An Assessment of the Value and Practicality of

Habitat Re-creation Opportunity Mapping

A pilot study covering East Dorset, Purbeck and Christchurch

November 2004

RSPB
The Lodge
Sandy
Bedforshire SG19 2DL

Introduction

The RSPB has identified a need to investigate spatial representation of habitat re-creation opportunities. This need has arisen as it has become increasingly apparent, through processes such as identifying sites to deliver Biodiversity Action Plan (BAP) targets and identifying land for compensatory habitat provision, that habitat re-creation opportunities are finite. The physical requirements of some habitats are very specific and are restricted by characteristics such as geology, soil type, climate, topography and hydrology. In these cases, re-creation opportunities can be extremely spatially limited.

The land-use planning system in the UK has shifted focus towards increased spatial representation under the Planning and Compulsory Purchase Act 2004. Such a shift creates an opportunity for land-use planning to play a more positive role in the delivery of BAP targets for habitat re-creation and restoration.

This project maps re-creation opportunities for priority habitats in East Dorset and Purbeck Districts and Christchurch Borough, in South East Dorset. It represents a starting point to inform the RSPB and others on the ease, practicality and value of representing biodiversity priorities spatially.

This Technical Report briefly sets out why the project has been undertaken and what it seeks to achieve, how the work has been carried out and key specific and generic conclusions and recommendations for how this approach can be taken forward.

Context

Throughout the 20th Century there has been a massive reduction in the area and quality of some of the UK's most valuable wildlife habitats. This has largely been a result of changes in agriculture, the planting of conifer forests and increasing urbanisation. Breaking remaining habitats up into fragments through road building and other development has damaged them further, reducing their viability and making them difficult to manage.

The Government and a range of nature conservation bodies including the RSPB are seeking a halt to losses of valuable habitats and have established a comprehensive programme of habitat re-creation under the UK Biodiversity Action Plan (UKBAP), a process resulting from John Major, then Prime Minister, signing the Biodiversity Convention in 1992. The England Biodiversity Strategy sets the framework by which government land-use policies should deliver UKBAP targets in England. Local Biodiversity Action Plans (LBAPs) have been prepared to complement national plans.

Past levels of habitat loss are such that for nearly all terrestrial habitats, substantial restoration and re-creation targets have been set as a means of extending their area. In most cases, current targets are best regarded as intermediate milestones towards an eventual level that would equate to favourable conservation status for those habitats and the many species which depend on them.

The RSPB, in *Futurescapes*[1], has set out its vision for large-scale habitat restoration:

> *We need to bolster the habitat fragments that remain in the countryside. By 2020, over 160,000ha of out most important habitats should be under re-creation management, including heathland and downland, reedbed and other freshwater wetlands, heather moorland, woodlands, and saltmarsh, mudflats and other coastal wetlands*

In parts of the UK, and particularly across southern England, demand on land from a variety of uses is considerable. Competing uses often vie repeatedly for priority on the same area and nature conservation bodies find themselves repeatedly defending areas with ecological value from development. A suite of statutory and

[1]The RSPB (2001) *Futurescapes: large-scale habitat restoration for wildlife and people.* The Royal Society for the Protection of Birds, Sandy, UK.

non-statutory designations that recognises the value of sites with extant wildlife interest exists, and these designations offer some level of protection through wildlife laws and the planning system.

Meanwhile, however, sites that offer the best opportunities for habitat re-creation or for re-connecting habitat fragments in order to re-establish large, ecologically viable areas of habitat are being permanently lost to development and other non-compatible land-uses.

Under the new Planning and Compulsory Purchase Act, England's planning regime focuses out from its traditional, narrow view of land-use. In addition, with the introduction of statutory Regional Spatial Strategies and Local Development Frameworks under the Act, forward planning takes on a much more spatial dimension.

In a letter dated 5 December 2002 to Local Authority Chief Executives and Chief Planning Officers summarising the implications of the Planning and Compulsory Purchase Bill for Development Plans and Regional Planning Guidance, Mike Ash[2] stated that:

> *'12.* [under the Government's proposals] *The focus of development plans would move from a traditional land use one to a more spatial one. …*
> *40. The Government intends that local development frameworks should contain an integrated expression of the policies that direct or influence the spatial distribution of activities within the local authority's area. This could involve a wider range of policies than has normally been included in development plans produced under the current system… local planning authorities should begin to consider how a greater expression of spatial policies could be contained within their future plans.'*

[2] Deputy Director Planning at the Office of the Deputy Prime Minister

The Case for Habitat Creation

Maintaining, restoring and re-creating large areas of land for wildlife has many diverse benefits for society over and above the direct advantages of maintaining the variety and abundance of our wildlife, meeting international conservation obligations, helping to ensure that species are able to adapt to climate change and maintaining our planet's life-support systems. It is increasingly widely recognised and accepted that ecologically sensitive land management can significantly contribute to a better quality of life for society and is fundamental to sustainable development. Some of its wider benefits are briefly considered below.

Wildlife habitats provide the public with opportunities for leisure, physical and spiritual refreshment and quiet enjoyment of the countryside. Research[3] shows that one in four people in England visit the countryside at least once per week for a wide range of reasons including walking, jogging, dog-walking, horse-riding, cycling, fishing and increasingly simply watching wildlife.

Through encouraging people outside, wildlife habitats provide a foundation for improving our mental and physical health. Large areas of habitat offer rewarding opportunities for a wide range of compatible recreational activities as well as giving us somewhere to relax, unwind and to be inspired. The health benefits of regular exercise are well documented, and local wild open spaces give people the opportunity and, importantly, the motivation, to exercise, as demonstrated by initiatives such as *Walking the Way to Health*[4] and *Green Gym*[5].

Habitat restoration and re-creation schemes present a positive opportunity to engage with local communities from the earliest stages of project development, and often extend public access to the local countryside and provide a long-term resource for education, health and community participation.

Nature conservation can also bring significant economic benefits to local economies. Tourism is a major source of income and employment in the countryside and increasing its beauty and appeal can help attract visitors, and insodoing attract tourism income and the raft of business opportunities maintained by tourism as well as encouraging re-location of people and business for quality of life reasons. In the South-West region, environment-related economic activity contributes about 100,000 jobs and £1.6 billion to the regional economy (5-10% of the region's Gross Domestic Product)[6].

In addition, habitat creation can assist in reducing public costs, such as those associated with the increasingly pressing issue of coastal and fluvial flooding. For instance, restoring functional floodplains can help to prevent flooding of urban environments through increasing flood storage capacity outside settlements. Such restoration can also be extremely valuable to wildlife. Inter-tidal habitats such as saltmarsh and mudflats can alleviate coastal flood risk by contributing to sustainable and economically viable sea defences. The buffering effect provided by a stretch of saltmarsh fronting an eroding coast can be significant, and has been shown to massively reduce coastal defence costs.

[3] *Access to Other Open Countryside: Measuring potential demand.* Countryside Agency, 1999.
[4] British Heart Foundation/Countryside Agency and British Heart Foundation/Countryside Council for Wales.
[5] British Trust for Conservation Volunteers.
[6] De Winton T and Robins M (1999) *An Environmental Prospectus for South West England: Linking the Economy and the Environment.* Published by the Environment Agency and the RSPB for the SW Environment Prospectus Group.

Legal and Policy Drivers

Drivers for habitat re-creation fall into two categories:

1) Those to deliver new habitat for its own sake and to fulfil a range of related objectives; and
2) Those to deliver compensation for habitat loss or damage elsewhere.

1) Drivers to deliver new habitat for its own sake and to fulfil a range of related objectives.

The imperative to protect and re-create key wildlife habitats is central to the UK Biodiversity Action Plan, which is statutorily underpinned by Section 74, *Conservation of Biological Diversity*, of the Countryside and Rights of Way Act 2000:

> *(1)It is the duty of-*
>
> *a. any Minister of the Crown (within the meaning of the Ministers of the Crown Act 1975),*
> *b. any Government department, and*
> *c. the National Assembly for Wales,*
>
> *in carrying out his or its functions, to have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biological diversity in accordance with the Convention[7].*
>
> *(3) Without prejudice to subsection (1), it is the duty of a listing authority to take, or to promote the taking by others of, such steps as appear to the authority to be reasonably practicable to further the conservation of the living organisms and types of habitat included in any list published by the authority under this section.*

It is also required in EU Member States under the provisions of the Wild Birds Directive[8] notably Article 3:

> ***Article 3***
>
> *In the light of the requirements referred to in Article 2[9], Member States shall take the requisite measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Article [10]1. The preservation, maintenance and re-establishment of biotopes and habitats shall include primarily the following measures:*
>
> - *creation of protected areas;*
> - *upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones;*
> - *…*
> - *creation of biotopes.*

Local authorities have general powers and duties to promote sustainable development, enshrined both in the Local Government Act 2000 and the Planning and Compulsory Purchase Act 2004. Government considers biodiversity a cornerstone of sustainable development and a key indicator of our success in achieving it.

Planning and Compulsory Purchase Act 2004:

> *39 Sustainable development*
>
> *(1) This section applies to any person who or body which exercises any function-*
>
> *(a) under Part 1 in relation to a regional spatial strategy;*
> *(b) under Part 2 in relation to local development documents;*
> *(c) under Part 6 in relation to the Wales Spatial Plan or a local development plan.*
>
> *(2) The person or body must exercise the function with the objective of contributing to the achievement of sustainable development.*

---

[7] Where "the Convention" is the United Nations Environmental Programme Convention on Biological Diversity 1992

[8] Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds

[9] *Article* 2 *Member States shall take the requisite measures to maintain the population of the species referred to in Article 1 at a level which corresponds in particular to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements, or to adapt the population of these species to that level.*

[10] *Article 1*

1. *This Directive relates to the conservation of all species of naturally occurring birds in the wild state in the European territory of the Member States to which the Treaty applies. It covers the protection, management and control of these species and lays down rules for their exploitation.*
2. *It shall apply to birds, their eggs, nests and habitats.*
3. *This Directive shall not apply to Greenland.*

Local Government Act 2000:

Promotion of well-being.
2. *- (1) Every local authority are to have power to do anything which they consider is likely to achieve any one or more of the following objects-*

…

(c) the promotion or improvement of the environmental well-being of their area.

(2) The power under subsection (1) may be exercised in relation to or for the benefit of-

(a) the whole or any part of a local authority's area, or

(b) all or any persons resident or present in a local authority's area.

(4) The power under subsection (1) includes power for a local authority to-

(a) incur expenditure,

(b) give financial assistance to any person,

(c) enter into arrangements or agreements with any person,

(d) co-operate with, or facilitate or co-ordinate the activities of, any person,

(e) exercise on behalf of any person any functions of that person, and

(f) provide staff, goods, services or accommodation to any person

2) Drivers to deliver compensation for habitat loss or damage elsewhere.

