

14.1 Introduction

This flora and fauna impact assessment has been prepared by Robertson & Associates. It qualitatively assesses the proposed development of an organic waste composting facility at Pass of Kilbride, Co. Westmeath within the context of the potential direct, indirect, secondary and cumulative impacts upon the flora and fauna presently existing on-site, and in the immediate environs.

The proposed development comprises a 4.8 hectare facility in a 17.5 hectare site. The boundary of the study area is indicated in Figure 14.1. The site is located to the west of a county road connecting Correllstown on the N4 to Pass of Kilbride on the N6 and is accessed by a small road from this county road. The majority of the land is presently under arable use.

The site itself is classified as Greenfield, comprised of a large barley field, a remnant blanket bog, some bog woodland and associated hedgerows with the exception of the raised bog. The topography of the site is generally flat, with some minor undulations and slopes towards a drainage ditch to the north of the site. While the majority of the subject land itself is heavily anthropogenically influenced there are some natural habitats both within and outside of the site, which contain a number of semi-natural habitats of ecological significance.

The study area contains cultivated land habitats, freshwater, grassland, peatland, and woodland, while the surrounding environs contain grassland, woodland and built land habitats. Detailed habitat descriptions are provided later under section 14.3, Receiving Environment.



Plate 1. View of development area facing east

14.2 Methodology

A qualitative baseline study of the subject site and its environs was carried out 15th March 2004 and 20th April 2004. During these site visits a detailed and comprehensive account of the floral and faunal composition encountered during the survey was recorded. This, combined with desktop consultations of the following resources produced the finalised baseline report as presented.

- O.S. maps for Pass of Kilbride
- Site Location Map
- National Parks and Wildlife, The Department of the Environment, Heritage and Local Government.
- RT Cullen preliminary ecological constraint report.

The proposed development site was surveyed using methodology outlined in the Joint Nature Conservancy Council's Phase I Habitat Survey Techniques (JNCC, 1993). The principal habitats present within the site were identified and classified using the Heritage Council's A Guide to Habitats in Ireland (Fossitt, 2000). The dominant species were noted and a species list compiled for each habitat represented.

Floral nomenclature follows An Irish Flora (Webb, Parnell & Doogue, 1996) for latin names and the Census Catalogue of the Flora of Ireland (Scannell & Synnott, 1987) for common names. Nomenclature for horticultural species follows the Royal Horticultural Society's Encyclopaedia of Garden Plants (Brickell, 1998).

Faunal identifications were confirmed using the following sources:

- The Macmillan Guide to Birds of Britain & Europe, Macmillan 1998,
- Collins Bird Guide, HarperCollins 2001
- Exploring Irish Mammals, Dúchas The Heritage Service 2001.

As opposed to floral investigations, the surveying of faunal usage of subject lands cannot be based upon direct sightings alone. The presence of fauna is substantiated through the detection of field signs such as tracks, habitats, markings, feeding signs, and droppings, as well as by direct observation. Likewise, bird species present on site are recorded along with any notable avifauna habitats, droppings, or tracks. The likely species were assessed in relation to the habitats present within the site.

14.2.1 Designated areas and protected species

The subject lands are not under any designation as per the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997). Nor is the site registered for containing any species under the Wildlife (Amendment) Act, 2000.

The lands located directly south of the subject site are however designated as a Natural Heritage Area (NHA) referred to as the Miltownpass Bog NHA. Miltownpass Bog NHA is a site of considerable conservation significance comprising a raised bog that includes both areas of high bog and cutover bog. Raised bogs are classified as an Annex 1 habitat within Council Directive 92/43/EEC on the Conservation of Natural habitats

and of Wild Fauna and Flora. The bog has pools present and is wet and quaking in places. The wet areas are formed by re-wetting of depressions on the high bog surface caused by subsidence. There is very little drainage on the high bog and no forestry. Cutover however is found all around the high bog margin with encroaching scrub and a forestry plantation. Broadleaved woodland occurs to the west of the site. The NHA supports a good diversity of raised bog microhabitats, including hummocks and pools and due to its easterly location; it is of bio-geographical importance.

A list of other designated areas occurring within a 10km radius of the site are provided below

Status	Name	Site code	Distance from site
NHA	Royal Canal	2103	4km N
SAC	Mount Hevey Bog	2342	10km NE
SAC	Lough Ennel	685	10km W
NHA	Woodown Bog	694	10km NW

14.3 Receiving Environment

As mentioned previously the subject lands for the proposed organic waste composting facility are comprised of a single large barley field, with a remnant bog and small area of bog woodland within the subject lands but outside of the development boundary. The site is accessed by a small road lying to the west of a county road connecting Correllstown on the N4 to Pass of Kilbride on the N6. The subject site hinterland is classified as rural comprised of a mixture of arable, pastoral and peat extraction.

Based on Ordnance maps for the area, the subject lands were once divided into a number of smaller fields with a drainage ditch running from the raised bog area in the west of the lands to the county road to the east of the lands. Today there is no trace of the old field boundaries nor of the drainage ditch which must have been removed some time in the past to make the field more efficient for arable use. In between the initial site visit and the second site visit, further anthropogenic influences have come to play within the subject lands, whereby substantial portions of the barley field have been prepared for imminent commercial mixed conifer and broadleaf planting.

In the immediate vicinity there is some coniferous forestry to the west of the remnant raised bog, and a drainage ditch which runs along the northern boundary of the subject lands. The east of the site is bordered by the county road, and further east from that are some wet grassland and peatland habitats which are presently being extracted. The southern extent of the subject lands are delimited by a small access road which most likely served to provide access to a farmhouse directly south of the subject lands that is now derelict. This small access road forms the northern boundary of the Milltownpass Bog NHA. Between the bog and the access road lies a band of mature bog woodland and some rank fields associated with the aforementioned farmhouse.

Sparse hedgerows run along the northern, eastern and southern perimeters of the subject lands.

