



Biodiversity Offsetting to compensate for nightingale habitat loss at Lodge Hill, Kent

Environment Bank Ltd.
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Appendices attached separately.



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1 Introduction

The Lodge Hill planning application and proposed strategic allocation are complex matters requiring the planning authority to consider a wide range of issues. Environmental concerns are one of these and whilst this covers many different species and habitats, there has been a particular focus on one species, the nightingale *Luscinia megarhynchos*.

It has been known for many years that the Lodge Hill site is used by nightingales, a species that is globally common (17-72 million individuals, Birdlife International 2012) but which has declined considerably in Britain over the past 60 years. The developer has accepted that habitats used by nightingales would be lost as a result of the development, and initially proposed strategies to compensate for the loss of suitable nightingale habitats by creating off-site compensatory habitat - these proposals have been under consideration.

In 2012, a new national survey of nightingales suggested that the site holds many more birds than was previously thought (and also means that the site is now being considered for notification by Natural England as a Site of Special Scientific Interest, although this issue is not considered further here). In 2011, 'biodiversity offsetting' was announced as a new initiative in the Government's Natural Environment White Paper, with an accompanying framework of national metrics (prepared by Defra) to quantify how much habitat offsetting is necessary to ensure 'no net loss' of biodiversity. The Defra metrics are designed for habitats rather than species, with Defra's advice that "local discretion be used to decide whether the mechanisms can be used as a way of delivering any required compensation [for species]".

Biodiversity offsets are conservation activities designed to deliver biodiversity benefits (in one place) in compensation for losses (in another place), in a measurable way. Biodiversity offsetting is currently being trialled by Defra, Natural England and local authorities in six pilot areas to develop a body of information and evidence that the Government will use to decide whether to support the greater use of biodiversity offsetting in England and if so, how to use it most effectively. Government policy for biodiversity offsetting is that it should;

- not change existing levels of protection for biodiversity;
- expand and restore habitats and contribute to enhancing ecological networks;
- be managed locally as far as possible;
- be as simple as possible and transparent.

Given the availability of biodiversity offsetting to be used by planning authorities, Medway Council commissioned The Environment Bank to undertake an analysis of the potential for offsetting to compensate for any environmental impact on the nightingale habitat, and in particular to provide an answer to the question "Is there a reasonable prospect that adequate compensatory habitat can be established for Lodge Hill?"

This report builds on (and specifically in the calculations of how much offsetting might be required, supersedes) the first 'scoping' report compiled by The Environment Bank,



which was submitted to, and considered by, a technical workshop of experts held on 25 September 2012. That report was based on best available knowledge at that time, addressed the loss of woodland and scrub only and considered the compensatory proposals put forward at that time, but then needed to make a range of assumptions, or without assumptions provide a range of areas, on what offsetting might be necessary. The scoping report concluded that offsetting was technically feasible at Lodge Hill and the workshop then considered that conclusion.

A first draft of this report was submitted to and considered by a meeting of stakeholders invited by Medway Council and held on 9 November 2012. A second and final draft was circulated on 14 November 2012 for further consideration by stakeholders and all the representations made, and The Environment Bank's response to them, are available elsewhere.

This report thus considers, and incorporates in summary where relevant;

- the main conclusions of the 25 September 2012 technical workshop,
- the comments received at the 9 November 2012 stakeholder meeting,
- comments received from stakeholders on the final draft circulated on 14 November 2012,
- the British Trust for Ornithology report commissioned to consider ornithological issues and made available to all stakeholders,
- further ornithological advice commissioned from the BTO following the stakeholder meeting,
- a site visit by The Environment Bank and the BTO to Lodge Hill to assess habitat condition,
- a report from 'Greening the Gateway Kent and Medway' which scoped out the potential for receptor sites (which was also made available to stakeholders), and
- preliminary site visits to those receptor sites considered to be of greatest potential.

