

KIRKTON SOLAR PHOTOVOLTAIC PV AND ENERGY STORAGE

Habitats Regulations Appraisal Report



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1 INTRODUCTION

1.1 Background

RPS was commissioned by Elgin Energy to undertake a Habitats Regulation Appraisal (HRA) in support of the proposed Kirkton Solar PV and Energy Storage Facility near Peterhead, Aberdeenshire, (central Ordnance Survey grid reference NK 11151 50845). The location of the proposed development is shown in Figures 1 and 2.

The proposed development is located on approximately 112.7 hectares (ha) of open farmland habitat. This equates to the area within the red-line planning boundary. The proposed area of infrastructure, including the significant spaces between panel arrays is 76.5 hectares. The habitats present within the site are used by wintering waterfowl (in particular pink-footed geese *Anser Brachyrhynchus*) as part of their wider foraging resource. The site lies approximately 6.5 km south of the Loch of Strathbeg Special Protection Area (SPA) and Ramsar site, which is internationally designated for its wintering waterfowl and breeding sandwich tern populations. NatureScot (formally Scottish Natural Heritage) have highlighted that there is the potential for Likely Significant Effect (LSE) on the SPA resulting from the development and as such a HRA is required to provide Aberdeenshire Council with sufficient information to inform an Appropriate Assessment of the proposed development and the SPA.

1.2 SPA and Ramsar Context

Loch of Strathbeg SPA comprises a large, coastal shallow water loch, surrounded by grassland wetland and dune habitats. It qualifies under Article 4.1 by regularly supporting populations of European importance of the Annex 1 species: sandwich tern *Sterna sandvicensis* (1985 to 1990 an average of 280 pairs, 2.0% of the GB population); whooper swan *Cygnus* (a 5-year winter peak mean between 1986/87 and 1990/91 of 245 individuals, 4% of the GB population) and Svalbard barnacle goose *Branta leucopsis* (a 5-year winter peak mean between 2005/06 and 2009/10 of 520 individuals, 1.6% of the GB population).

Loch of Strathbeg SPA further qualifies under Article 4.2 by regularly supporting populations of European importance of the migratory species: pink-footed goose (1986/87 to 1990/91, average winter peak count of 27,500 individuals, 25% of the Eastern Greenland/Iceland/UK biogeographic population); and greylag goose *Anser anser* (1986/87 to 1990/91, average winter peak count of 5,565 individuals, 6% of the Iceland/UK/Ireland biogeographic population).

Loch of Strathbeg SPA also qualifies under Article 4.2 by regularly supporting in excess of 20,000 individual waterfowl. In the five year winter period 1986/87 to 1990/91 the average peak count was 32,600 individual wildfowl including nationally important populations of the following species: teal *Anas crecca* (1,270 individuals, 1% of the GB population); greylag goose (5,565 individuals, 6% of the GB population); pink-footed goose (27,500 individuals, 25% of the GB population); whooper swan (245 individuals) and goldeneye *Bucephala clangula* (150 individuals, 1% of the GB population). The assemblage additionally includes (in the five year winter period 2005/06 to 2009/10), nationally important populations of: Svalbard barnacle goose (520 individuals).

Loch of Strathbeg also qualifies as a Ramsar site (a wetland of international importance) on account of its eutrophic loch habitats and its wintering greylag goose population.

Of these qualifying interests, the conservation status of greylag geese is unfavourable (no change), pinkfooted geese favourable (maintained), barnacle geese unfavourable (declined), whooper swan favourable (maintained), teal favourable (maintained), goldeneye not assessed, sandwich tern unfavourable (no change) and waterfowl assemblage favourable (declining).

1.3 Conservation Objectives for Loch of Strathbeg SPA

The conservation objectives of Loch of Strathbeg SPA are:

- 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:
 - 1. Population of the species as a viable component of the site;

- 2. Distribution of the species within site;
- 3. Distribution and extent of habitats supporting the species;
- 4. Structure, function and supporting processes of habitats supporting the species;
- 5. No significant disturbance of the species.

The aim of the conservation objectives is to maintain the favourable conservation status of the qualifying interests. The Habitats Directive¹ defines the 'conservation status' of a species as "the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a national level." The conservation status will be taken as 'favourable' when:

- "population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis".

1.4 Overview of the HRA Process

The European Union Council Directives on the Conservation of Wild Birds (2009/147/EC) – the Birds Directive – and on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) – the Habitats Directive – are implemented in Scotland by the Conservation of Habitats and Species Regulations 2017², known as the 'Habitat Regulations'. The Habitat Regulations place a statutory duty on Planning Authorities to meet the requirements of these Directives.

The Habitats Regulations impose specific and strict legal 'tests' that must be met before plans or projects, not directly connected with or necessary to the management of a site, can be approved by the competent authority (in this case the Aberdeenshire Council).

The competent authority must determine whether the plan or project is likely to have a significant effect on the site. If the plan or project is deemed to have a likely significant effect (LSE), either individually or in combination with other plans or projects, it will be subject to 'appropriate assessment'.