The subject lands and those lands to the north and east of the site are heavily anthropogenically influenced. The raised bog in the western portion of the subject lands, outside of the development boundary has become isolated and fragmented due to peat extraction and active drainage. The bog woodland to the south of the subject lands shows signs of afforestation, however they still form a valuable ecological buffer for the Milltownpass Bog. Aside from some isolated undulations, the site is quite flat, with a noticeable slope towards the drainage ditch along the northern boundary.

There is a relatively high diversity of habitats within the site, and correspondingly a high diversity of species. The habitat types identified during the survey fall under the following categories:

- Freshwater Habitat (within subject lands)
- Grassland Habitat (outside of subject lands)

- Peatland Habitat (within subject lands, outside development boundary)
- Woodland Habitat (within and outside of subject lands)
- Cultivated Land (within subject lands)
- Built Land (outside of subject lands)

Floral species lists for each habitat is given in Appendix 14.1. Figure 14.1 provides a habitat map depicting the extent of each habitat described both within and outside of the subject lands.

14.3.1 Habitats within the Subject Lands

Freshwater Habitat

As can be seen in Figure 14.1 this classification is comprised of a drainage ditch which runs along the northern boundary of the subject lands.

Drainage Ditches (FW4)

This ditch was approximately 2m wide with steep grassed sides and a moderate flow in an easterly direction. The substrate was comprised of peaty silt. Vegetation within the ditch was quite diverse dominated by fool's watercress (*Apium nodosum*), flag iris (*Iris pseudocacorus*), floating sweetgrass (*Glyceria fluitans*) and bog pondweed (*Potamogeton polygonifolius*); a plant that is characteristic of acidic drainage ditches. Submerged vegetation was comprised of perfoliate pondweed (*P. perfoliatus*) and some young branched bur reed (*Sparganium erectum*) was also noted. Wherever the banks of the ditch opened out marsh marigold (*Caltha palustris*) dominated.

The grass component of the ditch bank was dominated by reed sweetgrass (*G. maxima*), tufted hair grass (*Deschampsia caespitosa*) and Yorkshire fog (*Holcus lanatus*), along with stands of false oat grass (*Arrhenatherum elatius*). In addition to the grasses, hart's tongue (*Asplenium scolopendrium*), ivy (*Hedera helix*), dock (*Rumex sanguineus*), water chickweed and ground elder (*Aegopodium podagraria*) was noted.

Mammals

No signs of otter (*Lutra lutra*) or mink (*Mustela vison*) activity were noted along the area surveyed. Otters and mink are unlikely to utilise the agricultural and peat land within the study area due to its open exposed nature, and the lack of deep water and prey items available.

Avifauna

No avifauna were noted using the drainage ditch during the time of the survey. While none were spotted it would be expected to see possibly a dipper (*Cinclus cinclus*).

Fish

The ditch flows into the Kinnegad River approximately 200m to the east of the subject lands. The Kinnegad River is known to support salmonid (trout and salmon) populations and spawning grounds. While the ditch itself does not provide a suitable substrate for salmon spawning, the quality of this water directly affects the quality of the Kinnegad River.

Amphibian

It should be considered highly likely to discover frogspawn (*Rana temporaria*) within the ditch during the spring months.

Invertebrate

Intensive invertebrate usage of the ditch was not evident due to the time of the year that the survey was carried out. However later on in the year it would be expected to see dragonflies, crickets, grasshoppers, hoverflies, beetles, butterflies, moths and various arachnids. More invertebrates with aquatic stages in their life cycle are likely to be particularly abundant throughout the summer months.

Peatland Habitat

The western section of the subject lands contains the remnants of a raised bog (PB1). This habitat is outside of the development boundary but was included in the assessment.

Raised Bog (PB1)

Historically this raised bog habitat was much larger in extent most likely extending further into the subject lands. However centuries of extraction, agriculture and forestry have resulted in this diminished bog area. This bog remnant may have once been connected to Milltownpass Bog, however it is no longer attached. The bog is drained by drainage ditches to the north, west and south, and there is evidence of recent on-going extraction along the eastern face.

Notwithstanding the fact the bog is isolated and just 0.4 hectares in extent, it contributes significantly to the overall species diversity of the subject lands. Bogs are a very heterogeneous habitat, providing many niche micro-habitats which are exploited by particular species. The zonation of these microhabitats are determined principally by water content and to a lesser degree exposure and can vary over a matter of centimetres. All raised bogs are acidic and as such all floral species within a raised bog are tolerant of low levels of pH. An understanding of the importance of the hydrological and micro-structure of a raised bog is necessary to understand the potential indirect impacts that a proposed development can bring about.

While it is stated previously that raised bog habitats are very heterogeneous on the micro-scale, this particular habitat is homogeneous on the macro-scale, as in that it does not contain any bog pools, or wet quaking areas. The periphery of the bog is cutover however not to a high degree, and as such there is little variation in this structure.

The raised bog habitat is relatively wet, vegetated principally by Ling (*Calluna vulgaris*) on the slightly drier areas and by bell heather (*Erica cinerea*) and cross leaved heather (*C. tetralix*) in the wetter areas.

Bog rush (*Schoenus nigricans*), tufted hair grass and deer grass (*Trichophorum caespitosum*) comprised the grassy component of the hummocks and drier areas while the wetter areas and hummocks were dominated by sedge such as white beaked sedge (*Rhynchospora alba*). *Carex diandra*, a frequent sedge in midland lowland bogs, but rather rare elsewhere throughout the country was also noted in this habitat and remote sedge (*C. remota*) appeared in greater abundance towards the edge of the habitat by the birch woodland.

Flowering plants noted during the survey were just comprised of bog asphodel (*Narthecium ossifragum*), however it would also be expected to find round-leaved sundew (*Drosera rotundifolia*) within this habitat.

The lichen component of the flora of this habitat was characterised by *Cladonia portentosa* which was ubiquitous amongst the Ling heather and *C. floerkeana* growing on the bare sides of peat hummocks. On the horizontal, wetter areas *C. polydactyla* was growing with the sphagnum mosses.

