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10.0 FLORA AND FAUNA

Section 1 (Introduction), Section 6 (Site Setting) and Section 8 (Description of the Proposed Development) of the EIS should be referred to before reading this section.

10.1 Introduction

A detailed baseline ecological survey of the Site was undertaken on 15/04/08 and 12/06/08. Following on from this an impact assessment was carried out on the flora and fauna in relation to the proposed restoration plan. This assessment was conducted in accordance with 'EPA Guidelines on the Information to be contained in Environmental Impact Statements' (EPA, 2002), 'EPA Advice Notes on Current Practice' (EPA, 2003), and with reference to the 'Guidelines for Ecological Impact Assessment in the United Kingdom' (IEEM, 2006), and the Landscaping and Restoration Plan outlined in Section 8.7 of this document.

10.2 Methodology

A desktop review was conducted of all available published and unpublished information together with consultation with National Parks and Wildlife Services (NPWS) to identify key habitats and species that may be present, particularly those protected by legislation.

Walkover surveys of the Site were conducted on 14 April and 12 June 2008 to record the habitats and flora of the Site. Habitat Assessment follows Joint Nature Conservation Committee (JNCC) Phase One Habitat Survey methodology (JNCC, 1990, revised 2003) and the 'Habitat Survey Guidelines' (Draft 2, Heritage Council, 2005). Aerial photographs and site maps assisted the habitat survey. Fauna were recorded by sightings, signs of activities or dens/roosts.

Habitats are named and described following Fossitt (2000). Nomenclature for higher plants principally follows that given in Webb *et al.* (1996). Habitats are assessed according to the Site evaluation scheme contained in the 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (NRA, 2006).

In relation to mammals, the survey was based upon sightings and signs of mammal activity during the habitat survey and also the identification of possible suitable habitats. The survey was carried out in the main bird breeding season (typically March to July).

Photographs taken during the surveys are given in Attachment 10.1.

10.3 Existing Environment

10.3.1 Ecological landscape of the Site

The proposed restoration site is located ca. 5 km southeast of Naas, along the road between Beggar's End Cross Roads and Walshestown, off the L6042. The ca. 68.0 ha Site comprises the existing quarry, processing areas, lagoons and agricultural fields to the south.

The Site is bordered by either treelines or hedgerow on all sides. There are three lagoons/ponds to the northwest of the Site (Pond A1/A2 and A3), one lagoon/pond to the south of the Site (Pond B) and a small silt settlement pond near the Site entrance (Pond C) (Figure 8.1). A large, dried-out silt lagoon occurs in the northern section of the Site; this area has started to become colonised by rushes (*Juncus* sp.) and colt's-foot (*Tussilago farfara*). There is a wet recolonising area in the northeast of the Site; this area was previously occupied by a silt-settlement lagoon. The area of the Site to the south of the quarry void comprises a mosaic of scrub, wet grassland, heath, bare ground and recolonising ground.

The surrounding land is mainly agricultural fields and quarries, with scattered residential housing. Punchestown Racecourse lies directly to the west of the Site.

10.3.2 Areas of nature conservation

The Site is located ca. 5 km northwest of Poulaphouca Reservoir, which is designated as both a pNHA (Site Code 000731) and an SPA (Site Code 004063), and ca. 5 km southwest of Red Bog, which is designated as an SAC (Site Code 000397) (Figure 10.1).

The SPA at Poulaphouca Reservoir is selected for the presence of an internationally important greylag goose (*Anser anser*) population, which is one of the largest in the country. The NPWS Site Synopsis for the SPA is included in Attachment 10.3.

The pNHA at Poulaphouca Reservoir is selected for the presence of the protected species red deer (*Cervus elaphus*), and sika deer (*Cervus nippon*), as well as records of the rare plant species basil thyme (*Acinos arvensis*), which is listed as vulnerable in the Red Data Book (Curtis & McGough, 1988). These species are protected under the Wildlife Act and Flora (Protection) Order, 1999. Site synopses for pNHAs are not currently available from the NPWS.

Red Bog SAC is designated for the presence of transition mire, a habitat listed on Annex I of the EU Habitats Directive. Protected species occurring in this SAC are identical to those listed previously for Poulaphouca Reservoir pNHA. The NPWS Site Synopsis for the SAC is included in Attachment 10.3.

The habitats present at the Site are detailed in Section 10.4 below.

10.4 Habitats

The habitats recorded at the Site are given in Table 10.1 and shown in Figure 10.2.

Table 10.1 Habitats recorded at Walshestown

HABITAT	HABITAT CODE
Dry calcareous and neutral grassland	GS1
Dry meadows and grassy verges	GS2
Wet grassland	GS4
Improved agricultural grassland	GA1
Scrub	WS1
Hedgerows	WL1
Treelines	WL2
Other artificial lakes and ponds	FL8
Exposed sand, gravel or till	ED1
Spoil and bare ground	ED2
Recolonising bare ground	ED3
Buildings and artificial surfaces	BL3

Dry calcareous and neutral grassland GS1

Dry, species-rich calcareous grassland occurs to the north of the Site (Figure 10.2). Species commonly occurring in this area include bird's-foot trefoil (*Lotus corniculatus*), common spotted orchid (*Dactylorhiza maculata*), fragrant orchid (*Gymnadenia conopsea*), yarrow (*Achillea millefolium*) and lesser trefoil (*Trifolium dubium*), as well as yellow-wort (*Blackstonia perfoliata*), Yorkshire fog (*Holcus lanatus*), cock's-foot (*Dactylis glomerata*), creeping thistle (*Cirsium arvense*) and white and red clover (*Trifolium repens*, *T. pratense*). Photo 1 in Attachment 10.1 depicts this habitat at the Site.

Dry meadows and grassy verges GS2

This habitat occurs in several areas on the Site, including a rank area towards the centre of the Site (Photo 2), and a dry grassy area which occurs on the slope by the processing area to the northeast of the Site.

The rank area towards the centre of the Site shows signs of previous grazing by cattle. There is evidence of patchy grazing of the area by rabbits. Species occurring in this area include creeping bent (*A. stolonifera*), cock's-foot (*Dactylis glomerata*), red fescue (*F. rubra*), perennial rye-grass (*L. perenne*), meadow-grass (*Poa* sp.), gorse (*U. europaeus*), white clover (*T. repens*), dandelion (*Taraxacum* agg.), tormentil (*P. erecta*) and common mouse-ear (*C. fontanum*).

An earthen bank separates the recolonising silt lagoon from the processing area. The top of the bank is lined with Leyland cypress (*x Cupressocyparis leylandii*), and the grassy slopes of the bank support a species-rich calcareous grassland, with quaking grass (*Briza media*) occurring in places, together with abundant creeping cinquefoil (*Potentilla reptans*), bird's-foot trefoil (*Lotus corniculatus*), and ribwort plantain (*Plantago lanceolata*). Insect diversity in this area was high, and is detailed in Section 10.6.

Wet grassland GS4/ Improved agricultural grassland GA1

Wet grassland occurs in the fields to the south of the quarrying area (Photo 3), in the area surrounding the wet drain towards the centre of the Site, and around the edges of the lagoons in the north and south of the Site.

