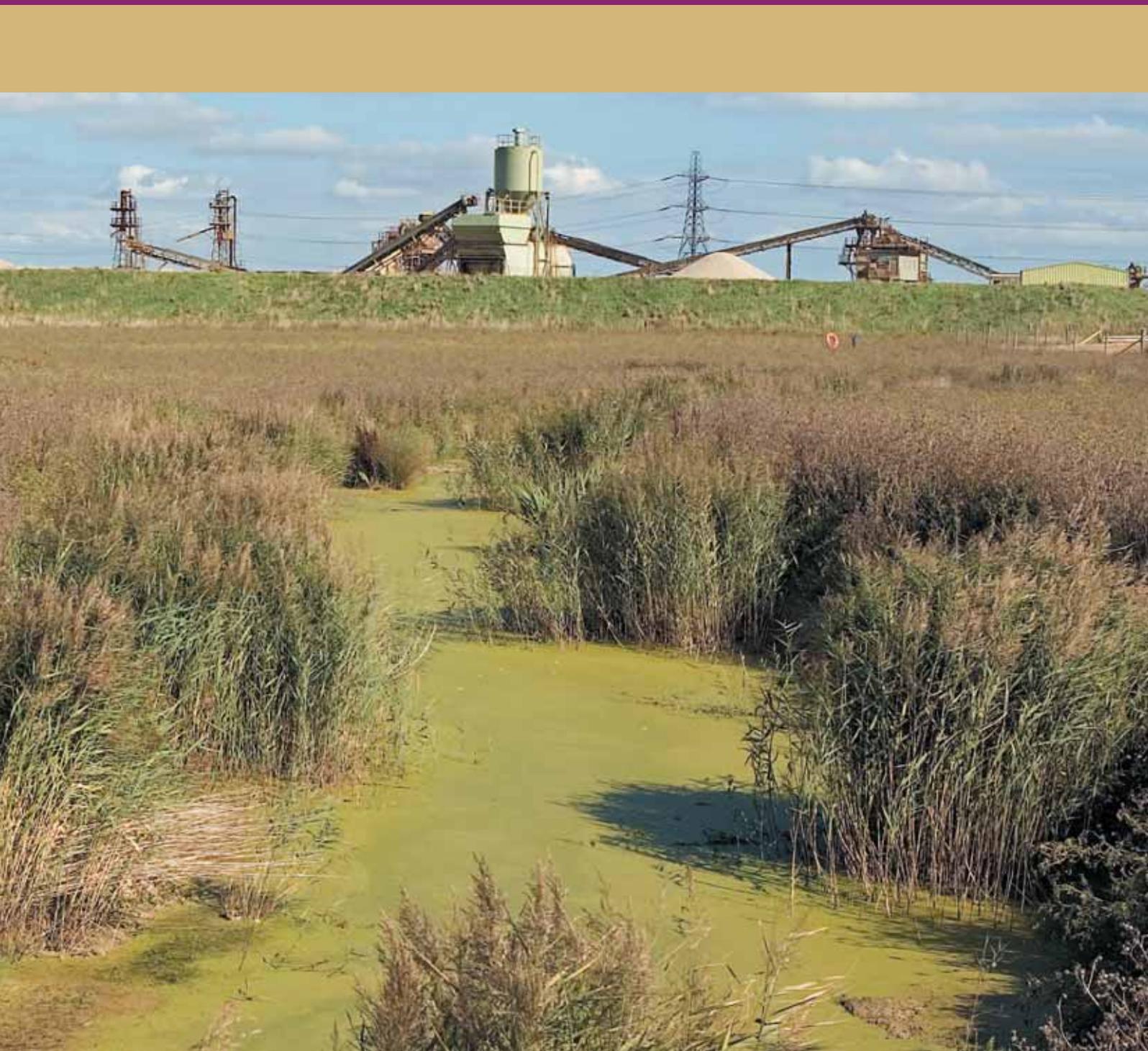




for birds  
for people  
for ever



# **NATURE AFTER MINERALS:** **how mineral site restoration can benefit people and wildlife**





# NATURE AFTER MINERALS: how mineral site restoration can benefit people and wildlife

A M Davies

November 2006

The evidence supporting this advocacy document is outlined in the technical report: A M Davies (2006) *Nature After Minerals – How mineral site restoration can benefit people and wildlife: the report*. The RSPB

Both the technical report and advocacy document can be downloaded from [www.afterminerals.com](http://www.afterminerals.com). For more information about this document, or to receive further copies, please contact Alice Davies at the RSPB.