As it is expected with a raised bog, the greatest diversity was attributed to the mosses (Order Bryophyta), which were dominated by the Sphagnum species. Overall the moss community was characterised by swaths of *Sphagnum capillifolium* mixed with *S. magellanicum*. Clumps of *S. compactum* were prevalent on top of the hummocks with *Dicranum majus* being found on the drier hummocks. The base of the hollows where it was the wettest were characterised by *S. papillosum*, while other more generally wet areas were comprised of mats of *Aulacomnium palustre*, *S. magellanicum*, and *S. cuspidatum*. Loose mats of *Hypnum jutlandicum* were noted throughout the habitat but to a lesser degree on top of the hummocks.

Mammals

No mammals, nor signs of any mammals were noted during the survey. Given the proximity of the bog habitats to the bog woodland adjacent to it, which as described in the following pages supports active badger (*Meles meles*) setts, the bog habitat undoubtedly provides a transitory and foraging role for badgers. It would also be expected to find mountain (Irish) hare (*Lepus timidus hibernicus*) within this habitat.

Avifauna

During the survey a total of four snipe (*Gallinago gallinago*) were flushed from this habitat and three lapwing (*Vanellus vanellus*) were noted flying overhead. Two of these lapwing were male and were performing display flights over the bog habitat. Both of these birds are typical of wet habitats within agricultural areas. A total of five skylark were also noted singing over this habitat. A male pheasant (*Phasianus colchicus*) was noted on one of the peatlands to the east of the subject lands, and it would be considered likely that this species also uses this bog habitat.

No nests were noted during the time of the survey, however it should be considered likely that snipe could nest within this habitat.

Invertebrates

No invertebrate species were encountered during the survey.

Woodland Habitat



Plate 2. Bog woodland within subject lands. Note badger setts

As stated previously the subject lands have very sparse hedgerows (WL1) located along the northern, eastern, and southern boundaries of the site. In addition to this there is a small area of bog woodland (WN7) situated to the north of the remnant raised bog.

Hedgerows (WL1)

The hedgerows were shrubby in character being dominated by hawthorn (*Crataegus monogyna*) with the occasional ash (*Fraxinus excelsior*) forming a canopy layer. Holly (*Ilex aquifolium*) and gorse (*Ulex europaeas*) formed the scrub layer and brambles (*Rubus fruticosus* agg.) were noted on the ground. The hedgerows along the north and east were extremely gappy, providing little to no cover and as such there was no related ground layer vegetation. Along the southern boundary hedgerow cover was somewhat more dense, permitting species such as hard fern (*Polystichum setiferum*), hart's tongue, ivy, nettle, and bush vetch (*Vicia sepium*) to grow in the ground layer.

Bog Woodland (WN7)

This is a small woodland located on the periphery of the raised bog habitats. The canopy is comprised solely of birch (*Betula pubescens*) and was fairly dense. Gorse formed a thick scrub layer around the edge of this habitat and was also present intermittently throughout the shrub layer of the habitat. Ground flora was dominated by bracken (*Pteridium aquilinum*) along with brambles, ivy, tufted hair grass, cocksfoot (*Dactylis glomerata*), sweet vernal grass (*Anthoxanthum odoratum*), remote sedge and soft rush (*Juncus effusus*) in wetter areas. It would be expected to find some greater woodrush (*Luzula sylvatica*) at a later stage in this habitat.

There was quite an extensive cover of mosses with *Hypnum cupressiforme* and *Thuidium tamarifascinum* present on the ground. *Polytrichum formosum* and *Mnium hornum* were noted on the base of the trees with *Byrum capillare* noted further up. The moss *Neckra complana* was found on tree trunks where there was more gorse cover and hence more shade. Lichen cover on the trees was quite good, indicating good air quality including *Cladonia polydactyla*.

Mammals

Hedgerows often act as wildlife corridors allowing mammal species to move and disperse between habitats. They can be important for bat species which use them as navigational guides and sometimes they may roost in mature hedgerow trees.

No direct sightings of mammals within the hedgerow habitat were made during the walkover survey. However as mentioned above a number of badger setts were noted within the bog woodland. Two of these setts were very active while the remaining five are probably inactive but can easily be re-used again. Signs that badgers were lining the inside of the setts with barley from the adjacent habitat were prevalent during the time of the survey. Despite the apparent wetness of the peat, this small bog woodland is clearly an important area for badgers.

House mouse (*Mus musculus domesticus*) and brown rat (*Rattus norvegicus*) may use the hedgerow habitat for shelter and feeding purposes. Due to lack of structure and maturity the hedgerows themselves are unlikely to be used as roosting locations or feeding grounds for bat species, however all hedgerows can be used as navigational aids for bats roosting in the area. The low flora diversity, height and cover provided by the hedgerow means that it is unlikely to be of high value for mammal species.

Avifauna

Hedgerows can provide important habitats for a variety of bird species. They provide valuable feeding resources in the form of seeds and berries. In addition they provide nesting sites and shelter from weather conditions as well as good cover from predators.

The relative lack of species diversity and cover within the hedgerow habitat when compared with off-site woodland areas mean that little avifaunal usage of the hedgerows was noted during the survey. Those recorded include; blackbird (*Turdus merula*), robin (*Erithacus rubecula*), and magpie (*Pica pica*). Additional species which may use this habitat would include; blue tit (*Parus caeruleus*), song thrush (*Turdus philomelos*), chaffinch (*Fringilla coelebs*), wren (*Troglodytes troglodytes*) and sparrow (*Passer domesticus*).

Invertebrates

Hedgerows may support a variety of invertebrate fauna, despite the fact that these species are often inconspicuous and not always easily seen (a hawthorn tree is known to support over one hundred different insect species alone). Detailed invertebrate analysis was not carried out and due to the time of year very few species were noted. However a range of invertebrate fauna would be expected to be present in this habitat including; earthworms, snails, slugs, woodlice, spiders and beetles.

Overall the hedgerow habitat provides a low diversity of flora and fauna and is of low local ecological value. The bog woodland however is of high local ecological value due to the badger population that it supports.

Cultivated Land

As can be seen in Figure 14.1 this category comprises the majority of the subject lands.

