Foel Fach Wind Farm Limited.

Foel Fach Wind Farm – Environmental Statement Volume III

Appendix 6.4: Habitats Regulations Assessment - Ornithology

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Energy for generations

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Foel Fach Wind Farm

on behalf of Foel Fach Wind Farm Limited

Environmental Statement

Appendix 6.4:

Habitats Regulations Assessment - Ornithology

avianecology

CONTENTS

EXECUTIVE SUMMARY

This Technical Appendix provides information to inform a Habitats Regulations Appraisal (HRA) with regards to likely significant effects (LSEs) on the Migneint-Arenig-Dduallt Special Protection Area (SPA) and Berwyn SPA. A screening for LSEs is provided, looking at qualifying features of both SPAs. Following the screening process, an appropriate assessment (AA) was considered a requirement with respect to the Berwyn SPA, and the collision mortality risk resulting from the Proposed Development on red kite. A shadow AA is thus provided as the final part of the Technical Appendix which concludes that the Proposed Development (alone and in-combination with other wind farm developments) would have no adverse effects on the site integrity of the Berwyn SPA.

1 INTRODUCTION

1.1.1 This Technical Appendix has been prepared to accompany Environmental Statement **(ES) Volume II, Chapter 6: Ornithology**, for the Proposed Development.

1.1.2 Under the Conservation of Habitats and Species Regulations 2017, as amended (the Habitats Regulations), any development that may have a likely significant effect (LSE) on a European site (Special Protection Area (SPA) or Special Area of Conservation (SAC), as well as Ramsar sites (which have been given the same protection)) require an Appropriate Assessment (AA) to be carried out by the relevant competent authority, to determine whether or not that development would have an adverse impact on the integrity of the designated area either alone or in combination with other projects.

1.1.3 Before an AA is initiated, a screening process is undertaken to determine whether any of the predicted impacts of the development would result in an LSE. This Screening Assessment ('Stage 1') is presented, to provide information to the competent authority that allows them to reach a decision on whether or not the development would have an LSE on European sites and, therefore, whether an AA ('Stage 2') is required. Where an LSE cannot be ruled out, a shadow AA is provided within this document.

1.1.4 The two stage process is referred to as a Habitats Regulations Assessment (HRA). Only the competent authority can undertake HRA, but 'information to inform the HRA' is provided within this Technical Appendix.

1.1.5 This Technical Appendix only covers internationally designated sites with ornithological qualifying features. For an assessment of designated sites with non-avian ecological features (i.e. SACs) pertinent to the Proposed Development see **ES Volume II, Chapter 5: Terrestrial Ecology**.

2 IDENTIFICATION OF DESIGNATED SITES & QUALIFYING INTERESTS

2.1.1 Two statutory sites of international importance with ornithological qualifying features have been identified for screening; Migneint-Arenig-Dduallt SPA (805 m from the Site) and Berwyn SPA (7.3 km from the Site). No other internationally designated areas with ornithological interests are located within 10 km of the Site (the area in which the Proposed Development will be located) or are otherwise found within potential connectivity distance of the Proposed Development, based on guidance (SNH, 2016).

2.1.2 Hen harrier, peregrine and red kite were recorded during the field surveys undertaken to inform the baseline conditions for the purpose of Environmental Impact Assessment (EIA). These surveys findings included records of hen harrier and red kite in the breeding season (details into the survey results with respect to these species is provided in **Section 3**). Hen harrier and peregrine are qualifying features of the Migneint-Arenig-Dduallt SPA and Berwyn SPA, and red kite is a qualifying feature of Berwyn SPA.

2.2 Migneint-Arenig-Dduallt SPA

2.2.1 The Standard Data Form of the Migneint-Arenig-Dduallt SPA[1] lists three qualifying features (breeding): hen harrier, merlin and peregrine. At the time of SPA designation (2003), the SPA held 10-12 pairs of hen harrier, 9-12 pairs of merlin and 12 pairs of peregrine.

2.2.2 The full citation[2] for Migneint-Arenig-Dduallt SPA also lists, as non-qualifying species of interest, breeding golden plover, dunlin, red grouse, chough, red kite, black grouse and curlew. Given these species are not part of the SPA designation, these have been excluded from assessment.

2.2.3 Migneint-Arenig-Dduallt SPA covers a large upland area of 19,968.31 ha, and is predominantly 'bogs, marshes, water fringed vegetation, fens' (51.9 %), with 'heath, scrub, maquis and garrigue, phygrana' (16.3 %), 'dry grassland, steppes' (14.8 %) and humid grassland, mesophile grassland (12.9 %), with the rest of the habitats forming much lower proportions (<2.5 %). The SPA is located 805 m west of the Site at its nearest point (the proposed access track; **ES Volume IV, Figure 6.1: Ornithological Statutory Designated Sites**). The SPA lies to the west of the B4501 from the Site.

2.2.4 The conservation objectives[3] for breeding hen harrier in the Migneint-Arenig-Dduallt SPA are:

- The size of the population is at least 8 breeding pairs (SPA form 2003 10-12 pairs) and preferably increasing (2007 – 11 pairs).
- Hen Harrier nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate habitats.
- Hen Harrier breeding success is at least one young fledged per nest.
- There is sufficient nesting and roosting tall heather habitat to support the population in the long-term.
- There is sufficient hunting habitat, often in mosaic and including areas of grassland, bogs, flushes, short heath and bracken with low trees/scrub present. There is an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if productivity is low.
- All factors affecting the achievement of these conditions are under control.