In particular (further details are explained below and in the main appendix) in reaching our conclusion of whether or not there is a reasonable prospect that adequate compensatory habitat can be established for the Lodge Hill nightingales, this report:

- considers **all** of the semi-natural habitat at Lodge Hill on the precautionary basis that the site is abandoned by nightingales, and takes account of the fact that the site visit determined that habitats at Lodge Hill were broadly in good condition for nightingales,
- considers the expert advice provided by the BTO on habitat offsetting for nightingales, and their conclusion that 300-400 ha of offset habitat would be required,
- independently estimates how much habitat would be required using the Defra offsetting metrics,
- considers a preliminary search for potential receptor sites and sets out in summary the main issues of delivery that any future offsetting strategy would need to overcome.

This report has sought to reflect and incorporate the comments and challenges received from stakeholders throughout the process. However, this is an Environment Bank report and it is not intended to represent formally the opinions of any stakeholders - indeed some stakeholders disagree with parts of the report and its conclusions.



2 Analysis of impact and offsetting needed

2.1 BTO estimation of offset required

The BTO report was welcomed by the 25 September technical workshop, is publicly available and is only briefly summarised here. Following the Lodge Hill site visit, the BTO estimate that the development would cause the probable loss of c.66 nightingale territories, and possible loss of 71 territories. The BTO predict that not all territories within the development boundary will be lost, but also that some outside the development area will be lost, so that *overall* we estimate that the total number of nightingales lost will be similar to the total number present within the boundary. The BTO report concluded that it is theoretically feasible to create habitat that will be occupied by nightingales and, indeed, that if the right conditions were satisfied there is greater probability of achieving success in Kent than elsewhere (because Kent is in the core of the current nightingale range).

The BTO report (and the technical workshop) also identified what sort of habitat criteria might be used to define what was 'right' for the nightingale receptor sites and therefore key in maximising the chance of success – these included factors such as site characteristics (altitude, damp with some open water), proximity to existing populations, freedom from disturbance and predation, and trialling the provision of (artificial) social attraction. Even with all these factors in place the BTO noted that the establishment and persistence of a large nightingale population “*cannot be absolutely guaranteed*”.

The report proposed, cautiously and with caveats on the uncertainties of habitat creation, that between **300-400 ha** of habitat creation – of the right sort, of the right quality, of the right size, with the right management, and in the right place - would need to be created off-site to provide adequate compensatory habitat.

The BTO recommendation is based on expert ornithological opinion of what habitat would be lost to nightingales and how much would need to be created to provide replacement habitat. Although it seeks to answer the same question, it is entirely different to the offsetting methodology using the Defra habitat-based metrics that the Environment Bank deploy in the remainder this report.

2.2 Technical workshop

The technical workshop was convened by Medway Council and comprised a range of national and local organisations with technical expertise in, or knowledge of, the site or nightingales or biodiversity offsetting. The workshop concluded, *inter alia* (see workshop report for further details), that:

- there are a range of habitat criteria that can usefully guide habitat creation/restoration schemes but also uncertainties relating to nightingale ecology and nightingale habitat creation;
- offsetting could work in principle for nightingales in Kent – it is technically feasible but it is neither straightforward nor guaranteed;
- that, given the development schedule set out in the Core Strategy, some temporary reduction in habitat availability was unavoidable;
- the biodiversity offsetting strategy for nightingales should be inclusive of all semi-natural habitats present at the site.



The technical workshop welcomed the BTO report and there was broad consensus that the area of habitat proposed by the BTO (with all the caveats) seemed about right. A number of workshop attendees indicated their preference for expert opinion over the habitat-based offset calculations, although it was agreed at that time to continue to run both in parallel.

In terms of the offset calculations that follow below and are detailed in Appendix 2, the final point above on the 'loss' (to the nightingales) of all the semi-natural habitats at Lodge Hill is important. Based on expert ornithological opinion, we will now assume that all of the habitat within the Lodge Hill site will be lost to nightingales as a consequence of the development. Consequently, in this report the metrics are applied to the entire Lodge Hill site with the exception of some small areas of hard-standing and buildings, and compared to the original scoping report many more habitats (and larger areas) are included in the final analysis.

