Kintore Hydrogen Plant
Outline Biodiversity Enhancement and Management Plan

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EXECUTIVE SUMMARY

EnviroCentre Ltd were commissioned by Kintore Hydrogen Limited to produce an outline Biodiversity Enhancement Management Plan (OBEMP) to specify actions which will be undertaken in conjunction with the proposed works to at the Kintore Hydrogen Plant site. The report is required to demonstrate how the proposed development will meet National Planning Framework (NPF) 4 policies in relation to biodiversity enhancements.

The scope of the OBEMP was to identify, maintain and/or enhance ecologically valuable habitat and species important to the local area.

Ecological baseline data for the site was collected via a Preliminary Ecological Appraisal (PEA) undertaken in 2023 and further targeted surveys to inform an EcIA required as part of the EIA. The baseline studies identified statutory and non-statutory designated sites in the vicinity, notable habitats within the site boundary and evidence of protected species within the site boundary and in adjacent habitats.

Upon review of the ecological information available for the site and conservation objections outlined in local biodiversity plans, the following enhancement/compensation actions will be undertaken at the site and are detailed further in this plan;

- Creation of 27 ha of other neutral grassland at moderate condition to replace modified grassland and cropland (not proposed for permanent removal for infrastructure).
- Creation of 3.2 ha of mixed scrub to moderate condition to replace gorse scrub lost to development, on site.
- Inclusion of attenuation basin on site of moderate condition, to be planted with species rich wetland grassland (approximately 1.4 ha).
- Creation of 6 ha of lowland mixed deciduous woodland (poor-moderate condition) and 1 ha mixed woodland planting on site to replace 0.19 ha of lowland mixed deciduous woodland which is to be lost from the development.
- Replace 0.31 km of broadleaved (sycamore) treelines with 0.67 km of Scot's pine treelines within the north western area of the site and mixed treeline in the north east of the site.
- Creation of 0.36 km native hedgerows within the south east of the site.
- Enhance 6.9 ha of moderate condition other neutral grassland to good condition other neutral grassland.
- Removal of Invasive Non-Native Species (INNS) from watercourses which dissect the site.

Additional enhancements for the site in relation to species include:

- Increase the availability of foraging and roosting opportunities for bats.
- Enhance and extend habitat for red squirrel and pine marten.
- Increase the availability of foraging and commuting opportunities for badger.
- Provide hibernation, resting and breeding opportunities for hedgehogs.
- Provide opportunities for reptiles in the locale to use the site.
- Create nesting and foraging opportunities for birds.
- Create nesting, breeding and foraging habitat for a range of insect species.

It is considered that with the implementation of these enhancement features will increase commuting, foraging, breeding, resting and wintering resource fora range of species long term and provide for continued and increased biodiversity interest at the site.

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1 INTRODUCTION

1.1 Terms of Reference

EnviroCentre Ltd were commissioned by Kintore Hydrogen Limited to produce an outline Biodiversity Enhancement Management Plan (OBEMP) to specify actions which will be undertaken in conjunction with the proposed works to at the Kintore Hydrogen Plant site. The report is required to demonstrate how the proposed development will meet National Planning Framework (NPF) 4 policies in relation to biodiversity enhancements.

1.2 Scope of Report

The OBEMP sets out actions, based on the existing BNG Feasibility Assessment[1], to enhance terrestrial habitats within the site boundary. It also provides details of actions to improve the freshwater environment. It outlines future management requirements to maintain the habitats and a monitoring programme to determine if objectives are being met. The results of monitoring will determine future management actions with the plan to be reviewed following each monitoring period. The plan covers the initial 30-year period post construction.

This plan has been produced in reference to the Scottish Biodiversity List (SBL)[2], Aberdeenshire Council Local Development Plan[3] and associated supporting guidance [4], the North East Scotland Biodiversity Partnership (NESBiP)[5] and consultation with Edwin Third from the River Don Trust[6].

1.3 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

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[1] EnviroCentre Report 14331 *Kintore Hydrogen Plant Indicative Biodiversity Net Gain Feasibility Assessment* (September 2024)
[2] Scottish Biodiversity List (SBL), available at: https://www.nature.scot/doc/scottish-biodiversity-list (Accessed July 2024)
[3] Aberdeenshire Council Local Development Plan (ALDP), available at: https://www.aberdeenshire.gov.uk/planning/plans-and-policies/ldp-2023 (Accessed July 2024)
[4] Aberdeenshire Council Planning Guidance for Developers, available at: https://www.aberdeenshire.gov.uk/environment/natural-heritage/biodiversity/ PA2023-10: Guidance on securing positive effect for development (PDF 648KB) (Accessed July 2024)
[5] North East Scotland Biodiversity Partnership (NESBiP), available at: https://www.nesbiodiversity.org.uk/ (Accessed July 2024)
[6] On site discussions with Edwin Third in regard to ecological enhancement opportunities for the River Don on 8th March 2024

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2 BASELINE

2.1 Site Location and Description

The site is located south of Kintore, centred at National Grid reference: NJ 78276 14343, 91m above sea level. The site consists of a mosaic of agricultural land, grassland, scrub, trees, heathland, woodland, residential cottage, ruined building and horse steading. The site also includes parts of several watercourses including the River Don, Park Burn, Dewsford Burn, Tuach Burn and Silver Burn and a pond in the central region.

The site comprises three main areas and a series of thin corridors between and to the south of the three main areas. The site is bounded to the north by the B977, the Harthills plantation and agricultural fields, to the east by the River Don, and to the south and west by agricultural fields. The site is crossed by the B977 in the west and the A96 and the Rushlach in the east.

2.2 Project Description

The main elements of the development are the electrolysis plant, located west of Kintore 400 kV substation; a short underground electrical connection into the substation; an underground hydrogen export pipeline to a connection point on the existing high-pressure natural gas pipeline west of the A96; and underground water intake and discharge pipelines to the River Don. At the River Don, there will be intake and outfall structures on the south bank and a pumping station.

2.3 Ecology Survey Summary

Terrestrial habitats within the site include:

- Arable field margins
- Temporary grass and clover leys;
- Cereal crops;
- Lowland fens
- Purple moor-grass and rush pasture
- Lowland acid grassland
- Other neutral grassland;
- Deschampsia neutral grassland
- Holcus-juncus neutral grassland
- Modified grassland;
- Gorse scrub;
- Mixed scrub;
- Rivers (priority habitat);
- Other rivers and streams;
- Other standing water;
- Buildings;
- Built linear features;
- Wet woodland
- Lowland mixed deciduous woodland
- Other broadleaved woodland;
- Native pine woodlands
- Other coniferous woodland.

Habitat suitability for the following species:

- Bats
- Otter
- Pine marten
- Red squirrel
- Badger
- Reptiles
- Birds
- Fish
- Hedgehog
- Brown hare
- Amphibians
- Invertebrates

3 AIMS, OBJECTIVES AND MANAGEMENT PRESCRIPTIONS

It should be noted that the mitigation and management measures set out in this Outline BEMP (which implement the recommended mitigation specified in Volume 2, Chapter 8: Ecology and Biodiversity of the Environmental Impact Assessment Report (EIAR) following assessment of impacts) prevail in the case of any conflict with initial mitigation or management measures that were identified as potentially required in ecology surveys reported in Volume 3 of the EIAR.

The overall aim of the OBEMP is to deliver habitat improvements which provide positive effects for biodiversity within the proposed development area, as well as increasing habitat connectivity. The proposed timeline for delivery of objectives is 30 years. The actions to achieve the objectives are described.

Further, more specific aims and objectives are set out for the two main areas of the site below:

- Main electrolysis plant area
- Compensatory area

The following sections comprise a description of the aims, objectives and prescriptions recommended within each location.

3.1 Main Electrolysis Plant Area

Grassland

3.1.1 Aim

Create other neutral grassland (wildflower grassland) to increase floral diversity. Also to maintain connectivity for a range of species (bats, badger, hedgehog, brown hare, birds etc.) present in the locale.

3.1.2 Objectives

Grasslands fall within the NESBiP Grasslands Statement[7]. Grasslands can host a diverse range of species and provide valuable habitat for rare or threatened breeding bird species. Neutral grasslands are one of the most diverse as well as threatened habitats in the UK. Aberdeenshire Council recommends the establishment of meadows and creation of species-rich grasslands are incorporated into developments.

It is anticipated that the overall aim can be achieved through meeting the following objectives:

- Replace modified grassland and cropland (not proposed for permanent removal for infrastructure) on site through the creation of 27 ha of other neutral grassland at moderate condition.
- Ensure varied sward height throughout the grassland through management.
- Low or no cover of bracken and/ or scrub to be included within the grassland.

[7] https://www.nesbiodiversity.org.uk/wp-content/uploads/2019/10/Grasslandsv1.pdf

3.1.3 Prescriptions

The enhancement and creation of species rich other neutral grassland (moderate condition) through surface sowing of grass mixes on to bare soil, or the grassland should be scarified and over sown with a species rich grassland mix. Appropriate mixes may include Scotia Seeds MG5 Meadow Mix[8].

Most similar seed mixes will contain yellow rattle, however, if it isn't in the selected mix then it should be sown separately as it is parasitic on grasses, it helps reduce their vigour and facilitates the growth of other wildflowers. Sowing instructions of selected mixes should be followed. Sowing is likely to be best done during the autumn, especially for yellow rattle.

