Marches Ecology

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20th January 2010

Our Ref: C070-KPPL_Site3-200110v2-TK

Dear Mr Goddard

Re – Walkover Survey of Sites 3 and 3B, Kingmoor Park, Bryn Lane, Wrexham Industrial Estate

Introduction

Marches Ecology was commissioned by Kingmoor Park Properties Ltd to undertake a walkover survey of Site 3, Kingmoor Park, Bryn Lane, Wrexham Industrial Estate, Wrexham (OS Grid Ref. SJ391 503). The walkover survey is required to update the findings of a survey undertaken on 4th August 2008, more specifically an assessment of the habitat for its potential value to two species of butterfly; Dingy Skipper (*Erynnis tages*) and Grizzled Skipper (*Pyrgus malvae*).

The 2008 survey was reported in the following document:

- Marches Ecology (2008). *Kingmoor Park, Wrexham Industrial Estate – Ecological Surveys*. Unpublished report produced on behalf of Kingmoor Park Properties Ltd.

This report was submitted as supporting evidence to an outline planning application (P/2008/0993) for B2/ B8 development on land to the north of the existing TDG plc complex. A plan entitled '*Site Location Plan – Site 3, Kingmoor Park, Wrexham*' (Drawing No. 26405-PL01, dated 26/08/08) submitted with the application sub-divides the application site into five plots; Site 1, Site 2, Site 3, Site 3A and Site 3B. This current walkover survey considers Sites 3 and 3B only as edged in red on the plan entitled '*Site Location Plan – Site 3, Kingmoor Park, Wrexham*' (Drawing No. 26405-PL30, dated 07/01/10) to be submitted with a new planning application. The new planning application concerns a single industrial unit and associated infrastructure; described under the '*TDG plc expansion*' in the previous submission.

Methodology

The survey site was visited on 20th January 2010 by Tom Knight of Marches Ecology. The weather during the survey was overcast, cold, with rain and a light breeze. The survey comprised a brief walkover of Sites 3 and 3B to confirm any changes in the habitat condition since the 2008 assessment. Where changes were identified the potential value of the habitat was re-assessed in accordance with the methodology, in particular the qualitative scale, provided in Marches Ecology (2008).

Update Survey Findings

Some localised disturbance of the ground has resulted following dredging of the pond located immediately to the north of *Target Note 6* (see *Figure 1a*, Marches Ecology, 2008). It is understood that this work was undertaken to enhance the pond for the population of Great Crested Newts (*Triturus cristatus*). Sections of low bund have been formed around the pond using dredged material. This activity has affected a small part of the habitat resource previously identified at *Target Notes 6* and *9*. The area at *Target Note 6* was previously assessed as being of 'Medium Potential Value' for both Grizzled and Dingy Skipper. The area at *Target Note 9* was previously assessed as being of 'Low Potential Value' for Grizzled Skipper and 'High Potential Value' for Dingy Skipper. The overall assessment of the potential value of these areas remains unchanged although there has been a small reduction in size due to the creation of the bunds around the pond. The physical perturbation of the ground surface where an excavator has accessed this pond is unlikely to have affected the value of the habitat.

Similar dredging and scrub clearance work has been carried out at Pond 3 (see *Figure 2*, Marches Ecology, 2008). No habitat of potential value for either species of butterfly was identified in 2008 within the vicinity of this pond. This work did not impact any habitat of potential value for Grizzled and Dingy Skippers.

The habitat within Site 3 was found to be little changed since the assessment completed in 2008 other than the small-scale localised work detailed above. As such the walkover survey completed on 20th January 2010 confirmed that the results of the assessment detailed in Marches Ecology (2008) remain broadly pertinent and that *Figure 1a-d* remains an accurate representation of the potential habitat available for Grizzled and Dingy Skipper within Site 3 (in accordance with the qualitative scale described above).

If you require any further information or have any queries regarding this letter report please do not hesitate to contact me.

Yours sincerely

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Report Title	Kingmoor Park, Bryn Lane, Wrexham Industrial Estate - Ecological Surveys
Client	Kingmoor Park Properties Ltd
Date	September 2008

this report was produced by

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This report has been prepared by Marches Ecology with all reasonable skill, care and diligence within the terms of the Contract with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Report Title	Kingmoor Park, Bryn Lane, Wrexham Industrial Estate - Ecological Surveys
Client	Kingmoor Park Properties Ltd
Marches Ecology Ref	C070
Date issued	September 2008
Author	Tom Knight
Checked by	Max Ellson

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1 INTRODUCTION

1.1 Project Background

1.1.1 Marches Ecology was commissioned by Kingmoor Park Properties Ltd to undertake ecological surveys of a proposed development site at Kingmoor Park, Bryn Lane, Wrexham Industrial Estate, Wrexham (OS Grid Ref. SJ 392 504). More specifically these surveys were required to determine the presence/ absence of Lesser Silver Water Beetle (*Hydrochara caraboides*) and to assess the habitat quality for two species of butterfly; Grizzled Skipper (*Pyrgus malvae*) and Dingy Skipper (*Erynnis tages*). The surveys have been carried out in response to a request by the Countryside Council for Wales (CCW). This report is provided in support of the outline planning application for the site. The location of the survey site (which includes the proposed development site) is shown in *Figure 1.*

1.1.2 The surveys and this report have four principal aims:

- to determine the presence or likely absence of the Lesser Silver Water Beetle within the survey site and whether any of the waterbodies provided potentially suitable breeding habitat;
- to assess the quality of the habitat, and therefore its potential to support, Grizzled and Dingy Skippers;
- to detail further surveys that may be required; and
- to identify potential development constraints relating to these species and outline potential mitigation.

1.1.3 This work comprised an ecological background data search and review of information held by Marches Ecology, a site visit to appraise the potential habitat value for the two butterfly species and detailed survey of four ponds for the Lesser Silver Water Beetle. This report presents the findings of these surveys.

1.2 Legislation and Policy

Introduction

1.2.1 This sub-section provides a brief summary of key relevant legislation. It should not be considered a comprehensive review and is not meant to be so. It is provided here for information only and is not intended to replace specialised legal advice. It does not replace the text of the legislation, but summarises the salient points.

Lesser Silver Water Beetle

1.2.2 The Lesser Silver Water Beetle (*Hydrochara caraboides*) is included on *Schedule 5* of the *Wildlife & Countryside Act 1981*, as amended. Under this legislation it is an offence to intentionally or recklessly:

- kill, injure or take an individual of such a species;
- possess any part of such species either alive or dead;
- damage, destroy or obstruct access to any place or structure used by such species for shelter, rest, protection or breeding;
- disturb such a species whilst using any place of shelter or protection; or
- sell or attempt to sell any such species.

1.2.3 The Lesser Silver Water Beetle is listed as a 'species of principal importance for the conservation of biological diversity in Wales' under *Section 42* of the *Natural Environment and Rural communities Act 2006* (NERC Act). *Section 74(2)* of the *Countryside and Rights of Way Act 2000* (now under *Section 42* of the *Natural Environment and Rural Communities Act 2006*) requires the government to prepare and publish a list of species and habitats that it considers to be of principal importance for the conservation of biological diversity in Wales. *Section 74* places a duty on the government to have regard, in exercising all its functions, to conserve biological diversity in accordance with the United Nations Convention on Biodiversity.

1.2.4 *Sections 40* to *42* of the *Natural Environment and Rural Communities Act 2006* (NERC Act) replace *S74* of the CRoW Act. *Section 40* of the *NERC Act* extends to all public authorities (includes local planning authorities) the existing *S74* duty to have regard to biodiversity as far as is consistent with the proper exercise of their functions.

1.2.5 The Lesser Silver Water Beetle is also a UK BAP priority species and a Red Data Book 1 species – Vulnerable (Foster, in press). The 'Lesser Silver Diving Beetle' is identified as 'Nationally Important' on the Provisional List of Locally Important/Endangered Species in the Wrexham Biodiversity Action Plan (Wrexham County Borough 2003) although the scientific name given is incorrect. However such Action Plans and lists are more important for guiding proposals for habitat creation/enhancement and conservation resource prioritisation. The Wrexham BAP is a supplementary planning guidance document.

Grizzled Skipper

1.2.6 The Grizzled Skipper (*Pyrgus malvae*) is listed as a 'species of principal importance for the conservation of biological diversity in Wales' under *Section 42* of the *Natural Environment and Rural communities Act 2006*.

1.2.7 The Grizzled Skipper has recently been adopted as a UK BAP priority species (Biodiversity Reporting & Information Group, 2007). It is also identified as 'Locally Threatened' on the Provisional List of Locally Important/Endangered Species in the Wrexham Biodiversity Action Plan (Wrexham County Borough 2003). Butterfly Conservation (a charitable non-governmental organisation) has produced a National Action Plan for Wales (Joy & Bourn, 1998). This plan identifies the Grizzled Skipper as a high priority species important in Wales.

Dingy Skipper

1.2.8 The Dingy Skipper (*Erynnis tages*) is listed as a 'Species of principal importance for the conservation of biological diversity in Wales' under *Section 42* of the *Natural Environment and Rural communities Act 2006*. It has also recently been adopted as a UK BAP priority species. It is identified by Butterfly Conservation as a medium priority species important in Wales.