**Lydd Quarry, Brett Aggregates Ltd,  
where a mosaic of wetland  
habitats such as reedbed is  
being created.**

David Kjaer ([rspb-images.com](http://rspb-images.com))

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**Nightingale singing at  
Paxton Pits nature reserve,  
Cambridgeshire,  
Aggregate Industries.**  
Ian Johnston





### **Extraction at Farnham Quarry, Hanson.**

Alice Davies (RSPB)

## **Foreword**

The RSPB has a long history of creating semi-natural habitats, often on post-industrial land. Some of our most beautiful nature reserves are former mineral extraction sites. Places like Dungeness and Fairburn Ings benefit not only wildlife, but also local communities, providing attractive greenspace where they can meet friends and family, take a gentle stroll, and be surrounded by nature. Using local greenspace in this way, means people improve both their physical and mental wellbeing. New nature reserves also provide jobs and attract visitors, thereby supporting and generating economic activity within local communities.

Creating priority wildlife habitats allows us to redress historical habitat loss. It is exciting to be able to put something back – to help turn the tide of habitat destruction. By increasing the area of priority habitats we can help ensure the plants and animals that depend on them can expand in range and population. In an increasingly uncertain world, where wildlife is under pressure from challenges such as climate change and changing land-uses, creating habitat can make species more resilient, increasing the chances of future generations enjoying a country rich in biodiversity. Targets for habitat creation are included in the UK Biodiversity Action Plan, the UK Government's commitment to biodiversity.

Mineral sites offer a fantastic opportunity to contribute to these habitat creation targets. Some wonderful examples already exist, as shown by the case studies throughout this report. However, the scale of the opportunity unearthed by this study certainly surprised me – the potential for habitat creation is far in excess of what was previously understood. With the possibility that habitat creation on mineral sites could exceed government targets for many priority habitats, it is clear that such sites could provide a lifeline for our wildlife.

This report sets out a vision of large-scale habitats being created on mineral sites for people and for wildlife. Here is an opportunity for a major industry and the planning system to work together with nature conservation organisations to provide vast public good by making this vision a reality.

**Mark Avery**  
**Director of Conservation, The RSPB**

# Executive summary

Minerals sites have the potential to enhance biodiversity and to provide a public benefit at the end of their working lives through restoration. Demand for minerals in England is ongoing, with the location of extraction defined by underlying geology.

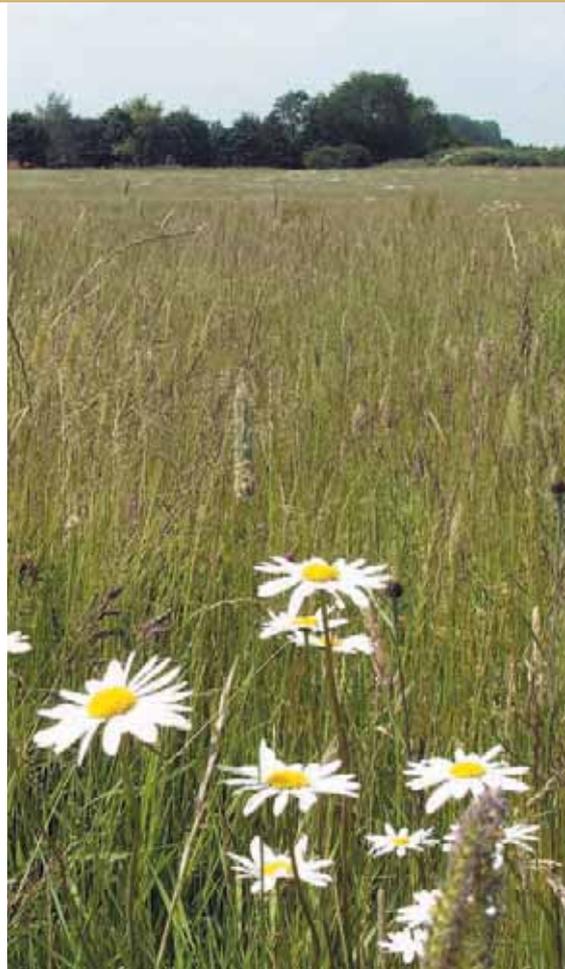
As part of the Minerals Restoration Potential (MRP) project, the RSPB has created a Geographical Information System (GIS) model, to assess every active mineral site in England for its potential to support UK BAP priority habitats. The results of this model have shown that the potential contribution of the minerals industry to UK BAP targets is immense. For example, focussing efforts on 412 mineral sites within 1 km of nine priority habitat types would see existing UK BAP habitat creation targets met for those habitats.

