APPENDIX V2- 5.4: SHADOW HABITATS REGULATIONS APPRAISAL FOR THE CUILLINS SPECIAL PROTECTION AREA

Appendix Figures

1. SHADOW HABITATS REGULATIONS APPRAISAL FOR THE CUILLINS SPECIAL PROTECTION AREA

1.1 Introduction

1.1.1 Whilst the 2017 Habitats Regulations provide that an assessment of whether there would be adverse effects from an electricity proposal on a Special Protection Area (SPA) is the responsibility of the competent authority, this Report provides a summary examination of the relevant issues to enable the competent authority to undertake the assessment in respect of the Cullins SPA. In particular, it provides relevant information pertaining to the potential effect of the Skye Reinforcement Project ("the Proposed Development") on the Cuillins SPA, classified for its breeding population of golden eagle *Aquila chrysaetos*.

1.1.2 There are two European Directives that are relevant, namely Council Directive 79/409/EEC on the Conservation of Wild Birds (the Birds Directive) and Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna (the Habitats Directive). The Wildlife and Countryside Act 1981 transposed many parts of the Birds Directive into domestic legislation. The Habitats Directive was initially transposed through The Conservation (Natural Habitats, & c.) Regulations 1994 ("the 1994 Habitats Regulations") into UK law. Guidance for the implementation of the Directives in Scotland is provided in Scottish Executive Circular No. 6/1995 (revised June 2000)[1]. Subsequently, the application of regulations 48 and 49 of the 1994 Habitats Regulations to electricity projects for which consent is sought under sections 36 or 37 of the Electricity Act 1989, was revoked by The Conservation of Habitats and Species Regulations 2017 (hereafter "the Habitats Regulations"). The Habitat Regulations are expressly applied to Scotland for the assessment of implications for a European site located in Scotland that may be adversely affected by an electricity project. Post-Brexit Guidance by the Scottish Government (EU Exit: The Habitats Regulations in Scotland, December 2020) confirms the continuing relevance of the Habitats Regulations and related guidance.

1.1.3 Regulation 63 of the Habitats Regulations refers to three assessment steps: the outcome of the first two deciding whether or not the third needs to be implemented. The three steps, set out below as questions, are:

- Step 1: Is the proposal directly connected with or necessary to the management of the site?
- Step 2: Is the proposal, alone or in combination, likely to have a significant effect on the site? If a significant effect is likely, then an appropriate assessment is necessary; and
- Step 3: Can it be ascertained that the proposal will not adversely affect the integrity of any of the SPA, either by itself or in combination with other plans or projects?

1.1.4 With regards to Step 1, the Proposed Development is not directly connected to, or necessary for, the management of the Cuillins SPA, and therefore the next step needs to be considered.

1.1.5 Step 2 requires an assessment of whether there is potential for a likely significant effect, either alone or in combination, on the Cuillins SPA. Golden eagle is the qualifying interest of the SPA relevant to the consideration of the Proposed Development. Due to parts of the Proposed Development being within the boundary of the SPA on habitats used by the qualifying species and the likely potential for disturbance, displacement and collision mortality to the species during the construction and operation of the Proposed Development, as well as dismantling of the existing overhead line (OHL), it is considered that there is a likelihood of significant effects.

[1] SERAD (Scottish Executive Rural Affairs Department). (2000). Habitats and Birds Directives, Nature Conservation: Implementation in Scotland of EC Directives on the Conservation of Natural Habitats and of Wild Flora and Fauna and the Conservation of Wild Birds ('The Habitats and Birds Directives'). Revised Guidance Updating Scottish Office Circular No 6/1995.

1.1.6 As a likely significant effect cannot be ruled out at this stage, and following Step 3, an Appropriate Assessment is required to be undertaken by the competent authority on the implications for the SPA in view of the conservation objectives. This assessment provides information to inform the Appropriate Assessment.

1.1.7 To establish the effect of the Proposed Development on the integrity of the SPA, it is necessary to consider the relevant conservation objectives which may be affected.