2.2.5 The conservation objectives[3] for breeding merlin in Migneint-Arenig-Dduallt SPA are:

- The size of the population is at least 9 breeding pairs (SPA form 2003 9-12 pairs, 0.7-0.9 % GB) and preferably increasing.
- Merlin nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate habitats.
- Merlin breeding success is at least one young fledged per nest when sample monitoring is carried out.

[1] Available from: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9013131.pdf (Accessed June 2025).
[2] Available from: https://cdn.cyfoethnaturiol.cymru/632420/SPA_UK9013131_Register_Entry_EN001.pdf (Accessed June 2025).
[3] Available from: https://cdn.cyfoethnaturiol.cymru/672797/MigneintADd%20WES32%20plan%20English.pdf (Accessed June 2025).

- There is sufficient nesting and roosting tall heather, individual trees often with crows' nests and forestry edge habitat to support the population in the long-term.

- There is sufficient hunting habitat, often in mosaic and including areas of grassland, bogs, flushes, short heath and bracken with low trees/scrub present. There is an adequate supply of prey species in the form of small birds (commonly meadow pipit and skylark) and large insects to maintain successful breeding. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if productivity is low.

- All factors affecting the achievement of these conditions are under control.

2.2.6 The conservation objectives[3] for breeding peregrine in Migneint-Arenig-Dduallt SPA are:

- The size of the population is at least 9 breeding pairs (SPA form 2003 9-12 pairs, 0.7-0.9 % GB) and preferably increasing.

- Peregrine nesting distribution within the site is maintained or expanded, so that breeding occurs in all appropriate nest sites.

- Peregrine breeding success is at least one young fledged per nest when sample population monitoring is carried out.

- There are sufficient cliff and crag with ledges suitable for nesting usually known traditional nest sites to support the population in the long-term.

- There is a sufficient hunting habitat and prey. Prey supply cannot be easily monitored or assessed but may be an important attribute, for research and study, if peregrine productivity is low.

- All factors affecting the achievement of these conditions are under control.

2.1 Berwyn SPA

2.1.1 The Standard Data Form of the Berwyn SPA[4] lists four qualifying features (breeding): hen harrier, merlin, peregrine and red kite. At the time of SPA designation (1996), the SPA held 14 pairs of hen harrier, 14 pairs of merlin, 18 pairs of peregrine and 2-3 pairs of red kite.

2.1.2 The full citation[5] for Berwyn SPA also lists as 'notable' two other Annex 1 species: golden plover and short-eared owl. The citation further goes on to list black grouse is present in 'important numbers', and also breeding are curlew, dunlin, raven, ring ouzel, snipe and teal. There is also a large and economically important population of red grouse. As these species are non-qualifying species of the SPA these have been excluded from assessment.

2.1.3 Berwyn SPA covers a large upland area of 24,268.13 ha, and is predominantly 'heath, scrub, maquis and garrigue, phygrana' (38.0 %), 'bogs, marshes, water fringed vegetation, fens' (34.0 %), and 'dry grassland, steppes' (22.0 %), with the rest of the habitats forming much lower proportions (<1.5 %). The SPA is located 7.3 km south of the Site at its nearest point (**ES Volume IV, Figure 6.1**). The SPA lies to the south of the A494, and the village of Llandderfel.

[4] Available from: https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9013111.pdf (Accessed June 2025).

[5] Available from: https://cdn.cyfoethnaturiol.cymru/632307/SPA_UK9013111_Register_Entry_EN001.pdf (Accessed June 2025).

2.1.4 The conservation objectives[6] for breeding hen harrier in the Berwyn SPA are:

- The size of the population must be being maintained at eleven breeding pairs or increased beyond this.
- There will be sufficient appropriate habitat to support the population in the long-term including patches of tall heather available for nesting and roosting, areas grasslands, bracken of low trees/scrub for feeding with an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding.
- Distribution of species within site is maintained.
- Distribution and extent of habitats supporting the species is maintained.
- Developments should not be permitted where they can be shown to have likely adverse impacts upon hen harrier.
- Populations of legally controllable predator species, such as foxes and carrion crows, will not pose a threat to ground nesting birds.
- Hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines.
- There will be no disturbance of any nest location.
- Illegal human persecution of protected bird species should not occur.
- All factors affecting the achievement of these conditions are under control

2.1.5 The conservation objectives[6] for breeding merlin in the Berwyn SPA are:

- The size of the population must be being maintained at 13 breeding pairs or increased beyond this.
- There will be sufficient appropriate habitat to support the population in the long-term including patches of tall heather available for nesting and roosting, areas grasslands, bracken of low trees/scrub for feeding with an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding.
- Distribution of species within site is maintained.
- Distribution and extent of habitats supporting the species is maintained.
- Developments should not be permitted where they can be shown to have likely adverse impacts upon merlin.
- Populations of legally controllable predator species, such as foxes and carrion crows, should not pose a threat to ground nesting birds.
- Adjoining hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines.

[6] Available from: https://naturalresources.wales/media/670888/Berwyn%20man%20plan%20(E)%20(table%20revis%2010.09.09).pdf Accessed June 2025).

