

Racehill Community Orchard: Ecological Impact Assessment

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INTRODUCTION

This report assesses the potential ecological effects of establishing a community orchard on land at the Racehill, Whitehawk. It has been written by Matthew Thomas, Ecologist for Brighton & Hove City Council to inform a decision by the Council as landowner, on whether the land should be released for this purpose.

The report considers the impacts of the orchard on the ecology of the Site, explores how any negative impacts might be minimised or avoided and considers the potential for ecological benefits and how these might be maximised.

Limitations

The report considers potential ecological impacts only. Other environmental effects, such as those affecting landscape and archaeology, have not been taken into account.

Background

Brighton & Hove Food Partnership's Harvest Project and Brighton Permaculture Trust are proposing to plant a community orchard on the Site, which is located to the north of Swanborough Drive at OS Grid Ref. TQ 337,054 and is of approx 1.3 ha in size (see Figure 1).

Figure 1: The Site (*not to scale*)



A public consultation was carried out during autumn 2012 to find out the views of local residents and organisations about the community orchard. Some concerns were raised about potential impacts on the ecology of the Site and this assessment has been commissioned to address those concerns.

ASSESSMENT METHODOLOGY

Scope of Assessment

The assessment covers the habitats and species that could potentially be affected by the proposed orchard. The assessment extends beyond the Site boundary in order to:

- a) determine the ecological context;

- b) determine the likelihood of movements of valued species through or over the Site; and
- c) provide cues for habitat creation and enhancement measures.

From previous experience of ecological appraisals, the survey area was set at 200m beyond the Site boundary.

The assessment methodology used is based on the national guidelines on Ecological Impact Assessment published by the Institute of Ecology and Environmental Management¹. These Guidelines have been endorsed by many agencies including Natural England and the Environment Agency. They are principally designed to be applied to development proposals requiring planning permission, but can be adapted to address any kind of land-use change.

The first step of the IEEM method is an initial scoping process, which involves setting the Site in its bio-geographical context and in a context of biodiversity policy and legislation. This review permits the establishment of baseline study areas, a list of features to be studied, methods and survey timescales. In this case only basic survey methods over a short period of time were used because of the comparatively small scale of the project and the limited resources available.

The review is used to establish of the highest and lowest levels of ecological value relevant to the assessment. In this case, the lowest relevant level of value was considered to be 'Site' and the highest 'City'.

The legal protection afforded to species does not always reflect actual biodiversity value; nevertheless, the assessment method fully acknowledges legal protection status and the associated requirements of mitigation in law.

The second step is to define the likely impacts of the predicted changes on the ecological resources. This process entails consideration of all impact characteristics such as: impact magnitude, extent, duration, reversibility, timing, frequency, in order to determine which impacts are significant in ecological terms.

Mitigation measures are developed through the assessment process to avoid, reduce or remedy any significant adverse impacts which are identified.

Finally, the IEEM Guidelines recommend that any residual impacts, whether positive or negative be reviewed to determine whether any additional action is required. In the case of this assessment, any opportunities to enhance the local ecology are also described.

SIGNIFICANCE CRITERIA

The aim of the ecological assessment is to facilitate the making of a judgement as to whether the integrity of the local ecology or the conservation status of a habitat or species is likely to be affected.

'Integrity', can be defined as follows (based on the IEEM Guidelines):

¹ Institute of Ecology and Environmental Management. 2006. Guidelines for Ecological Impact Assessment in the United Kingdom. IEEM, Winchester.

'The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations.'

To assess whether the integrity of an ecological feature is likely to be affected by a proposal, potential impacts on all features must be fully described. On the basis of all of these factors, available scientific knowledge of the feature, and available information on sensitivities to predicted ecological changes, a professional judgement can then be made as to whether there would be a significant effect on the feature. The 'level of significance' can then be defined by stating the value of resource affected and the degree of the effect.

Figure 2 (below) has been used to assess the significance of an impact, based on the scale of the impact:

Geographical Scale at which impact is significant in ecological terms	EIA Significance
County or higher	Major Adverse/Major Beneficial
City of Brighton and Hove	Moderate Adverse/beneficial
Parish – site context	Minor Adverse/Beneficial
Less than Site	Not Significant

The level of confidence attached to all assessments is also stated. This allows measures to be put in place to increase the degree of confidence in such a prediction. The scale used here is:

- Certain/near-Certain: probability estimated at 95% chance or higher
- Probable: probability estimated above 50% but below 95%
- Unlikely: probability estimated above 5% but less than 50%
- Extremely Unlikely: probability estimated at less than 5%.

