

# Invermark Farm Survey Summary 2015 and 2016

#### 1.0 Introduction

During 2015 and 2016 Taylor Wildlife undertook bird, butterfly and moth, mammal and habitat surveys on Invermark for the Basic Payment Scheme Farm Environmental Surveys. The following report summarises results collected during these two years. These surveys form part of a five-year monitoring programme that will repeat the surveys in 2017, 2018 and 2019.

#### 2.0 Survey Methods

Bird surveys were undertaken using a modified Brown and Shepherd methodology as defined in the SGRPID/SNH guidelines for the project. Due to SGRPID not publishing guidelines until May 2015, the 2015 bird surveys were carried out between mid-May and mid-July. 2016 surveys were carried out between mid-April and mid-July, future surveys will also be undertaken between these dates. Due to the disparity between the survey periods in 2015 and 2016 it is not currently possible to produce year on year comparison figures, instead trend analysis will be provided at the end of the five-year survey period.

Butterfly surveys were undertaken using the Butterfly Conservation Wider Countryside Survey methodology. Two permanent transect lines were established in each kilometre square so that results could be compared year on year. Each kilometre square was visited three times, starting in June and finishing before the end of August, with at least 10 days between each survey visit.

The survey area was categorised into broad habitats using BAP habitat categories and these habitats were then mapped using SGRPID mapping guidelines. In addition to this, 30 habitat impact assessment plots were randomly selected from a list of possible coordinates provided by SNH (for deer habitat impact assessments) in both blanket bog and dwarf shrub heath habitats. The Habitat Impact Assessment methodology used SNH Deer Best Practice Guidelines as prescribed by SGRPID.

#### 3.0 Results

#### 3.1 Birds

In 2015, a total of 81 species were recorded on the site. This figure comprises 52 species considered to be breeding on site, 19 additional species noted during surveys as flying over and 10 species documented as incidental sightings recorded outside of specific bird surveys. In 2016, a total of 77 species were recorded on site. This figure comprises 50 species considered to be breeding on site, 16 additional species noted during surveys as flying over and 11 species documented as incidental sightings recorded outside of specific bird surveys. Across the two survey seasons a total species abundance of 86 species were recorded, which includes 8 waders and 10 raptor species.

Declining red and amber-listed waders such as Dunlin (*Calidris alpine*), Curlew (*Numenius arquata*), Woodcock (*Scolopax rusticola*), Snipe (*Gallinago gallinago*), Oystercatcher (*Haematopus ostrlegus*), Common Sandpiper (*Actitis hypoleucos*) and Lapwing (*Vanellus vanellus*) were all recorded during surveys in both years. These species have all undergone long-term declines in population size throughout Scotland from 1995 - 2014, so data recorded on these species will be of value over the rest of the survey timeframe.

Other highlights over the two survey years include the Pied Flycatcher (*Ficedula hypoleuca*), a recent addition to the BTO red list due to its declining population throughout the UK, along with the red-listed Spotted Flycatcher (*Muscipaca striata*) and Skylark (*Alauda arvensis*), both of which are in widespread decline throughout Scotland. The red-listed Black Grouse (*Tetrao tetris*) and Linnet (*Carduelis cardelis*) were recorded on site in 2015 but not in 2016 (although Black Grouse was recorded as an incidental sighting in 2016 but not during bird surveys). Each of these species is currently in decline throughout Scotland. Six species showed no variation in abundance between 2015 and 2016, including the amber-listed Short-eared Owl (*Asio flammeus*), and the Dipper (*Cinclus cinclus*). The Dipper is a recent addition to the amber-list due

to continuing population declines. It should be noted that small population variations are expected between years and due to this and the previously mentioned disparity in timings, no trends or firm conclusions can be drawn from these figures.

