



The Sizewell C Project

8.11 Code of Construction Practice (CoCP) Appendix A: Freshwater Fish and Aquatic Invertebrates Mitigation Strategy

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1 INTRODUCTION

a) Purpose

1.1.1 SZC Co. is proposing to build and operate a new nuclear power station on the Suffolk coast, known as Sizewell C power station (hereafter referred to as Sizewell C) located to the north of the existing Sizewell B power station.

1.1.2 This Aquatic Invertebrate and Fish Mitigation Strategy ('Mitigation Strategy'), compiled by Arcadis Consulting (UK) Limited (hereafter referred to as 'Arcadis') outlines the key approaches to mitigating potential impacts to aquatic invertebrate and fish present within or adjacent to the construction site for Sizewell C main development site. It will be used by SZC Co., consultant ecologists and any relevant subcontractors, in relation to the proposal to build the Sizewell C power station during the construction phase of the development and/ or during the undertaking of any relevant enabling works.

1.1.3 This document has been drafted based on the survey data collected to date, including work undertaken in 2020. The requirements for mitigation are based on the impacts outlined in the ES chapter associated with the proposed main development site works. This document has been informed by the following documents:

- **Volume 2, Chapter 14 of the Environmental Statement (ES) [APP-224]:** Terrestrial Ecology and Ornithology
- **Volume 2, Chapter 22 of the ES [APP-317]:** Marine Ecology and Fisheries.
- **Volume 2, Chapter 14, Appendix 14A4 of the ES [APP-231]:** Invertebrates.
- **Volume 1, Chapter 2 of the ES Addendum (Doc Ref. 6.14):** Main Development Site
- **Invertebrate Survey Report 2020 (Doc Ref. 6.13A)**
- **Fish Surveys 2020 (Doc Ref. 6.13A)**

2 BACKGROUND

a) Legal Status

2.1.1 Aquatic environments within and adjacent to the main development site support at least one species of fish and one species of aquatic invertebrate that have legal protection along with a large number of other species of aquatic invertebrates with recognised conservation status due to their threat of extinction or rarity. The legally protected species are:

- Norfolk Hawker (*Aeshna isocetes*); protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref 1.2) which prohibits the intentional killing, injuring or taking of individuals and intentional damage or destruction/obstruction to any structure or place used for shelter or protection.
- European eel (*Anguilla anguilla*); protected by The Eels (England and Wales) Regulations 2009 (Ref 1.3) which afford powers to the Environment Agency to implement measures for the recovery of European eel stocks and have important implications for operators of abstractions and discharges.

2.1.2 Also of note is the presence of low numbers of bullhead (*Cottus gobio*), an Annex 2 non-priority species under the Habitats Directive 2017 (Ref 1.1). Annex 2 species can form the basis of Special Area of Conservation (SAC) designated site selection

b) Document Structure

2.1.3 This Mitigation Strategy has been set out as follows:

- Section 1: Introduction
- Section 2: Background
- Section 3: Aquatic invertebrate and fish baseline
- Section 4: Potential impacts of the development
- Section 5: Mitigation measures
- Section 6: Monitoring
- Section 7: Criteria for Success

2.1.4 The layout of the Sizewell C main development site is shown in **Figure 14C2A.1** [APP-255] and a full description of the proposed development is provided within **Volume 2** of the **ES**.

c) Roles and Responsibilities

2.1.5 The roles and responsibilities for implementation of this Mitigation Strategy are outlined below:

1. SZC Co.

- Ensuring any habitat areas which have already been created are managed appropriately to ensure suitable conditions remain for aquatic invertebrates and fish species (where appropriate).
- Ensure this Mitigation Strategy is implemented and updated as required through the development process and that any method statements on mitigation measures that are subsequently drafted are implemented.

ii. Consultant ecologist

- Developing and updating the Mitigation Strategy and the plan for its implementation.
- Providing advice on Sizewell drain reinstatement and retained Leiston drain in liaison with relevant stakeholders and site managers.
- Undertaking pre-construction surveys of land take areas and baseline surveys of created habitats.
- Long-term monitoring of the aquatic invertebrates to ensure the mitigation implemented has been effective and successful.
- Progress reporting.

iii. Site Managers

- appropriate management of newly reinstated Sizewell drain and retained Leiston drain .

iv. Contractors/sub-contractor

- appropriate management of newly reinstated Sizewell drain and retained Leiston drain.
- adhering to agreed Method Statements, under a watching brief from an Ecological Clerk of Works (ECoW).

