

APPENDIX 8.1: DETAILED DESCRIPTION OF HABITATS WITHIN STUDY AREA

Woodland and Scrub

1. Woodland habitats typically occurred as linear woodlots situated along roads, small woodlands within or around the edge of arable fields, or as planted as shelterbelts within fields and along roads. In the centre of the Study Area, between Thurston Manor and Woodhall, there was a particular concentration of broad-leaved woodland sites. Two of woodlands in the Study Area represented small portions of more extensive woodland blocks which were situated outside the Study Area. Firstly, around Wetherley and within the valley of the Boonslie Shank, the Study Area overlaps small sections of Woodhall Dean SSSI. Secondly, to the east of Wetherley, the Study Area overlaps small sections of a large offsite plantation called High Wood.
2. The majority of woodland was classified as **broad-leaved, semi-natural woodland**. Although, there was a degree of variation in shrub layer and ground flora species from place to place, the typical species composition of this habitat type included abundant to frequent ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus* with occasional oaks *Quercus robur* and *Q. petraea* and silver birch *Betula pendula* forming the woodland canopy. Shrub layer species typically included frequent wych elm *Ulmus glabra* and sycamore and ash saplings, with occasional hawthorn *Crataegus monogyna*, with rarely noted holly *Ilex aquifolium* and yew *Taxus baccata*. The ground flora was typically lush and relatively species-rich including ancient woodland indicator species (Rose, 2006) such as frequent sanicle *Sanicula europaea* and occasional or very locally abundant woodruff *Galium odoratum*, dog's mercury *Mercurialis perennis* and wild garlic *Allium ursinum*. A well-developed fern and moss component was present in the majority of broad-leaved woodland stands, including occasional to locally abundant male fern *Dryopteris filix-mas* agg. and broad-buckler fern *Dryopteris dilatata*, with lady fern *Athyrium filix-femina* widespread but rare in abundance. The mosses *Kindbergia praelonga*, *Hypnum cupressiforme* and *Brachythecium rutabulum* were frequent and species such as *Eurhynchium striatum*, *Cirriphyllum piliferum* and *Plagiomnium undulatum* were occasional.
3. Almost all of the **broad-leaved semi-natural woodlands** were not in active management as evidenced by the scarcity of recently coppiced or pollarded trees and the well-developed shrub layer. However, many of the semi-natural woodlands included planted trees including occasional conifers and young trees in tree-guards indicating recent planting. Several of the woodlands contained fly-tipping and showed signs of ground disturbance and nutrient enrichment as evidenced by localised dominance of nettle *Urtica dioica* and/or cleavers *Galium aparine*.
4. The majority of **broadleaved, semi-natural woodland** stands were classified as **W9a Fraxinus-excelsior-Sorbus aucuparia-Mercurialis perennis typical sub-community** although in certain instances classification was ambiguous as certain sub-communities of the W8 community share similar ground flora and shrub layer species with W9. In addition, certain woodland stands showed signs of eutrophication with locally abundant nettle and cleavers thus obscuring NVC classification. However, the grassier appearance of the woodland ground flora, including locally abundant false oat-grass *Arrhenatherum elatius*, cock's-foot *Dactylis glomerata* and tufted hair-grass *Deschampsia cespitosa*, and the presence of ferns and mosses more typical of W9 (see above) were key factors used to classify this habitat.

5. A single stand of relatively species-poor **broad-leaved, semi-natural woodland** dominated by a narrow-leaved willow *Salix* sp. with an understorey of abundant chickweed *Stellaria media*, common nettle and hemlock water-dropwort *Oenanthe crocata* was recorded in the valley of the Thornton Burn near the A1.

6. Other woodland types recorded include:

Mixed plantation woodland: Two areas of this woodland type were recorded within the Study Area, both of limited extent. Around Thurston Manor this woodland type contained a shrub layer and ground flora which was very similar to adjoining areas of broad-leaved, semi-natural woodland. However, sufficient coverage of planted beech *Fagus sylvatica*, sitka spruce *Picea sitchensis*, pine *Pinus* sp. and European larch *Larix decidua* were present (>30% collectively) to classify as a plantation under the JNCC (2010) methodology. South of the A1 a woodland planted as a linear shelterbelt was also recorded dominated by beech and Scot's pine *Pinus sylvestris*.