2.3 Stakeholder meeting

The stakeholder meeting considered the first draft of this report, along with the BTO report and the results of the preliminary visits to assess potential receptor sites; notes of the meeting are provided elsewhere, for this report the main conclusions were;

- the technical feasibility of habitat creation and restoration for compensation was accepted but there was no consensus that delivery of an offsetting strategy was guaranteed;
- consideration of the practical delivery of an offsetting strategy would need to include a wide range of factors;
- that a wide range of site-specific factors needed full consideration before individual sites could be recommended as potential receptor sites;
- it was reiterated that some temporary loss of habitat was inevitable *given the proposed schedule of development* – stakeholders noted that the effect would depend on the phasing (or otherwise - it was noted at the meeting that ordnance issues may in fact require complete scrub clearance from across the entire site at the start of development) of the habitat loss at Lodge Hill;
- temporary loss of habitat was likely to affect site-faithful individual birds but there was no consensus at the meeting on whether it would have a temporary or permanent effect on the local *population* of nightingales (this is considered further in section 3 below);
- that the two different techniques for calculating offset areas – one based on expert opinion and assuming perfect delivery, and one based on Defra metrics and incorporating risks - had delivered complementary results;
- that it would be informative to further vary the Defra metric so as to see the effects of assuming *all* habitat used by the nightingales was of 'high' distinctiveness;
- there was discussion on the appropriate process and timing of the Sustainability Appraisal and Core Strategy examination that was noted by Medway Council but is outside the terms of reference of this report.

2.4 Applying Defra metrics to estimate compensatory requirements

Assessment of the habitat condition for an estimate of compensatory habitat requirements has required the creation of nightingale-specific criteria using independent ornithological expertise, followed by a site visit to Lodge Hill in which the

criteria were applied to habitats present. The habitat phase 1 mapping was reviewed (as proposed at the technical workshop), so as to account for changes in habitats since the original survey was carried out in 2008 (the Thomson Ecology revised habitat phase 1 map is attached at Appendix 1).

The updated habitat classification and additional habitat condition information allowed for the estimates for compensatory habitat requirement set out in the original 'scoping' report to be refined and assumptions of condition to be withdrawn. The national Defra metrics were applied:

- with the assumption of habitat loss or degradation of the entire site due to the development and subsequent disturbance and pressures, as agreed by the stakeholders – in effect, the total abandonment of the development site by the nightingales. Therefore, proposed habitat retention and onsite habitat creation is not factored into the metric calculations;
- using the complete data set on the location and numbers of breeding nightingales to determine the condition of habitats – in this case we have used data from nightingale surveys from 2009, 2010 and 2012 to give complete coverage of all habitat used by the birds.

Application of the Defra metrics is sensitive to the type and condition of the habitat being lost, the type and condition of the habitat being created off-site in compensation, and the timeframe of the compensation delivery. Differences in habitat type and condition uplift provided by the enhancement works, and the length of project and spatial context can make a large difference to the amount of offsetting required. In the absence of a detailed assessment of the offset site or sites, and management plans of habitat creation or restoration works off-site, it is not possible to limit all of these variables. In the interest of comprehension therefore, the following assumptions in the application of the metrics have been made:

- for habitat types deemed to be of value to nightingales a like-for-like offset strategy has been applied, e.g. scrub habitats will be required to be offset by the creation or restoration of scrub habitats (the metrics' definition of 'like for like' is un-nuanced – restoration ecologists will also be concerned about functional equivalence in habitat structure and condition – the quality of the created habitats);
- the target distinctiveness and condition of any offset habitat restoration is limited to a maximum increase of two categories, e.g. a habitat with a baseline of medium distinctiveness and poor condition could be restored to a target condition of good whilst the distinctiveness remained the same and the target condition is limited to moderate for creation activities;
- all estimates are based on management agreements for offset sites to be a minimum of 25 years - this is the estimated minimum required length of time to be able to deliver appropriate levels of habitat enhancements (in practice management tenures for specific receptor sites should be as long as possible, and preferably in perpetuity but we have not assumed this to be the case);
- all offset sites will contribute to existing ecological networks and establish greater interconnectivity between existing green spaces.