The Habitats Directive[11] requires Member States to secure the coherence of the Natura 2000 network by ensuring that where any Natura 2000 site is damaged by a 'legitimate' *plan* or *project*, for *imperative reasons of over-riding public* interest, compensation is provided. This represents another legal driver to identify and safeguard habitat re-creation opportunities since if it is considering consenting a plan or project that would have an adverse effect on the integrity of a European site or Ramsar site, identifying and mapping re-creation opportunities would allow the Government to know whether or not it can '*ensure that the overall coherence of Natura 2000 is protected*' and, therefore, whether or not it is legally entitled to give consent.

Article 6

4. If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.

Compensatory provision is also enshrined in Article 3 of the Wild Birds Directive:

Article 3

In the light of the requirements referred to in Article 2, Member States shall take the requisite measures to preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Article 1. The preservation, maintenance and re-establishment of biotopes and habitats shall include primarily the following measures:

…

- *re-establishment of destroyed biotopes;*

This range of drivers creates a legal and policy framework that should ensure that furthering nature conservation through habitat re-creation is central to the full range of relevant Government functions.

Land-use planning is one of the most relevant of these functions. It has the potential to play a fundamental role in the co-ordinated planning and delivery of habitat re-creation targets and yet arguably does not currently deliver in this respect. The Planning and Compulsory Purchase Act provides a timely mechanism to ensure that land-use planning does begin to deliver biodiversity restoration more effectively.

[11] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Project Objectives

1. To express habitat re-creation objectives for South East Dorset spatially.
2. To consider mechanisms for allocating land for habitat re-creation through the planning system.
3. To comment on the value of this work and if appropriate to recommend how to take it forward.

Choice of Project Location

The project study area covers Purbeck District, East Dorset District and Christchurch Borough. This study area was selected because, due to local geology, climate, soil, topography, land-use and other physical characteristics, in addition to having an abundance of recognised (eg. through statutory and non-statutory designation) important wildlife habitats, it offers considerable opportunities to re-create a range of UK BAP priority habitats.

It also continues to be subject to major development pressures, in particular arising from the Poole-Bournemouth conurbation. Therefore, perhaps most starkly within the South West Region, the project area represents the conflict between the need to safeguard and implement key habitat re-creation opportunities and that to provide land to accommodate legitimate demands for new housing and other built and related land-uses.

Methodology

Essentially, the project involved identifying, through assessing a range of physical and biological features, priority land in the study area on which key habitats can be re-created, and mapping these.

Table 1 shows how the habitats considered in this project were selected. From the JNCC's list of 17 terrestrial and freshwater UK BAP Broad Habitat Types[12], habitats were selected according to two main criteria: 1) Extent of minimum physical requirements; and 2) Relevance to the Study Area. These are briefly explained below.

1) Extent of minimum physical requirements

Habitat re-creation opportunities are restricted by physical characteristics such as geology, soil type, hydrology, climate, topography, etc. These particular physical requirements can for some habitats be very specific, meaning that re-creation opportunities are often extremely limited. The primary criterion for identifying opportunities for a given habitat is therefore the physical ability of land to support that habitat.

For example, *calcareous grassland* can only be re-created on chalk or limestone geology on land that has not been heavily agriculturally improved. Similarly, wetland habitats can clearly only be established where there is an adequate and sustainable water supply and where the topography is favourable.

On the other hand, *broadleaved, mixed and yew woodland* is broadly defined. It encompasses a wide range of woodland types and consequently woodlands falling within this category can develop on a wide variety of geology and soil types. Opportunities for its re-creation are therefore unlikely to be limited other than by an absolute lack of available land. It is not therefore considered worthwhile to map *broadleaved, mixed and yew woodland* re-creation opportunities in this study. However, certain types of woodland do have specific geological and hydrological requirements and, if these are being considered independently (ie. not grouped as part of *broadleaved, mixed and yew woodland*), there may be value in mapping opportunities for their re-creation.

For non-specific or broadly defined habitats such as *broadleaved, mixed and yew woodland*, factors such as proximity to existing habitat blocks and opportunities for connecting existing habitat areas should inform the

[12] Box 1 of JNCC's report *Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): Definitions and the relationship with other habitat classifications*[12], which can be found at: http://www.jncc.gov.uk/communications/Report307/Contents.htm#_Toc491228790

selection of opportunities. These will also inform the prioritisation of opportunities for habitats with more specialised physical requirements, such as *dwarf shrub heath*, once assessment of characteristics such as geology and soil have defined suitable areas of search.

Importantly, habitat re-creation targeting should avoid areas that are already ecologically valuable. For 'generalist' habitats, targeting should avoid land on which an alternative habitat with specialised requirements could be delivered.

2) Relevance to the Study Area

An assessment was made of how relevant, or how much of a priority, each habitat is within the study area. This is based on considering LBAP priority habitats, the scale of the opportunity within the study area and on the views of local experts.

Table 1. Selection of Project Habitats

UK BAP Broad Habitat Type	Physical requirements	Ease of Creation	Relevance to Study Area	Opportunities identified in this study?
Broadleaved, mixed and yew woodland	General	Difficult and long-term: It takes a long time for mature woodland of high conservation value to develop	High	No
Coniferous woodland	General	Easy but medium-term	Low	No
Boundary and linear features	General	Easy but medium-term	High	No
Arable and horticulture	General	Easy and short-term	High	No
Improved grassland	General	Easy and short-term	Low	No
Neutral grassland	Not general – only on neutral (not strongly acid or base) soils with appropriate drainage	Difficult on land that has been improved	High	No (but would be valuable)
Calcareous grassland	Specific – only on shallow chalk and limestone soil/geology	Difficult on land that has been improved	High	Yes
Acid grassland	Specific – only on acidic soils	Difficult on land that has been improved	High	Yes, as part of heathland mosaic
Bracken	General	Easy	Low	Not specifically, but will be present as a component of heathland mosaic
Dwarf shrub heath	Specific	Difficult, particularly on soil that has been subject to organic enrichment	High	Yes, as part of heathland mosaic
Fen, marsh and swamp	Specific	Difficult	High	Yes, as part of wetland (may also overlap with heathland mosaic)
Bogs	Very specific	Extremely difficult	High	Yes, as part of wetland (may also overlap with heathland mosaic)
Standing open water and canals	General other than hydrology	Easy	High	No
Rivers and streams	General other than hydrology	Difficult	Low	No
Montane habitats	Very specific	Difficult	Low	No
Inland rock	Very specific	Extremely difficult	High	No (save as sand exposures within heathland mosaic)
Built up areas and gardens	General	Easy	High	No

From Table 1, three 'habitat categories' were identified as priorities for this project. Habitat categories (rather than specific habitats) have been used since:

i. a particular range of physical conditions may permit re-creation of more than one habitat (Eg. within the study area, lowland heathland and acid grassland could both be created on the same sites – the conditions that are appropriate for one are equally appropriate to the other);
ii. it is not within the remit of this project to determine which of the potential habitats is most appropriate on each site; and
iii. a mosaic of complimentary habitats would be likely to achieve most biodiversity benefit.

The three habitat categories are described in Table 3 and are: heathland and acid grassland mosaic; calcareous grassland; and wetland.

One of the outcomes of this work is an assessment of how the Local BAP (LBAP) targets for habitat re-creation in the study area relate to the opportunities on the ground, in order to judge whether or not they are achievable and whether they adequately reflect the full scale of the opportunity. Appendix 1 summarises the range of BAPs relevant to the study area. The Dorset BAP was considered the most relevant of these from which to derive habitat re-creation targets for the study area, since of the three study area Local Authorities only Purbeck has its own LBAP. Dorset BAP targets are given by Natural Area. The derivation of re-creation targets for appropriate habitats within the study area from the Dorset BAP was done on a pro-rata basis according to proportions of the Natural Area occurring in Dorset within the study area. Appendix 2 illustrates how habitat category targets were derived from Dorset Biodiversity Partnership's specific habitats, by Natural Area (again, calculated on a pro-rata basis, according to the proportion of each Natural Area within Dorset). Appendix 3 then shows how these targets were derived for each of the study area Local Authorities from the Dorset target for each habitat category, according to Natural Area. These derived targets are given below, in Table 2. Appendix 4 shows targets from the SW Regional BAP, Dorset BAP and Purbeck BAP for relevant habitat categories. These were used as a 'safety check' to ensure that derived LBAP project area targets are at least broadly consistent with targets set at the regional and local levels.

Table 2. Derived LBAP Targets for the Study Area (Ha)

Local Authority / Habitat Category	Purbeck District	EastDorset District	Christchurch
Heathland Mosaic	416	260	42
Calcareous Grassland	27	21	0
Wetland	18	18	2

Data on habitats and land-use was collected from a range of organisations, including English Nature, the National Soil Resources Institute, the Countryside Agency, Dorset Wildlife Trust, Dorset County Council and Dorset Environmental Records Centre. This was mapped and incorporated into the Geographical Information System (GIS) on which the mapping work was undertaken to inform opportunity selection. Extant habitat maps, where adequate in terms of coverage and currency, were used to show the existing habitat resource in order that genuine re-creation (rather than enhancement) opportunities are identified and to allow the identification of strategic habitat links.

The mapping should be undertaken at a scale that is useful at appropriate administrative levels. For instance, at the District/Borough level it is sensible to represent re-creation opportunities according to fairly large tracts of land, or *areas of search*. These can be determined by overlaying maps for the basic physical determinants of habitat feasibility, such as geology, soil, etc, at a relatively low resolution. In reality, due to the fairly broad-brush way in which these areas have been identified, there are likely to be small areas of land within areas of search that are not suitable for habitat re-creation because of specific local conditions.

The project seeks to identify all major areas of land within the study area on which re-creation of each of the selected habitat categories is possible. However, some level of prioritisation is valuable to filter out the areas on which, although (given unlimited resources) it may be physically possible to re-create habitat, in reality it is unlikely to be worthwhile. This prioritisation is inevitably a somewhat subjective process. Selection is informed by a range of factors, including, most importantly:

- Scale: the larger the area the better. Larger areas of habitat offer greater biological viability, are likely to be more robust to climate change, for instance by allowing species to move and are more efficient management units.
- Ease of re-creation: Given sympathetic physical conditions, the ease with which habitat re-creation is possible is likely to depend on a whole range of factors relating to past management. For instance, if sandy soil over acidic geology has recently been agriculturally improved (particularly if over a long time and if high levels of organic matter have been added), levels of nitrogen, phosphorous, potassium, calcium (N, P, K & Ca) and organic matter in the soil may prohibit successful regeneration of heathland plants in the short term. Restoration of such land to *dwarf shrub heath* in the short term would be likely to require soil stripping, which is costly and resource-intensive. Whilst the cost of doing this may be worthwhile, Eg. where a strategic link offers an opportunity for major benefits, resources may be more effectively spent on habitat re-creation elsewhere. In the longer term, fertiliser chemicals and organic material will leach out of the soil, returning improved sites to a more sympathetic condition for habitat re-creation. Natural leaching can be accelerated by processes such as sowing and removing lawn turf, extractive agriculture and zero-input grazing.
- Opportunity: such as increasing the size of existing habitat blocks, or re-uniting areas of habitat that have become fragmented, thereby increasing the viability of existing sites and realising cumulative benefits from re-creation effort. Opportunities for targeted habitat re-creation to benefit particular species of particular conservation interest in a locality may also be prioritised.

