

Irish Hen Harrier Survey Survey & Recording Guidelines for Contributors

- In order to establish population estimates the primary objective of the hen harrier field survey is to establish whether suitable habitat is occupied by breeding hen harriers. Secondary objectives are to establish whether a breeding attempt was initiated and to establish breeding outcome (i.e. success or failure of a nest and if successful establish the number of fledged young).

Defining the survey area

- The survey areas are defined by the Irish 10km Grid Squares (see Appendix 1). These areas have been selected as they have previously been recorded to contain breeding hen harriers and/or contain suitable breeding habitat for hen harriers.
- Prior to commencing the survey fieldworkers use maps and aerial photographs of each 10km grid square to exclude unsuitable habitat, identify areas of potentially suitable hen harrier breeding habitat and locate suitable vantage points for timed observations. The suitability of these areas can be confirmed during the first visit by driving through the square to “ground-truth” likely breeding habitats.
- Suitable breeding habitat is defined as heather dominated and/or grass moorland, other open habitats with extensive scrub or bramble cover and developing pre-thicket forest (first and second rotation crops).
- Ground above 600m; built-up/urban areas or within 100m of occupied farms and dwellings; improved pasture and arable farmland; the interior of unbroken, closed-canopy forest blocks; sheep-walk; extensive areas of bracken; degraded or overgrazed upland areas without any heather cover and areas within close proximity to sea-cliffs, inland crags, rocky outcrops, boulder fields and scree slopes are classified as unsuitable habitat and can be excluded on maps and from further survey effort (see Hardey *et al.*, 2009).
- Particular attention is paid to heather moorland which contains stands of deep (usually >0.4m tall), well-drained heather with greater than 50% cover and areas with good all-round visibility such as slopes and river valleys and deep heather areas within forest clearings, forest rides and heather at the edges of forest plantations. The latter is usually found where livestock are excluded by fencing associated with afforestation and/or unplanted areas within the forest ownership boundary.
- Grass-dominated and degraded moorland are also surveyed where these contain patches of deep heather or other shrub cover. Other shrub-dominated areas such as river valleys, abandoned fields and scrubby bogs are included in the survey.
- Pre-thicket coniferous forests are surveyed and particular attention is paid to areas where forest compartments are characterised by prolific shrub layers.
- Mature coniferous forests are surveyed where hen harriers observations were regularly associated with post-thicket stage plantations since tree-nesting has been recorded in Northern Ireland and harriers will often nest in rides or open lacunas within mature plantations.

- In addition, areas of scrub (e.g. willow and bramble), often on the edges of moorland or bog, are surveyed for occupancy by hen harriers.
- Suitable habitat with all survey squares are preferably to be visited on four occasions between late March and the end of July, but a minimum of three visits are required.
- Firstly, two visits to establish territorial occupancy are required with the first visit between late March and mid-April and the second between mid-April and mid-May. These two visits are the most important as this helps identify where the hen harrier territories may occur.
- A third survey visit is recommended (but not essential) during late May and late June to establish evidence of breeding, with particular emphasis on locating active nests, where these are not already located.
- A fourth visit is required between late June and the end of July to confirm nest activity and whether fledged are observed to establish breeding outcome.

Table 1. Timings of survey visits

Visit No.	Type of visit	Timings
1	Required	Late March – Mid April
2	Required	Mid April – Mid May
3	Optional	Late May – Late June
4	Required	Late June – Mid July

- These survey visits reflect the seasonality of the hen harrier breeding activities (see Table 2) and includes the periods of territorial display/mate advertisement, incubation, nestling and fledgling periods (Hardey *et al.*, 2009). The additional visit between late May and late June is to increase the likelihood of detecting a nest location (Hardey *et al.*, 2009) and valuable data can be obtained on the hen harriers sightings.

Table 2. Summary of hen harrier breeding season (Hardey *et al.*, 2009).