1.3 Structure of this Report

1.3.1 The remainder of this report is structured as follows:

Section 2 describes the survey methodology;
Section 3 describes the results;
Section 4 outlines ecological issues including potential mitigation; and
Section 5 contains the target notes.

Further sections give references and tables of data.

2 METHODOLOGY

2.1 Contextual Information/ Ecological Background Data Search

2.1.1 Existing records for Grizzled and Dingy Skipper particularly from Wrexham Industrial Estate were requested from Zara Lomax (Wrexham County Borough Council, Ecologist). The data supplied has been supplemented by records held by Marches Ecology from other studies undertaken around the Industrial Estate. Records of Lesser Silver Water Beetle within the Industrial Estate were requested from Zara Lomax and supplemented by records held by Andy Harmer (Cheshire Biodiversity Officer for the Lesser Silver Water Beetle). A general request for data within 1 km of the survey site was also submitted to Cofnod (the North Wales Environmental Information Service).

2.1.2 In addition widely available contextual information was consulted as follows:

- the National Biodiversity Network Gateway (http://www.searchnbn.net);
- UK Biodiversity Action Plan (UKBAP); and
- Wrexham Biodiversity Action Plan.

2.2 Lesser Silver Water Beetle Survey

Survey Methodology

2.2.1 A single visit was undertaken to each of the four ponds within the survey site (Plots 1 and 3). The location of these ponds is shown on *Figure 2*. The survey was undertaken on 13th August 2008 by Andy Harmer. This work was carried out under CCW licence OTH:SA:353:2008. The weather was warm/ muggy, dry and with a light breeze. The presence/ absence survey included the following elements (Harmer 2008):

- Inspection of the waterbody for floating egg cocoons, initially from the pond perimeter, and then more thoroughly by wading into the water, carefully inspecting areas between vegetation;
- Sweep-netting of the ponds for adults, cocoons, and larvae. Netting was undertaken for approximately 45 minutes at each pond, with the option of extending the search for breeding evidence if an adult beetle were located;
- Identification of all aquatic macro-invertebrates encountered to species level where possible in order to assess the assemblage for breeding pool indicator species (see *Table 1* below);

2.2.2 The invertebrate and amphibian assemblage was assessed with reference to species that often indicate that the habitat is favourable for Lesser Silver Water Beetle. *Table 1* below lists some species that can usually be found co-existing with Lesser Silver Water Beetle in lowland Cheshire and Wrexham County Borough.

Table 1 – Species Indicative of Favourable Habitat for Lesser Silver Water Beetle

Common Name	Scientific Name
A Leech	*Erpobdella testacea*
Mud Snail	*Lymnaea glabra*
Twisted Ramshorn	*Bathyomphalus contortus*
Ruddy Darter	*Sympetrum sanguineum*
Emperor Dragonfly	*Anax imperator*
A Diving Beetle	*Hydaticus seminiger*
A Diving Beetle	*Dytiscus semisulcatus*
Great Crested Newt	*Triturus cristatus*

Survey Timing

2.2.3 The discovery of numerous egg cocoons from a number of ponds in the neighbouring county of Cheshire suggests that there are two breeding periods within the northwest population; May to June and July to August. It is reasonable to expect that successful recruitment from the first breeding period will swell the ranks of breeding adults in the second period. The timing of this survey coincides with perhaps the window that would witness most adults and larvae at any one time; adults from the initial breeding period, recruitment from the initial period and larvae from the second breeding period. However some ponds may either lose their favourability or gain it within a single season due to water level changes or temporary shading from summer plant growth. This could result in a single recruitment period before the beetles disperse from the pond, and likewise a pond that becomes favourable may have adult beetles disperse to it. A single survey visit can often suffice to determine presence/ absence but in some instances, should the pond only be suitable during one of the breeding periods, further survey may be required.

2.3 Grizzled Skipper and Dingy Skipper Habitat Assessment

2.3.1 The main flight period for the Grizzled Skipper in North Wales is usually from late April/ early May up to mid-June. The main flight period of the Dingy Skipper in North Wales is usually from the first or second week of May up to the start of July. Survey of the proposed development site concentrated on assessing the potential quality of the habitat for these two species. The survey was carried out on 4th August 2008 by Tom Knight and Max Ellson of Marches Ecology. The weather was warm and sunny with occasional light showers and a light breeze. The survey focussed on land within the proposed development site; Plot 1 and Plot 3 (as referred to henceforth). Target Notes (provided in *Section 5*) describe vegetation types and other features of interest. Species of butterfly/ macro-moth observed during the habitat assessment are listed in *Table 7* in *Section 7*.

2.3.2 A simple qualitative scale (*Tables 2* and *3* below) has been used to categorise habitat value so that this can be mapped (*Figures 1a-d*). As a subjective survey tool it is entirely reliant on surveyor experience. The boundaries between different habitat categories shown in *Figures 1a-d* are often arbitrarily drawn and should be treated as such when interpreting this map.

2.3.3 The habitat assessment scales have been adapted from parameters detailed in the following texts:

- Brereton, T.M., Bourn, N.A.D., Warren, M.S. (1998). *Species Action Plan – Grizzled Skipper Pyrgus malvae*. Butterfly Conservation, Wareham.
- Bourn, N.A.D., Jeffcoate, G.E. & Warren, M.S. (2000). *Species Action Plan – Dingy Skipper Erynnis tages*. Butterfly Conservation, Wareham.
- Ellis, J. (2006). *Brownfield Sites of Conservation Importance for Butterflies and Moths in the West Midlands – Butterfly Conservation Report S06-09*. Butterfly Conservation, East Lulworth. Unpublished report.
- Joy, J, & Bourn, N. (1998). *National Action Plan for Wales*. Butterfly Conservation, Wareham.

Although the Grizzled Skipper and Dingy Skipper often inhabit broadly similar habitat patches within brownfield sites (and can be found in the same area) there are certain habitat parameters that are preferential for each species. Such parameters include the Dingy Skipper's preference for shorter vegetation especially at egg-laying plants and more obviously the different larval host-plants. It was therefore felt that a separate assessment scale was required for each species.

Table 2 - Grizzled Skipper Habitat Assessment

Value	Habitat Parameters
None	The habitat includes at least two of the following parameters, including one of the first two listed. • The vegetation is likely to be species-poor or have an unsuitable structure; • There are no larval food-plants present; • There is no bare ground or short/ sparse vegetation; • The site may be very open or scrubbing over (may include barriers to dispersal).
Low	The habitat includes at least three of the following parameters, including both of the first two listed. • Relatively species-poor vegetation with few nectar sources; • The key larval food-plants are occasional at most; • The vegetation structure is sub-optimal for the species (*e.g.* it may be too tall and rank); • There are few larval food-plants located in suitable egg-laying conditions; • Bare ground is infrequent at most; • Little shelter is provided or scrub colonisation may be well advanced.
Moderate	The habitat includes at least three of the following parameters, including both of the first two listed. • Vegetation is moderately species-rich with few potential nectar sources; • The key larval food-plants may be locally frequent but are not found throughout the area; • The optimal height around larval food-plants may not always be achieved (*e.g.* due to lack of grazing or other management); • Bare ground is present but may not be frequent; • The vegetation may not provide a range of conditions;

Value	Habitat Parameters
	• The site may or may not be sheltered.
High	The habitat includes at least four of the following parameters, including both of the first two listed. • Abundant spring (April to mid-June) nectar sources; • Abundance of at least one of the following key larval food-plants: Agrimony, Creeping Cinquefoil, Wild Strawberry, or more infrequently Barren Strawberry and Tormentil; • Larval food-plants are growing in short (<10 cm), herb-rich vegetation; • Bare ground is frequent with larval food-plants often adjacent; • A vegetation mosaic exists whereby patches of taller vegetation (10-50 cm) are present; • Some taller vegetation with larger leaves (*e.g.* Bramble and larger cinquefoil leaves); • Sheltered, sunny site (by scrub/woodland edges).

Table 3 - Dingy Skipper Habitat Assessment

Value	Habitat Parameters
None	The habitat includes at least three of the following parameters, including one of the first two listed. • The vegetation is likely to be species-poor or have an unsuitable structure; • There are no larval food-plants present; • There is no bare ground or short/ sparse vegetation; • The site may be very open or scrubbing over (may include barriers to dispersal); • The site may be heavily grazed in spring/ summer.
Low	The habitat includes at least three of the following parameters, including one of the first two listed. • Relatively species-poor vegetation with few nectar sources; • The key larval food-plant is occasional at most; • The vegetation structure is sub-optimal for the species (*e.g*. it may be too tall and rank); • There are few larval food-plants located in suitable egg-laying conditions; • Bare ground is very infrequent; • Little shelter is provided or scrub colonisation may be well advanced.
Moderate	The habitat includes at least three of the following parameters, including both of the first two listed. • Vegetation is moderately species-rich with few potential nectar sources; • The key larval food-plant may be locally frequent but is not found throughout the area; • The optimal height around larval food-plants may not always be achieved (*e.g.* due to lack of grazing or other management); • Bare ground is present but may not be frequent; • The vegetation may not provide a range of conditions; • Suitable habitat covers an area of less than 2 hectares; • The site may or may not be sheltered;

Value	Habitat Parameters
	• Grazing regime may not be entirely appropriate.
High	The habitat includes at least four of the following parameters, including both of the first two listed. • Abundant spring (April to mid-June) nectar sources; • Abundance of the key larval food-plant: Common Bird's-foot-trefoil (or sometimes Greater Bird's-foot-trefoil); • Larval food-plants are growing in short (<5 cm) or sparse, herb-rich vegetation; • Bare ground/ rock is frequent, often large, with larval food-plants often adjacent; • Bare ground is frequent; • A vegetation mosaic exists whereby patches of taller vegetation (10-50 cm) are present. • Suitable habitat covers an area in excess of 2 hectares; • Sheltered, sunny site (by scrub/woodland edges); • Absence of heavy grazing (particularly in spring/summer).