Broad-leaved plantation woodland: The woodland type was relatively uncommon in the survey area and mainly comprised a small number of relatively small woods where the canopy was dominated by even aged stands of mature to semi-mature sycamore and/or beech with occasional to frequent ash. Trees were planted relatively densely and shading by the canopy was often heavy and thus ground flora and shrub layers were sparse with abundant bare earth. A narrow band of plantation beech and sycamore woodland was recorded along the access road to Crystal Rig Wind Farm (west of Falsely Hill) which contained numerous, well-spaced mature trees, and a grassy ground flora with frequent creeping soft-grass *Holcus mollis* and red fescue *Festuca rubra* in addition to acidiphilous herb species such as frequent wood sorrel *Oxalis acetosa* and the mosses *Polytrichum formosum* and *Rhytidiadelphus squarrosus* which were occasional. Male fern was locally abundant as were some of the moss species which were noted within areas of broad-leaved, semi-natural woodland.

Coniferous plantation woodland: This woodland type was located in the west of the Study Area as part of High Wood plantation. The canopy was typically dominated by sitka spruce and/or larch with a sparse shrub and ground layer. An area of **recently felled coniferous plantation** was recorded within the coniferous plantation. This was dominated by wavy hair-grass *Deschampsia flexuosa* with acidiphilous herbs such as occasional heath bedstraw *Galium saxatile* and rarely noted heather and heath woodrush *Luzula multiflora*.

Other woodland types included **parkland with scattered broad-leaved trees and mixed, semi-natural woodland**.

7. Both **dense scrub** and **scattered scrub** communities account for a relatively small proportion of the Study Area. Concentrations of this habitat type were recorded in three key locations:

At the eastern end of the Study Area, a number of small patches of dense scrub <0.1 ha were noted. These were typically located either side of small streams, at the edges of arable fields or along road embankments. Typical dominant species included hawthorn and rose *Rosa* sp. with occasional bramble *Rubus fruticosus* agg. One area north of Thornton Burn was dominated by gorse *Ulex europeus*;

Either side of the Dry Burn and north of the AI, dense areas of hawthorn, rose and *Prunus* sp. scrub were recorded. This scrub was very dense and even-aged and appeared to have been planted;

Dense patches of gorse were frequently noted in the vicinity of the access road to Crystal Rig Wind Farm, close to the northern edge of High Wood, on steep slopes; and

Small stands of mature juniper *Juniperus communis* ssp. *communis* scrub (less than the MMU) were recorded amongst areas of acid grassland and continuous bracken in the valley of the Boonslie Shank and the southern end of the valley of Woodhall Burn.

Grassland

8. A change in geology, elevation and land use between areas to the east of Woodhall and those to the west was reflected in the differing character of grassland habitats. Four Phase I Habitat grassland communities were recorded, some were entirely restricted to the western Study Area whilst others were mainly situated within the eastern Study Area.
9. **MGI *Arrhenatherum elatius* grassland (semi-improved neutral grassland)** to the east of the Woodhall occurred along road verges and areas of steep ground which could not be farmed. These grasslands comprised dense, tussocky vegetation which was mown infrequently and dominated by false oat-grass with abundant to frequent cock's-foot and frequent red fescue. In a small number of places this habitat contained scattered scrub (mainly hawthorn or elder *Sambucus nigra*). The following sub-communities were identified:
 - a) The majority of MGI grassland was **MGIa *Festuca rubra* sub-community** which favoured areas which had been occasionally mown. Although not recognised as a species-rich community, examples of MGIa within the Study Area incorporated a range of herbaceous associates such as yarrow *Achillea millefolium*, bird's-foot trefoil *Lotus corniculatus*, ribwort plantain *Plantago lanceolata*, dandelion *Taraxacum officinale* agg., white clover *Trifolium repens* and meadow vetchling *Lathyrus pratensis*. Where mowing was less frequent tall herbs such as cow parsley *Anthriscus sylvestris* and hogweed *Heracleum sphondylium* were often abundant, and sweet cicely *Myrrhis odorata* was locally abundant on a small number of MGIa road verges.
 - b) Occasional areas of **MGIb *Urtica dioica* sub-community** characterised by a similar suite of species to MGIa but with frequent nettle and cleavers recorded. This sub-community tended to be associated with arable field edges and/or interspersed with larger blocks of MGIa.
 - c) Small areas of **MGIc *Centaurea nigra* sub-community** were noted in mosaic with other sub-communities. This is a relatively species-rich sub-community including many of the herbs noted above for MGIa but with additional species such as black knapweed *Centaurea nigra*, germander speedwell *Veronica chaemydryas* and yellow oat-grass *Trisetum flavescens*. Key areas where this habitat was recorded included south of Thorntonloch on sloping ground by a communications mast and on road embankments of the AI west of Skateraw Gate.
10. **MG9 *Holcus lanatus-Deschampsia cespitosa* (semi-improved neutral grassland)** was recorded over damp or partially water-logged soils in the west of the Study Area, north east of Friardykes Dod and close to the Crystal Rig Wind Farm sub-station. Tufted hair-grass *Deschampsia cespitosa* dominated with frequent Yorkshire fog *Holcus lanatus* and soft rush