Breeding activity (No. of days)	Range	Peak period
<i>Site occupation & display</i>	Late February to late May	Early April to early May
<i>Nest building</i>	April to late May	-
<i>Egg laying (5-12 days)</i>	Mid April to late June	Late April to mid May
<i>Incubation (29-31 days)</i>	Mid April to late July	Late April to mid June
<i>Hatching</i>	Mid May to late July	Late May to mid June
<i>Young in nest (28-39 days)</i>	Mid May to late August	Late May to mid July
<i>Fledging</i>	Mid June to late August	Late June to mid July
<i>Juvenile dispersal</i>	August to September	-

Data entry, survey maps & recording forms

- In order to help us understand where your sightings or breeding activity occurred it is really important that you submit your records. Please submit all records by the 31st August 2022 to allow us the time to input and analyse the data.
- If you use printed maps and forms in during your field surveys these forms and maps can be submitted by:
- **Hard-copy data** and returned by post to one of the below addresses.
- Dr Marc Ruddock (GET): 12 Ely Place, Dublin 2, Co. Dublin marcruddock@goldeneagle.ie
- Mr Ryan Wilson-Parr (IRSG): 12 Rock Court, Slane, Co. Meath secretary@irsg.ie
- Mr John Lusby (BWI): 27 Beechgrove, Oranmore, Co. Galway jlusby@birdwatchireland.ie
- **Digital copy data** can also be digitised by you into the survey excel spreadsheets and emailed to irishhenharriersurvey@hotmail.com or any of the project managers named above. You can then scan and email your survey maps or post the maps to any of the above addresses.
- **Online data** - hen harrier data can also be entered online via www.irishhenharriersurvey.com and use either i) the public sightings page or ii) the data entry page. The sightings form is currently live on the website (<http://www.irishhenharriersurvey.com/report-a-hen-harrier-sighting/>) and the detailed data entry portal will be launched in early April following completion of workshops and allocation of survey squares.
- You are provided with a map and an aerial photograph of your allocated 10km square(s). Where available we will also send you some additional information on previously used vantage point locations, previously suitable habitats and historical hen harrier sightings.
- It is important to note that the habitats may have changed since the previous surveys and similarly hen harriers may have moved since previous surveys or visibility of vantage point locations may have changed since previous surveys (e.g. increased forest height). It is really important to familiarise yourself with the suitable breeding habitats in your chosen 10km square(s) and survey all areas that contain suitable breeding habitat.
- There a key data to be recorded and these primarily fall into the following categories:
 - **Contact information**
 - **Survey effort (location & duration)**
 - **Hen harrier observations (date, time, location, behaviours & habitat)**
 - **Other priority bird species observations (location & behaviour)**
 - **Identification of pressures and threats, if any, to hen harriers in your survey area**
- You are provided with a map and an aerial photograph of your allocated 10km square(s).
- Please use a different map and recording form for each visit to an area of suitable habitat to record the surveyed areas and the locations of hen harrier sightings and/or nests.

- Familiarise yourself initially with the map, suitable hen harrier habitat, main roads and potential vantage point locations (such as elevated hills or topographical features) and areas of unsuitable habitat that can be excluded from further survey effort.
- Then during your first field visit exclude any further unsuitable hen harrier habitat on the map during and during vantage point watches.
- The aerial photograph may be used to assist in excluding unsuitable habitat prior to your first visit, but please be aware these photos may have been taken a few years earlier and some habitat changes may have occurred.
- During vantage point watches please mark the area visible during your observations, vantage point grid references will be recorded in the main recording form.
- If a nest is located please mark with an **X** on the map.
- Complete the survey form during each vantage point watch and finalise at the end of your survey day.
- It is important to submit nil return sheets if you have no sightings, but still record all survey details.

Recording forms, data spreadsheets and online recording:

One recording form is used for each area of suitable habitat being watched – you can use the same form for all visits and use more sequential forms for survey areas with lots of activity.

All your sighting information is valuable and will allow us to examine which habitats or areas hen harriers are flying, hunting as well as where they are breeding and any activities or threats and pressures nearby. Recording forms should include details on:

- the name(s) of observer name surveying the 10km square
- the observer email address for follow up contact if required
- the number of pages and current page number e.g. page 1 of 2, 2 of 2 etc
- the name of the organisation or study group to which the observer(s) belong
- the phone number of the surveyor
- the type of observation (please tick) which should be either i) casual or ii) vantage point observation
- the 10km grid reference of the square (1 letter & 2 numbers)
- the county in which the 10km square is located
- the survey area name i.e. nearest place name or townland to the surveyed area (taken from the survey map)
- the activities/threats or pressures observed, if any, within 500m and within 2km of the survey area (Table 3)