3 BASELINE

a) Aquatic invertebrate baseline

- 3.1.1 Please refer to **Volume 2, Chapter 14, Appendix 14A4** of the **ES** [APP-231] and **Volume 1, Chapter 2** of the **ES Addendum** (Doc Ref. 6.14) for full details of the aquatic invertebrate baseline.
- 3.1.2 **Volume 2, Chapter 14** of the **ES** [APP-224] assesses terrestrial and aquatic invertebrates together due to the nature of the wetland habitats on site and the crossover of species considered terrestrial and aquatic using both terrestrial and aquatic habitats. A number of species, notably dragonflies, including the Norfolk hawk, have both aquatic and aerial life stages. Further terrestrial and aquatic invertebrate surveys, detailed in the **Invertebrate Survey Report 2020** (Doc Ref. 6.13A), were undertaken in 2020 which focused on wetland associated invertebrates within Sizewell Marshes SSSI and adjacent areas.
- 3.1.3 The results of the initial baseline and the 2020 surveys showed the presence of valued wetland invertebrate assemblages, especially those associated with “permanent wet mire” and “reed-fen and pool” habitats (typical of mires and seepages which may have little open water but remain permanently wet), which were well represented across Sizewell Marshes SSSI and were assessed as being of national importance. The invertebrate assemblage associated with “mineral marsh and open water” habitats (typically found in floodplain wetlands, fluctuating meres, carr and wet woodland), while not as well represented, were also considered of high conservation value. Surveys in 2020 identified the presence of an important invertebrate assemblage associated with dead wood habitats found in the wet woodland. Aquatic ditch sampling undertaken in 2020 recorded only low numbers of invertebrate species of which only one of which has recognised conservation status, the ornate brigadier soldierfly (*Odontomyia ornata*), considered Nationally Scarce¹. The presence of these assemblages confirms the importance of the wetland habitats within Sizewell Marshes SSSI.
- 3.1.4 Norfolk hawk dragonfly, which requires well vegetated aquatic habitat to breed, especially unspoilt grazing marsh dyke systems with clean, non-saline water and rushy margins (Ref 1.4), was recorded in low number within the wider Sizewell Marshes SSSI grazing marsh systems, outside of the proposed area of landtake. Much of the ditch habitat potentially subjected to land take is shaded by wet woodland and so is considered sub-optimal to be used for breeding by this species.
- 3.1.5 Proposed aquatic invertebrate surveys in 2021 will further update the baseline and include a further, early season, visit to sample the Sizewell

¹ Species thought to occur in between 16 and 100 10-km squares of the National Grid

and Leiston drains and a targeted survey for Norfolk hawker to determine in greater detail its distribution within Sizewell Marshes SSSI and the new wetland at Aldhurst Farm.

b) Fish baseline

- 3.1.6 The baseline presented in **Volume 2, Chapter 14** of the **ES** [APP-224] states that glass (young) eels were found in the Leiston Drain during aquatic macrophyte surveys, showing that the Minsmere sluice is permeable to eels and that eels are therefore present within the ditch network of Sizewell Marshes SSSI. In addition, anecdotal evidence from the Suffolk Wildlife Trust suggests that Sizewell Marshes SSSI supports a population of coarse fish including rudd (*Scardinius erythrophthalmus*).
- 3.1.7 Fish surveys undertaken in 2020 within the Sizewell and Leiston drains and area of wetland land take within the SSSI Triangle, detailed in **Sizewell C - 2020 Fish Survey Report** and covered in **Volume 1, Chapter 2** of the **ES Addendum** (Doc Ref. 6.14), recorded seven species, including protected and notable species, European eel and bullhead.
- 3.1.8 The composition of the fish assemblage was considered typical for a lowland ditch in close proximity to the sea however the presence of bullhead was unexpected due to the lack of suitable habitat for this species.