Arable crops (BC1)

At the time of surveying the lands this habitat had been harvested and as such it was easier to examine the perennial vegetation growing beneath the crops in this field. The dominant vegetation within this habitat is of course barley (*Hordeum distichon*) which is grown each year for animal fodder, however below the barley there is a considerable grass layer comprised of Yorkshire fog, annual meadow grass (*Poa annua*) and cocksfoot. There are a few locations within the field where it is noticeably damper and here tufted hair grass and soft rush were noted. Remote sedge was noted throughout the field and in the wetter areas at the western edge of this habitat yellow sedge (*C. viridula subsp. oedocarpa*) was noted. This sedge is frequently found growing in wet areas by the edge of bogs. The ruderal component of this habitat was comprised of knotgrass (*Polygonum aviculare*), ragwort (*Senecio jacobaea*), germander speedwell (*Veronica chamaedrys*), forget-me-knot (*Myosotis arvensis*), common dock (*Rumex sp.*), sheep sorrel (*R. acetosella*), and creeping thistle (*Cirsium arvense*).

The grassy verges along the perimeter of the field were vegetated with Italian rye-grass (*Lolium multiflorum*) and velvet bent (*Agrostis canina*), along with a mixture of wild oat (*Avena fatua*), annual meadow grass, and creeping bent (*Agrostis stolonifera*) along with nettles, ragwort, willowherbs, and thistles (*C. arvense* and *C. vulgare*). During the summer months it would be expected to see the following species growing in the grassy verge; yellow vetchling (*Lathyrus aphaca*), white campion (*Silene latifolia*), red deadnettle (*Lamium purpureum*), nipplewort (*Lapsana communis*), hedge woundwort (*Stachys sylvatica*), figwort (*Scrophularia nodosa*).

During the second site visit this particular habitat had been quite altered. A substantial portion of the field has been prepared for coniferous planting. An approximate 80m wide band of soil along the southern, eastern and northern boundaries of the field have been dug and prepared for tree planting. While the trees have not yet been planted, it is understood that they will be planted imminently and will consist of 85% Norway spruce (*Picea abies*) and 15% broadleaf mixture of willow (*Salix spp.*), birch (*Betula pubescens*), holly (*Ilex aquifolium*), alder (*Alnus spp.*), and hazel (*Corylus avellana*). The 15% broadleaf mixture will be divided between two planting areas; one stretch along the eastern boundary beside the public road, and the second forming an ecological corridor between the remnant bog and the NHA.

Mammals

A total of two burrows were located within the field during the time of the survey which were either used by rabbit (*Oryctolagus cuniculus*) or Irish mountain hare. These burrows are now abandoned, being used during the summer months. When the barley crops within the field are fully grown the crop provides ideal coverage for such animals as rabbit or hare.



Plate 3. View from cutover edge of remnant bog within subject lands facing east (outside development boundary)

No other mammal species were recorded during the time of survey, however this habitat it is likely to be valuable for several other mammal species. Its proximity to associated hedgerows and drainage ditches adds to the value for mammals. Species such as hedgehog (*Erinaceus europaeus*), pygmy shrew (*Sorex minutus*), wood mouse (*Apodemus sylvaticus*) and brown rat (*Rattus norvegicus*) will almost certainly make use of the grassy field verges for transit purposes, moving between feeding and shelter areas.

Fox (*Vulpes vulpes*) is likely to be found in the surrounding farmland and is likely to make use of the grassy verges for transit purposes and for hunting prey items.

Avifauna

Little usage by avifauna of this habitat was noted during the time of the survey however, the grassy field verges support good invertebrate life which provides prey items for a range of bird species. It is expected that a range of birds may feed within this habitat including for example; woodpigeon (*Columba palumbus*), robin, stonechat (*Saxicola torquata*), blackbird, song thrush (*Turdus philomelos*), wren, coal tit (*Parus ater*), blue tit (*Parus caeruleus*), great tit (*Parus major*), chaffinch (*Fringilla coelebs*), goldfinch (*Carduelis carduelis*), greenfinch (*Carduelis chloris*) and bullfinch (*Pyrrhula pyrrhula*).

Invertebrates

Good invertebrate usage within this habitat was not evident during the survey. Seven spot ladybird (*Coccinella 7-punctata*), the hoverfly *Syrphus ribesii* and aphid (*Macrosiphum rosae*) were noted.

Additional invertebrate groups likely to be found within this habitat include flies, crickets, grasshoppers, moths, dragonflies, damselflies, ants, beetles, spiders, slugs, millipedes and worms.

14.3.2 Habitats within the Surrounding Area

As stated previously the lands to the north of the site are under pastoral use classified as wet grassland (GS4), and the lands to the east of the subject lands are comprised of a mixture of wet grassland (GS4) habitats and raised bog habitats (PB1) which are presently being extracted. A conifer plantation (WD4) is located to the west of the subject lands.

Of importance however are the adjacent lands located directly to the south of the subject site which are designated under Statutory Instrument No. 600 of 2003 as a Natural Heritage Area. These lands are designated because of the raised bog habitat located in the centre of them, the particulars of which have been described in Section 14.2 "Designated Areas and Protected Species". Between the raised bog and the subject lands there is a derelict farmhouse (Building and Artificial Surfaces, BL3) with some rank fields (Wet grassland, GS4) and a bog woodland (WN7). In light of the designated status of these lands, these areas were also surveyed.

Bog Woodland (WN7)

While this area of woodland primarily falls within the habitats category of bog woodland, there are many anthropogenic influences which have resulted in the introduction of species not normally associated with bog woodland.

Overall the canopy is well established and mature comprised of ash, Scot's pine (*Pinus sylvestris*) and birch, along with some sycamore (*Acer pseudoplatanus*). The subcanopy was dominated by alder (*Alnus glutinosa*), while holly (*Ilex aquifolium*) and hawthorn contribute to the scrub layer. Ground flora comprised of ivy, brambles, bracken, sweet vernal grass, cocksfoot, and Yorkshire fog. Closer towards the bog, gorse starts to appear within the shrub layer, and heathers (ling and bell heather) occur in the ground layer.