To encourage both species and structural diversity the below mowing regime should be implemented:

- For areas where modified grassland or crops remain, to prepare the ground, the grassland present should be heavily grazed or close mown (with cuttings removed to reduce enhanced soil fertility), between June and July to create approximately 50% bare ground. Remove livestock if there is persistent heavy rain to minimise poaching of the soil;
- When enhancing/ creating habitat of high biological value, sourcing seeds of local provenance is of importance, as it promotes 'adaptation and resilience' and provides seeds acclimatised to a particular geography. Therefore, increasing the likelihood of successful habitat establishment and long-term success. Scotia seeds are based in Angus, with crops grown from small collections made in the wild around Scotland;
- Grass mixes should be surface sown in spring or autumn (March and April and July to September), at a rate of 40g/m2 onto a freshly prepared seed bed and can be applied by machine (such as grass harrow, or grass stitcher);
    - After sowing, seeds should be rolled using a tractor mounted field roller, to facilitate seed germination;
    - The project ecologist, during ongoing monitoring of the enhanced habitat can determine whether additional overseeding of seed mix is required.
- For the meadow mix, the first cut of newly sown meadow seed should occur when annual weeds reach approximately 30cm in height and all cuttings should be removed. If a spring sow, cut after eight weeks and again after a further eight weeks. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wildflowers. Avoid cutting in the spring and early summer if the mixture has been sown in autumn sown to allow initial establishment of flowering plants. Once established (year two onwards) the meadow grassland should be strimmed twice a year, avoiding spring / early summer when plants are in flower. All strimmed material must be removed from site, though it is recommended that material is left for one week prior to removal to allow any seeds to drop, promoting regeneration of vegetation;
- Mowing should be avoided immediately after, or during, wet conditions to prevent machinery causing rutting and/or soil compaction;
- Spot spraying of herbicides using a knapsack applicator, by an approved contractor can be undertaken to manage weed establishment within grassland habitat, including broad leaved dock (*Rumex obtusifolius*), creeping thistle (*Cirsium arvense*), spear thistle (*Cirsium vulgare*) and common nettle (*Urtica dioica*);
    - Herbicide application should be undertaken between March and October, targeting young and actively growing weed species.

[8] Scotia Seeds MG5 Meadow Mix, available at: https://www.scotiaseeds.co.uk/shop/mg5-meadow-mix/ (Accessed July 2024)

Scrub

3.1.4 Aim

Create a diverse area of mixed scrub that will offer sheltered commuting and foraging opportunities for a range of species (bats, badger, hedgehog, birds etc.) present in the locale.

3.1.5 Objectives

Scrub falls within the NESBiP Woodland Statement[9]. Planting of native species which complement those in the locale. Including scrub within the site will increase species diversity, maintain landscape character, enhance biodiversity associated through provision of foraging, resting and nesting habitat and promote connectivity through enhancing wildlife corridors. Management of the scrub will be required to prevent growth into woodland.

It is anticipated that the overall aim can be achieved through meeting the following objectives:

- Creation of 3.2 ha of mixed scrub of moderate condition to replace gorse scrub lost to development.

3.1.6 Prescriptions

To achieve this, the below should be implemented:

- Areas of scrub should be planted using a mix of native species such as:
    - Blackthorn (*Prunus spinosa*)
    - Broom (*Cytisus scoparius*)
    - Elder (*Sambucus nigra*)
    - Gorse (*Ulex europaeus*)
    - Hawthorn (*Crataegus monogyna*)
    - Hazel (*Corylus avellana*)
    - Juniper (*Juniperus communis*)
- Planting is best done between October and April;
- Pre-planting soil preparation should aim to:
    - Loosen the soil to a depth equivalent to the height of the rootball and over a wide area to eliminate compaction and improve drainage;
    - Where needed, incorporation of organic matter, to improve soil structure on heavy or sandy soils;
    - Although not beneficial to apply fertiliser at planting time, on poor soils sprinkling an inoculant of mycorrhizal fungi over and in contact with the roots, may help shrubs establish.
- When planting scrub the following should be undertaken:
    - Adhere to any guidance from scrub supplier in regard to preparation of individuals prior to installing into ground;
    - Dig a planting hole that is no deeper than the roots, but is at least (ideally) three times the diameter of the root system;
    - Break soil up with a fork before planting where the sides of the planting hole are compacted;

[9] https://www.nesbiodiversity.org.uk/wp-content/uploads/2019/10/Woodlandsv1-1.pdf

    - Place the shrubs in the planting hole and position so that the first flare of roots are level with the soil surface when planting is complete. Deep planting prevents essential air movement to the root system and makes the lower trunk vulnerable to disease – leading to poor establishment;
    - Refill the planting hole carefully, placing soil between and around all the roots to eliminate air pockets and firm the soil gently to avoid compaction in a hard mass and water;
    - Where required, shrubs can be protected from deer and rabbits where necessary using guards.
- General aftercare should be provided to planted shrubs through watering, feeding, pruning and removal of guards, where necessary;
- Management of scrub once established (scrub generally takes about 15 years to reach maturity) should involve rotational management so there is a mix of young and mature scrub, as this ensures greater structural diversity and more of an appeal to a wider variety of species. Low intensity management at regular intervals is generally better and easier than major work every few years. Also ensure there are patches of tall and short vegetation in and around scrub to provide ecotones for species, such as reptiles;
- Various techniques (or combinations of techniques) can be used to control scrub such as:
    - Cutting with brush cutters, chainsaws and hand tools;
    - Cutting by mowing or flailing.
- Time works of scrub cutting to minimise impacts on wildlife (avoid nesting bird season (May-August)), ideally where possible undertaking works between November and February (although pre checks for hibernating hedgehog and reptiles should be undertaken).

Attenuation Basins

3.1.7 Aim

Create enhanced attenuation basin habitat on site and increase resources for wildlife.

3.1.8 Objectives

Ponds are identified as a Scottish Biodiversity List (SBL) priority habitat and standing open water (ponds and lakes) are considered within the NESBiP Freshwater Habitats Statement[10] which states that '*Sustainable Urban Drainage Schemes (SuDS) are required as part of all new developments which provides opportunities for the creation of ponds, basins and wetlands within larger developments. Opportunities should be taken to maximise the biodiversity value of these'*.

It is anticipated that the overall aim can be achieved by:

- Creation of 1.4 ha attenuation basin on site of moderate condition, to be planted with species rich wetland grassland.

3.1.9 Prescriptions

The attenuation basins incorporated into the design will be enhanced to provide greater species richness and in turn provide habitat for invertebrates, aquatic mammals, birds and amphibians in the locale. The design should include:

[10] https://www.nesbiodiversity.org.uk/wp-content/uploads/2019/10/FreshwaterHabitatsv1.pdf

- Permanent water should, where practicable (taking into account that levels may be below this during dryer spells), be minimum 300mm in depth and (also where practicable) gently sloping, vegetated sides.
- Vegetated banks surrounding the attenuation basins should be planted with native, species such as those within Scotia Seeds Wet Meadow Mix [11] which include species such as:
    - Sneezewort (*Achillea ptarmica*)
    - Common knapweed (*Centaurea nigra*)
    - Marsh thistle (*Cirsium palustre*)
    - Meadowsweet (*Filipendula ulmaria*)
    - Meadow cranesbill (*Geranium pratense*)
    - Water Avens (*Geum rivale*)
    - Square-stemmed St John's wort (*Hypericum tetrapterum*)
    - Cat's ear (*Hypochaeris radicata*)
    - Yellow flag iris (*Iris pseudacorus*)
    - Yellow rattle (*Rhinanthus minor*)
    - Oval sedge (*Carex ovalis*)
    - Chewing's fescue (*Festuca rubra commutata*)
    - Smooth-stalked meadow grass (*Poa pratensis*)
- Sow on low nutrient soils in March to June or mid-August to September to avoid the wildflower seedlings being outcompeted by fast growing weeds;
- Once planted you can leave the plants to mature and develop with little management except for occasional weed control as necessary.

Woodland

3.1.10 Aim

Creation/ replacement of woodland to create ecologically rich and diverse communities which support a range of wildlife, as well as helping to mitigate climate change through carbon sequestration.

3.1.11 Objectives

Lowland mixed deciduous woodland is a SBL priority habitat and features within the NESBiP Woodland Statement[12]. Mixed woodland features within the Wood Pasture and Parkland category in the Woodland Statement. The creation of native woodland as habitat for wildlife as well as landscape-scale connectivity, placing a particular focus on habitat quality and increase the native tree-canopy cover by establishing new woodland habitat within the site/ landscape which will increase the functional connectivity, as well as providing habitat mosaics with a variety of niches and resources to support a range of species of woodlands.

In the BNG feasibility study is it has been considered feasible to obtain poor condition for woodland creation, however with the inclusion of appropriate management, it is considered feasible to achieve woodland at moderate condition over a 30-year period.

It is anticipated that the overall aim can be achieved by:

- Creation of 6 ha of lowland mixed deciduous woodland (poor-moderate condition) and 1 ha mixed woodland planting on site to replace 0.19 ha of lowland mixed deciduous woodland which is to be lost from the development.

[11] https://www.scotiaseeds.co.uk/shop/wet-meadow-mix/
[12] https://www.nesbiodiversity.org.uk/wp-content/uploads/2019/10/Woodlandsv1-1.pdf

- Planting of a mix of species (five or more native tree or shrub species) that lowland mixed deciduous woodland is considered to be comprised of.
- Planting of a mix that mixed woodland is considered to be comprised of in accordance with local landscape.
- Avoidance of non-native species planting/ introductions.
- Planting/ translocating of appropriate ground layer species to the locale.
- Management of woodland through selected felling to allow creation of deadwood and presence of open areas.
- Presence of three age-classes and three storeys across the woodland.
- Protecting the woodland from browsing pressure.