4 POTENTIAL IMPACTS OF THE DEVELOPMENT

4.1.1 **Volume 2, Chapter 14** of the **ES** [APP-224] explains that the main impact pathways during construction and operation would be associated with:

- Direct land take resulting in habitat loss;
- Habitat fragmentation, and obstruction of passage for migratory fish and aquatic invertebrates; and
- Incidental mortality of aquatic invertebrates and fish.

4.1.2 As part of the Sizewell C main development site design, there will be embedded mitigation measures and/or industry standard protection procedures, as well as additional mitigation measures as required. These are described in **Section 1.4** of **Volume 2, Chapter 14** of the **ES** [APP-224] and in the **Volume 1, Chapter 2** of the **ES Addendum** (Doc Ref. 6.14).

4.1.3 The **ES Addendum** (Doc Ref. 6.14) considers further a number of changes which have been introduced into the Sizewell C proposals, including the inclusion of a 30m open span bridge rather than a culvert to provide the SSSI crossing. Impacts such as reductions in the associated direct landtake and reduced habitat fragmentation as relevant to fish and aquatic invertebrates are described in the **ES Addendum** (Doc Ref. 6.14).

4.1.4 The remainder of this Mitigation Strategy focusses on the mitigation required to minimise the incidental mortality of aquatic invertebrates and fish present in the Sizewell and Leiston drains during the construction phase.

5 MITIGATION MEASURES

5.1.1 This section outlines the proposed mitigation strategy for aquatic invertebrates and fish. In summary, this will consist of an invertebrate and fish (including European eel) rescue, which is detailed below.:

i. Aquatic Invertebrates

5.1.2 The section of the Sizewell drain to be realigned is considered to be sub-optimal for breeding Norfolk Hawker due to shading from adjacent wet woodland, and larvae, if present, are considered to be low in number. To reduce potential mortality, a search and translocation of this species, and other aquatic invertebrates, will be undertaken, under a Norfolk Hawker licence from Natural England using the following methodology:

- The banks of the isolated drain will be netted by an ecologist trained in aquatic invertebrate sampling. Aquatic invertebrates caught will be placed in sample buckets before being moved to an adjacent established watercourse, unaffected by realignment. The netted samples will be checked for the presence of Norfolk Hawker larvae and any individuals will be recorded prior to re-release to unimpacted sections of the Leiston drain.
- Following this, vegetation removed from the Sizewell drain will be translocated along the banks of adjacent established ditches to allow aquatic invertebrates, particularly any present Norfolk Hawker larvae, within this vegetation to crawl into an unaffected watercourse. Vegetation will be left in place for up to 2 days before being removed (Ref 1.5), to maximise the chance of aquatic invertebrate transfer whilst minimising the introduction of plant matter to other watercourses. This will be carried out under supervision of an ECoW who will confirm the absence of protected or invasive species prior to vegetation removal.
- Aquatic invertebrates will not be released directly to the realigned Sizewell drain as the habitat will likely be immature and lack vegetation.

ii. Fish

- The banks of the water body will be subject to strimming and vegetation clearance in order to permit safe and clear means of access to the waterbody prior to capture and relocation of fish species present. The removal of vegetation will ensure no features remain which could risk the welfare of fish during the activities below and to ensure they do not become damaged or entangled in the vegetation present.

- Fish in the affected drain will be caught during daylight hours through electro fishing methods and using specialist nets and placed in oxygenated containers.
- If dewatering is required from sections of drain that would be infilled, a small abstraction pump would be used. The pump would be fitted with mesh to ensure fish do not become entrained during this exercise. The works will be overseen by suitability experienced specialists. Whilst the dewatering exercise is carried out, any further fish encountered will be captured and removed appropriately.
- Once sections of the drain have been fully drained and all fish removed, a destructive search of the bed of the drain will be carried out to ensure all fish have been removed and that all silt substrates are extracted and relocated to the newly created ditch network to maximise the rate of vegetation and ecosystem generation. In addition, bankside turves will also be translocated to newly constructed ditches to maximise vegetation establishment.
- During the exercise, all fish species will be recorded as well as their size, and weight. In line with Environment Agency guidelines, all fish will be health checked and certified before release. This check involves an internal and external examination to look for parasites and disease (Ref 1.6).
- Fish will then be moved by hand to the realigned Sizewell drain (upstream to the works) or into adjacent unaffected watercourses within Sizewell Marshes SSSI. Only waterbodies which are established with vegetation and suitable habitat conditions will be used to receive the captured and relocated fish.

