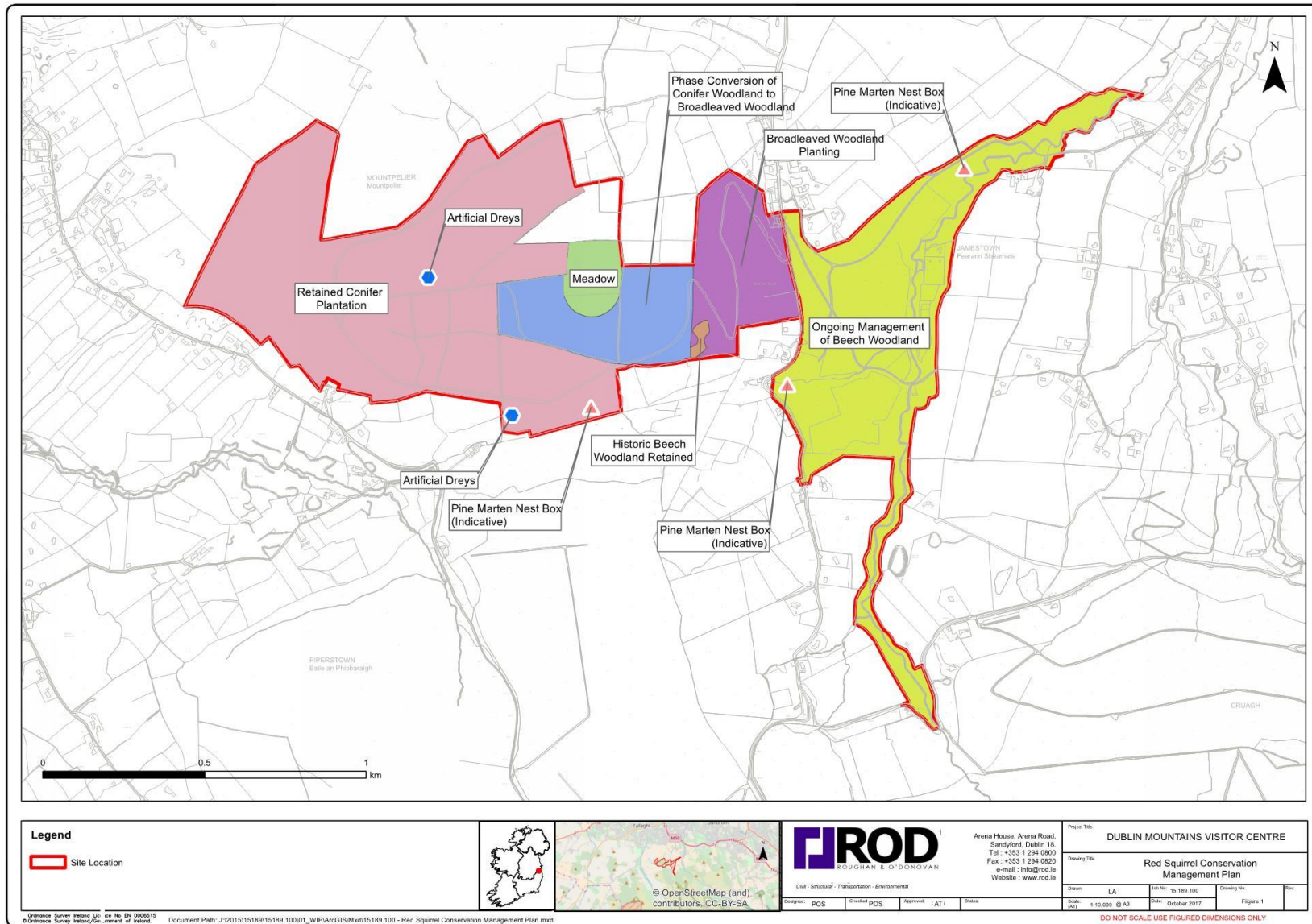
- A suitably qualified ecologist, i.e. an Ecological Clerk of Works (ECoW), will direct the installation of the artificial Pine Marten nest boxes;
- Two artificial Pine Marten nest boxes will be installed in Massy's Wood;
- The specification of the artificial nest box should be similar to the example shown in Plate 2 below (available from <http://www.nestbox.co.uk>).



Plate 2. Pine Marten Nest Box.

APPENDIX B

Proposed Landscape Plan





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