Application by NNB Generation Company (SZC) Limited for an Order Granting Development Consent for The Sizewell C Project

The Examining Authority's written questions and requests for information (ExQ1)Issued on 21 April 2021

ExQ1 Part 2 - Part 1Biodiversity and ecology (terrestrial& marine) – General

Andrew McDonald[RR-0060], The Applicant Mr McDonald states in [RR-0060]:

"Friends of the Earth estimate that, in addition to direct mortality, there would be a loss of bird life of up to 30% extending to 1 km either side of each new road". Please will Mr McDonald state where this is to be found and if possible submit a copy of the document. Please will the Applicant comment.

Thank you for the opportunity to expand on this aspect of the damage to biodiversity that will be caused by roadbuilding consequent on the developments proposed in the DCO application.

The estimate claimed will be found in the Written Representation from Friends of the Earth Suffolk (FOTE) on the damaging impacts of the new Access Road, and is based partly on research carried out by:

- Pierre Ibisch *et al*, *A global map of roadless areas and their conservation status* in *Science (*vol 354, 2016);
- Reijnen, R., Foppen, R & Meeuwsen, H. (1996). '*The effects of traffic on the density of breeding birds in Dutch agricultural grasslands*.' Biological Conservation, 75: 255-260;
- Fahrig, L. & Rytwinski, T. (2009). '*Effects of roads on animal abundance: An empirical review and synthesis*,' Ecology & Society: vol 14, 1 (June);

and

- Benitez-Lopez, A. et al (2010). *'The impacts of roads and other infrastructure on mammal and bird populations: A meta-analysis,*' Biological Conservation, 143: 1307-1316.

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- and on associated papers. I have written down some extracts and references below for the ExA's and the applicants' attention. The final version of the Friends of the Earth Suffolk Written Representation will of course be available to ExA and the Applicant.

1 **FOTE Suffolk Written Representation – general comments on the Access Road**

- The building of the road would involve the total destruction of the north-eastern triangle of Sizewell Marshes Site of Special Scientific Interest (SSSI) with its reedbeds, ditches, open water, wet woodland and grazing marsh. An 'outstanding' assemblage of invertebrate species, a special interest feature of the SSSI, depend on this

wetland, some Red Listed and rare. Breeding and visiting birds would similarly have their habitat destroyed here.

2 **FOTE Suffolk – comments on 'Road Effect Zones'**

- Research into the 'road effect zone' (REZ) demonstrates that, in addition to mortality of wild species through traffic collisions, up to 1km either side of the road would become degraded, with a loss up to 30% of bird species. There would also be population declines of a similar percentage of mammals, but stretching to 5km (according to mobility). This would directly affect species that depend on Sizewell Marshes SSSI, Minsmere-Walberswick SSSI, and the Minsmere-Walberswick SAC, SPA and Ramsar, particularly the south-eastern portion.

<u>Detailed comments - The Road Effect Zone (REZ)</u>

A considerable body of research exists that demonstrates that it is not just the road itself that reduces biodiversity, in terms, for example, of green land-take and wildlife mortality through traffic accidents, but the areas all around the roads. The worst affected is the zone lying within 1km either side of the road, and the nearer to the road, the greater the negative impacts. Depending on the animals involved and their degree of mobility, this zone may extend to 5km.

As far as the Sizewell Access Road is concerned, this is deeply worrying, as 1km north of the road would include virtually all of the Minsmere Southern Levels, with the Minsmere-Walberswick SSSI, and parts of the European designated habitats and Ramsar lying to the east along the coast. 1km south of the road would cover most of Sizewell Marshes SSSI and Sizewell Levels & Associated Areas County Wildlife Site (CWS). **This means that all of these protected areas would become permanently degraded due to the Access Road.**

Decline in populations of birds would be up to 30% within the 1km zone and of mammals the same percentage within 5km either side of the road, depending on mobility (Rejnen, R. *et al*, 1996; Fahrig & Rytwinski, 2009; Benitez-Lopez *et al*, 2010). Wide-ranging animals, such as deer and otters, would be affected throughout this whole area.

The effects south of the road would be compounded by the 'Green' railway line during construction, that would run all along the north-western edge of Kenton Hills, making this area largely untenable for wildlife. Affected species here would include the rare Barbastelle bat.

3 **Pierre Ibisch *et al, op cit***

'…The impact of roads on the surrounding landscape extends far beyond the roads themselves. Direct and indirect environmental impacts include deforestation and fragmentation, chemical pollution, noise disturbance, increased wildlife mortality due to car collisions, changes in population gene flow, and facilitation of biological invasions…'

'..the 1-km buffer along each side of the road represents the zone with the highest level and variety of road impacts…'

The spatial extent of road impacts is specific to the impact in question and to each particular road and its traffic volume, as well as to taxa, habitat, landscape, and terrain features. Moreover, for a given road impact, its area of ecological influence is asymmetrical along the road and can vary among seasons, between night and day, according to weather conditions, and over longer time periods.