1.1.8 The conservation objectives for SPAs are the same as for other Natura sites in Scotland in having an overarching conservation objective to avoid deterioration of the habitats of the qualifying interest, or significant disturbance to the qualifying interest, thus ensuring that the integrity of the site (SPA) is maintained. The component conservation objectives which encapsulate the maintenance of site (SPA) integrity in the long-term, are as follows:

1. ensure for the qualifying species that there is no significant disturbance in the long term;
2. ensure for the qualifying species that the structure, function and supporting processes of habitats supporting the species are maintained in the long term;
3. ensure for the qualifying species that the distribution and extent of habitats supporting the species are maintained in the long term;
4. ensure for the qualifying species that the distribution of the species within the site is maintained in the long term; and
5. ensure for the qualifying species that the population of the species is maintained as a viable component of the site.

1.1.9 As noted earlier, under Step 2 of the assessment process, it was considered reasonable to conclude that it was likely that the Proposed Development could have a significant effect on the site's interest. **Tables 1.1** and **1.2** provide the competent authority with the necessary information to undertake an assessment under the Habitats Regulations, with explicit reference to the relevant conservation objectives of the Cuillins SPA.

1.2 Assessment of Effects on Conservation Objectives During Construction and Dismantling Phases

Table 1.2: Summary of Potential Effects on the Cuillins SPA During the Construction and Dismantling Phases

***"To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term"*:**	
Conservation Objective	**Potential Effect**
1. No significant disturbance of the species	<u>Disturbance at breeding sites</u> Disturbance distances for various breeding birds have been reviewed by NatureScot (Ruddock & Whitfield, 2007[2] and Whitfield *et al*., 2008[3]). The relevant distances in relation to the Proposed Development are to maintain a minimum disturbance-free distance of 1000 to 1500 m for breeding golden eagle. As all phases of works within the SPA will be undertaken during the non-breeding season (taken as between September to the end of February) or checked and confirmed by the ECoW that such activities can progress, works will be temporally short-term and at distances greater than 1500 m from known golden eagle breeding sites, no impacts on breeding SPA golden eagles are predicted.

[2] Ruddock, M. & Whitfield, D.P. (2007). A review of disturbance distances in selected bird species. Report from Natural Research (Projects) Ltd. to Scottish Natural Heritage.
[3] Whitfield, D.P., Ruddock, M. & Bullman, R. (2008). Expert Opinion as a Tool for Quantifying Bird Tolerance to Human Disturbance. Biological Conservation, 141:2708-2717

"*To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term*":	
	<u>Displacement from foraging habitats</u> Assuming that works could lead to the displacement of golden eagles from suitable foraging habitat, the effects on the SPA golden eagle population would amount to a reduction in the use of a relatively small area of foraging habitat when compared to the species' core foraging range. Golden eagle core foraging range during the breeding season is 6 km, with a maximum range of up to 9 km (SNH, 2016)[4]. Furthermore, as these works are located on low ground, they will be less important for foraging golden eagles (*sensu* Fielding *et al.,* 2019)[5], much of which abuts the A87 and generally follows the existing OHL, i.e., two existing sources of disturbance/displacement to golden eagle. There were no indications from baseline surveys that the small area affected by the OHL route through the SPA was critical or even favoured as a foraging area. More widely, there is a substantial amount of suitable habitat in the SPA. Therefore, the possible effects of this short-term loss in suitable habitat would likely be compensated by birds exploiting suitable habitats elsewhere in their range. Given the small area of potentially suitable foraging habitat affected, it seems highly unlikely that short-term displacement would elevate mortality rates or reduce productivity rates in the golden eagle population to the extent that the population trajectory in the SPA would be affected. <u>Disturbance at roost sites</u> A recent study, using satellite telemetry, on the roosting behaviour of golden eagles has shown that the number of roost sites used was substantially greater than expected and that 70% of these roost sites were only used for one night (Ford *et al*., 2020)[6]. Therefore, the probability of causing disturbance to golden eagle at these transient roost sites is low as golden eagles will selectively choose transient roost sites away from sources of potential disturbance. Furthermore, territorial pairs have been suggested to roost close to or on nest sites (SNH, 2014)[7]. While this supposition has not been examined empirically, it will likely apply more to roost sites chosen during the breeding season, especially early in the season. Moreover, when the majority of multi-use roost sites can be located on crags even in afforested territories (Ford *et al*., 2020)[5] then, as the works within the SPA will be undertaken on the lower flatter slopes, away from suitable multi-use roosting sites and at distances greater than 1500 m from known golden eagle breeding sites, no long-term impacts on roosting SPA golden eagles are predicted. As such, this Conservation Objective would not be compromised.
2. Structure, function and supporting processes of habitats supporting the species	Construction and dismantling works within the SPA are short-term and over a very limited extent of SPA habitats. There would be no direct or indirect effects on golden eagle breeding or roosting sites and short-term displacement from foraging habitats would have no measurable effect on species survival or productivity, see above. Therefore, the structure, function and supporting processes of habitats supporting golden eagle would remain unchanged and maintained in the long-term.
3. Distribution and extent of habitats supporting species	Construction and dismantling works within the SPA are short-term and over a very limited extent of SPA habitats. All habitats will be restored on completion of works. Therefore, the distribution and extent of habitats supporting golden eagle will remain unchanged and maintained in the long-term.