An additional 27 species were recorded only as flyovers or incidental species over the two years. These are birds which were observed flying over the site, but are not necessarily associated with the habitat they were initially observed flying over, and are not known to be breeding on the site. These records include raptors such as Osprey (*Padion haliaetus*), Peregrine (*Falco peregrinus*), White-tailed Eagle (*Haliaetus albicilla*), Merlin (*Falco columbarius*) and Hen Harrier (*Circus cyaneus*), as well as the red-listed wader, the Dotterel (*Charadrius morinellus*).

Table 1 Summary of Bird Species Recorded on Surveys (2015-2016)

Common Name	Scientific Name	Status	2015	2016
Grey Heron	Ardea cinerea	Green	0	3
Feral Pigeon	Columba livia	Green	0	1
Stock Dove	Columba oenas	Amber	0	1
Red-legged Partridge	Alectoris rufa	No Status	0	1
Pied Flycatcher	Ficedula hypoleuca	Red	0	1
Siskin	Spinus spinus	Green	2	7
Buzzard	Buteo buteo	Green	3	8
Spotted Flycatcher	Muscicapa striata	Red	3	8
Robin	Erithacus rubecula	Green	5	12
Teal	Anas crecca	Amber	2	4
Great Tit	Parus major	Green	1	2
House Martin	Delichon urbicum	Amber	2	4
Treecreeper	Certhia familiaris	Green	1	2
Blackbird	Turdus merula	Green	5	9
Pheasant	Phasianus colchicus	No Status	6	10
Coal Tit	Periparus ater	Green	3	5
Common Sandpiper	Actitis hypoleucos	Amber	16	22
Wren	Troglodytes troglodytes	Green	84	102
Oystercatcher	Haematopus ostrlegus	Amber	12	14
Willow Warbler	Phylloscopus trochilus	Amber	33	38
Woodpigeon	Columba palumbus	Green	9	10
Pied Wagtail	Motacilla alba	Green	10	11
Skylark	Alauda arvensis	Red	36	38
Chaffinch	Fringilla coelebs	Green	25	26
Mallard	Anas platyrhynchos	Amber	4	4
Ptarmigan	Lagopus muta	Green	2	2
Dipper	Cinclus cinclus	Amber	15	15
Great Spotted				
Woodpecker	Dendrocopus major	Green	1	1
Short-eared Owl	Asio flammeus	Amber	1	1

Table 1. (continued)

Common Name	Scientific Name	Status	2015	2016
Mistle Thrush	Turdus viscivorus	Red	6	5
Goldcrest	Regulus regulus	Green	11	9
Ring Ouzel	Turdus torquatus	Red	32	26
Kestrel	Falco tinnunculus	Amber	5	4
Golden Plover	Pluvialis apricaria	Green	68	49
Song Thrush	Turdus philomelos	Red	17	12
Dunlin	Calidris alpina	Red	32	22
Wheatear	Oenanthe oenanthe	Green	34	23
Grey Wagtail	Motacilla cinerea	Red	19	12
Cuckoo	Cuculus canorus	Red	9	5
Curlew	Numenius arquata	Amber	12	6
Woodcock	Scolopax rusticola	Red	4	2
Dunnock	Prunella modularis	Amber	2	1
Jackdaw	Corvus monedula	Green	2	1
Redstart	Phoenicurus phoenicurus	Amber	2	1
Stonechat	Saxicola torquata	Green	2	1
Snipe	Gallinago gallinago	Amber	15	7
Carrion Crow	Corvus corone	Green	9	3
Twite	Linaria flavirostris	Red	6	2
Lesser Redpoll	Acanthis cabaret	Red	9	2
Lapwing	Vanellus vanellus	Red	8	1
Black Grouse	Tetrao tetrix	Red	1	0
Bullfinch	Pyrrhula pyrrhula	Amber	2	0
Goldfinch	Carduelis carduelis	Green	1	0
Linnet	Carduelis cannabina	Red	1	0
Reed Bunting	Emberiza schoniclus	Amber	1	0
Rook	Corvus frugilegus	Green	1	0

Red grouse have not been included in the summary tables or the general bird summary as due to the survey methods used and the relatively high density observed, the data does not give an accurate count of red grouse numbers. Similarly, in accordance with standard practice and the survey guidelines, Meadow Pipit numbers were not recorded.