- the visit number i.e. whether visit 1, 2, 3 or 4 on the survey schedule (see Table 1)
- the date please use the following format e.g. 01 06 = 1st June
- the vantage point grid reference (1 letter & 6 numbers). Specify the location from which your observation was made
- the start time of your vantage point watch or observation, this helps us understand survey effort
- the end time of your vantage point watch or observation, this helps us understand survey effort
- the sighting time insert the time at which you saw the hen harrier(s) or the other species
- the grid reference of the sighting (1 letter & 6 numbers). Specify the grid reference of mid-point of activity where it occurs over a large distance or in multiple locations by the same pair/individual. Please specify clearly the grid reference of the nest (if located) and mark this on your map with an **X**. This data will all be kept confidentially.
- the hen harrier numbers are to identify the number of individuals (0, 1, 2, 3 etc) seen during each sighting of each age group and sex.
- the behaviour code(s) (see Table 3), please record all behaviours noted during sighting, you can record multiple behaviour codes here. The more information you provide the more useful your sightings will be during analysis
- the habitat code(s), which is the dominant habitat within 100m of the sighting or nest (see Table 4)
- the other species code(s) which are to record any other raptors, waders or priority species encountered during surveys. The main focus of the survey is for hen harriers but since surveyors will be widely dispersed over the country this is an opportunity to collect some additional information on some priority bird species. Please focus survey effort on hen harriers but it is useful to record any casual sighting time, sighting grid reference, behaviour codes and habitat codes also for some of the other species. BTO species codes are provided on the recording form.
- the survey area summary is to help inform us what your perception of the sightings and activity are at each of your surveyed areas and to advise how we should classify each of your survey areas; these should be classified according to Table 6.
- the notes section is to allow the addition of any relevant information. In particular, this should include any suspected persecution of hen harriers or disturbance or poor weather recorded during your fieldwork, details of any wing tagged hen harriers should also be recorded to include colour of left wing tag, colour of right wing tag and any codes on the tags
- Some 10km squares may not contain nesting hen harriers, it is important that the suitable habitat is still covered and that negative results are submitted. Please enter visit dates and in the number of hen harriers box please write NIL and provide comments on the suitability, activities, threats or pressures of the habitat for nesting hen harriers.
- Casual sightings of hen harriers in other squares are also welcomed, please submit a recording form for the relevant 10km square and tick casual sightings box.

Table 3. Activities, management, threats or pressures codes and descriptions for use on recording forms.

Code	Description of activity, threat or pressure
A1	modification of cultivation practices
A2	agricultural intensification
A3	mowing / cutting of grassland
A4	abandonment / lack of mowing
A5	intensive grazing
A6	non intensive grazing
A7	abandonment of pastoral systems, lack of grazing
A8	fertilisation (agricultural)
A9	removal of hedges and copses or scrub
B1	forest planting on open ground (increase in forest area, planting e.g. on grassland , heathland)
B2	forest and plantation management & use
B3	forest replanting (i.e. replanting on forest ground after clear-cutting)
B4	forest clearance (clear-cutting, removal of all trees)
B5	thinning of tree layer
B6	fertilisation (forestry)
B7	other forest activities (e.g. erosion due to forest clearing, fragmentation)
C1	hand cutting of peat
C2	mechanical removal of peat
C3	wind energy production
D1	paths, tracks, cycling tracks (includes non-paved forest roads)
D2	roads, motorways (all paved/ tarred roads)
D3	utility and service lines (e.g. power-lines, pipelines)
D4	aircrafts or flightpaths
D5	improved access to site
E1	urbanisation, residential and commercial development
E2	dispersed habitation (i.e. little or no human disturbance)
F1	nest destruction
F2	illegal killing (e.g. shooting, trapping, poisoning)
G1	human intrusions and disturbances
G2	outdoor sports and leisure activities, recreational activities
G3	walking, horse-riding and non-motorised vehicles
G4	motorised vehicles
G5	off-road motorised driving
G6	other outdoor sports and leisure activities
G7	military manoeuvres

Code	Description of activity, threat or pressure
H1	pollution (e.g. water pollution, fly-tipping)
J1	natural fires
J2	controlled burning (e.g. strip burning for grouse management)
J3	uncontrolled burning (e.g. widespread unmanaged or malicious burning)
J4	modification of water levels or waterbodies
J5	reduction or loss of specific habitat features (e.g. removal of hedgerows, deep heather, scrub, walls, drains)
J6	reduction of prey availability
J7	anthropogenic reduction of habitat connectivity (i.e. fragmentation such as by removal of large areas of habitat or creation of barriers between habitats)
K1	interspecific faunal relations - predation (by other birds e.g. crows)
K2	interspecific faunal relations - predation (by mammals e.g. foxes)
X	no threats or pressures
O	other threats or pressures not listed above

Table 4. Behaviour codes and descriptions utilised during the survey.