3 RESULTS

3.1 Contextual Information

Brief Summary of Species Ecology

Lesser Silver Water Beetle

3.1.1 Optimal pond conditions for Lesser Silver Water Beetles in Cheshire/ Wrexham are as follows (after Guest, 1996 and Webb & Harmer, 2006):

- Mats of floating vegetation (often strong enough to support Willows) with a diverse plant community;
- Clean water that does not come from a eutrophic source;
- Shallow (and therefore comparatively warm) water generally less than 0.2 m deep;
- Over two-thirds of the water without excessive growth of *Lemna* spp. (Duckweed) or filamentous algae;
- A thick layer of leafy or other organic detritus that has formed at the bottom of the pond;
- An abundance of invertebrate prey;
- Cattle poached areas away from the floating raft of vegetation that usually contains stands of *Sparganium erectum* (Branched Bur-reed), *Glyceria maxima* (Reed Sweet-grass), *Juncus effusus* (Soft-rush) and *Potamogeton natans* (Broad-leaved Pondweed); and
- Absence of fish.

Grizzled Skipper and Dingy Skipper

3.1.2 The Grizzled Skipper occurs in several different habitats, all of which are characterised by short vegetation, warmth and shelter from prevailing winds. These include woodland edges and rides, chalk downs, where scrub encroachment has produced pockets of (largely unimproved) grassland and their food-plants thrive, sheltered hill-sides and valleys, and young coppice. It is frequently found on post-industrial brownfield sites, although it is more typical of woodland rides and chalk downland. The species typically lives in small (less than 50 individuals), self-contained colonies often in sheltered locations. On brownfield sites one of the main habitat requirements appears to be a plentiful supply of food-plants, patches of bare ground, and an abundance of spring nectar plants. The larval host-plants include *Agrimonia eupatoria* (Agrimony) and *Potentilla reptans* (Creeping Cinquefoil). The distribution of Creeping Cinquefoil is often linked to shallow surface disturbances and the occurrence of sparse, open swards.

3.1.3 Skippers are active usually only on warm days or in bright sunshine, when they can be seen darting from flower to flower or to and from perches on low vegetation. They usually keep low to the ground and rarely stray from their favoured habitats. Males are often fiercely territorial and spend much of their active lives perched on a vantage point, from which they assail other males and other small passing insects which pass within a few metres. Warm, sheltered positions are chosen in the hope that these will attract females. Adults usually roost in tall ungrazed or uncut vegetation (around 40 cm).

3.1.4 Unlike other British skippers, both the Grizzled and Dingy Skipper can have small second broods in hot years, but are usually univoltine. Eggs are laid singly or in small groups onto

the food-plants. These include a variety of plants of the family *Rosaceae* including *Fragaria vesca* (Wild Strawberry), *Potentilla reptans* (Creeping Cinquefoil), *Agrimonia eupatoria* (Agrimony), *Potentilla erecta* (Tormentil) and *Potentilla anserina* (Silverweed). The species is also recorded as using *Rubus fruticosus* agg. (Bramble). Egg-laying principally takes place on plants in short vegetation (less than 10 cm) or bare ground.

3.1.5 The Dingy Skipper is found in a range of open habitats and favours areas of bare earth, with taller vegetation for roosting. The larval host-plant is *Lotus corniculatus* (Common Bird's-foot-trefoil) which is a common and widespread species. It similarly lives in small (less than 50 individuals), self-contained colonies.

Status in (north) Wales

Lesser Silver Water Beetle

3.1.6 The Lesser Silver Water Beetle has been recorded from two counties in England; Cheshire and Somerset. The main stronghold for this beetle remains on the peat moors of the Somerset levels but the northwest population (in Cheshire and northeast Wales) now numbers 55 known breeding sites. It is known from a small number of ponds within Wrexham (County Borough) all from the Maelor (particularly the Penley-Overton-Horseman's Green area) an area of lowland agricultural land similar in many respects to the bordering Cheshire plain. In 2006 the Lesser Silver Water Beetle had been recorded from 11 tetrads (2 by 2 km squares) in Cheshire (Harmer, 2006). Fewer records exist for Wrexham.

Grizzled Skipper and Dingy Skipper

3.1.7 There are around 10-15 known colonies of Grizzled Skipper in Wales (Asher *et. al.* 2001) and approximately three in Clwyd (Brereton *et. al.* 1998). The Grizzled Skipper is generally thought to be under-recorded in Wales, and other colonies may be present within Wrexham Industrial Estate where suitable habitat exists. As such if there is a colony present on the site it may be part of a larger meta-population distributed across the Industrial Estate with occasional dispersal between sub-populations. Sub-populations within a meta-population can be subject to local extinctions and re-colonisations. It is now known that Grizzled Skippers are present on several land parcels distributed across the Industrial Estate.

3.1.8 The Dingy Skipper remains relatively widespread in north Wales and can be found in large numbers at some sites. It is largely uncommon due to loss of habitat in recent years.

3.2 Ecological Background Data Search

Lesser Silver Water Beetle

3.2.1 Zara Lomax provided three records of Lesser Silver Water Beetle; none from Wrexham Industrial Estate. All three records are from ponds within agricultural land to the east of Overton; near The Cloy (*e.g.* SJ3955 4315). The Cloy is over 7.5 km south of the proposed development site.

3.2.2 In 2002 a pond survey undertaken on behalf of Wrexham County Borough Council (Guest & Harmer 2002) located the first two modern breeding records for Lesser Silver Water Beetle in Wales. In 2004 a similar survey (Harmer 2004) located a further three breeding records; these are the records that were supplied by Zara Lomax as described above. A further three

breeding ponds were recorded by 2008 (records from Ellson, Harmer, Denton see *Table 4* below). The number of known breeding ponds within Wrexham borough is now eight sites. The closest known site is at The Cloy as detailed above. It is likely that further (as yet un-surveyed) breeding ponds form part of this cluster. *Table 4* below lists all known records of Lesser Silver Water Beetle within Wrexham borough.

Table 4 – Records of Lesser Silver Water Beetle from Wrexham Borough

Location: OS Grid Ref.	**Year**	**Recorder**
SJ4391 4153	2008	Andy Harmer
SJ438416	2008	Max Ellson/Tom Knight
SJ394424	2004	Andy Harmer
SJ391424	2004	Andy Harmer
SJ395431	2004	Andy Harmer
SJ3747	2004	Jonty Denton
SJ405407	2002	Andy Harmer
SJ431414	2002	Andy Harmer

3.2.3 Cofnod provided no records of Lesser Silver Water Beetle within 1 km of the survey site. A review of species records on the NBN website for the wider area provided no further records.

Grizzled Skipper and Dingy Skipper

3.2.4 Zara Lomax provided records of Grizzled and Dingy Skipper for two 10-km squares; SJ34 and SJ35. The proposed development site is located within SJ35. These records cover a period from 1995 to 2004 and are from a database held by Butterfly Conservation. They include nine records of Grizzled Skipper from three different sites and ten records of Dingy Skipper from three different sites. *Table 5* below provides a summary of these records.

Table 5 – Records of Grizzled and Dingy Skipper supplied by WCBC

Species	Grid Ref.	No. of Records	Years	Highest no. Seen
Grizzled Skipper	SJ386 493; The Oaks	5	1998-2004	11
	SJ381 488; Spectrum Industrial Estate (WAG land)	2	2004	6
	SJ380 502; Norish FP Ltd	2	2004	2
Dingy Skipper	SJ386 493; The Oaks	5	1995-2004	2-9
	SJ381 488; Spectrum Industrial Estate (WAG land)	3	2004	19
	SJ380 502; Norish FP Ltd	2	2004	4

3.2.5 Marches Ecology retains records for both species from several sites around Wrexham Industrial Estate (obtained during the course of ecological studies for unrelated projects). Permission to reproduce these records has been obtained in each case from the client (the data holder). The records are provided in *Table 6* below.