[4] Scottish Natural Heritage (SNH). (2016). Assessing connectivity with Special Protection Areas (SPAs). Version 3. Battleby, UK.

[5] Fielding, A.H., Haworth, P.F., Anderson, D., Benn, B., Dennis, R., Weston, E. & Whitfield, D.P. (2019). A simple topographical model to predict Golden Eagle Aquila chrysaetos space use during dispersal. Ibis 162:400–415.

[6] Ford, A., Taylor, J. & Jardine, D.C. 2020. Observations on the roosting behaviour of adult male Golden Eagles from satellite telemetry. Ringing & Migration 34 (1): 1-7.

[7] Scottish Natural Heritage (SNH). 2014. Guidance Note: Implications of Additional Protection for Hen Harrier, Red Kite and Golden Eagle under Schedules A1 & 1A of the Wildlife and Countryside Act (1981). Battleby, UK

***"To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term"*:**	
4. Distribution of the species within site	Consideration of the potential effects on the distribution of golden eagle within the SPA should be conditional on the outcome of assessment against Conservation Objectives 1 and 5; i.e. no significant disturbance of the species and to maintain the population of golden eagle as a viable component of the SPA. It follows from the conclusions arrived at in respect of Conservation Objectives 1 above and Conservation Objective 5 below, that the distribution of the species within the SPA will be unaffected by construction and dismantling works and, therefore, the distribution of the species within the SPA would not be impinged and the existing distribution of golden eagle within SPA will remain unchanged.
5. Population of the species as a viable component of the site	In its simplest terms the viability of a population depends on its survival and productivity rates. Birds that are disturbed from suitable foraging areas are susceptible to reductions in feeding efficiency or profitability which in turn may lead to a reduction in the productivity and survival rates of bird populations. It follows from the conclusions arrived at in respect of Conservation Objectives 1 above, that the short-term displacement from small areas of potentially suitable foraging habitat would have no measurable effect on these vital rates when considered against the size of a golden eagle's core range. Therefore, there will be no change to the SPA golden eagle population which will remain as a viable component of the site.

1.3 Assessment of Effects on Conservation Objectives During the Operational Phase

Table 1.2: Summary of Potential Effects on the Cuillins SPA During the Operational Phase

***"To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term"*:**	
Conservation Objective	**Potential Effect**
1. No significant disturbance of the species	<u>Disturbance at breeding sites</u> Disturbance distances for various breeding birds have been reviewed by NatureScot (Ruddock & Whitfield, 2007[2] and Whitfield *et al*., 2008[3]). The relevant distances in relation to the Proposed Development are to maintain a minimum disturbance-free distance of 1000 to 1500 m for breeding golden eagle. Due to the distance of the Proposed Development to known breeding sites and the nature of routine operation and maintenance activities, operational disturbance would be at a level which would not cause significant disturbance. An exception may occur if maintenance activities replicate those during construction (e.g. replacement of a tower) and in such cases the temporal restrictions which would be enacted during the construction phase will also apply. Therefore, no impacts on breeding SPA golden eagles are predicted. <u>Displacement from foraging habitats</u> Currently, approximately 22 km of existing OHL runs through the Cuillins SPA. The majority of the Proposed Development that passes through the SPA would be underground, approximately 15 km, therefore no long-term displacement from foraging habitats is predicted. Indeed, there would be a net gain in foraging habitats along the underground cable once