Current end-use plans are not achieving this potential. Whilst nature conservation features on many sites as part of an amenity end-use, large-scale habitat creation of the kind that maximises benefits for biodiversity and people, is not occurring.

The RSPB has a vision for large-scale mosaics of appropriately sited, priority BAP habitats created on mineral sites. These would make space for wildlife, contributing substantially to UK BAP habitat creation targets, and provide natural space for people to relax and enjoy time away from the intensity of modern life.

Following a survey, as part of the MRP project, we now understand the main blocks preventing habitat creation on mineral sites. There is a need to maintain and build on ever-developing momentum for change in the restoration of minerals sites to ensure the potential identified in this report is delivered. In particular, the RSPB believes the following recommendations are key to ensuring our vision of mineral site restoration for wildlife and for people is realised:

1. Securing funding for long-term management will unlock many more opportunities by making nature conservation a more attractive option to landowners. Guidance must be provided to facilitate this through local planning policies (including for minerals) and a revised Mineral Planning Statement on reclamation of sites.
2. Regional and local planning policies and site allocations should support habitat creation on mineral sites.
3. *Minerals planning guidance 7: Reclamation of mineral workings* is no longer fit for purpose and must be reviewed by Department for Communities and Local Government in the next 2 years, with full stakeholder engagement.
4. Appropriate habitat creation can be a solution to the identified problem of bird-strike. A risk assessment approach must be taken by safeguarding authorities and Mineral Planning Authorities.



**Meadow created at Farnham  
Quarry, Hanson.**

Alice Davies (RSPB)

# Introduction

## The minerals industry in England

Minerals are natural resources with many uses. Many products we take for granted – from paper to glass, cosmetics to toothpaste – are manufactured using materials derived from quarrying.

Although a finite resource, demand for minerals is ongoing, and every year nearly four tonnes of aggregates are needed per head of the population in the UK<sup>1</sup>. The use of recycled aggregate is increasing, but there is still considerable demand for primary aggregate. In 2006, predicted demand was for 247 million tonnes of aggregate, of which 191 million tonnes will be from primary sources<sup>2</sup>.

Mineral sites are unique. Deposits can only be extracted where they exist – therefore the locations of sites are defined by the underlying geology. The extraction is a temporary land-use, though some quarries may be worked for a number of decades. At the end of their working life all sites must be restored, presenting particular opportunities for nature conservation.

For the purposes of this report, mineral extraction includes the winning of the following materials:

- sand and gravel
- clay and brick-making material
- soft rock, such as chalk
- hard rock, such as limestone and igneous formations
- open cast coal.

## Opportunities for habitat creation

During the second half of the 20th century there was a massive reduction in the area of semi-natural wildlife habitats in England due to changes in agriculture, the planting of non-native conifer forests, and increasing urbanisation. The remaining areas of habitat were in many cases reduced to small and often isolated fragments. These patches of habitat are extremely vulnerable, supporting reduced and isolated populations of plants and animals that will struggle to respond to challenges like climate change.

Habitat creation can reverse this historical loss. Existing fragments can be buffered and linked. Taking



**Minerals extraction in England is ongoing, and provides an opportunity for restoration of large areas of land**

LEFT AND BELOW: Alice Davies (RSPB)



opportunities to create new habitat around existing fragments will help to secure the future of our best wildlife sites by making them larger and more sustainable. New patches can be created, providing 'stepping stones' and making an otherwise intensively managed landscape more permeable to wildlife. Creating new habitat also takes some of the pressure off existing fragments, allowing more people to enjoy wildlife-rich areas without threatening fragile sites.