Juncus effusus. A single, small patch of this habitat type was also recorded around a pond within Birky Bog Plantation in the central part of the Study Area. This habitat was characteristic of damp soils and neglected pastures. Classification to sub-community was not undertaken as this community is of limited conservation interest.

11. **U5 *Nardus-stricta-Galium saxatile* grassland (unimproved acid grassland)** was of restricted extent and mainly located south of the fence on the western flank of Bransly Hill. It comprised a short-grazed, relatively species-poor sward dominated by mat-grass *Nardus stricta* along with other frequent to occasional species such as occasional heath rush *Juncus squarrosus* and tormentil *Potentilla erecta*.
12. **U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* (typical sub-community) grassland (unimproved acid grassland)** was located around the Thorter Cleugh Burn and within the valley of the Boonslie Shank. This habitat comprised small patches of acid grassland co-dominated by sheep's fescue *Festuca ovina* and common bent *Agrostis capillaris* with frequent heath bedstraw and a dense moss layer including frequent *Hylocomium splendens*, *Pleurozium schreberi* and *Rhytidiadelphus squarrosus*.
13. **U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* grassland (unimproved acid grassland)** included a single, relatively species-poor area located due north west of Falsely Hill. This was dominated by sheep's fescue with occasional heath bedstraw, sheep's-sorrel *Rumex acetosella* and mouse-ear hawkweed *Pilosella officinarum*. This acid grassland type was recorded downslope of an area of dense gorse scrub and was heavily grazed by rabbit (approximate sward height <5cm).
14. Small areas of **semi-improved acid grassland** around Thorter Cleugh Burn included species typical of U4a acid grassland in addition to species indicative of improvement, including abundant perennial rye-grass *Lolium perenne* and frequent crested dog's-tail *Cynosurus cristatus*. At the time of survey, this area was heavily grazed by cattle (sward height <10cm) and a tractor was observed spreading chemical (probably fertiliser or lime). It is likely that this area was formerly unimproved acid grassland (e.g., U4a) that has been improved to provide cattle pasture.
15. **M23 *Juncus effusus/acuteiflorus-Galium palustre* rush pasture community (marshy grassland)** was confined to the area west of Woodhall. Key concentrations of this habitat type included low lying valley bottoms and lower valley slopes in between Finley How and Wetherley and in the valley bottom of the Weatherley Burn, Thorter Cleugh and Boonslie Shank. A large expanse of marshy grassland was noted due east of the Crystal Rig Wind Farm sub-station in the valley of the Tay Burn. Signs of grazing by cattle and poaching were commonplace, however, the rush sward was mainly >50 cm in height. Typically, this habitat was dominated by either soft rush or sharp-flowered *Juncus acuteiflorus*, although often both species shared equal dominance. In many instances this habitat was relatively species-rich with a variety of occasional herb species noted in amongst the rush sward including sorrel *Rumex acetosa*, marsh bedstraw *Galium palustre*, marsh thistle *Cirsium palustre*, lady's smock *Cardamine pratensis*, ragged robin *Lychnis flo-cuculi*, marsh violet *Viola palustre*, tufted forget-me-not *Myosotis laxa* and the moss *Calliergonella cuspidata*. Both the **M23a *Juncus acuteiflorus* sub-community**, dominated by sharp-flowered rush with greater tall herb diversity and the **M23b *Juncus effusus* sub-community**, dominated by soft rush and with a lower herb diversity were recorded in close association with one another.

