R.A.P.T.O.R.

Recording and Addressing Persecution and Threats to Our Raptors

2015

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

An Roinn Ealaíon, Oidhreachta, Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

An Roinn Caiteachais Phoiblí agus Athchóirithe
Department of Public Expenditure and Reform

REPORT PREPARED BY

NATIONAL PARKS & WILDLIFE SERVICE
DEPARTMENT OF ARTS, HERITAGE, REGIONAL, RURAL AND GAELTACHT AFFAIRS

UTILISING ANALYSIS AND RESULTS FROM

REGIONAL VETERINARY LABORATORIES,
DEPARTMENT OF AGRICULTURE, FOOD AND THE MARINE

AND

THE STATE LABORATORY
DEPARTMENT OF PUBLIC EXPENDITURE AND REFORM

Corressponding author:

Dr. Barry O'Donoghue,
NPWS,
Custom House,
Flood Street,
Galway.

Barry.O'Donoghue@ahg.gov.ie

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SUMMARY

This is the fifth annual report from the RAPTOR scheme detailing direct threats and pressures (other than habitat related threats and pressures) facing birds of prey in Ireland. A key objective of the RAPTOR scheme is to provide a platform for informed, targeted and effective approaches in addressing these threats and pressures.

Poisoning (whether intentional or not) and persecution (always illegal) are of particular concern. Poisoning of any wildlife (other than rats or mice) is recorded, because in the vast majority of cases raptors could have ingested the same poison, or fed on prey that had itself been poisoned. In 2015, a total of 35 poisoning or bird of prey persecution incidents were confirmed in Ireland. This is the largest number of confirmed incidents since the RAPTOR protocol came into being in 2011 and follows an increasing trend in recent years. The 35 poison/persecution incidents were comprised of 26 poison incidents involving 23 birds of prey and 3 poison bait incidents (2 of which resulted in the deaths of multiple bird deaths including Starlings and corvids, as well as dogs). In addition, there were 9 separate incidents where birds of prey were shot – the highest number of such incidents recorded in a single year since records began. A number of suspected and unconfirmed incidents were also recorded. Such incidents are held on the NPWS RAPTOR database. Such cases are as informative and important as confirmed cases in providing data on threats to our raptors.

Of the raptors confirmed to have been poisoned or persecuted in 2015, the most frequent casualty was Common Buzzard (15), Red Kite (5) Barn Owl (3), Peregrine Falcon (2), Kestrel (2), White-tailed Sea Eagle (1), Sparrowhawk (1), Long-eared Owl (1) and Hen Harrier (1).

1. INTRODUCTION

This is the fifth annual report derived from a national scheme to monitor human related injury and mortality in Irish birds of prey, as well as any incidents of poisoned bait or poisoning of any wildlife. The scheme is known as the RAPTOR (Recording and Addressing Persecution and Threats to Our Raptors) scheme.

In 2011, a protocol for dealing with threats and disturbance to birds of prey was agreed between the National Parks & Wildlife Service (Department of Arts, Heritage & the Gaeltacht), the Veterinary Laboratory Service (Department of Agriculture, Food and Marine) and The State Laboratory (Department of Public Expenditure & Reform). The full text of the protocol as updated in 2013 is presented in Appendix 5. The majority of records produced in this report have been derived from work under this protocol. The NPWS RAPTOR Database was also set up in 2011.

The national scheme to monitor human, non-habitat related disturbance to Irish birds of prey and other wildlife species has seven key aims:

1. Collection of evidence to support prosecutions for illegal poisoning.
2. Monitoring of the impact of poisoning on Irish raptor populations.
3. Monitoring the incidence of poisoning and impact of illegal poisoning on other vulnerable species (e.g. Raven)
4. Monitoring the incidence of poisoning in species vulnerable to secondary poisoning by rodenticides (in particular Common Buzzard, Barn Owl, Kestrel, Red Kite and Long-eared Owl).
5. Monitoring the impact of other types of persecution on Irish raptors and maintaining a database of such incidents.

6. Providing evidence of the causes of death of other wildlife species where poison is strongly suspected
7. Quantifying the use of specific poisons.

The incident recording database maintained by the National Parks & Wildlife Service also incorporates other human related incidents of raptor deaths, disturbance or injury such as road casualties and collisions with fences, wind turbines and power lines. Impacts of habitat change are not recorded in this protocol.

The primary aim of this report is to catalogue all records of human non-habitat related disturbance and threats to birds of prey. Doing so will add to the datasets of previous years and build a clear and robust picture of poison and persecution incidents, with data including poison and persecution methods, peaks months for incidents, associated land-use types, black spot areas and much more. The recording, analysis and reporting of such data allows a more informed approach to dealing with these issues by means of education, enforcement and/or forward planning. The addition of information on other types of mortality and injury gives a more complete picture of the threats to wildlife.

2. CONFIRMED PERSECUTION AND POISONING INCIDENTS 2015

Table 1 lists all persecution and poisoning incidents that were confirmed and recorded in 2015, while Figure 2 displays the geographical location of these incidents.

Table 1. Confirmed Persecution & Poisoning Records 2015

No.	10km	County	Month	Bait	Receiving Species	Issue	Comments
1	V46	Kerry	Jan	-	Hen Harrier	Shot	Satellite tracked young female named "Heather"
2	W87	Cork	Jan	-	Common Buzzard	Poison	Chloralose, Brodifacoum and Bromadiolone
3	C31	Donegal	Jan	-	Common Buzzard	Poison	Difenacoum
4	T29	Wicklow	Jan	-	Red Kite	Poison	Carbofuran and Alphahloralose
5	T16	Wexford	Jan	-	Red Kite	Poison	Carbofuran, Broadifacoum, Bromadiolone,
6	N91	Wicklow	Jan	-	Common Buzard	Shot and Poison	Shot killed bird. SGARs in system: Brodifacoum, Bromadiolone, Difenacoum and Flocoumafen
7	T27	Wicklow	Jan	-	Common Buzzard	Poison	Flucomafen
8	N93	Kildare	Feb	-	Common Buzzard	Shot and Poison	Shot killed bird. SGARs in system: Bromadiolone and Flocoumafen
9	O14	Dublin	Feb	-	Common Buzzard	Poison	Bromadiolone and Brodifacoum
10	T29	Wicklow	Feb	-	Red Kite	Poison	Carbofuran and Alphachloralose
11	N94	Meath	Mar	-	Rooks, Jackdaw, Grey Crow (50 birds)	Poison	Alphachloralose

12	M41	Galway	Mar	-	Common Buzzard	Poison	Brodifacoum, Bromadiolone, Difenacoum and Flocoumafen
13	M72	Galway	Mar	Lamb laced with Nitroxynil	-	Poison Bait	Nitroxynil
14	R72	Limerick	Mar	-	Sparrowhawk	Shot	
15	O03	Meath	Apr	-	Barn Owl	Poison	Flucomafen , Bromadiolone and Brodifacoum
16	L74	Galway	Apr	Lamb carcass laced with Alphachloralose	White-tailed Sea Eagle	Poison (and Bait)	Alphachloralose
17	O01	Wicklow	May	-	Long-eared Owl	Poison	Bromadiolone
18	M71	Galway	May	-	Peregrine Falcon	Poison	Brodifacoum
19	M73	Galway	May	-	Barn Owl	Poison	Brodifacoum and Flocoumafen
20	M65	Galway	May	-	Barn Owl	Poison	Flocoumafen
21	T38	Wicklow	Jun	-	Red Kite	Poison	Alpha Chloralose, Bromadiolone, Flocoumafem
22	S91	Wexford	Jun	-	Common Buzzard	Poison	Brodifacoum and Flocoumafen. Had to be euthanised
23	S91	Wexford	Jun	-	Common Buzzard	Poison	Brodifacoum, Flocoumafen
24	T28	Wicklow	Jul	-	Red Kite	Poison	Brodifacoum, Bromadiolone, Flocoumafen
25	N91	Wicklow	Jul	-	Common Buzzard	Poison	Bromadiolone, Flocoumafen. Had to be euthanised
26	S03	Tipperary	Jul	-	Common Buzzard	Shot	

27	S95	Wexford	Jul	-	Common Buzzard	Shot and Poison	Shot killed bird. SGARs in system: Brodifacoum and Flocoumafen
28	S83	Wexford	Jul	-	Common Buzzard	Shot and Poison	Shot killed bird. SGAR in system: Brodifacoum
29	O25	Dublin	Sep	-	Kestrel	Poison	Flucomafen
30	J00	Louth	Sep	Sardines	Hooded Crow (and dogs)	Poison Bait	Carbofuran
31	R54	Limerick	Sep	-	Peregrine Falcon	Shot	
32	M22	Galway	Sep	-	Starlings (5 birds)	Poison Bait	Alphachloralose
33	T27	Wexford	Oct	-	Common Buzzard	Poison	
34	N41	Offaly	Oct	-	Common Buzzard	Shot	
35	N50	Offaly	Dec	-	Kestrel	Poison	Bromadiolone, Difenacoum and Flocoumafen

Figure 1 compares the amount and type of poison and persecution incidents recorded in between 2011 and 2015.