The competent authority may only agree to the proposals after having ascertained that they will not, in combination with other plans or projects, adversely affect the integrity of the site based on its qualifying species and the conservation objectives for the site (required to maintain Favourable Conservation Status). The competent authority may consider any mitigation measures committed to maintain site integrity when undertaking the Appropriate Assessment.

In Scotland, the competent authority must consult NatureScot, as the Statutory Nature Conservation Organisation, for advice during the HRA process prior to making their determination.

The European Commission has provided guidance in relation to the appropriate assessment process³. This guidance sets out the procedure for an appropriate assessment and provides help in defining the terms used in the Habitats Directive. In simple terms, this means that if a proposed development, such as a solar farm, is likely to have a significant effect on an SPA, then the competent authority must undertake an 'Appropriate Assessment'. The mechanism of this is described in more detail below.

The key considerations to inform the appropriate assessment are to:

- Describe the potential impacts of the proposal on the qualifying species detailing which aspects or effects of the proposal could impact them and their conservation objectives;
- Characterise the potential impacts, e.g. whether short/long term, reversible or irreversible, and in relation to the proportion/importance of the interest affected, and the overall effect on the site's

¹ 92/43/EEC.

² https://www.legislation.gov.uk/uksi/2017/1012/contents/made.

³ European Commission 2000. Managing Natura 2000 Sites: The provisions of Article 6 of the "Habitats" Directive 92/43/EEC. Office for official publications of the European Communities, Luxembourg.

conservation objectives, taking into account any possible 'in combination' effects with other plans or projects;

- Each conservation objective should be considered to determine whether the conservation objective will still be maintained in the event of consent of the development;
- If an adverse effect on site integrity is concluded there is a requirement to consider alternative solutions which could avoid the effect;
- Where there are no satisfactory alternative solutions a project can only proceed where there are imperative reasons of overriding public interest.

1.5 Consultation

A summary of consultations with NatureScot is presented in Table 1.

Table 1: Consultation Summary

Date	Key Comments	Response
6 th February, 2018	The survey methodology and survey effort, combined with available background data are adequate for an assessment of effects on waterfowl. A GIS analysis that identifies the proportion of the total foraging habitat available to the SPA geese that would be lost should the proposal go ahead, is also recommended. This analysis should also take account of possible barriers to foraging, such as wind turbines and woodland edges.	A GIS analysis of loss of foraging habitat to the development as a proportion of available foraging habitat within core foraging ranges is presented in this assessment.
25 th April, 2018	Works during the wintering geese period should be kept to a minimum to minimise disturbance.	Where possible works will avoid the wintering geese period.
	The potential loss of goose foraging area will likely be our main focus as it relates to the Loch of Strathbeg SPA goose population. We therefore recommend that, in addition into the survey work undertaken, a GIS analyses is undertaken to relate the potential lost foraging area to the total foraging area available to the geese roosting at the SPA.	A GIS analysis of loss of foraging habitat to the development as a proportion of available foraging habitat within core foraging ranges is presented in this assessment.
11 th December, 2020	Reiteration that survey effort is sufficient for the assessment of SPA birds. Highlighting the need for the provision of Information to Inform an Appropriate Assessment by the competent authority (Aberdeenshire Council) in respect of the effects of the Development on Loch of Strathbeg SPA. Mention was made of potential vulnerability of whooper swan collision and potential for waterbirds to mistake PV panels for waterbodies from height and attempt to land on them. It is possible that whooper swans could collide with the panels with sufficient force to cause injury or death. This should be taken into consideration alongside the loss of foraging habitats used by geese. The proposal is unlikely to have a significant effect on the goldeneye, sandwich tern or teal of Loch of Strathbeg SPA	This HRA is designed to provide Aberdeenshire Council with sufficient information to allow an assessment of the potential effects of the development on the integrity of the SPA. An assessment of collision risk is provided in this document. Whooper swans were not recorded during the surveys and therefore no effect is predicted on this species.

2 METHODOLOGY

2.1 Desk Study

Background records of Loch of Strathbeg SPA/Ramsar species were requested as part of the wider ecological desk study for the project. The desk study survey area comprised all land within the site boundary and within 2km of the site.

Desk study records of SPA/Ramsar species were requested from the North East Scotland Biological Records Centre (NESBReC) and the North East Scotland bird recorder in 2018 and again in 2020 to ensure the most current background dataset was available for the assessment.

2.2 Field Survey

Field surveys followed guidance set out in NatureScot's survey guidance for onshore wind farms⁴. Six surveys were undertaken to record the presence of wintering waterfowl foraging within 500m of the development site. Surveys were undertaken on a fortnightly basis between February and April, 2018 inclusive. The time frame for the surveys was agreed with NatureScot. Full survey timings and weather conditions are presented in Appendix 1.

All waterfowl species present within this area during the survey visits were recorded, as well the presence of any goose droppings indicative of recent foraging activity. The survey area was divided into existing field boundaries and each group of wintering wildfowl mapped in the appropriate field number to show foraging distribution across the survey area. Field numbers are illustrated in Figure 3.

⁴ SNH (2014). Recommended bird survey methods to inform impact assessment of onshore wind farms.