"*To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term*":	
	the cable is laid and habitats are restored, due to the removal of the existing OHL. Assuming that the presence of the remaining above ground elements of the Proposed Development, approximately 7 km, could lead to the displacement of golden eagles from suitable foraging habitat, the effects on the SPA golden eagle population would amount to a reduction in the use of a very small area of foraging habitat when compared to the species' core foraging range. Golden eagle core foraging range during the breeding season is 6 km, with a maximum range of up to 9 km (SNH, 2016)[4]. However, as these above ground elements are located on low ground, these areas will be less important for foraging golden eagles (*sensu* Fielding *et al*., 2019)[5], much of which abuts the A87 and follows the existing OHL, i.e., two existing sources of displacement to golden eagle. Therefore, it is predicted that there will be no increase in the loss of foraging habitat in these areas and the above ground elements will be neutral in effect. There were no indications from baseline surveys that the small area affected by the OHL route through the SPA was critical or even favoured as a foraging area. More widely, there is a substantial amount of suitable habitat in the SPA. Therefore, the possible effects of this long-term loss in suitable habitat would likely be compensated by birds exploiting suitable habitats elsewhere in their range. Given the small area of potentially suitable foraging habitat affected, it seems highly unlikely that long-term displacement would elevate mortality rates or reduce productivity rates in the golden eagle population to the extent that the population trajectory in the SPA would be affected. As such, this Conservation Objective would not be compromised.
2. Structure, function and supporting processes of habitats supporting the species	There would be no direct or indirect effects on golden eagle breeding or roosting sites and long-term displacement from foraging habitats would have no measurable effect on species survival or productivity, see above. Therefore, the structure, function and supporting processes of habitats supporting golden eagle would remain unchanged and maintained in the long-term.
3. Distribution and extent of habitats supporting species	All habitats will be restored on completion of works. As approximately 15 km of the existing OHL is to be replaced with underground cable there will be a net gain in supporting habitats, albeit small. Therefore, at worst, the distribution and extent of habitats supporting golden eagle will remain unchanged and maintained in the long-term.
4. Distribution of the species within site	Consideration of the potential effects on the distribution of golden eagle within the SPA should be conditional on the outcome of assessment against Conservation Objectives 1 and 5 – no significant disturbance of the species and to maintain the population of golden eagle as a viable component of the SPA. It follows from the conclusions arrived at in respect of Conservation Objectives 1 above and Conservation Objective 5 below, that the distribution of the species within the SPA will be unaffected by the operation of the Proposed Development and, therefore, the distribution of the species within the SPA