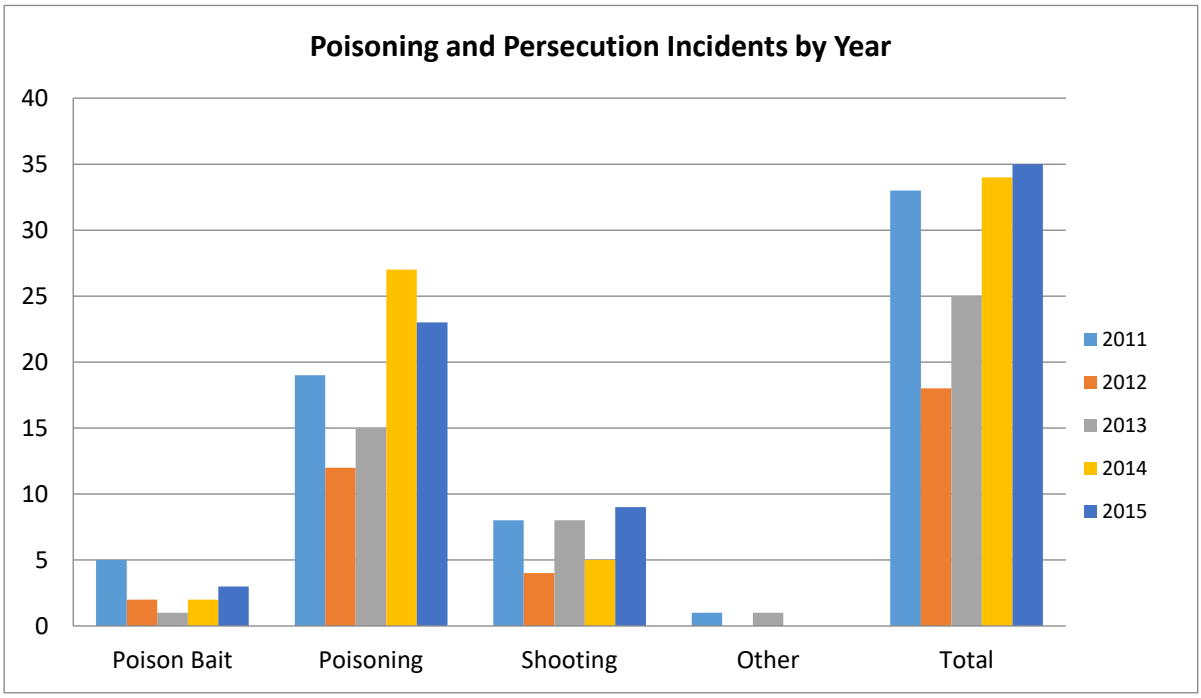

Figure 1. Annual poison and persecution incidents 2011 to 2015.

Figure 2 shows the distribution of poison and persecution incidents in 2015.

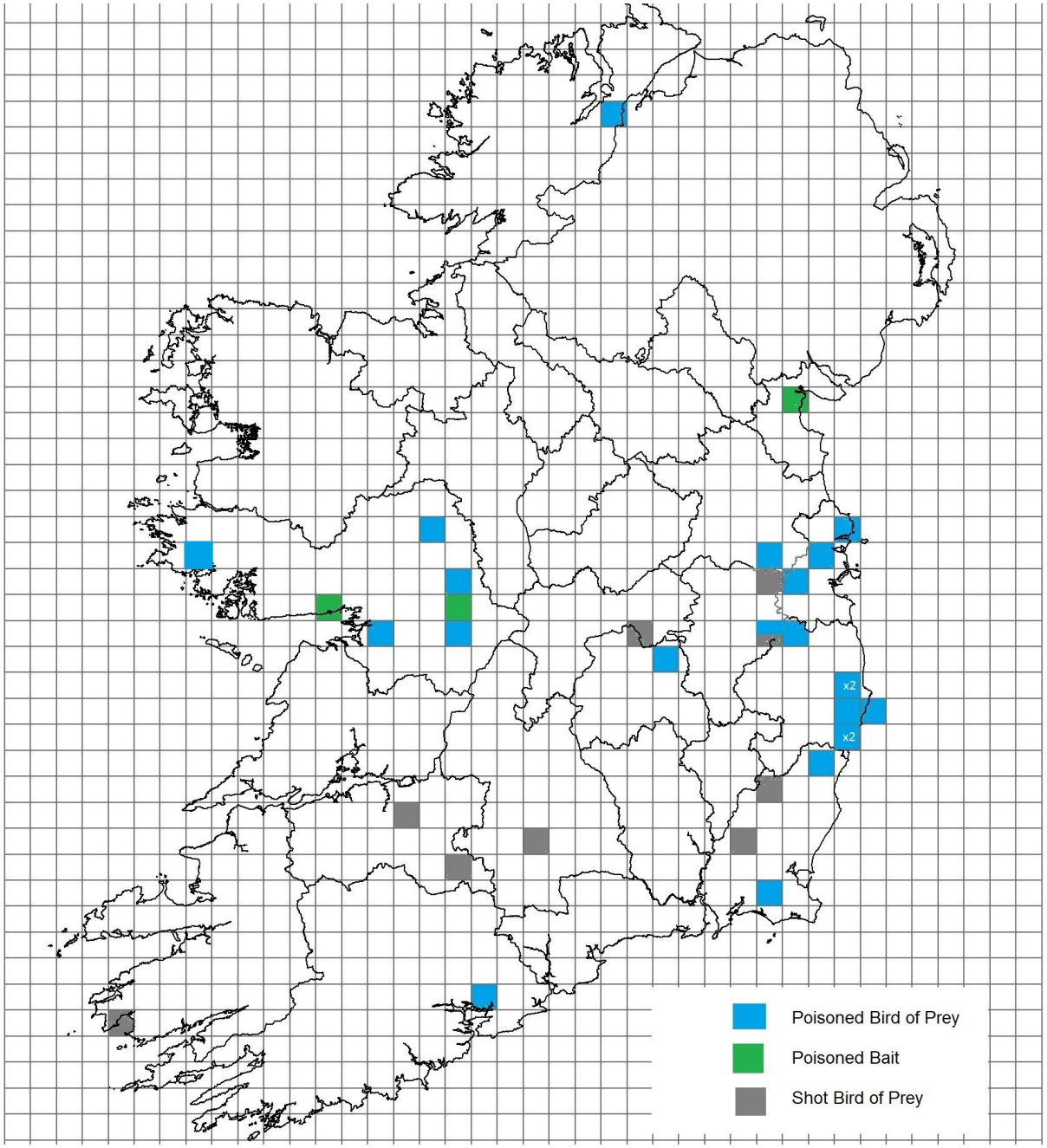

Figure 2. Map of Confirmed Poisoning and Persecution Incidents in Ireland 2015.

Figure 3 summarises the number of illegal incidents on a monthly basis in 2015, whereby use of illegal poison, poison meat bait or shooting was confirmed.

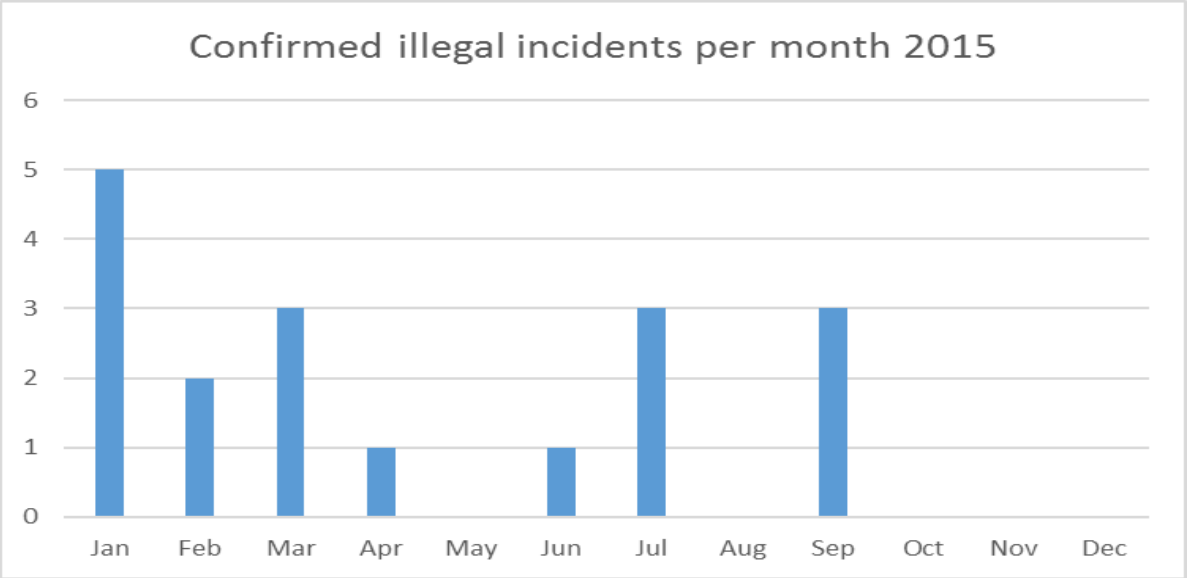

Figure 3. Confirmed illegal incidents per month in 2015.