Outside of the derelict farmhouse there were a number of planted oak (*Quercus robur*) trees and the ground flora underneath them was dominated by a cover of ramsons (*Alium ursinum*).

One of the drainage ditches within the subject lands appears to feed into one area of this woodland contributing to slightly wetter conditions. This area of woodland is dominated by birch with some osier (*Salix viminalis*) growing around the edge. The ground layer is dominated by grasses such as sweet vernal grass,

tufted hair grass, velvet bent and cocksfoot, along with some heathers (bell and Ling). Remote sedge was also noted in this area. There is evidence of birch coppicing throughout this habitat.

Further into the woodland, to the north west of the Mitlowpass raised bog there are signs of afforestation with some immature Norway spruce (*Picea abies*). Here the ground flora is dominated by Ling heather with occasional inclusions of gorse and bracken.



Plate 4. Bog woodland outside of Subject lands in NHA

Wet Grassland (GS4)

This is comprised of a number of small fields which were associated with the farmhouse. These fields may have been used at one time for the grazing of livestock, however they have since become very rank. Local hydrological conditions mean that these fields are periodically inundated to the extent that they are characterised by more wet grassland species.

The herbaceous layer is less dominant in this habitat with sweet vernal grass, crested dog's tail (*Cynosurus cristatus*) and soft rush being more prevalent within the sward, however it was still dominated by the meadowgrasses and perennial ryegrass.

Ground cover such as forget-me-not, greater plantain (*Plantago major*), and ragwort seemed to prevail in this area with a noticeable decrease in broad-leaved dock.

Building and Artificial Surfaces (BL3)

The derelict farmhouse has fallen into bad repair. The walls of the building were covered in ivy. The original roof has disappeared and is replaced with corrugated sheeting. There was no ground flora growing within the remains.

Mammals

No direct sightings of mammals were made during the walkover survey. However, species likely to be found within the NHA would include house mouse (*Mus musculus domesticus*), brown rat (*Rattus norvegicus*), rabbit and mountain Irish hare. Species such as hedgehog, pygmy shrew and wood mouse may also be present in the NHA. Due to the high degree of connectivity between most of the habitats in this NHA it is considered highly likely to be used by mammals.

A daytime visual survey of the derelict farmhouse was made for the presence of bat species. There were no basements and the roof was exposed facilitating an easy visual assessment. No bats, nor signs of any bat roosts were noted. A brief visual survey of the building walls was also conducted. The walls contain a number of small cracks and crevices; however no signs such as marking, droppings or urine stains were noted.

Avifauna

Avifaunal usage of the bog woodland in the NHA was very high during the time of the survey, principally dominated by passerines. Amongst the birds noted were song thrush (*Turdus philomelos*), great tit (*Parus major*), tree sparrow (*Passer montanus*) and chaffinch (*Fringilla coelebs*).

It would also be expected find sky lark (*Alauda arvensis*), yellowhammer (*Emberiza citrinella*), reed bunting (*E. schoeniclus*), magpie (*Pica pica*), blackbird (*T. merula*), robin (*Erithacus rubecula*), wren, blue tit (*P. caeruleus*), coal tit (*P. ater*), goldfinch (*Carduelis carduelis*), greenfinch (*C. chloris*), bullfinch (*Pyrrhula pyrrhula*), stonechat (*Saxicola torquata*) and woodpigeon (*Columba palumbus*) to name a few.

Invertebrates

Intensive invertebrate usage of the NHA was not evident during the survey. Likely insect groups that would use the site would include crickets, grasshoppers, beetles, earthworms, snails, slugs, woodlice, and spiders.

14.3.3 Evaluation of Habitats

The cultivated habitat and the hedgerow habitat within the subject lands are both of low local ecological value.

The freshwater habitat within the subject lands is of high local ecological value. Due to the presence of badgers, the bog woodland within the subject lands is also of high local ecological value.

The peatland habitat within the subject lands (but outside of the development boundary) is to be considered of high regional ecological value.

The peatland, woodland, grassland and built land habitats within the NHA outside of the study area are by virtue of their legal designation considered to be of high National ecological value.

14.4 Characteristics of the Proposal

It is proposed to construct and operate an organic waste composting facility. This will entail the development of an enclosed tunnel composting building and open aerated static piles with associated administration facilities and a new entrance road.

The development footprint will encompass approximately 4.5 hectares of the 17.5 hectare site and all works will be contained within the cultivated land habitat.

Surface water runoff from the development will be discharged via hydrocarbon interceptors and silt traps to the drainage ditch to the north of the subject lands, while a reed bed system will be installed to treat process wastewater arising from the development. A proprietary treatment system will be used for treatment of domestic water.

14.5 Potential Impact of the Development

14.5.1 Construction Phase

The potential negative impacts associated with the construction phase of this proposed development will involve the physical, and direct disturbance of the cultivated land habitat on site. There will be no direct removal of the remaining habitats within the subject lands, or those outside the subject lands. There will however be a number of indirect construction impacts to the remaining habitats.

Direct Impact

The direct impact to the cultivated land habitat will result in the permanent loss of the majority of this habitat. This impact is of no ecological significance.

Indirect Impact

Often times it is the indirect and secondary impacts associated with a proposed development that can be of greater environmental concern. In this instance many of the potential indirect impacts such as disturbance of the drainage ditches, hedgerows, woodlands and peatlands through; compaction, vehicular movements, spoil and materials storage, diesel spills etc., are of direct concern.

Unless construction within the subject lands is carefully controlled there is potential for a highly significant environmental impact.

The proximity of the proposed development to the remnant peat bog within the subject lands must be carefully considered as there is a high potential for significant ecological impacts to this habitat. Likewise unrestricted construction activities could lead to the damage of the badger habitats located within the small bog woodland within the subject lands. However it is understood that planning approval currently exists for the complete extraction of the peat bogland, and in this regard these habitats may be removed at some stage in the near future.