In 2005, over 64,000 ha of land in England was under planning permission for the active working of minerals. This represents a snapshot of minerals extraction – at any one time a similar area is likely to be under active permissions. As

each site is worked, it must be restored to an end-use agreed with the relevant Mineral Planning Authority (MPA).

The winning of minerals therefore presents an opportunity for habitat creation on a very large scale. The RSPB has a vision of Futurescapes – large-scale habitat creation for wildlife and for people<sup>3</sup>. Mineral sites could offer an unprecedented opportunity to create Futurescapes, which is why the RSPB has been researching their potential nationally.

Past mineral extraction has resulted in the development of some good wildlife habitats, either through planned restoration or through being left to natural processes alone. Over 600 SSSIs have been designated in

former quarries, often for their geological interest exposed by the extraction process. In recent years, the mineral extraction industry has developed expertise and new techniques to create wildlife habitat on mineral sites. Our understanding of how to restore for biodiversity is better than ever before.

Potential for habitat creation should never outweigh the importance of retaining existing priority wildlife habitats. These should be fully safeguarded from direct extraction and indirect impacts.



## Habitat creation allows us to reverse historical losses of semi-natural habitats

LEFT: Nosterfield nature reserve, once a sand and gravel quarry. Alice Davies (RSPB)  
BELOW: Lapwing. Andy Hay (rspb-images.com)



# Restoration for wildlife benefits people

Restoring mineral sites to rich wildlife habitats improves the quality of peoples' lives in a variety of ways:

- **it can support and generate economic activity**

Jobs in the nature conservation sector, requiring skills such as countryside management, natural sciences, visitor services and environmental education, and those supported by the natural heritage, play a significant role in rural development. For example, the 1,000 jobs supported by the RSPB reserves in the UK are valuable as a direct source of jobs and for the seasonal and occupational diversity they bring to rural areas.

Employment on the RSPB's reserves averages 7.1 full time equivalent (FTE) jobs per 1,000 ha of productive land<sup>8</sup>.

The overall impact on economic activity for local economies is even larger given the spending of conservation workers and visitors alike that support further activity in

a range of economic sectors, like construction and hospitality. Managed wildlife habitat also offers a valuable increase in the variety of employment available, helping to diversify local economies and enhancing local and regional identity.

- **it can provide a valuable resource to sustain and enhance our health**

Physical inactivity is a major preventable health risk, affecting about 60% of the population and costing the UK economy more than £8 billion a year. It leads directly to chronic disease and lack of independence in the elderly.

Physical activities involving an environmental experience is a sustainable way to improve public health. During green exercise, like the 1.1 million visits to the RSPB reserves each year, physical exertion becomes an unnoticed secondary benefit from the enjoyable primary activity of being outdoors enjoying nature<sup>7</sup>.

New research is also showing how the proximity and quality of nature affects our psychological wellbeing. The World Health Organisation estimates that depression and depression-related illness will become the greatest source of ill-health by 2020<sup>10</sup>. Nature, through the role it plays in stimulating and encouraging physical activity, and through the direct impact it has on our emotional state, can help alleviate a range of psychological problems<sup>11</sup>.

This positive correlation between natural green space and physical and psychological wellbeing is, however, seldom reflected in health care policies, planning guidelines or economic strategies. By creating wildlife-rich habitat on mineral sites, local communities could be happier and healthier.

- **it offers educational opportunities**

Learning experiences in the real world, such as visits to nature reserves, add significantly to a child's education. A quality outdoor

**Restoration of mineral sites for wildlife can benefit local economies, public health and education**

**In the UK, uses of wild biodiversity directly support over 35,000 full-time equivalent (FTE) jobs and contribute over £4.8 billion to GDP<sup>9</sup>.**

David Levenson (rspb-images.com)



educational experience delivers benefits including greater depth of understanding and improved learning across all curriculum subjects, and a more powerful grasp of environmental issues<sup>12</sup>.