Finally, the offsetting metrics allow for compensation either by creating habitat or by restoring existing habitat. The area of habitat required under habitat restoration schemes is smaller than under habitat creation schemes because the risks of delivery (and therefore the multipliers used to calculate areas needed) are reduced. So, we

have calculated the area of offset needed for both habitat restoration and habitat creation options.

The full offsetting report, demonstrating the calculation of the metrics, is attached at Appendix 2. The results for both 'restoration' and 'creation' offsetting strategy scenarios are set out in Table 1 below.

2.5 Results of applying Defra metrics

The results of applying the Defra metrics are set out in the summary table below. A site visit was undertaken in October 2012 (by EBL & BTO) to assess habitat condition for all habitat blocks at the site. The condition assessment determined that 70% of the habitat blocks were in 'good' condition, 11% in 'moderate' condition and 15% in 'poor' condition. In this scenario we assume that the nightingales abandon the site, and the consequent habitat loss suffered by the birds is much greater than considered previously; in this case, one would need to restore 465 hectares of habitat, or create 851 hectares along with 455m of hedges. The offset requirement is likely to be c. 600-660 hectares if a combination of creation and restoration options is used.

Table 1 Showing the areas of habitat creation or restoration that would be required for each habitat type (area data provided by Thomson Ecology)

Assumptions:

- all on-site mitigation (both retention and creation) does not contribute towards providing suitable nightingale habitat;
- target condition of any future off-site habitat creation is limited to a maximum increase of two categories;
- all offsets will contribute to the current ecological network;
- minimum 25 years compensatory strategy.

Habitat	Area (ha)	Credit Requirement	Restoration (ha)	Creation (ha)
Semi-natural broadleaved woodland	86.1	1381.4	195.7	352.3
Planted broadleaved woodland	17.6	281.1	39.8	71.7
Scattered broadleaved woodland	0.24	4.0	0.6	1.0
Scattered mixed woodland	0.08	1.4	0.2	0.4
Hedges	455m	455m	-	455m
Dense scrub	35.3	391.7	63.1	123.4
Scattered scrub	7.2	48.1	8.4	16.8
Improved grassland	33.4	66.8	11.7	9.4
Semi-improved grassland	38.1	235.7	41.2	67.8
Coarse grassland	49.6	460.5	80.1	159.9
Standing water	0.9	14.6	2.2	1.8
Tall ruderal vegetation	6.8	67.4	11.7	20.7



Ephemeral/short perennial vegetation	0.2	1.1	0.2	0.2
Amenity grassland	7.6	49.6	8.5	16.8
Introduced shrub	0.01	0.03	0.005	0.006
Bare ground	1.0	6.1	1.5	1.5
Arable	3.1	6.4	1.1	2.2
Hardstanding	37.7	n/a	n/a	n/a
Buildings	2.8	n/a	n/a	n/a
Total	327.8	3016.2*	465.8	850.5

*Not inclusive of hedge requirement

The stakeholder meeting requested, for information, that the offsetting analysis was repeated with a different assumption - that *all* the habitats used by nightingales at the site were considered to be of 'high' distinctiveness – this goes beyond the recommendations of the Defra metric. We have done this with the result that a total of 3419 credits would be required, which would be delivered through 537 ha of habitat restoration or 990 ha of habitat creation.

3 Delivering compensatory habitat through offsetting

3.1 Potential for habitat management to deliver offsetting

Preliminary work to identify potential habitat sites within the area was done by the Greening the Gateway Kent and Medway project. Initially 7 'Medway' sites were described on the Hoo peninsula (labelled A – G) on Figure 2. Thereafter, using nightingale-specific criteria based on information provided by the BTO report, a GIS-based search to identify suitable areas for locating compensatory sites across Kent was carried out. The GIS-based analysis mapped wet geology, ancient and deciduous woodland along with altitude contours below 21m and 40m. The work located potentially suitable areas and analysed suitability based on;

- size – a minimum requirement of 50 ha for each site was suggested in the technical workshop and has been adopted here;
- proximity to existing nightingale habitat – this aspect will require revision as mapped BTO Nightingale Survey 2012 data is not yet available for Kent;
- potential for scrub conversion or restoration – determined by a preliminary site visit undertaken by EBL and BTO as only the 1999 Kent Habitat Survey scrub habitat maps were publicly available;
- proximity to developed areas – a minimum distance of 500 m was used;
- surrounding land use – eliminating sites adjacent to areas potentially earmarked for development;
- ownership details and willingness, where possible.