There will also be high potential for deleterious impact to the water quality of the northern drainage ditch either from the construction of the discharge culverts or the silt run-off from earth movement works.

As has been stated in the Water Section of the EIS, there will be no predicted impact to the hydrology of the area, and hence upon the ecology of Miltownpass Bog. The existing bog woodland between the bog and the subject lands provides more than sufficient buffering capacity.

14.5.2 Operational Phase

Direct Impact

Once operational all surface and foul water will be adequately treated and as such will not present an ecological impact.

Indirect Impact

The greatest potential for operational indirect impacts would be that brought about by increased ambient noise. Given that the subject lands are located close to existing noisy operations such as the road and the peat extraction industry it is considered unlikely that the predicted increase in noise levels stated in the noise Chapter of this EIS will bring about any secondary ecological impacts to adjacent habitats.

The various odour control measures that have been incorporated into the design of the proposed development, coupled with the pest control measures will negate the possibility of the increase of scavenging species within the study area.

There are no foreseeable indirect ecological impacts arising from the proposed development.

14.6 "Do-Nothing" Scenario

Should the proposed development not proceed the lands would remain under their current use.

14.7 Avoidance, Remedial or Reductive Measures

14.7.1 Mitigation by Avoidance

The Wildlife (Amendment) Act, 2000 prevents the cutting or destruction of hedgerows from the beginning of March through to the end of September primarily to avoid negative impacts to nesting bird species. As such, those areas of hedgerow which will need to be removed in order to provide the new access road should be removed outside of this time period. This will ensure that no avi-fauna is directly affected by the proposed development.

The decision to construct a new access road will mean that the potential impact to the existing access road located within the NHA boundary will not occur.

14.7.2 Mitigation by Reduction

Taking measures to limit the working area during the construction phase will reduce the impacts of the development on the habitats within and adjacent to the subject lands. The construction area should be clearly delimited as shown in Figure 14.2 and machinery should operate only within the allocated area. During dry windy days in the construction period sprinkler systems should be installed to prevent any dust blow to areas outside the delimited construction areas.

All construction and operation related fuel should be contained within specially constructed bunds to ensure that fuel spillages whether accidental or otherwise are fully contained.

It is recommended that the applicant utilises silt fences as specified in Figure 14.2 during construction works close to the drainage ditch and bog woodland in the NHA. Silt fences are constructed of geotextile membrane which will permit the movement of water past the temporary barrier however will retain any construction related silt (Figure 14.3). All construction operations, including the temporary storage of excavated materials must occur outside these fences. The silt fences should be inspected daily. The use of chemicals on site, including concrete must adhere to Department of Marine Communications and Natural Resources Fisheries Guidelines.

All mounded soils, waste and rubble must not be placed within 5m of the woodland, freshwater, peatland habitats located within the subject lands or adjacent to the subject lands prior to their removal off-site. They must also be properly sited so that run off from these mounds will not enter the drainage ditch or the adjacent NHA.

14.7.3 Mitigation by Remedy

Remedial measures involve the creation or enhancement of new areas of habitat to mitigate the loss of existing areas. While habitat creation will have a positive impact on the new environment it does not fully compensate for the loss of mature habitat and should be considered alongside avoidance and reductive measures.

It is proposed to construct a reed bed for the treatment of both process and domestic wastewater on site. This proposal opens up a possibility for the creation of an additional habitat of moderate ecological value. Where possible, the sides should slope shallowly, creating a shelf for the development of emergent vegetation. Native species such as bulrush and branched bur-reed should be planted in this region with common reed (*Phragmites australis*) in the deeper main section of the bed. Ecological and landscape value could be enhanced by the planting of species such as yellow iris, marsh marigold, summer snowflake (*Leucocjum aestivum*), flowering-rush (*Butomus umbellatus*) and purple loosestrife (*Lythrum salicaria*). The planting of trees at the margin would further enhance the ecological value of the reed bed and would also form an attractive landscape feature. The planting of native species such as alder, goat willow and grey willow could be considered.

As described previously an area of planting is proposed to form an ecological corridor between the remnant raised bog in the subject lands the Milltownpass Bog NHA, the approximate extent of which is proposed in Figure 14.3. This planted area will follow the existing hydrologic connection between the remnant bog and the bog woodland in the NHA. The fringe of this habitat will be planted with birch, and then alder, and goat willow towards the wetter parts in the centre. Understorey planting of holly and hawthorn will be provided to increase structure and diversity. Planted areas should be fenced off to prevent damage to the saplings and allow them to develop.

As far as is practicable, natural colonisation of the planted areas should be encouraged and areas set aside where landscaping and management is kept to a minimum. Removal of weedy species should be carried out to maintain the aesthetic value of the habitats and enhance diversity by allowing less competitive species to establish.

14.8 Predicted Impact

Taking the above mitigation measures into account the following predicted impacts will apply.

14.8.1 Construction Phase

Direct Impact

The removal of trees outside of the nesting period will negate any direct impact to birds.

The removal of the majority of the cultivated land habitat within the site will present no ecological impact.

Indirect Impact

The control of the construction area will result in negligible impacts to the peatland, woodland, freshwater and badger habitats within the subject lands.

Likewise the use of silt fences will result in negligible ecological impacts to the freshwater habitat on site and the bog woodland habitat off-site.

The control of potentially polluting substances during construction will reduce the potential risk to the freshwater habitat to the extent where it will be non significant.

14.8.2 Operational Phase

The control of potentially polluting substances during operation will reduce the potential risk to the freshwater habitat to the extent where it will be non significant.

The creation of the reed bed habit and the ecological corridor between the remnant bog and the NHA woodland will help to enhance the ecological value of the area.

14.9 Monitoring

No monitoring is required.