3 **RESULTS**

3.1 Desk Study Results

NESBReC supplied background records of 181 records comprising the following six SPA species dated between 1995 and 2011. No records were returned between 2012 and 2020:

- Whooper swan;
- Pink-footed goose;
- Greylag goose*;
- Barnacle goose;
- Goldeneye; and
- Sandwich tern.

*Greylag goose also qualifies as the single Ramsar listed bird species for Loch of Strathbeg

Of these records, only pink-footed goose was recorded within 500m of the site.

The North-East Scotland Bird Recorder supplied a further 226 records of all seven Loch of Strathbeg SPA qualifying species dated between 2003 and 2020. Of these, only pink-footed goose and whooper swan (a single bird within 500m of the site in 2016; and a further eight birds on the edge of this area, also in 2016).

3.2 Field Survey Results

The results of the field surveys are presented in Table 2.

Table 2: Field Survey Results

Date	Species	Total Count	Field Numbers	On Site or in Wider 500m Survey Area	Goose Droppings Present (inc. field numbers)
17 th Feb, 2018	Pink-footed goose	2,050	5, 8, 10, 12, 16	Both	Yes (10, 13, 19, 22, 27-29, 32, 35, 37, 39, 41, 43, 44, 46, 47, 48, 53, 63)
27 th Feb, 2018	Pink-footed goose	181	10, 28, 53	Wider survey area only	Yes (15, 39)
12 th Mar,	Pink-footed goose	700	5	Wider survey area only	Yes (10, 19, 43)
2018	Greylag goose	10	39	On site	
	Teal	14	5	Wider survey area only	
23 rd Mar,	Pink-footed goose	2,494	5, 10, 12, 27, 28	Both	Yes (18, 19, 44, 53, 54)
2018	Teal	6	5	Wider survey area only	
06 th Apr,	Pink-footed goose	1,311	5, 10, 19, 43, 47	Both	Yes (53)
2018	Teal	45	5, 56	Both	
21 st Apr,	Pink-footed goose	220	5	Wider survey area only	Yes (18, 41)
2018	Barnacle goose	2	5	Wider survey area only	
	Teal	65	5, 13, 56	Both	

4 SUMMARY OF DEVELOPMENT

It is understood that the proposed Kirkton Solar PV and energy storage facility will comprise Photovoltaic (PV) Solar Panels erected on steel or aluminium frames in linear arrays. Works will also involve construction of accompanying infrastructure, specifically a Primary Sub-Station, 50 Inverter substations, deer style fencing and associated internal service tracks. Access for the site is via an existing lane from the A90 located immediately to the west of the Site.

When constructed the electricity generating station will have an installed capacity in excess of 50MW consisting of a solar PV farm of approximately 50MW capacity and a battery energy storage facility with a capacity of approximately 20MW capacity comprising approximately ten storage units.

It is proposed the storage facility will be located beside the proposed Primary Substation within the site and near to its south-western boundary. The total area of the site is approximately 112.7 ha and for the purposes of this assessment it is assumed that this area in its entirety will be lost to the development. This is a robust assessment given that, as stated in Section 1.1 above, only 76.5ha of land within the site boundary are proposed for infrastructure, including the large spacing's between panels which will be left free from development.

Project components are confirmed below:

- Photovoltaic (PV) Solar Panels erected on steel/aluminium frames in linear arrays;
- 1 on-site Primary Sub-station typically measuring 6m (I) x 3.2(w) x 3.4m (h);
- 50 No. Inverter Substations typically measuring 7m (I) x 2.5(w) x 3m (h) to be located across the site;
- Perimeter post and wire "deer" fencing (2.45m high);
- A number of strategically located CCTV security cameras (3m high);
- Access is via an existing lane onto the A90 which is immediately west of the site; and
- Associated internal service tracks.

5 RECEPTORS SCOPED OUT OF DETAILED ASSESSMENT

All Loch of Strathbeg SPA qualifying species except pink-footed geese have been scoped out of detailed assessment. The grounds for the inclusion or removal of SPA species are presented in Table 3: Receptors Scoped Out of Detailed Assessment below.

Table 3: Receptors Scoped Out of Detailed Assessment

Species	Results Summary and Evaluation	Include in detailed assessment
Pink-footed goose	Desk study confirms presence within 500m of site. Recorded within the field survey area on all survey visits and on site in 50 % of the survey visits. The distance between the development site and the SPA lies well within the core 20km foraging range for this species ⁵ .	Yes
Greylag goose	No desk study records within 500m of the site and a single flock of 10 birds foraging on site on one occasion during all of the field survey visits, and none in the wider survey area. It is considered the site and surrounding area is not a key foraging resource for this species.	No
Whooper swan	Desk study confirms presence within 500m of site, but in very low numbers and very rarely. Not recorded in the survey area during any of the field surveys undertaken to inform the assessment of the development. This species has a core foraging range of 5km ⁵ , which is beyond the distance of the SPA from the Development and wider survey area. The survey area is not considered to be a key resource for this species.	No
Barnacle goose	No desk study records within 500m of the site and only two birds present on one occasion in the wider survey area during the field surveys. The survey area is not considered to be a key resource for this species.	No
Teal	No desk study records within 500m of the site. Recorded during the field surveys in the site and wider survey area in March and April only, with numbers increasing in April. A French study comprising four winters found teal typically forage 1-2km from their roost sites ⁶ . The fact numbers are increasing in early spring is indicative of birds staging, prior to migrating to their breeding grounds, with potentially the presence of a couple of local breeding pairs. While teal are a resident species in the UK, the winter population is augmented by birds from Northern Europe. These birds are known to return to their Northern European breeding grounds over a long period (February to May) ⁷ . On the basis of the above information, it is considered extremely unlikely these birds are part of the Loch of Strathbeg SPA population and they are not considered further in this assessment.	No
Goldeneye	No desk study records within 500m of the site and only two birds present on one occasion in the wider survey area during the field surveys. No known use of the site.	No
Sandwich tern	No desk study records within 500m of the site. No known use of the site. Sandwich terns are present during the summer months, where they breed on shingle and forage for sand eels and small fish at sea. The habitats within the site are of little to no use for this species.	No
Waterfowl assemblage	For the reasons described above only pink-footed goose are taken forward for detailed assessment.	No