5.1.3 Fish removal requires consent from the Environment Agency, which will be obtained by the appointed sub-contractor prior to the work.

5.1.4 These measures will be undertaken during daylight hours under strict biosecurity measures. Watercourses selected as adjacent receptor sites will be hydrologically linked with the original Sizewell drain to prevent the spread of disease. If invasive species are identified, work will not be undertaken prior to their removal and disposal. Further information regarding control and removal of invasive species is provided in the **Code of Construction Practice (CoCP)** [APP-615].

5.1.5 The above methodology would be aligned with the mitigation works proposed for the displacement of water vole, detailed in **Table 1.6** of the **Draft Water Vole License Method Statement**. It is likely that netting aquatic invertebrates would be undertaken before vegetation removal (**Step 1, Table 1.6**) and the fish rescue would then be undertaken during

the five days allocated for (any) water vole relocation (**Step 6, Table 1.6**). Translocating in-channel vegetation could be undertaken during bank excavation (**Step 7, Table 1.6**).

- 5.1.6 It is currently thought unlikely that any clearance of aquatic and riparian vegetation along the Leiston drain will be required prior to ground improvement construction for the SSSI crossing, although some clearance may be needed to encourage water voles out of the area (see **Draft Water Vole License Method Statement**). If aquatic vegetation removal is required, this will be undertaken following the steps highlighted in **Paragraph 5.1.25.1.1** to allow for the transfer of aquatic invertebrate species, particularly Norfolk Hawker, to a different section of the Leiston drain and reduce incidental mortality. Any Norfolk Hawker larvae will be recorded during this process which will be undertaken with adherence to a bespoke construction Reasonable Avoidance Measures (RAMs) Method Statement.

6 MONITORING

- 6.1.1 All of the construction would be undertaken with adherence to bespoke RAMS. Proposed monitoring for aquatic invertebrates and fish during pre-construction, construction, and operation are to be detailed in the **Terrestrial Ecology Monitoring Plan** (in prep.).

7 CRITERIA FOR SUCCESS

7.1.1 Surveying and monitoring of aquatic invertebrates and fish and their habitat would provide evidence to assess the success of the mitigation strategy.

7.1.2 Success would be measured by:

- Maintaining the conservation status of the invertebrate assemblages supported by Sizewell Marshes SSSI.
- Development of sufficient created replacement habitats, along reinstated lengths of the Sizewell Drain and other water bodies to accommodate colonisation of invertebrate assemblages associated with wetland habitats.
- Successful establishment of Norfolk Hawker in the reinstated Sizewell Drain .
- No incidental mortality to fish during construction.

REFERENCES

- 1.1 The Habitats Directive 2017. Europa. European Commission
- 1.2 Wildlife and Countryside Act, as amended. 1981. (Online) Available at: <http://www.legislation.gov.uk/ukpga/1981/69/contents> (Accessed October 2020).
- 1.3 The Eels (England and Wales) Regulations 2009. (Online) Available at: <https://www.legislation.gov.uk/uksi/2009/3344/contents/made> (Accessed October 2020)
- 1.4 British Dragonfly Society. 2019. Norfolk Hawker. (Online) Available at: <https://british-dragonflies.org.uk/species/norfolk-hawker> (Accessed October 2020).
- 1.5 British Dragonfly Society 2010. Norfolk Biodiversity Action Plan – Norfolk Hawker. (Online) Available at: <http://www.norfolkbiodiversity.org/assets/Uploads/Norfolk-Hawker2.pdf> (Accessed October 2020).
- 1.6 Gov Guidance – Fish Health Checks (Online) Available at: <https://www.gov.uk/guidance/fish-health-checks> (Accessed October 2020).