4 **Reijnen *et al, op cit***

Abstract

The effect of traffic on the breeding density of grassland birds was studied in 1989 in 15 transects along main roads in The Netherlands. Out of 12 species that could be analysed, 7 showed a reduced density adjacent to the road. There was also a strong effect on the summed densities of all species. Disturbance distances varied between species, ranging from 20 to 1700 m from the road at 5000 cars a day and from 65 to 3530 m at 50,000 cars a day (car speed 120 km/h). At 5000 cars a day most species had an estimated population loss of 12–56% within 100 m of roads, but beyond 100 m > 10% loss only occurred in black-tailed godwit Limosa limosa (22% for 0–500 m zone) and oystercatcher Haematopus ostralegus (44% up to 500 m and 36% for 0–1500 m zone). At 50,000 cars a day all species had estimated losses of 12–52% up to 500 m while lapwing Vanellus vanellus, shoveler Anas clypeata, skylark Alauda arvensis, blacktailed godwit and oystercatcher populations were reduced by 14–44% up to 1500 m.

5 **Fahrig & Rytwinsky, *op cit***

Abstract

We attempted a complete review of the empirical literature on effects of roads and traffic on animal abundance and distribution. We found 79 studies, with results for 131 species and 30 species groups. Overall, the number of documented negative effects of roads on animal abundance outnumbered the number of positive effects by a factor of 5; 114 responses were negative, 22 were positive, and 56showed no effect. Amphibians and reptiles tended to show negative effects. Birds showed mainly

negative or no effects, with a few positive effects for some small birds and for vultures. Small mammals generally showed either positive effects or no effect, mid-sized mammals showed either negative effects or no effect, and large mammals showed predominantly negative effects. We synthesized this information, along with information on species attributes, to develop a set of predictions of the conditions that lead to negative or positive effects or no effect of roads on animal abundance. Four species types are predicted to respond negatively to roads: (i) species that are attracted to roads and are unable to avoid individual cars; (ii) species with large movement ranges, low reproductive rates, and low natural densities; and (iii and iv) small animals whose populations are not limited by road-affected predators and either (a) avoid habitat near roads due to traffic disturbance or (b) show no avoidance of roads or traffic disturbance and are unable to avoid oncoming cars. Two species types are predicted to respond positively to roads: (i) species that are attracted to roads for an important resource (e.g., food) and are able to avoid oncoming cars, and (ii) species that do not avoid traffic disturbance but do avoid roads, and whose main predators show negative population-level responses to roads. Other conditions lead to weak or non-existent effects of roads and traffic on animal abundance. We identify areas where further research is needed, but we also argue that the evidence for population-level effects of roads and traffic is already strong enough to merit routine consideration of mitigation of these effects in all road construction and maintenance projects.

6 **Benitez-Lopez *et al, op cit l***

Abstract

Biodiversity is being lost at an increased rate as a result of human activities. One of the major threats to biodiversity is infrastructural development. We used meta-analyses to study the effects of infrastructure proximity on mammal and bird populations. Data were gathered from 49 studies on 234 mammal and bird species. The main response by mammals and birds in the vicinity of infrastructure was either avoidance or a reduced population density. The mean species abundance, relative to non-disturbed distances(MSA), was used as the effect size measure. The impact of infrastructure distance on MSA was studied using meta-analyses. Possible sources of heterogeneity in the results of the meta-analysis were explored with meta-regression. Mammal and bird population densities declined with their proximity to infrastructure. The effect of infrastructure on bird populations extended over distances up to about 1 km, and for mammal populations up to about 5 km. Mammals and birds seemed to avoid infrastructure in open areas over larger distances compared to forested areas, which could be related to the reduced visibility of the infrastructure in forested areas. We did not find a significant effect of traffic intensity on the MSA of birds. Species varied in their response to infrastructure. Raptors were found to be more abundant in the proximity of infrastructure whereas other bird taxa tended to avoid it. Abundances were affected at variable distances

from infrastructure: within a few meters for small-sized mammals and up to several hundred meters for large-sized mammals. Our findings show the importance of minimizing infrastructure development for wildlife conservation in relatively undisturbed areas. By combining actual species distributions with the effect distance functions we developed, regions sensitive to infrastructure development may be identified. Additionally, the effect distance functions can be used in models in support of decision making on infrastructure planning.

7 **Trombulak and Frissell**

Although not cited by FOTE Suffolk, a paper published in *Conservation Biology*, (vol 14, No. 1, February 2000, pp 18-30) - *Review of Ecological Effects of Roads on Terrestrial and Aquatic Communities, Stephen C. Trombulak and Christopher A. Frissell, Department of Biology, Middlebury College, Middlebury, VT 05753, U.S.A)* contains a useful set of road impact descriptors (set out below) and a very strong closing statement that has clear relevance to the proposed developments at Sizewell:

'…If a broad view of the ecological effects of roads reveals a multiplicity of effects, it also suggests that it is unlikely that the consequences of roads will ever be completely mitigated or remediated. Thus, it is critical to retain remaining roadless or near-roadless portions of the landscape in their natural state…'

Impact factors:

Mortality from Road Construction
Mortality from Collision with Vehicles
Modification of Animal Behavior
Disruption of the Physical Environment
Alteration of the Chemical Environment
Spread of Exotic Species
Changes in Human Use of Land and Water

Andrew McDonald
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