⁵ SNH (2016). Assessing connectivity with Special Protection Areas (SPAs), Version 3.

⁶ Legagneux, P., C. Blaize, F. Latraube, J. Gautier, and V.Bretagnolle. 2009. Variation in home-range size and movements of wintering dabbling ducks. Journal of Ornithology 150(1):183-193. http://dx.doi.org/10.1007/s10336-008-0333-7.

⁷ Wernham, C., Toms, M., Marchant, J., Clark, J., Siriwarderna & Baillie, S. (2002). The migration atlas: movements of the birds of Britain and Ireland. Published for the British Trust for Ornithology by Poyser. London.

6 POTENTIAL EFFECTS ON PINK-FOOTED GOOSE

There is the potential for loss of foraging habitat, disturbance to foraging birds and increased mortality (via collision with solar panels) as a result of the installation, operation and decommissioning of the development. These impact pathways are considered in detail in this section.

Loss of Foraging Habitat – While the area of the SPA itself remains unaffected by the development, the results of the desk study and field survey work show pink-footed geese regularly use the habitats within the site and surrounding area for foraging. The distance between the site and the SPA also lies well within the 20km core foraging range for this wintering species.

Disturbance to Foraging Birds – In the absence of mitigation there is the potential for the disturbance to pink-footed goose during the construction phase of the development, if this occurs during mid-September to mid-May inclusive, when the birds have the potential to be present.

Collision Risk – As highlighted in correspondence with NatureScot there is the potential for birds to collide with solar panels due to glare given off from the sun causing their surfaces to be mistaken for waterbodies.

6.1 Pink-footed Goose Population Status

The most recent UK population estimate of pink-footed geese is 510,00 birds⁸. The UK pink-footed goose population has increased by 67% in the last 10 years and 124% in the last 25 years⁹. In 2007 the Scottish population was considered to be approximately 200,000 birds in October (c. 50% of the global population), with about 150,000 remaining through winter and spring¹⁰.

An annual census of pink-footed geese in the UK has been undertaken by the Wildfowl and Wetlands Trust (WWT) every year since 1960. The census indicates a favourable trend for this species, increasing from a UK wintering peak of 50,000 birds in the 1960s to its current level, and the population has continued to increase in recent years⁸. The most recent 2019 counts for the North-east Scotland population totalled 77,826 birds in October, and 95,855 in November.

As mentioned, in Section 1.2 the Loch of Strathbeg designated pink-footed goose population was considered to be a winter peak mean of 27,500 birds between winter 1986/87 and winter 1990/91. However, in parity with the upward trend nationally, the SPA population has also increased considerably, with the winter peak mean between 2006/07 and 2010/11 having almost doubled to 51,969 birds¹¹.

Pink-footed geese were frequently recorded foraging in and adjacent to the Development site between February and April 2018, with the number of birds present within the survey area varying between 181 and 2,494.

6.2 Future Baseline

Recent research has concluded over the last decades, the pink-footed goose has expanded its use of farmland areas due to a combination of increased protection from hunting, warmer winters, better winter food supplies as well as improved breeding conditions due to a warmer climate¹². As a result of this combination of factors adult bird survival and breeding success have increased, leading to a large population increase for this species. The current increasing trend may continue, despite concerns from farmers on the effects of

⁸ Frost, T., Austin, G., Hearn, R., McAvoy, S., Robinson, A., Stroud, D., Woodward, I and Wotton, S. (2019) Population estimates of wintering waterbirds in Great Britain British Birds. Vol 112. pp 130–145.

⁹ Frost, T.M., Calbrade, N.A., Birtles, G.A., Mellan, H.J., Hall, C., Robinson, A.E., Wotton, S.R., Balmer, D.E. and Austin, G.E. 2020. Waterbirds in the UK 2018/19: The Wetland Bird Survey. BTO, RSPB and JNCC, in association with WWT. British Trust for Ornithology, Thetford.

¹⁰ Forrester, R.W., Andrews, I.J., McInerny, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C., and Grundy, D.S. (eds) (2007) The Birds of Scotland. The Scottish Ornithologists Club, Aberlady.