Contact with nature is also associated with:

- improved children’s behaviour and self-discipline
- enhanced emotional development in school children
- reduced crime and aggression, and improved community integration<sup>7</sup>
- increased physical activity, which improves schoolwork and cognitive functioning.

Direct contact with nature fascinates children, and rich wildlife habitats provide an array of opportunities and activities for 'real world' learning that can play a role in combating the likelihood of future generations becoming inactive, obese adults.

- **and it can contribute to the regeneration of sustainable communities**

Wherever communities need regenerating, biodiversity and natural green space can make a real difference to the quality of both urban and rural living. Wildlife rich habitat can act as a vehicle for landscape-scale environmental enhancement; as a symbol of an attractive location; as a focal point for accessing and enjoying natural green space; and as a catalyst for better health. The restoration of mineral sites provides a great opportunity to improve landscapes and help a location portray a positive image – an attractive place for people to live and work.



The stunning landscape created at Old Moor.

Andy Hay (rspb-images.com)

### Case Study: Old Moor

Old Moor is located in the Dearne Valley, just south east of Barnsley. It is a wonderful example of how habitat creation in a post-industrial landscape can bring substantial social and economic benefits to a local community.

This RSPB reserve attracts in excess of 65,000 visitors per year, mostly from the local area, and employs 24 members of staff. Facilities include a visitor centre with shop as well as a restaurant and conference meeting rooms which are regularly used by local businesses and community groups. A local sourcing policy increases the long-term viability of other business in the area. For example, a local company that sources local sustainable timber supplies wood chips that are produced to specification for the boiler at the reserve. The wood chips are stored and delivered by a local farmer.

Over 10,000 people participate annually in the events and outreach programme thanks to the support of the Heritage Lottery Fund, Yorkshire Forward, WREN and many others. This includes 4,000 school children from 80 different schools that visit Old Moor as part of the Living Classrooms programme. The children get a chance to be outside in green space, and to learn and play games built around wildlife and the natural world. The reserve is also enjoyed by a number of local walking and health groups.

Enjoying the view at the Gannet Café.

Andy Hay (rspb-images.com)



# The UK Biodiversity Action Plan

In 1992, the UK Government, together with over 150 other countries, signed The Convention on Biological Diversity (CBD) at the 'Earth Summit' in Rio de Janeiro. This was one of several initiatives that together form an International Agreement on Sustainable Development, Agenda 21.

As part of its response to the CBD the UK Government published *Biodiversity: The UK Action Plan* in 1994. This sets out the broad strategy for conserving and enhancing wild species and wildlife habitats in the UK. It also initiated the production of detailed action plans (between 1995 and 1999) to guide the work needed to conserve the individual habitats and species most in need of conservation in the UK.

The original UK Habitat Action Plans contained targets for the maintenance, restoration and, in many cases, expansion of the priority habitat. Expansion of existing habitat extent is important in order

to start to redress historical habitat loss, create more habitat for priority species and help wildlife withstand pressures and challenges. Some of these targets have expired, a few have been met and all terrestrial habitat targets have now been revised. The revised habitat targets for England were published in November 2006 as part of the update of the England Biodiversity Strategy<sup>4</sup> (see table 1).

Habitat creation on mineral sites offers the minerals industry, working together with planners and conservation organisations, an opportunity to contribute to the UK Biodiversity Action Plan (UK BAP) targets.

## Planning policy context

Minerals planning in England is supported by:

- Planning Policy Statements (PPSs) – formerly Planning Policy Guidance Notes (PPGs)

- Mineral Planning Statements (MPSs) – formerly Mineral Planning Guidance Notes (MPGs).

Their content guides Mineral Planning Authorities on the writing of Minerals and Waste Development Frameworks (M&WDFs), which set local policy to regulate the extraction of minerals.

Advice on restoration and aftercare of mineral sites is contained in *Mineral Planning Guidance 7: Reclamation of Mineral Workings*<sup>5</sup> (MPG7), published in 1996. This recommends only three types of restoration: agriculture, forestry and amenity. During the post-war period, most restoration was to agricultural land, and this remains the dominant end-use today (over 50% of mineral sites include agriculture as an end-use). Forestry is an infrequent end-use with less than 5% of sites including this as an end-use. Amenity has gradually become a more common end-use, and nature conservation has fallen within this category, often as a small and untargeted part of wider amenity use.