References

- Curtis, T.G.F. & McGough, H.N. (1988) The Irish Red Data Book. 1. Vascular Plants. The Stationery Office, Dublin.
- European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997).
- Fossitt, J.A. (2000) A Guide to Habitats in Ireland. The Heritage Council.
- Joint Nature Conservancy Council (1993) Phase I Habitat Survey Techniques. JNCC.
- Scannell, M.J.P & Synnott, D.M. (1987) Census catalogue of the flora of Ireland. (2nd Ed.). Stationery Office, Dublin.
- Webb, D.A., Parnell, J. and Doogue, D. (1996) An Irish Flora. Dundalgan Press, Dundalk.
- Wildlife (Amendment) Act, 2000 (S.I. No. 38 of 2000).

File name: Fig 14.1 ecology.dwg
 Plot date: Aug 23, 2004 - 10:49am
 Ref: \\DGV\GAD\TEAM\new-car\0071000\AREA-FIGURES

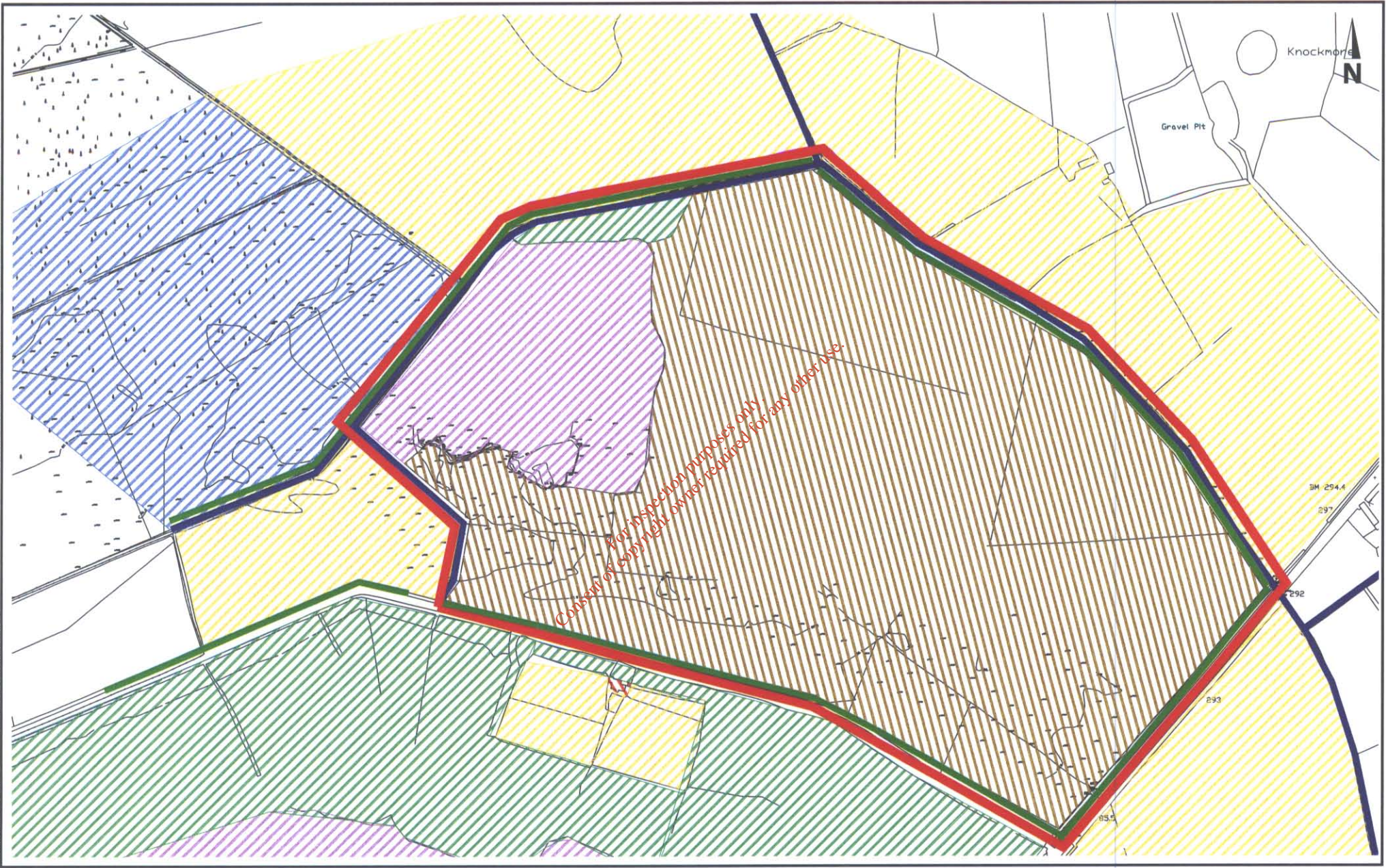


FIGURE 14.1
HABITAT MAP

NOTES:
 1. Based on Figure 1.1 Habitat Map, provided by Robertson & Associates, dated January 2004

KEY:	Subject Lands	Arable Crops (BC1)	Conifer Plantation (WD4)
Drainage Ditch	Bog Woodland (WN7)	Raised Bog (PB1)	Wet Grassland (GS4)
Hedgerows	Building and Artificial Surfaces		