DESK SURVEY

The desk survey comprised a collation of all known existing ecological survey information for the Site and surrounding area within 200m of the Site boundary. Records held by the Sussex Biodiversity Record Centre² and recorded on the CityWildlife database were used for this purpose, together with other known records from the immediate area (ie within 200m of the Site).

FIELD SURVEYS

A Phase 1 Habitat Survey was carried out on a single day on 18th September 2012 (see Appendix 2). The survey followed the guidelines for Phase I Habitat Survey published by the Joint Nature Conservation Committee (as amended by the Institute of Environmental Assessment) as far as possible within resource constraints.

The Phase 1 method involves the standard mapping of habitats within the Site, noting their existing or potential value for notable fauna and flora.

In addition, all habitats of potential or designated value adjacent to the Site were also noted.

² See <http://sxbrc.org.uk>

LEGISLATION AND POLICY

The key pieces of national legislation relevant to the Site are:

- National Parks and Access to the Countryside Act 1949 (Section 21 deals with the declaration of Local Nature Reserves).
- The Wildlife and Countryside Act 1991 (as amended) (addresses protected species).
- The Natural Environment and Rural Communities (NERC) Act came into force on 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England.

The legal protection afforded to species relevant to the assessment is summarised in Appendix 1.

BASELINE CONDITIONS

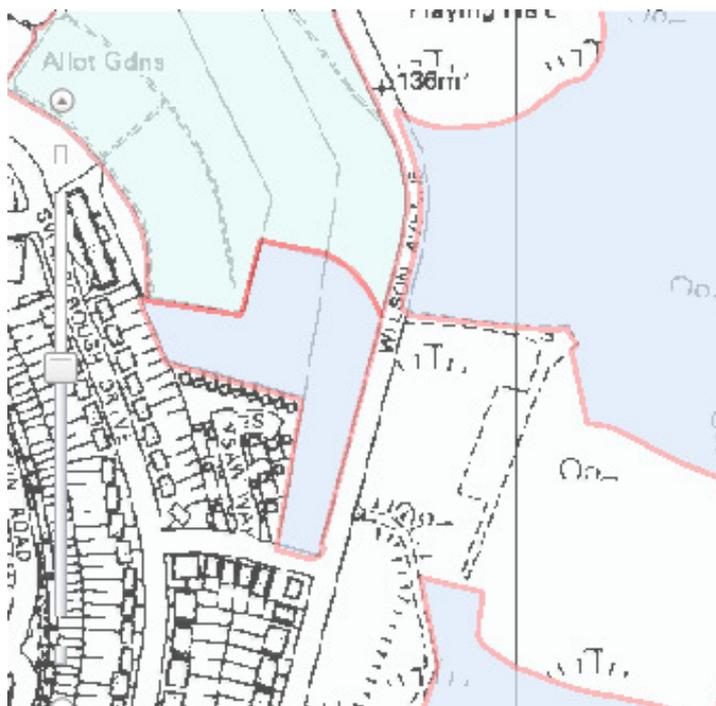
Findings of the Desktop Study

The Site is wholly within Whitehawk Hill Local Nature Reserve (see Figure 3), a statutory designation made by local authorities under National Parks and Access to the Countryside Act 1949. When declaring an LNR, the local authority accepts a legal responsibility for ensuring that the special ecological interest of the land is maintained.

Wilson Avenue Site of Nature Conservation Importance (SNCI) is adjacent to and immediately south of the LNR. SNCIs are non-statutory policy designations made by local authorities and designed to protect sites of County-wide (in this case City-wide) nature conservation importance.

To the east, within 200m of the Site is Sheepcote Valley SNCI. Sheepcote Valley is separated from the Site by Wilson Avenue.