Behaviour (Code)	Description of behaviour
<i>Display (D)</i>	Including "sky-dancing" or aerial display involving rapid stooping and climbing and occasionally mutual or individual high circling may be observed
<i>Food pass (FP)</i>	Male passing food to the female or adult to juvenile, usually in mid-air
<i>Hunting (H)</i>	Low level "quartering" flights <5m above ground level
<i>Flying (F)</i>	Flying or commuting where no other behaviours are recorded
<i>Alarm (A)</i>	Adults calling or appearing agitated, usually occurs close to the nest during territorial defence
<i>With Prey (WP)</i>	Carrying prey in its talons
<i>Soaring (S)</i>	Circling very high (above tree-tops) on thermals
<i>Circling (C)</i>	Circling below tree-top height
<i>Perched (P)</i>	Perched on a tree or fence post
<i>on Ground (G)</i>	Perched on the ground
<i>Mobbing (M)</i>	Territorial behaviour and chasing or attacking other harriers or other bird species. May occasionally be observed to attack mammal predators
<i>Other (O)</i>	Describe behaviour(s) where not indicated by any other category above

Table 5. Habitat codes and descriptions utilised during the survey.

Habitat (Code)	Description of habitat
<i>First rotation (or new) forest (1F)</i>	First-rotation forest plantations before canopy closure. Characterised by prolific herb layer with varying shrub layer development. Trees generally >1m tall with large open spaces between lines of planting.
<i>Second rotation forest (2F)</i>	Second-rotation forest plantations before canopy closure. Characterised by varying shrub layer development and brash and tree root-plates from the previous crop and large open spaces between lines of planting. Newly established second-rotation trees are not always obvious.
<i>Thicket (pole) or mature stage forest (T)</i>	Closed-canopy forest plantations including both 1F & 2F crops. Usually >10 years old. Characterised by absence of shrub layer, except in rides between stands of trees and in small patches of unplanted ground or failed crop.
<i>Clearfell (CF)</i>	Harvested plantation not yet restocked with trees. Characterised by limited development of herb and shrub layer, and brash and tree root-plates evident from the previous crop.
<i>Heather moorland/bog (H)</i>	Unenclosed heather-dominated moorland characterised by species such as heather, bilberry and purple-moor grass plus blanket bog characterised by <i>Calluna</i> and bell heather, bog cotton, deer grass and moss. Typically grazed by red deer and low densities of sheep.
<i>Grass moorland (G)</i>	Unenclosed grass-dominated moorland usually grazed by sheep. Characterised by species such as wavy hair grass, mat grass and heath rush. Stands of <i>Juncus</i> spp. and bracken occasionally occur.
<i>Rough grassland (RG)</i>	Unenclosed or enclosed, neglected pastures occasionally stocked with sheep or cattle that have not recently been improved, re-seeded or fertilised. Usually contains long grass, waterlogged areas and stands of rushes (<i>Juncus</i> spp).
<i>Improved grassland (IG)</i>	Enclosed pastures that have been drained, fertilised or re-seeded characterised by lush green grass vegetation and containing higher densities of sheep or cattle. Also includes hay meadows.
<i>Scrub (S)</i>	Areas outside or away from plantation forests consisting of willow, bramble, furze etc which have not been tended by humans. Includes bushy vegetation such as Willow (<i>Salix</i> spp), Gorse (<i>Ulex</i> spp), Bramble (<i>Rubus</i> spp), Alder (<i>Alnus</i> spp), Birch (<i>Betula</i> spp) and Bracken (<i>Pteridium</i> spp).
<i>Linear feature associated with rough grassland (LR)</i>	Linear feature (e.g. hedgerows, ditches, drainage channels etc) that are contained or in close proximity to rough grassland
<i>Linear feature associated with improved grassland (LI)</i>	Linear feature (e.g. hedgerows, ditches, drainage channels etc) that are contained or in close proximity to improved grassland
<i>Other (O)</i>	Description of habitat where it does not fall into one of the categories outlined above.