In the time available, a total of 14 possible nightingale habitat creation areas were identified across Kent, of which 5 were assessed as potentially suitable (green colour code in table legend - see map in Figure 2). Four of these were discussed in more detail at the stakeholder workshop. Although we were unable to define exact areas, each of the four sites comprised over 100 ha. Of the 7 previous Medway sites, three



are considered to meet the criteria and present good opportunities for habitat creation or restoration (Martin Hall pers comm). On the basis of this initial search, it therefore appears likely that there will be enough sites available in the area to provide compensatory habitat.

The stakeholder workshop noted, and The Environment Bank agrees, that there are a wide range of other criteria, both ecological and non-ecological, that need to be applied when considering specific individual sites as potential habitat creation locations – these include: soil type, previous land use, owner willingness, habitat creation/restoration costs, existing biodiversity, etc. These criteria would certainly be better informed by a more detailed analysis of existing case studies of habitat management, as was suggested by the technical workshop.

If offsetting were to proceed then we would recommend that the site search be extended to provide additional potential sites and to investigate potential site areas to more completely assess whether an offsetting strategy in Kent would be deliverable. Additional potential sites would be helpful as applying further criteria may well further limit the suitability of those sites identified thus far.

3.2 Temporary loss of habitat – delivery lag and effects

Offsetting schemes often mean that there is some temporary loss of habitat during the delivery process – because whilst habitats can be destroyed instantaneously, ecologically functional habitat cannot be created overnight. In absolute terms, temporary loss can only be avoided by planning and delivering the creation of ‘habitat banks’ of new habitat *ahead* of any developmental loss – this is happening for some habitats in the USA but has not yet happened in the UK. Instead, the Defra offsetting metrics specifically recognise the temporal lag in habitat creation and factor it in to the multipliers for habitat creation.

As noted previously, certainly for nightingale habitat (woodland, scrub or grassland) there will be a lag between the start of habitat creation/restoration and the habitat being functionally available to the birds. Thus we conclude that, *given the development schedule currently proposed*, a temporary loss of habitat is unavoidable. The exact scale of the temporary loss is unquantifiable at this stage, since it would depend on the exact phasing of development (would all of the nightingale habitat at Lodge Hill be lost at the outset as ordnance is cleared or in phases?) and the measures taken for delivery of functional habitat (are there mechanisms to deliver ‘interim’ habitat types, that might be quicker to reach functionality although less permanent?).

The key question is whether the temporary loss of habitat would have a significant effect on individual nightingales – and then if the temporary loss would have a significant effect (either temporarily or permanently) on the nightingale population of Kent (rather than just individuals). These effects might be indirect, such as increasing conspecific competition through displacement of individual birds.

The BTO advise (Hewson pers comm) that temporary loss of habitat probably wouldn't lead to a permanent reduction in the breeding population, provided that a suitable source population persisted in the area and that the compensatory habitat was close to it. It is believed that the Kent population of nightingales is, however, still in decline so it is difficult to predict with certainty whether this condition will be met, given the lag before functional habitat becomes available. All existing populations require constant top-up from recruits anyway – and it seems possible that Lodge Hill is one source of such recruits for both its own and other populations, which would increase its

importance from a conservation perspective, making it a key site for nightingales in Kent. On the other hand, the species occupies successional habitat, probably has only a moderate degree of fidelity to its natal area and has fairly good dispersive ability, both of which would increase the chances of recruits from other areas being available to occupy the newly created offset habitat, and would reduce the chances of permanent reduction in the Kent population.