3.1.12 Prescriptions

The creation of woodland increases biodiversity value to sites and by planting along boundaries and within the site will ensure new links to surrounding habitat are created, which will provide increased habitat connectivity for a range of species in the locale including red squirrel, pine marten, badger, birds, hedgehog, invertebrates and brown hare. To achieve this, the below should be implemented:

Trees:

- Based on the composition of lowland mixed deciduous woodlands in the locale, the following species are recommended: oak (*Quercus sp.*), birch (*Betula sp.*), elm (*Ulmus sp.*), rowan (*Sorbus aucuparia*), alder (*Alnus sp.*), beech (*Fagus sylvatica*) and field maple (*Acer campestre*) also occurring. Therefore, a mix of these species should be planted;
- Based on the composition of mixed woodland in the north east, the following species are recommended: elm, alder, oak, birch, Scot's Pine (*Pinus sylvestris*) and yew (*Taxus baccata*);
- Trees can be planted at any density and spatial configuration from three or more trees per square metre through to widely spaced individual trees. Densities of between 1,600 and 2,500 stems/ha (or higher) are designed to aid early canopy closure, which is appropriate for the establishment of groves, where regular management is anticipated to promote the development of structural complexity, and as areas where limited intervention can enable competitive exclusion – promoting decaying wood development and other processes;
- Phasing the initiation of trees on the site over 10 years, provides time and space for further natural colonisation. This may also allow other habitats and species to emerge as the vegetation changes. Decisions on further planting can be made later in the establishment phase, based on observations of site development;
- The pre-planting and planting steps as well as aftercare within section 3.1.6 should be followed for tree planting;
- All young trees are susceptible to browsing pressure and damage from vole, rabbit, squirrel and deer. Therefore, tree shelters, tree tubes and/or fencing is likely to be required to protect trees from browsing pressure and ensure successful initiation.
- On-going management should be undertaken through selected felling to allow for open areas and other species to grow, as well as for allowing the presence of deadwood.

Ground Flora:

In addition, including planting of ground flora is a vital part of woodland establishment and translocating plant species that are missing from the site and unlikely to arrive by natural colonisation, which are common are recommended.

- Translocations of plants can be done at any time, however establishing woodland plants by seeding at the time of planting is a more useful option in sites on highly modified agricultural soils and where persistent competitive 'weedy' ground cover is likely to develop. This can be

done using the relatively cheap through collecting seeds and plant fragments from local sites, obtaining seeds through local growers or obtaining seeds or plants directly from seed suppliers and wildflower nurseries, or by more intensive but expensive methods such as soil inversion and complete re-seeding;

- In order to determine which plants would be most suited to the woodland, soil conditions or surveys of similar woodland within the site should be considered. Species should be those which are:
    - Common and familiar;
    - Locally native;
    - Characteristic of the main types of broadleaved woodland i.e. oak-birch, ash and alder woodland;
    - Known to have limited dispersal capabilities;
    - Quick to establish and grow robustly and are therefore able to overcome competition from other plants.
- It is important to have a mix of plants that are considered to be woodland specialists, woodland edge species and plants that thrive in woodland, woodland-edge and open ground;
- Consideration of competing 'weeds' throughout the woodland during the initial stages (and where needed into the mature stages) and management is necessary, involving cultivation and possibly herbicide treatment. Depending on the weed species present, different management options would likely be available;
- The methods used to establish woodland plants is dependent upon the species of plants, risks and control of outcomes (likelihood of establishment), woodland floor conditions, budget and scale of operation and can be done through:
    - Sowing seeds in woodland;
    - Planting 'plant fragments';
    - Planting of potted plants.

Sowing densities can be undertaken in the following ways:

    - Sowing approximately 10% of the woodland area with a mixture of species at a low sowing rate (say 0.3 g / m^2);
    - Sowing a smaller proportion of the area with a mixture of species at a high sowing rate (say 1 – 3 g / m^2);
    - Plant patches of plants clustered in groups across the site;
    - Seeds can be sown via hand, hay crops, planted from pots or fragments.
- Planting of both seeds and plants is best carried out in early spring, i.e. March and April. Spring sowing avoids predation over the winter and means that young plants can establish roots and benefit from the entire growing season. Potted plants can be successfully established at any time during the growing season, provided dry periods are avoided. It is risky to plant in May because of the likelihood of dry weather. Costs are reduced if seed and plants are planted out at the same time in one operation. Bulbs and rhizomes can be planted at any time between June and October, but ideally before mid-September;
- It is important to keep records of plant translocations. This serves three purposes, i.e. to:
    - inform people which species were planted, to enable them to better understand the ecological developments in the wood;
    - document the outcomes of different establishment treatments;
    - understand the future distributions of plants.
- Ensuring plant health and biosecurity are essential, with there being two main routes for the introduction of new pests and pathogens, through: contaminated plants and soils; and contaminated tools, vehicles and equipment. Considerations to minimise the risk of introducing new pests and pathogens to the woodland are essential.

Treelines and Hedgerows

3.1.13 Aim

Creation/ replacement of treelines and hedgerows to enhance biodiversity and ecologically connectivity throughout the site to support a range of wildlife.

3.1.14 Objectives

Treelines offer connectivity between woodland blocks within the site, which offers greater opportunities for a range of species. As part of the NESBiP Woodlands Statement opportunities for woodland habitats, it is recommended that habitat connectivity should be increased by joining existing woodland blocks using appropriate planting.

All hedgerows consisting predominantly of at least one woody UK native species (i.e. 80% or more cover) are considered a SBL priority habitat[13] and hedgerows are considered within the NESBiP Woodland statement. Native hedgerows are known to be highly valuable features for biodiversity, especially in agricultural landscapes. Mature hedgerows are not as common a landscape feature in North East Scotland as other regions in the UK. Hedgerows provide many species with food, shelter and a safe means of dispersal.

It is anticipated that the overall aim can be achieved through meeting the following objectives:

- Replace 0.31 km of broadleaved (sycamore) treelines with 0.67 km of Scot's pine treelines within the western area of the site and mixed treeline in the north east of the site.
- Creation of 0.36 km native hedgerows within the south east of the site.

3.1.15 Prescriptions

To achieve this, the below should be implemented:

Treelines:

- Tree species should comprise: Scot's pine, oak, birch, elm, rowan, alder, beech and field maple;
- Tree planting is usually carried out between October and March;
- The ground should be prepared by any compacted ground being opened up or areas with long grass and weeds being strimmed down to make the area accessible;
- Trees should be planted approximately 2 m apart (but can be between 1-5 m);
- Pit planting is considered to be the best option for tree planting as it is more thorough and ensures trees have better contact with the soil (and is suitable for all ground condition types), however silt planting (suitable for bare soil or grass – easier for planting on stony soil) or T-notch planting (only for grass covered ground and not bare soil) are other options;
- Tree guards and/ or fencing should be installed to help avoid grazing pressures;
- Keeping a 1m diameter around the tree clear from weeds and grass for the first 2-3 years will reduce competition for moisture and nutrients. This can be achieved through inclusion of mulch (bark chips or straw bales) applied to a depth of approximately 10 cm and topped up annually. Ideally chemical suppressants should be avoided;

[13] https://data.jncc.gov.uk/data/ca179c55-3e9d-4e95-abd9-4edb2347c3b6/UKBAP-BAPHabitats-17-Hedgerows.pdf

- Avoid watering unless a particularly dry spell is encountered and avoid grass cutting near trees;
- Ensure any grass growing inside the guards are removed to avoid competition;
- Guards should be removed as soon as they split (usually after 5-10 years) and should be disposed of appropriately;
- Although not essential, pruning can be undertaken where encouragement of trees to grow upwards rather than outwards is required. Trees are best pruned in winter when dormant.

Hedgerows:

- The ground should be prepared so that the soil becomes friable (has a crumbly texture) and is free of other growth;
- Hedgerows should incorporate a minimum of five native species such as hawthorn, blackthorn, oak, rowan or hazel – other native species can be used intermixed randomly rather than blocks;
- A thick and bushy hedge is best created by planting a double row of shrubs at a spacing of 20—30cm (approximately six plants for every metre).
- 60—90cm high 'whips' have a better survival rate and will grow more quickly than larger shrubs;
- Care should be taken of the roots before planting by keeping them covered at all times, especially when it is sunny or windy, to avoid damage;
- The best time to plant hedges is November—March, during the period where shrubs are dormant (between losing leaves and producing buds). Avoiding planting in very cold or windy weather to reduce risks of damage to the roost;
- The hedgerow plants may need to be fenced off to protect from grazing. Fences should be kept at a minimum distance of 1.5 m in width to allow hedgerows to grow to full potential without being constrained by fencing;
- Controlling competitive weeds (such as brambles (*Rubus fruticosus*), nettles (*Urtica dioica*) and grasses) during the first growing season will be required as these weeds can reduce the growth rate of the new plants by competing for soil moisture, nutrients and light. Controlling of weeds should be done by hand rather than using a strimmer or herbicides as these can damage the hedgerow plants. A mulch of chopped bark placed along the length of the hedgerow is an additional option which will prevent weeds from growing up in the first place and help to reduce moisture loss;
- Where shrubs have not been successful, these gaps should be replaced with new shrubs in the autumn or winter;
- The shrubs should be cut down to 45-60cm above the ground in the first spring in order to encourage shrubs to bush out in order to create a thick hedge;
- Once the hedgerow has reached a good height, an undisturbed margin can be left adjacent to the hedgerow (approximately at least 2m wide). This margin can be enhanced through seeding with a mixture of native grass and wildflower seeds such as Scotia Seeds Hedgerow Meadow Mix (SCM4)[14];
- For hedgerow maintenance once established, hedges should be cut in winter, ideally in early February, avoiding March-September as birds are nesting. Where possible delaying maintenance until late autumn to allow wildlife to make use of fruiting shrubs. In addition, as fruit is usually borne on last year's growth it is better to cut hedges every other year or alternatively, cut one side one year and the other side the next;
- The margins can either have an annual cut in August, after the flowers have seeded, or be cut bi-annually in rotation. This ensures some over-wintering vegetation is always provided. The cuttings should be removed.