In the fields to the south of the currently disturbed area, the ground is quite wet underfoot and is primarily utilised as pasture, with cattle grazing the area during the June site visit. This area is classified as wet grassland, with elements of improved agricultural grassland. This area is used as nesting and foraging habitat for the Red listed bird species – lapwing. Clumps of gorse (*Ulex europaea*) are scattered throughout the area, and soft rush (*Juncus effusus*), hard rush (*J. inflexus*), common sedge (*Carex nigra*) and glaucous sedge (*Carex flacca*) are frequent. Other species present include creeping bent (*Agrostis stolonifera*), meadow grass (*Poa* sp.), perennial rye-grass (*Lolium perenne*), red fescue (*Festuca rubra*), dandelion (*Taraxacum* agg.), creeping buttercup (*Ranunculus repens*), common mouse-ear (*Cerastium fontanum*), creeping thistle (*Cirsium arvense*), tormentil (*Potentilla erecta*), yarrow (*Achillea millefolium*), white clover (*Trifolium repens*), curled dock (*Rumex crispus*), lesser trefoil (*T. dubium*) and daisy (*Bellis perennis*).

The wet grassland surrounding the edges of the lagoons contains species including creeping bent (*Agrostis stolonifera*), hard rush and soft rush (*J. inflexus*, *J. effusus*), field horsetail (*Equisetum arvense*), creeping buttercup (*R. repens*) and willow (*Salix* sp.) saplings.

A wet, overgrown drain and adjacent damp earth bank occur towards the centre of the Site (Photo 4); these are colonised by field horsetail (*Equisetum arvense*) and lesser celandine (*Ranunculus ficaria*), with extensive moss cover.

Scrub WS1

Scrub occurs in scattered clumps around the Site (Photo 5). The dominant species in the area of scrub toward the centre of the Site is gorse (*U. europaeus*), interspersed with grasses such as creeping bent (*A. stolonifera*) and cock's-foot (*Dactylis glomerata*), soft rush (*J. effusus*), nettle (*Urtica dioica*) and curled dock (*Rumex crispus*). There is some scrub encroachment on the slope of the field by the south western boundary of the Site; this also consists primarily of gorse (*U. europaeus*). Bullfinch (*Pyrrhula pyrrhula*) was noted foraging in this area during

the June visit, and may have been nesting nearby. Gorse scrub is also beginning to colonise the west-facing slopes of the lagoons to the north of the Site.

Hedgerows WL1

Mature hedgerows occur along much of the boundary of the Site (ref. Photo 1). The main species occurring in the hedgerows are mature ash (*Fraxinus excelsior*), elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*) trees, with gorse (*Ulex europaeus*), bramble (*Rubus fruticosus*), ivy (*Hedera helix*), nettle (*Urtica dioica*), curled dock (*R. crispus*), creeping buttercup (*R. repens*), creeping thistle (*Cirsium arvense*), herb-Robert (*Geranium robertianum*), sticky mouse-ear (*Cerastium glomeratum*), dandelion (*Taraxacum* agg.), fescues (*Festuca* sp.) and meadow grass (*Poa* sp.) in the understorey.

Treelines WL2

Treelines occur along sections of the Site boundary, and also in areas within the Site itself. The majority of the northern boundary of the Site is planted with a screening treeline of Leyland cypress (*x Cupressocyparis leylandii*), as is the western boundary of the Site adjoining Punchestown Racecourse, and a further treeline of this species also occurs along the top of the earthen bank separating the recolonising silt lagoon from the processing area. A treeline along the northwestern boundary of the Site is composed of mature larch (*Larix* sp.) and other conifers, with mature elder (*Sambucus nigra*), hawthorn (*C. monogyna*), and poplar (*Populus* sp.). Another mature treeline that occurs along the western boundary contains mature blackthorn (*Prunus spinosa*) and crab-apple (*Malus sylvestris*).

A planted hawthorn (*C. monogyna*) hedgerow along the western boundary towards the southern area of the Site is interspersed with a planted treeline of field maple (*Acer campestre*).

The treeline which occurs at the western boundary of the southern extremity of the Site contains mature ash (*Fraxinus excelsior*), hawthorn (*C. monogyna*), blackthorn (*P. spinosa*), and elder (*S. nigra*); many of which are densely covered in ivy (*H. helix*). Dog rose (*Rosa canina*), bramble (*R. fruticosa*), creeping thistle (*C. arvense*) and nettle (*Urtica dioica*) occur in the understorey.

Artificial lakes and ponds FL8

There are several water-filled lagoons/ponds on the Site. Three lagoons/ponds (Ponds A1/A2, and A3) occur to the north west of the Site (Photo 6). There is another large lagoon/pond, Pond B, to the south of the Site (Photo 7). There is a small former silt settlement pond, Pond C, adjacent to the Site entrance (Photo 8).

The lagoons towards the northwestern boundary of the Site, Ponds A1/A2 and A3, are edged by species including hard rush (*J. inflexus*), soft rush (*J. effusus*), bulrush (*Typha latifolia*), horsetail (*Equisetum* sp.), and willow (*Salix* sp.) saplings.

Pond B, the lagoon to the south of the Site, has been partially recolonised, and contains a man-made island at the western edge. This island has become colonised with a range of vegetation, including soft rush (*J. effusus*), glaucous sedge (*C. flacca*), red fescue (*F. rubra*), white clover (*T. repens*), creeping bent (*A. stolonifera*), cock's-foot (*D. glomerata*), tormentil (*Potentilla erecta*) and creeping buttercup (*R. repens*).

The small silt settlement pond at the Site entrance, Pond C, is currently disused and has become colonised with a variety of aquatic plant species including hard rush (*J. inflexus*), soft rush (*J. effusus*), yellow flag iris (*Iris pseudacorus*) and bulrush (*T. latifolia*).

Exposed sand, gravel or till ED1

There is an exposed low (ca. 7ft) cliff face which was formerly quarried for sand to the west of the Site. Sand martins (*Riparia riparia*) are nesting throughout the cliff face (Photo 9). There are some grass and ruderal plant species growing in areas of this habitat, including dandelion (*Taraxacum* agg.) and creeping thistle (*C. arvense*).

Spoil and bare ground ED2

This habitat occurs in the northeast of the Site and in the disturbed area south of the lagoons (Photo 10). Species such as weld (*Reseda luteola*), ragweed (*Senecio jacobea*), colt's-foot (*Tussilago farfara*), dandelion (*Taraxacum* agg.) and common mouse-ear (*C. fontanum*) are beginning to colonise the area, however the vast majority of the area remains bare.

The exposed face of a heap of sand in the northeastern area of the Site has become colonised by nesting sand martin (*Riparia riparia*), an Amber listed bird species.

Recolonising bare ground ED3

This habitat type occurs widely in the northeastern area of the Site (Photo 11). The former silt settlement pond in the northeast of the Site is colonised with a range of plant species, dominated by colt's-foot (*T. farfara*). The ground is wet underfoot in places and many of the species occurring in the wet grassland habitat recur in these areas, such as hard rush (*J. inflexus*), soft rush (*J. effusus*), glaucous sedge (*Carex flacca*), field horsetail (*Equisetum arvense*) and mosses.

The west-facing slopes by the lagoons to the northwest of the Site have become colonised by willow saplings (*Salix* sp.), some gorse (*U. europaeus*), meadow grass (*Poa* sp.), cock's-foot (*Dactylis glomerata*), colt's-foot (*T. farfara*) and bird's-foot trefoil (*Lotus corniculatus*).

The ground that runs between Ponds A2 and A3 to the northwest of the Site contains several plant species which are not found in other areas of the Site. These are columbine (*Aquilegia vulgaris*), pink crane's-bill (*Geranium versicolor*), and sycamore (*Acer pseudoplatanus*); which are likely to be garden escapes; and butterfly-bush (*Buddleja davidii*).