- There will be no disturbance of any nest location.
- Illegal human persecution of protected bird species should not occur.
- All factors affecting the achievement of these conditions are under control.

2.1.6 The conservation objectives[6] for breeding peregrine in the Berwyn SPA are:

- The size of the population must be being maintained at 13 breeding pairs or increased beyond this.
- Mountainous and moorland terrain with cliffs, crags and quarries for nesting and roosting plus grasslands, bracken of low trees/scrub for feeding with an adequate supply of prey species in the form of small birds and small mammals to maintain successful breeding.
- The range of the population must not be contracting.
- Distribution and extent of habitats supporting the species is maintained.
- Developments should not be permitted where they can be shown to have likely adverse impacts upon peregrine.
- Populations of legally controllable predator species, such as foxes and carrion crows, should not pose a threat to ground nesting birds.
- Adjoining hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines.
- There will be no disturbance of any nest location.
- Illegal human persecution of protected bird species should not occur.
- All factors affecting the achievement of these conditions are under control.

2.1.7 The conservation objectives[6] for breeding red kite in the Berwyn SPA are:

- The size of the population must be being maintained at two breeding pairs or increased beyond this.
- Sufficient broadleaf woodland required for nesting and roosting plus heath and rough grassland for feeding with an adequate supply of prey species in the form of carrion, small birds and small mammals to maintain successful breeding. (NOTE: Red kite do not nest within the SPA.)
- Developments should not be permitted where they can be shown to have likely adverse impacts upon red kite.
- Adjoining hunting territories will be managed by controlled grazing to improve structural diversity within the grasslands. This will increase seed production and maximise prey availability e.g. small passerines.
- There will be no disturbance of any nest location.
- Illegal human persecution of protected bird species should not occur.
- All factors affecting the achievement of these conditions are under control.

2.1.8 Screening is undertaken to determine the potential for a LSE upon the qualifying features stated above, with reference made to the listed conservation objectives, where relevant.

3 STAGE 1: SCREENING FOR LSE

3.1.1 Stage 1: Screening for LSE considers three important aspects of the proposal and the qualifying features of the designated site:

- Connectivity between the Proposed Development and the designated site;
- Route to impact between the Proposed Development and the designated site; and
- Numbers of qualifying features available for impact (consequential or inconsequential).

3.1.2 An impact on the SPA population is possible where the qualifying feature i) uses the area in the vicinity of the Proposed Development, putting birds at risk of disturbance or displacement impacts, potentially reducing productivity (construction, operational and decommissioning phases); or ii) where birds regularly pass across the turbine area of the Proposed Development, putting birds at risk of collision, resulting in direct fatality (operational phase only).

3.1.3 Within this Technical Appendix the following three evidence-led tests are considered:

- Is there evidence to suggest that breeding adults of all classified features from the Berwyn and Migneint-Arenig-Dduallt SPAs are ecologically dependent on the Proposed Development area for foraging?
- Is there evidence to suggest that wintering adults of all classified features from the Berwyn and Migneint-Arenig-Dduallt SPAs are ecologically dependent (i.e., foraging or roosting) on the Proposed Development area?
- Is the maintenance of conservation objectives for all classified features of the Berwyn and Migneint-Arenig-Dduallt SPAs dependent on recruitment from within the Proposed Development area? If so, would this loss of emigration represent an adverse impact to the favourable condition of the qualifying features of the Berwyn and/or the Migneint-Arenig-Dduallt SPAs?

3.1.4 When assessing for potential disturbance and displacement and collision impacts, if it can be clearly demonstrated that there is no connectivity, no route to impact or an inconsequential number of qualifying features would be impacted, it can be concluded that there is no LSE on the designated site. If, however, there is any doubt that no LSE can be concluded in Stage 1, the process moves on to Stage 2 (shadow AA).

3.1.5 Due to the separation distance between the Site and both the Migneint-Arenig-Dduallt SPA and Berwyn SPAs, there would be no impacts (directly or indirectly) on the habitats contained within the two designated sites as a result of the Proposed Development. The conservation objectives for merlin, peregrine and red kite for the Berwyn SPA also state appropriate management of adjoining habitats. This assessment thus also considers habitats on the immediate periphery of the SPA. Given the spatial separation of the Site and the Berwyn SPA (7.3 km), effects on habitats adjoining the SPA are not anticipated either. Therefore, the conservation objectives of sustaining nest sites and feeding habitat (for both SPAs) and roost sites (for the Berwyn SPA) within the SPAs would be unaffected by the Proposed Development and are therefore not discussed further in this report.

3.2 Hen harrier

3.2.1 Hen harrier is a qualifying feature of both the Migneint-Arenig-Dduallt SPA, and the Berwyn SPA.

3.2.2 Due to the separation distance between the Site and the Migneint-Arenig-Dduallt SPA (minimum of 805 m), and between the Site and the Berwyn SPA (minimum of 7.3 km) there is no route to impact for disturbance on SPA birds whilst within the SPA boundaries (upper disturbance limits of breeding hen harrier is 750 m, from Goodship and Furness, 2022).