In addition to these generic factors, opportunities must be selected according to criteria specific to each habitat category. The criteria used in this project are given in Table 3.

If large areas of land conducive to habitat re-creation exist in a study area, it may be valuable to prioritise re-creation opportunities beyond the fairly broad level defined by the generic and habitat-specific factors discussed above. Prioritisation can be informed by setting or changing the threshold for physical parameters, Eg. by only selecting re-creation areas over a certain size, or only selecting potential opportunities within a minimum distance of areas of extant habitat.

Once land on which habitat re-creation is physically possible has been identified (as in the maps accompanying this report), social factors such as level of recreational pressure likely to be experienced (a function of proximity to residential areas, local population size, car parking opportunities, etc), economic factors and development pressures will be used to inform the prioritisation of opportunity delivery. These other factors are likely to influence the value of the area in terms of quality of the habitat and its attractiveness to wildlife. For instance, an area of heathland created adjacent to a large residential area will be very well used as a local amenity, by joggers, dog-walkers, as a children's play area, etc. As a result, its wildlife would be likely to be heavily disturbed and would be at risk, for example from predation and disturbance from domestic pets, and from damage by heathland fires. So long as other opportunities existed, such a site would therefore be unlikely to be a high priority for re-creation if nature conservation was the only objective (a different perspective on the opposition by nature conservation bodies to new housing developments near to high quality heathland). However, it could still be a priority for heathland re-creation to deliver social objectives, for instance to provide a recreational and amenity area for the local population, which would still deliver some benefits for wildlife and provide an opportunity for educating people about heathland and its wildlife and cultural value. Similarly, re-creating an area of lowland wet grassland in a river floodplain that is not considered a nature conservation priority could have flood risk management as its primary objective or be a response to an economic imperative

to reduce flood defence costs. In such cases, where nature conservation benefits are incidental, it is nonetheless valuable to maximise these and to ensure that they are co-ordinated with other wetland re-creation projects.

Maps showing re-creation opportunities for each habitat category are set out in the following pages. They were developed on Merlin, the RSPB's MapInfo-based Geographical Information System (GIS). The use of GIS assists in the identification of potential habitat re-creation opportunities, allowing multiple layers of data to be overlain on an Ordnance Survey map base. GIS is also an effective tool for presenting this data.

The work to identify land for habitat re-creation involved sourcing local expertise following a process of analysis of the following layers of physical attribute data:

- soil categories;
- wildlife designations (Sites of Special Scientific Interest and Sites of Nature Conservation Interest);
- extant habitats;
- developed land and planned development allocations;
- agricultural land classification;
- Countryside Agency Landscape Description Units;

In order to allow presentation of how target areas were identified, acetate maps of some of the key datasets are presented in the following pages, overlaying an OS base-map. From these GIS layers, land on which habitat re-creation opportunities are possible were identified according to the criteria given in Table 3.

Table 3. Selected Habitat Categories

Habitat Category	Description	Criteria used to inform selection of opportunities
Heathland and Acid grassland mosaic	Open areas dominated by ericaceous shrubs and gorse on nutrient-poor soils, usually of sand and gravel. Includes a sequence of habitats such as mire, wet heath and dry heath as well as associated habitats such as acid grassland, scrub, scattered trees, bare sand and open water.	• Underlying geology must be predominantly of sand or gravel. • Soils must be nutrient poor and acidic. • Viability of re-creation opportunities from agricultural land will depend on soil depth, history and intensity of agricultural improvement, concentrations of N, P, K & Ca levels and organic material in the soil and subsoil and the need for intensive work such as soil removal. Agricultural land classification provides a useful indication of potential, since heathland soils tend to be of low grade. *Best and most versatile* soils can therefore be discounted. • Reversion of forestry and mineral sites and low-grade unimproved agricultural land can be relatively straightforward. • Topography will inform the range of compatible habitat types possible (Eg. from mire to dry heath). A varied topography is likely to deliver a richer habitat mosaic. • Contiguity with existing heathland, particularly where the opportunity exists to re-join extant heathland fragments.
Calcareous grassland	Develop on areas of free-draining and nutrient poor soils over chalk or limestone geology. Characteristically rich in plant and invertebrate species, and includes associated scrub.	• Chalk or limestone geology and soil. • Viability of re-creation opportunities from agricultural land will depend on historic level and timing of agricultural improvement, N, P and K levels, and soil depth. Where soil is greater than c.2inches deep, it would need to be removed in order to allow calcareous grassland generation. This is an intensive, expensive process which is likely in effect to render these locations low priority. Efforts may be more effectively spent elsewhere, whilst these sites stay in arable production which can if sympathetically managed be rich in biodiversity. • Quarry areas can offer favourable opportunities as soils have already been stripped so effort is minimal. • Chalk slopes also generally offer better opportunities as they will tend to have shallow soils and N,P and K more likely to have leached away.
Wetland	Incorporates a broad variety of wetland types, including: Managed grassland and tall herb, fen and carr situated below 200m, currently or recently subject to periodic inundation from rivers, streams or springs and usually containing small waterbodies and ditches. Reedbed: Habitat dominated by common reed, *phragmites australis.* Covers a wide range of characteristics, from wet to dry and fresh to saline.	• Hydrology. Must have an adequate supply of water. • Topography. Must be relatively flat and low-lying in relation to water source. • Already agreed priorities, Eg. mapped data from Dorset Wetland Group's floodplain grazing marsh maps for the Frome and the Piddle.

Habitat Re-creation Opportunities

Maps showing re-creation opportunities for each habitat category are given on pages 15-y. Below, the principal areas of opportunity for each habitat category are described for each District/Borough.

Calcareous Grassland

East Dorset

East Dorset District has significant areas of chalk geology and soils, principally in the northwest of the District, falling in the South Wessex Downs Natural Area. Relevant soils in this part of the District are mainly categorised as *freely draining lime-rich soils* and *shallow lime-rich soils over chalk or limestone,* and they include parts of Cranborne Chase and the Dorset Downs.

The South Wessex Downs Natural Area is based on a chalk outcrop, with principally Upper Cretaceous geology. Its targets include *reduce habitat fragmentation* and *implement appropriate habitat re-creation and restoration to achieve biodiversity targets.* The Natural Area Profile[13] states that:

'*There is considerable scope for recreation and restoration of some of the key habitats especially on low fertility arable land. … The prime candidates are*

- *Chalk grassland and associated habitats'*

With *Component Objectives including:*

- *identify key areas for potential habitat restoration and recreation based on biodiversity hot spots (prime biodiversity areas)*
- *implement appropriate schemes, tying in with BAP targets for key habitats and species*

There are therefore significant opportunities for calcareous grassland re-creation in the north and west of East Dorset District.

The South and East of the District lie largely within the Dorset Heaths Natural Area, which is dominated by sandy, loamy and clayey acid soils and is not conducive to the development of calcareous grassland.

Purbeck

Purbeck District has a diverse geology and falls within three Natural Areas. Of these, of greatest significance for chalk and limestone soils within Purbeck is the Isles of Portland and Purbeck Natural Area, with its distinctive chalk ridge and limestone plateau of the Portland and Purbeck Beds. Much of the rest of Purbeck District, notably the Tertiary sand and clay deposits, underlie the acid-dominated soils of the Dorset Heaths Natural Area, however a small part of north west Purbeck captures shallow, lime-rich soil over chalk and is in the South Wessex Downs Natural Area.

Calcareous grassland is the most extensive semi-natural habitat within the Isles of Portland and Purbeck Natural Area. Many calacareous grassland sites of high nature conservation value occur in Purbeck District on thin calcareous soils, particularly on free-draining slopes with species composition varying according to aspect and degree of slope as well as historic and current management. Changes in agriculture over recent decades, including in grazing regimes and, particularly on more level areas away from the coastal slopes, to arable production, have resulted in a reduction in the area and in some cases the quality of the calcareous grassland resource.

[13] English Nature, 1998. *South Wessex Downs Natural Area Profile.* English Nature Wiltshire Team, Wiltshire.

As within East Dorset District, the South Wessex Downs Natural Area within Purbeck District offers considerable potential for calcareous grassland re-creation, principally on the chalk ridge and limestone plateau to the south and east but also over the chalk outcrop underlying north west Purbeck.

Christchurch

Christchurch District does not have any significant areas of calcareous geology and soil, or unsurprisingly of extant chalk-based habitat. For the purposes of this project, it is not therefore considered worthwhile to map chalk grassland re-creation opportunities within Christchurch District.

Heathland

East Dorset District

The south-eastern half of East Dorset District falls into the Dorset Heaths Natural Area (other than a narrow strip at its eastern extremity which is within the New Forest Natural Area). It lies over Tertiary sand and clay deposits and is dominated by a variety of acidic soil types, including *Naturally wet very acid sandy and loamy soils, Slightly acid loamy and clayey soils with impeded drainage, Freely draining slightly acid loamy soils* and *Freely draining very acid sandy and loamy soils.* These are ideal heather soils, and indeed some 200 years ago almost the entire Natural Area was swathed in heath, which now covers just 15% of its former area and is highly fragmented, separated by generally poor quality agriculture, conifer plantations and urban expansion. Other than urban expansion, these land-use changes can be reversed and the south east of the District therefore offers excellent opportunities to re-create heathland on a large scale and to re-link historically fragmented sites.

Purbeck District

Much of Purbeck District lies within the Dorset Heaths Natural Area, between the chalk ridge and plateau to the south and the South Wessex Downs to the north. As with East Dorset District, the most suitable heathland soils in Purbeck include *Naturally wet very acid sandy and loamy soils* and *freely draining very acid sandy and loamy soils.* Whilst this area already encompasses large tracts of extant heathland, there is scope for the re-creation of significant new areas, in particular to join existing sites and reverse historic fragmentation.

Christchurch District

Christchurch Borough is split east/west between the New Forest Natural Area and the Dorset Heaths Natural Area respectively. Other than the loamy and clayey floodplain soils of the Avon and Stour valleys, both of these Natural Areas within Christchurch are dominated by *freely draining slightly acid loamy soils* and *Naturally wet very acid sandy and loamy soils.* These soil types offer plenty of scope for heathland development. Indeed, Figure 1 *The extent of heathland in the Poole basin in 1759 (from Webb and Haskins 1980)* of the Dorset Heaths Natural Area Profile[14] shows that much of this area was heathland in 1979.

