

1 Introduction

1.1 The CRISIS project

The Forest Service agreed in 2005 to fund a three-year project aimed at the conservation of the red squirrel and the protection of the broadleaf estate in the Republic of Ireland through judicious management of the grey squirrel problem. This arose because of increasing concern over the spread of the grey squirrel in Ireland, and the widespread perception that it represents a significant threat to the expanding broadleaf forest estate and the conservation of the native red squirrel. The project was given the pseudonym “CRISIS” meaning “Combined Research and Investigation of Squirrels in Irish Silviculture”.

1.2 CRISIS objectives

The primary objective of CRISIS was to develop a protocol and set of standardised operating procedures for the protection of the broadleaf estate, and the conservation of the red squirrel in the Republic of Ireland through judicious management and control of the alien grey squirrel population. In the Business Plan for CRISIS it was stated that this would be achieved through the pursuance of a number of key objectives:

- 1) Development and costing of a series of standard operating procedures and practical measures that will ensure the conservation of the red squirrel and the effective control of the grey squirrel
- 2) Development of strategies for the extension of the findings to woodlands outside of the pilot areas
- 3) Development and implementation of an educational programme for schools and other stakeholders focusing on the need to conserve the red squirrel from extinction
- 4) The establishment of contact with key stakeholders

1.3 Project Timeframe and Management

The project commenced in October 2005 and was completed in June 2008. It was carried out by a team comprised of Dr Michael Carey, Forestry and Management Consultant and Mr. Geoff Hamilton, a qualified Zoologist with a background in squirrel ecology. Dr Carey was Project Manager and Mr. Hamilton was employed full time to address the various tasks set out in the Business Plan. He reported to Dr Carey on an ongoing basis. The Project Team reported to both the Forest Service and an Advisory Group set up to oversee the project on a regular basis. The Group met on six occasions during the project and comprised:

Dr Eugene Hendrick, Chairman, Coford

Mr. Joe Barry, Woodland Owner and Journalist

Mr. John Connelly, Senior Inspector, Forest Service

Ms Bernie Kiely, Assistant Principal, Forest Service

Mr. Liam Kelly, Teagasc Farm Forestry Advisor

Dr Ferdia Marnell, National Parks and Wildlife Service

Dr Colin Lawton, National University of Ireland, Galway

Mr. Sean Rooney, Central Fisheries Board

Mr. Alistair Pfeifer, Coillte

Mr. Andy Verney, Gamekeeper, Rathvilly, Co Carlow

Doyle Foley, Accountants, Gorey, Co Wexford were responsible for the management of the project accounts and reported to Dr Carey on an ongoing basis.

2 Strategic context

2.1 Irish Forestry

There has been a sevenfold increase in the forest cover in the Irish Republic over the last one hundred years. Arising from a series of successful Government initiatives, which focused initially on the expansion of the public forestry sector and more recently on the expansion of private forestry, the forest area in the country has increased from 104,000 ha in 1904 to almost 700,000ha in 2007 (Forest Service 2007). The actual stocked area amounts to some 625,750 ha. Forty three per cent of the forest area is now owned by the private sector, a figure that is set to increase over the coming years as more farmers respond to attractive financial incentives available for afforestation. Over 14,000 farmers are currently engaged in forestry, a figure that was predicted to increase to 20,000 by 2007 (Bacon 2004).

The forestry strategy was reviewed in 2004 and the report that followed acknowledged that a broadleaf target of 30 percent had been set. It recommended that greater attention should be paid to achieving the target in a manner that maximises the benefits of broadleaves rather than a planting structure that just meets the target in a numerical sense. Besides recommending revision of the payment structures for grants and premiums, the review also recommended greater emphasis on the maintenance of plantations and on the development and implementation of appropriate measures for the control of deer and grey squirrel populations (Bacon, 2004).

2.2 Ireland's broadleaf cover and broadleaf planting

There are approximately 152,000 hectares of broadleaf forest in the Republic of Ireland representing some 21 percent of the total forest area or 24.3 percent of the stocked area. Almost 93,000 hectares or 61 percent of the broadleaf area is owned by the private sector, a figure that is growing significantly with increased farmer planting. One third or 28,000 hectares of the privately owned broadleaf sector has been grant aided over the past two decades. At current grant levels this represents an investment of approximately €170 million and an annual premium equivalent of some €7 million. Typically farmers receive

grants to cover afforestation costs and annual premiums for a period of 20 years following planting.

Details regarding the areas of broadleaves present in the 26 counties are shown in Table 2.1. The broadleaf planting pattern across the 26 counties between 1997 and 2006 is outlined in Table 2.2.

Table 2.1 – Total area of broadleaves by county in the Republic of Ireland (Source: FS 2007)

County	Forest Area (1000 ha)	Area of Broadleaves (1000 ha)	% Broadleaf Cover
Carlow	6.40	1.22	19.00
Cavan	13.65	4.87	35.60
Clare	43.44	10.53	24.20
Cork	70.89	14.04	19.80
Donegal	52.29	9.03	17.80
Dublin	4.41	1.02	27.30
Galway	54.62	11.52	21.01
Kerry	41.30	9.34	22.06
Kildare	9.20	5.66	61.05
Kilkenny	16.18	4.64	28.07
Laois	22.85	5.79	25.03
Leitrim	20.57	4.32	21.00
Limerick	20.35	3.07	15.01
Longford	07.97	2.32	29.20
Louth	2.02	0.81	40.00
Mayo	46.11	7.25	15.70
Meath	9.71	5.64	58.10
Monaghan	5.61	2.59	46.10
Offaly	19.69	7.49	38.00
Roscommon	19.41	4.31	22.20
Sligo	17.81	3.08	17.30
Tipperary	42.67	8.99	21.10
Waterford	22.52	7.48	33.20
Westmeath	10.37	4.28	41.20
Wexford	13.04	4.60	35.30
Wicklow	32.64	7.62	23.30
Total	623.75	151.95	24.30