Table 6 – Records Retained by Marches Ecology

Species	Grid Ref.	Years	Highest no. Seen
Grizzled Skipper	SJ389 501; adjacent to Bryn Lane.	2007-2008	2
	SJ381 488; Spectrum Industrial Estate (WAG land)	2008	4
	SJ385 496; adjacent to Abbey Road	2008	1
Dingy Skipper	SJ389 501; adjacent to Bryn Lane.	2007-2008	3

3.2.6 The land adjacent to Bryn Lane detailed in *Table 6* is currently the subject of a mitigation programme for both species of butterfly (as well as other, mainly legally protected, species). This programme was agreed to mitigate for the impacts of a separate development project adjacent to Bryn Lane and includes ongoing management of the habitat for these butterflies.

3.2.7 Cofnod provided no records of Grizzled Skipper or Dingy Skipper within 1 km of the survey site. A review of species records on the NBN website for the wider area provided no further records.

3.3 Lesser Silver Water Beetle Survey

Pond 1

3.3.1 Pond 1 appears to be a series of ponds that have been joined. There are a number of fishing platforms present, which suggests the presence of coarse fish. Coarse fish have yet to be recorded in a Lesser Silver Water Beetle breeding pond. The structure of the pond offered very little favourable habitat for the Lesser Silver Water Beetle; it had shaded banks, abrupt edges, no cattle access, and the limited amount of floating vegetation that is present is surrounded by much deeper water than is normally associated with the larval requirements of this insect. The animal assemblage recorded contained no indicator species. No Great Crested Newts have been recorded from this pond (Derek A. Whitcher Ltd, 2008). This pond is considered unsuitable for the Lesser Silver Water Beetle.

Photograph of Pond 1

Pond 2

3.3.2 Pond 2 has fairly rich stands of marginal vegetation and a healthy invertebrate assemblage. However it lacks the features associated with a Lesser Silver Water Beetle breeding waterbody such as cattle poached margins, a floating raft of vegetation, and gently shelved shallow margins. The Emperor Dragonfly (*Anax imperator*) was the only indicator species encountered, but this should be viewed in the context of a group of animals. The Emperor is a typical species of fishing ponds such as this and would only be relevant if recorded as part of a group of indicator species. Coarse fish activity was evident during the survey visit. No Great Crested Newts have been recorded from this pond (Derek A. Whitcher Ltd, 2008). This pond is considered unsuitable for the Lesser Silver Water Beetle.

Photograph of Pond 2

Pond 3

3.3.3 Pond 3 is an elongated waterbody typical of multiple marl-pits that have merged over time. Cattle can access both the eastern and western bank; although it appears that the steepness of the banks may act as a deterrent and consequently limits livestock activity within the pond. This has allowed tall herbage, shrubs and trees to flourish along the centre and flanks of the waterbody, creating shade and organic detritus through leaf litter. There is little floating vegetation other than duckweed species; *Lemna minor* (Common Duckweed) and *Lemna trisulca* (Ivy-leaved Duckweed). The Lesser Silver Water Beetle can tolerate duckweed species but proliferation of this plant can chill the water, inhibiting recruitment of larvae and its prey species. It may also inhibit cocoon construction which usually takes place in clear open shallow water. No indicator species were found during netting. A small population of Great Crested Newt has been recorded from this pond (Derek A. Whitcher Ltd, 2008). This pond is considered unsuitable for the Lesser Silver Water Beetle.

Photograph of Pond 3

Pond 4

3.3.4 Pond 4 consists of two marl-pits that have joined to make a figure of eight shape. One of the pools appeared to have been recently dredged but the second pool has retained features associated with favourable Lesser Silver Water Beetle habitat. Favourable features included a dense stand of *Typha latifolia* (Bulrush) which has over time spread across most of the pool to create a tightly-matted raft of floating vegetation. The pond has arrived at this state of succession through many years of cattle access though it appeared at the time of survey that little trampling had occurred in recent months. Cattle poaching is considered a crucial activity for a Lesser Silver Water Beetle breeding pool.

3.3.5 Two indicator species were recorded that reflects the known paradox of Lesser Silver Water Beetle breeding ponds; the Ruddy Darter (*Sympetrum sanguineum*) is intolerant of new sparsely vegetated ponds and has an affinity with densely vegetated ponds of antiquity, while the Emperor Dragonfly (*Anax imperator*) is a pioneer of newly created areas of water often over mineral substrate seemingly attracted by the constantly regenerated poached margins. The Water Spider *Argyroneta aquatica* was also recorded and although it is not included in the indicator species list provided in *Table 1* it is a scarce species that is found in bio-diverse ponds of antiquity such as Lesser Silver Water Beetle breeding ponds. Soft bodied invertebrates – potential prey species for Lesser Silver Water Beetle larvae – are also numerous. A small population of Great Crested Newt has been recorded from this pond (Derek A. Whitcher Ltd, 2008). Although no Lesser Silver Water Beetles were recorded during the present survey this pond is considered potentially suitable for the Lesser Silver Water Beetle.

Photograph of Pond 4

3.4 Grizzled Skipper and Dingy Skipper Habitat Assessment

Habitat Description

3.4.1 Plot 3 extends to 38.96 hectares and encompasses a range of habitat types. In terms of grassland vegetation there are broadly four main types; agriculturally improved pastures, (poor) semi-improved pastures, species-rich neutral grassland on brownfield land and intensively managed amenity grassland. The three large fields to the north of the west-east stream that dissects Plot 3, adjacent to Ridley Wood Road (*Target Note 16*) are all agriculturally improved fields. The grassland in these fields has been re-sown and is intensively managed for silage production. They are of no value for Grizzled and Dingy Skipper.

3.4.2 Directly to the south of the west-east stream there is a large field of species-poor semi-improved grassland (*Target Note 17*) that also offers no value for the two target species. The three fields to the south of this, although marginally more species-rich, have similarly been assessed as not suitable.

3.4.3 Within Plot 3, to the east of Bryn Lane and west of the fields described above, there are three small field units (*Target Notes 11*, *13* and *13a*). These fields may be considered to be semi-improved or unimproved neutral grassland and in places the sward is species-rich. They appear to have been subject to less intensive management and not as recently managed as those at *Target Note 17*. However due to the lack of management (grazing/ cutting/ perturbation actions) a tall rank sward has developed throughout much of this area dominated by coarse grass species such as *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Holcus lanatus* (Yorkshire-fog) with various tall bulky herbs. The increase in these species is likely to have coincided with a decline in species-

richness. The result is that patches of species-rich vegetation that contain one or more of the key larval host-plants are very limited in these fields and although small areas have been assessed as of low potential value they could be considered unsuitable due to the height of the sward, its generally uniform structure and the lack of bare soil/ rock.

3.4.4 Plot 1 extends to 2.49 hectares (*Target Note 15*). It provides a similar grassland resource to that described at *Target Notes 11* and *13*. It is therefore unlikely to be of any potential value to the two target species.

3.4.5 There are small areas of intensively managed amenity grassland associated with the existing site entrance (*Target Note 14*). Small amounts of *Lotus corniculatus* (Common Bird's-foot-trefoil) and *Potentilla reptans* (Creeping Cinquefoil) are present. However this vegetation is considered to be of no potential value for the target species due to the regular mowing, uniform structure and absence of bare soil/ rock.

3.4.6 The habitat within the remaining area of Plot 3 (*Target Notes 1, 2, 3, 4, 5, 6, 7, 8* and *9*) appears to have developed over sub-soil and concrete rubble material with several areas of hard-standing, spoil piles and piles of rubble. The vegetation includes unimproved species-rich neutral grassland subject to varying amounts of disturbance and rabbit grazing, stands of various tall herbs, bare soil, scrub and wetlands. Habitat that is suitable for Dingy Skipper and Grizzled Skipper within the survey site is more-or-less restricted to this area.

3.4.7 The vegetation described at *Target Notes 2, 3, 4, 5* and *9* may be considered to be of the highest potential value. Although *Lotus corniculatus* (Common Bird's-foot-trefoil) is recorded throughout this area and is often abundant the key larval host-plants of the Grizzled Skipper; at this site most likely to be *Potentilla reptans* (Creeping Cinquefoil), are mostly occasional and only locally frequent. The species-rich unimproved neutral grassland over rubble/ sub-soil material described at *Target Note 3* may be considered *optimal* for both species. The sward is typically sparse with further disturbance by Rabbits creating bare areas. Grazing by Rabbits maintains the sward height to as low as 0.02 to 0.03 m in places although taller grass and tall herbs are located near the fringing patches of scrub; mostly *Crataegus monogyna* (Hawthorn), *Rubus fruticosus* agg. (Bramble) and *Salix caprea* (Goat Willow). Within the grassland *Potentilla reptans* (Creeping Cinquefoil) is locally abundant with *Lotus corniculatus* (Common Bird's-foot-trefoil) frequent throughout. *Fragaria vesca* (Wild Strawberry) is also occasional. The species-rich sward contains many potential nectar sources including several locally scarce[1] plants such as *Euphorbia exigua* (Dwarf Spurge).

3.4.8 The species-rich unimproved neutral grassland described at *Target Note 5* is often taller and denser than that described at *Target Note 3* although Rabbit grazing provides a varied structure in places. It is often dominated by *Agrostis capillaris* (Common Bent) with abundant *Lotus corniculatus* (Common Bird's-foot-trefoil). This grassland is of high potential value for Dingy Skippers but of comparatively less value for Grizzled Skippers as *Potentilla reptans* (Creeping Cinquefoil) is at most locally frequent. An adjacent south-facing bank (*Target Note 4*) may be of particular value for thermophilic (warmth-loving) insects.