Figure 3: Detail of the northern boundary of Whitehawk Hill LNR, showing the Site. Wilson Avenue SNCI is adjacent to the southern Site boundary. Parts of Sheepcote Valley SNCI are to the east



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There are no records held at the Sussex Biodiversity Record Centre for the Site itself. However within 200m of the site boundary, the following notable species have been recorded: (See Figure 4):

Species (Latin)	Species (Common)	OS Grid Ref	Date record made	Comments
<i>Adscita globulariae</i>	Scarce Forester	TQ339,053	03/05/2000	Sheepcote Valley. Nationally Scarce. Larval food plants are common knapweed (<i>Centaurea nigra</i>) and greater knapweed (<i>C. scabiosa</i>).
<i>Anguis fragilis</i>	Slow-worm	TQ338,105	28/04/2008	Whitehawk Hill.LNR. NERC S41 species. Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1, 9.5a,b). Prefers rough, sunny grassland and open scrub with basking areas
<i>Anguis fragilis</i>	Slow-worm	TQ339,053	03/05/2000	Sheepcote Valley. NERC S41 species. Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1, 9.5a,b). Prefers rough, sunny grassland and open scrub with basking areas
<i>Asilus crabroniformis</i>	Hornet robberfly	TQ339,053	03/05/2000	Sheepcote Valley. NERC S41 species, Local BAP species, Declining but still found on horse pastures south of Bevendean. Problems include use of Avermectins (wormers and boticides used for treating livestock), habitat loss or deterioration: grassland improvement, overgrazing, absence of suitable dung.
<i>Drilus flavescens</i>	Yellowish Drile	TQ338,052	13/06/2001	Whitehawk Hill LNR, Nationally Notable A. Predates snails. Downland specialist.
<i>Drymus (Drymus) latus</i>	none	TQ338,052	14/08/2001	Whitehawk Hill LNR. The host plants are unclear; it has been recorded from a variety of habitats on both chalk and acid soils. In the London area it is mainly associated with sparsely-vegetated sites.
<i>Fumaria densiflora</i>	Dense-flowered Fumitory	TQ533,105	30/05/2008	Sheepcote Valley. Arable or sparsely vegetated, regularly disturbed sites.
<i>Lathyrus aphaca</i>	Yellow Vetchling	TQ339,053	03/05/2000	Sheepcote Valley. Dry, well drained and sparsely vegetated habitat.
<i>Lathyrus aphaca</i>	Yellow Vetchling	TQ339,055	1989	Sheepcote Valley. Dry, well drained and sparsely vegetated habitat.
<i>Poa bulbosa</i>	Bulbous Meadow-grass	TQ533,105	12/05/2006	Whitehawk Hill LNR. Dry and disturbed habitats
<i>Poa bulbosa</i>	Bulbous Meadow-grass	TQ339,053	03/05/2000	Sheepcote Valley. Dry and disturbed habitats
<i>Vicia lutea</i>	Yellow-vetch	TQ339,053	03/05/2000	Sheepcote Valley. An annual found on disturbed ground on thin soils.
<i>Vipera berus</i>	Adder	TQ339,053	03/05/2000	Sheepcote Valley. Requires habitat complexity including open, basking

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				areas, longer grass and scrub.
<i>Zootoca vivipara</i>	Viviparous Lizard	TQ339,053	03/05/2000	Sheepcote Valley. Prefers rough, sunny grassland and open scrub with basking areas

CityWildlife has one record for the Site itself, that being Dunnock (*Prunella modularis*). Because of the method of recording data used by the CityWildlife database, it is not possible to provide full details of the records held, but the following information is available for records made within approximately 200m of the Site (Figure 5):