### 3.2 Butterflies

A total of 8 species of butterfly were recorded on Invermark in 2016. This was a decrease from 2015 when 9 were recorded. Butterflies were generally distributed along south facing slopes and along valley sides and floors. It can be seen from Table 2 that Small Heath (*Coenonympha pamphilus*), Small Pearl-bordered Fritillary (*Boloria selene*), Northern Brown Argus (*Aricia artaxerxes*), Ringlet (*Aphantopus hyperantus*), Small Tortoiseshell (*Aglais urticae*) and Green-veined White (*Pieris napi*) were found in fewer grid squares than in 2015. Common Blue (*Polyommatus icarus*) held the same distribution in both years and Dark-green Fritillary (*Argynnis aglaja*) were distributed across more grid squares. It is thought that the observed declines are likely to be due to low detection rates as opposed to mass declines, although it should be noted that butterflies are r-selected species and sensitive to weather conditions. As such species can experience large fluctuations in population from year to year. Future surveying should allow real trends to be observed.

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Table 2. Summary of butterfly species distribution in 2015 and 2016 across the survey area (not habitat specific).

		Number of grid	
		squares	species
		prese	ent in
Common Name	Scientific Name	2015	2016
Dark-green Fritillary	Argynnis aglaja	15	18
Common Blue	Polyommatus icarus	6	6
	Coenonympha		
Small Heath	pamphilus	28	27
Small Pearl-bordered			
Fritillary	Boloria selene	13	8
Northern Brown Argus	Aricia artaxerxes	6	3
	Aphantopus		
Ringlet	hyperantus	14	6
Small Tortoiseshell	Aglais urticae	5	2
Green-veined White	Pieris napi	9	2
Red Admiral	Vanessa atalanta	2	0

### 3.3 Habitat Impact Analysis

A total of 60 habitat plots were surveyed in July and August 2015, comprising 30 plots each for the two dominant habitats in the survey area, namely blanket bog and dwarf shrub heath. The plots were revisited at the same time of year in 2016 and the survey repeated. It should be noted that data recorded in 2015 and 2016 is part of a longer-term (5-year) monitoring programme and as such it is too early to attempt to extract trends from the data. The data collected in 2015 forms a baseline, continued monitoring in 2017-2019 and extended surveying will be used to inform decisions on how the estate may manage the habitat and wildlife in future. The results of both surveys are shown in Tables 3 and 4 below.

Table 3. Results of habitat impact assessment on blanket bog in 2015 and 2016

Year	Average	Average	% last	Average	Frequency	Frequency
	frequency	frequency	year's	veg	of total	of total
	of	of	heather	height		number of
	quadrats	quadrats	shoots	(cm)	number of	plots with
	with hoof	with bog	browsed		plots with	hare dung
	prints on	moss			pioto with	
	bare	present			deer dung	
	ground					
2016	0.08	0.32	< 33	14.5	0.47	0.63
2015	0.06	0.28	< 33	16	0.20	0.90

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Table 4. Results of habitat impact assessments on dwarf shrub heath in 2015 and 2016

Year	% of quadrats with heather	% last year's heather shoots browsed	Average veg height (cm)	% heather stem breakage	Frequency of total number of plots with deer dung	Frequency of total number of plots with hare dung
2016	0.91	< 33	26.5	Light/ moderate	0.37	0.44
2015	0.70	< 33	25	Light/ moderate	0.36	0.56

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#### Appendix A: Habitat specific numbers

Summary figures for each habitat are shown below. Note that riparian habitats are recorded under the terrestrial habitat they are passing through or surrounded by rather than listed individually.