3. DISCUSSION OF RESULTS

The number of confirmed poison and persecution incidents recorded in 2015 was the highest recorded in a single year since the RAPTOR protocol came into being in 2011. As referenced in previous reports, the number recorded is likely to be only a fraction of the number of incidents that occurred in total. Some incidents might never have been discovered if not for radio/satellite tracking devices that pointed towards the location of the birds, while other incidents were discovered through detailed investigative work of NPWS rangers and information from the public. As the monitoring scheme continues and expands in the future, a more complete picture of such threats to our native birds of prey and a long-term trend of poisoning and persecution will emerge. This will inform the relevant authorities of where best to target actions to prevent such incidents re-occurring and act as a measure of success with regard to actions taken. Already, trends are beginning

to emerge as to the main threats, the main victims, timing, methods and reasons for poisoning and persecution incidents.

As in previous years, a significant proportion of records in 2015 were in the east of the country. Incidents involving poison, persecution or other threats to Raptors are however very widespread across the country can be seen in Figure 8, with particular poison and persecution black spots where multiple incidents have been recorded between 2007 and 2015.

January was again a key month for incidents in 2015, as was July.

There are a number of anecdotal records of birds of prey having been poisoned or persecuted in 2015. While such incidents are not included on the confirmed persecution list, they are recorded and collated in the database. Other records of bird of prey mortality and injury records are useful as they point towards other existing and potential threats to these species. These are also held on the National Parks & Wildlife Service database.

The five principal poisons that were implicated in the deaths of birds of prey in 2015 were Flocoumafen (in 13 cases), Brodifacoum (12), Bromadiolone (12), Alphachloralose (7), Carbofuran (4), Difenacoum (4), and Nitroxynil (1). Alphachloralose is only registered and approved for the control of rats and mice. Carbofuran, which is highly lethal to vertebrates has been banned in Europe since 2008. Both Alphachloralose and Carbofuran are regularly found used together in Ireland by those targeting Peregrine Falcons. Brodifacoum, Bromadiolone, Difenacoum, and Flocoumafen are second generation anticoagulant rodenticide ingredients that are regularly linked with secondary poisoning of wildlife. The spike in incidents involving Flocoumafen in 2015 (13 incidents compared to just 1 in 2014) is noteworthy.

Table 2 summarises the recorded instances of persecution since 2007, according to species affected. It should be borne in mind that the RAPTOR protocol including a more robust approach to detecting and confirming persecution came into being in 2011, but a certain number of incidents between 2007 and 2010 were previously recorded (see Appendix 1).

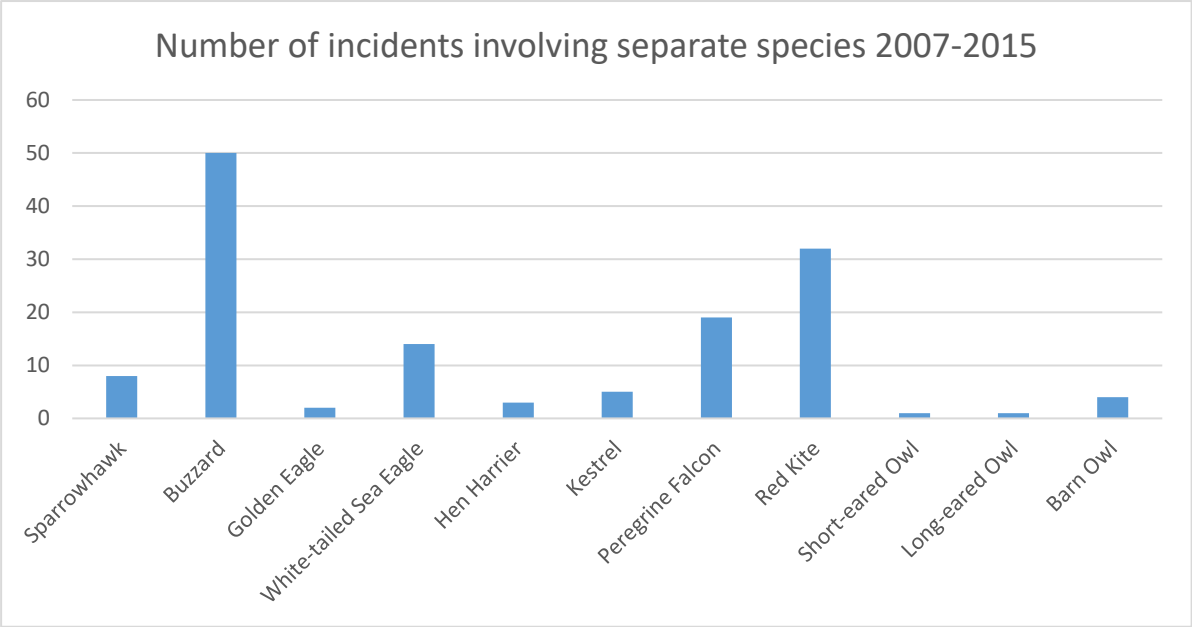

Figure 4. Number of incidents involving separate species 2007 -2015.

(Common) Buzzard and Red Kite are the two most highly recorded victims of poisoning or persecution. In the majority of cases, these incidents have been found to originate with Second Generation Anti-coagulant Rodenticides (SGARs) and the poisoning is believed to have been bio-accumulated from the ingestion of rodents and thus is taken to be secondary and unintentional. Barn Owls are also known to suffer a high incidence of poisoning from SGARs, with over 85% of Irish Barn Owls having detectable residues in their systems (J. Lusby pers. comm.), but the number of incidents recorded by the RAPTOR protocol is low. In addition to some Buzzards which have also been shot; Kestrel, Hen Harrier, Peregrine Falcon, Sparrowhawk and White-tailed Sea Eagles are among those confirmed to have been deliberately targeted and persecuted.

Standard toxicology examinations came into being with the RAPTOR protocol in 2011. Figure 5 summarises both the number of incidents and the number of casualties associated with poisoning between 2011 and 2015. The data is presented according to poison type. Poisons are regularly found acting in tandem and until quantitative tests are developed it is not possible to say in all cases that a particular poison was responsible for death.

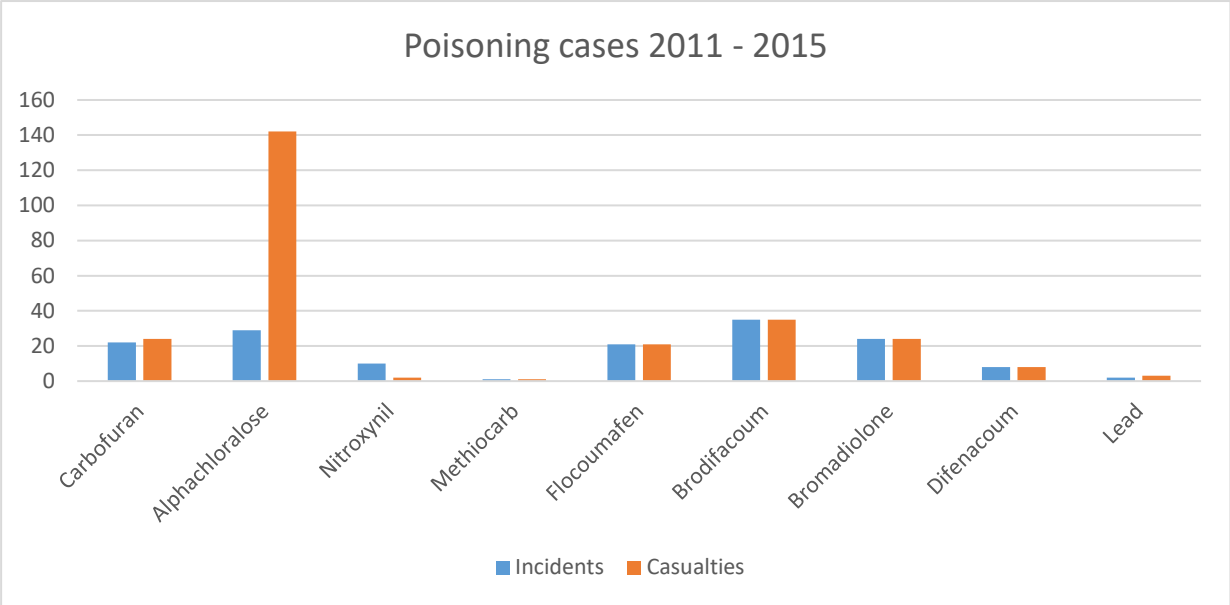

Figure 5. Poisoning Cases 2011 – 2015.