Species (Latin)	Species (Common)	Site	Comments
<i>Agaricus lutosus</i>	None	Whitehaweck Hill LNR	a fungus
<i>Agrocybe pediades</i>	Common Fieldcap	Whitehaweck Hill LNR	Fields and lawns
<i>Anguis fragilis</i>	Slow-worm	Wilson Avenue SNCI	NERC S41 species Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1, 9.5a,b). Prefers rough, sunny grassland and open scrub with basking areas
<i>Anguis fragilis</i>	Slow-worm	Whitehaweck Hill LNR	NERC S41 species Wildlife and Countryside Act 1981 (Schedule 5 Section 9.1, 9.5a,b). Prefers rough, sunny grassland and open scrub with basking areas
<i>Bovista plumbea</i>	Grey Puffball	Whitehaweck Hill LNR	scattered to clustered in disturbed areas, especially in sparse grassland
<i>Callophrys rubi</i>	Green Hairstreak	Wilson Avenue SNCI	Wide habitat range but prefers scrubby plants and hedgerows
<i>Entoloma conferendum</i>	Star Pinkgill	Whitehaweck Hill LNR	in grassland or in grassy woodland clearings
<i>Falco tinnunculus</i>	Kestrel	Whitehaweck Hill LNR	Protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), Rough grassland (hunting)
<i>Hirneola auricula-judae</i>	Jelly Ear	Whitehaweck Hill LNR	on dead wood, often Elder
<i>Medicago sativa ssp. varia</i>	Sand Lucerne	Wilson Avenue SNCI	open, grassy areas
<i>Polyommatus icarus</i>	Common Blue	Wilson Avenue SNCI	unimproved dry grassland
<i>Prunella modularis</i>	Dunnock	Whitehaweck Hill LNR	Protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)
<i>Vascellum pratense</i>	Meadow Puffball	Whitehaweck Hill LNR	pastures

In 2001, the adjacent Wilson Avenue SNCI was subject to a planning application for housing (which was subsequently disallowed at appeal). Several specialist surveys were carried out during the following summer and the findings included the discovery of a number of Nationally Scarce species of beetle, including *Panagaeus bipustulatus*, *Athous campyloides*, *Drilus flavescens*, *Scymnus schmidtii*, *Scaphidema metallicum*, *Longitarsus dorsalis* as well as the uncommon bugs *Psithyrus rupestris*, *Mutilla europaea* and the neuropteran *Nothochrysa capitata*. These species tend to be associated with dry sandy or chalky places in short turf or sparse vegetation.

Of particular note during the 2002 surveys was the discovery of three female individuals of *Malthodes lobatus*. This species had not previously been recorded from the British Isles and has subsequently been named 'the Whitehawk Soldier Beetle'. The specimens were taken from an area of short rabbit-grazed sward adjoining an old hedgerow. In continental Europe the species is normally associated with shady grasses in warm, sunny woodlands, or from the margins of hedgerows.

Findings of the Phase 1 Survey

Due to time limitations, the Phase 1 survey was confined to the boundaries of the Site itself.

Ecologically the Site is a complex mosaic of habitats comprising:

B6	Poor Semi-improved Grassland	50% cover approx.
C3.1	Tall Ruderal	30% cover approx.
A2	Scrub	15% cover approx.
J1.3	Ephemeral/short Perennial	5% cover approx.

Appendix 2 contains photographs of the Site taken at the time of the survey.

To the east and south, the Site is bounded by an intact hedge (J2.1), to the west by scrub and to the north by poor semi-improved grassland.

The commonest habitat on the Site is species-poor semi-improved grassland, which integrates seamlessly into Tall Ruderal throughout. Species typical of this habitat include Yarrow (*Achillea millefolium*), Cock's-foot (*Dactylis glomerata*), Common Couch (*Elymus repens*) and False Oat Grass (*Arrhenatherum elatius*) with Common Vetch (*Vicia sativa*), Agrimony (*Agrimonia eupatoria*), Ragwort (*Senecio jacobea*), Hawkweed Oxtongue (*Picris hieracioides*), Nipplewort (*Lapsana communis*), Spear Thistle (*Cirsium vulgare*) and Creeping Thistle (*Cirsium arvense*). Sycamore (*Acer pseudoplatanus*) seedlings are common in places. There are also some species present at low density which indicate a chalk influence, principally Wild Parsnip (*Pastinaca sativa*), Ploughman's Spikenard (*Inula conyza*), Field Scabious (*Knautia arvensis*), Wild Basil (*Clinopodium vulgare*) and Wild Marjoram (*Origanum vulgare*). At the time of the survey, Common Green Grasshopper (*Omocestus viridulus*) and European Garden Spider (*Araneus diadematus*) were noticeably abundant throughout and a Viviparous Lizard (*Zootoca vivipara*) was seen.