[14] https://www.scotiaseeds.co.uk/shop/hedgerow-mix/ https://www.scotiaseeds.co.uk/shop/hedgerow-mix/

3.2 Compensatory and Enhancement Area

Grassland

3.2.1 Aim

Enhance other neutral grassland (wildflower grassland) from moderate to good condition to increase floral diversity. Also to enhance habitats for a range of species (bats, badger, hedgehog, brown hare, birds etc.) present in the locale.

3.2.2 Objectives

Grasslands fall within the NESBiP Grasslands Statement[15]. Grasslands can host a diverse range of species and provide valuable habitat for rare or threatened breeding bird species. Neutral grasslands are one of the most diverse as well as threatened habitats in the UK. Aberdeenshire Council recommends the establishment of meadows and creation of species-rich grasslands are incorporated into developments.

It is anticipated that the overall aim can be achieved through meeting the following objectives:

- Enhance 6.9 ha of moderate condition other neutral grassland to good condition other neutral grassland.
- Varied sward height throughout the grassland through management.
- Low or no cover of bracken and/ or scrub to be included within the grassland.
- Increase the number of species present to at least 10 per m^2 within the other neutral grassland, where possible.

3.2.3 Prescriptions

To enhance the moderate condition other neutral grassland to good condition, management should be the main focus initially:

- An appropriate grazing regime for species-rich neutral grassland would involve an annual cattle stocking density to 0.6-0.8 LU/ha[16] between June and February. A late entry for livestock grazing allows for flowering within the sward;
- Overwintering by sheep can be used to manage any weed establishment, due to the nature in which sheep graze, close to the ground and finding weed species palatable (creeping thistle, common nettle, broadleaved dock). Due to their weight and hoof size, sheep are also unlikely to poach the meadow habitat over winter;
- Spot spraying of herbicides using a knapsack applicator, by an approved contractor can be undertaken to manage weed establishment within grassland habitat, including broad leaved dock, creeping thistle, spear thistle and common nettle. Consideration of proximity to the River Don should also be a consideration before undertaking and any appropriate precautions undertaken to avoid chemicals entering the water system;
    - Herbicide application should be undertaken between March and October, targeting young and actively growing weed species;

[15] https://www.nesbiodiversity.org.uk/wp-content/uploads/2019/10/Grasslandsv1.pdf

[16] LU/ha refers to Livestock Units (LU) per hectare. Cattle have an LU of 0.6-1 depending on age. Ewe (inc. lambs) have an LU of 0.15.

- Livestock must be removed prior to spraying, for a period of 7 days post spray application.

Where management alone does not improve sward composition, the following enhancement measures can also be undertaken:

- To prepare the grassland, it should be heavily grazed or close mown (with cuttings removed to reduce enhanced soil fertility), between June and July to create approximately 50% bare ground. Remove livestock if there is persistent heavy rain to minimise poaching of the soil;
- Oversowing of yellow rattle for its semi-parasitic qualities, to reduce vigour and biomass of grasses and legumes. This allows for native wildflowers to establish, as grass species are less able to dominate;
- The use of wildflower rich 'green hay' harvested near the site can also be incorporated where deemed appropriate;
  - Green hay can be distributed across the site using a dung spreader. Hay should be spread thinly and evenly across the site;
  - After spreading hay should be rolled using a tractor mounted field roller, to facilitate seed germination.
- To support/compliment the use of green hay, species-rich grassland mixes such as neutral grassland mix MG5 Meadow Mix[17] can be sown. Seeds can be sown between March and April and July to September, using a direct seeding equipment, such as grass harrow, or grass stitcher;
  - After sowing, seeds should be rolled using a tractor mounted field roller, to facilitate seed germination.
- Supplementary 'plug plants' can be used to enhance grassland. Suggested species include;
  - Bugle (*Ajuga reptans*)
  - Harebell (*Campanula rotundifolia*)
  - Cuckoo flower (*Cardamine pratensis*)
  - Meadow cranesbill
  - Wood cranesbill (*Geranium sylvaticum*)

Trees

3.2.4 Aim

Planting of trees to offer benefits to fish through increasing shading of watercourses as well as offering connectivity for other species.

3.2.5 Objectives

Water temperature has a fundamental influence on the health of fish populations, especially for species such as Atlantic salmon (*Salmo salar*). As a result of climate change it is anticipated that river temperatures will rise resulting in potential negative consequences for fish and invertebrate populations. Loss or lack of tree cover and other vegetation in the riparian zone can contribute to increases in water temperature, through a lack of shading, however, over-shading can impact on fish production. Therefore, dappled shade is the preference along watercourses and to achieve this, the following should be undertaken:

[17] https://www.scotiaseeds.co.uk/shop/mg5-meadow-mix/

- Sensitive planting of individual native trees along a section of the northern bank of the River Don to increase shading.

3.2.6 Prescriptions

To achieve this, the below should be implemented:

- Planting trees along a section of the northern bank of the River Don could offer increased shade which is considered beneficial for fish species by helping to maintain water temperatures, as well as increasing riparian connectivity which would benefit a range of species. Tree species recommended are those which are more tolerant to water, including (but not limited to) alder, birch and willow (*Salix sp.*). Trees should be planted following steps 3.1.15, at variable spacing with areas of open ground between, to allow for ground flora to develop.

3.3 Throughout the Site

Watercourses

3.3.1 Aim

To enhance existing watercourses within and adjacent to the site.

3.3.2 Objectives

Watercourses fall within the NESBiP Freshwater Habitats Statement[18]. Watercourses within the site comprise Annex I River Don habitat and multiple other watercourses which are considered priority habitats. Rivers and burns support a wide range of habitats and species and form important wildlife corridors. Continuity of bankside habitat and enhancement of riparian habitat as well as control of invasive non-native species are recommendations by Aberdeenshire Council.

It is anticipated that the overall aim can be achieved through meeting the following objective:

- Removal of Invasive Non-Native Species (INNS) from watercourses which dissect the site.

3.3.3 Prescriptions

To achieve this, the below should be implemented:

- Six of the watercourses contain INNS and therefore removal will aid in the enhancement and improve condition of these features;
- An INNS management plan should be devised which will determine the appropriate needs for each watercourse, how the removal of the INNS will be achieved and the appropriate monitoring that should be implemented within the site.

[18] https://www.nesbiodiversity.org.uk/wp-content/uploads/2019/10/FreshwaterHabitatsv1.pdf

Bats

3.3.4 Aim

Increase the availability of foraging and roosting opportunities for bats.

3.3.5 Objectives

Bats are a national (SBL) and international (European Protected Species) priority species due to historic population declines and persecution. Six species of bats are listed as priority species by NESBiP. Natural roosting spaces for bats in woodland has become increasingly sparse as a result of felling mature trees to facilitate agriculture, commercial and residential developments, and via planting of commercial conifer plantations. Trees with PRFs which have/ in future will likely have suitability for bats will be lost as part of the development and bat species have been recorded throughout the site, with the wetland area in the north (to be retained) being considered a core sustenance zone. Limited recordings of bats were returned within the southern area of the main electrolysis plant likely due to a lack of habitat connectivity of linear features, thus creation of these would enhance the landscape for foraging and commuting bats.

Bat boxes, when placed in the right environment, have been shown to have good uptake and can provide roosting resources in an area which is otherwise lacking.

3.3.6 Prescriptions

- Planting of woodland and treelines along boundaries to provide connectivity throughout the site and provide links to existing woodland and scrub;
- Install 10 bat boxes on retained mature trees within the site boundary. The boxes should be installed at a minimum 4m height, unobstructed by branches and south facing where possible; Hardwearing woodcrete boxes are recommended such as Convex Bat Box (wildcare.co.uk). Other boxes which can be installed include: Schwegler 1FD bat box[19], Large Multi Chamber WoodStone Bat Box[20], and Greenwoods Ecohabitats boxes[21]. Boxes should be checked annually for maintenance/ replacement;
- Planted trees and shrub species identified in the landscape plan produce nectar such as blackthorn and hawthorn and therefore attract insects and thus increase food availability to bats in the locale;
- External lighting should avoid adjacent areas of green and blue habitats. Long wavelength LED no more than 2700k is best to avoid disturbance to bats and other nocturnal wildlife.

Red Squirrel and Pine Marten

3.3.7 Aim

Enhance and extend habitat for red squirrel and pine marten.