Alphachloralose stands out as the single poison that has been involved in the highest number of casualities recorded since 2011. This is primarily because of single cases involving large numbers of victims. The highly lethal Carbofuran has also been recorded in a relatively large number of incidents, as has the SGAR agent Brodifacoum.

Figure 6 provides a breakdown of prevalence between rodenticide type poisons and other poisons.

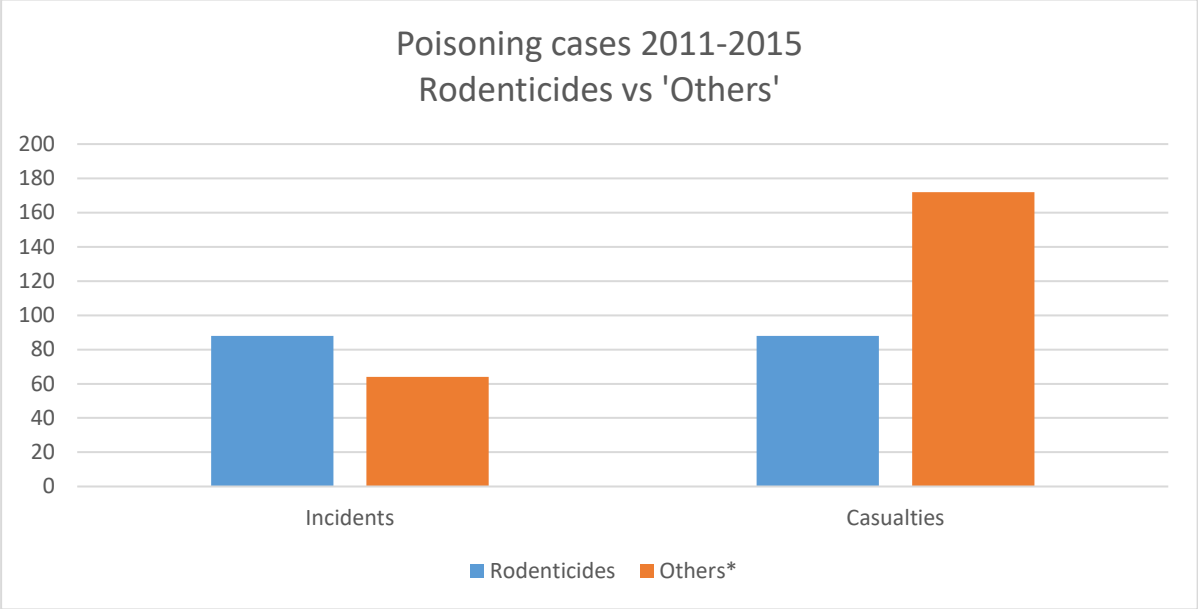

Figure 6. Poisoning Cases 2011 – 2015: Rodenticide vs 'Others'

* includes Alphachloralose

Poisons other than rodenticides have accounted for 42% of all incidents recorded and confirmed during the period of the RAPTOR protocol to date. These poisons are namely Carbofuran, Alphachloralose, Methiocarb and Lead. The incidents involving lead were accidental. The other poisons would have been used with the intent of targeting wildlife. Methiocarb, a molluscicide, was banned since 19 September 2015. The biocides Carbofuran and Alphachloralose have been discussed above.

Rodenticides have been recorded in 58% of incidents thusfar. As discussed already, their presence and impact is taken to be secondary and unintentional. Nonetheless, they have lethal properties and their presence in protected wildlife is unwelcome. The Campaign for Responsible Rodenticide Use has been established with key objectives that involve reducing the prevalence of rodenticides in protected wildlife (Appendix 6).

4. OTHER DATA RECORDED AND ANALYSED

The database has recorded the land use type with which poisoning and persecution incidents have been associated. While particular trends with regard to land-use type and recent activity in the areas are already emerging, for the time being these will not be reported on publically. Other data recorded includes the age and sex of the birds/animals affected.

5. PROSECUTIONS

There were two charges brought to court arising from investigations under the RAPTOR protocol in 2015. Both related to the use of poison meat bait and both were successfully prosecuted.

6. INDIVIDUAL LIFE STORIES

Reading a report such as this, which deals primarily in facts and figures, can remove the reader somewhat from the real damage caused to our environment and wildlife by the irresponsible or deliberate actions of certain individuals. Every individual bird or animal that was lost in 2015 and indeed in previous years has their own individual life story, as seen in the case below, described in a Press Release from the Department of Arts, Heritage & the Gaeltacht in January 2015:

- A satellite tagged hen harrier was found shot dead this week in Co Kerry.
- The young female had been followed by thousands of people across the world on the website henharrierireland.blogspot.ie
- She was fitted with a satellite tag

· This was part of an education and awareness campaign that highlighted the spectacular nature of these rare birds among the local community as well as a national and international audience.

· It is a serious offence under the Wildlife Act and can result in a fine and penalty

· The NPWS has launched an investigation into the shooting of this Hen Harrier and has informed local Gardaí

♦ Dr. Barry O'Donoghue of the National Parks & Wildlife Service oversaw the satellite tracking project. Reacting to the shooting of the bird, Barry said:

♦ "Knowing this bird since she was a tiny chick, and having followed her every movement remotely and in the field was a real privilege. It was heart-breaking to find this young bird when she had been shot.

♦ "Through the satellite tracking programme, thousands of people were given an insight into the life of this bird. Her progress was followed from Kerry to the Wicklow Mountains. She visited County Meath, then Louth and Monaghan and Armagh and rested by the shores of Lough Neagh, before making a long distance journey all the way to the Atlantic cliffs of South County Cork.

♦ "She stayed there for most of her first winter with a number of other harriers. From these older birds, she would have learned of good hunting places and safe places to spend each night.

♦ "In late 2014 she returned to South Kerry, back to the very site where she was born. It seems likely that she might have returned to breed there this summer, but unfortunately her life has been cut short."

Figure 7. Heather the Hen Harrier. Clockwise from top left: Heather and her siblings in nest. Heather's journey throughout Ireland until she was shot in South Kerry. Heather found dead. There was significant national and international media coverage of this incident, which was widely condemned.

7. CONCLUSION

After five years of the RAPTOR protocol, it is clear that human, non-habitat related threats to Irish raptors are widespread. There are blackspots throughout the country, many of which are in areas where there is no NPWS Conservation Ranger. It would be naive to think that any more than a fraction of raptor poisoning and persecution can be formally recorded. The chances of finding a bird carcass, considering a varied landscape and terrain, tall vegetation and scavengers can be considered as slim. The relatively large proportion of individuals recorded in the NPWS database that had been fitted with telemetry (namely radio and satellite tags) suggests that many more birds without telemetry devices were not discovered. It is considered even more difficult to discover birds that have been shot illegally, as the perpetrator will often remove or conceal the carcass to reduce the chance of being apprehended.

Intelligence gathering, training, surveillance and forensic analysis of wildlife crime scenes are all necessary to get on top of wildlife crime. A large amount of dedicated investigative work on behalf of regional NPWS staff in cases of Peregrine Falcon targeting clearly shows

the need for authorised officers on the ground to deal with such illegal acts. Much more damage could be caused in the absence of such action.

The RAPTOR protocol (providing the NPWS database and annual reports) is beginning to provide a clearer picture of poisoning and persecution in Ireland and just how big an issue it is. We now have a good idea of the species affected, the methods of poisoning and persecution and hotspots of such incidents. Continuing to record confirmed and possible events in a systematic fashion will build on the database and provide stronger background information to target illegal activity through enforcement and education and in turn combat human-related raptor mortality. Likewise, the information garnered from recording and analysing incidents of road, turbine or fence collisions can help inform forward planning on such matters.