3.2.3 No hen harrier breeding territories were recorded during two years of baseline surveys undertaken for the Proposed Development within the survey area (Site plus 2 km buffer). Hen harrier activity during baseline surveys was low and infrequent (only five flights of five solo birds, across the entire two-year survey period, with two during the breeding season, and with only two of the five flights at risk from collision). The paucity of records is evidence that hen harrier from other areas, such as those breeding in the SPAs, do not regularly forage within the Site and it cannot be considered as being an important foraging area for hen harrier. The Berwyn SPA is also located 7.3 km from the Site which well exceeds the core foraging range[7] of hen harrier during the breeding season (2 km, from SNH, 2016), and thus the hen harrier recorded are considered unlikely to be Berwyn SPA birds. Migneint-Arenig-Dduallt SPA is closer to the Site (805 m from the Site, in terms of the proposed access track, with the nearest turbine >2 km from the SPA). The potential for the small, infrequent numbers of hen harriers recorded during surveys being connected to the Migneint-Arenig-Dduallt SPA is more plausible.

3.2.4 During construction, any hen harriers foraging in the Site may avoid an area of up to 750 m around construction works, based on Goodship and Furness (2022). Only construction work related to the access track, including the associated movement of construction vehicles and works occurring within the temporary construction compound would take place within core foraging range of any hen harriers breeding within Migneint-Arenig-Dduallt SPA and only for those within the closest part of the SPA to the Site. The localised and temporary nature of access track construction works and the construction compound means that any avoidance would have a negligible impact, particularly on a species that has a territory with a core radius of 2 km (maximum range of 10 km, SNH, 2016).

3.2.5 Any Migneint-Arenig-Dduallt SPA hen harriers that forage in the Site, and within 2 km (core range) of the Site, would be expected to continue to do so following construction of the Proposed Development. Indeed, it has been shown that wind farm sites can support hen harrier (foraging and breeding/nesting) and there is no evidence of any large-scale avoidance of wind farms by hen harriers (Haworth and Fielding, 2012).

3.2.6 In summary, with regards to the Berwyn SPA, the SPA is located 7.3 km from the Site which well exceeds the core foraging range[7] of hen harrier during the breeding season (2 km, from SNH, 2016), and thus the hen harrier recorded are considered unlikely to be Berwyn SPA birds.

3.2.7 For the Migneint-Arenig-Dduallt SPA, the SPA is 805 m from the Site, with the nearest part of the Proposed Development the proposed access track (and temporary construction compound). Construction works within the hen harriers core foraging range would only be associated with works on the access track. Effects of these works on any SPA hen harriers active is predicted to be negligible.

3.2.8 For disturbance and displacement, **no LSE can be concluded** for hen harrier of the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

3.2.9 The level of flight activity within the wind farm development area recorded during baseline VP flight activity surveys was very low for hen harrier. A total of two flights were recorded in the breeding season during the two years of baseline surveys, with one in Year 1 and one in Year 2. Neither flight was regarded as being at collision risk (i.e. within the 'collision risk zone' (a single area encompassing the outermost turbines, plus 300 m) at rotor sweep height). As hen harriers are short-range migrants that disperse from breeding sites in winter, those present at other times of year are unlikely to

[7] Core foraging range rather than maximum foraging range is typically used when determining potential connectivity with designated areas.

represent breeding birds from the SPAs. The collision mortality risk to breeding hen harrier has been concluded as being nil or negligible in magnitude and inconsequential on both the Migneint-Arenig-Dduallt SPA and Berwyn SPA populations.

3.2.10 For collision, **no LSE can be concluded** for hen harrier of the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

3.2.11 In terms of the three evidence-led tests considered (see above), there is no evidence that breeding hen harrier or non-breeding hen harrier are dependent on the Site. Furthermore, there is no evidence that maintenance of either of the SPA's conservation objectives, in relation to hen harrier, are dependent on recruitment from the Site (with no evidence of breeding recorded and only very limited activity).

3.3 Merlin

3.3.1 Merlin is a qualifying feature of both the Migneint-Arenig-Dduallt SPA, and the Berwyn SPA.

3.3.2 Due to the separation distance between the Site and the Migneint-Arenig-Dduallt SPA (minimum of 805 m), and between the Site and the Berwyn SPA (minimum of 7.3 km) there is no route to impact for disturbance on SPA birds whilst within the SPA boundaries (upper disturbance limits of breeding merlin is 500 m, from Goodship and Furness, 2022).

3.3.3 No merlin breeding territories or flight activity were recorded during two baseline survey years for the Proposed Development. The paucity of records is evidence that merlin from other areas, such as those breeding in the SPAs (although unlikely, see below), do not regularly forage (if at all) within the Site and it cannot be considered as being an important foraging area for merlin. The Berwyn SPA is located 7.3 km from the Site, which exceeds the foraging range of merlin during the breeding season (within 5 km, from SNH, 2016), and any merlin that may use the Site are considered not to be Berwyn SPA birds. Migneint-Arenig-Dduallt SPA is closer to the Site (805 m from the Site, in terms of the proposed access track, with the nearest turbine >2 km from the SPA). The potential for merlin from the Migneint-Arenig-Dduallt SPA cannot be discounted, although there was no evidence of this during baseline surveys. There is therefore considered to be a potential route to impact for merlin associated with Migneint-Arenig-Dduallt SPA and no connectivity with Berwyn SPA.

3.3.4 During construction, any birds foraging in the Site may avoid an area of up to 500 m around construction works, based on upper disturbance limits (Goodship and Furness, 2022). This would have a negligible impact on a species that has a territory with a 5 km radius.