3.4.9 An old disused track described at *Target Note 2* has developed a flora that is locally dominated by *Potentilla reptans* (Creeping Cinquefoil) and may therefore be of particular value to Grizzled Skippers. It is fringed with low-growing *Rubus fruticosus* agg. (Bramble)

[1] In Vice County 50, a scarce plant is described as being recorded in 4-15 10 km squares (Green, 2006).

scrub with tall herbs such as *Epilobium hirsutum* (Great Willowherb) and *Pulicaria dysenterica* (Common Fleabane) which provide sheltered conditions. The height of the species-rich unimproved neutral grassland sward is kept low in places (0.1 m) by the actions of Rabbits. Although bare patches are infrequent potential egg-laying plants are adjacent.

3.4.10 A ditch located along the eastern boundary of the survey site is described at *Target Notes 7* and *10*. The southern stretch of this ditch has an east-facing bank that supports species-rich unimproved neutral grassland with abundant *Lotus corniculatus* (Common Bird's-foot-trefoil). Potential larval host-plants for the Grizzled Skipper are more-or-less absent from this side of the ditch although *Potentilla reptans* (Creeping Cinquefoil) is occasional on the opposite (west-facing) bank. A fringe of *Crataegus monogyna* (Hawthorn) and *Rubus fruticosus* agg. (Bramble) scrub, particularly along the top of the west-facing bank provides shelter. Although these patches of suitable habitat are relatively small they are considered to be of potentially moderate or high value for Dingy Skipper and low or moderate value for Grizzled Skipper.

3.4.11 The northern stretch of the ditch (*Target Note 10*), where it is located adjacent to the poor semi-improved pasture fields, has been re-profiled. As a result there is virtually no scrub on the northeast-facing bank although the southwest-facing bank has a similar scrub fringe to that described at *Target Note 7*. It should be noted that the southwest-facing bank is located outside the boundary of the survey site. The northeast-facing bank appears to have been poached by livestock in the past and as a result supports comparatively little *Lotus corniculatus* (Common Bird's-foot-trefoil) and *Potentilla reptans* (Creeping Cinquefoil). The southwest-facing side is comparatively species-rich and has frequent *Lotus corniculatus* (Common Bird's-foot-trefoil) with occasional *Potentilla reptans* (Creeping Cinquefoil). The northeast-facing bank is of potentially low value for both target species while the southwest-facing bank is of low potential value for Grizzled Skipper and moderate to high potential value for Dingy Skipper.

Other Species

3.4.12 During the habitat assessment survey 13 species of butterfly were recorded and two day-flying macro-moths. Both the *Coenonympha pamphilus* (Small Heath) butterfly and *Tyria jacobaeae* (The Cinnabar) moth are listed under *Section 42* of the *NERC Act 2006* as species of principal importance for the conservation of biological diversity in Wales. They are also both UK BAP priority species but only for monitoring of habitat condition trends (Biodiversity Reporting & Information Group, 2007). Joy & Bourn (1998) list the Small Heath as a low priority species in Wales and describe it as 'widespread and common'. All of the 13 species of butterfly recorded are listed as a low priority species in Wales and 12 of the 13 are described as widespread and common. A single Purple Hairstreak (*Neozephyrus quercus*) was recorded at *Target Note 12*. This species is described as 'probably widespread and under-recorded'. Both species of macro-moth recorded may also be considered widespread species.

3.4.13 Although recording of numbers was not undertaken there was a marked concentration of butterflies around the area of brownfield land (*e.g. Target Notes 1* to *9*). Although the species of brown (Small Heath, Meadow Brown, Gatekeeper and Speckled Wood) use various grasses as larval host-plants the abundant nectar sources within the species-rich unimproved neutral grassland attracted much larger numbers than recorded elsewhere within the survey site. The Common Blue whose larval host-plants are mainly *Lotus*

corniculatus (Common Bird's-foot-trefoil) and *Medicago lupulina* (Black Medick) exhibited a similar distribution across the site.

3.5 Summary of Findings

Lesser Silver Water Beetle

3.5.1 No Lesser Silver Water Beetles were recorded from any of the surveyed ponds. Ponds 1, 2 and 3 are considered unsuitable for the Lesser Silver Water Beetle. Pond 4 is considered potentially suitable for the Lesser Silver Water Beetle.

3.5.2 The Lesser Silver Water Beetle is a good flyer and is known to colonise suitable pond clusters of similar pond types. A percentage of adult beetles probably disperse from the natal pond after pupation, but perhaps the biggest reason for dispersing or remaining in situ is pond suitability/unsuitability. Even within a year, a pond may have a window of favourability for the Lesser Silver Water Beetle. Several species considered indicative of favourable habitat conditions for the Lesser Silver Water Beetle were recorded from Pond 4. It is likely that earlier in the year, perhaps during the first breeding period of the Lesser Silver Water Beetle (May/June), that the water level will be higher and the vegetation will be lower; two factors that will determine the depth of the water column, availability of open areas of water, and temperatures within those micro-habitats. It is therefore possible that Pond 4 may be suitable during the first breeding period and often unsuitable during the second breeding period.

Grizzled Skipper and Dingy Skipper

3.5.3 Available habitat within the survey site that is suitable for both target species of butterfly is more-or-less restricted to the brownfield land (*Target Notes 1, 2, 3, 4, 5, 6, 7* and *9*) directly to the north of the TDG complex (Plot 2). Much of this area may be considered of moderate or high potential value for both species. Most of the remaining area of Plots 1 and 3 is not suitable for either species.

3.5.4 If a population of Grizzled and or Dingy Skippers is present on the site it may be part of a larger meta-population that inhabits suitable habitat patches throughout Wrexham Industrial Estate. However most Grizzled and Dingy Skippers stay within small discrete colonies. Although the Grizzled Skipper is capable of movements of at least 1.5 km, Brereton *et. al*. (1998) suggests that separate colonies exist where they are separated by 100 m of unsuitable habitat. The Dingy Skipper is also a sedentary species unlikely to colonise new areas unless suitable habitat is directly adjacent to an existing population. This may reduce the possibility of inter-change of individuals between the survey site and other populations within the Industrial Estate or the chance of colonisation in the first place. However observations of natural colonisations suggest that some individual Dingy Skippers can move several kilometres (Bourn *et al*. 2000).

3.5.5 The closest known populations of both species to the proposed development site are located immediately adjacent to Bryn Lane and directly east of Plot 1. This land is located approximately 40 m from the boundary of Plot 1 at its closest point. However it is located approximately 230 m from the core area of potentially moderate/ high value habitat identified during the habitat assessment.

4 ECOLOGICAL ISSUES

4.1 General

4.1.1 The proposed development is illustrated on a plan entitled Proposed Commercial Development – Preliminary Site Plan (26405-SK31-C, dated 28/07/08). This plan is provided as part of an outline planning application for B2 and B8 uses. The plan depicts a commercial unit with a floor area of 400,000 square feet located to the north of the west-east stream with associated infrastructure including car parks and access road off Bryn Lane. To the south of the west-east stream there is a second commercial unit with a floor area of 250,000 square feet with associated infrastructure including car parks and again an access road off Bryn Lane. This southern part of the proposed development also provides for an expansion of the buildings (by a further 250,000 square feet). This plan has been used to provide an assessment of ecological issues as follows:

- a brief assessment of the potential impacts of the proposed development on the three surveyed species;
- further survey requirements; and
- potential development constraints and associated mitigation requirements.

4.2 Brief Impact Assessment

Lesser Silver Water Beetle

4.2.1 Pond 4 is located within the proposed development footprint and is considered to be potentially suitable for the Lesser Silver Water Beetle. Ponds 1 and 2 will also be lost due to the proposed development although these are not considered to be suitable for the Lesser Silver Water Beetle. Should Lesser Silver Water Beetle be present within Pond 4 then the significance of the loss of this habitat can only be determined with a greater understanding of how the species utilises this pond and its position within an ecological unit (*e.g.* as part of a possible cluster of breeding ponds).

Grizzled Skipper and Dingy Skipper

4.2.2 The proposed development will result in the loss of small areas of potential habitat for Grizzled Skipper and Dingy Skipper considered of low value at most (*Target Notes 11, 13a,* west of *14* and a small area at the southern end of Plot 1). A further small loss of potential habitat for both species will result should the 250,000 square foot expansion and associated access road (connecting this with the existing TDG complex) is constructed. The access road bisects an area of habitat that is considered to be of medium value for Grizzled Skipper and of medium and high value for Dingy Skipper. In terms of the potential habitat available to these species this loss is likely to be insignificant and would not represent a barrier to dispersal. The majority of the habitat of potential value for both species, particularly the areas identified as of medium or high value including the ditch along the eastern site boundary will be retained. The proposed development also provides the opportunity for considerable biodiversity gain.