¹¹ Mitchell, C. 2012. Mapping the distribution of feeding pink-footed and Iceland greylag geese in Scotland. Wildfowl and Wetlands Trust / Scottish Natural Heritage Report, Slimbridge. 108pp.

¹² Jensen, G.H., Tombre, I.M., and Madsen, J. (2016) Environmental factors affecting numbers of pink-footed geese *Anser brachyrhynchus* utilising an autumn stopover site Wildlife Biology, 22(5) : 183-193.

increased goose grazing on winter crops¹³,¹⁴. The immediate future appears positive for this species therefore, due to these higher levels of breeding success, adult survival and increasing temperatures.

6.3 Effects Resulting from Disturbance to Foraging Birds During Construction

Although the Development does not physically overlap the SPA, pink-footed goose foraging activity was recorded during all baseline survey visits and the SPA lies within the core foraging range for pink-footed goose. If the works take place over winter, there is potential for disturbance of birds from fields around the works, resulting in a loss of foraging habitat, within the foraging range of this species for birds from the SPA.

6.3.1 Mitigation

The construction period for the project is predicted to be 16 weeks. Construction works will be timed to avoid as much of the wintering geese period (mid-September to mid-May) as possible, thus minimising the potential for disturbance to foraging pink-footed goose.

6.3.2 Summary of Effect

Given the relatively short construction period and the embedded timing mitigation, disturbance effects on foraging pink-footed geese resulting from construction are predicted to be of a low level and as such it is considered that the integrity of the SPA pink-footed goose population and that the conservation objectives of the SPA can be maintained.

6.4 Effects Resulting from Loss of Foraging Habitat

NatureScot highlighted during the consultation process that an assessment of the loss of foraging habitat for pink-footed goose should be a key consideration in the HRA. The north-east of Scotland supports large areas of winter arable crop fields and improved grassland, providing an abundant foraging resource for pink-footed goose. A high-level GIS analysis of broad land types within 20km of the SPA (the foraging range for pink-footed goose⁵) is presented in Table 4 below and illustrated on Figure 4. Data for the land cover within the 20km was obtained using combination of OS OpenMap-Local and OS VectorMap District obtained through Ordnance Survey OpenData.

Land type	Area (ha)	% area
Open space	53972.69	84.17
Built up	2107.05	3.29
Road	885.67	1.38
Waterbody	478.96	0.75
Woodland	5440.64	8.48
Foreshore	595.03	0.93
Dune	640.84	1.00
TOTAL	64120.88	100.00

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Table 4:	Droad		bes within	1 206111	OI LOCH	of Stratinge	U SPA

A peak count of 2,494 pink-footed geese were recorded within the survey area, which represents 9.07 % of the SPA population at its designation. However, give the upward trend in pink-footed goose numbers at Loch of Strathbeg (winter peak mean of 51,969 birds between 2006/07 and 2010/11), this is more likely to be in the region of 4 % of the current SPA population. The mean count of pink-footed geese using the survey area

¹³ Summers, R.W. (1990) The Effect on Winter Wheat of Grazing by Brent Geese Branta bernicla. Journal of Applied Ecology. Vol. 27, No. 3, pp. 821-833.

¹⁴ Gill, J.G. (1996) Habitat Choice in Pink-Footed Geese: Quantifying the Constraints Determining Winter Site Use. Journal of Applied Ecology. Vol. 33, No. 4, pp. 884-892.

during the six survey visits was 1,159 birds, representing 4.21 % of the designated SPA population and approximately 2.23 % of the Loch of Strathbeg. 2006/07 to 2010/11 winter peak mean of 51,969 birds.

In addition, the Loch of Strathbeg Goose Management Scheme has focussed on the provision of goose refuge areas, to encourage foraging birds within identified core feeding areas within 3.5km of the Loch of Strathbeg¹⁵. Patterson (2017)¹⁶ identified a sustained upward trend in the use of these areas up until end of the scheme in 2017 with a peak 45,270 pink-footed geese recorded in March, 2017 over five years between 2013-2017.

While not all areas of open habitat will be suitable for goose foraging as they include recreational ground and ploughed fields without suitable forage crops or grasses, even if 50 % of this land provides a suitable foraging resource, the loss of the habitats within the site (106 ha) would constitute only 0.4 % of the total available foraging resource. Although this loss will be in effect for the lifespan of the development (approximately 40 years), it is not considered significant due to the abundant alternative foraging habitats available within the large 20 km foraging range.

6.4.1 Mitigation

On the basis of the above, mitigation for pink-footed geese is not considered necessary.

Through an on-site Habitat Management Plan (HMP) however, to minimise operational disturbance to geese foraging in adjacent fields, hedge planting and gapping up around the site will be carried out and maintained in the long term, in line with good practice guidance.

6.4.2 Summary of Effect

On consideration of this information, it is anticipated that habitat loss following the installation of the development will not affect the integrity of the SPA pink-footed goose population and that the conservation objectives of the SPA can be maintained.