Table 2.2 - Broadleaf planting 1997-2006 by county (ha) (Source: FS 2007)

County	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Carlow	13	14.85	34.59	8.43	16.57	31.21	31.23	25.98	58.26	15.34	249.46
Cavan	56	89.99	47.27	59.71	84.69	114.46	58.07	106.21	219.14	41.73	877.27
Clare	108	144.24	85.48	110.74	126.57	57.81	79.49	203.42	572.40	222.98	1711.12
Cork	193	272.63	176.23	160.92	165.95	486.31	300.43	602.33	1,133.24	507.88	3998.92
Donegal	127	46.46	37.17	60.20	70.80	72.58	7.65	45.81	293.94	39.23	800.83
Dublin	8	57.00	4.68	11.42	1.56	4.80	19.05	11.36	0.00	0.00	117.87
Galway	80	28.04	23.15	38.31	37.10	70.67	62.3	116.67	377.09	131.15	964.48
Kerry	57	61.03	61.81	67.97	146.32	289.88	187.46	291.97	521.98	244.67	1930.09
Kildare	111	136.91	78.00	57.70	35.27	102.60	61.96	59.23	39.39	46.38	728.44
Kilkenny	82	26.05	70.37	44.36	69.70	123.87	168.19	106.86	386.35	157.86	1235.61
Laois	61	79.18	16.80	116.39	48.30	82.25	30.34	71.10	120.90	30.00	656.26
Leitrim	70	46.40	31.18	35.91	35.53	39.70	49.82	71.32	332.04	34.40	746.30
Limerick	52	50.83	86.19	148.37	106.51	202.98	151.03	123.24	522.54	145.61	1589.30
Longford	46	12.34	37.06	46.25	54.88	138.83	50.21	52.01	172.47	61.34	671.39
Louth	0	7.45	2.19	2.98	1.78	16.20	6.4	8.47	0.00	10.20	55.67
Mayo	58	87.42	77.62	114.63	80.16	112.54	67.28	98.42	253.17	76.34	1025.58
Meath	102	101.94	150.86	161.61	97.53	45.83	108.78	64.93	96.65	114.78	1044.91
Monaghan	8	9.39	0.00	2.09	7.38	13.36	13.97	20.87	46.99	37.10	159.15
Offaly	35	143.36	166.20	107.95	94.91	75.18	106.06	112.63	168.76	68.76	1078.81
Roscommon	63	67.69	44.57	42.29	44.26	39.04	31.49	90.33	241.92	42.53	707.12
Sligo	80	20.16	10.37	37.19	37.95	24.40	39.71	50.90	195.94	30.34	526.96
Tipperary	225	193.55	266.85	357.79	258.67	180.68	199.7	164.23	767.57	212.70	2826.74
Waterford	63	58.17	73.69	52.27	21.40	69.92	32.38	32.16	170.03	95.55	668.57
Westmeath	114	153.33	129.42	48.14	137.01	91.43	110.98	134.81	213.49	55.30	1187.91
Wexford	35	73.60	121.50	79.43	74.87	51.76	80.63	104.26	144.06	82.25	847.36
Wicklow	25	77.34	81.99	53.52	66.87	84.57	20.76	30.19	45.80	22.74	508.78
Total	1872	2059.33	1915.24	2026.57	1922.54	2622.86	2075.37	2799.71	7094.12	2527.16	26914.90

Key features in Table 2.1 and Table 2.2:

- Clare, Cork, Galway and Kerry have the largest area of broadleaves
- Almost 27,000 ha of broadleaves were planted between 1997 and the start of 2007
- Clare, Cork, Kerry, Kilkenny, Limerick, Offaly, Tipperary and Westmeath have shown the largest increase in the area of new broadleaves cover over the period 1997 to 2006
- Kildare, Louth, Meath, Monaghan and Westmeath have the highest percentage broadleaf cover relative to the overall forest estate in the respective counties

Table 2.3 provides a breakdown of the broadleaf area by species. Although there is limited information on the species planted over the last decade the total area planted since 1996 comprised some 20 percent for each of the main species, oak, ash, sycamore and beech with alder, birch and other species making up the remainder. There are indications that there may be ongoing changes in species mix. Increased proportions of alder have been a feature in recent years with the species now accounting for some 40 per cent of the total area planted. Such changes reflect the quality of the various site types available for planting in addition to evolving information on species performance and the high cost of protecting some species against deer and grey squirrel.

Within the Coillte estate 73 percent of the broadleaves is located in areas east or south of the River Shannon. Beech is the most common species accounting for 23 percent of the area, with oak, ash and birch being in the order of 20 percent and sycamore about 6 percent.

Table 2.3 - Species composition of the broadleaf estate (Source: FS 2007)

Species	Area (1000 ha)
Sessile and Pedunculate Oak	14.63
Beech	8.71
Ash	19.2
Sycamore	8.06
Various Birch species	29.69
Various Alder species	11.50
Other long living broadleaves	9.55
Other short living broadleaves	50.64
Total	151.95