4.3 Further Survey and Mitigation

Lesser Silver Water Beetle

4.3.1 Pond 4 provides potentially suitable habitat for the Lesser Silver Water Beetle. It has not been possible to determine presence/ likely absence of this species during the present survey as it is considered likely that the habitat conditions may be more favourable earlier in the year. In such cases it is necessary to undertake two survey visits within a season focussing on the two breeding periods; May/June and July/August. A second survey visit is therefore required in spring (May/June) 2009 to verify presence/likely absence. Should the Lesser Silver Water Beetle be found to be present then appropriate mitigation measures can be established at that time. Further survey is required before detailed mitigation measures can be designed. The proposed loss of a possible Lesser Silver Water Beetle breeding pond in a country where only eight are known to occur requires greater survey effort of the surrounding pondscape to determine the significance of this potential impact.

4.3.2 For the purpose of this submission it must be assumed that the Lesser Silver Water Beetle is present within Pond 4 and therefore mitigation/ compensation measures are required. Without pre-empting survey results, mitigation for this pond loss may be to:

- Locate late successional ponds that can be regressed to provide a favourable habitat (likely to be outside the current survey site and subject to an appropriate management agreement with the landowner).
- Translocate the raft of floating vegetation from Pond 4 to a newly created pond (within the survey site), thereby inoculating the pond and accelerating succession.

4.3.3 It is recognised that simply excavating a new pond will not provide suitable conditions as this insect favours old established ponds with dense mats of floating vegetation. Any mitigation/ compensation must also facilitate cattle access to the pond if it is to be given the best chance of success.

4.3.4 The results of this survey have established the requirement for further survey of Pond 4 and ponds in the surrounding area wherever access permission is provided. A commitment is made to undertake this survey at an appropriate time in 2009. Should Lesser Silver Water Beetle be recorded from Pond 4 detailed mitigation/ compensation measures can be designed and agreed at that time. However such measures are likely to include one or both of the options identified above.

Grizzled Skipper and Dingy Skipper

4.3.5 As indicated above nearly all of the medium or high value potential habitat for Grizzled Skipper and Dingy Skipper will be retained. Patches of short sward within this area are likely to be maintained both by the nutrient-deficient nature of the substrate, by some ground disturbance and by Rabbit grazing. As part of the overall package of ecological mitigation it is proposed that the key areas of habitat be surveyed at an appropriate time of year (May/ June) to determine presence/absence of both species. Management mechanisms to maintain suitable conditions for the butterflies can then be proposed based on the results of this survey. However if considered appropriate management options for the sparse/ ephemeral grassland may include providing conditions to maintain a reasonable Rabbit population, and possibly some cutting of the grassland combined with occasional and localised perturbation of the substrate.

4.3.6 The large area of hard-standing immediately to the east of the habitat identified as of greatest value is believed to consist of concrete and provides an opportunity for substantial habitat creation. The concrete could be broken up and mixed with the under-lying sub-soil material wherever possible. When appropriate levels have been achieved this area could be seeded with a (British) native seed mix that incorporates a significant proportion of the key larval host-plants (*e.g.* Common Bird's-foot-trefoil, Creeping Cinquefoil and Agrimony). It is suggested that the sowing rate is low enabling natural colonisation wherever possible. Cultivation of the sub-soil and concrete rubble is likely to provide ideal circum-calcareous nutrient-deficient conditions for the development of sparse but species-rich grassland that is likely to exhibit many of the characteristics of vegetation types recorded on brownfield land elsewhere on Wrexham Industrial Estate. This will more than off-set the small losses of potential habitat detailed above.

4.3.7 Landscape permeability is an important issue for less mobile species that may be prevented from colonising new areas by seemingly inconsequential physical barriers. In order to facilitate potential dispersal as far as is reasonably possible from and to the small colonies to the west of the proposed development site, on the opposite side of Bryn Lane; patches of suitable grassland should be created directly adjacent to the existing site access road. These patches would be orientated in a strip between the proposed car park/ lorry park associated with the 250,000 square foot unit and the existing access road. They should extend from Bryn Lane and as far to the east as possible to link with the core area of medium/ high value habitat. This grassland should be created through creation of an appropriate substrate and subsequent seeding with a (British) native seed mix that incorporates a significant proportion of the key larval host-plants. Maintenance may require occasional mowing/ perturbation dependent on the levels of Rabbit grazing.

4.3.8 During the construction period it will be important to stop site personnel/ machinery entering the area of habitat to be retained in order to prevent accidental damage. This should be accomplished through the use of appropriate fencing combined with signs. In addition site awareness should be achieved through tool-box talks or a site induction (for all site personnel) that incorporates the identification of ecologically sensitive areas that should not be accessed as well as 'best practice' working procedures.

4.3.9 The construction of the access road from the existing TDG complex to the southeast corner of the proposed future expansion unit represents the only construction work that will result in the loss of medium/ high value habitat. In order to minimise that loss and reduce the risk of damage to the immediately surrounding vegetation this access road should be constructed 'in-line' and the working area fenced prior to the commencement of construction. This fence should be maintained throughout the construction of this access road; site personnel should be made aware that no work is allowed beyond the fence.

5 TARGET NOTES

Target Note 1. A narrow south-facing bank between a car park and the TDG boundary fence. It has been subject to some recent disturbance as there is a lot of bare ground. Where less disturbed it supports unimproved neutral grassland that is subject to a moderate level of grazing by Rabbits. Potential nectar sources are locally frequent; *Potentilla reptans* (Creeping Cinquefoil) and *Lotus corniculatus* (Common Bird's-foot-trefoil) are generally rare. Some shelter is provided by a small number of *Betula pendula* (Silver Birch) trees. Although much of the sward is fairly short (approximately 0.1 to 0.2 m) there are a few patches of tall herbs particularly *Pulicaria dysenterica* (Common Fleabane) and some long grass. Open, gravely areas are present along the edge of the car park.

Target Note 2. An old disused track that is locally dominated by *Potentilla reptans* (Creeping Cinquefoil). It is fringed with low-growing *Rubus fruticosus* agg. (Bramble) scrub with tall herbs such as *Epilobium hirsutum* (Great Willowherb) which provide sheltered conditions. The height of the species-rich unimproved neutral grassland sward is kept low in places (0.1 m) by the actions of Rabbits. Although bare patches are infrequent potential egg-laying plants are adjacent.

Target Note 3. Species-rich unimproved neutral grassland over rubble/ sub-soil material. The sward is typically sparse with further disturbance by Rabbits creating bare areas. Grazing by Rabbits maintains the sward height to as low as 0.02 to 0.03 m in places although taller grass and tall herbs are located near the fringing patches of scrub; mostly *Crataegus monogyna* (Hawthorn), *Rubus fruticosus* agg. (Bramble) and *Salix caprea* (Goat Willow). Within the grassland *Potentilla reptans* (Creeping Cinquefoil) is locally abundant with *Lotus corniculatus* (Common Bird's-foot-trefoil) frequent throughout. *Fragaria vesca* (Wild Strawberry) is also occasional. The species-rich sward contains many potential nectar sources including several locally scarce plants such as *Euphorbia exigua* (Dwarf Spurge). It is a largely open situation and the exposed rubble is likely to provide a suitably warm micro-climate.

Target Note 4. A south-facing bank that supports species-rich unimproved neutral grassland with exposed soil and some patches of *Acer campestre* (Field-maple) scrub. *Lotus corniculatus* (Common Bird's-foot-trefoil) is abundant.

Target Note 5. Species-rich unimproved neutral grassland that is often taller and denser than that described at *Target Note 3* although Rabbit grazing provides a varied structure in places. It is often dominated by *Agrostis capillaris* (Common Bent) with abundant *Lotus corniculatus* (Common Bird's-foot-trefoil), *Galium verum* (Lady's Bedstraw), *Medicago lupulina* (Black Medick), frequent *Briza media* (Quacking-grass), *Centaurea nigra* (Common Knapweed), *Plantago lanceolata* (Ribwort Plantain), *Centaurium erythraea* (Common Centaury), *Cynosurus cristatus* (Crested Dog's-tail), locally frequent *Carex flacca* (Glaucous Sedge), occasional *Blackstonia perfoliata* (Yellow-wort), *Leucanthemum vulgare* (Oxeye Daisy), *Prunella vulgaris* (Selfheal), *Trifolium repens* (White Clover), *Trifolium pratense* (Red Clover), *Holcus lanatus* (Yorkshire-fog), *Anthoxanthum odoratum* (Sweet Vernal-grass) and lesser amounts of *Carex otrubae* (False Fox-sedge), *Primula veris* (Cowslip), *Dactylorhiza fuchsii* (Common Spotted-orchid) and *Potentilla reptans* (Creeping Cinquefoil).

Target Note 6. The unimproved neutral grassland at this location is species-rich but there is virtually no bare ground and there is comparatively less Rabbit grazing. The sward is generally higher (to approximately 0.5 m). Both *Potentilla reptans* (Creeping Cinquefoil) and *Lotus corniculatus* (Common Bird's-foot-trefoil) are locally frequent.