Table 6. Classification of breeding status

Breeding status	Behaviours, evidence and/or activities observed
<i>Confirmed breeding</i>	<p>Food pass observed</p> <p>Adult carrying prey</p> <p>Recently fledged young</p> <p>Agitated behaviour or calls given by adults</p> <p>Direct evidence of a nest (eggs or chicks seen, chicks heard, used nest or eggshells found)</p> <p>Courtship or display behaviour involving both a male & female noted on two visits separated by at least a week</p> <p>A pair seen visiting a probable nest site on two visits separated by at least a week</p> <p>Nest building or carrying nest material</p>
<i>Possible breeding</i>	<p>Courtship or display behaviour involving both a male & female noted on only 1 visit, or only</p> <p>Only one bird is ever seen (e.g. displaying male seen twice but no female seen)</p> <p>A pair seen visiting a probable nest site on only one visit</p> <p>Pair or female seen in possible nesting habitat between mid May & end of June</p>
<i>Seen</i>	<p>Single male, female or pair (outside mid-May & June) observed with no evidence of breeding behaviour</p>
<i>Not seen</i>	<p>Area of suitable breeding habitat with no observations of hen harriers</p>



Irish Raptor Study Group

Grúpa Staidéir Éan Creiche na hÉireann



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An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

Office Use Only

Observer Name:

Observer email address:

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Organisation:

Phone number:

Submit forms by 31st August 2022.

Return to:

Ryan Wilson-Parr (IRSG): 12 Rock Court, Slane, Co. Meath
John Lusby (BWI): 27 Beechgrove, Oranmore, Co. Galway
Marc Ruddock (GET): 12 Ely Place, Dublin 2, Co. Dublin

Type of observation (please tick):

Casual sighting

Vantage point observation

10km Square Reference (e.g. R26)

County:

Survey area name (nearest place name or townland):

Activity/threat/pressure observed (codes):

500m		2km	
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Visit No.	Date e.g. 01 06	Vantage point grid reference e.g. R123456	Start time (hh:mm)	End time (hh:mm)	Sighting time (hh:mm)	Sighting grid reference e.g. R123456	Hen harrier numbers				Behaviour code(s)	Habitat code(s)	Other species code(s)
							Adult male	Immature Male	Female	Juvenile			

Survey area summary:	Notes
Maximum breeding evidence (please tick) Confirmed <input type="checkbox"/> Possible <input type="checkbox"/> Seen <input type="checkbox"/> Not seen <input type="checkbox"/>	

Behaviour codes: D - Display FP - Food pass H - Hunting F - Flying A - Alarm WP - Carrying prey S - Soaring C - Circling P - Perched G - On ground M - Mobbing V - Visiting nest O - Other (please specify)

Habitat codes: 1F - First rotation forest 2F - Second rotation forest T - Thicket (or pole) stage forest CF - Clearfell H - Heather moorland G - Grass moorland RG - Rough grassland IG - Improved grassland LR - Linear feature associated with rough grassland LI - Linear feature associated with improved grassland O - Other (please specify)

Activity/management/threat/pressure codes: (Please check method statement for description of codes): A1; A2; A3; A4; A5; A6; A7; A8; A9; B1; B2; B3; B4; B5; B6; B7; C1; C2; C3; D1; D2; D3; D4; D5; E1; E2; F1; F2; G1; G2; G3; G4; G5; G6; G7; H1; J1; J2; J3; J4; J5; J6; J7; K1; K2; X; O

Other bird species: PE Peregrine falcon ML Merlin KT Red kite WE White-tailed eagle EA Golden eagle GI Goshawk OP Osprey MH Marsh harrier BZ Common buzzard K. Kestrel SH Sparrowhawk BO Barn owl SE Short-eared owl LE Long-eared Owl RZ Ring ouzel CF Chough RG Red grouse CU Curlew GP Golden plover SN Snipe JS Jack snipe L. Lapwing RK Redshank NJ Nightjar CE Corncrake