"To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term":	
	would not be impinged and the existing distribution of golden eagle within the SPA will remain unchanged.
5. Population of the species as a viable component of the site	Loss of birds from an SPA through disturbance and adverse effects on mortality and (indirectly) on breeding success through collision can potentially impact on the maintenance of a species as a viable component of the site, but as disturbance is considered under other conservation objectives, only the effects of collision mortality on the maintenance of species viability is considered under this objective. Despite being thermal soarers, golden eagles are generally reported as collision victims in low numbers, probably due to a low number of span crossings per day and their solitary habits (Janss, 2000)[8]. Bevanger (1998)[9] classifies eagles as having low to medium wing load and low aspect, so are classified as low susceptibility to collision. As such, golden eagles are generally considered to be at low risk of collision with OHLs. The Cuillins SPA population of golden eagle is in favourable maintained status, which suggests that collision mortality is not limiting the population. Currently, approximately 22 km of existing OHL runs through the Cuillins SPA. The majority of the Proposed Development that passes through the SPA will be underground, approximately 15 km, therefore there will be no long-term risk of collision mortality. The remaining above ground elements of the Proposed Development, approximately 7 km, will be significantly reduced from that which is currently present, further reducing the very small probability of collision. It is also reasonable to assume that given the existing OHL is already present within the SPA that adults will have become, at least partially, habituated to its presence. There were no indications from baseline surveys that the small areas affected by the OHL route through the SPA were critical or even favoured as foraging areas and as these above ground elements are located on low ground on the periphery of the SPA, these areas will be less important for foraging golden eagles (*sensu* Fielding *et al*., 2019)[4]. Hence, the level of flight activity in these areas will be commensurately low. These predictions are further supported by the results of Golden Eagle Territory (GET) modelling (Fielding *et al*., 2020)[10] and presented in **Figures 5.4.1** and **5.4.2**. Of further relevance, as shown by Fielding *et al*. (2021)[11], who studied eagles' reactions to numerous wind farms of varying turbine models across Scotland, their avoidance of turbines (and so the extremely low risk of collision) was largely unaffected by turbines' dimensions. Therefore, despite the small increase in tower dimensions between the existing OHL and the Proposed Development it is unlikely to have any material bearing on the issue being considered.

[8] Janss, G.F.E. (2000). Avian mortality from power lines: a morphologic approach of a species-specific mortality. Biological Conservation 95(3): 353-359.

[9] Bevanger, K. (1998). Biological and conservation aspects of bird mortality caused by electricity power lines: a review. Biological Conservation 86(1): 67- 76.

[10] Fielding, A., Haworth, P.F., Anderson, D., Benn, S., Dennis, R., Weston, E. & Whitfield, D.P. (2020). A simple topographical model to predict Golden Eagle (Aquila chrysaetos) space use during dispersal. Ibis, 162, 400-415.

[11] Fielding A. H., Anderson D., Benn S., Dennis R., Geary M., Weston E. & Whitfield, D.P. (2021). Responses of dispersing GPS-tagged Golden Eagles Aquila chrysaetos to multiple wind farms across Scotland. Ibis. https://doi.org/10.1111/ibi.12996

"*To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and to ensure for the qualifying species that the following are maintained in the long term*":	
	Therefore, it is predicted that there would be no change to the SPA golden eagle population which would remain as a viable component of the site.

1.3.1 In evaluating the impact of the Proposed Development in isolation, therefore, there is no prospect that the Proposed Development could affect the integrity of the Cuillins SPA.

1.4 In Combination Effects

1.4.1 As noted above, it is necessary that the competent authority considers, within the assessment steps, the potential effect of the Proposed Development alone or "in combination" with other projects.

1.4.2 However, the predicted in-isolation effects of the Proposed Development are considered to have no potential to contribute to in-combination effects. Therefore, there is no prospect that the Proposed Development in-combination with other plans or projects could affect the integrity of the SPA.