There is no evidence of recent management and the Site shows all the hallmarks of a classic seral progression towards woodland. Throughout, grassland gives way to a tall ruderal community. Species typical of this habitat include Common Hogweed (*Heracleum sphondylium*), Greater Burdock (*Arctium lappa*), Common Teasel (*Dipsacus sylvestris*), Tansey (*Tanacetum vulgare*), Nettle (*Urtica dioica*), Evening Primrose (*Oenothera biennis*), Rosebay Willowherb (*Chamerion angustifolium*) and Hemp Agrimony (*Eupatorium cannabinum*). Larger blocks of dense Bramble (*Rubus spp.*) have developed in some places.

There are also some areas where intensive Rabbit grazing has created a short, tight sward with bare patches of soil. Here, more diminutive plant species have been able to establish, including Field Forget-me-not (*Myosotis arvensis*), Red Fescue (*Festuca rubra*), Ribwort Plantain (*Plantago lanceolata*), White Clover (*Trifolium repens*), Red Bartsia (*Odontites serotina*), Ground Ivy (*Glechoma hederacea*), Common Chickweed (*Stellaria media*), Scarlet Pimpernel (*Anagallis arvensis*), Creeping Buttercup (*Ranunculus repens*), Common Toadflax (*Linaria vulgaris*) and Devil's-bit Scabious (*Succisa pratensis*). Greater Mullein (*Verbascum thapsus*) is occasional in these areas.

Small patches of scrub and isolated trees are scattered throughout, chiefly Sallow (*Salix caprea*) but also Dog Rose (*Rosa canina*), Dogwood (*Cornus sanguinea*), Hawthorn (*Crataegus monogyna*) and Elder (*Sambucus nigra*).

A number of plant species present indicate past cultivation, including cultivated Strawberry (*Fragaria spp*) in the shorter grass areas, Spear Mint (*Mentha spicata*) in the semi-improved grassland, cultivated Gooseberry (*Ribes spp.*), Pendulous Sedge (*Carex pendula*) and Russian Vine (*Fallopia baldschuanica*). The eastern boundary hedge is predominantly Garden Privet (*Ligustrum ovalifolium*) (although Wild Privet (*Ligustrum vulgare*) has seeded into the hedge base) and an unidentified cultivated Plum (*Prunus spp.*). Taken together, these species support anecdotal reports that the Site has been cultivated some time ago as allotment land.

Site Assessment

In the absence of management, the Site is developing from semi-improved, species-poor grassland to scrub. The species present indicate a fairly nutrient-rich sward, which would accord with its suspected history as an allotment site.

The habitats present are of value at the site level in the Brighton and Hove context. Although the Site is within the LNR, in isolation it would probably not warrant national protection as an LNR but as part of the much larger Whitehawk Hill LNR, the site contributes features of nature conservation value and importantly, connects otherwise more isolated areas of valuable habitat.

At present the majority of the Site is in transition between species-poor grassland and tall ruderal. The dense areas of scrub and tall ruderal are likely to be of value at the site level as nesting and feeding habitat to the more common species of garden bird. All wild birds, their nests and eggs are protected by law. It is an offence to intentionally kill, injure or take any wild bird or to take, damage or destroy the nest of any wild bird while it is in use or being built.

The habitat is also suitable for reptiles and the available survey information indicates that it is likely to support populations of Viviparous Lizard, Slow-worm and potentially Adder. These species are nationally protected from killing and injury under the Wildlife and Countryside Act 1981, although their habitat is not protected. Depending on the population size of these species, the site may be of value at the city scale for this species group, but more information is required to determine this.

Botanically the Site itself is not of particular merit, but records from the vicinity include a number of scarce and diminutive species, most of which tend to be associated with thin, well drained soils. The small proportion of the Site which is rabbit grazed may remain suitable for the establishment of these species, although previous cultivation is likely to have enriched the soil to the point where habitat restoration would be a challenge.

Land immediately west of the Site supports a notable fungal community, although the reasons for this are unclear. The ecological requirements of most of the fungi found there are grassland or sparse grassland, suggesting that the more sparsely vegetated areas are the most valuable for fungal biodiversity.

Important invertebrate interest has been noted on adjacent land, particularly Wilson Avenue SNCI. In accord with the plant and fungal communities of note, these invertebrates tend to be associated with sparse vegetation cover on thin, well drained soils and these features are almost absent from the Site. However it does have ecological value, being adjacent to the only known locality for *Malthodes lobatus* in the British Isles, if only to provide a buffer

function to potentially damaging or disturbing land use. Suitable habitat for the species would appear to occur on the Site in the form of hedgerows with warm, south-west facing sides, although the vegetation might be too rank across the majority of the Site to support the species. Further survey is required to determine whether *Malthodes lobatus* is present.