3.3.5 Any Migneint-Arenig-Dduallt SPA birds that forage in the Site would be expected to continue to do so following construction of the Proposed Development. Indeed, it has been shown that wind farm sites can be an important stronghold for breeding merlin (e.g. Vattenfall, 2023).

3.3.6 In summary, with regards to the Berwyn SPA, the SPA is located 7.3 km from the Site which exceeds the foraging range of merlin during the breeding season (5 km, from SNH, 2016), and thus any merlin is considered unlikely to be Berwyn SPA birds.

3.3.7 For Migneint-Arenig-Dduallt SPA, any merlin (noting none were recorded during two years of field surveys) that use the Site, are expected to do so with any displaced from construction works considered to be negligible in impact.

3.3.8 For disturbance and displacement, **no LSE can be concluded** for merlin of the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

3.3.9 No merlin flight activity was recorded within the wind farm development area during baseline VP flight activity surveys. Accordingly, no collision mortality risk to merlin has been identified.

3.3.10 For collision, **no LSE can be concluded** for merlin of the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

3.3.11 In terms of the three evidence-led tests considered (see above), there is no evidence that breeding merlin or non-breeding merlin are dependent on the Site. Furthermore, there is no evidence that maintenance of either of the SPA's conservation objectives, in relation to merlin, are dependent on recruitment from the Site (with no evidence of breeding or any activity recorded).

3.4 Peregrine

3.4.1 Peregrine is a qualifying feature of both the Migneint-Arenig-Dduallt SPA, and the Berwyn SPA.

3.4.2 Due to the separation distance between the Site and the Migneint-Arenig-Dduallt SPA (minimum of 805 m), and between the Site and the Berwyn SPA (minimum of 7.3 km) there is no route to impact for disturbance on SPA birds whilst within the SPA boundaries (upper disturbance limits of breeding peregrine is 750 m, from Goodship and Furness, 2022).

3.4.3 No peregrine breeding territories were recorded during two baseline survey years for the Proposed Development within the survey area (Site plus 2 km buffer). Peregrine activity during baseline surveys was very low and infrequent (only two flights across the entire two-year survey period, with both flights single birds during the non-breeding season). The paucity of records is evidence that peregrine from other areas, such as those breeding in the SPAs (although unlikely, see below), do not regularly forage within the Site and it cannot be considered as being an important foraging area for peregrine. The Berwyn SPA is located 7.3 km from the Site, which well exceeds the core foraging range of peregrine during the breeding season (2 km, from SNH, 2016), and thus the peregrine recorded are considered unlikely to be Berwyn SPA birds. Migneint-Arenig-Dduallt SPA is closer to the Site (805 m from the Site, in terms of the proposed access track, with the nearest turbine >2 km from the SPA). Therefore, although not recorded in the breeding season during baseline flight activity surveys, there is the potential for connectivity between the Site and peregrines from Migneint-Arenig-Dduallt SPA.

3.4.4 During construction, any peregrines foraging in the Site may avoid an area of up to 750 m around construction works, based on Goodship and Furness (2022). Only construction work related to the access track and associated with the temporary construction compound would take place within core foraging range of any peregrines breeding within Migneint-Arenig-Dduallt SPA and only for those within the closest part of the SPA to the Site. The localised and temporary nature of access track construction works means that any avoidance would have a negligible impact, particularly on a species that has a territory with a core radius of 2 km (maximum recorded UK range of 18 km, SNH, 2016).

3.4.5 Any Migneint-Arenig-Dduallt SPA peregrines that forage in the Site would be expected to continue to do so following construction of the Proposed Development. Indeed, anecdotal evidence suggests that peregrine can be tolerant of wind farms, with evidence that some wind farms support breeding peregrine, with some pairs even having nested on turbines[8].

3.4.6 In summary, with regards to the Berwyn SPA, the SPA is located 7.3 km from the Site which well exceeds the core foraging range of peregrine during the breeding season (2 km, from SNH, 2016), and thus the peregrine recorded are considered unlikely to be Berwyn SPA birds.

3.4.7 For the Migneint-Arenig-Dduallt SPA, the SPA is 805 m from the Site, with the nearest part of the Proposed Development the proposed access track. Construction works within the peregrines core foraging range would only be works on the access track and associated with the temporary

[8] https://www.windpowermonthly.com/article/1489017/safe-havens-protected-birds (Accessed June 2025).

construction compound. Effects of these works on any SPA peregrines active is predicted to be negligible.

3.4.8 For disturbance and displacement, **no LSE can be concluded** for peregrine of the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

3.4.9 The level of flight activity within the wind farm development area recorded during baseline VP flight activity surveys was very low for peregrine. A total of only two flights were recorded (none in the breeding season), although these two flights were identified as being potential at collision risk flights. The collision mortality risk to peregrine has been concluded as being sufficiently low that the risk does not require quantifying through Collision Risk Modelling (CRM) analysis, with the level of risk inconsequential to the breeding Migneint-Arenig-Dduallt SPA and Berwyn SPA populations.

3.4.10 For collision, **no LSE can be concluded** for peregrine of the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

3.4.11 In terms of the three evidence-led tests considered (see above), there is no evidence that breeding peregrine or non-breeding peregrine are dependent on the Site. Furthermore, there is no evidence that maintenance of either of the SPA's conservation objectives, in relation to peregrine, are dependent on recruitment from the Site (with no evidence of breeding recorded and only very limited activity).