Buildings and artificial surfaces BL3

Buildings and artificial surfaces within the Site include various structures around the grading machines and the Site offices (Photo 12), along with an access road, loading areas and parking areas. Swallows were observed to be nesting in the sheds by the processing elevator on both visits. A variety of plant species have colonised areas where substrate associated with processing works has accumulated, including colt's-foot (*T. farfara*), field horsetail (*Equisetum arvense*), cock's-foot (*Dactylis glomerata*), creeping thistle (*C. arvense*), and dandelion (*Taraxacum* agg.), as well as rushes (*J. inflexus*, *J. effusus*, *J. acutiflorus*) in areas where water has pooled.

10.5 Flora – Species of conservation importance

NPWS (www.npws.ie, mapviewer) hold records of the rare plant species basil thyme (*Acinos arvensis*) as being located in the same 10 km square (N19) as the Site. Details of this are listed in Attachment 10.3. The listed rare plant species occur in Rathmore, which is not in the vicinity of the Site. This species was not noted on Site during the Phase 1 survey.

10.6 Fauna - Species

10.6.1 Mammals

There were several sightings of mammals during the Site visits; these were Irish hare (*Lepus timidus hibernicus*) - four juveniles and three adults were sighted; and numerous rabbit (*Oryctolagus cuniculus*). There was evidence of rabbit (*O. cuniculus*) grazing at grassy areas throughout the Site, and there was a burrow entrance in one of the spoil heaps near the ruins by the quarried area.

It is possible that mammal species that favour hedgerows/treelines such as hedgehog (*Erinus europaeus*), wood mouse (*Apodemus sylvaticus*), and pygmy shrew (*Sorex minutus*), may use the hedgerow and scrub within the Site. Rabbit remains to the south of the quarry were considered to be evidence of fox (*Vulpes vulpes*) feeding at the Site, and a strong fox scent was noted by the mature treeline along the western boundary of the Site, indicating a territory boundary.

Badger (*Meles meles*) setts have been previously noted at the Site. Badger prints were observed in the sand by the bridge towards the centre of the Site. Deer tracks were also observed in this area.

10.6.2 Birds

A variety of bird species were recorded nesting and/or feeding in the grassland and hedgerows of the Site and adjacent areas. These include lapwing (*Vanellus vanellus*) which were nesting on the Site, skylark (*Alauda arvensis*), meadow pipit (*Anthus pratensis*), blackbird (*Turdus merula*), wren (*Troglodytes troglodytes*), robin (*Erithacus rubecula*), and pied wagtail (*Motacilla alba*). Sand martin (*Riparia riparia*) breed on the Site, with multiple nests built into sandy cliff faces at the west of the Site, and in a sand heap in the northeast of the Site. Snipe (*Gallinago gallinago*) was flushed from the wet grassland to the south of the quarry. A number of wildfowl species were noted on the waterbodies of the Site, these included tufted duck (*Aythya fuligula*), little grebe (*Tachybaptus ruficollis*), mallard (*Anas platyrhynchos*), coot (*Fulica atra*), waterhen (*Gallinula chloropus*), and mute swan (*Cygnus olor*). The full Bird Survey report is provided in Attachment 10.2.

10.6.3 Reptiles and amphibians

No reptiles or amphibians were observed on the Site during the course of the survey. The water-filled lagoons on the Site provide suitable habitat for frogs (*Rana temporaria*) however, and the bare sandy areas that occur throughout the Site are potential basking sites for common lizard (*Lacerta viviparia*).

10.6.4 Invertebrates

Large numbers of heath snail (*Helicella itala*) were observed on the surface of the wet grassland areas of the Site. Common froghopper (*Philaenus spumarius*) was noted by the wet drain towards the centre of the Site. Numerous common blue butterfly (*Polyommatus icarus*) were observed during the June site visit. Seven-spot ladybird larvae (*Coccinella septempunctata*) occurred in large numbers on colt's-foot (*T. farfara*) leaves on the west-facing slopes of the lagoons to the north of the Site. Variable damselfly (*Coenagrion pulchellum*) was observed basking on a dead grass stem on the north-facing grassy slope to the northeast of the Site. It is likely that a range of other butterfly, damselfly and dragonfly species occur in season. The food-plants of butterflies such as small tortoiseshell (*Aglais urticae*) and painted Lady (*Vanessa cardui*) (nettle and thistle respectively) occur throughout the Site.

10.6.5 Fauna – Species of Conservation Importance

NPWS records (www.npws.ie, mapviewer) show records of fauna species protected under the Wildlife Act and Flora (Protection) Order, 1999 in the 10km square (N19) in which the Site is located (Attachment 10.3). These are red deer (*Cervus elaphus*) and sika deer (*Cervus nippon*). None of the listed rare species were observed on the Site during this survey, although deer tracks were observed in sand by the bridge on Site. Several sightings of Irish

hare (*Lepus timidus hibernicus*) were made during the survey, and evidence of badger use of the Site was noted.

Attachment 10.2 gives details of the bird species present on the Site. Birds of conservation importance that are nesting and foraging on Site include;

Lapwing: A flock of at least 30 individuals was observed on a bare area of ground to the south of Pond B. At least 5 of these remained in a territorial position when the remainder of the flock were alarmed and took flight; direct evidence of the holding of breeding territory by lapwing in this area. The lapwing were also foraging in the wet pasture fields further south of the lagoon.

Amber listed species of moderate conservation concern, confirmed breeding/ holding territories on the site, include:

Swallow: These were observed to be nesting in the disused buildings at the northeast of the Site in the old processing facility, and several individuals were noted foraging throughout the Site.

Sand martin: A colony of six active burrows exists in a stockpile opposite the buildings in the processing area were noted. A second colony was observed on a low stockpile by a track towards the centre of the Site (Photo 1). A third colony was noted next to the lagoon in an exposed sandy face towards the centre of the Site. At least 40 burrows were counted in this colony, and at least 20 were active. Sand martin was observed foraging over the dried silt lagoon area, and the water-filled lagoons to the northwest of the Site.

Starling: A flock of starling (ca. 80 individuals) were present on the stockpiles abutting the processing machinery.

Skylark: Several pairs were noted holding territories in areas of the Site including the recolonising silt lagoon to the north of the Site, and in the wet grassland area towards the centre of the Site.

Snipe: Individual birds were flushed from long grass in the wet grassland area towards the south of the Site over winter months.

Coot: 6 individuals were noted on Pond A1/A2 to the northwest of the Site and at least one pair was nesting.

Little grebe: A pair (probably breeding) was observed on the largest water-filled lagoon towards the northwest of the Site.

10.7 Assessment

10.7.1 Habitats

Table 10.2. Walshestown Site Evaluation using NRA Scheme

HABITAT NAME	HABITAT CODE	RATING	IMPACT DURING WORKS	IMPACT AFTER MITIGATION
Dry calcareous and neutral grassland	GS1	C	Moderate negative	Neutral
Dry meadows and grassy verges	GS2	D	Moderate negative	Neutral
Wet grassland	GS4	B	Moderate negative	Neutral
Scrub	WS1	D	Minor negative	Neutral
Hedgerows	WL1	C	Neutral	Neutral
Treelines	WL2	C	Neutral	Neutral
Other artificial lakes and ponds	FL8	C	Moderate negative	Neutral
Exposed sand, gravel or till	ED1	C	Minor negative	Minor negative
Spoil and bare ground	ED2	E	Minor negative	Neutral
Recolonising bare ground	ED3	E	Minor negative	Neutral
Buildings and artificial surfaces	BL3	D	Minor negative	Neutral

The evaluation and assessment of each habitat at the Site is given in Table 10.2 and is based on the NRA Site Evaluation Scheme and Criteria for assessing the impact significance (Attachment 10.4).