Recording information

Members of the public are asked to contact their local National Parks & Wildlife Service office (see www.npws.ie/contactus) with any information regarding poisoning or persecution incidents. These matters will be treated confidentially. If the incident occurs out of normal office hours, please take a photograph of the carcass/poison and record its precise location.

Local wildlife rehabilitators are usually the best placed to treat injured wildlife (see www.irishwildlifematters.ie).

Wildlife rehabilitators are asked to submit annual returns of injuries and deaths of birds of prey to NPWS, using a standard reporting form. Where foul play is suspected, NPWS or An Garda Síochána should be contacted immediately upon receiving the animal or hearing about the incident. For live birds where poisoning is suspected, the first faecal droppings to be passed should be collected and sent via NPWS for testing at the RVLs or State Lab. Carcasses should not be frozen, but can be refrigerated if necessary.

Combating Poisoning and Persecution

The poisoning and persecution protocol agreed between the relevant state agencies is reviewed on an annual basis or as necessary. With regard to enforcement of legislation, the responsible authorities will continue in concerted efforts to combat illegal poisoning and persecution and the misuse of drugs and biocides. Education is seen as an important tool in this campaign also. The continued reporting and recording of relevant incidents will ensure a targeted and more effective approach.

Detecting poison levels

At present, the tests undertaken under this protocol can detect poison above particular levels but it is not possible to determine the precise level. If tests can be developed and made available under the protocol to determine exact toxin levels, these can be used to provide more certainty as to whether the toxins found in the system were enough to have killed the bird, or whether there may have been sub-lethal effects. The State Lab is currently working on such testing techniques.

ACKNOWLEDGEMENTS

Members of the public for reporting incidents.

Staff of NPWS for finding, collecting and submitting samples and reporting incidents.

Staff of the Regional Veterinary Laboratories for their professionalism and diligence.

The State Laboratory for expert analysis of toxin levels.

Private veterinary practices for providing x-ray services.

The media for reporting on poisoning and persecution and bringing these serious issues to the public.

Appendix 1: Persecution and Poisoning Incidents Recorded between 2007 and 2014

No.	10km sq	Species	Incident	Date found	County
1	G13	Red Kite	Poison	Oct 2007	Leitrim
2	V98	White-Tailed Sea Eagle	Poison	Nov 2007	Kerry
3	V77	White-Tailed Sea Eagle	Poison	Feb 2008	Kerry
4	V78	White-Tailed Sea Eagle	Poison	Feb 2008	Kerry
5	V77	White-Tailed Sea Eagle	Poison	May 2008	Kerry
6	S69	Hen Harrier	Shot	Sep 2008	Kildare
7	B81	Golden Eagle	Poison	Feb 2009	Donegal
9	T29	Redkite	Poison	Mar 2009	Wicklow
10	V99	White-Tailed Sea Eagle	Poison	Mar 2009	Kerry
11	G74	Golden Eagle	Poison	Feb 2010	Leitrim
12	T39	Red Kite	Poison	Feb 2010	Wicklow
13	T18	Red Kite	Poison	Feb 2010	Wicklow
14	N70	Red Kite	Poison	Mar 2010	Kildare
15	T27	Peregrine	Poison	Mar 2010	Wicklow
16	XO9	Common Buzzard	Poison	Mar 2010	Waterford
17	W87	Buzzard	Poison	Mar 2010	Cork
18	V89	White-Tailed Sea Eagle	Poison	Apr 2010	Kerry
19	V89	White-Tailed Sea Eagle	Poison	Apr 2010	Kerry
20	T08	Red Kite	Poison	Apr 2010	Wicklow
21	B83	Common Buzzard	Poison	Apr 2010	Donegal
22	N55	Common Buzzard	Poison	Apr 2010	Westmeath
23	T27	Peregrine	Poison	Apr 2010	Wicklow
24	V89	White-Tailed Sea Eagle	Poison	May 2010	Kerry
25	V44	Poison Meat Bait	Poison Meat Bait	Mar 2011	Cork
26	F71	Hooded Crow	Poison	Apr 2011	Mayo
27	-	Hooded Crow	Poison	Apr 2011	Kerry
28	S19	Poison Meat Bait	Poison Meat Bait	Jul 2011	Offaly
29	S19	Common Buzzard	Poison	Jul 2011	Offaly
30	S19	Common Buzzard	Poison	Jul 2011	Offaly
31	T18	Poison Meat Bait	Poison Meat Bait	Jul 2011	Wicklow
32	T18	Peregrine Falcon	Poison Meat Bait	Jul 2011	Wicklow
33	O26	Red Kite	Poison	Jul 2011	Dublin
34	S19	Sparrow-hawk	Poison	Jul 2011	Offaly
35	Q96	Peregrine Falcon	Shot	Jul 2011	Clare
36	Q96	Kestrel	Shot	Jul 2011	Clare
37	Q96	Sparrow-hawk	Shot	Jul 2011	Clare
38	N74	Common Buzzard	Shot	Aug 2011	Meath
39	N93	Gulls, Corvids, Pigeons	Poison	Aug 2011	Kildare
40	T27	Common Buzzard	Poison	Aug 2011	Wicklow

41	T27	Red Kite	Poison	Sep 2011	Wicklow
42	H40	Common Buzzard	Shot	Sep 2011	Cavan
43	N80	Common Buzzard	Shot	Oct 2011	Kildare
44	B92	Poison Meat Bait	Poison Meat Bait	Nov 2011	Donegal
45	B61	Poison Meat Bait	Poison Meat Bait	Nov 2011	Donegal
46	C20	Rook (x20)	Poison	Nov 2011	Donegal
47	O25	Red Kite	Poison	Nov 2011	Dublin
48	O26	Red Kite	Poison	Nov 2011	Dublin
49	T28	Red Kite	Poison	Nov 2011	Wicklow
50	O25	Red Kite	Poison	Nov 2011	Dublin
51	O25	Red Kite	Poison	Nov 2011	Dublin
52	T38	Red Kite	Poison	Dec 2011	Wicklow
53	O25	Red Kite	Poison	Dec 2011	Dublin
54	O25	Red Kite	Poison	Dec 2011	Dublin
55	S77	Common Buzzard	Shot	Dec 2011	Carlow
56	R55	Peregrine Falcon	Shot	2011	Clare
57	R44	Peregrine Falcon	Injury	2011	Limerick
58	N10	-	Poison Meat Bait	Jan 2012	Offaly
59	O25	Common Buzzard	Poison	Jan 2012	Dublin
60	N50	Common Buzzard	Poison	Feb 2012	Laois
61	T17	Raven	Poison	Mar 2012	Wexford
62	T00	Rook, Jackdaw, Magpie, Pheasant	Poison	Mar 2012	Wexford
63	V78	-	Poison Meat Bait	Mar 2012	Kerry
64	M09	White-tailed Sea Eagle	Poison and Shot	Apr 2012	Mayo
65	G99	White-tailed Sea Eagle	Poison	Apr 2012	Donegal
66	S88	Otter	Poison	May 2012	Wicklow
67	N06	Muscovy Duck	Poison	May 2012	Longford
68	T17	Red Kite	Poison	Sep 2012	Wicklow
69	T29	Red Kite	Poison	Oct 2012	Wicklow
70	T18	Red Kite	Poison	Nov 2012	Wicklow
71	S54	Common Buzzard	Poison	Nov 2012	Kilkenny
72	T02	Hen Harrier	Shot	Nov 2012	Wexford
73	O07	Common Buzzard	Shot	Dec 2012	Meath

74	Q93	Short-eared Owl	Shot	Dec 2012	Kerry
75	V95	White-tailed Sea Eagle	Poison	Jan 2013	Cork
76	T39	Red Kite	Poison	Jan 2013	Wicklow
77	N32	Common Buzzard	Shot	Jan 2013	Offaly
78	S38	Common Buzzard	Shot	Jan 2013	Laois
79	W05	-	Poison Meat Bait	Jan 2013	Cork
80	N93	Common Buzzard	Poison	Feb 2013	Kildare
81	S87	1 Common Buzzard, 7 Gulls	Poison	Mar 2013	Carlow
82	T17	Red Kite	Poison	Apr 2013	Wicklow
83	T18	Red Kite	Poison	Apr 2013	Wicklow
84	G10	2 Rooks	Poison	May 2013	Mayo
85	R37	12 Pigeons	Poison	May 2013	Clare
86	O20	Common Buzzard	Poison	Jun 2013	Wicklow
87	S01	Peregrine Falcon	Shot	Jun 2013	Tipperary
88	S22	Peregrine Falcon	Shot	Jun 2013	Tipperary
89	G12	9 Rooks	Poison	Jul 2013	Mayo
90	O07	79 Corvids, 1 Gull	Poison	Jul 2013	Meath
91	S22	Peregrine Falcon	Shot	Jul 2013	Tipperary
92	N09	Sparrowhawk and Hooded Crow	Fen Trap	Aug 2013	Leitrim
93	N87	Sparrowhawk	Shot	Sep 2013	Meath
94	O15	Red Kite	Poison	Sep 2013	Dublin
95	T26	Red Kite	Poison	Sep 2013	Wicklow
96	O20	Red Kite	Poison	Sep 2013	Wicklow
97	O08	Peregrine Falcon	Shot	Sep 2013	Louth
98	T27	Red Kite	Poison	Nov 2013	Wicklow
99	R73	Peregrine Falcon	Shot (and poison)	Dec 2013	Limerick
100	R89	White-tailed Sea Eagle	Shot	Jan 2014	Tipperary
101	S15	Peregrine Falcon	Poison	Jan 2014	Limerick
102	C01	Buzzard	Poison	Jan 2014	Donegal