3.5 Red kite

3.5.1 Red kite is a qualifying feature of the Berwyn SPA. It is noted from the conservation objectives that red kite does not nest within the SPA itself[6]. The two to three breeding pairs stated in the SPA citation is now outdated given the continued growth of the red kite population and a recent report by Hereward *et al*. (2024) reported a population of four kite pairs for the Berwyn SPA, and ten kite pairs when a 2 km buffer is applied around the Berwyn SPA (this is considered as an area of potentially functionally linked land with the SPA).

3.5.2 Due to the separation distance between the Site and the Berwyn SPA (minimum of 7.3 km) there is no route to impact for disturbance on SPA birds whilst within the SPA boundary (upper disturbance limits of breeding red kite is 300 m, from Goodship and Furness, 2022), nor within functionally linked land, which is regarded as a 4 km surrounding area from the SPA.

3.5.3 No red kite breeding territories were recorded within the survey area (Site plus 2 km buffer) during two baseline survey years for the Proposed Development. No nest sites would therefore be impacted as a result of the Proposed Development.

3.5.4 In the breeding season, red kite has a core range of 4 km (maximum of 6 km; SNH, 2016). It is therefore considered unlikely that red kite recorded during field surveys are birds that breed within the Berwyn SPA site boundary, given the spatial separation between the Site and the SPA exceeds even the maximum range for this species in the breeding season. However, as the conservation objectives for Berwyn SPA acknowledge that birds nesting outside the SPA constitute SPA birds, and functionally linked land extends to 4 km around the SPA boundary, there is potential connectivity with SPA birds. Any red kites that breed within 4 km of the SPA and also within 4 km of the Site could provide this connectivity, although this small overlapping area means few birds would meet this criteria.

3.5.5 In the non-breeding season, red kites may forage up to 10 km from roosting sites (Pendlebury *et al*., 2011). Although the nearest roosting location to the Site is not known (none recorded in vicinity of the Site during baseline surveys), there is potential for connectivity between the Berwyn SPA (including birds found within the SPA boundary) and the Proposed Development in the non-breeding season.

3.5.6 Red kites have been shown to continue to use a wind farm site during construction (e.g. Duffy and Urquhart, 2014). However, birds foraging in the Site may avoid an area of up to 300 m around construction works, based on upper disturbance limits from Goodship and Furness (2022). This would have a negligible impact on a species that has a foraging range with a 4 - 6 km radius (10 km in the non-breeding season). Research into red kites across numerous sites has shown that they continue to use operational wind farms (e.g. Mammen *et al*., 2011), where suitable habitat continues to be available.

3.5.7 Therefore, the evidence suggests that red kites are not greatly impacted by disturbance and displacement from wind farm projects and use of the Site by SPA birds (where this may occur) is likely to continue during construction and operation of the Proposed Development, with only minor changes in distribution expected.

3.5.8 For disturbance and displacement, **no LSE can be concluded** for red kites of the Berwyn SPA.

3.5.9 The operation of the Proposed Development would put red kites at risk of potential collision with active turbines. CRM analysis was undertaken for red kite, and this estimated a potential mortality risk of 0.207 – 0.675 (average of 0.441) bird collisions per year. This level of additional mortality is considered sufficiently consequential to potentially have a detectable adverse effect on the SPA population.

3.5.10 A **potential for an LSE cannot be ruled out** for red kite of the Berwyn SPA in relation to potential collision impacts. **Collision impacts on red kite are therefore progressed to Stage 2: Appropriate Assessment.**

3.6 Summary

3.6.1 The Migneint-Arenig-Dduallt SPA has been identified as having potential connectivity with the Proposed Development and screening for LSE has been undertaken for its three qualifying features of hen harrier, merlin and peregrine. For all three qualifying features, no LSE has been concluded in respect to all potential impacts resulting from the Proposed Development. **No AA is required for Migneint-Arenig-Dduallt SPA**.

3.6.2 The Berwyn SPA has also been identified as having potential connectivity with the Proposed Development and screening for LSE has been undertaken for its four qualifying features of hen harrier, merlin, peregrine and red kite. For hen harrier, merlin and peregrine no LSE has been concluded in respect to all potential impacts resulting from the Proposed Development.

3.6.3 A LSE as a result of collision mortality to red kite cannot be ruled out at the screening stage and requires further assessment. **Therefore, an AA is required for Berwyn SPA, in relation to potential collision impacts on red kites only.**

3.6.4 A shadow AA (information to inform an HRA) in respect of collision mortality to red kites is provided below.

4 STAGE 2: SHADOW APPROPRIATE ASSESSMENT

4.1 Identification of collision risk – red kite

4.1.1 CRM analysis has been undertaken for red kite using the results of the baseline VP flight activity surveys. A precautionary approach has been taken, with the inclusion of the entirety of height bands 2 to 6 (20 – 250 m) considered as at potential collision height (PCH), where these flights passed into the collision risk zone (CRZ), which has been taken as one continuous area around all ten turbines using a buffer of 300 m (>200 m beyond rotor length). This is despite the actual collision risk height

being 25 – 220 m, and with a maximum tip height of 200 m for four of the ten turbines). During the two years of survey there were a total of 63 red kite flights (69 individuals) recorded at risk from collision, with 34 recorded during the breeding season and 29 recorded during the non-breeding season.