[19] https://www.nhbs.com/1fd-schwegler-bat-box
[20] https://www.nhbs.com/large-multi-chamber-woodstone-bat-box
[21] https://www.greenwoodsecohabitats.co.uk/shop

3.3.8 Objectives

Red squirrel (*Sciurus vulgaris*) and pine marten (*Martes martes*) are a SBL and NESBiP Priority Species. Both species are key charismatic and recognisable species associated with Scottish woodland and forestry and rely on good habitat connectivity and a variety of foraging resource throughout the year. Evidence of both species has been identified associated the site and surrounding habitats.

3.3.9 Prescriptions

- A mix of native seed, nut and fruit producing species is required to provide a foraging resource year-round.
- The inclusion of Scot's pine trees treeline along the north west boundary connecting coniferous woodland blocks with native pinewoods, to improve connectivity within the site, by providing links to existing woodland and scrub habitat;
- Log piles will be created from cleared woody vegetation in landscaped/ woodland and located in open areas to encourage invertebrates and fungi which are important seasonal food sources for red squirrel and pine marten.

Badger

3.3.10 Aim

Increase the availability of foraging and commuting opportunities for badger.

3.3.11 Objectives

Badgers and their setts are protected under the Protection for Badgers Act 1992 (as amended) and are known as Britain's largest carnivore. Badgers mainly feed on earthworms but will also forage for nuts, seeds, fruit, small mammals (mice, rats, rabbits, frogs, toads, hedgehogs and birds' eggs).

3.3.12 Prescriptions

- External lighting should be positioned so to not illuminate adjacent or newly created green space that badgers may use to commute or forage at night;
- Landscaping incorporates a mix of native berry, seed and nut producing species to offer a foraging resource for badger present in the locale;
- Future greenspace management should avoid use of pesticides, insecticides and slug pellets which are toxic to badger/ their prey;
- Maintain a slow site speed limit (max 15 mph) and install speed bumps on access roads (where possible) to avoid vehicle collisions with badger.

Hedgehogs

3.3.13 Aim

Provide hibernation, resting and breeding opportunities for hedgehogs.

3.3.14 Objectives

Hedgehogs are protected under the Wildlife and Countryside Act 1981 (Schedule 6) and rely on diverse environments, such as those provided by gardens and hedgerows, for shelter and food. The hedgehogs' diet mainly consists of invertebrates such as insects, worms and beetles which are used to build up fat reserves before hibernating in late autumn to early spring.

3.3.15 Prescriptions

- Provision of artificial hedgehog nests within woodland and/or scrub in and adjacent to site boundaries to provide additional hibernation, resting and breeding opportunities.
- Retain areas of unkempt leaf litter, dead wood and scrub to provide shelter for hedgehogs.
- Minimise areas of hard standing grass in favour of species-rich wildflower grassland to encourage invertebrate food for hedgehogs.
- Water features and ditches should always have a sloped exit for hedgehogs to escape.

Reptiles

3.3.16 Aim

Provide opportunities for reptiles in the locale to use the site.

3.3.17 Objectives

Reptiles form a valuable part of Scotland's biodiversity and form an important role in effective ecosystem functioning and provide an indication of the health of our environment. Scotland supports three established native reptile species all identified as priority species in the SBL: adder (*Vipera berus*), common lizard (*Zootoca vivipara*) and slow-worm (*Anguis fragilis*). Reptiles are under threat from habitat loss and degradation, pollution, the spread of disease, as well as the impacts of climate change. A 'good' population of common lizard was recorded in the north of the site, with some of this habitat to be removed to facilitate the development.

3.3.18 Prescriptions

- The creation of ecotones via the other neutral grassland, scrub and woodland and attenuation basin features provide commuting and foraging opportunities for reptiles;
- Wood or stones acquired as a result of the proposed development works should be retained and recreated into hibernaculum to provide hibernating/ over-wintering opportunities for reptiles in the locale.

Birds

3.3.19 Aim

Create nesting and foraging opportunities for birds as well as replacement of foraging habitat.

3.3.20 Objectives

A range of bird species have been recorded utilising the site for a range of activities (loafing, foraging, resting and nesting). The site and surrounds also offer suitable habitat for a range of SBL/NESBiP priority bird species associated within the region. In addition, a Barn Owl (*Tyto alba*) is present within the site. Barn Owl are a Schedule 1 and 9 species, meaning it's illegal to intentionally or recklessly disturb them. In addition, Geese have been recorded utilising modified grassland and cropland habitat on and adjacent to the site. Therefore, provisioning bird species with opportunities for nesting and foraging are considered important.

3.3.21 Prescriptions

- Sensitive clearance of modified grassland and cropland habitats during the winter foraging season for geese and reinstatement of grassland and cropland habitats within areas of temporary works to provision species of geese with continued foraging opportunities;
- Planting and retaining woodlands on site, using are range of native species, as the landscape plan suggests, will provide a long-term diverse habitat for a range of bird species;
- Planting of treelines and hedgerows will also allow for good connective habitat for foraging and nesting bird species;
- The creation of grassland areas within the site will offer provisions for Barn Owl, through greater foraging opportunities;
- Retention of any standing deadwood will provide roosting resource for woodland specialists such as the Great Spotted Woodpecker (*Dendrocopos major*) which are known to be in the locale. Deadwood will also encourage a variety of invertebrate assemblages that will provide a food source for a range of birds;
- Any shrubs and vegetated margins should be cut on a rotational basis, every three years, to ensure a continuous food source and shelter for birds;
- A selection of bird boxes should be installed on mature retained trees within the site at a height of 3-4m from ground level, on sheltered aspects. Boxes should be checked annually for maintenance/ replacement. Recommended boxes include:
    - 10x mixed hole size small bird boxes: Eco Small Bird Box | The Nestbox Company
    - 5x Robin boxes: Eco Robin Nest Box | The Nestbox Company
    - 5x Large bird nest boxes: Large Bird Nest Box | The Nestbox Company
    - 4 Barn Owl boxes: Barn Owl Nest Box | the Nestbox Company

Invertebrates

3.3.22 Aim

Create nesting, breeding and foraging habitat for a range of insect species.

3.3.23 Objectives

Invertebrates are biodiversity indicators and essential building blocks for other species. A range of invertebrate species were identified within the site, therefore enhancing and creating the site to offer nesting, breeding and foraging opportunities for a range of invertebrates is essential.

3.3.24 Prescriptions

- Inclusion of insect shelters throughout the site, which could take the form of rock piles, deadwood piles and/or ‘bug hotels’ which contain a range of features for sheltering and nesting insects. There are a variety of bug hotel designs, these could be freestanding or mounted on small posts within the enhanced grassland;
- Planting of a mix of flowering plants such as bluebell (*Hyacinthoides non-scripta*), bugle, foxglove (*Digitalis purpurea)*, and primrose (*Primula vulgaris*), will provide opportunities for hoverflies, bees, wasps and other flies. Night-scented flowers, such as jasmine (*Jasminum officinale*) and honeysuckle (*Lonicera periclymenum*) will also provide opportunities for moths.

4 MONITORING

Monitoring is required to determine the success of mitigation and enhancement measures and provide data on which to base adaptive management when objectives are not being achieved. It is anticipated that the following monitoring will be required during and/or post-construction, as outlined in Table 4-1 below. If monitoring results indicate that habitats were not establishing as expected or achieving desired outcomes, then management will need revised.

Table 4-1: Summary of the Monitoring Methods per Habitat Type

Habitat Type	Monitoring assessment criteria	Timing of monitoring activities
Other neutral grassland	To achieve moderate condition grassland, three or four of the following would need to be achieved: • The grassland represents a good example of its habitat type with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type. • Sward height is varied (at least 20% of the sward is less than 7cm and at least 20% is more than 7cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed. • Cover of bare ground is between 1% and 5%. • Cover of bracken (*Pteridium aquilinum*) is less than 20% and cover of scrub (including bramble) is less than 5%. • Combined cover of species indicative of suboptimal condition and physical damage (excessive poaching, damage from machinery use or storage etc.) accounts for less than 5% of total area. To achieve high condition grassland, all of the above need to be achieved plus the following: • 10 or more vascular plant species per m^2 present, including forbs that are characteristic of the habitat type.	Electrolysis plant grassland: • Establishment phase: Years 1, 2 and 3. • 4-10+ years to monitor for any required management via re-seeding required. Compensatory and enhancement area grassland: • 0-5 years to monitor for success in establishment and re-seed any failed areas. • 5-10 years to monitor for inclusion of any enhancements. • 10+ years to monitor for any further future management via re-seeding required.

Habitat Type	Monitoring assessment criteria	Timing of monitoring activities

Scrub	To achieve moderate condition mixed scrub the following would need to be achieved:
	• The scrub represents a good example of its habitat type – the appearance and composition of the vegetation closely match UKHab description:
	  ○ At least three native At least 80% of scrub is native
	  ○ There are at least three native species.
	  ○ No single species comprises more than 75% of the cover.
	• Seedlings, saplings, young shrubs and mature shrubs are all present.
	• There is an absence of non-native invasive species and species indicative of suboptimal condition make up less than 5% ground cover.
	• Scrub has well-developed edge with scattered scrub and tall grassland and/ or forbs present between scrub and adjacent habitat.
		• 0-15 years to monitor success of establishment.
		• 15+ years to monitor for any additional required management via replacement planting.