103	H61	Buzzard	Poison	Jan 2014	Monaghan
104	H52	Buzzard	Poison	Jan 2014	Monaghan
105	N99	Buzzard	Poison	Feb 2014	Louth
106	S97	Raven	Poison	Mar 2014	Wicklow
107	T39	Red Kite	Poison	Mar 2014	Wicklow
108	R44	Buzzard	Poison	Mar 2014	Limerick
109	M32	Sparrowhawk	Poison	Mar 2014	Galway
110	X19	Sparrowhawk	Poison	Mar 2014	Waterford
111	S40	Peregrine Falcon	Poison	Mar 2014	Waterford
112	S40	Peregrine Falcon	Poison	Mar 2014	Waterford
113	S40	Peregrine Falcon	Poison	Mar 2014	Waterford
114	X19	Sparrowhawk	Poison	Apr 2014	Waterford
115	X19	Peregrine Falcon	Poison	Apr 2014	Waterford
116	S15	Peregrine Falcon	Poison	May 2014	Tipperary
117	N81	Buzzard	Poison	May 2014	Kildare
118	C32	-	Poison Bait	May 2014	Donegal
119	X29	Buzzard	Shot	Jun 2014	Waterford
120	O22	-	Poison Bait	Jun 2014	Dublin
121	B81	Kestrel	Poison	Jun 2014	Donegal
122	N50	Buzzard	Shot	Jul 2014	Laois
123	O25	Barn Owl	Poison	Aug 2014	Dublin
124	V57	White-tailed Sea Eagle	Poison	Sep 2014	Kerry
125	T39	Buzzard	Poison	Oct 2014	Wicklow
126	O25	Buzzard	Poison	Oct 2014	Dublin
127	R65	Kestrel	Poison	Nov 2014	Limerick
128	S95	Buzzard	Shot	Nov 2014	Wexford
129	T05	Buzzard	Shot	Nov 2014	Wexford
130	O14	Buzzard	Poison	Nov 2014	Dublin
131	O13	Buzzard	Poison	Dec 2014	Dublin
132	O25	Buzzard	Poison	Dec 2014	Dublin
133	W87	Buzzard	Poison	Dec 2014	Cork

Appendix 2: Distribution of all confirmed incidents between 2007 and 2015.

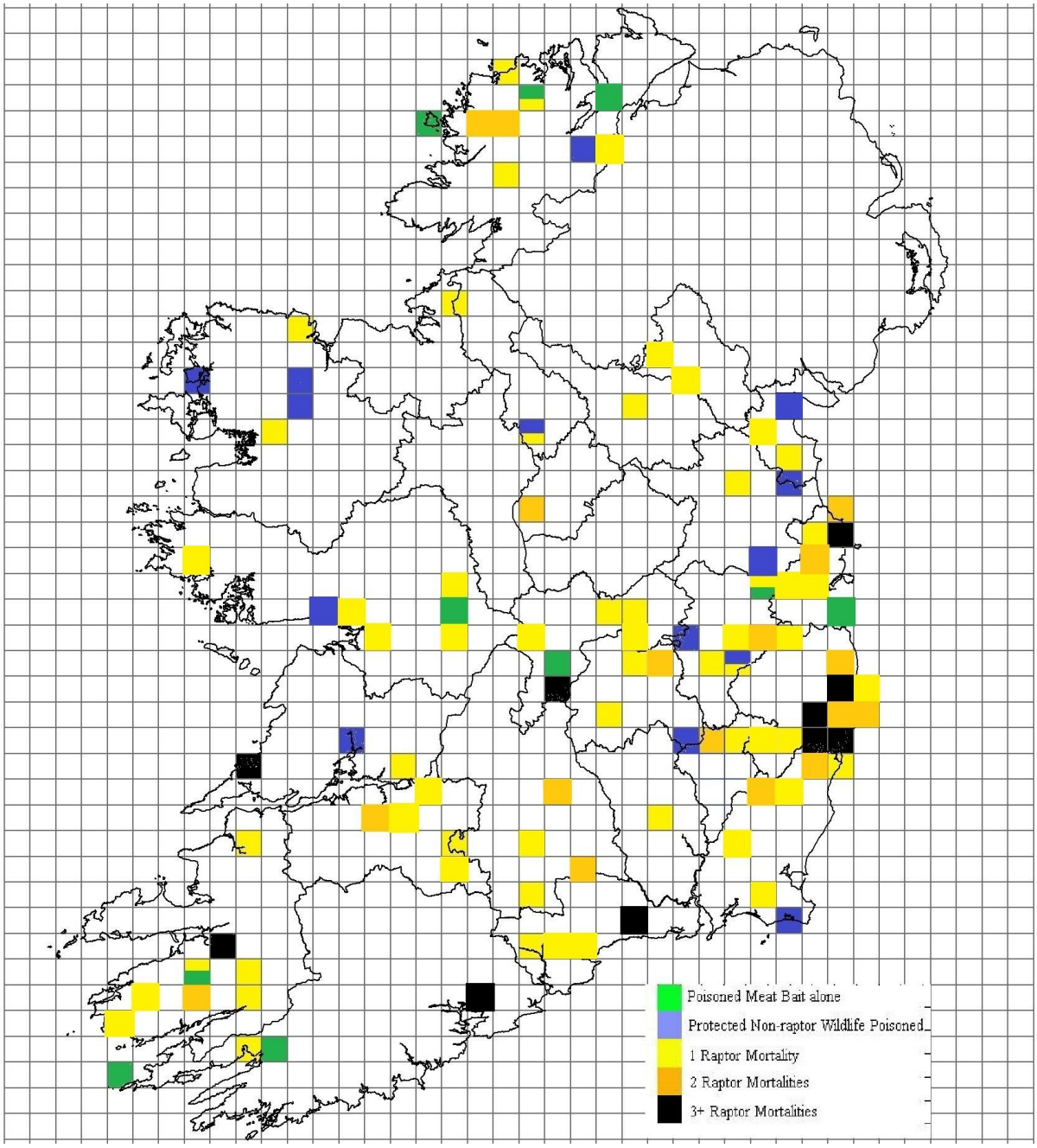

Figure 8. All poison and persecution incidents recorded between 2007 and 2015.

Appendix 3: Key Legislation

There are a number of key Irish statutes that deal with the poisoning and persecution of wildlife. The Wildlife acts 1976, 2000 and 2010 are the primary Acts concerning the

protection of wildlife in Ireland. Under the Wildlife Acts, in line with the EU Birds Directive (2009/147/EC), all birds in Ireland are protected. Article 9 of the Birds Directive allows Member States to make derogations from its protective measures in the interests of public health and safety, air safety, to protect flora and fauna and to prevent serious damage to crops, livestock, forests, fisheries and fauna. The European Communities (Wildlife Act, 1976) (Amendment) Regulations, 1986 – (S.I. No. 254 of 1986) allow specific derogations to be implemented by way of Ministerial Declarations, which are renewed every four months. The species included in the Irish Ministerial Declarations are grey crows, magpies, rooks, jackdaws and some members of the pigeon family. Until the beginning of 2008, poisoned or anesthetic bait was allowed for control of grey crows, magpies and pigeons. From 1 January 2008, the Ministerial Declarations allowed the use of non-meat baits only when laying poison for the control of grey crows, magpies and pigeons. The change was made due to concerns that the use of meat baits could lead to the accidental poisoning of birds of prey such as the reintroduced species. Ministeral Declarations with effect from September 2010 have prohibited the use of any poisoned or anaesthetic bait for the control of grey crows and magpies. Thereafter, grey crows and magpies could only be controlled by shooting or the use of legal cage traps. The provision in the Ministerial Declarations on the use of non meat-based poisoned or anaesthetic bait to control certain species of pigeon was retained on the basis of a licensing regime by National Parks & Wildlife Service.