In their comments on a draft of this report, the RSPB “*do not accept that temporary loss of habitat will **not** lead to a permanent reduction in the breeding population of Kent*” largely because “*the removal of such a large proportion of the Lodge Hill population (through what we now understand to be a one-off clearance of much of the habitat that supports them) could have serious consequences for the integrity of the wider Kent population, and inevitably impact on the success of birds establishing successfully in offset habitats*”.

In their comments on a draft of this report, Natural England’s summary of the time lag in habitat delivery is that “*whilst there is a risk, we do not consider it so grave as to rule out habitat compensation as worthwhile for nightingales, as long as measures are taken to reduce this risk..... The more habitat is provided, and the wider its distribution, the more quickly one would expect potential nightingale colonists to encounter it when it is first ready*”.

Finally, several stakeholders have noted that a) the draft Medway Core Strategy states that compensation strategies should be in place and functioning prior to the commencement of development and b) that the Lodge Hill Development Brief states that “new habitat must be ecologically functioning before the area it is replacing is developed” – this is not possible with the current development schedule. Others have noted that temporary loss could be entirely avoided if either the development were significantly delayed to allow habitat creation to get underway, or of course if the development of Lodge Hill was prevented.

It must be stressed that the metrics are not affected by the issue of whether the loss of habitat at Lodge Hill through development is phased or not – loss of habitat is loss of habitat that should be offset, whether it is quick or slow. So, changes to the phasing do not affect the calculation of how much habitat compensation is required. They do however, affect the risk that the temporary loss of habitat would be permanent, and a phased loss of habitat would almost certainly reduce that risk.

3.3 Practical aspects of compensatory habitat delivery

If offsetting were to proceed there are a number of practical aspects to overcome, some of these were raised in the stakeholder meeting and include;

- length of management agreement – which should be at least 25 years and aim for ‘in perpetuity’; long-term land management agreements that bind the land are (in the absence in the UK of land covenants) legally complex and land purchase is usually more straightforward;
- the legal planning process to ensure delivery of compensation – Defra guidance on this matter covers s106 obligations, negative conditioning and CIL contributions;
- the long-term monitoring and enforcement of land management for conservation – The Environment Bank has legal contracts for this purpose;
- the deployment of adaptive management – how soon does one know whether the habitat management prescribed is working for the nightingales, and how it

should be adapted to improve? The BTO advise that occupancy by nightingales is the only reliable indicator of whether the habitat creation is working;

- the costs of habitat management and, potentially, land purchase and how these would be estimated and delivered;
- what habitat to restore or create, in what ratios, with what priority, and how and where – whether, for instance, habitat should be actively created through planting or whether natural regeneration provides the best habitat for the species (the current view of ornithologists favours natural regeneration);
- how important the effects of habitat creation will be and how limiting habitat is on the species at this time – if you create habitat does it necessarily increase population size?
- whether habitat creation in adjacent counties might in fact be better for the Lodge Hill nightingale populations.

All of these issues, and more, are part of an offsetting compensatory strategy that would comprise the next step from ‘is there a reasonable prospect?’ to ‘so how would you deliver?’

Finally, there are a range of options for types of habitat and methods of creation which would probably affect the speed and predictability of offsetting delivery – these are summarised in table 2 below, which has been produced by the BTO. Once again, expert consideration of these variables is part of the delivery of an offsetting scheme.

Table 2 Illustrating the range of factors associated with different methods of habitat creation for nightingales. Note that the time for habitat to reach optimum condition will usually be longer than the time for the habitat to come into condition.