The principal habitats within the Site are hedgerow and treelines, scrub, wet improved grassland and the lagoons from previous quarry activity. The ecological value of these habitats is rated as being of high value, and locally important, according to the NRA site evaluation scheme. The hedgerows within the Site provide refuge, feeding sites and corridors for the movement of animals and birds, and the water bodies are locally important for waterfowl. The remnant cliff faces are utilised as nesting areas by sand martins. The wet grassland areas are important feeding and breeding areas for birds including lapwing (red-listed on the Irish list of bird species of conservation concern), snipe and skylark, as well as providing habitat for hare and rabbit. There is evidence of badger, deer and fox activity on Site.

Dry calcareous and neutral grassland GS1

The dry, species-rich calcareous grassland occurs to the north of the Site, between the Site boundary and the bare and recolonising area (Photo 1). Common spotted orchid (*Dactylorhiza maculata*), and fragrant orchid (*Gymnadenia conopsea*), are common in this area, as well as a range of other grass and herb species, and the area is also grazed by rabbit. It is thus considered to be of high ecological value and locally important.

Areas of this habitat are to be created as part of the planned restoration, and managed appropriately for the development and maintenance of a species-diverse sward. The area to be developed as grassland will be cross-ripped and sown with a seedmix of simple grasses including creeping bent (*Agrostis stolonifera*), red fescue (*Festuca rubra*) and sheep's fescue (*Festuca ovina*) from indigenous seed sources; areas treated in this manner will become naturally colonised by species from adjacent plant communities and the pre-existing soil seed bank over time (NRA, 2005). Once established, moderate grazing is the ideal means of management; otherwise half of the grassland can be cut each winter (with cuttings removed to prevent additional nutrient input to the soil) to promote the development of short and tall swards, which provide good cover for faunal species (Gilbert & Anderson, 1998).

The impact on this habitat during restoration works is considered to be moderate negative. However, it is anticipated that the restored habitat will exceed the current area of dry calcareous grassland on the Site; therefore the overall impact of the restoration activities on the Site is considered to be neutral.

Dry meadows and grassy verges GS2

This habitat is located towards the centre of the Site and scrub area, and on the grassy slope to the northeast of the Site (Photo 2). The area of this habitat towards the centre of the Site comprises a rank, tussocky sward of low species diversity. It is of moderate ecological value and locally important, giving it a rating of D.

The area of this habitat which occurs on the grassy west-facing slope in the northeast of the Site is more diverse, containing species such as quaking grass (*Briza media*), creeping cinquefoil (*Potentilla reptans*), and supports a range of invertebrate species. This area is considered to be of high ecological value and locally important.

Although this habitat is likely to be lost during restoration activities (a moderate negative impact in the context of the Site), it will be encouraged to re-establish naturally in the vicinity of the retained treeline and hedgerow areas, creating a structurally diverse transitional habitat; this will reduce the overall impact to neutral.

Wet grassland GS4/ Improved agricultural grassland GA1

This habitat occurs in the fields to the south of the Site (Photos 3, 4). There are several grass species and some sedges and rushes occurring in this area, as well as a range of broad-leaved herbs. A flock of lapwing (ca. 30 individuals) and skylark were recorded on Site breeding and foraging in this habitat. Lapwing is on the Red list of Bird Species of Conservation, and as such is considered globally threatened (Lynas et al., 2007). This area is thus considered to be of high ecological value and is rated as B.

This area will be retained in order to protect the lapwing and other bird species (Figure 10.3). The area will be fenced and screened during construction activities in order to keep disturbance to a minimum. Construction activities in relation to screening and fencing of this area will be restricted to times outside the bird breeding season.

Thus, the overall impact of restoration activities on this habitat is considered to be neutral.

Scrub WS1

This habitat occurs in patches throughout the Site, and consists primarily of gorse (*U. europaea*) (Photo 5). It is likely that this area provides habitat, refuge, and foraging opportunities for a range of fauna, thus it is considered to be of moderate ecological value and locally important, giving it a rating of D. These scrub areas will be lost during restoration, which is considered to be a minor negative impact. However, scrub habitat will be encouraged to develop as part of the restoration plan. The planting of native species woodland and scrub around the proposed wetland area as part of the planned restoration works will reduce the overall impact to neutral.

Hedgerows WL1, and Treelines WL2

Mature hedgerow and treelines border the Site (Photo 1), with mature trees occurring throughout, and a range of scrub and herb species forming the understorey. These contain native tree species including ash, elder and hawthorn, which are considered to be of high ecological value. These hedgerows and treelines provide habitat, refuge, foraging opportunities and landscape connectivity for a range of mammals and birds. The habitat is of high value and locally important, giving it a rating of C.

The Leyland Cypress treelines along the western boundary and between the processing area and the recolonising silt lagoons are to be removed as part of the planned restoration; this is a non-native tree species of limited ecological value, so the impact of its loss is considered to be neutral. All other hedgerows and treelines surrounding the Site are to be retained as they form the Site boundary, and native-species hedgerow will be planted within the Site as part of the restoration plan, thus the overall impact on these habitats is considered to be neutral.

Artificial lakes and ponds FL8

There are three lagoons/ponds to the northwest of the Site (Pond A1/A2 and A3), one lagoon/pond to the south of the Site (Pond B) and a small silt settlement pond near the Site entrance (Pond C) (Figure 8.1). The larger lagoons support a range of waterfowl, several of which are breeding in these areas. These habitats are considered to be of high ecological value and locally important, giving them a rating of C.

The loss of Pond B to the south of the Site as a result of restoration of that area to semi-natural grassland is considered to be a moderate negative impact, however the reshaping and extension of Pond A1 as a water feature and wetland area as part of the restoration plan will reduce this impact to neutral. Infilling of lagoons will be carried out outside of the breeding season.

Exposed sand, gravel or till ED1

This habitat occurs in the formerly quarried areas of the Site. Sand martins are nesting throughout the quarry, as a result these areas are considered to be of high ecological value and locally important, giving this habitat a rating of C. The loss of this habitat is considered to be a minor negative impact. Although this habitat will not be recreated as part of the restoration plan, other similar quarries in the vicinity of the Site are likely to provide alternative nesting sites for sand martin. Providing that restoration works in the vicinity of the colonies are undertaken outside of the sand martin breeding season, the overall impact on this habitat is considered to be minor negative.

Spoil and bare ground ED2

This habitat occurs throughout the Site. It is sparsely vegetated with a few ruderal plant species and is typically considered to be of low ecological value – a rating of E, however it may provide suitable basking habitat for common lizard (*Lacerta vivipara*) and a range of invertebrates. During restoration works, there will be a temporary minor negative impact on this habitat. Patches of this habitat will be recreated throughout the semi-natural grassland as part of the planned restoration works; thus the overall impact on this habitat is considered to be neutral.

Recolonising bare ground ED3

This habitat has occurred as a result of disturbance where quarrying activities formerly took place, and is transient in nature. Various ruderal plant species are recolonising the area and there are rabbit burrows in one of the spoil heaps. The habitat is considered to be of low ecological value yet locally important, giving it a rating of E. This habitat will be recreated during the process of Site restoration. Since this habitat is transient by nature, and high value

habitat is to be created at other areas of the Site as part of the restoration plan, the impact of the loss of this habitat is considered neutral.