16. **Marshy grassland** was recorded in the upper reaches of the Tay Burn due west of the sub-station for Crystal Rig Wind Farm. This vegetation was broadly similar to M23a as described above, however, the sward was taller (approximately 70-100 cm), the water table was at the surface and the ground was wet underfoot and brown sedge *Carex disticha* was locally abundant to dominant. There is no direct NVC equivalent for this vegetation.
17. Narrow linear strips of **marshy grassland** were frequently noted along trackside verges and ditches in the western half of the Study Area, within the Crystal Rig Wind Farm site. This mainly comprised of species-poor swards of *Juncus effusus* of approximately 50 cm in height above an understorey of acid grassland species e.g., *Nardus stricta*, *Festuca rubra* and *Potentilla erecta*.
18. In a number of areas, marshy grassland was recorded in an intricate association with other habitat types such as acid grassland, acid flush and blanket bog; hence these areas were mapped as mosaics. For example, **marshy grassland/acid flush/blanket bog mosaic** was mapped east of the Crystal Rig Wind Farm sub-station which included a complex mosaic of small areas dominated by soft rush, small areas dominated by hare's-tail cottongrass *Eriophorum vaginatum* and small areas dominated by bottle sedge *Carex rostrata* over a understorey of abundant *Sphagnum fallax* and *S. palustre* (mosses). A hillside approximately 350 m north east of Thorter Cleugh was classified as **marshy grassland/acid grassland/acid flush with scattered bracken mosaic**. Owing to the small-scale variation, no NVC classification was attempted for either area of habitat mosaic.
19. **MG6a *Lolium perenne*-*Cynosurus cristatus* grassland (improved grassland)** was mainly recorded west of Woodhall, with several fields of this vegetation type south east of Innerwick. This vegetation was grazed by cattle or sheep and comprised a very short sward (less than 10 cm high). Perennial rye-grass was dominant with frequent crested dog's-tail and occasional white clover, common mouse-ear *Cerastium fontanum* and creeping buttercup *Ranunculus repens*, along with several other herbaceous associates all at low abundance. In places where animal dung or disturbance was noted, common nettle, creeping thistle *Cirsium arvense* and/or spear thistle *Cirsium vulgare* were locally frequent.
20. **MG6b *Anoxanthum odoratum* sub-community (improved grassland)** was recorded on the valley sides sloping down from High Wood, north east of Croft Angry. This was similar in composition to MG6a but with a more diverse array of occasional grass and herb species including sweet vernal-grass, common sorrel and rarely pignut *Conopodium majus*.
21. Two very small areas of **CG10a *Festuca ovina* - *Agrostis capillaris* - *Thymus polytrichus* grassland, *Trifolium repens*-*Luzula campestre* sub-community (calcareous grassland)** were identified, both of which were below the MMU, one on the north bank of the Weatherly Burn due south of Weatherly farm and one on the banks of the Boonslie Burn south east of the ford. The very short sward (less than 5 cm) was dominated by sheep's fescue and common bent with a range of frequent to occasional herbs including wild thyme *Thymus polytrichus*, yarrow, ribwort plantain, cat's-ear *Hypochaeris radicata*, mouse-ear hawkweed, lady's bedstraw and spring sedge *Carex caryophylla*.
- Tall Herb and Fern
22. **Continuous bracken** was recorded in a small number of locations, west of Woodhall. Tall, dense swards of bracken dominated with a sparse understorey mainly comprised of grasses such as common bent and sheep's fescue. Key locations where this vegetation occurred include the valleys of the Wetherley Burn and the Boonslie Shank.