Target Note 7. The east-facing bank of this ditch supports species-rich unimproved neutral grassland with abundant *Lotus corniculatus* (Common Bird's-foot-trefoil). The bank is approximately 3 m wide and has a slope of 45°. Potential larval host-plan ts for the Grizzled Skipper are more-or-less absent from this side of the ditch although *Potentilla reptans* (Creeping Cinquefoil) is occasional on the opposite (west-facing) bank. Fringing *Crataegus monogyna* (Hawthorn) and *Rubus fruticosus* agg. (Bramble) scrub provides shelter. Although not mapped (due to their small size) there are further small patches of suitable habitat (potential high value for Dingy Skipper) to the north of this location on both ditch banks where they have not been colonised by scrub.

Target Note 8. This area of rough grassland/ tall herbs/ scrub is considered to be unsuitable for both target species of butterfly. This is the only location within the survey site from which the potential larval host-plant (for Grizzled Skipper) *Agrimonia eupatoria* (Agrimony) was recorded.

Target Note 9. This area is considered to be of high potential value for Dingy Skipper; it is sparsely vegetated with lots of bare soil, is species-rich and has abundant *Lotus corniculatus* (Common Bird's-foot-trefoil).

Target Note 10. The northern continuation of the ditch described at *Target Note 8*. Where it is located along the edge of the poor semi-improved pasture fields the northeast-facing bank has been re-profiled so it is clear of scrub. It also appears to have been poached by livestock until relatively recently. As a result this bank supports comparatively little *Lotus corniculatus* (Common Bird's-foot-trefoil) and *Potentilla reptans* (Creeping Cinquefoil). The southwest-facing side [which is outside the survey site boundary] is comparatively species-rich and has frequent *Lotus corniculatus* (Common Bird's-foot-trefoil) with occasional *Potentilla reptans* (Creeping Cinquefoil). The top of the southwest-facing bank is fringed with *Crataegus monogyna* (Hawthorn) and *Rubus fruticosus* agg. (Bramble) scrub.

Target Note 11. This small field supports species-rich unimproved neutral grassland in places although the majority of the field is species-poor and dominated by the coarse grasses *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Holcus lanatus* (Yorkshire-fog). Within the more species-rich areas *Potentilla reptans* (Creeping Cinquefoil) is locally frequent although only small amounts of *Lotus corniculatus* (Common Bird's-foot-trefoil) were recorded. These patches are of low potential value for both target species at most; there is no bare ground and a lack of grazing/ management has led to the development of a tall (generally 0.5 m), rank sward.

Target Note 12. A single Purple Hairstreak (*Neozephyrus quercus*) was seen to fly up into and land in a semi-mature *Crataegus monogyna* (Hawthorn) shrub beneath a mature *Quercus robur* (Pedunculate Oak).

Target Note 13. This field is similar to that described at *Target Note 11* in that it is species-rich in places but is predominantly characterised by a species-poor sward of coarse grasses and tall herbs. Both *Potentilla reptans* (Creeping Cinquefoil) and *Lotus corniculatus* (Common Bird's-foot-trefoil) are locally frequent but there are no bare patches and the sward is generally between 0.4 m to 1 m. It has not been subject to recent grazing or management. It is therefore considered to be of low potential value for both target species at most.

Target Note 13a. A similar grassland sward to that described at *Target Note 13*. A small amount of the locally scarce plant *Silaum silaus* (Pepper-saxifrage) is present.

Target Note 14. Amenity grassland regularly cut to approximately 0.05 to 0.1 m high. Both *Potentilla reptans* (Creeping Cinquefoil) and *Lotus corniculatus* (Common Bird's-foot-trefoil) are locally frequent but there are no bare patches, it has a uniform structure and due to the regular mowing it is considered unsuitable for the two target species.

Target Note 15. A similar grassland sward to that described at *Target Notes 11* and *13*. .

Target Note 16. Three agriculturally improved pasture fields adjacent to Ridley Wood Road.

Target Note 17. Poor semi-improved grassland that is currently unmanaged. The sward is therefore mostly about 0.5 m high.

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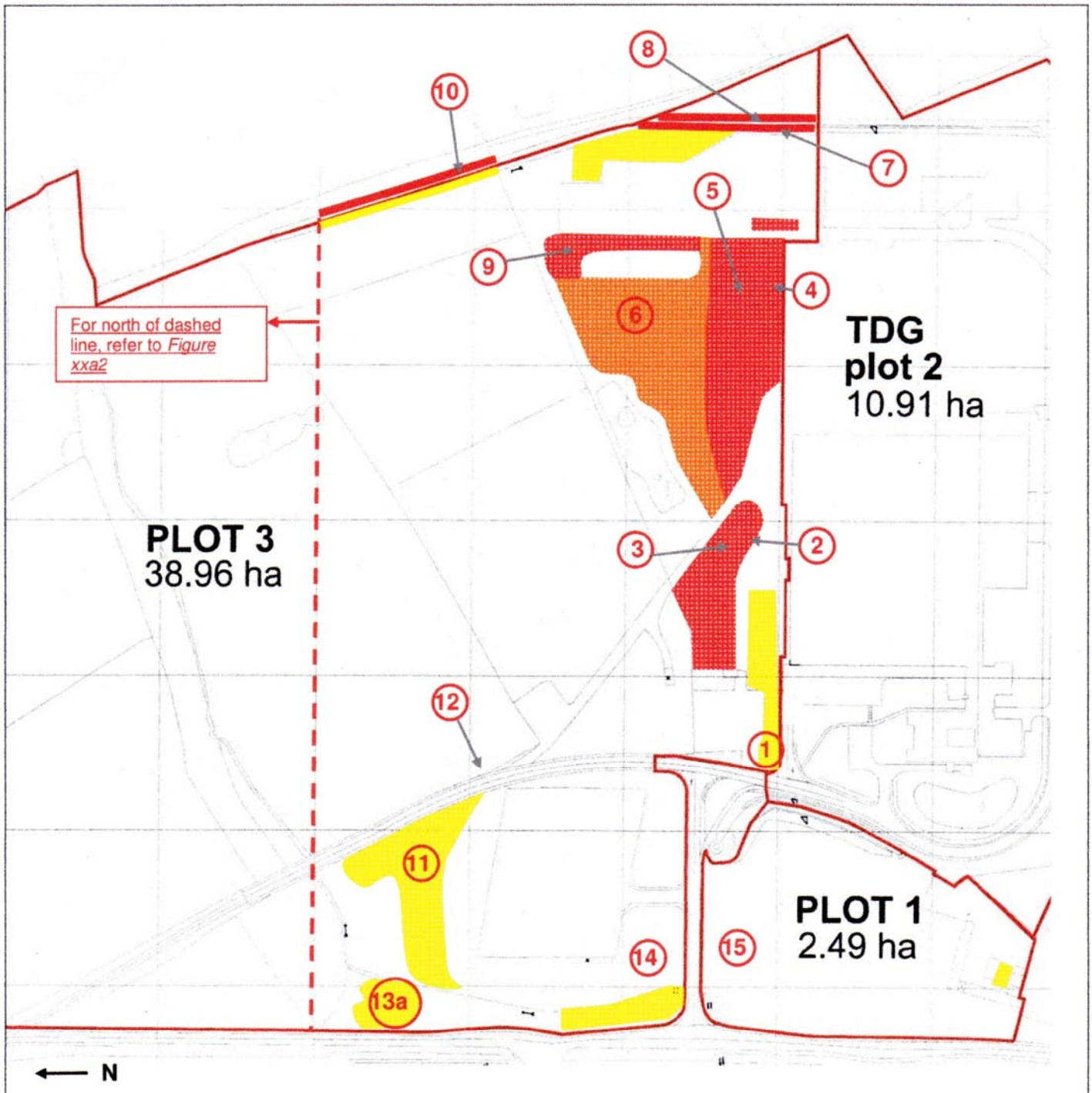
7 DATA

Table 7 – Species of Butterfly and Macro-moth Recorded during Survey

Species	Notes
Autographa gamma (Silver-Y)	
Celastrina argiolus (Holly Blue)	Single recorded along hedge near *Target Note 12*.
Coenonympha pamphilus (Small Heath)	
Lycaena phlaeas (Small Copper)	
Maniola jurtina (Meadow Brown)	
Neozephyrus quercus (Purple Hairstreak)	Single seen at *Target Note 12*.
Ochlodes venata (Large Skipper)	
Pararge aegeria (Speckled Wood)	
Pieris brassicae (Large White)	
Pieris napi (Green-veined White)	
Pieris rapae (Small White)	
Polyommatus icarus (Common Blue)	
Pyronia tithonus (Gatekeeper)	
Thymelicus sylvestris (Small Skipper)	
Tyria jacobaeae (The Cinnabar)	Caterpillars recorded on Common Ragwort.



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Marches Ecology

C070 Kingmore Park, Bryn Lane, Wrexham Industrial Estate – Ecological Surveys

Figure xxa1* – xxx Dingy Skipper **DRAFT*

Drawn by: ME
Checked by: TK
Date: 06.08.08

Key – Potential Value of Habitat to Dingy Skipper

None

Low

Medium

High

(1) Target Note (also applicable for *Figure xxb1*)

Note – Survey comprised Plots 1 and 3 only.