Method of habitat creation	Time to come into condition	Habitat quality resulting	Long term management requirement	Predictability & likelihood of success	Notes (simulated social attraction is assumed)
Mulching or re-instating coppicing in broadleaved woodland	c.4 years	Moderate	Cutting every 10 years	High likelihood and predictability	Would be most successful on recent young growth; probably less successful or take longer on other habitats due to lower density of large stems producing less lush re-growth at first; not always beneficial to other forms of wildlife
Re-instating sweet chestnut coppice	c.4 years	Low	Cutting every 10 years	Low success with high predictability	Sweet chestnut coppice is a poor habitat for nightingales
Planting trees & shrubs	5-15years? (dependent on amount of planting and size of trees / shrubs used)	Moderate?	Likely to be required sooner than for natural regeneration and more often than for that on poor soils	Moderate likelihood and low-moderate predictability	This method could potentially speed up the growth of habitat into structures suitable for nightingale but it may not produce the precise structures or habitat mosaics at appropriate scales to create optimal nightingale conditions

Natural regeneration of scrub on poor soils	15-20+ years	Very high	Little required at first and then less frequent than other methods. Without management will remain in good condition for longer than other created habitats	High likelihood and predictability, given optimal site e.g. along river valley	There are many examples of habitats created in this way that have resulted in high densities of nightingales, particularly when near to water features (reservoirs, gravel pits, rivers, etc). Slow rate of vegetation development likely to impede initial colonisation but would allow build-up of nightingale population without management
Natural regeneration of scrub on fertile soils	c.10-12 years	Moderate-very high	Greater than for poor soils (more frequent)	Moderate-high likelihood and predictability	Faster rate of vegetation development leads to earlier suitability. This could increase even further if habitat with a dense nettle layer was created (e.g. with fertilizer application), as some habitats with a less dense shrub layer are then occupied by good numbers of nightingales.
Combination of natural regeneration on fertile soils and planting of trees	6-8 years?	Moderate to very high	Likely to be required soon and often but could be relatively straightforward in linear habitats	Moderate-high likelihood and moderate predictability	It may be possible to rapidly establish a combination of dense nettles and sufficiently dense understorey by planting willow along ditches, etc. at damp/wet sites to supplement existing habitat & natural regeneration.

4 Conclusion

The Environment Bank would like to thank all participants in the technical workshop and stakeholder meeting for their input to this report; we hope contributors recognise how we have carefully considered their input. The Environment Bank conclude that;

- biodiversity (habitat) offsetting for nightingales is an appropriate compensatory mechanism to ensure no net loss of biodiversity and is technically feasible in Kent, although there are uncertainties in calculating how much is necessary, and in delivering a 'good' offsetting strategy;
- the habitat requirements of the species are relatively well understood by experts and we have a clear idea of what sort of habitat should be created, although there remain uncertainties on the role of conspecific attraction; natural regeneration of scrub seems to be key to creating good habitat;
- within the current development schedule temporary loss of habitat is unavoidable, and there are differing views as to whether this would lead to a permanent reduction in nightingales; The Environment Bank concur with the views of the BTO & Natural England – temporary loss is unlikely to lead to a permanent reduction in the breeding nightingale population of Kent provided that a strong source population of potential colonists persists in Kent;

- it is not possible to be precise on the area of offset land that would be needed, but there are now two estimates using two different methodologies
 - the consensus of expert opinion is that 300 – 400 ha is necessary, but with significant caveats on the assumption that this is ‘good’ habitat (i.e. without any delivery risk management);
 - employing the Defra habitat metrics (which try to account for delivery risk) produces estimates of c.851 ha of habitat creation **or** c.466 ha of habitat restoration; the precise area would depend on the kind of compensatory habitats available, but a combination approach of restoration and creation (75:25 - 50:50) would suggest 560 – 660 ha;
- the *precise* potential for habitat creation or restoration is unknown at this stage, but other studies suggest there are enough suitable areas to create or restore adequate nightingale habitat;
- an offsetting strategy could proceed subject to the establishment of the specific potential for habitat creation and restoration in Kent with suitable sites confirmed;
- with these caveats, **we conclude that restoring and creating c.650 ha of nightingale habitat would compensate for the loss of Lodge Hill nightingale habitat and that there is a reasonable prospect that this can be achieved within Kent.**

Figure 1. Nightingale territories at Lodge Hill for three years 2009-2012.