There are various directives and regulations concerning the use of biocides and poisons in the EU and Ireland (e.g. Poisons Regulations 2008; Use and Control of Biocidal Products) Regulations, 2001) and it is illegal to sell or use any pesticides/biocides in a manner which is not registered or approved. Since 2008 there has been no pesticide/biocide registered for use in the control of birds or any mammal other than rabbits, rats or mice**.** Proper use is ensured through inspections at wholesale, retail and farm level and through the testing of food commodities on the Irish market for the presence of pesticides residues. The State took prosecutions in 2009 and 2010 which led to convictions and fines against landowners using Alphachloralose to kill rooks. The Restrictions on Use of Poison Bait Regulations (SI No. 481 of 2010) underpin the legalities relating to poison bait. The Animal Health and Welfare Act (2013) outlines an offence where a person lays "poison by a method or in a manner that a protected animal has or would have access to the poison."

The conservation of biodiversity in Ireland has been strengthened and expanded by EU law, most notably by the EU Birds Directive and EU Habitats Directive (92/43/EEC) and also by the EIA Directive (85/337/EEC). The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010. Many of our native raptors (including Peregrine Falcon, Merlin, Hen Harrier, Golden Eagle, White-tailed Sea Eagle and Red Kite) are listed on Annex I of the EU Birds Directive (Directive 2009/147/EC). Special Protection Areas (SPAs) may be designated to protect the habitats and ranges of these species. Article 4(4) of the same directive requires that even outside of SPAs, Member States shall strive to avoid pollution or deterioration of habitats of these birds.

For farmers, poisoning of bird species is a breach under cross-compliance (Statutory Management Requirement 2 - Conservation of Wild Birds and Statutory Management Requirement 10 – Plant Protection Products (Pesticides)). Further details are provided in Appendix 4.

Where to find relevant legislation:

Wildlife Acts 1976, 2000 and 2010
www.irishstatutebook.ie

EU Birds Directive Derogations

http://www.npws.ie/legislationandconventions/irishlaw/eubirdsdirectivederogations/

SI No. 481 of 2010. Restrictions on Use of Poison Bait Regulations 2010
www.irishstatutebook.ie

Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market as amended by Council Regulation 1882/2003/EC) and Commission Directives 2006/50/EC, 2006/140/EC and 2007/20/EC
http://eur-lex.europa.eu

S.I. No. 625 of 2001. European Communities (Authorization, Placing on the market, Use and Control of Biocidal Products) Regulations 2001
www.irishstatutebook.ie

S.I. No. 511 of 2008. Poisons Regulations 2008.
www.irishstatutebook.ie

Regulation (EU) No. 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.
http://eur-lex.europa.eu

Animal Health and Welfare Act 2013
www.irishstatutebook.ie

Protocol for investigation of deaths of Birds of Prey and other wildlife

Veterinary Laboratory Service (Department of Agriculture, Fisheries and the Marine),
The State Laboratory (Dept. of Public Expenditure & Reform)
and
National Parks and Wildlife Service (Department of Arts, Heritage and the Gaeltacht)

May 2013

Further to a series of meetings between representatives of the Veterinary Laboratory Service of the Department of Agriculture, Fisheries and the Marine, the State Laboratory, and the National Parks and Wildlife Service (NPWS), the following protocol is agreed.

Scope:

This is a national scheme to monitor mortality in Irish birds of prey and other wildlife species with seven key aims:

1. Collection of evidence to support prosecutions for illegal poisoning.
2. Monitoring of the impact of poisoning on Irish raptor populations.
3. Monitoring the incidence of poisoning and impact of illegal poisoning on other vulnerable species (e.g. Raven)
4. Monitoring the incidence of poisoning in species vulnerable to secondary poisoning by rodenticides (in particular Barn Owl, Kestrel, Common Buzzard, Red Kite and Long-eared Owl).
5. Monitoring the impact of other types of persecution on Irish raptors and maintaining a database of such incidents.
6. Providing evidence of the causes of death of other wildlife species where poison is strongly suspected
7. Quantifying the use of specific poisons.

Scale of Work:

It is expected that the scale of the work is unlikely to exceed 50 specimens per annum The State Laboratory has the capacity to deal with 5 of these specimens as urgent and treat them accordingly. Cases will be deemed urgent by a designated Wildlife Inspector with National Parks & Wildlife Service. Any urgent cases in excess of this would be dealt with on a case by case basis but urgent processing of these could not be guaranteed due to the extra resources required.

Stakeholders:

Government Departments and Agencies:
Department of the Arts, Heritage and the Gaeltacht (National Parks and Wildlife Service)
Department of Agriculture (Veterinary Laboratory Service)
The State Laboratory
Environmental Protection Agency

NGOs:

Farm organisations
Golden Eagle Trust Ltd
BirdWatch Ireland
NARGC

1. **Publicising awareness of the scheme**

A national awareness campaign will be carried out, targeting NARGC Gun Clubs, Farming representative bodies, Raptor Study Group members, Bird Watch Ireland branches, Gardai, veterinary practices, wildlife rehabilitation centres, falconers and taxidermists, giving details of scheme, and contact details for members of the public finding carcasses of wild birds of prey.
Information will also be provided on the NPWS website.

2. **Day-to day operation of Scheme:**

Routine Submissions:

Specimens for testing (i.e. dead birds or faecal samples from suspected poisoned but living birds) will normally be submitted by NPWS rangers to Regional Veterinary Laboratories (RVLs), or by certain other nominated individuals only. Members of the public and NGOs are asked to contact NPWS in the first instance to arrange delivery of specimens to RVLs where possible. Protocols on collection, assessment, investigation and chain of evidence will be followed. [RVL may decide to accept specimens from other sources.]

In the following cases, specimens will be held for post-mortem and toxicology analysis in monthly batches to allow for cost-effectiveness:

- Any bird of prey or Raven, or other bird species where a number of specimens are involved, found dead in circumstances suggesting poisoning but where prosecution is not considered appropriate/possible [Note: where multiple birds/samples arise from the same event, they will share a common submission form, reference number etc.]
- Any barn owl, long-eared owl or kestrel
- Suspected bait items where poisoning is suspected but where a prosecution is not considered possible
- Suspected poisons or other chemicals recovered during an investigation or search
- Faecal samples from birds suspected to have been poisoned but still living (these samples should be taken at the very earliest stages of discovering the bird).

Urgent Submissions:

In the following cases, and where NPWS requests through Wildlife Inspector Dr. Barry O'Donoghue, post-mortem and toxicology analysis will be fast-tracked (subject to the note on capacity in the State laboratory under "Scale of Work" on p1):

- Any Golden Eagle, White-tailed Eagle or Red Kite
- Any other bird of prey found dead in circumstances suggesting poisoning and where a prosecution following investigation is considered possible
- Any bird species where a number of specimens are found dead suggesting poisoning and where a prosecution following investigation is considered possible

- Any suspected bait items where poisoning is suspected and a successful prosecution is considered likely

Sample Reception:

Cases will be booked in advance, by an NPWS conservation ranger, who will specify that this is a Raptor Poisoning case. The ranger & RVL will agree a suitable time to deliver it to the RVL. The NPWS Ranger will be given the name of a person to hand it to, who will complete the 'chain of custody' section of the submission form (see below).

RVL Addresses, directions, and contact times are attached in Appendix 1

On arrival at the RVL, the NPWS ranger will present

- carcass/suspect bait as defined in NPWS section of protocol
- specimen will be in a leak-proof container (e.g. Ziploc bag, plastic box), sealed and clearly labelled with species, site, contact number (ranger's mobile)
- completed submission form – this will show chain of custody, and this should be maintained in the RVL. This form (with copy retained in RVL is sent to the State Lab with the samples
- hard copy of x-rays (if digital X-Ray system has been used, a set of digital images e-mailed in advance to Research Officer on duty will substitute) [RVLs do not undertake x-rays. X-rays should be undertaken at designated veterinary practices]

Chain of custody:

Each person taking custody of the samples will complete the "chain of custody section' of the form and will take responsibility for securely handling, storing, testing or dispatching samples as required.