THE PROPOSED DEVELOPMENT

The proposal is for the planting of a fruit tree orchard across the entire 1.3 ha site. The orchard would be managed organically and planted at a comparatively low tree density of 8m spacing or more. Some vegetation clearance would be necessary during the establishment phase to improve access and to plant and maintain the trees. Additional hedgerows would be planted to shelter the trees during their development. In this report it is assumed that:

- the Site would be maintained by local volunteers, with free public access at all times;
- that there would be no inputs of chemicals such as pesticides and inorganic fertilisers and
- Access for vehicles would be limited to occasional along the central track way, for maintenance purposes only.

PREDICTION OF IMPACTS

The following prediction of impacts is organised by phase of establishment (planting then operation). The relevant biophysical changes that the proposed orchard is predicted to cause are considered and the impacts of these on ecological features are characterised. Consideration is also given to the social and educational impacts of the orchard proposal with regards to its potential to improve local community engagement with the natural environment and the LNR in particular.

ESTABLISHMENT

Direct loss of habitats

Some initial clearance of the existing vegetation would be necessary to facilitate tree planting and subsequent maintenance. The habitat most affected would be the areas of tall ruderal and scattered scrub. These habitats are of importance at the site level in the Brighton and Hove context.

Small blocks of other habitat would require clearance for the tree planting itself. However at a tree spacing of 8m, the area affected would be less than 3% of the total Site.

Disturbance to habitats

Habitat disturbance will increase during planting as taller vegetation is partially cleared.

Damage due to pollution

Some localised nutrient enrichment around the tree bases might occur through the use of organic fertilizer. Significant nutrient enrichment would be detrimental to the ecology of the Site, particularly as many of the features of importance in the locality are associated with thin soils and sparse vegetation.

The use of power tools would introduce a risk from fuel spillage although this is highly unlikely to be more than very local and temporary within the site context and therefore insignificant. The use of power tools would also introduce some noise pollution with the

potential to disturb nesting birds, contrary to the requirements of the Wildlife and Countryside Act, 1981.

Disturbance to species

Site clearance and tree planting can disturb nesting birds and basking or feeding reptiles in the spring, summer and autumn. There is a small risk that reptiles hibernating deep in the leaf litter may be killed or injured during vegetation clearance and tree planting at any time of the year.

OPERATION

Habitat change or loss due to increased shading

As the fruit trees grow towards maturity there will be an increase in shading over the Site. However at traditional orchard tree densities this will be much less than would otherwise occur through natural succession, if the site were to continue to be left unmanaged. When mature, traditional apple orchards normally allow sufficient light to reach the ground to allow species-rich floras to develop and it is reasonable to assume this would be the case here.

Increased disturbance due to increased presence of people

The Site is already open to free public access and an informal footpath runs through the centre of it. However the orchard would be likely to attract increased numbers of visitors due to the nature of the land use, any associated publicity and because the site will be more open than at present. Significantly increased use may occur during the fruiting season, on 'open day' and similar events. This has the potential to impact the value of the site for reptiles and nesting birds in particular.

Other species of note in the area are unlikely to be directly affected because these tend to be associated with sparsely vegetated, dry, infertile soils which are not present on the Site. It is considered unlikely that the Site will be used at levels where 'spill over' disturbance could be regarded as significant.

Habitat change due to ongoing management

Management as an orchard is likely to result in increased homogeneity of the habitat; areas of tall ruderal and scrub would reduce and the grassland may become more uniform in structure. However without management, the Site is likely to lose grassland, tall ruderal and eventually scrub in favour of species-poor secondary woodland.

Ecologically, much depends on the techniques used for habitat management. Sheep grazing at low stocking levels would result in a more heterogeneous sward and avoid large scale clearance through cutting which might otherwise be damaging to common invertebrate and reptile populations. Both grazing or cutting would be beneficial in creating the more open conditions necessary for the scarce invertebrates recorded in the locality to colonise the site. Sheep dung may attract the Hornet Robberfly to breed. Although some sheep breeds are not compatible with apple trees due to browsing problems, a few are used to graze old orchards, notably Miniature Southdowns (the traditional breed of the South Downs) and Shropshire Down sheep. However it is considered unlikely that sheep grazing will be used on site, at least initially and Figure 7 (below) therefore assumes occasional cutting by machine will be used to maintain the sward.