4.1.2 The CRM analysis estimated mortality risks of an average of 0.277 birds for the breeding season and 0.164 birds for the non-breeding season, giving an average annual estimate of 0.441 bird collisions per year.

4.1.3 Caution should be applied when using the outputs of CRM analysis. Although a useful tool for providing an indication as to the level of risk, the estimate should not be taken as the number of bird deaths that would definitely occur as a result of a project.

4.1.4 In a recent report investigating population impacts of wind farms on red kites in Wales, Hereward *et al*. (2024) calculated the 'risk of collision per exposed bird' rather than using the absolute number of birds, which is the output of CRM analysis. They used an average value that equates to roughly one collision for every 400 birds exposed (0.0027). Given the CRM analysis for the Proposed Development was calculated based on 63 at collision risk individuals, this would suggest the actual risk of collision is considerably lower than that determined by the site-specific CRM analysis, although it is acknowledged that these two methods of estimating risk are not directly comparable.

4.1.5 In this assessment, the average mortality estimate of 0.441 birds per annum calculated by CRM is used here to assess the potential impact of collisions on the red kite population associated with the Berwyn SPA.

4.2 Identification of at risk population – red kite

4.2.1 To determine whether the mortality risk estimate has potential to result in an adverse effect on the integrity of the designated feature (population of red kite), requires the size of the source population to be estimated.

4.2.2 At the time of designation (1996) the Berwyn SPA held two to three pairs of red kites. The conservation objectives for red kite listed in the Conservation Management Plan[6], include a target for the designated site (noting the SPA itself supports none of the nest sites) to support at least two pairs of breeding red kites.

4.2.3 Since the SPA designation, the red kite population in Wales has increased dramatically, with the species now on the BoCC Green list in both Wales (Johnstone *et al*., 2022) and Great Britain (Stanbury *et al*., 2021). Numbers of red kite in Wales has risen by 413 % since 1995 (Harris *et al*., 2020), and Wales now supports *c*. 30 % of the British population (Hughes *et al*., 2021). The recent report by Hereward *et al*. (2024) estimates the Welsh red kite breeding population as 2,117 pairs (and another recent report estimated the breeding population as being 2,500 pairs; Jenks, 2020). Subsequently, it is clear that the red kite population is in a sustained period of growth.

4.2.4 The population associated with the Berwyn SPA has similarly increased considerably in that time. Hereward *et al*. (2024) provide the following estimates (for 2022) for the SPA and for the wider region:

- Berwyn SPA (noting identified nest sites were in peripheral areas to the SPA): four pairs (eight adults);
- Berwyn SPA (plus 2 km buffer): ten pairs (19 adults); and,
- North-west Wales: 99 pairs (198 adults).

[redacted]

4.2.6 Red kite adults are mostly sedentary and so breeding population estimates are considered to be applicable throughout the year (i.e. no need to assess collision risk separately for the breeding and non-breeding seasons). Flight activity (at risk from collision) between the seasons was typically similar with 34 of the at risk from collision flights during the breeding season, and 29 of these flights during the non-breeding season.

4.2.7 It is considered that the large majority of red kite activity is likely to be non-SPA birds given the spatial separation between the Site and the SPA (7.3 km), compared to the core foraging range for the species during the breeding season (4 km; SNH, 2016), although maximum foraging range is 6 km, and ranging out to 10 km during the non-breeding season is possible (Pendlebury *et al.*, 2011). [redacted]

4.2.8 Although the likelihood is the kite recorded VP flight activity surveys are non-SPA birds, this cannot be conclusively proven. Therefore, as a precaution all kites using the Site are considered to be associated with the SPA for the purposes of the assessment. Therefore, mortality risk is assessed against the SPA population to determine impact, although this can be considered a 'worst case' scenario, given the much larger North Wales population (99 breeding pairs), and number of breeding kite at the locality of the Proposed Development [redacted]), taken from Hereward *et al.* (2024)[9].

4.2.9 It should be noted that the SPA breeding population estimates refer to the number of breeding adult pairs, i.e. they do not include juvenile and immature birds. Thus, the true population will be greater than that used in the assessment, which will also exaggerate the level of impact.

4.2.10 It is inappropriate to assess impacts against the population at the time of SPA designation, given it is significantly lower than current estimates (and is known to be out-dated). The best available contemporary estimates for the SPA are those given by Hereward *et al.* (2024). As the conservation objective for maintaining the red kite population relates to birds breeding within the SPA plus a 2 km buffer, it is this breeding population estimate that is used in the assessment, [redacted]. A population estimate for the SPA plus a 4 km buffer (i.e. within functionally linked land) is not known, but clearly this would provide a greater SPA population estimate; thus, the 2 km buffer estimate used is precautionary.

4.2.11 The relevant conservation objective for the Berwyn SPA[6] states that that the population must be maintained at two breeding pairs of red kites, or greater. Hereward *et al.* (2024) provides estimates of [redacted]. It is therefore apparent that the red kite estimate for the Berwyn SPA (ten pairs) is well exceeding the SPA's conservation objective (at least two pairs maintained). Therefore, in this assessment, maintenance of the current population (ten pairs) is taken to be the desired objective.

4.3 Assessment of potential impacts (project alone)

4.3.1 Acknowledging the reasons why the collision mortality estimate is precautionary (as set out above), the output of CRM analysis provides a valid basis for assessing potential collision impacts on the integrity of the red kite population associated with the Berwyn SPA.