23. Areas of **tall ruderal** habitat were of restricted extent and generally comprised stands of common nettle or rosebay willowherb *Chamaerion angustifolium* on road embankments. On occasion tall ruderal vegetation contained scattered hawthorn, elder and/or bramble scrub.
- Heath
24. Small areas of **H12 *Calluna vulgaris*-*Vaccinium myrtillus* heath (dry dwarf shrub heath)** were recorded on the slopes of the Boonslie Burn on very steep, rocky valley sides and, west of the Crystal Rig Wind Farm sub-station in a mosaic with acid grassland. Heather and bilberry *Vaccinium myrtillus* were frequently co-dominant with occasional mat-grass, wavy hair-grass and heath rush and locally frequent bracken. The inaccessible nature of this habitat prevented detailed survey and thus further classification to sub-community level.
25. A small patch of **M16d *Erica tetralix*-*Sphagnum compactum* wet heath, *Juncus squarrosus*-*Dicranum scoparium* sub-community (wet dwarf shrub heath)** was recorded between High Wood and Boonslie. Heather dominated with frequent *Sphagnum compactum* moss and heath rush and occasional purple moor-grass *Molinia caerulea* and cross-leaved heath *Erica tetralix*
26. **M15 *Trichophorum cespitosum* - *Erica tetralix* wet heath (wet dwarf shrub heath)** formed two small patches to the west of the Crystal Rig Wind Farm sub-station, on the northern slopes of Friardykes Dod where it comprised a mosaic with acid grassland. These included species-poor, dry heath vegetation as described above but with abundant purple moor-grass. It was difficult to assign an NVC sub-community given the species-poor character of this habitat, but it probably represents **M15d *Vaccinium myrtillus* sub-community**, the driest, grassiest M15 assemblage.
- Mire and Bog
27. Three patches of blanket bog vegetation were identified immediately north of the Crystal Rig Wind Farm sub-station. The furthest of these comprised a small stand of **M18a *Erica tetralix*-*Sphagnum papillosum* raised and blanket mire, *S. magellanicum* - *Andromeda polifolia* sub-community (blanket bog)**. Species included abundant hare's-tail cotton grass, frequent heather and a deep moss layer comprised of frequent *Sphagnum papillosum*, *S. magellanicum* and *S. capillifolium* along with pleurocarpus mosses such as *Hylocomium splendens* and occasional herbs such as round-leaved sundew *Drosera rotundifolia*. The two remaining patches were classified as **M19 *Calluna vulgaris*-*Eriophorum vaginatum* blanket mire**. This vegetation was generally co-dominated by hare's-tail cottongrass and heather with a fairly sparse moss layer. NVC sub-community could not be assigned owing to the fact it was poor in species. Neither NVC type showed signs of grazing.
28. A single area of **M20 *Eriophorum vaginatum* blanket and raised mire (wet modified bog)** was recorded to the northeast of the Crystal Rig Windfarm. This vegetation had an approximate sward height of 40 cm and was dominated by hare's-tail cottongrass with frequent purple moor-grass and occasional heather and wavy-hair grass. These plants grew above a relatively diverse moss layer including occasional *Plagiothecium undulatum*, *Polytrichum commune* and frequent *Sphagnum fallax*. This vegetation was closest in correspondence to **M20b *Calluna vulgaris* - *Cladonia* sub-community**. However, a high cover of *Sphagnum fallax* was noted which is not recognised in the NVC floristic tables but is within the range of variation for this habitat (Averis et al. 2004). No evidence of livestock grazing or other