Buildings and artificial surfaces BL3

Buildings within the Site include various structures around the grading machines and the Site offices, along with an access road, loading areas and parking areas. Swallow (*Hirundo rustica*), which is on the amber list of Birds of Conservation Concern (Lynas *et al.*, 2007) was observed nesting in several of the buildings on Site. These buildings are thus considered to be of moderate ecological value, and are rated D. As some of the buildings will be retained and once removal of any buildings is carried out outside of the bird breeding season the impact is considered be neutral.

The buildings on the Site offer potential roosting habitat for bats. All bat species in Ireland are strictly protected; a bat survey will be required to determine the presence or absence of bats prior to removal of the buildings; therefore until the bat survey is carried out, the buildings are rated as C (high ecological value, locally important). If the buildings are found to contain bats, a bat specialist must be present on Site during the removal of the buildings. The impact of the removal of the buildings on bats (should they contain them) can be significantly ameliorated by implementing the recommended mitigation measures of the bat survey.

10.7.2 Fauna

10.7.2.1 Habitat Loss

Birds

Habitat loss will be the main impact to the birds using the scrub, Pond B to the south of the quarry area, and the exposed sandy cliff faces. The majority of the birds observed on the Site are relatively common species. A notable exception is a flock of breeding lapwing (*Vanellus vanellus*), which is on the red list of Birds of Conservation Concern in Ireland (Lynas *et al.*, 2007). Coot (*Fulica atra*), snipe (*Gallinago gallinago*), little grebe (*Tachybaptus ruficollis*), skylark (*Alauda pratensis*), starling (*Sturnus vulgaris*), swallow (*Hirundo rustica*) and sand martin (*Riparia riparia*) were observed on the Site, all of which are on the amber list of Birds of Conservation Concern in Ireland.

It is likely that most of these bird species will use alternative habitat created within the restored site. Nesting and foraging habitat for lapwing will be retained and protected from construction activities in the southern part of the Site. The treelines and hedgerows being retained, together with the native hedgerow and woodland to be planted as part of the restoration, will provide extensive habitat for other birds. The retention and expansion of one of the larger lagoons at the northwest of the Site (Pond A1) will provide alternative habitat for

the waterfowl species, and the creation of a wetland area extending from the lagoon will provide habitat for snipe. The loss of the sandy cliff face will result in the loss of sand martin from the Site, however it is expected that these birds will relocate to similar habitat areas which are plentiful in the locality of the Site.

The main impact of habitat loss to bird species is therefore considered to be of low significance overall. This is based upon the understanding that any habitat removal or alterations will take place during 1 September to 1 March, i.e. outside the bird breeding season.

Mammals

The removal of treelines, scrub and areas of long grass may impact some mammals including badger, fox, rabbit, hedgehog, wood mouse, brown rat and pygmy shrew. The removal of these during restoration works may result in some temporary loss of potential foraging habitat; however as alternative foraging habitat occurs within (treelines, scrub and hedgerow along the Site boundary) and outside of the Site, the significance of this habitat loss to these species during the restoration process is considered minor. It is anticipated that the overall impact of the planned restoration and habitat creation on mammal species will be neutral.

There is evidence of badger activity on the Site, therefore it is recommended that a badger survey be carried out prior to commencement of works on the Site and if necessary, appropriate measures according to standard guidelines should be undertaken prior to the commencement of works, in consultation with NPWS.

Bats

The buildings and structures of the quarry have potential as bat roosting habitat. The removal of these as part of the restoration plan could potentially impact on possible roosts and cause fatalities if bats are present when works are carried out. As bats are legally protected, a bat survey will be carried out prior to removal of buildings on the Site, and any potential impacts will be ameliorated through appropriate mitigation, such as, the provision of bat boxes.

Amphibians and reptiles

No amphibians or reptiles were recorded during the habitat survey, however the water-filled lagoons to the northwest of the Site provide suitable habitat for frog, and the bare slopes surrounding them are potentially good basking habitat for lizard. These lagoons are to be developed into a waterbody as part of the restoration plan. It is anticipated that the waterbody and its associated wet areas will provide spawning habitat for frogs, and bare areas scattered throughout the Site will provide suitable basking habitat for lizard. The overall impact of the planned restoration works on amphibians and reptiles is considered to be neutral.

Invertebrates

Invertebrate activity was observed on the Site during the June visit, this activity was concentrated on the northwestern-facing grassy slope (planted with Leyland Cypress along the top) in the northeast of the Site; and in the rank, tussocky grassland area towards the centre of the Site. These areas will be lost temporarily during restoration works; however similar habitats will be recreated as part of the planned restoration of the Site. These and other planned diverse habitats will provide habitat, refuge, and foraging opportunities for a range of invertebrate species, and the proposed waterbody will provide breeding opportunities for invertebrate species with aquatic stages in their life-cycles, such as dragonflies. The overall impact of the planned restoration works on invertebrates is thus considered to be neutral.

10.7.2.2 Noise

Birds

Sensitivity to noise disturbance varies amongst bird species. Most bird species present on the Site are accustomed to disturbance due to quarrying activities within the Site and the surrounding area. The main impact will occur during the construction phase, and thus will be temporary. It is likely that the impact of noise will be reduced as a result of the restoration of the Site to a wildlife-focussed end-use. The impact of noise on birds on the Site is therefore considered to be of low significance, with an overall neutral-positive impact post restoration.

Mammals

Animal response to noise is a function of many variables, including characteristics of the noise and duration, life history characteristics of the species, habitat type, season and current activity of the animal, sex and age, previous exposure and whether other physical stressors (e.g. hunger) are present. As the area has been quarried for a number of years, it is likely that mammals utilising the area have become accustomed to the noise and activities of the quarry and adjacent quarries. The main impact will occur during the construction phase, and as such will be temporary in nature; and the planned wildlife end-use of the Site will eliminate noise impact on mammals at the Site. Thus the effect of the planned restoration on noise impact on mammals at the Site will be neutral-positive.

10.7.2.3 Dust, sediments and other emissions

Flora and Invertebrates

Smothering by dust can interfere with photosynthesis and transpiration of plants and thus growth rates and seed rates etc. Dust can harm invertebrates indirectly by eliminating their habitat or food plants or by making them unavailable, and directly by being toxic or by causing mechanical damage. The effect of dust depends on the prevailing winds and the

transport distance is related to particle size. Providing that the recommended measures of the dust minimisation plan (as outlined in Section 14.0) are adhered to, the overall impact on flora and invertebrates is considered to be neutral.

10.7.3 Sites of conservation importance

The Site is located within 5km of Poulaphouca Reservoir, which is designated both as an SPA and an NHA; however it is not within its watershed catchment. The Site synopsis for Poulaphouca Reservoir is included in Attachment 3. The proposed restoration plan at Walshestown will not impact Poulaphouca Reservoir SPA.

10.8 Mitigation

10.8.1 Site run-off

All surface water collected from the operating site drainage will be treated in a sustainable manner prior to discharge to minimise the impact on water quality and prevent habitat degradation. Treatment will be designed with adequate storage capacity and in a manner to facilitate maintenance.

The following measures are critical for preserving water quality and aquatic habitats:

- Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from the water body. Refuelling of machinery, etc., will be carried out in bunded areas or off-site where necessary;
- Run off from machine service areas will be controlled to prevent entry to the watercourse;
- Run off from the Site will only be routed to a watercourse via suitably designed and sited settlement ponds/filter channels/interceptors;
- Settlement ponds will be inspected daily and maintained regularly; and
- Measures will be taken to prevent sediments from entering the lagoon planned for retention and the stream which feeds it.