6.5 Effects Resulting from Collision Risk

During the consultation process NatureScot highlighted the potential for collision risk from birds mistaking the solar panels for a waterbody due to reflection from the sun. Collision risk with wind farms is well documented, but there is less data on collision risk at solar farms. Natural England note that due to the lack of fast-moving parts and high-altitude structures in solar farms, it would intuitively suggest that the potential collision risk for flying animals is lower for solar farms than it is for wind farms¹⁷. Grid connection is also a key consideration for collision risk to birds resulting from energy projects, with cases of birds colliding with overhead lines¹⁸. For this project new overhead lines will only be limited to approximately 4 crossing points over pipelines which will measure approximately 52-54m in length and so the risk is reduced.

There are two main types of solar farm Concentrated Solar Power (CSP) facilities, which are not present in the UK and solar PV facilities, which do exist in the UK. DeVault et al (2014)¹⁹ observed no obvious evidence for bird casualty caused by solar panels, despite conducting 515 bird surveys at solar PV sites. Studies looking at CSP and PV developments in California found that mortality rate (proportional to the generating capacity of the facility) associated directly with solar facilities was between seven and 21 times higher at CSP sites than at PV sites, but this study is limited by a sample size of only three sites. CSP bird injuries and collisions are also often associated with singeing of birds wings from concentrated rays¹⁷.

¹⁵ https://www.nature.scot/professional-advice/land-and-sea-management/managing-wildlife/managing-geese/loch-strathbeg-localgoose-management-scheme.

¹⁶ Patterson, I.J. (2017). Monitoring of goose use of the refuges in the Loch of Strathbeg Goose Management Scheme 2017. SNH. Battleby.

¹⁷ www.gov.uk/natural-englandEvidence review of the impact of solar farms on birds, bats and general ecology (NEER012) (2017).

¹⁸ SNH (2016). Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds. SNH. Battleby.

¹⁹ DeVault, T. L. et al. (2014). Bird use of solar photovoltaic installations at US airports: implications for aviation safety. Landsc. Urban Plan.122,122–128.

6.5.1 Mitigation

Birdlife Europe (2011) have suggested planting hedgerows at solar farms can help breakup the potential for a waterbody like appearance at solar farms and help reduce collision risk²⁰. The current Development will be bound by existing hedgerows and new planting will also be incorporated to reduce the risk of collision. A boundary fence will also be erected at the site, which will run alongside existing hedgerows and in addition to this, any fencing not marked with an adjacent hedgerow will be demarcated to increase visibility and reduce collision risk.

The main connecting wires from the solar panels to the Development sub-station building, will be undergrounded, as will the grid connection when it emerges and which will be dealt with as part of a separate application. This removes the risk of bird collision with overhead lines.

In addition to the above, panels at the Development will be opaque in nature and are designed specifically to absorb rather than reflect the sun's rays, thus minimising reflection and further ameliorating collision risk to birds.

6.5.2 Summary of Effect

On consideration of the above it is considered collision risk resulting from the development is likely to be negligible and accordingly it is considered that the integrity of the SPA pink-footed goose population and that the conservation objectives of the SPA can be maintained.

²⁰ Birdlife Europe (2011) 'Meeting Europe's Renewable Energy Targets in Harmony with Nature.' Sandy, UK: RSPB (eds. Scrase I. and Gove B).

7 IN-COMBINATION ASSESSMENT

On the basis that pink-footed geese have a core foraging distance of 20 km, cumulative sites within 20 km with the potential to cause an additional cumulative effect on the SPA are considered in the in-combination assessment. The in-combination assessment covers consented developments, developments under construction and operational developments.

A list of developments that fit these criteria is presented in Appendix 2.

All potential effects assessed in developments within 20 km are predicted to have either a negligible effect or no effect on the SPA populations. On consideration of the sites in Appendix 2 in-combination with Kirkton Solar PV, it is considered that additive effects resulting all projects would not add up to any significant effect on the conservation objectives for the SPA and that the development, alone or in combination with current plans and projects, could not result in an adverse effect on the integrity of Loch of Strathbeg SPA/Ramsar.