Organically managed orchards are themselves of high biodiversity value and are included in the national list of important habitats for biodiversity (the 'NERC S41 list'). Although their

value is usually associated with their age, it is probable that the orchard will attract additional species as the trees offer new habitat niches to be exploited.

EVALUATION OF THE SIGNIFICANCE OF IMPACTS (UNMITIGATED)

Figures 6 and 7 (below) summarise the predicted ecological impacts of the orchard on the site during the establishment and operational phases:

Figure 6: Predicted significance of ecological impacts in the establishment phase - unmitigated

Feature	Predicted Significance of Impact on Biodiversity Value	Confidence Level	Predicted Significance of Impact on Ecological Amenity/Educational Value	Confidence Level
LNR	Not Significant	Certain	Moderate Beneficial	Probable
Tall Ruderal	Not Significant	Probable	Not Significant	Certain / near certain
Species-poor grassland	Not Significant	Near certain	Not Significant	Certain / near certain
Scrub	Minor adverse	Probable	Not Significant	Certain / near certain
Ephemeral/short Perennial	Not Significant	Near certain	Not Significant	Certain / near certain
Scarce invertebrates	Not Significant	Certain	Minor beneficial ³	Probable
Fungi	Not Significant	Certain	Not Significant	Certain / near certain
Reptiles	Moderate Adverse	Probable	Not Significant	Certain / near certain
Breeding Birds	Moderate Adverse	Probable	Not Significant	Certain / near certain

Figure 7: Predicted significance of ecological impacts in the management phase - unmitigated

Feature	Predicted Significance of Impact on Biodiversity Value	Confidence Level	Predicted Significance of Impact on Ecological Amenity/Educational Value	Confidence Level
LNR	Not Significant	Certain	Moderate Beneficial	Probable
Tall Ruderals	Minor Adverse	Near Certain	Not Significant	Certain / near certain
Species-poor grassland	Minor Adverse	Near Certain	Not Significant	Certain / near certain
Ephemeral/short Perennial	Minor Adverse	Near certain	Not Significant	Certain / near certain
Scrub	Minor Adverse	Probable	Not Significant	Certain / near certain
Scarce invertebrates	Minor Beneficial	Probable	Minor Beneficial	Probable
Fungi	Minor Beneficial	Probable	Minor Beneficial	Probable

³ Opportunities to talk about the Whitehawk Soldier Beetle with local people during the planting

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Reptiles	Moderate adverse	Probable	Not Significant	Certain / near certain
Breeding Birds	Moderate adverse	Probable	Minor Beneficial	Probable

MITIGATION

The assessment shows that proposed orchard will not have any significant adverse impact on the ecology of the Local Nature Reserve. This is due to the nature of the land use change, the proportionately small size of the site and the relative importance of the habitats within it. The community orchard also has potential to act as a 'honey pot' for community activity, stimulating increased interest in the Local Nature Reserve from local people and therefore creating a probable moderate beneficial impact on the amenity / educational value of the LNR as a whole.

There is a minor adverse impact during the establishment phase due to the probable loss of scrub from the site to make way for the tree planting and to improve access. Planting hedgerow windbreaks would mitigate for the loss of scattered scrub across the site, potentially increasing scrub species diversity and creating areas potentially suitable for colonisation by the Whitehawk Soldier Beetle. Other impacts are not considered to be significant at the Site scale or greater.

Moderate adverse impacts during the establishment phase are due to the probable killing or injury of reptiles and disturbance to nesting birds during site clearance and tree planting. The probability of these occurrences can be reduced to extremely unlikely by restricting the clearance and planting to the winter (November to February inclusive), when birds are not nesting and reptiles are in hibernation and by ensuring that all tree planting and vegetation clearance is carried out with hand tools only. Personnel should also be briefed about the small risk that hibernating reptiles will be killed and asked to be vigilant, particularly when digging. Should a reptile be discovered it should carefully placed in a cloth bag and moved to an undisturbed part of the Site, ideally beneath a hedgerow and then lightly covered with soil and leaf debris.