Pond (attenuation basin)	To achieve a moderate condition attenuation basin the following would need to be achieved: • The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. • There is semi-natural habitat (moderate distinctiveness or above) completely surrounding the pond, for at least 10m from the pond edge for its entire perimeter. • Less than 10% of the surface water is covered with duckweed (*Lemna spp.*) or filamentous algae. • There is an absence of non-native plant and animal species. • The pond is not artificially stocked with fish.	• 0-5 years to monitor success of establishment. • 5+ years to monitor for any additional required management via re-seeding.

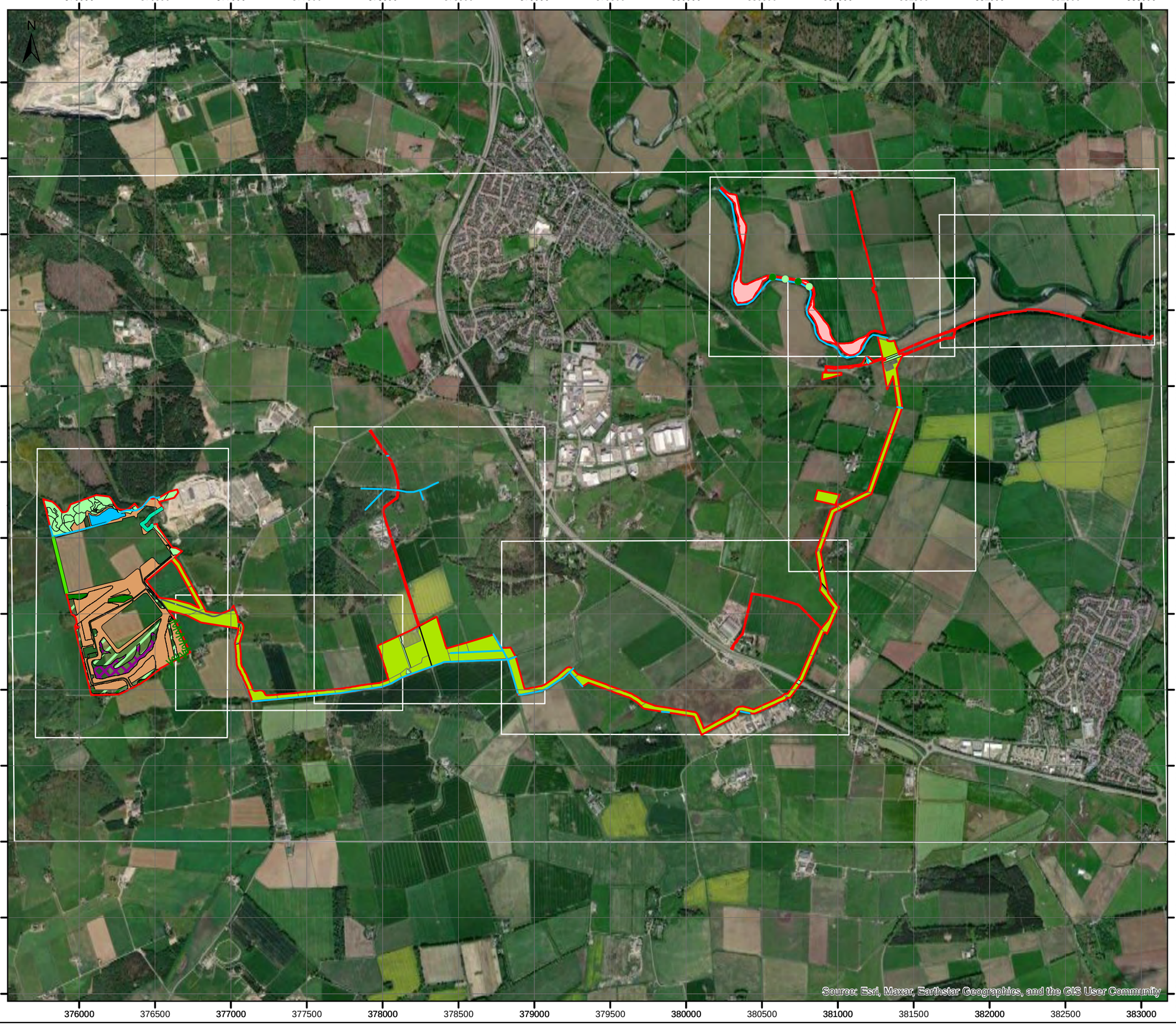
Habitat Type	Monitoring assessment criteria	Timing of monitoring activities
	• The pond surface is no more than 50% shaded by adjacent trees and scrub.	
Hedgerows	To achieve moderate condition hedgerows the following would need to be achieved: • Hedgerow should be >1.5m in height (on average) along length. • Hedgerow should be >1.5m in width (on average) along length. • Gaps between ground and base of canopy <0.5m for 90% of hedgerow length. • Gaps make up <10% of total length and no canopy gaps >5m. • >1m width of undisturbed ground with perennial herbaceous vegetation >90% of length (present on at least one side). • Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground. • >90% of the hedgerow and undisturbed ground is free of invasive non-native species and recently introduced species. • >90% of the hedgerow or undisturbed ground is free from damage caused by human activities. • At least 95% of hedgerow trees are in healthy condition. There is little or no evidence of adverse impact on tree health by damage from livestock or wild animals, pests of disease, or human activity.	• Establishment phase: 0-10 years • Shrubs should be cut down to 45-60cm above the ground in the first spring (year 1) • Margins either have an annual cut in August, or be cut bi-annually in rotation • 10+ years to monitor for any additional required management vie re-planting of hedgerows or re-seeding of margins.
Treelines	To achieve moderate condition treelines the following would need to be achieved: • At least 70% of the trees are native species. • Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5m wide.	• Establishment phase: 0-10 years • Guards removed as soon as they split (usually after 5-10 years) • 10+ years to monitor for any additional required management via re-planting.

Habitat Type	Monitoring assessment criteria	Timing of monitoring activities
	• At least 95% of the trees are in a healthy condition. There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	
Woodland (lowland mixed deciduous and mixed woodland)	To achieve moderate condition woodland the following would need to be achieved: • Three age-classes present. • Evidence of significant browsing pressure is present in less than 40% of the woodland. • No invasive species present in woodland. • Five or more native tree or shrub species across the woodland. • >80% of canopy trees and understory shrubs are native. • 0-10% of woodland will have areas of temporary open space. • All three age-classes present in woodland. • Tree mortality 10% or less and no pests or diseases and no crown dieback. • Three or more storeys across woodland or complex woodland structure. • Between 25% and 50% of woodland having deadwood • No nutrient enrichment or damaged ground evident If all these conditions are not met, a poor score would be achieved.	• 0-30 years for establishment and on-going management via felling, re-planting and/ or re-seeding
Trees	To enhance watercourse and provide shading for fish, tree planting along banks should be implemented.	• Establishment phase: 0-10 years • Guards removed as soon as they split (usually after 5-10 years) • 10+ years to monitor for any additional required management via re-planting.

Habitat Type	Monitoring assessment criteria	Timing of monitoring activities
Watercourses	To enhance watercourses, invasive non-native species should be removed following a management plan.	• 0-30 years to establish removal of invasive non-native species and devise on-going management.
Bats	Inspections by licensed ecologists or activity surveys of installed bat boxes to determine uptake and use of bat boxes by bats.	• Annual checks to be made to check for damage with boxes replaced as necessary. • Checks on uptake to be done annually for first 5 years with need for any further monitoring to be reviewed.
Red squirrel and pine marten	Surveys to monitor presence/ absence through field signs or direct sightings.	• Checks to be done annually for first 5 years with need for any further monitoring to be reviewed.
Badger	Surveys to monitor activity associated with the site.	• Checks to be done annually for first 5 years with need for any further monitoring to be reviewed.
Hedgehog	Surveys of installed artificial hedgehog nest boxes to determine uptake and use	• Annual checks to be made to check for damage with boxes replaced as necessary. • Checks on uptake to be done annually for first 5 years with need for any further monitoring to be reviewed.
Reptiles	Inspections of hibernaculum for reptiles during summer period, to determine use of features.	• Checks to be done annually for first 5 years with need for any further monitoring to be reviewed.
Birds	Surveys of installed bird boxes to determine uptake and use of bird and owl boxes.	• Annual checks to be made to check for damage with boxes replaced as necessary. • Checks on uptake to be done annually for first 5 years with need for any further monitoring to be reviewed.
Invertebrates	To determine the effects on insect assemblage it is recommended that pollinator counts are conducted within each area of grassland annually. The Flower-Insect Timed (FIT) Counts methodology will follow that used by the UK Pollinator Monitoring Scheme. Survey results should be submitted to the scheme to feed into data collection on national trends.	• Checks to be done annually for first 5 years with need for any further monitoring to be reviewed.