For south of dashed line, refer to *Figure 1a*

PLOT 3
38.96 ha

17

16

N

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Marches Ecology

C070 Kingmoor Park, Bryn Lane, Wrexham Industrial Estate – Ecological Surveys

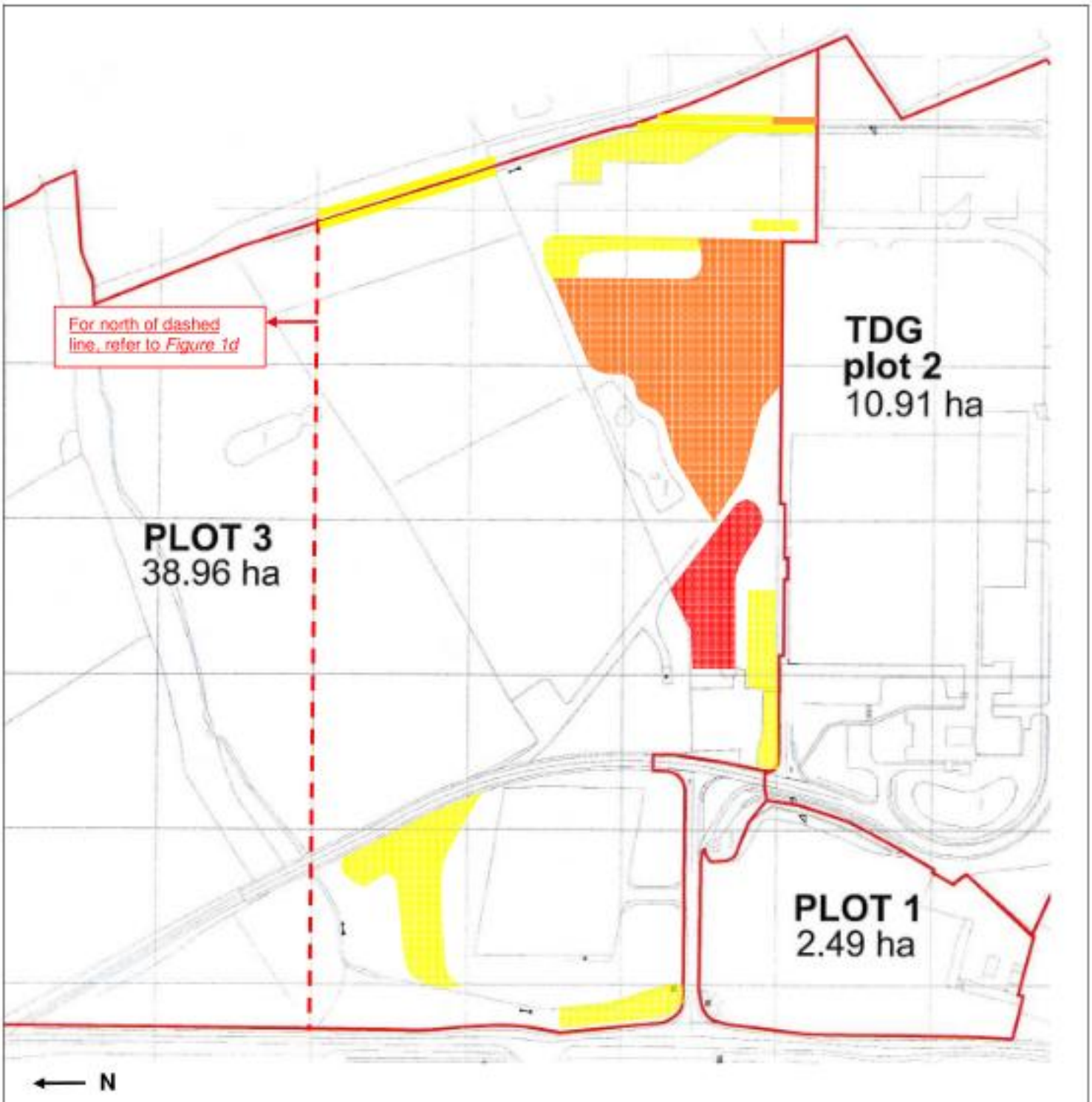
***Figure 1b* – Site Location and Butterfly Habitat Assessment Plan (Dingy Skipper)**

Drawn by: ME
Checked by: TK
Date: 19.08.08

Key – Potential Value of Habitat to Dingy Skipper

None
Low
Medium
High
1 Target Note (also applicable to *Figure 1d*)

Note – Survey comprised Plots 1 and 3 only.



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Marches Ecology

C070 Kingmoor Park, Bryn Lane, Wrexham Industrial Estate – Ecological Surveys

***Figure 1c* – Site Location and Butterfly Habitat Assessment Plan (Grizzled Skipper)**

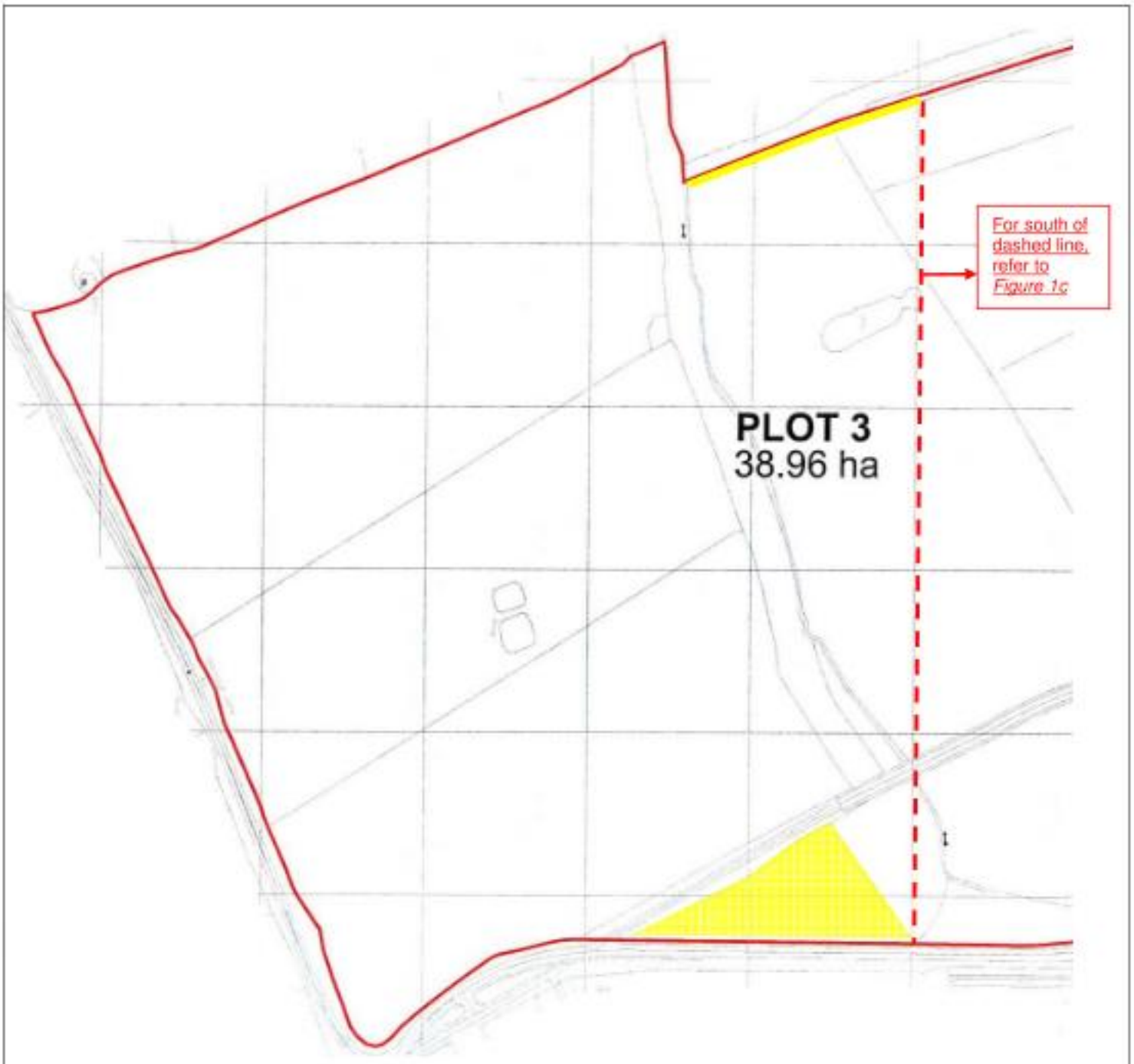
Drawn by: ME
Checked by: TK
Date: 19.08.08

Key – Potential Value of Habitat to Grizzled Skipper

None
Low
Medium
High

Note – Survey comprised Plots 1 and 3 only.

For Target Notes, refer to *Figure 1a*



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Marches Ecology

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***Figure 1d* – Site Location and Butterfly Habitat Assessment Plan (Grizzled Skipper)**

Drawn by: ME
Checked by: TK
Date: 19.08.08

Key – Potential Value of Habitat to Grizzled Skipper

- None
- Low
- Medium
- High

Note – Survey comprised Plots 1 and 2 only.

For Target Notes, refer to *Figure 1b*