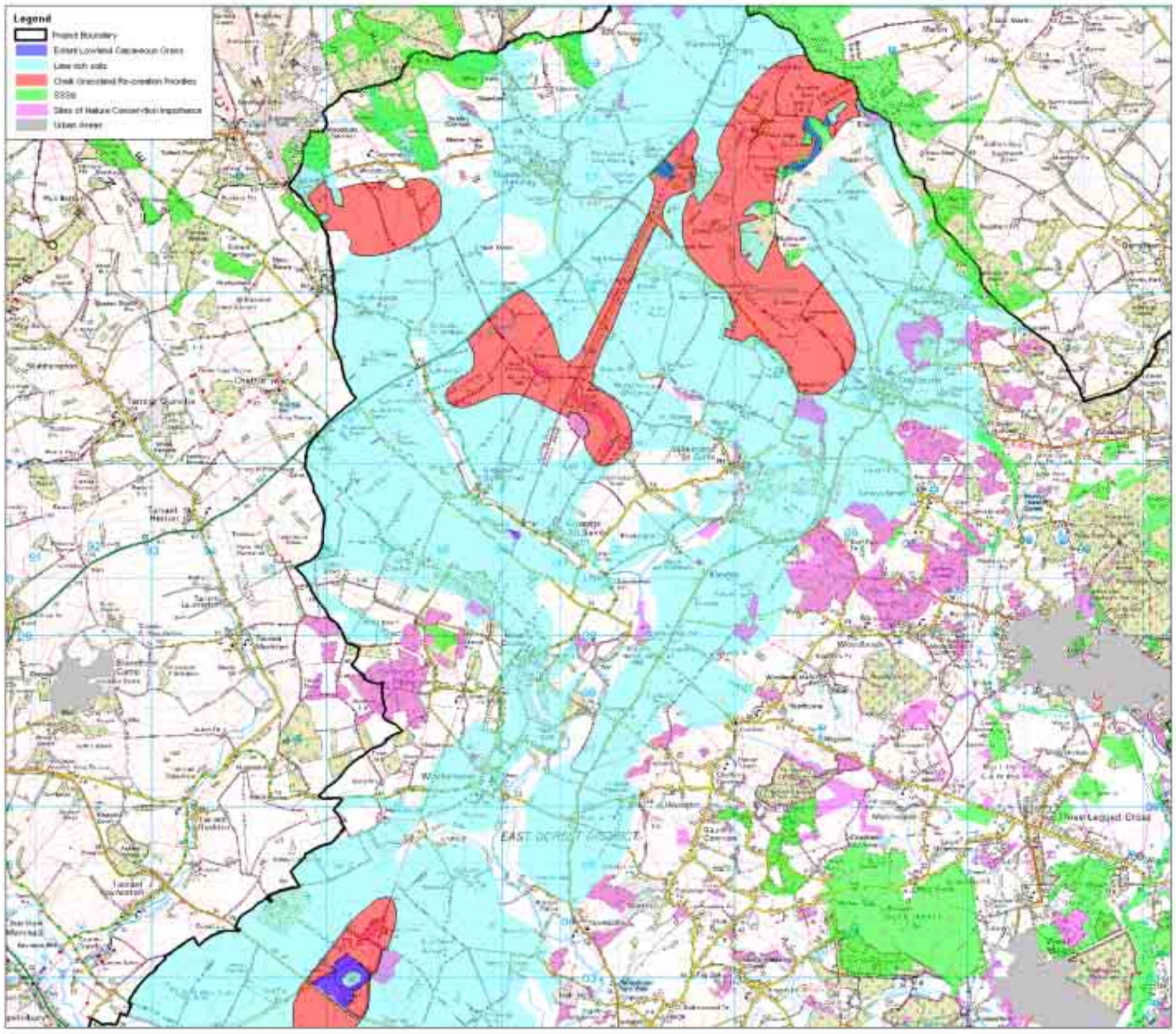
Wetland

Each of the three Local Authority areas have several main river systems flowing through them: East Dorset District has the Stour, Allen, Crane and western margins of the Avon; Purbeck District has the Piddle, Frome and Corfe; and Christchurch Borough has the Moors, Avon and Stour. The valleys of these river systems provide the principal opportunities for wetland habitat re-creation within the study area, and these are identified in the various *wetland* maps.

[14] English Nature, ?199?, Dorset Heaths Natural Area Profile, English Nature Dorset, Dorset.

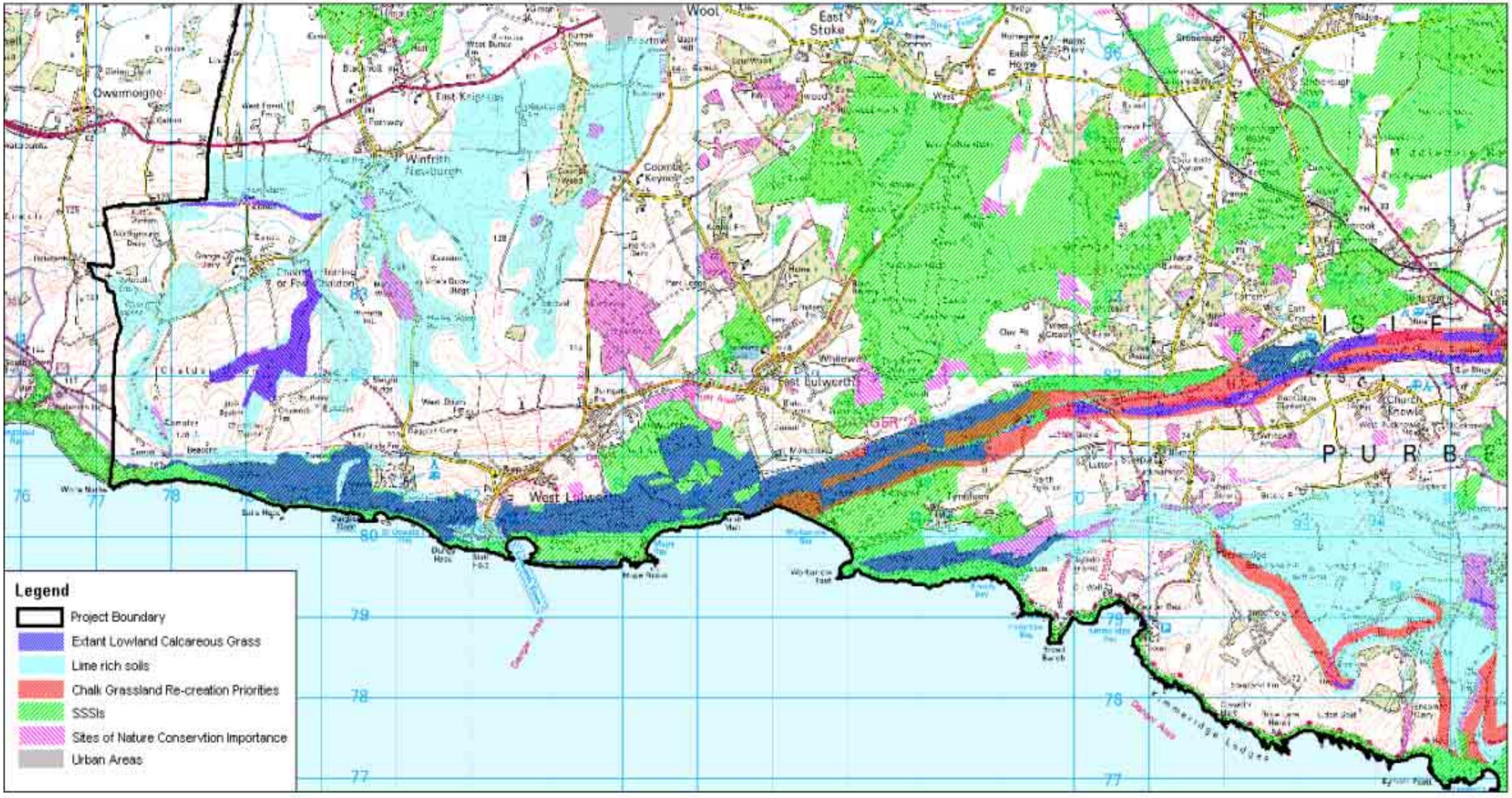
MAPS

Potential Priorities for Lowland Calcareous Grassland Re-creation and Restoration in East Dorset



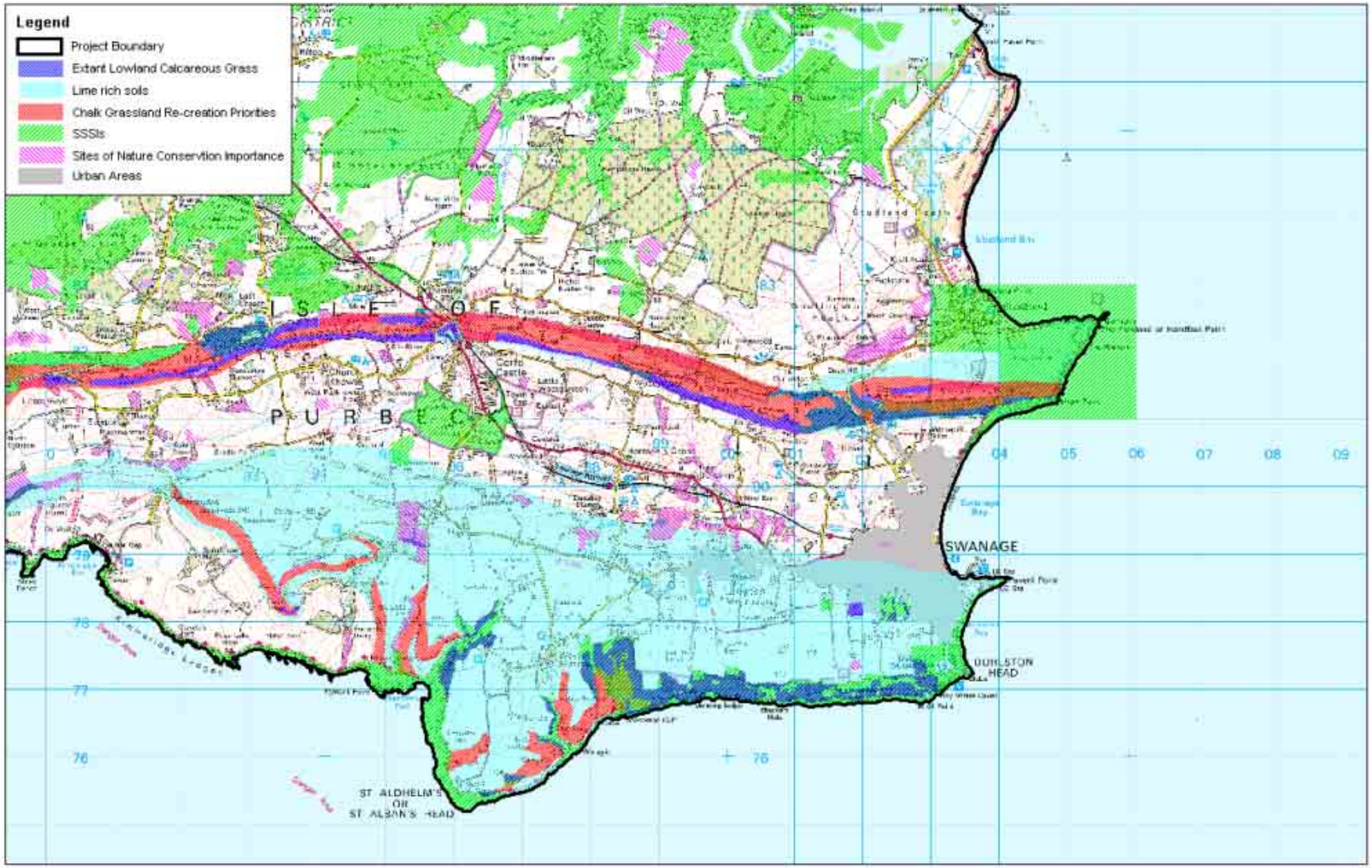
Potential Priorities for Lowland Calcareous Grassland Re-creation and Restoration in West Purbeck