Post mortem examination, sampling and sample dispatch by the RVL:

Post Mortem Examination:

1. Keep a printed copy of the attached PM summary in the post mortem area where it can be referred to by the duty pathologist, and the most recent version of this protocol in the front office where it can be referred to by reception staff
2. Record details of each Raptor Protocol submission on LIMS as per submission form *(attached)* using the Raptor Protocol Workflow *(currently in development & testing)*
3. Weigh the bird, record the weight
4. Photograph the carcass before the PM, and photograph any significant lesions, ensuring that the case number and scale are visible in the photos
5. Record carcass condition in respect of fat, muscle, degree of crop fill
6. Record plumage condition, any evidence of chemical staining or burns
7. Perform full post mortem where carcass is intact and fresh, with bacteriology, virology, histology as judged appropriate by the duty pathologist, and keeping a contemporaneous record of as a hard copy. Perform a post mortem directed primarily at sampling where carcass is decomposed and or scavenged, recording reasons for this.
8. Test a sample of fresh kidney for lead content

Sampling:

Regardless of condition of carcass, sample as many as possible of the following into rigid screw-top containers or twist-seal sterile sampling bags:

- Crop contents
- Stomach contents
- Intestinal contents
- Cloacal contents
- Liver
- Kidney
- Skeletal Muscle
- Blood
- Samples of suspected poison

Create a separate aliquot for each sample collected above, store each aliquot in a sealed container (universal type, or larger).
Label each tube with sample ID and state which matrix it contains (e.g. blood, faeces)
The aim of sampling is to recover a sample for testing and a sample for archiving, so up to 10g/10ml of each of the above to be sampled if available.

Dispatch of samples to State Lab:

1. Notify State Lab contact point (Ed Malone and John McBride) in advance of the arrival of Raptor Protocol samples by email to edward.malone@statelab.ie and john.mcbride@statelab.ie, and only dispatch samples when it is confirmed that somebody will be available to receive them

2. Dispatch all samples to Ed Malone, State Laboratory, Backweston Laboratory Campus, Young's Cross, Celbridge, Co. Kildare by registered post, clearly marked as "Raptor Protocol Samples" by the end of the working day after receipt.

3. Include the original submission form, keeping a photocopy on file at the RVL

4. Inform State Lab of any specific reasons to suspect toxicity, and any circumstantial evidence seen at PM e.g. yellow staining of nitroxynil

5. Put all samples into individual sealed evidence bags, labelled and identified on the included form

Testing by the State Lab:

1. The State Lab proposes to carry out all testing by LC-MS/MS and using confirmatory criteria commonly applied in others areas of similar testing,

2. These tests will not be accredited by the State Lab but validation work will be carried out to determine the fitness for purpose of the tests. The tests will be

deemed confirmatory and stand up to some scrutiny because mass spectrometry is used as the primary detection technique.

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3. Where a prosecution is in train, the State Lab will send reference samples to another laboratory in the UK for confirmatory testing if this is deemed necessary.

4. The State Lab currently tests for:

		Reporting Level (µg/kg)
a.	Strychnine	2000
b.	Nitroxynil	50
c.	Paraquat	5000
d.	Alpha Chloralose	500
e.	Carbofuran	50
f.	Methaldehyde	2500
g.	Warfarin	50
h.	Brodifacoum	1000
i.	Dicumarol	50
j.	Difenacoum	50
k.	Flocoumafen	500
l.	Flunixin	250

5. The State Lab will report results as
    a. Present at greater than the reporting level
    b. A response was noted at the retention time of “analyte” but is less than the reporting level.
    c. Not Detected
    d. Not tested

6. The number of matrices tested will depend on whether the sample is routine or urgent

a. On urgent samples liver and crop contents will be tested, with other matrices examined only if SL believes that this may provide more information.

7. On routine samples, only crop contents and liver tissue will be tested routinely.

8. The State Lab will hold an archive of the tissues submitted. Tissues will be released for subsequent testing on
    a. A case-by-case basis, by agreement between representatives of the State Lab (I. Kinahan) Veterinary Lab Service (M. Casey) and NPWS (B. O'Donoghue)
    b. Or on the basis of a further protocol on sample sharing

Testing by the Agri-food Biosciences Institute, Northern Ireland:

Although not a party to this protocol, AFBI were consulted during its preparation and indicated that they may be in a position to support this scheme from time to time by:

- Botulism testing
- Confirmatory testing
- Testing urgent samples (which could be directed to State Lab/AFBI, depending on which one had a batch of routine samples 'ready to run')

Reporting arrangements

Routine cases:

A preliminary report will be issued by the receiving RVL within one week, giving PM findings and test results received to date. The State Lab will typically report toxicology results from routine cases in 28 days to the RVL

A final report on routine cases will typically issue from the RVL within one week of all tests being completed and results received at RVL

Urgent cases, where prosecution is likely:

Where sample has been flagged as urgent (by NPWS Wildlife Inspector Barry O'Donoghue), the preliminary findings of the PM will be issued by phone/email within two working days. Test results from the RVL on urgent cases will ordinarily be completed and reported within one week of the carcass's submission.

The State Lab will typically report toxicology results from urgent cases in 7 days to the RVL. A final report on urgent cases will typically issue within two working days of the last test result being received in the RVL

Publication of aggregated results:

3. Outputs

For all recording and reporting purposes, the RVLs shall send post mortem reports (preferably by email) to NPWS Wildlife Inspector Dr. Barry O'Donoghue and include in the same correspondence, NPWS staff member(s) relevant to the particular case. Correspondence should include a full post mortem report and a copy of the completed submission form (showing reference number, chain of custody etc.). Where cases are referred to the State laboratory, the results will be sent back to the RVL, with NPWS contact point Dr. Barry O'Donoghue included in the same correspondence.

NPWS staff seeking updates shall contact Dr. Barry O'Donoghue only.

The NPWS will provide an annual report of the poison use surveillance data, with mapping of incidents associated with specific poisons, published in first quarter of each year.

Copies of the report will be sent to the Minister for Agriculture, Fisheries and the Marine, the Minister for Arts, Heritage and the Gaeltacht, , the Pesticide Registration & Control Division (Pesticides Registration Authority), the EPA and interested NGOs.

Peer-reviewed scientific publication of the aggregated results of this testing shall be by agreement of representatives of the State Lab (I. Kinahan) Veterinary Lab Service (M. Casey) and NPWS (C. O'Keefe).

All three partner organisations will be able to use aggregated results in non-peer-reviewed publications e.g. annual reports, which can be published on official websites where agreed.

Enforcement of Legislation

Depending on the situation, follow-up investigation or enforcement will be carried out by the authority/authorities responsible for the relevant legislation.

Legislation that may be invoked includes

Legislation	**Responsible Authority**
The Wildlife Acts	NPWS, An Garda Síochána
SI No. 481 of 2010. Restrictions on Use of Poison Bait Regulations 2010	NPWS, An Garda Síochána
S.I. No. 625 of 2001. European Communities (Authorization, Placing on the market, Use and Control of Biocidal Products) Regulations 2001	
S.I. No. 511 of 2008. Poisons Regulations 2008.	

Review of Protocol

This protocol will be reviewed annually or as necessary, so that changes can be agreed if required ahead of the following calendar year, and a full uniform set of data acquired for the following using the revised Protocol.

Mícheál Casey,	Barry O'Donoghue	Ita Kinahan
On behalf of RVLs	On behalf of NPWS	On behalf of State Lab.

Appendix 6: Campaign for Responsible Rodenticide Use

The demands of consumers for high quality and safe food means that there is an ever-increasing need for higher standards in all stages of the food chain. This has led to much stricter quality assurance requirements from buyers, such as supermarkets and food processing companies.

Among these requirements is the need for more effective control of pests, such as rodents, which contaminate and destroy food while still in farm stores. At the same time, there is a

greater recognition of the need to protect and enhance wildlife in rural areas.

The Campaign for Responsible Rodenticide Use (CRRU) aims to protect wildlife while promoting and providing effective rodent control through the responsible use of rodenticides. In a bid to ensure that any negative impact on wildlife caused by poor pest control practice is eliminated, CRRU is actively promoting the responsible use of rodenticides and has launched a code under the banner 'Think Wildlife'. These essential guidelines promote best practice in rodent control.

From advising those using rodenticides to have a planned approach and always using enough baiting points, to warning them never to leave bait around at the end of treatment, the code will help rural users to get the best results from their rodent control programmes, yet reduce the potential harmful effects on wildlife.

To learn more on this initiative, launched in Ireland in September 2013, or how to minimise risk to wildlife, go to www.thinkwildlife.org

Appendix 7: Central Contact Details of Stakeholders

Central Contact Details of Key Stakeholders	
Stakeholder	**Contact Details**
National Parks & Wildlife Service, Department of Arts, Heritage & the Gaeltacht	7. Ely Place, Dublin 2 +353 1 888 3242 www.npws.ie nature.conservation@ahg.gov.ie

Regional Veterinary Laboratories Department of Agriculture, Food & Marine	Agriculture House, Kildare St. Dublin 2 +353 1 607 2000 www.agriculture.gov.ie info@agriculture.gov.ie
The State Laboratory Department of Public Expenditure & Reform	Backweston Laboratory Campus Celbridge Co. Kildare +353 1 5057000 www.statelab.ie info@statelab.ie