#### **Blanket bog**

Table 5. Bird species recorded on Blanket Bog habitats (2015-2016).

Common Name	Scientific Name	Status	2015	2016
Buzzard	Buteo buteo	Green	1	7
Common Sandpiper	Actitis hypoleucos	Amber	8	13
Wren	Troglodytes troglodytes	Green	10	16
Teal	Anas crecca	Amber	2	3
Dipper	Cinclus cinclus	Amber	9	11
Mallard	Anas platyrhynchos	Amber	4	4
Woodpigeon	Columba palumbus	Green	1	1
Skylark	Alauda arvensis	Red	32	32
Short-eared Owl	Asio flammeus	Amber	1	1
Golden Plover	Pluvialis apricaria	Green	56	38
Dunlin	Calidris alpina	Red	31	19
Wheatear	Oenanthe oenanthe	Green	10	6
Snipe	Gallinago gallinago	Amber	6	3
Carrion Crow	Corvus corone	Green	6	3
Pied Wagtail	Motacilla alba	Green	2	1
Grey Wagtail	Motacilla cinerea	Red	10	3
Ring Ouzel	Turdus torquatus	Red	9	2
Curlew	Numenius arquata	Amber	5	0
Song Thrush	Turdus philomelos	Red	1	0

#### **Bracken**

Table 6. Bird species recorded on Bracken habitats (2015-2016)

Common Name	Scientific Name	Status	2015	2016
Pheasant	Phasianus colchicus	No Status	1	1
Red-legged Partridge	Alectoris rufa	No Status	0	1
Ring Ouzel	Turdus torquatus	Red	1	1
Twite	Linaria flavirostris	Red	1	1
Wheatear	Oenanthe oenanthe	Green	1	2
	Haematopus			
Oystercatcher	ostrlegus	Amber	2	0

# **Broadleaved and Mixed Woodland**

Table 7. Bird species recorded on Broadleaved and Mixed Woodland habitats (2015-2016).

Common Name	Scientific Name	Status	2015	2016
Chaffinch	Fringilla coelebs	Green	8	7
Jackdaw	Corvus monedula	Green	2	1
Twite	Linaria flavirostris	Red	2	1
Lesser Redpoll	Acanthis cabaret	Red	3	1
Lapwing	Vanellus vanellus	Red	5	1
Kestrel	Falco tinnunculus	Amber	1	0
Snipe	Gallinago gallinago	Amber	1	0
Dipper	Cinclus cinclus	Amber	1	0
Goldfinch	Carduelis carduelis	Green	1	0
Spotted Flycatcher	Muscicapa striata	Red	1	6
Willow Warbler	Phylloscopus trochilus	Amber	1	6
Woodpigeon	Columba palumbus	Green	1	3
Robin	Erithacus rubecula	Green	1	3
Cuckoo	Cuculus canorus	Red	1	2
Pheasant	Phasianus colchicus	No Status	2	4
Blackbird	Turdus merula	Green	2	4
Goldcrest	Regulus regulus	Green	1	2
Mistle Thrush	Turdus viscivorus	Red	1	2
Treecreeper	Certhia familiaris	Green	1	2
Oystercatcher	Haematopus ostrlegus	Amber	4	7
Song Thrush	Turdus philomelos	Red	5	6
Curlew	Numenius arquata	Amber	1	1
Woodcock	Scolopax rusticola	Red	1	1
Redstart	Phoenicurus phoenicurus	Amber	1	1
Great Spotted				
Woodpecker	Dendrocopus major	Green	1	1

# **Coniferous Woodland**

Table 8. Bird species recorded on Coniferous Woodland habitats (2015-2016)