Figures

Figure 1: Site Location and Context

Figure 2: Site Plan

Figure 3: Goose Field Use Survey Locations and Results

Figure 4: Indicative Habitats within 20km of Loch Strathbeg SPA









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Appendix 1

Survey Timings and Conditions

Date	Hour	Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
17 th Feb, 2018	1	09:00	2-3	SW	0	2	2	2	0	0
17 th Feb, 2018	2	10:00	2-3	SW	0	2	2	2	0	0
17 th Feb, 2018	3	11:00	2-3	SW	0	3	2	2	0	0
17 th Feb, 2018	4	12:00	2-3	SW	0	6	2	2	0	0
17 th Feb, 2018	5	13:00	2-3	SW	0	4	2	2	0	0
17 th Feb, 2018	6	14:00	2	SW	0	4	2	2	0	0
17 th Feb, 2018	7	15:00	2	SW	0	4	2	2	0	0
27 th Feb, 2018	1	08:30	4	E	0	6	2	2	0	0
27 th Feb, 2018	2	09:30	4	E	0	7	2	2	0	0
27 th Feb, 2018	3	10:30	4	E	0	8	2	2	0	2
27 th Feb, 2018	4	11:30	3	E	0	3	2	2	0	0
27 th Feb, 2018	5	12:30	3	E	0	6	2	2	0	2
27 th Feb, 2018	6	13:30	3	E	0	7	2	2	0	0
27 th Feb, 2018	7	14:30	3	E	0	7	2	2	0	2
12 th Mar, 2018	1	07:00	1	NW	1	8	1	1	0	0
12 th Mar, 2018	2	08:00	2	NW	1	8	1	1	0	0
12 th Mar, 2018	3	09:00	2	NW	0	8	1	2	0	0
12 th Mar, 2018	4	10:00	2	NW	1	8	1	2	0	0
12 th Mar, 2018	5	11:00	2	NW	2	8	1	2	0	0
12 th Mar, 2018	6	12:00	2	NW	2	8	1	2	0	0
12 th Mar, 2018	7	13:00	2	NW	2	8	1	2	0	0
12 th Mar, 2018	8	14:00	2	NW	0	8	1	2	0	0
23 rd Mar, 2018	1	07:00	5	SSW	1	8	1	1	0	0
23 rd Mar, 2018	2	08:00	5	SSW	1	8	1	1	0	0
23 rd Mar, 2018	3	09:00	6	SSW	3	8	1	1	0	0
23 rd Mar, 2018	4	10:00	5	SSW	0	8	1	1	0	0
23 rd Mar, 2018	5	11:00	4	SSW	0	7	2	2	0	0
23 rd Mar, 2018	6	12:00	5	SSW	4	8	1	1	0	0
23 rd Mar, 2018	7	13:00	6	SSW	0	7	2	2	0	0
23 rd Mar, 2018	8	14:00	5	SSW	2	8	2	2	0	0
06 th Apr, 2018	1	06:30	5	SE	0	8	2	2	0	0
06 th Apr, 2018	2	07:30	5	SE	0	8	2	2	0	0
06 th Apr, 2018	3	08:30	5	SE	0	8	2	2	0	0
06 th Apr, 2018	4	09:30	5	SE	0	8	2	2	0	0
06 th Apr, 2018	5	10:30	5	SE	0	8	2	2	0	0
06 th Apr, 2018	6	11:30	5	SE	0	8	2	2	0	0
06 th Apr, 2018	7	12:30	5	SE	0	8	2	2	0	0
21 st Apr, 2018	1	06:10	0	N.A.	0	1	2	2	0	0
21 st Apr, 2018	2	07:10	0	N.A.	0	1	2	2	0	0

REPORT

Date	Hour	Time	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Visibility	Frost	Snow
21 st Apr, 2018	3	08:10	1	SW	0	1	2	2	0	0
21 st Apr, 2018	4	09:10	2	SW	0	1	2	2	0	0
21 st Apr, 2018	5	10:10	3	SW	0	1	2	2	0	0
21 st Apr, 2018	6	11:10	3	SW	0	1	2	2	0	0
21 st Apr, 2018	7	12:10	3	SW	0	1	2	2	0	0
21 st Apr, 2018	8	13:10	3	SW	0	1	2	2	0	0