human impacts were noted, however, M20 vegetation is intrinsically considered to be a 'modified' form of bog vegetation compared to M18 and M19 noted above.

29. A linear strip of vegetation forming an intermediate between NVC types **M20** (as described above) and **M4 *Carex rostrata-Sphagnum recurvum* mire (wet modified bog/acid flush mosaic)** was recorded parallel to the eastern side of the access track by Crystal Rig Wind Farm. This water-logged vegetation was dominated by hare's-tail cottongrass in close association with small areas (less than MMU) of bottle sedge dominated vegetation with abundant *Sphagnum fallax* and *S. palustre*.

Open Water

30. One area of **standing water**, an artificial pond (c. 400m²), was identified within the Study Area within Birky Bog Plantation. The pond was well vegetated with marginal species such as soft rush and meadow sweet *Filipendula ulmaria* growing frequently around its shore, and frequent broad-leaved pondweed *Potamogeton natans* and water milfoil *Myriophyllum* sp. within the water column.
31. Within the grounds of Thurston Manor Campsite a pond was identified from OS mapping but it was found to be dry over the summer period in 2011 (checked several times between May and August) and was dominated by soft rush.
32. A number of **running water** streams were identified within the Study Area including the following:
- Thornton Burn was a small relatively fast, flowing stream of approximately 3-4 m width and <40 cm depth with a rocky channel. Arable cultivation to within 3-4 m of the stream channel left a relatively thin band of riparian habitat which comprised occasional patches of mown grassland together with more structurally complex vegetation including tall-ruderal, wetland and scrub species such as frequent creeping thistle, marsh horsetail *Equisetum palustre* and cleavers, with occasional bramble, elder and gorse. The stream bed was poorly vegetated and was mapped as **other [rock] exposure**. Marginal vegetation was of limited extent and included wetland plants such as hemlock water-dropwort, floating sweet-grass *Glyceria fluitans* and water-cress *Rorippa nasturtium-aquaticum* were occasional to rare.
 - Woodhall Burn was a small stream of approximately 2 m width and <30 cm depth with a rocky stream bed. Plants such as brooklime *Veronica beccabunga* were rarely noted as marginal species. Linear strips of relatively diverse M23a rush mire vegetation (described above) were recorded parallel to the channel.
 - Dry Burn flowed through the northwest corner of the Study Area close to the A1 road. This was a rocky bottomed stream approximately 2-3 m wide and 50 cm deep. The stream banks had been modified on either side by installation of steep sloping, stone filled gabions and boulders. Bankside vegetation was a complex, relatively diverse mosaic of scrub, tall ruderal and semi-improved grassland vegetation (MGIa). In-stream vegetation comprised locally abundant patches of tufted forget-me-not *Myosotis laxa*, water cress, brook lime and yellow iris *Iris pseudacorus*.
 - A number of small streams running through arable fields were noted east of Woodhall. Typically these were <1 m wide with a water depth <30 cm. These streams were of limited botanical interest owing to heavy over-shading by frequent bramble, elder and

hawthorn scrub or rank, tussocky MGIa and MGIb grassland. True wetland species were uncommon and typically included occasional to rare great willowherb *Epilobium hirsutum* and yellow iris with locally frequent Himalayan balsam *Impatiens glandulifera* which is an invasive, non-native species.

- Boonslie Burn was a small rocky, bottomed stream approximately 2 m wide and <30 cm deep flowing through a steep sided rocky gully with sides rising between 5 and 15 m above the level of the channel. South of the ford, stream and bankside vegetation was similar to Woodhall Burn. North of the ford the burn flowed in to Woodhall Dean SSSI.
- The channel of the Tay Burn comprised water-logged M23a marshy grassland with abundant brown sedge (described above under marshy grassland). Further downstream, towards the edge of the Study Area, species-rich M23a bankside vegetation was noted.

Coastal Habitats

33. Approximately 1.3 km of coastal habitats were recorded from Thorntonloch Campsite in the north south west along the coast. These were mainly confined to a narrow belt which was approximately 100 to 250 m wide. A coastal defence wall of concrete and stone filled gabions was recorded adjacent to Thorntonloch Campsite and was approximately 600 m long. Coastal habitats were noted to be fairly modified by human activities along the coast. It is suspected this mainly resulted from stabilisation of dune vegetation by the seawall but also as a result of tipping of garden waste and erosion along footpaths. Steep grassy slopes were recorded in the south eastern corner of the Study Area (due east of the Hamlet of Lawfield) and were more semi-natural and not protected by the sea wall.
34. **Open dune** vegetation was recorded in localised patches such as the north eastern corner of the Study Area by the Thorntonloch Campsite and the footings of the steep grassy slopes (noted above). This was dominated by marram grass *Ammophila arenaria* with frequent bare sand. Close to Thorntonloch Campsite this habitat was noted in between the seawall and the predominantly amenity grassland habitats of the campsite. It is anticipated that owing to stabilisation of the sand dunes caused by the sea wall, this habitat type may in time demise as marram grass requires active sand movement. No NVC type was ascribed to this vegetation as it was considered to be heavily modified and was of restricted extent.
35. **Open dune/coastal grassland mosaic** was recorded between Thornton Burn and the private house known as Thornly. Lyme grass *Lymus arenarius* and bare sand were abundant in this area with marram grass occasional. Areas of short, rabbit grazed grassland dominated by red fescue with bare sand rarely noted were recorded in mosaic with the former habitat. Occasional herb species recorded across both dune and grassland habitats in this area included sea campion *Silene uniflora*, sea mayweed *Tripleurospermum maritimum*, ribwort plantain and lady's bedstraw, common restharrow *Ononis repens* and sand sedge *Carex arenaria*. Occasional coarse weedy species including cock's foot, creeping thistle, and common ragwort *Senecio jacobea* and the horticultural species red hot poker *Kniphofia* sp. were occasional to rarely recorded in this area. These species are likely to be introduced or encouraged by dumping of garden compost. No NVC type was ascribed to this vegetation as it was considered to be heavily modified.
36. **Dune grassland** was recorded on steeply sloping ground in the south east corner of the Study Area. This vegetation was 30-50 cm in height and grazed locally by rabbits. Red