Common Name				
	Scientific Name	Status	2015	2016
Siskin	Spinus spinus	Green	1	4
Blackbird	Turdus merula	Green	1	3
Robin	Erithacus rubecula	Green	2	5
Great Tit	Parus major	Green	1	2
Willow Warbler	Phylloscopus trochilus	Amber	5	10
Chaffinch	Fringilla coelebs	Green	6	11
Woodpigeon	Columba palumbus	Green	1	1
Dunnock	Prunella modularis	Amber	1	1
Wheatear	Oenanthe oenanthe	Green	1	1
Wren	Troglodytes troglodytes	Green	4	4
Coal Tit	Periparus ater	Green	3	2
Goldcrest	Regulus regulus	Green	9	6
Grey Wagtail	Motacilla cinerea	Red	2	1
Buzzard	Buteo buteo	Green	1	0
Common Sandpiper	Actitis hypoleucos	Amber	1	0
Lapwing	Vanellus vanellus	Red	1	0
Snipe	Gallinago gallinago	Amber	1	0
Cuckoo	Cuculus canorus	Red	1	0
Lesser Redpoll	Acanthis cabaret	Red	2	0
Mistle Thrush	Turdus viscivorus	Red	1	0
Stonechat	Saxicola torquata	Green	1	0

# **Dwarf Shrub Heath**

Table 9. Bird species recorded on Dwarf Shrub Heath habitats (2015-2016)

Common Name	Scientific Name	Status	2015	2016
Teal	Anas crecca	Amber	0	1
Pied Flycatcher	Ficedula hypoleuca	Red	0	1
Siskin	Spinus spinus	Green	1	3
Robin	Erithacus rubecula	Green	2	4
Skylark	Alauda arvensis	Red	1	2
Common Sandpiper	Actitis hypoleucos	Amber	5	8
Pheasant	Phasianus colchicus	No Status	2	3
Oystercatcher	Haematopus ostrlegus	Amber	4	5
Wren	Troglodytes troglodytes	Green	67	72
Ring Ouzel	Turdus torquatus	Red	22	23
Kestrel	Falco tinnunculus	Amber	4	4
Peregrine	Falco peregrinus	Green	1	1
Golden Plover	Pluvialis apricaria	Green	4	4
Blackbird	Turdus merula	Green	2	2
Goldcrest	Regulus regulus	Green	1	1
Grey Wagtail	Motacilla cinerea	Red	7	7
House Martin	Delichon urbicum	Amber	1	1
Spotted Flycatcher	Muscicapa striata	Red	2	2
Stonechat	Saxicola torquata	Green	1	1
Pied Wagtail	Motacilla alba	Green	7	6
Curlew	Numenius arquata	Amber	6	5
Woodpigeon	Columba palumbus	Green	5	4
Dipper	Cinclus cinclus	Amber	5	4
Willow Warbler	Phylloscopus trochilus	Amber	23	18
Snipe	Gallinago gallinago	Amber	6	4
Chaffinch	Fringilla coelebs	Green	9	6
Mistle Thrush	Turdus viscivorus	Red	3	2
Wheatear	Oenanthe oenanthe	Green	22	14
Cuckoo	Cuculus canorus	Red	7	3
Song Thrush	Turdus philomelos	Red	10	4
Woodcock	Scolopax rusticola	Red	3	1
Lesser Redpoll	Acanthis cabaret	Red	4	1
Hen Harrier	Circus cyaneus	Red	1	0
Lapwing	Vanellus vanellus	Red	1	0
Bullfinch	Pyrrhula pyrrhula	Amber	2	0
Carrion Crow	Corvus corone	Green	1	0
Dunnock	Prunella modularis	Amber	1	0
Reed Bunting	Emberiza schoniclus	Amber	1	0
Rook	Corvus frugilegus	Green	1	0
Twite	Linaria flavirostris	Red	3	0

## **Improved Grassland**

Table 10. Bird species recorded on Improved Grassland habitats (2015-2016)