10.8.2 Dust

Dust minimisation measures will be implemented and are outlined in Section 14.5, these include the following:

- Site roads will be regularly cleaned and maintained and any site roads with the potential to give rise to dust will be regularly watered, as appropriate during dry and/or windy conditions;
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required, particularly during dusty activities and/or during dry or windy periods; and
- Ensure that all plant and machinery on site are suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum.

10.8.3 Habitats

The planned restoration makes provision for the retention and enhancement of existing habitats, together with the creation of new diverse areas. Specific actions being undertaken include:

- The scrub and hedgerows along the borders of the Site will be retained, to maintain connectivity with the wider landscape;
- The majority of the Site will be managed for the creation of a species-diverse, semi-natural grassland with a mosaic of bare patches throughout;
- Wet grassland area adjoining the proposed water feature to be created for fauna;
- The creation of a linear water feature along the western edge of the Site with surrounding vegetation to increase its attractiveness to wildlife;
- Tramping tracks around edge of Site for pedestrian access through enhancement of the existing 'Pilgrim's Walk', and interpretative signs to be installed at the Site;
- The filling in of Pond B to the south of the quarry area will be carried out between 1 September and 1 March, i.e. outside the bird nesting period;
- Any vegetation removal will be carried out between September 1st and March 1st, i.e. outside the bird nesting period; and

- The wet pasture fields in the southern section of the Site will be retained for lapwing and other bird species. This area will be screened off from the rest of the Site during construction activities. The current grazing regime of the pasture fields appears ideal for the maintenance of this habitat.

An outline of the proposed restoration plan is depicted in Figure 10.3.

10.8.4 Landscaping

Any landscaping/planting for screening will include the planting of native species only. The planted areas will be linked to existing areas of vegetation to enhance habitat linkages.

10.8.5 Summary of mitigation measures

- The treelines and hedgerows along the border of the Site will be retained (exception: non-native Leyland Cypress trees along western boundary to be removed as agreed with Punchestown Racecourse management);
- The majority of the Site will be managed for the development of species-rich grassland, with wet grassland and waterbodies in the west of the Site;
- Provisions for public access will be made, including car park, paths and interpretative signs;
- A badger survey will be carried out prior to commencement of works; if badgers are found to be present on site appropriate mitigation guidelines will be followed in consultation with NPWS;
- A bat survey will be carried out prior to buildings removal, and appropriate guidelines followed if they are found to be present on site, in consultation with Bat Conservation Ireland and NPWS;
- Vegetation removal will be restricted to 1 September to 1 March;
- Sediment and pollution control measures will be installed;
- Dust minimisation measures will be implemented;
- Pond B to be filled in outside of bird breeding season;
- The wet pasture fields in the southern section of the Site will be retained for lapwing and this area will be screened off from the Site prior to construction activities

commencing on Site. The screening will be put in place during 1 September to 1 March to avoid disturbance of lapwing during the breeding season;

- Native species will be planted in areas where hedgerows and woodland are to be created/enhanced; and
- A long-term management plan for the Site as outlined in the restoration plan will be implemented.

10.9 Residual

There will be some temporary loss of habitat during the restoration process. However, animals and birds present on the Site are accustomed to some disturbance and are likely to use some of the retained habitats and to move to similar ones that are common in the surrounding landscape during the restoration works, and are expected to return to the habitats created as part of the planned restoration works. It is anticipated that the habitats created as part of the restoration works will encourage the return of many species to the Site and that in the long-term there will be little residual effect. Once the recommended mitigation measures are implemented, the overall impact of the proposed restoration plan on flora and fauna at the Site will be positive.

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SITE SYNOPSIS

SITE NAME: POULAPHOUCA RESERVOIR SPA & NHA

SITE CODES: 004063, 000731

Poulaphouca Reservoir SPA, located in the western foothills of the Wicklow Mountains, was created in 1944 by damming of the River Liffey for the purpose of generating electricity from hydropower. The reservoir covers an area of approximately 20 square kilometres and is the largest inland water body in the mid-east and south-east regions. The reservoir receives water from two main sources, the River Liffey at the northern end, and the Kings River at the southern end. The exit is into the River Liffey gorge at the western end. Underlying the reservoir are sands and gravels deposited during the last glaciation. The shores of the lake are mostly sandy.

When water levels are low the exposed lake muds are colonised by an ephemeral flora of annual plant species. Wet grassland areas occur in sheltered bays around the lake but especially in the northern part. Reed Canary-grass (*Phalaris arundinacea*) is the main grass species present, but other plant species characteristic of wet grasslands occur, including Creeping Bent (*Agrostis stolonifera*), Meadowsweet (*Filipendula ulmaria*), Yellow Iris (*Iris pseudacorus*) and Water Mint (*Mentha aquatica*). Sedges (*Carex* spp.) are locally common, while Rusty Willow (*Salix cinerea* subsp. *oleifolia*) scrub is often found associated with the wet grassland. In some places the water washes against grassy banks which are generally less than a metre high, and in a few places there are steep sand and clay cliffs, up to 15 m high - these are remnants of the old River Liffey channel. In many places the banks are actively eroding, and a strip of conifers has been planted around much of the perimeter of the reservoir in an attempt to stabilise the banks.

Poulaphouca Reservoir is of international importance for its Greylag Goose population, which is one of the largest in the country. The Site provides the main roost for the birds, with feeding occurring mostly on improved grassland outside of the Site. An average peak of 1,058 individuals occurred during the five seasons 1995/96 to 1999/00. A range of other waterfowl species occur in relatively low numbers, including Whooper Swan (34), Wigeon (262), Teal (136), Mallard (283), Goldeneye (36), Cormorant (16), Great Crested Grebe (11), Curlew (118) and Mute Swan (17). The Site is also used by Grey Heron (12). The reservoir attracts roosting gulls during winter, most notably a large population of Lesser Black-backed Gull (1,116), which in Ireland is rare in winter away from the south coast. Black-headed Gull (1,245) and Common Gull (229) also occur. Breeding birds at the Site include Great Crested Grebe (several pairs), which is localised in its distribution in eastern Ireland, as well as Snipe and lapwing. The principal interest of the Site is the Greylag Goose population, which is of international importance. A range of other wildfowl species also occurs, including Whooper Swan, a species that is listed on Annex I of the E.U. Birds Directive. The Site is also notable as a winter roost for gulls, especially Lesser Black-backed Gull.

SITE SYNOPSIS

SITE NAME: RED BOG, KILDARE

SITE CODE: 000397

Red Bog, Kildare is located 3 km north of the village of Blessington in east Co. Kildare, close to the boundary with Co. Wicklow. It comprises a wetland complex of lake, fen and bog situated in a hollow between ridges of glacially-deposited material and underlain by rocks of Ordovician age.

The Site is a candidate SAC selected for transition mire, a habitat listed on Annex I of the E.U. Habitats Directive.

The shores of the lake are muddy and support such species as Bog Stitchwort (*Stellaria alsine*), Brooklime (*Veronica beccabunga*) and Soft Rush (*Juncus effusus*). Fringing the lakeshore is a narrow zone with emergent Soft Rush, Water-plantain (*Alisma plantago-aquatica*), Bottle Sedge (*Carex rostrata*), as well as the moss *Climacium dendroides*. In places, particularly at either end of the lake and along its south-eastern side, this zone grades into extensive areas of quaking scraw vegetation of dense Bogbean (*Menyanthes trifoliata*) and Marsh Cinquefoil (*Potentilla palustris*), accompanied by such species as Sharp-flowered Rush (*Juncus acutiflorus*), Cuckooflower (*Cardamine pratensis*), Marsh Speedwell (*Veronica scutellata*), Common Marsh-bedstraw (*Galium palustre*), Water Horsetail (*Equisetum fluviatile*), Common Sedge (*Carex nigra*), Common Spotted-orchid (*Dactylorhiza fuchsii*) and the mosses *Rhytidiadelphus squarrosus* and *Sphagnum squarrosum*. Bulrush (*Typha latifolia*) and areas of Willow scrub (*Salix* spp.) also occur in association with this vegetation.