fescue dominated with locally abundant cock's foot and occasional to rare marram grass. A relatively diverse range of frequent herb species were noted including bird's-foot trefoil, yarrow, ribwort plantain, germander speedwell, common restharrow and occasional lady's bedstraw, lesser meadow-rue *Thalictrum minus*, red campion *Silene dioica*, black knapweed, primrose *Primula vulgaris*, bulbous buttercup *Ranunculus bulbosus* and hogweed. In terms of NVC, this dune grassland fitted most closely to the **SD8 *Festuca rubra-Galium verum* fixed dune grassland** community. The community was not assigned to a NVC sub-community as a number of the species present are preferential to different SD8 sub-communities making further classification equivocal.

Other Habitats

37. **Arable farmland** was confined to the area east of Woodhall. Bread wheat *Triticum aestivum* and to a lesser extent barley *Hordeum* sp. were the dominant arable crops and were planted in monocultures with little or no set-aside or uncultivated land. The small amount of uncultivated land which was recorded was located around field margins or alongside of watercourses and roads. This vegetation typically corresponded to MG1a and MG1b NVC types (see descriptions above).
38. **Hedgerows** were all located east of Woodhall. Typically hedgerows were approximately 1.5 m-2 m high, defunct (not stock-proof) and cut frequently. Most hedgerows were species-poor and dominated by hawthorn with frequent to locally dominant rose *Rosa* sp. Gorse, elder, holly and elm were recorded occasionally to rarely. Single hedgerows dominated by beech and garden privet *Ligustrum ovalifolium* were recorded in association with private houses. The basal flora of hedges comprised tall ruderal vegetation such as common nettle, rank MG1 *Arrhenatherum elatius* grassland (see description above) or arable weed communities (see below).
39. **Arable weed communities** (mapped under arable farmland) were frequently noted amongst the arable crop and across the thin strip of bare earth at field edges. Typical species included occasional common fumitory *Fumaria officinalis*, bugloss *Anchusa arvensis*, goosefoot *Chenopodium* sp., parsley-piert *Aphanes arvensis*, common poppy *Papaver rhoeas*, and long-headed poppy *P.dubium*. Cleavers was locally abundant or scentless mayweed *Tripleurospermum inodorum* was locally dominant in different places. A single cornflower *Centaurea cyanus* was recorded close to Skateraw, however, this is unlikely to be from a natural seed source as it was within 10 m of a large private garden.
40. **Amenity grassland** was associated with areas of settlement such as campsites or residential houses. This habitat comprised of a short, mown sward (less than 5cm) and was dominated by perennial rye-grass with a small number of occasional to frequent associates such as red fescue, dandelion and daisy *Bellis perennis*.
41. **Ephemeral/short perennial vegetation** was relatively uncommon habitat and was typically associated with areas where soils had been recently disturbed. This included the banks of the Dry Burn near the AI where flood defence infrastructure had recently been constructed and an arable field corner south of Thorton Burn which had been ploughed but left uncropped to be colonised by casual plant species. Typically this habitat had frequent bare earth and frequent common nettle, poppies, teasel *Dipsacus fullonum*, weld *Reseda luteola*, creeping thistle, colt's-foot *Tussilago farfara*, black medick *Medicago lupulina* and broad-leaved dock *Rumex obtusifolius*. Occasionally this vegetation occurred in mosaic with scattered scrub such

as frequent bramble or hawthorn and tall ruderal vegetation, for example, stands of common nettle or hogweed.

42. **Continuous bracken** was locally abundant in the western Study Area. This vegetation was dominated by tall stands (approximately 1.0 m in height) of bracken *Pteridium aquilinum* over acid grassland vegetation such as NVC type U4 acid grassland (described above).