scale = 1 : 57142



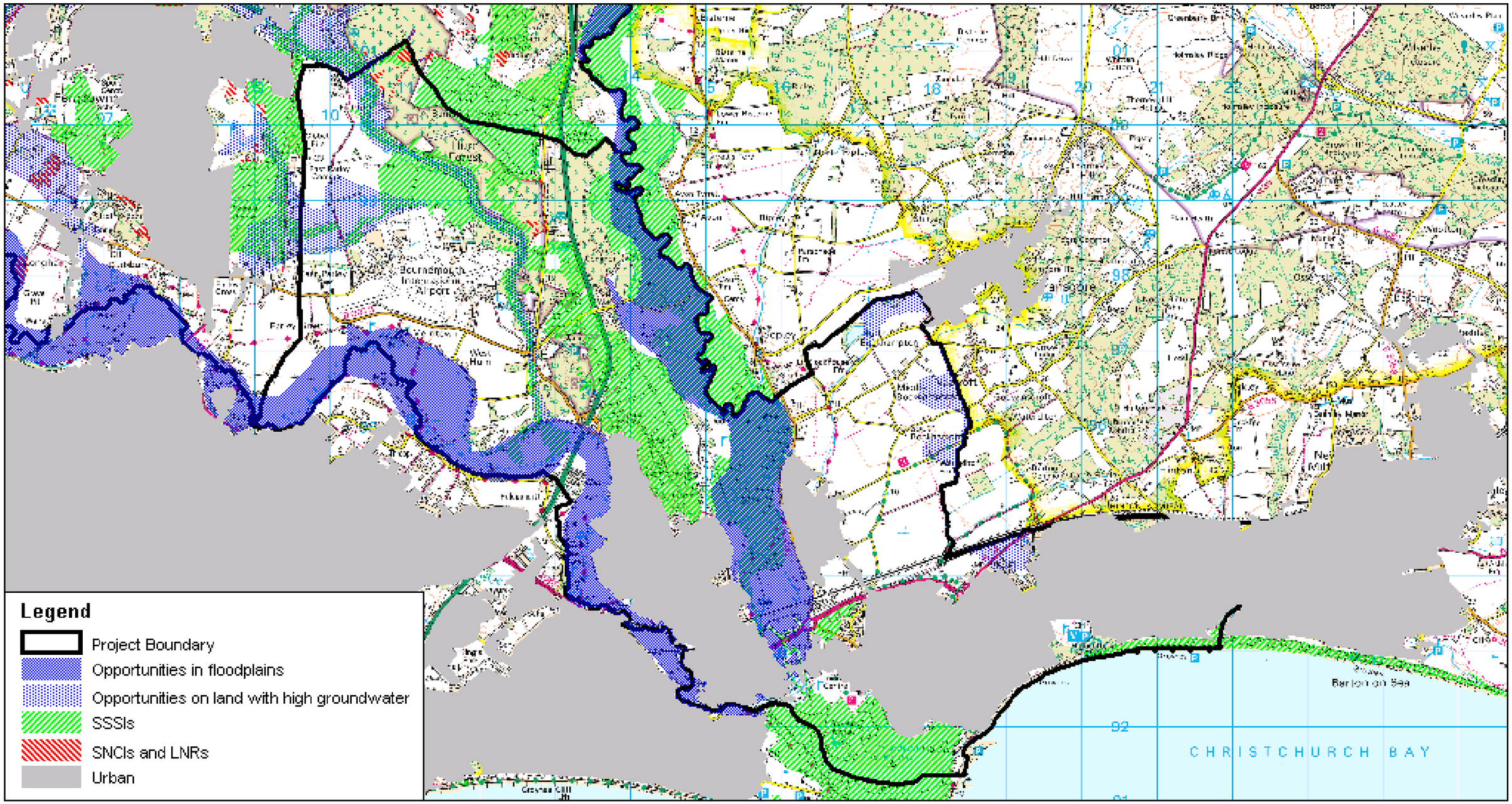
Potential Priorities for Lowland Calcareous Grassland Re-creation and Restoration in East Purbeck

scale = 1 : 57142



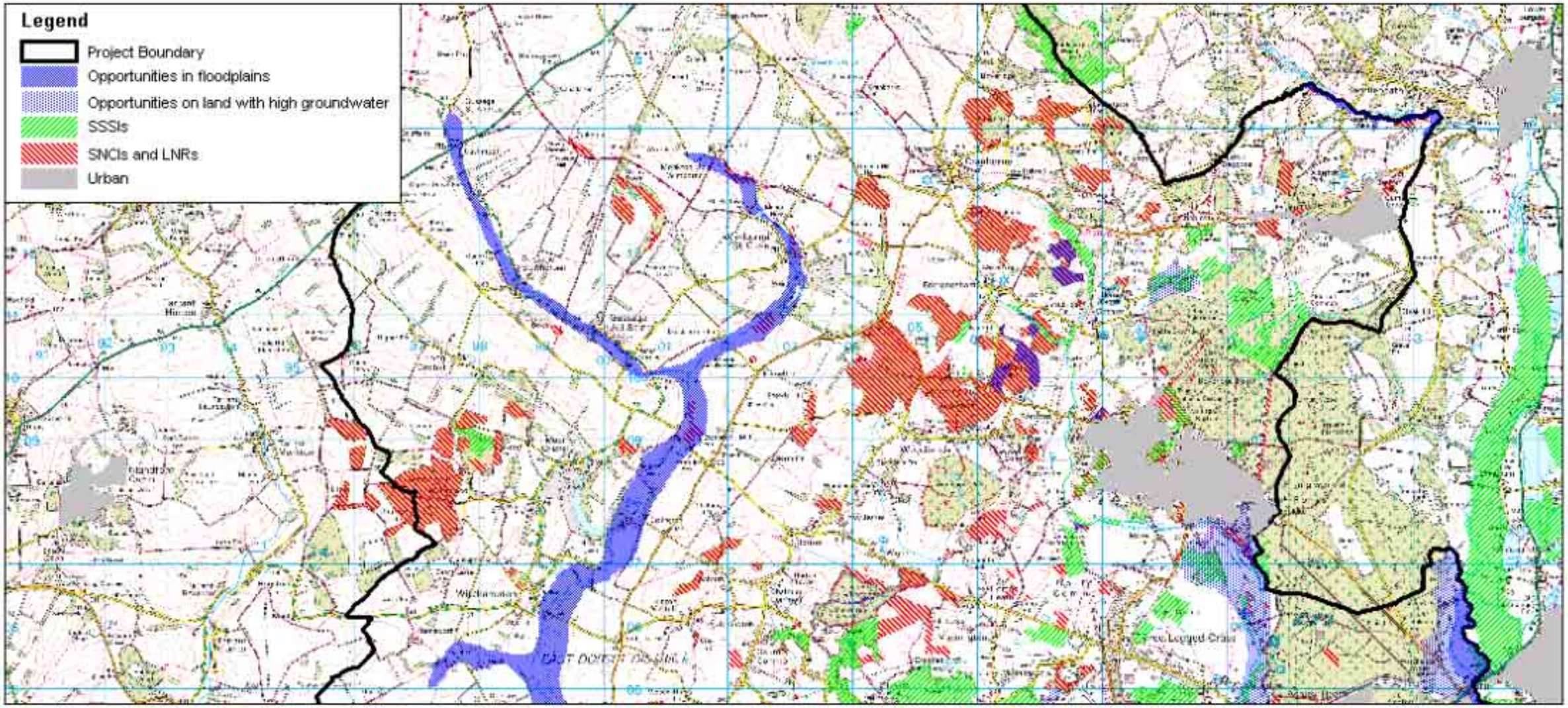
Potential for Wetland Habitat Re-creation and Restoration in Christchurch