The deeper water supports submerged aquatic plants such as Water-starwort (*Callitriche*) and Water-crowfoot (*Ranunculus* spp.), while in sheltered areas floating plants including Duckweed (*Lemna minor*) and the liverwort *Riccia fluitans* are found. At the north-east end of the Site bog vegetation has developed, with Ling Heather (*Calluna vulgaris*) and Hare's-tail Cottongrass (*Eriophorum vaginatum*) being the most frequent species. Other bog plants found here include Bog Asphodel (*Narthecium ossifragum*), Cross-leaved Heath (*Erica tetralix*), Tormentil (*Potentilla erecta*), Heath Wood-rush (*Luzula multiflora*), the mosses *Sphagnum palustre*, *S. capillifolium*, *S. subnitens*, *Hypnum cupressiforme*, *Polytrichum commune* and *Dicranum scoparium*, and the lichen *Cladonia portentosa*.

Red Bog is of ornithological significance and breeding birds recorded from the Site include Mute Swan, Mallard, Tufted Duck, Coot, Moorhen, Snipe and Black-headed Gull (< 20 pairs). Gravel extraction, drainage and eutrophication of the wetland from agricultural activities in the surrounding lands all pose a threat to the Site. Red Bog, Kildare is a site of particular conservation significance, supporting as it does, a good example of transition mire, a habitat that is listed on Annex I of the E.U. Habitats Directive.

13.06.2003

NPWS rare species data for 10km square N91

10KM SQUARE N91										
SPECIES	COMMON_NAME	LOCATION	10KM_SQ	FULL_GRID	RECORDED_DATE	HD_II	HD_IV	HD_V	WA_INCL_FPO	RED
<i>Acinos arvensis</i>	Basil Thyme	Rathmore	N91	N9010	1923				1	V
<i>Cervus elaphus</i>	Red deer	Stonebrook; Ballymore Eustace	N91						1	
<i>Cervus nippon</i>	Sika deer	Stonebrook; Ballymore Eustace	N91						1	

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Site evaluation scheme (NRA, 2006)

RATING	QUALIFYING CRITERIA
A	<p>Internationally Important</p> <p>Sites designated (or qualifying for designation) as SAC or SPA under the EU Habitats or Birds Directives</p> <p>Undesignated sites containing good examples of Annex I priority habitats under the EU Habitats Directive</p> <p>Major salmon river fisheries</p> <p>Major salmonid (salmon, trout or char) lake fisheries</p>
B	<p>Nationally Important</p> <p>Sites or waters designated or proposed as an NHA or statutory Nature Reserve,</p> <p>Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitat Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000.</p> <p>Major trout river fisheries</p> <p>Water bodies with major amenity fishery value.</p> <p>Commercially important coarse fisheries</p>
C	<p>High value, locally important</p> <p>Sites containing semi-natural habitat types with high diversity in a local context and a high degree of naturalness, or significant populations of locally rare species</p> <p>Small water bodies with known salmonid populations or with good potential salmonid habitat</p> <p>Sites containing any resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive</p> <p>Large water bodies with some coarse fisheries</p>
D	<p>Moderate value, locally important</p> <p>Sites containing some semi-natural habitat or locally important for wildlife</p> <p>Small water bodies with some coarse fisheries value or some potential salmonid habitat</p> <p>Any water body with unpolluted water (Q-value rating 4-5)</p>
E	<p>Low value, locally important</p> <p>Artificial or highly modified habitats with low species diversity and low wildlife value</p> <p>Water bodies with no current fisheries value and no significant potential fisheries value</p>

Criteria for assessing the impact significance (NRA, 2006)

IMPACT LEVEL	SITE CATEGORY*				
	A INTERNATIONALLY IMPORTANT	B NATIONALLY IMPORTANT	C HIGH VALUE, LOCALLY IMPORTANT	D MODERATE VALUE, LOCALLY IMPORTANT	E LOW VALUE, LOCALLY IMPORTANT
Severe negative	Any permanent impact	Permanent impacts on a large site			
Major negative	Temporary impacts on a large part of a site	Permanent impacts on a small site	Permanent impacts on a large part of a site		
Moderate negative	Temporary impact on a small part of the Site	Temporary impact on a large part of the Site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site	
Minor negative		Temporary impact on a small part of the Site	Temporary impact on a large part of the Site	Permanent impacts on a small part of a site	Permanent impacts on a large part of a site
Neutral	No impacts	No impacts	No impacts	No impacts	Permanent impacts on a small part of a site
Minor positive				Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site
Moderate positive			Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site	
Major positive		Permanent beneficial impacts on a small part of a site	Permanent beneficial impacts on a large part of a site		

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LIST OF TABLES

Table 1	List of species recorded: conservation status and breeding status with minimum number of territories
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1.0 BREEDING BIRD SURVEY WALSHSTOWN

1.1 Introduction

A breeding bird survey was carried out on 12 June 2008 by Golder Associates, at a former quarry site in Walshestown, Naas, Co. Kildare. The aim of this survey was to determine bird species currently breeding on the site and establish the potential impact of the planned restoration on the birds.

1.2 Methodology

The bird survey methodology comprised a field survey using appropriate breeding bird survey methodologies as described in Gilbert *et al.*, (1998) and similar to the Countryside breeding bird survey methodology used by Royal Society for the Protection of Birds (RSPB).

Bird species observed during the survey were recorded and counted by an experienced ornithologist using Mullarney *et al.*, (1999) as a field identification reference, if required. Species of conservation concern (Lynas *et al.*, 2007) were noted and breeding behaviour amongst all species was recorded. Particular attention was paid to checking waterbodies and associated wet grassland areas for waterfowl, which had been observed on the Site during earlier surveys.

No significant limitations existed to the survey as breeding birds were surveyed at appropriate times of the year, thus all summer migrants and resident species would be detected if present.

1.3 Existing Environment

The area surveyed includes formerly quarried areas with associated water-filled lagoons, a dried-out recolonising silt lagoon, spoil heaps, exposed sand faces, and recolonising areas, as well as offices, processing structures, mature hedgerows, treelines, and extensive areas of grassland; hereafter referred to as “the Site”. The Site is adjacent to Punchestown Racecourse.

A range of habitats exist, and these habitats influence the diversity, range and abundance of bird species recorded. Habitats noted include:

- A former quarry containing associated buildings, processing areas, spoil heaps and bare ground areas. The former quarry occupies the majority of the northern area of the Site;
- Water-filled lagoons, which are being colonised by a range of plant species, and dried-out recolonising silt settlement ponds;

- Mature hedgerows and treelines form the boundary of the Site. Leyland Cypress (*Cupressocyparis x leylandii*) treelines are planted along the northern boundary of the Site, and along the top of a screening earth bank near the processing area;
- Wet grassland with elements of improved grassland occupies much of the southern area of the Site;
- Patches of gorse (*Ulex europaeus*) scrub occur throughout the Site;
- Species-rich dry calcareous grassland occurs to the north of the Site; and
- Rank areas of tussocky grassy verges occur in several areas throughout the Site.

1.4 Survey Results

All species noted are listed in Table 1 below. This table details each species with its Irish conservation status, breeding status on the Site and the minimum number of recorded breeding territories within/ including the Site.