APPENDICES

A OUTLINE BEMP



Legend

- PAN boundary
- Compensatory and Enhancement Area
- Mixed scrub
- Reinstated
- Retained
- Retained woodland
- Attenuation Basin
- Wildflower grassland
- Woodland planting (lowland mixed deciduous)
- Woodland planting (mixed)
- Native hedgerow creation
- Tree Planting
- Tree line (mixed) creation
- Tree line (Scots pine) creation
- Watercourses

Do not scale this map

Client
Kintore Hydrogen Limited

Project
Kintore Hydrogen Plant

Title
Outline BEMP
Page 1 of 8

Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:24,000 @A3
0 120 240 480 720 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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375500 376000 376500 377000

814000 813500 813000

Reptile hibernaculum to be created to provide hibernating/ over-wintering opportunities

10 bat boxes to be installed on retained trees

Creation of 1.4 ha attenuation basin of moderate condition

Creation of 0.67 km Scot's pine and mixed treelines of moderate condition

Improved connectivity for red squirrel, pine marten, badger, birds, bats and invertebrates

Provision of artificial hedgehog boxes in woodland

Creation of 27 ha of moderate condition other neutral grassland

Creation of 0.67 km Scot's pine and mixed treelines of moderate condition

Creation of insect shelters and/or 'bug hotels' for sheltering and nesting insects

4 Barn Owl boxes to be installed on mature trees

20 bird boxes to be installed on retained trees

Log piles to provide opportunities for red squirrel, pine marten, birds, invertebrates and reptiles

Creation of ecotones for reptiles

Creation of 3.2 ha of mixed scrub at moderate condition

Creation of 0.36 km of native hedgerow of moderate condition

Poor-moderate condition mixed woodland to be created

Poor-moderate condition lowland mixed deciduous woodland to be created

Legend

- PAN boundary
- Compensatory and Enhancement Area
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- Reinstated
- Retained
- Retained woodland
- Attenuation Basin
- Wildflower grassland
- Woodland planting (lowland mixed deciduous)
- Woodland planting (mixed)
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- Tree line (Scots pine) creation
- Watercourses

Do not scale this map

Client
Kintore Hydrogen Limited

Project
Kintore Hydrogen Plant

Title
Outline BEMP
Page 2 of 8

Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:5,600 @A3
0 25 50 100 150 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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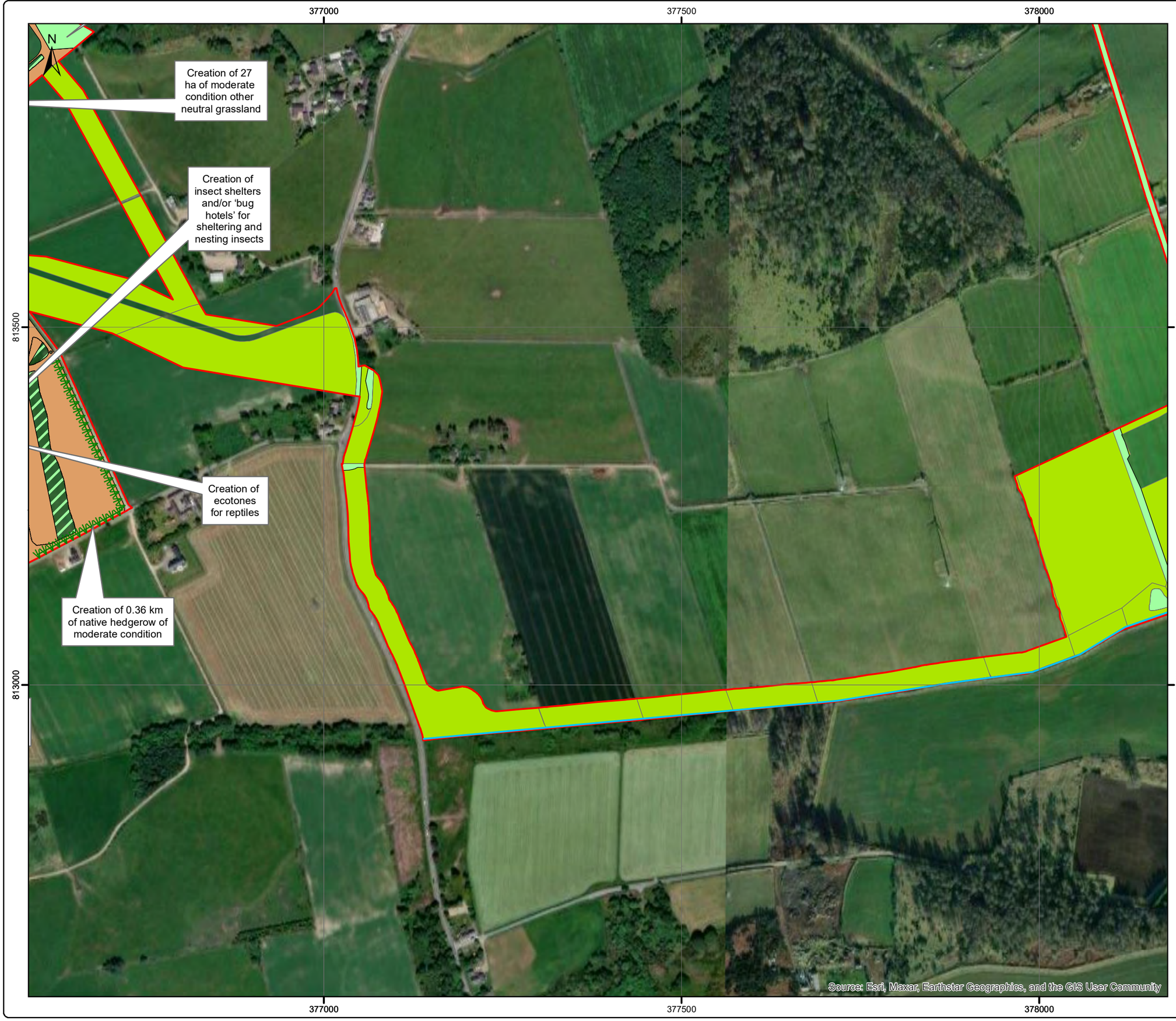

Legend

- PAN boundary
- Compensatory and Enhancement Area
- Mixed scrub
- Reinstated
- Retained
- Retained woodland
- Attenuation Basin
- Wildflower grassland
- Woodland planting (lowland mixed deciduous)
- Woodland planting (mixed)
- Native hedgerow creation
- Tree Planting
- Tree line (mixed) creation
- Tree line (Scots pine) creation
- Watercourses

Do not scale this map

Client
Kintore Hydrogen Limited

Project
Kintore Hydrogen Plant

Title
Outline BEMP
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Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:5,000 @A3
0 25 50 100 150 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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W: www.envirocentre.co.uk

Legend

- PAN boundary
- Compensatory and Enhancement Area
- Mixed scrub
- Reinstated
- Retained
- Retained woodland
- Attenuation Basin
- Wildflower grassland
- Woodland planting (lowland mixed deciduous)
- Woodland planting (mixed)
- Native hedgerow creation
- Tree Planting
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Do not scale this map

Client
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Project
Kintore Hydrogen Plant

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Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:7,000 @A3
0 35 70 140 210 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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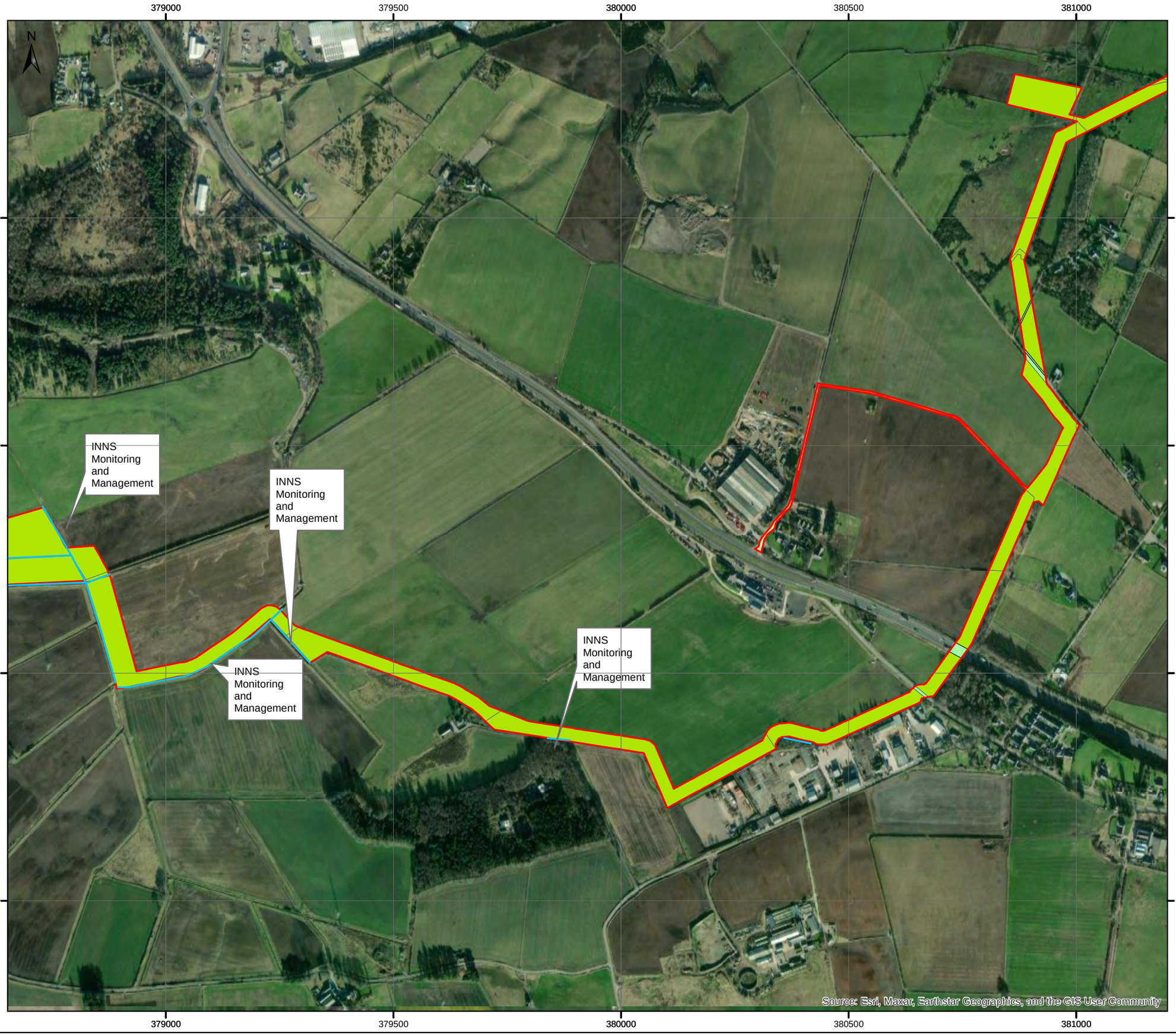