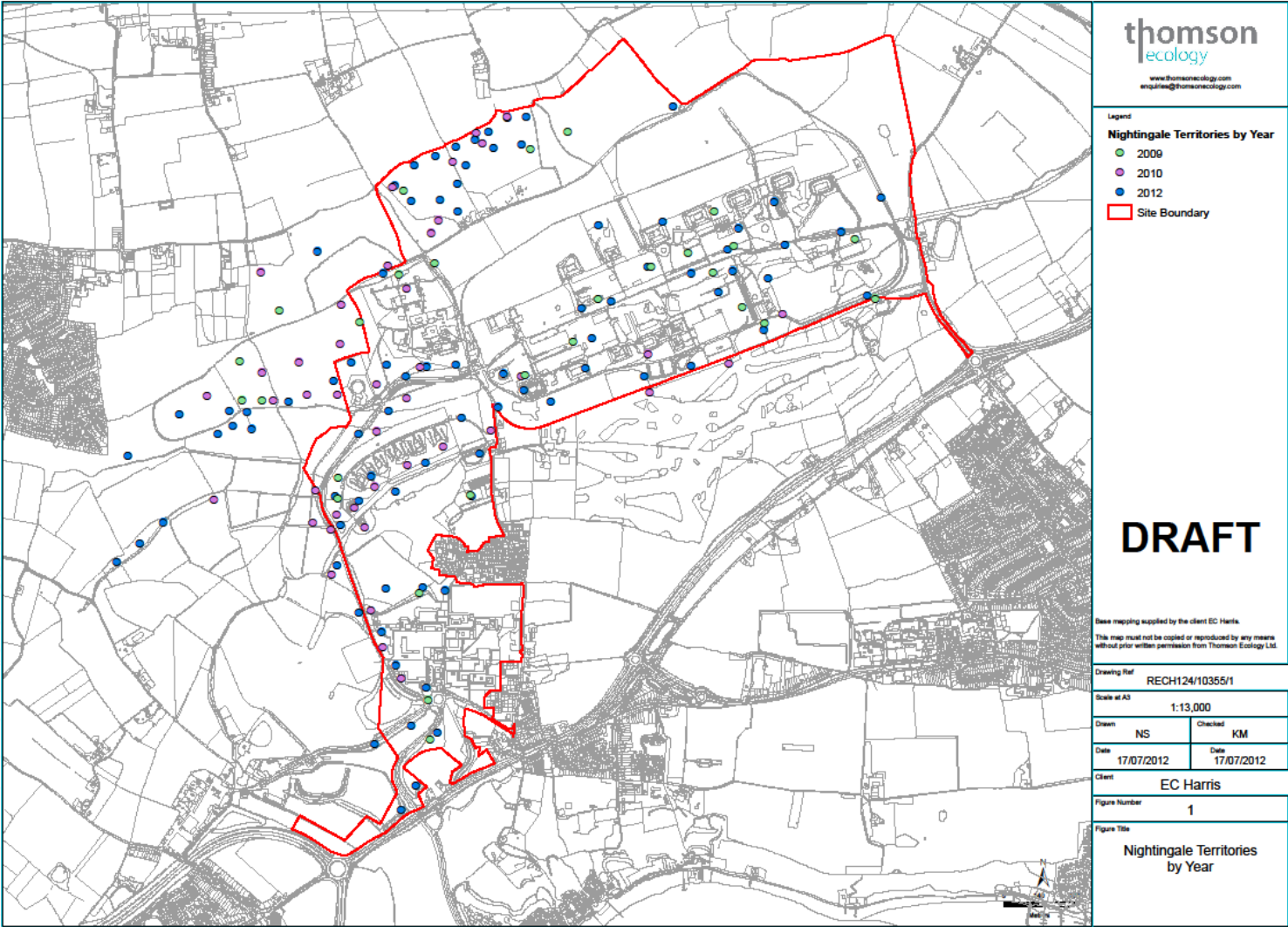


Figure 2. Location of possible opportunity sites in Kent: The map below shows the locations of Nightingale habitat creation opportunity sites. Map provided by GGKM.