Appendix 2

In-Combination Search Results

		- · · ·		
Planning reference ENQ/2020/0931	Location St Fergus Gas Terminal St Fergus Aberdeenshire AB42 3EP	Development Construction and Operation of a Carbon Capture, Compression & Conditioning Plant with Associated Infrastructure and CO2 Export Pipeline Connection	Decision (and date if applicable) Awaiting decision	Assessment of SPA species included No
APP/2017/3108	Address National Grid North Sea Gas Terminal St Fergus Peterhead Aberdeenshire AB41 7EP	Storage of Hazardous Substances	Approved Decision Issued Date Fri 29 Jun 2018	No NatureScot commented the proposals are unlikely to have an adverse efft on nature conservation.
APP/2020/2568	Address Land At St Fergus Gas Terminal St Fergus Peterhead AB42 3EP	Installation of Underground Fibre Optic Cable and Associated Works	Awaiting decision	No
ENQ/2018/2019	Address Land Adjacent To The St Fergus Gas Terminal St Fergus Peterhead	Erection of Electricity Substation Comprising Platform Area, Control Building, Associated Plant and Infrastructure, Ancillary Facilities, Access Track and Landscape Works	PAC Agreed as Specified in Notice 08 Jan 2019	No
APP/2019/2300	Address Land Adjacent To The St Fergus Gas Terminal St Fergus Peterhead	National for Erection of Electricity Substation Comprising Platform Area, Control Building, Associated Plant and Infrastructure, Ancillary Facilities, Access Track and Landscape Works	Approved 06 Mar 2020	HRA found no LSE on integrity of Loch of Strathbeg SPA/Ramsar site. NatureScot agreed no likely signigicant effect on Loch of Strathbeg SPA/Ramsar site.
APP/2020/0227	Address OP1 Site Newton Road St Fergus Aberdeenshire	Erection of 20 Dwellinghouses and Associated Infrastructure	Approved	No
APP/2019/0296	NO42 300	Installation of 36.6Mw Solar SV Park and Associated Infrastructure	Approved 20 Sep 2019	NatureScot commented the Habitat Loss, Disturbance and Collision risk were not likely to result in LSE on the integrity of Loch of Strathbeg/SPA/Ramsar site.
APP/2019/2293	Address The Former Airfield Hillhead Road Crimond AB43 8QQ	Section 42 application for the Erection of Crematorium and Promation of Associated Car Parking and Ancillary Landscaping Without Compliance With Condition 8 (Road Formation) and Condition 13 (Dust Control) of Planning Permission in Principle Reference APP/2010/0326	Approved 13 Jan 2020	No
APP/2018/1288	Address Sites 11-15 Longside Airfield Peterhead Aberdeenshire	Formation of Supply Base Including Provisions for Warehousing, Offices and Pipe Storage without Compliance with Condition 3 (Investigation of Potentially Contaminated Sites) and Condition 4 (Remedial Works) of Permission Reference APP/2015/0327	Approved 19 Jul 2018	No
ENQ/2020/1494	Address Land To The South Of Boothby Road Fraserburgh	Residential Development of 130 Dwellinghouses, Land for Affordable Housing and Associated	PAC Additional Nots/Cons Required	No
APP/2016/0618	Address Kirkton Development Phase 1 Land To South Of Boothby Road Fraserburgh	Erection of 120 Dwellinghouses, Provision of Land for Future Affordable Housing and Associated Landscaping and Infrastructure	22.042.020	No
APP/2018/2561	Address Blackhills Quarry Tyrie Fraserburgh Aberdeenshire	Continued Extraction of Sand and Gravel without Compliance with Condition 1 of Planning Permission Reference APR/2013/2030	Approved 25 Mar 2019	No
APP/2016/3150	Address Land Adjacent To Fetterangus Cemetery	Change of Use to Form Playing Field, Formation of Car Parking and Erection of Sports Pavilion (Part Pathopogetica)		No
APP/2020/2360	Address Land At Ferguson Street Fetterangus Peterhead Aberdeenshire	Erection of 26 Dwellinghouses and Associated Works	Awaiting decision	No
APP/2019/2294	Address Tufted Duck Hotel The Tufted Duck Corsekelly Place St Combs Aberdeenshire AB43 8ZS	Extension to Hotel	Approved 24 Dec 2019	No
APP/2016/0603	Address Site To Northwest Of Roseacre Rathen Fraserburgh Aberdeenshire	Erection of 10 No. Dwellinghouses, Associated Roads & Drainage Infrastructure	Approved 26 May 2017	No
APP/2019/0506	Address Overhead Lines Between Blackhillock Peterhead Substation And Kintore Substation	Reinforcement of 400kV Overhead Line	No Objection 03 Jul 2019	No
APP/2020/0897	Address Bridgend Quarry Longside Aberdeenshire	Extraction of Rock	Awaiting decision	No
APP/2016/3211	Address SITA (UK) LTD Landfill Site Stoneyhill Quarry Longhaven Peterhead Aberdeenshire AB42 0PR	Site and Erection of Waste Transfer Building without compliance with condition 10 (Blasting) of Approved Planning Permission N992222PF	Approved 27 Jan 2017	No
APP/2016/2789	Address Newton Of Savoch Quarry Blackhills Peterhead Aberdeenshire AB42 4YS	Extension to Existing Quarry for the Extraction of Minerals: Non Compliance to Condition 1 (Time) of Planning Permission Reference APP/2005/2087	Approved 02 Dec 2016	No
ENQ/2018/0535	Address Site Offshore To The South East Of Boddam	Installation of Underground HVDC Cables & 1.4GW HVDC Interconnector Cables	PAC Agreed as Specified in Notice	No
APP/2016/0720	Address Phase 5 Greenacres Wester Clerkhill Peterhead	Erection of 210 Dwellinghouses With Associated Infrastructure	00 Apr 2010	No
APP/2017/2547	Address OP1 Nether Aden Mintlaw Peterhead Aberdeenshire	Mixed Use Development - Erection of 500 Dwellinghouse, Business, Community, Services for the Elderly, Retail and 5Ha of Employment Land	Approved 03 Apr 2019	No
ENQ/2019/0563	Address Site OP1 And OP2 Maud Aberdeenshire Description Residential Development	Residential Development	PAC Agreed as Specified in Notice 27 May 2019	No
APP/2016/3211	Address SITA (UK) LTD Landfill Site Stoneyhill Quarry Longhaven Peterhead Aberdeenshire AB42 0PR	Alterations and Extension to Landfill Site and Erection of Waste Transfer Building without compliance with condition 10 (Blasting) of Approved Planning Permission N992222PF	Approved 27 Jan 2017	No
ENQ/2018/1746	Address Land To The South Of Newton Of Sandford Boddam Peterhead	Erection of Electricity Substation Comprising Platform Area, Control Building, Plant Enclosures, Associated Plant & Infrastructure, Ancillary Facilities, Landscape Works and Road Alterations and Improvement Works	PAC Agreed as Specified in Notice 26 Oct 2018	No
APP/2017/0050	Address M1 Site Cruden Bay Aberdeenshire	Erection of 150 Dwellinghouses, Provision of Land for Future Affordable Housing, Associated Landscaping and Infrastructure	Approved 8 Aug 2018	No