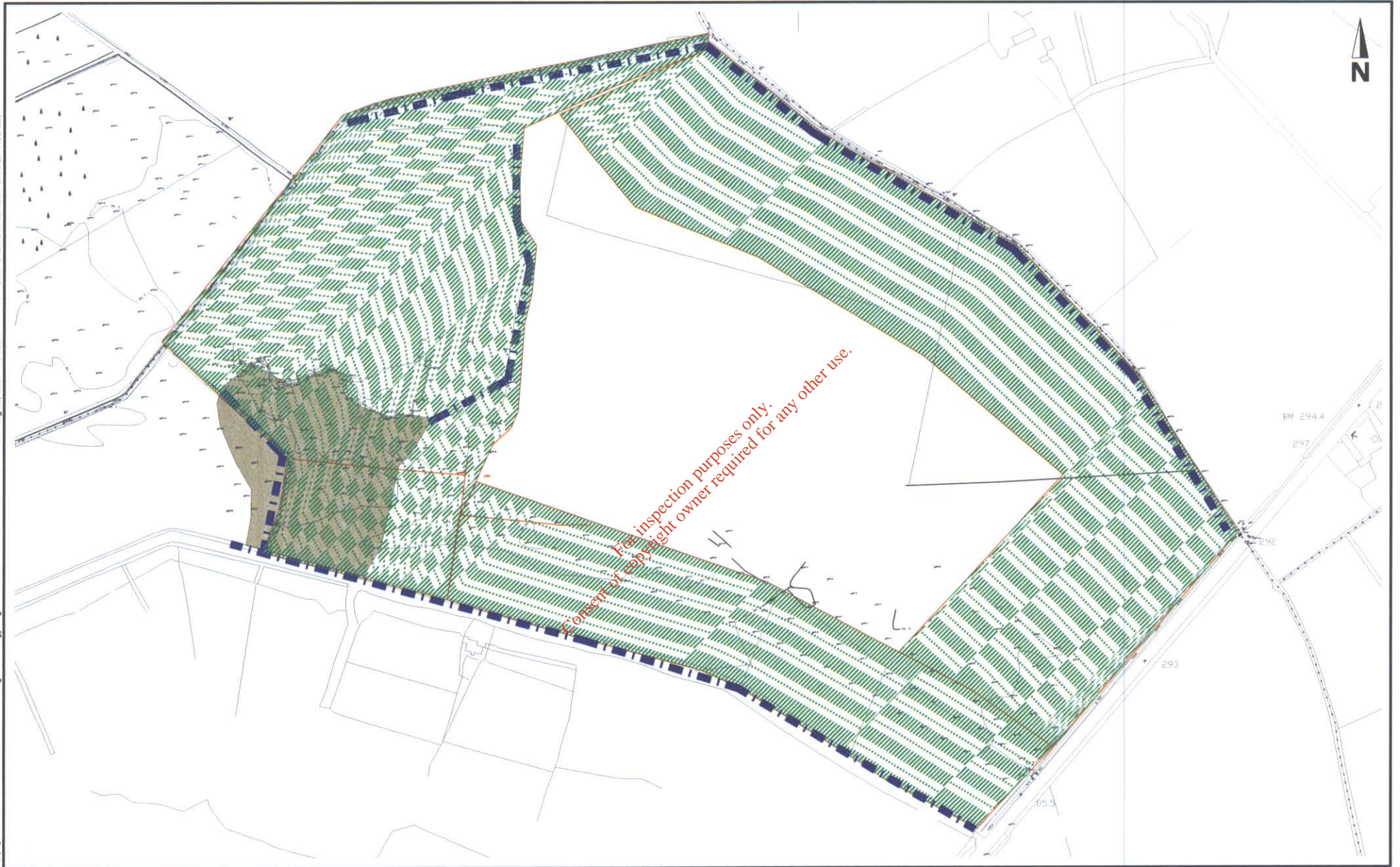


FIGURE 14.2
ECOLOGY MITIGATION PLAN

NOTES:

1. Based on Figure 1.2 (Ecology Mitigation Map), provided by Robertson & Associates, dated May 2004

KEY:

-  Construction Exclusion Zone
-  Ecological Corridor Planting
-  Silt Fences

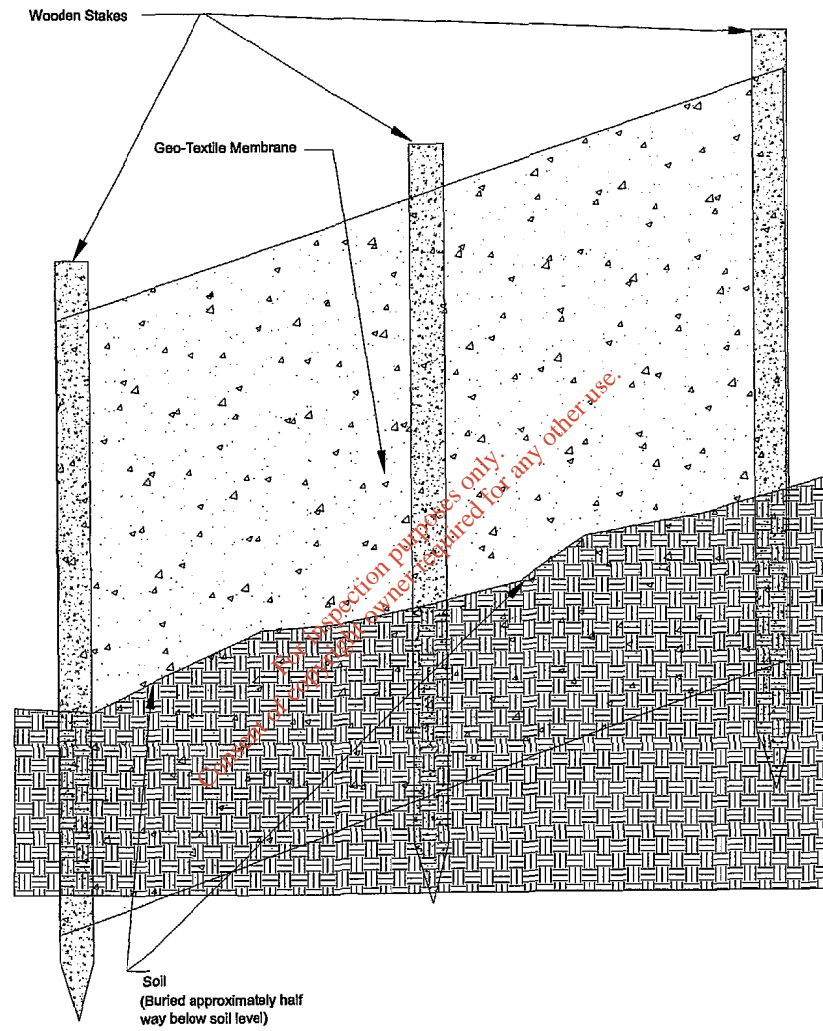


FIGURE 14.3
SILT FENCE DETAIL

NOTES:

1. Based on Figure 1.3 (Silt Fence), provided by Robertson & Associates, dated January 2004