scale = 1 : 74906



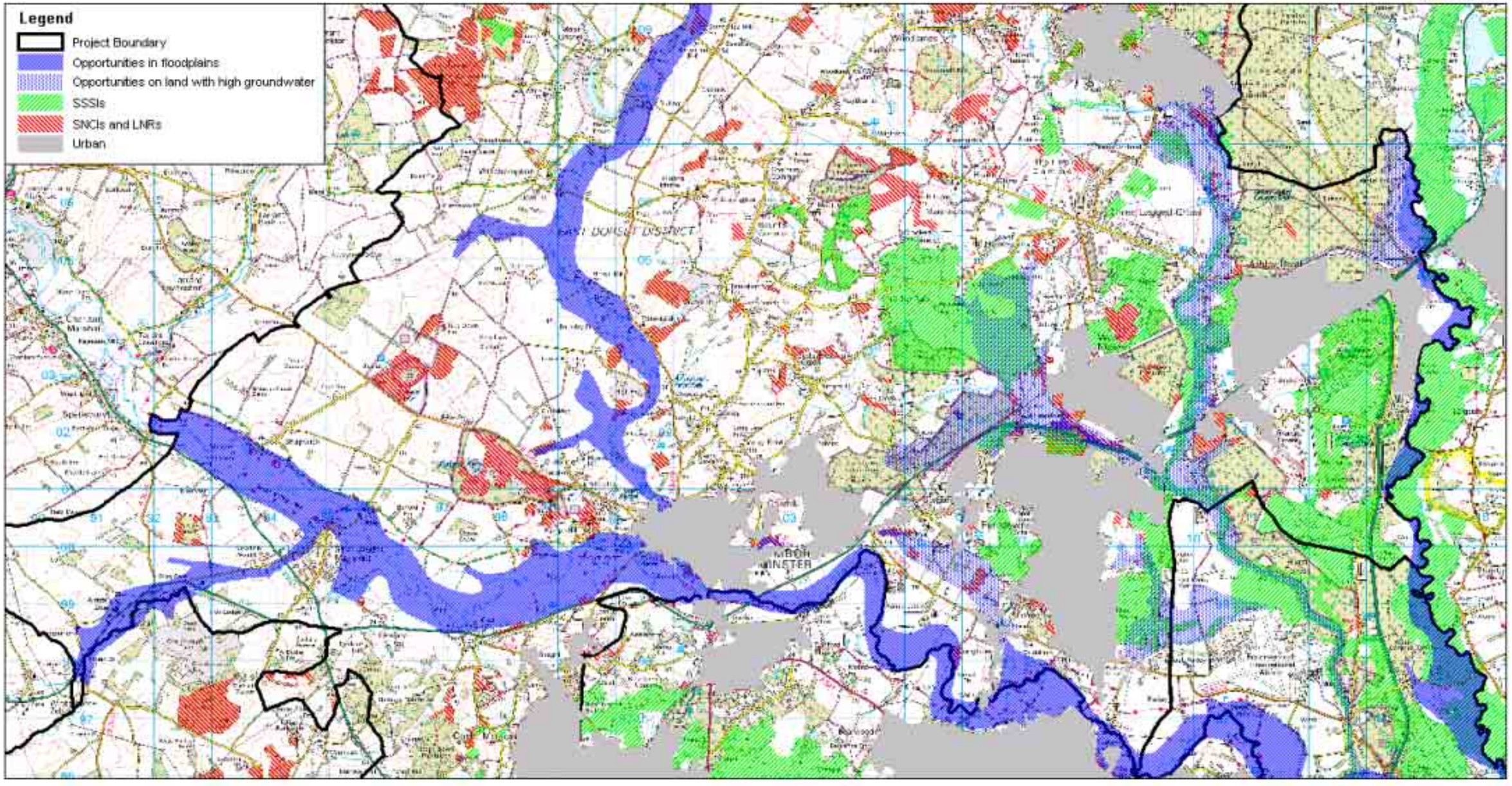
Potential for Wetland Habitat Re-creation and Restoration in northern East Dorset

scale = 1 : 71428



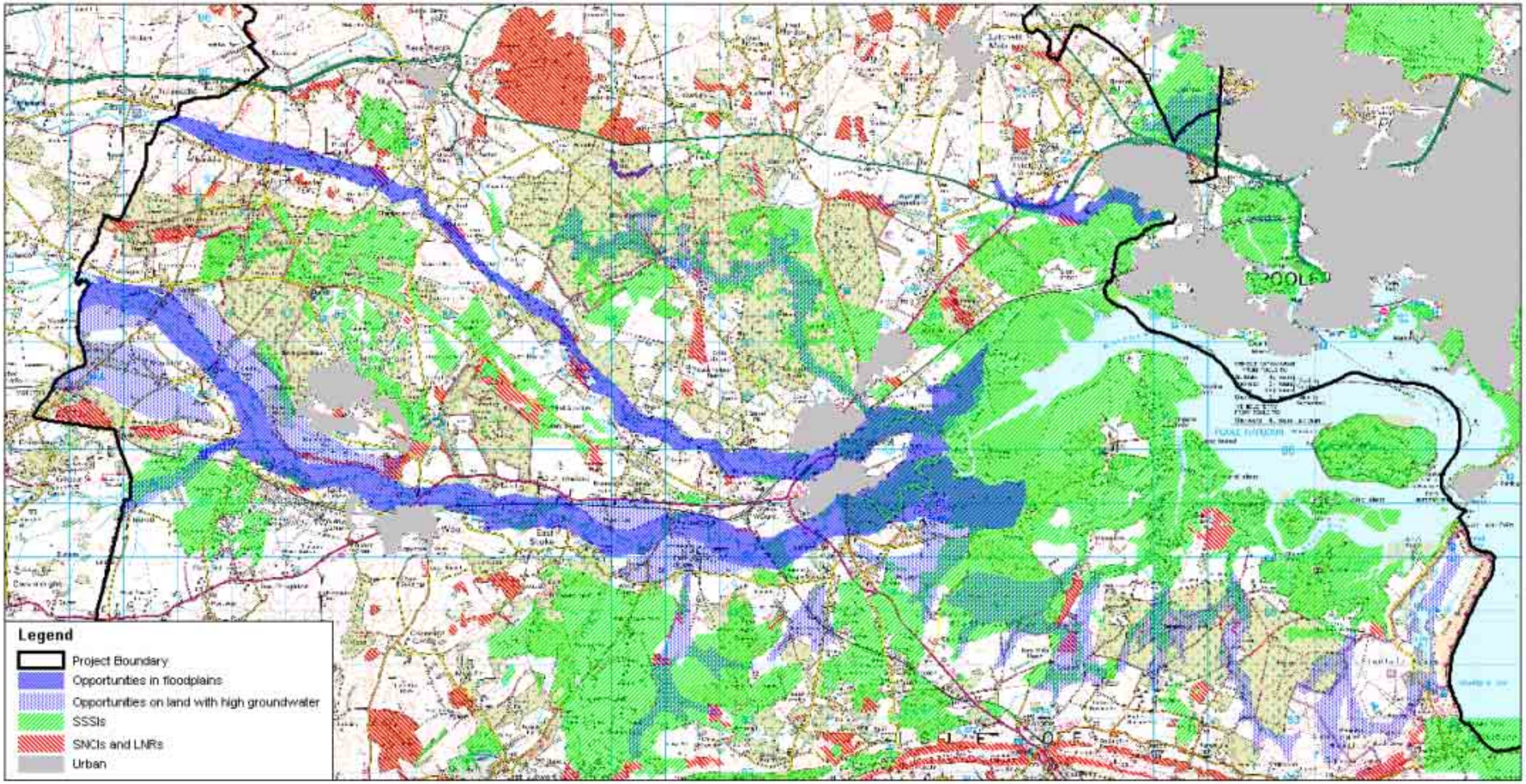
Potential for Wetland Habitat Re-creation and Restoration in southern East Dorset and northern Purbeck

scale = 1 : 71428



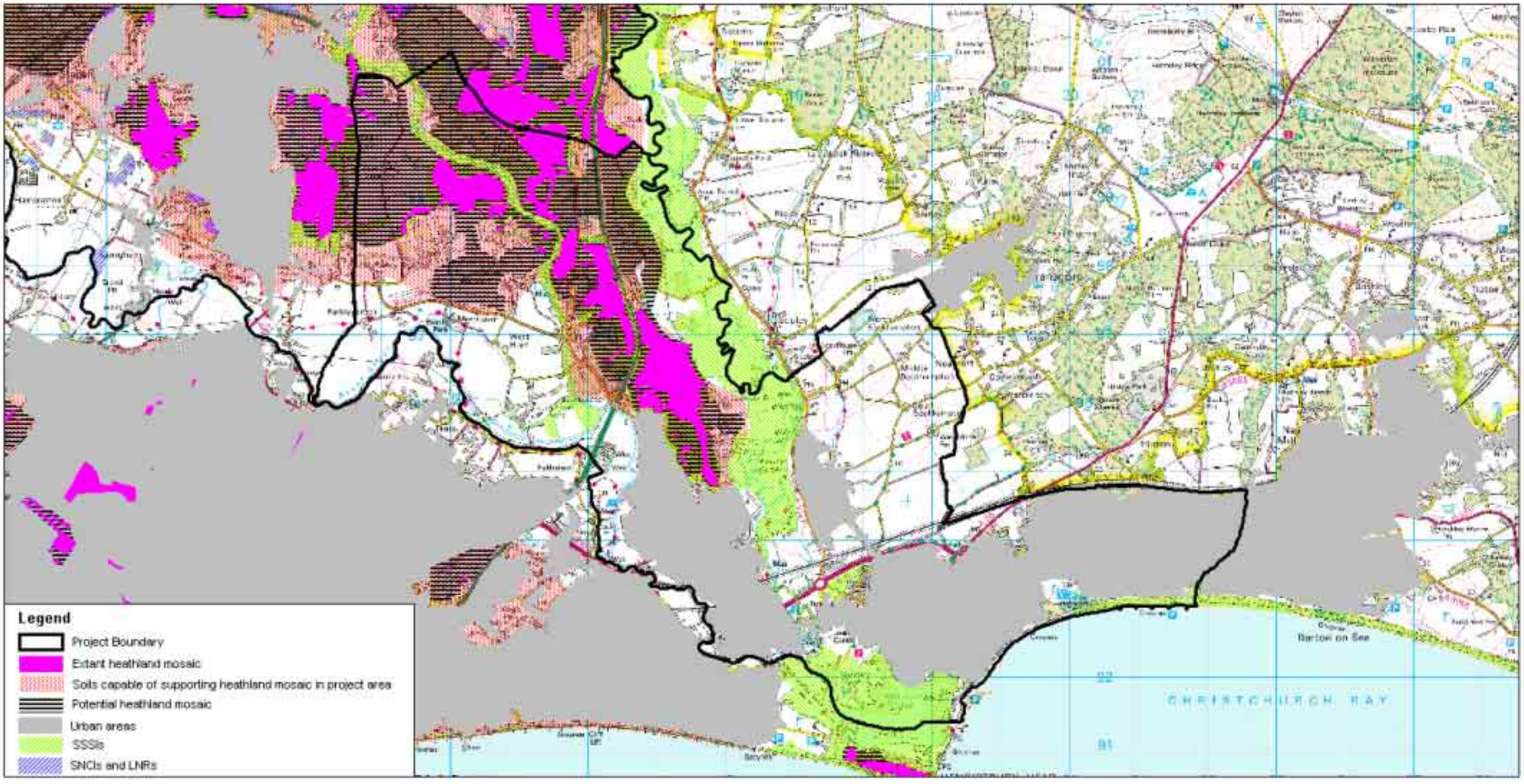
Potential for Wetland Habitat Re-creation and Restoration in southern Purbeck