During the management phase, minor adverse impacts on all the habitats are considered to be near certain, as ongoing management reduces habitat heterogeneity and the availability of scrub and tall ruderal. These impacts can be minimised by managing the site by light sheep grazing (which will promote heterogeneity) or by dividing the site into sections, cut at different times to 'stagger' management impacts. Nutrient enrichment of the soil should be avoided unless needed for the fruit trees, and then only immediately adjacent to fruit tree trunks. These and any other conservation measures should be defined through a written conservation management plan.

Moderate adverse impacts on reptiles and nesting birds are considered probable as a consequence of increased human activity and reduced habitat heterogeneity. Impacts on nesting birds can be reduced to unlikely by maintaining hedgerows in a suitable state for bird nesting and feeding through the Site conservation management plan. Impacts on reptiles can be reduced to unlikely by ensuring that all grass cutting is carried out using hand scythe rather than mechanical cutting and by subdividing the grassed areas into plots cut at different times.

RESIDUAL IMPACTS

There are considered to be no residual impacts requiring mitigation.

ENHANCEMENT

The proposed orchard creates opportunities to enhance the nature conservation value of the Site as follows:

- Wild flower plug planting could be used in conjunction with conservation management to increase the species diversity of the grassland areas. Local provenance wildflower plugs are available from Stanmer Nursery.
- If space is available, the topsoil could be stripped from some areas to expose nutrient-poor subsoil. The creation of open, sparsely vegetated areas in this way could attract the scarce species listed in this report to colonise the site.
- On and off site interpretation and other forms of community engagement could be used to raise awareness of the whole LNR amongst the local community.
- 'Habitat piles' could be created to improve the reptile hibernation potential of the site.
- A pond would diversify site biodiversity.

SUMMARY AND CONCLUSIONS

The proposed community orchard would not have any significant adverse impact on Whitehawk Hill Local Nature Reserve. Moderate adverse impacts on some species groups are considered probable, but these can be mitigated by appropriate site establishment and management. The proposed orchard also creates opportunities to increase the biodiversity of the Site and to benefit the LNR as a whole through increased community engagement.

Without management, the site would undergo natural succession to species-poor secondary woodland of comparatively low nature conservation value. An alternative scenario would be to fence and graze the site as part of plans to reintroduce grazing across Whitehawk Hill. This would deliver many of the same management benefits as the proposed orchard, keeping the site open for reptiles and other species. However, given the nutrient richness of the soil here it is considered unlikely that the species diversity of the site would improve without soil stripping and/or artificial introduction. Moreover the potential of the site as a community orchard to act as a 'honey pot' for community engagement with the LNR would be lost. On balance it is therefore considered that a community orchard is the preferred option with regards to the potential for benefits to the LNR as a whole.

APPENDICES

Appendix 1: Legal Protection Afforded to Wild Species in the UK

Wildlife and Countryside Act 1981 (as amended)

Part I Section 1 (all wild birds)

Offences under this section of this act include;

- a) To intentionally or recklessly to kill, injure or take any wild bird.
- b) To intentionally take, damage or destroy the nest of a wild bird whilst it is in use or being built.
- c) To intentionally take or destroy an egg of any wild bird.

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d) To intentionally or recklessly disturb any wild bird included in Schedule 1 whilst it is building a nest, on or near a nest containing eggs or young, or to disturb the dependent young of such a bird.

These offences apply to all wild birds. Special protection is afforded to those listed on Schedule 1.

Part I Section 9

Offences under this section of this act include;

- a) To intentionally kill, injure or take a species listed on Schedule 5.
- b) To intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a species listed on Schedule 5.
- c) To intentionally or recklessly disturb a species listed on Schedule 5 whilst it is occupying a structure or place used for shelter or protection.

These offences apply to all 'common reptiles'.

The Countryside and Rights of Way Act 2000

This act amended the species protection measures covered in the Wildlife and Countryside Act including the power to impose custodial sentences for offences relating to species listed on Schedule 5 (of the WCA).

Appendix 2: Photographs of the Site taken during the Phase 1 Survey

Unmanaged, species-poor semi-improved grassland with scattered trees



Tall ruderal plant community with Garden Privet hedge behind



A view of the central access path