Common Name	Scientific Name	Status	2015	2016
		_	2013	
Pied Wagtail	Motacilla alba	Green	1	4
House Martin	Delichon urbicum	Amber	1	3
Wren	Troglodytes troglodytes	Green	1	3
Pheasant	Phasianus colchicus	No Status	1	2
Song Thrush	Turdus philomelos	Red	1	2
Oystercatcher	Haematopus ostrlegus	Amber	2	2
Woodpigeon	Columba palumbus	Green	1	1
Chaffinch	Fringilla coelebs	Green	2	2
Mistle Thrush	Turdus viscivorus	Red	1	1
Willow Warbler	Phylloscopus trochilus	Amber	2	2
Common Sandpiper	Actitis hypoleucos	Amber	2	1
Lapwing	Vanellus vanellus	Red	1	0
Snipe	Gallinago gallinago	Amber	1	0
Linnet	Carduelis cannabina Phoenicurus	Red	1	0
Redstart	phoenicurus	Amber	1	0

## Inland Rock

Table 11. Bird species recorded on Inland Rock habitats (2015-2016)

Common Name	Scientific Name	Status	2015	2016
Wren	Troglodytes troglodytes	Green	2	7
Buzzard	Buteo buteo	Green	1	1
Willow Warbler	Phylloscopus trochilus	Amber	2	2
Golden Plover	Pluvialis apricaria	Green	1	0
Carrion Crow	Corvus corone	Green	1	0

#### **Montane Heath**

Table 12. Bird species recorded on Montane Heath habitats (2015-2016)

Common Name	Scientific Name	Status	2015	2016
Dunlin	Calidris alpina	Red	1	3
Skylark	Alauda arvensis	Red	3	4
Golden Plover	Pluvialis apricaria	Green	7	7
Ptarmigan	Lagopus muta	Green	2	2
Carrion Crow	Corvus corone	Green	1	0

## **Incidental Sightings and Flyovers**

Table 13. Bird species observed flying over the site or incidentally during other surveys, throughout all habitat types.

Common Name	Scientific Name	Status	2015	2016
Osprey	Padion haliatus	Amber	1	1
Peregrine	Falco peregrinus	Green	1	1
Red Kite	Milvus milvus	Amber	1	0
White-tailed	Haliaeetus alibicilla	Red	1	5
Eagle				
Golden Eagle	Aquila chrysaetos	Green	6	6
Merlin	Falco columbarius	Amber	6	3
Hen Harrier	Circus cyaneus	Red	6	2
Greylag Goose	Anser anser	Amber	12	0
Common Gull	Larus canus	Amber	37	4
Great Black- backed Gull	Larus marinus	Amber	0	8
Lesser Black- backed Gull	Larus fuscus	Amber	0	13
Raven	Corvus corax	Green	35	7
Sand Martin	Riparia riparia	Green	**	10
Sedge Warbler	Acrocephalus schoenobaenus	Green	**	3
Spotted Flycatcher	Muscicapa striata	Red	2	0
Jay	Garrulus glandarius	Green	1	1
Black-headed	Chroicocephalus	Amber	1	0
Gull	ridibundus			
Common Crossbill	Loxia curvirostra	Green	14	0
Wigeon	Anas penelope	Amber	5	2
Grey Heron	Ardea cinerea	Green	3	3
Whinchat	Saxicola rubetra	Red	3	4
Starling	Sturnus vulgaris	Red	25	0
Swallow	Hirundo rustica	Amber	5	10
Swift	Apus apus	Amber	**	0
Twite	Linaria flavirostris	Red	1	1
Tufted Duck	Aythya fuligula	Green	**	3
Coal Tit	Periparus ater	Green	5	3
Goosander	Mergus merganser	Green	**	3
Black Grouse	Tetrao tetrix	Red	1	20
Greenfinch	Carduelis chloris	Green	0	4
Dotterel	Charadrius morinellus	Red	0	2

<sup>\*\*</sup> presence was noted but number not recorded