scale = 1 : 80000



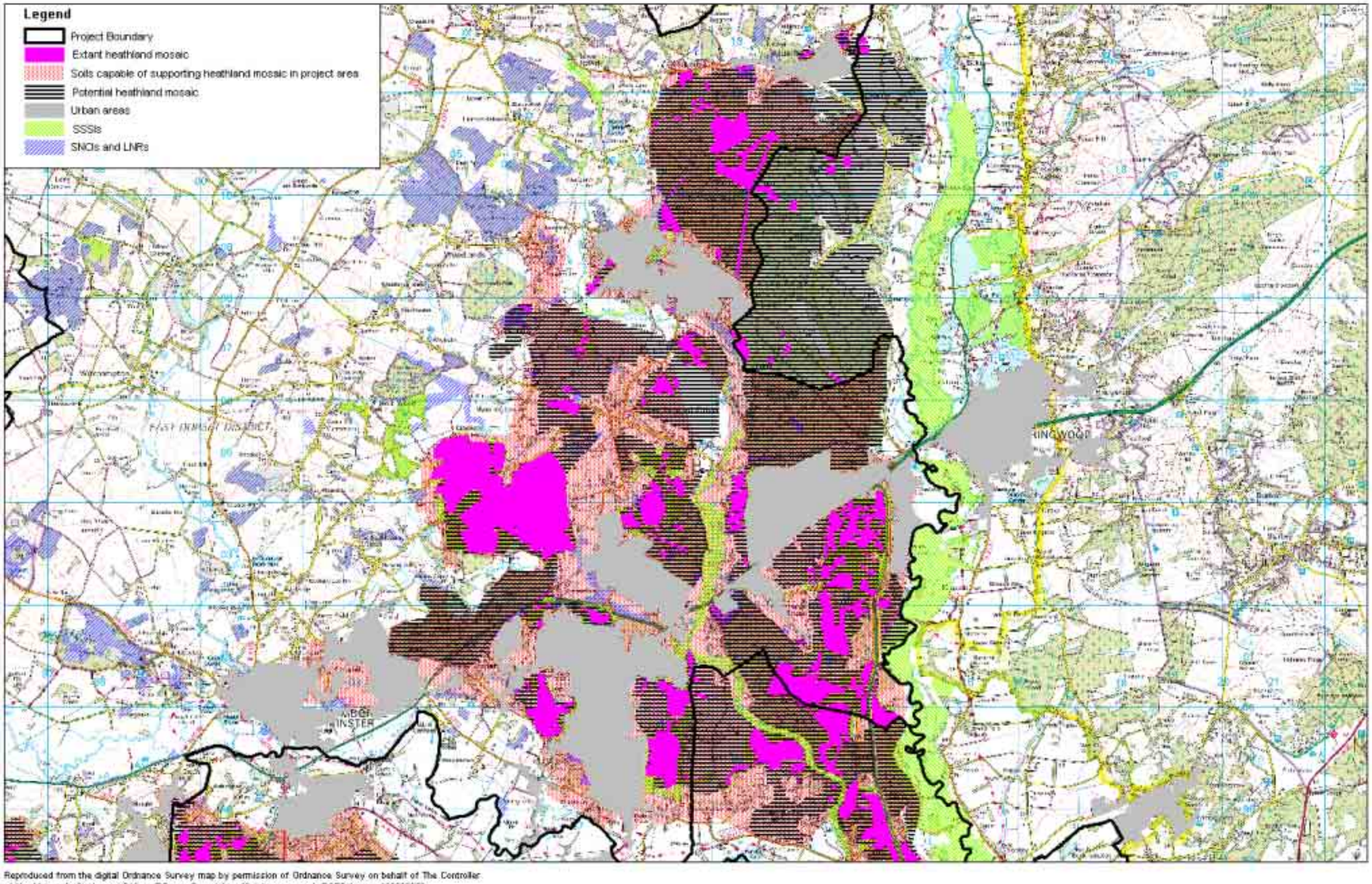
Potential for Restoration and Re-creation of Lowland Heathland and associated habitats in Christchurch

scale = 1 : 33424



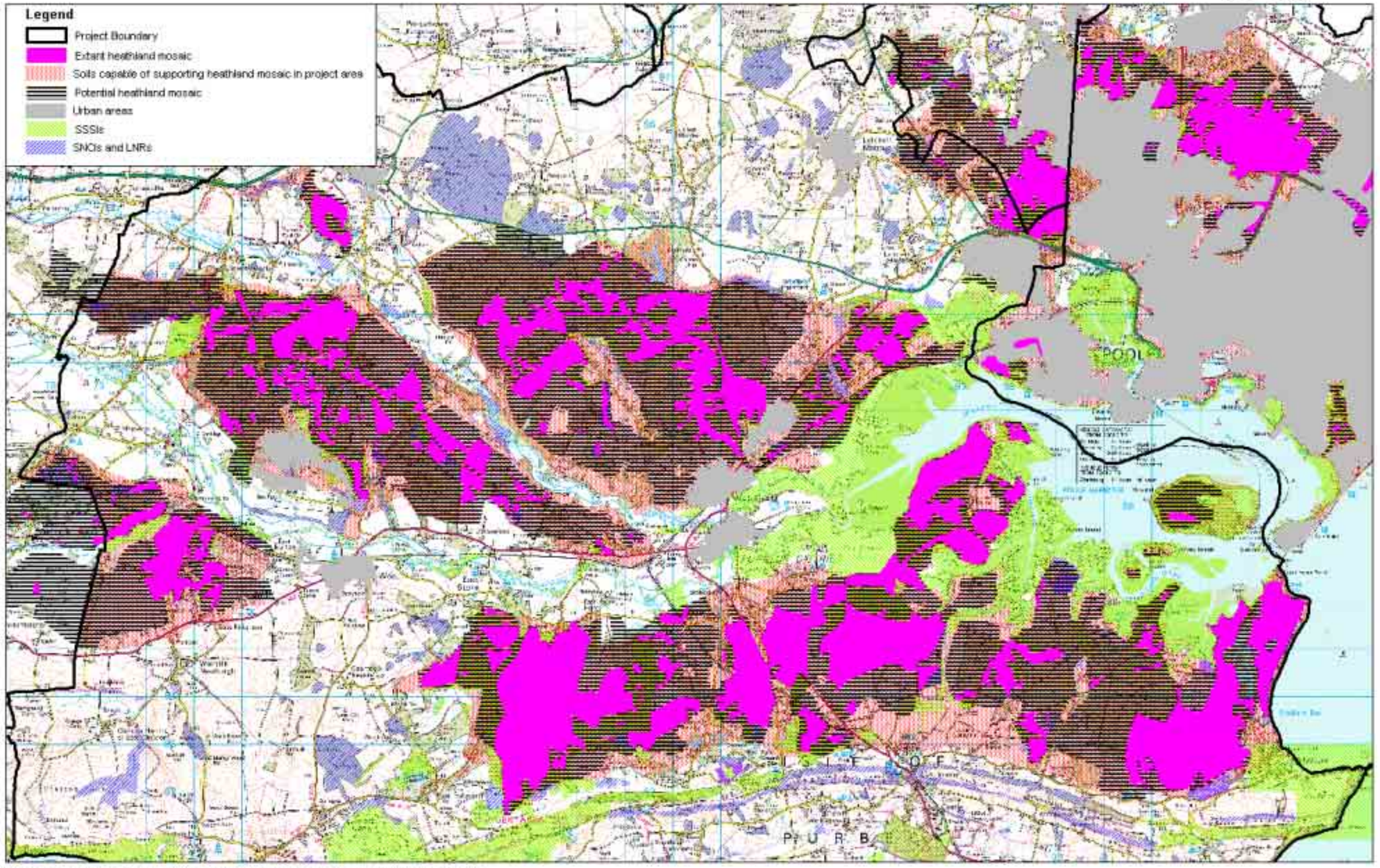
Potential for Restoration and Re-creation of Lowland Heathland and associated habitats in eastern East Dorset

scale = 1 : 73150



Potential for Restoration and Re-creation of Lowland Heathland and associated habitats in Purbeck and southern East Dorset

scale = 1 : 78356



Conclusions and Recommendations

This project demonstrates that it is possible, within a restricted budget and timescale, to systematically map key habitat re-creation opportunities according to an agreed suite of criteria within a given area.

Specific Comments on the Project Area

The project area has a wealth of re-creation opportunities for all of the habitat categories considered. It is clear from this work that, based on the study area's physical resources, the BAP habitat re-creation targets derived from the Dorset BAP can easily be met. It is not possible to conclude that this outcome can be generalised, even within Dorset, or that it is specifically due to the richness and diversity of the physical environment in South East Dorset or to particularly unchallenging LBAP habitat re-creation targets. However, arguably this work supports the notion that the BAP re-creation targets for these habitats should be increased to reflect the level of opportunity that exists within the study area. In order to ensure that these opportunities are maximised, habitat targets must be clear that re-creation, as well as enhancement, is to *favourable conservation status* – ie. it is essential that the habitat is restored to and maintained at high quality.

This work should be taken forward locally in line with the generic proposals for further work given below.

Generic Comments on the Approach

Comprehensive and reliable biological, soil/geology and land-use baseline data must be available to inform the selection of sites on the ground. Recent aerial photographs of the study area would also be of great benefit in helping to identify recent land use and character and to confirm the suitability of identified opportunities. Furthermore, maps and/or aerial photographs showing historic habitat extent can be extremely good indicators of re-creation opportunities, since if a habitat has existed in a particular location in the past, the physical characteristics that caused its presence are likely to remain. In general, unless it has undergone considerable rapid change, the more recently a habitat has existed the easier its re-creation will be.

There is a clear need for local expertise to inform the identification of opportunities, particularly for focussing in from broad areas of search to identifying priority opportunities at a local scale.

Unless the resource of available, undeveloped land resource is extremely limited, re-creation opportunity mapping is most valuable, and indeed considered only likely to be necessary, for habitats that have quite specific ecological requirements (ie. for which re-creation opportunities are genuinely limited).

The potential contribution of habitat re-creation opportunity mapping to biodiversity delivery

If the UK is to deliver on its legal and policy obligations to conserve and promote biodiversity, wildlife habitats and opportunities for their re-creation must be viewed as a key concern for the planning system. Identifying and mapping habitat re-creation opportunities to deliver agreed biodiversity objectives, in effect allocating suitable land for habitat re-creation and restoration, is considered necessary to effective biodiversity planning. Decisions on the future of such land could then be informed by the opportunity cost of compromising, or even sterilising, the habitat re-creation opportunity by permitting another, non-compatible land-use.

This proposed approach has parallels with how land is identified in minerals plans to safeguard mineral deposits, as set out in Mineral Planning Guidance 1 (see box), but goes a step further by encouraging positive planning for habitat re-recreation.

Minerals Planning Guidance 1: General considerations

36 The planning system has an important role to play in safeguarding deposits which are, or may become, of economic importance from unnecessary sterilisation by surface development. One mechanism by which non-energy mineral resources can be safeguarded is by MPAs defining mineral consultation areas (MCAs) in their plans.

The Planning and Compulsory Purchase Act 2004 and accompanying guidance has created a spatial planning system which is more wide-ranging and inclusive than the existing system. Spatial planning will provide greater scope for planning bodies and other organisations to promote and manage change to contribute more towards sustainable development. Forward planning documents, including the Regional Spatial Strategy and Local Development Documents will be key tools in this process by setting a broad vision for an area, by pro-actively managing change and by providing greater clarity on implementation.