Overall the Site has a moderate diversity of birds which reflect the range of habitats described, existing within the Site boundary.

1.4.1 Species of Conservation Concern

One red listed species of high conservation concern was recorded on the Site; this is Lapwing (*Vanellus vanellus*). Lapwing is a species of high conservation concern as a result of a population decline of $\geq 50\%$ over the past 25 years.

Lapwing: A flock of at least 30 individuals was observed on a bare area of ground to the south of the southernmost water-filled lagoon. At least 5 of these remained in a territorial position when the remainder of the flock were alarmed and took flight; direct evidence of the holding of breeding territory by Lapwing in this area.

Amber listed species of moderate conservation concern, confirmed breeding/ holding territories on the site, include:

Swallow: These were observed to be nesting in the disused buildings at the northeast of the Site in the old processing facility, and several individuals were noted foraging throughout the Site.

Sand martin: A colony of six active burrows exists in a stockpile opposite the buildings in the processing area were noted. A second colony was observed on a low stockpile by a track towards the centre of the Site (Photo 1). A third colony was noted next to the lagoon in an

exposed sandy face towards the centre of the Site. At least 40 burrows were counted in this colony, and at least 20 were active. Sand martin was observed foraging over the dried silt lagoon area, and the water-filled lagoons to the northwest of the Site.



Photo 1. Sand martin colony

Starling: A flock of starling (ca. 80 individuals) were present on the stockpiles abutting the processing machinery.

Skylark: Several pairs were noted holding territories in areas of the Site including the recolonising silt lagoon to the north of the Site, and in the wet grassland area towards the centre of the Site.

Snipe: Individual birds were flushed from long grass in the wet grassland area towards the centre of the Site over winter months.

Coot: 6 individuals were noted on the largest water-filled lagoon to the northwest of the Site and at least one pair was nesting.

Little grebe: A pair (probably breeding) was observed on the largest water-filled lagoon towards the northwest of the Site.

1.4.2 Other species

All other bird fauna confirmed holding territories are common species. These species included:

- The summer migrant willow warbler which occurred in an area of hedgerow and scrub;
- Species typical of open ground, wet grassland and scrubby areas such as meadow pipit (common);
- Waterfowl species present on the Site included mallard and moorhen;
- Scavenger species on the Site included one individual hooded crow;
- Species not breeding but recorded as feeding here included coal tit (several);
- Common resident species were concentrated in the treelines and scrub areas. These included wood pigeon, great tit, rook (abundant), wren, robin, blackbird, song thrush, chaffinch; and
- Pied wagtail were observed by lagoon edge and pools across the site.

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Table 1 List of species recorded: conservation status and breeding status with minimum number of territories

Species	Latin Nomenclature	Conservation Status ¹	Minimum No.s Breeding Pairs
Swallow	<i>Hirundo rustica</i>	amber	3B
Sand Martin	<i>Riparia riparia</i>	amber	30B
Starling	<i>Sturnus vulgaris</i>	amber	(80)
Rook	<i>Corvus frugilegus</i>	green	(20)
Blackbird	<i>Turdus merula</i>	green	2B
Chaffinch	<i>Fringilla coelebs</i>	green	2B
Robin	<i>Erithacus rubecula</i>	green	1B
Woodpigeon	<i>Columba palumbus</i>	green	3B
Willow Warbler	<i>Phylloscopus trochilus</i>	green	2B
Meadow Pipit	<i>Anthus pratensis</i>	green	3B
Skylark	<i>Alauda arvensis</i>	amber	6B
Song Thrush	<i>Turdus philomelos</i>	green	1B
Coal Tit	<i>Parus ater</i>	green	(12)
Great Tit	<i>Parus major</i>	green	1B
Wren	<i>Troglodytes troglodytes</i>	green	4B
Pied Wagtail	<i>Motacilla alba</i>	green	1B
Lapwing	<i>Vanellus vanellus</i>	red	4B
Snipe	<i>Gallinago gallinago</i>	amber	(3)
Coot	<i>Fulica atra</i>	amber	1B
Tufted Duck	<i>Aythya fuligula</i>	amber	(1)
Little Grebe	<i>Tachybaptus ruficollis</i>	amber	1B
Mallard	<i>Anas platyrhynchos</i>	green	1B
Moorhen	<i>Gallinula chloropus</i>	green	1B
Hooded Crow	<i>Corvus cornix</i>	green	(1)

B = Number of breeding territories confirmed (i.e. male bird holding territory or male/ individual in suitable habitat in breeding season)

b = Attracted to site for feeding probably breeding in the wider area but not confirmed breeding on site.

Bracketed Italicised numbers are counts of birds feeding on the site only.

¹ Conservation status (Lynas et al., 2007): Red = species of high conservation concern, amber = species of moderate conservation concern and green = species not currently of conservation concern.

1.5 Evaluation and Recommendations

Overall the Site has important ecological value for Lapwing, a Red listed species and some local ecological value for other breeding birds. Habitats and species particularly notable are:

1. An important section of the site for birds is the semi-improved wet grassland section edging the lagoon in the southern part of the Site. This area is currently used by breeding Lapwing, along with snipe, meadow pipit and skylark. The area is lightly grazed which has maintained the suitability of this habitat for these bird species. The planned restoration of the Site, includes the retention of this wet grassland along with one of the water features (Section 10.8.3) as well as the creation of new habitats. These will be managed longterm by light grazing to provide a short wet grassland sward, suitable for Lapwing amongst other bird species, to maintain current conditions. Scrapes will be incorporated into the surrounding area as nesting habitat for Lapwing. The proposed management of the restored area as a semi-natural grassland may in addition attract other bird species.
2. The presence of several small breeding colonies of sand martin in spoil heaps and exposed sandy faces at the Site. If it is not possible to provide alternative habitat for the sand martin during the restoration process, restoration works in these areas will be carried out outside of the main bird breeding season (1 March to 1 September).
3. The water-filled lagoons on the Site provide breeding and feeding habitat for a range of waterfowl, including little grebe, mallard, coot and waterhen. Some of the existing lagoons of the Site will be removed as part of the planned restoration, with one water feature retained in the northern part of the Site. The provision of this feature in the restoration plan aims to provide habitat for waterfowl present on the Site. Associated ditches and wetland will also be created to provide important fringing habitat, transition areas and refuge for the birds.
4. Other areas of note used by birds are screening treelines and hedgerows bordering the Site, scrub areas and rank grassland habitats. The screening treelines and hedgerows around the border of the Site are to be retained, and new hedgerows created within the Site as part of the restoration plan. Areas of gorse scrub will be developed throughout the Site and an ungrazed meadow area to the north of the Site will replace the current extent of rank grassland on the Site. These restored areas will have minimal human disturbance and with some grazing from the resident rabbit population will add a diversity of structure to the Site. These habitats will be of value to a range of bird species currently present on the Site, and those in the surrounding area.

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P1 Dry calcareous grassland (GS1) with mature hedgerow (WL1)



P2 Dry tussocky meadow (GS2), to south of quarry area



P3 Wet grassland (GS4)



P4 Wet drain with extensive moss cover (GS4)



P5 Gorse scrub (WS1)



P6 Water-filled lagoons to northwest of Site (FL8)



P7 Partially recolonised lagoon (FL8) to south of quarrying area



P8 Former silt settlement pond (FL8) at Site entrance



P9 Sand martin nests in exposed sandy cliff face



P10 Spoil and bare ground (ED2) (sand martin nests in spoil heap)



P11 Recolonising bare ground (ED3)



P12 Buildings and artificial surfaces (BL3)