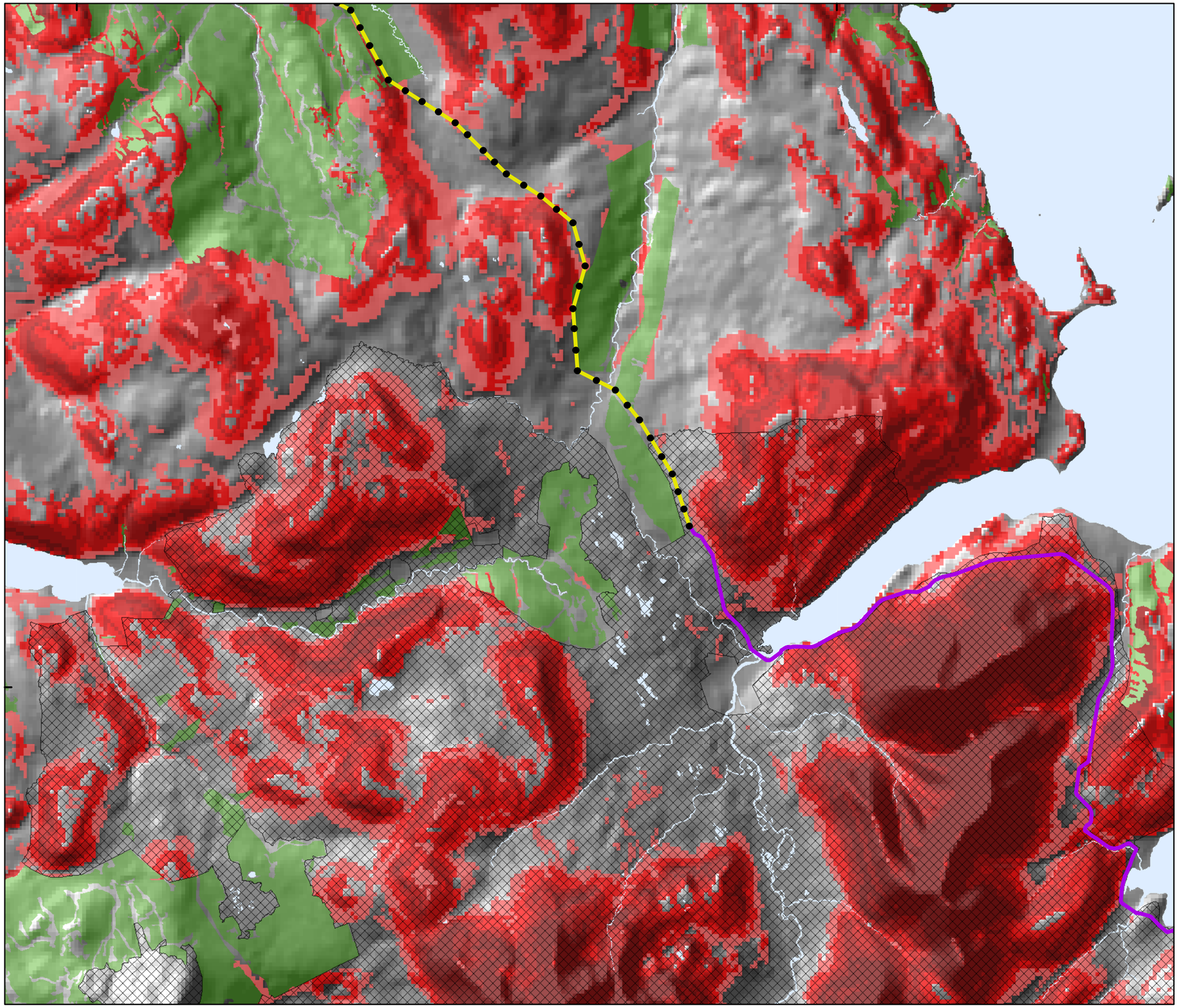
1.5 Conclusion

1.5.1 In conclusion, none of the SPA's conservation objectives would be compromised by the Proposed Development alone, or in combination with other plans or projects, and would, therefore, not affect the integrity of the SPA.

140000

150000

830000



© Crown copyright and database right 2022. Ordnance Survey 0100031673

NATURAL RESEARCH PROJECTS LIMITED

Key

- Towers
- Section 1 OHL
- Section 2 underground cable
- Cuillins SPA
- Water bodies
- Woodland

GET score

- 6
- 7
- 8
- 9
- 10

Date produced: 19/04/2022

Source: NRP LTD

N

0 0.5 1 2 km

Figure 5.4.1.

GET model results for Section 1 and Section 2

Skye Reinforcement Project

160000

830000

820000

nrp NATURAL RESEARCH PROJECTS LIMITED

Key

- Towers
- Section 2 OHL
- Section 2 underground cable
- Section 3 OHL
- Cuillins SPA
- Water bodies
- Woodland

GET score

- 6
- 7
- 8
- 9
- 10

Date produced: 19/04/2022
Source: NRP LTD

N

0 0.5 1 2 km

© Crown copyright and database right 2022. Ordnance Survey 0100031673

Figure 5.4.2.

GET model results for Section 2 and Section 3

Skye Reinforcement