These welcome changes to the planning system present a major opportunity to safeguard and help deliver BAP habitat re-creation opportunities by identifying where these exist, mapping them and using these maps to inform decision making. This represents a logical step in an ongoing process of integrating the spatial elements of Biodiversity Action Planning with land-use planning.

The RSPB **recommends** that the following mechanism for the systematic identification, mapping and delivery of priority habitat-re-creation opportunities is adopted by local planning authorities:

1. An agreed map of priority habitat re-creation opportunities, at least sufficient to deliver agreed Biodiversity Action Plan (BAP) targets, to be drawn up by a partnership of Local Authority officers, nature conservation experts and other relevant interests.
2. Habitat re-recreation opportunities to be identified on the Proposals Map in the Local Development Framework.
3. Policies in support of the identified habitat re-creation opportunities to be included in Development Plan Documents, to offer identified areas an appropriate level of protection and to promote contributions to the delivery of re-creation opportunities.
4. Further guidance, and details of implementation mechanisms, should be contained in a Supplementary Planning Document.
5. Decisions on applications within the identified re-creation areas to be made in the knowledge of the contribution the land could make to deliver BAP targets and of the opportunity cost of permitting non-complementary land-use.
6. Where, in exceptional circumstances, the need for a proposal that would damage an identified habitat re-creation opportunity is considered over-riding, it should only be granted permission if commensurate financial contributions towards the delivery of another re-creation opportunity for similar habitat are secured.
7. Sustainability appraisal and Strategic Environmental Assessment help to assess the cumulative effects of development plan policies and proposals on habitats and opportunities for their re-creation. It also provides an opportunity to consider the extent and location of compensation and mitigation measures which may be necessary to offset cumulative environmental impacts of strategic development allocations in a co-ordinated way. This should not prejudice legal and policy imperatives to deliver BAP targets and to secure protection and favourable management of designated wildlife sites.

8. Opportunities to secure the delivery of identified habitat re-creation potential to be investigated by the Local Authority, in partnership with potential funding parties, nature conservation bodies such as English Nature, the RSPB or county Wildlife Trusts and public bodies with large landholdings and/or regulatory functions capable of assisting delivery, such as Forestry Commission England and the MoD.
9. Whilst not within the direct gift of the planning system to deliver, other mechanisms that influence land-use, such as agri-environment schemes administered by the Rural Development Service, to be targeted to priority habitat re-creation opportunities accordingly.
10. Opportunity maps should be used by developers and planning officers to identify where habitat re-creation as environmental planning gain or mitigation or compensation for an ecologically damaging development is likely to be most appropriate.
11. The implementation of habitat re-creation policies and proposals should be regularly monitored and reported on in the local planning authority's annual monitoring report.
12. Priority habitat re-creation opportunities should be regularly reviewed as part of the normal process of development plan review.

Next Steps and Possible Further Work

In order for this opportunity mapping work to help deliver results on the ground, it is important that it is accepted by decision makers and, in particular, the planning fraternity, as a legitimate contribution to spatial land-use planning. This requires a commitment to the concept by Local Planning Authorities. This project clearly has direct relevance to the three Local Authorities within the study area, but it also has wider value in illustrating how the concept of mapping habitat re-creation opportunities might be taken forward on a broader front. This work will therefore be used to illustrate the concept and approach to forward planners nationally, regionally and locally, in order to seek the incorporation of the approach into mainstream biodiversity and land-use planning.

Further useful work could include the mapping of other land-use objectives, such as those for leisure, recreation and tourism, in order to explore how these might relate to habitat re-creation objectives. Whilst there is potential for conflict between these, there is also significant potential for complimentarity and a coherent, joined-up approach which makes the most of opportunities offered by the natural resources within an area whilst delivering legitimate development and other land-use needs is a valuable and achievable outcome of such an approach. The East of England Heathland Opportunity Mapping Project [15] takes such an holistic approach, illustrating how an ecological opportunity mapping project can incorporate social considerations and economic factors, with a view to identifying strategic priorities for heathland re-creation in an area according to the relative importance of these objectives.

[15] Reference: Eglington, S. (2004) *East of England Heathland Opportunity Mapping Project*. RSPB East of England Office

Appendix 1. Biodiversity Action Plans Relevant to the Study

Coverage	Biodiversity Action Plan	Description
National		
UK	Biodiversity: The UK Action Plan (1994)	The UKBAP was established to help the UK deliver its obligations under the Biodiversity Convention, which requires its signatories to create and enforce national strategies and action plans to conserve, protect and enhance biological diversity. In 1993, the UK government consulted widely over the key issues raised at the Convention – a process which culminated in the launch of *Biodiversity: the UK Action Plan* in 1994. This identified 59 broad activities for conservation work over the next 20 years and established fundamental principles for future biodiversity conservation in the UK. Between 1995 and 1999, the UK Biodiversity Steering Group published action plans to conserve 391 species and 45 habitats. Statutory agencies and NGOs collaborate in actions to achieve the biological targets for these UK plans, with national strategies (in England, *Working with the grain of nature*, 2002) to influence the land-use policies that can aid or constrain the conservation of wildlife. Progress towards the UK targets is assessed every three years, and the UK BAP priorities and targets will be revised in 2006.
Regional		
South West Region	Action for Biodiversity in the South West: A series of Habitat and Species Action Plans to Guide Delivery (1998)	A consortium including nature conservation bodies and the Regional Planning Conference produced the South-West Regional Biodiversity Action Plan in June 1997. This sets out 31 prioritised habitat and species action plans to assist biodiversity conservation, enhancement and re-creation objectives at the regional level. It aims to inform local BAPs and other local and regional conservation processes and to provide a link between the UKBAP and local plans.
County		
Dorset County	Dorset Biodiversity Strategy	The Dorset Biodiversity Partnership launched the Dorset Biodiversity Strategy in May 2003. The strategy establishes common goals for collaborative work and provides a framework for positive action for biodiversity in Dorset over the next 10 years. It helps to translate the priorities in the UK BAP into local action in Dorset. In October 2003 a new set of targets for priority habitats were established by the Partnership. These update the original targets in the Strategy, are specific to Dorset and are based on English Nature's Natural Area targets.
District		
Purbeck District	A Biodiversity Action Plan for Purbeck (1997)	*Greater Purbeck Biodiversity Plan: A Toolkit for the delivery of Biodiversity Conservation in Purbeck* was published in May 1997 by a Steering Group composed of NGOs, local authorities and government agencies. It sets out 10 habitat action plans, 7 habitat statements and species action plans for 18 species (considered in need of special attention locally and which would not be conserved through any habitat plan).
East Dorset	No dedicated District plan	N/A
Christchurch Borough	No dedicated Borough plan	N/A

Appendix 2. Habitat Group Targets by Natural Area

Broad Habitat Group	Dorset Biodiversity Partnership Habitats	Natural Area with the greatest potential for restoration and expansion	Re-creation Target by DBP Habitats	Re-creation Target by Habitat Category for each relevant Natural Area	
				Natural Area	Target
Heathland and Acid Grassland	Lowland heathland (including valley mire)	Dorset Heaths	1,000 ha by 2010	**Dorset Heaths**	**1,040**
		Wessex Vales	5 ha by 2010		
	Lowland dry acid grassland	Blackdowns	2ha by 2010		
		Dorset Heaths	40ha by 2010		
		Wessex Vales	5ha by 2010		
Calcareous Grassland	Lowland calcareous grassland	Isles of Portland and Purbeck	25 ha by 2010	**Isles of Portland and Purbeck**	**25**
		South Wessex Downs	100ha by 2010	**South Wessex Downs**	**100**
		Wessex Vales	10ha by 2010		
Wetland	Coastal & floodplain grazing marsh	Dorset Heaths South Wessex Downs Wessex Vales New Forest	100ha by 2010	**South Wessex Downs**	**41**
	Reedbeds	Solent & Poole Bay Wessex Vales		**Isles of Portland and Purbeck**	**5**
	Fens	Dorset Heaths Isles of Portland and Purbeck Wessex Vales		**New Forest**	**1**
				Dorset Heaths	**31**
	Wet woodland	Dorset Heaths Wessex Vales	10ha by 2015		
	Purple moor grass and rush pastures	Wessex Vales	6 by 2010	**Wessex Vales**	**6**
		South Wessex Downs	6 by 2010		
		Dorset Heaths	4 by 2010		

Appendix 3. Derivation of Habitat Category Targets by Local Authority within the Study Area

Broad Habitat Group	Re-creation Target by Broad Habitat for each relevant Natural Area		Local Authority Targets					
	Natural Area	Target	Purbeck		East Dorset		Christchurch	
			% of NA in Dorset in LA	Target (rounded)	% of NA in Dorset in L A	Target (rounded)	% of NA in Dorset in LA	Target (rounded)
Heathland and Acid Grassland	Dorset Heaths	1,040	40%	416	25%	260	4%	42
	TOTAL		416		260		42	
Calcareous Grassland	Isles of Portland and Purbeck	25	88%	22	0	0	0	0
	South Wessex Downs	100	5%	5	21%	21	0	0
	TOTAL		27		21		0	
Wetland	South Wessex Downs	41	5%	2	21%	9	0	0
	Isles of Portland and Purbeck	5	88%	4	0	0	0	0
	New Forest	1	0	0	12%	0	88%	1
	Dorset Heaths	31	40%	12	28%	9	4%	1
	TOTAL		18		18		2	
Woodland (other than wet woodland)	Dorset Heaths	239	40%	96	28%	67	4%	10
	Isles of Portland and Purbeck	49	88%	43	0	0	0	0
	New Forest	10	0	0	12%	1	88%	9
	South Wessex Downs	345	5%	17	21%	72	0	0
	TOTAL		156		140		19	

Appendix 4. Relevant UK Broad and Priority Habitats in Dorset and their re-creation targets in relevant BAPs

UK Broad Habitat Type	UK and Dorset Priority Habitat	SW Regional BAP Target	Dorset Biodiversity Project (October 2003) Target	Purbeck BAP Target
Calcareous grassland	Lowland calcareous grassland	4,000ha by 2010	135ha by 2010	No area specified
Acid grassland	Lowland dry acid grassland	3,500ha by 2010	47ha by 2010	970ha by 2010
Dwarf Shrub Heath	Lowland heathland		1,005ha by 2010	
Broadleaved, mixed and yew woodland	Lowland beech and Yew Lowland wood pasture and parkland Lowland mixed deciduous woodland	No Area Specified	1,025ha by 2015	400ha (for *Broad-leaved woodland)* No area specified for *Parkland and veteran trees*
	Wet woodland	N/A	10ha by 2015	N/A
Improved grassland	Coastal and Floodplain Grazing Marsh	No Area Specified	100ha by 2010	No Area Specified
Fen, marsh and swamp	Fens	N/A		N/A
	Reedbed	600ha by 2010		25ha by 2010
	Purple moor grass and rush pastures	N/A	15ha by 2010	N/A