[9] Information specific to the Proposed Development is taken from the confidential appendix provided by Hereward *et al.* (2024).

4.3.2 The average annual mortality risk has been estimated to be 0.441 collisions per year. This represents 2.32 % of the SPA population.

4.3.3 In the investigation of population-level impacts of wind farms on Welsh red kites, including analysis of the Berwyn SPA population, Hereward *et al*. (2024) calculated that an average of 12 % of the Welsh kite population could be lost through collisions each year before a decline in the population becomes more likely than not. It is stated that for the spatially-smaller and higher-density Berwyn SPA population, the threshold level of loss would be lower than that given for the national population (value not stated) but a 12 % loss is around six times the mortality loss that has been estimated for the Proposed Development, and such a threshold can be concluded as not having been reached.

4.3.4 It should be noted that the Proposed Development was included in the Hereward *et al.* (2024) assessment which predicts that *"currently proposed levels of wind farm development* (for which the Proposed Development is included) *are unlikely to prevent the continued growth of the Welsh red kite population, even in the most extreme scenarios where all sites currently in development go ahead."* This report adds that greater caution is required for those wind farm schemes in proximity to the SPAs (including Berwyn SPA). As discussed in this Technical Appendix, the Site is located on the periphery of the likely (core) foraging range for red kite from the Berwyn SPA (based on documented foraging ranges; SNH, 2016), so not all kites recorded are likely to be connected to the SPA.

4.3.5 The work done by Hereward *et al*. (2024) allows a conclusion to be made that potential losses resulting from the Proposed Development would not result in a decline of the SPA population of red kites and, additionally, would not prevent continued population growth. The conservation objective of maintenance of the breeding population remains met.

4.3.6 **The Proposed Development alone would have no adverse effect onsite integrity for the Berwyn SPA.**

4.3.7 In terms of the three evidence-led tests considered (see above), there is no evidence that breeding red kite or non-breeding red kite are dependent on the Site. Furthermore, there is no evidence that maintenance of the SPA's conservation objectives, in relation to red kite, are dependent on recruitment from the Site (with no evidence of breeding recorded).

4.4 Assessment of potential impacts (in combination)

4.4.1 The Population Viability Analysis (PVA) undertaken by Hereward *et al*. (2024) looked at the in combination impacts of all current and proposed wind farms (at the time of writing) on the Welsh red kite population at various scales (including the Proposed Development). This included an analysis for the Berwyn SPA red kite population. Nine proposed wind farms, including early concept projects, were used in the analysis. The projects are not named. The conclusions of the PVA are pertinent to this assessment and provide the information that is required to determine in combination impacts.

4.4.2 Under the scenario of including all proposed wind farm projects in the model, the probability of the Berwyn SPA red kite population declining was estimated at 0.4 %, compared to a 0 % probability without the inclusion of these proposed wind farms. There was considered to be a 99.6 % probability that the projects would not result in a population decline. For every impact scenario, population decline was predicted to be less likely than continued growth, at all outcome scales.

4.4.3 In all cases there is a greater than 50 % probability of continued growth in the kite population even in the event that the suite of wind farm developments is built (see Hereward *et al*. 2024). Even with the impacts of the proposed wind farms, the PVA found that for the Berwyn SPA the red kite population in 2050 would be considerably greater than its current level, albeit all the proposed wind farm developments in combination could slow down population growth within the SPA. A slowdown in the population growth for the Berwyn SPA, would not constitute an adverse effect on the integrity of the SPA population.

4.4.4 Based on the detailed study undertaken by Hereward *et al*. (2024), the additional mortality estimated for the Proposed Development (2.32 % of the Berwyn SPA (plus 2 km) population), even when added to the in combination impacts from other wind farms, can be concluded as not being sufficient to put the population trend into decline. It would remain the case that a continued increase in the Berwyn SPA population would be much more likely than not. This is considered a reliable conclusion given the Proposed Development was included as one of the wind farm developments considered in the Hereward *et al.* (2024) study (which predicted no adverse effects on the kite population, including the Berwyn SPA population), as well as the Proposed Development being spatially distant from the Berwyn SPA that the kite recorded during surveys are not all likely to be birds connected to the SPA.

4.4.5 **The Proposed Development in combination with other wind farm projects would have no adverse effect on site integrity for the Berwyn SPA.**

5 SUMMARY

5.1.1 Two European sites with ornithological listed interests were identified for Screening for LSE; the Migneint-Arenig-Dduallt SPA and the Berwyn SPA.

5.1.2 Following screening of potential impacts on the qualifying features of the SPAs, it was concluded that for potential collision impacts on red kite a LSE could not be ruled out for Berwyn SPA. Therefore, an Appropriate Assessment is required, with this regard.

5.1.3 Information to inform the AA has been provided. The information provided is that collision impacts on red kite as a result of the Proposed Development on its own and in combination with other projects would have no adverse effect onsite integrity for the Berwyn SPA.

5.1.4 In terms of the three evidence-led tests considered (see above), there is no evidence that any breeding or non-breeding populations of qualifying species of the Migneint-Arenig-Dduallt SPA or the Berwyn SPA are dependent on the Site. Furthermore, there is no evidence that maintenance of either of the SPA's conservation objectives, in relation to these species, are dependent on recruitment from the Site (with no evidence of breeding recorded and typically very limited activity for most species).

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