Legend

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Kintore Hydrogen Limited

Project
Kintore Hydrogen Plant

Title
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Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:8,000 @A3
0 40 80 160 240 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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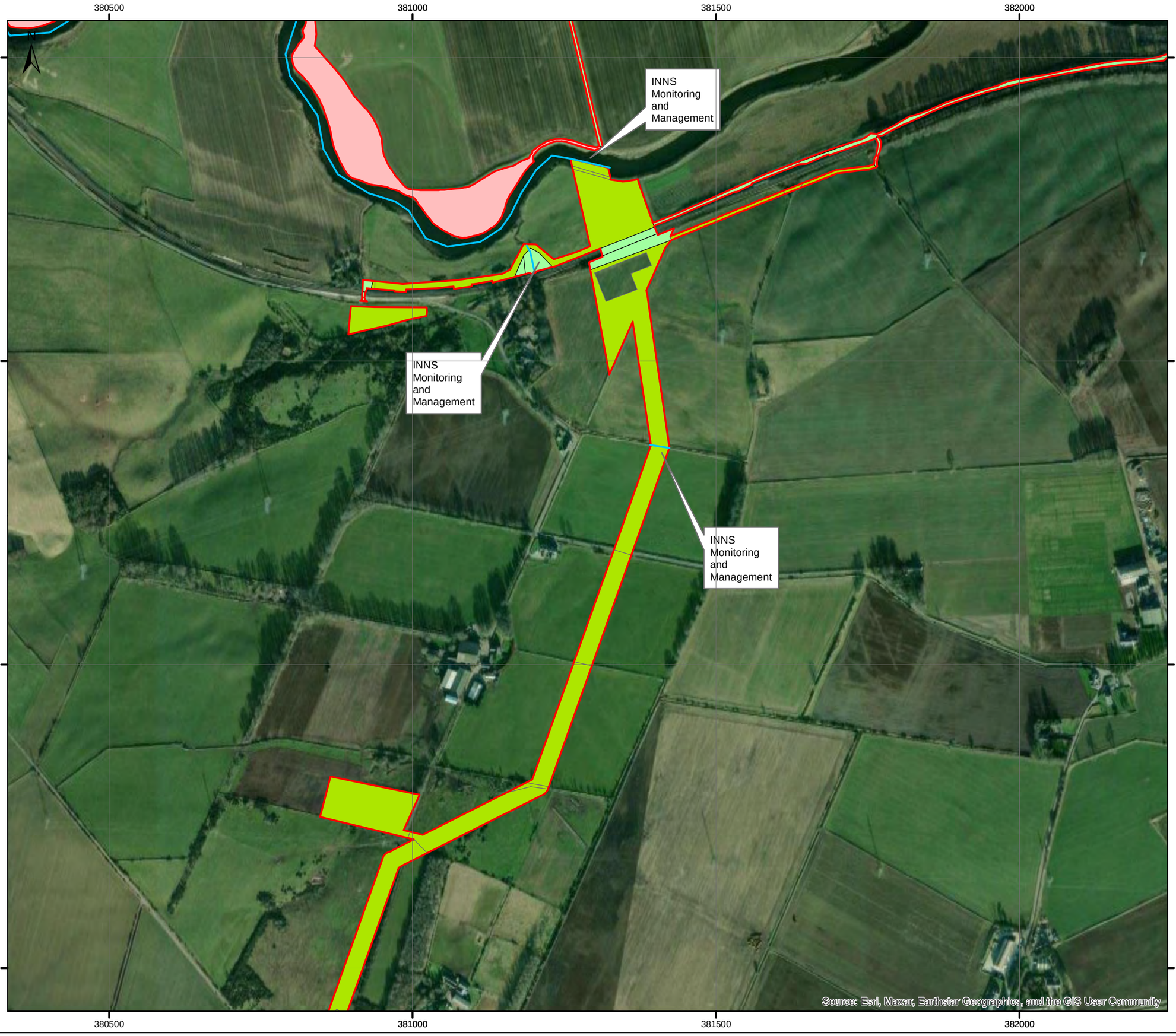

Legend

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Client
Kintore Hydrogen Limited

Project
Kintore Hydrogen Plant

Title
Outline BEMP
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Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:6,000 @A3
0 30 60 120 180 Metres

Rev	Date	Amendment	Initials
-	-	-	-

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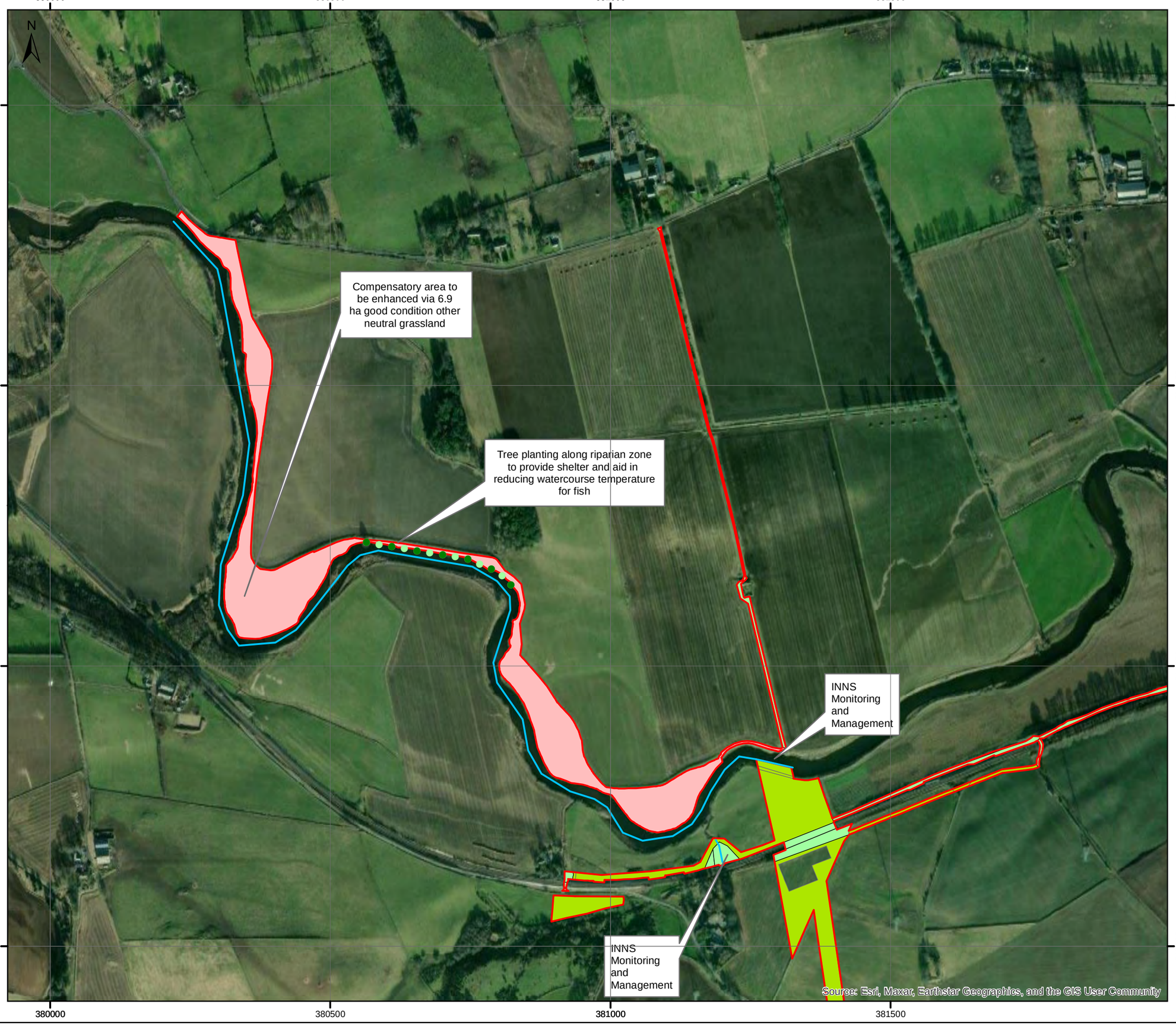

Legend

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Client
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Project
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Status
Final

Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
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Scale
1:6,500 @A3
0 30 60 120 180 Metres

Rev	Date	Amendment	Initials
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N

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

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Status
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Drawing No.	Revision	Date
376782-GIS032	A	20 Sept 2024
Drawn	**Checked**	**Approved**
JEP	GN	GN

Scale
1:4,500 @A3
0 20 40 80 120 Metres

Rev	Date	Amendment	Initials
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