*Planning Policy Statement 9: Biodiversity and Geological Conservation* published in 2005 gives strong support to biodiversity at every level of the planning system. It encourages planners to enhance biodiversity, including the 'restoration or creation of new priority habitats'<sup>6</sup>. Minerals sites present a good opportunity for local authorities to achieve this, and to contribute to local and UK BAP targets.

**Table 1**  
**UK BAP Habitat Expansion Targets for England by 2015**

Habitat	Current extent (ha)	Expansion target (ha)	% of existing habitat
Lowland dry acid grassland	20,142	276	1.4
Native woodland	535,000	53,000	10
Wood pasture and parkland	6,000	120	2
Lowland calcareous grassland	38,687	8,426	22
Lowland heathland	58,000	7,600	13
Purple moor grass and rush pasture	21,544	151	0.7
Wet reedbeds	5,200	1,900	36.5
Coastal and floodplain grazing marsh	170,000	1,250	0.7
Saline lagoons	1,205	100	8
Lowland meadows	7,282	256	2.5
Upland hay meadows	870	72	8

**The UK BAP is the Government's commitment to biodiversity and mineral sites offer an opportunity to contribute on a large scale**



## A vision for the future

Nature conservation is becoming a more common feature of mineral site restoration. Thanks to increasing enthusiasm and commitment within the minerals industry and planning authorities, there are now several excellent examples of large-scale priority habitat creation that go far beyond the amenity ponds and tree-planting that were typical of the past. However, whilst demonstrating the potential, they remain only a small fraction of what could be achieved.

The RSPB has a vision for minerals planning that sees many more sites with habitat creation as an end-use, with these sites at the core of wider landscape scale conservation projects.

These would contribute substantially to the UK Biodiversity Action Plan, as this report will show. In doing so, associated species would gain sufficient habitat to adapt to challenges such as climate change. Populations of our most vulnerable plants and animals would therefore be more secure. Communities would also benefit – with large natural spaces offering people places in which to walk, relax and enjoy time away from the pace of everyday life<sup>7</sup>.

The enthusiasm and expertise already exists to achieve this vision. If central government, local authorities, mineral operators and nature conservation organisations work together, it can happen.



Paxton Pits nature reserve, Cambridgeshire.

Ray Matthews

### Case study: Paxton Pits

Paxton Pits is located west of Cambridge in the valley of the River Great Ouse. Largely through community advocacy and support, part of the gravel pit complex was designated as a Local Nature Reserve in 1988 and has since been managed for its wildlife interest by Huntingdonshire District Council. The reserve provides valuable greenspace (78 ha) in an area under increasing development pressure. Extremely popular among local people, the Reserve has also become a regional attraction, with over 120,000 visitors a year. The Friends of Paxton Pits nature reserve supports all aspects of the reserve through volunteer involvement. Founded in 1995, the group now has over 1860 members and is campaigning for an enlarged nature reserve that would follow Aggregate Industries' (AI) proposed extraction of the remaining gravel reserves at the site.

While this approval would be a major departure from the County's Development Plan, permission will be granted providing AI can meet conditions which include the 'exceptional community benefit' provided by an enlarged nature reserve. The local community is closely involved with developing the plans (through The Friends), and has demonstrated its support for the proposals as the MPA received 326 letters in support of the scheme and only three objections. If approved, the nature reserve will extend to 285 hectares with the creation of new areas of reedbed, scrub, wet grassland and wet woodland.

#### Family pond-dipping at Paxton Pits.

Jim Stevenson



#### Otter at Paxton Pits.

Howard Birley



**Our vision is for large-scale mosaics of appropriately sited, priority BAP habitats created on mineral sites**

# What contribution can mineral sites make to the UK BAP?

In 2005, there were around 1,300 active mineral sites in England, covering over 64,000 ha. Of these, only 173 sites are not suitable for any priority habitat creation. The remaining 55,794 ha has the potential to support one or more of 17 priority BAP habitats (see maps).

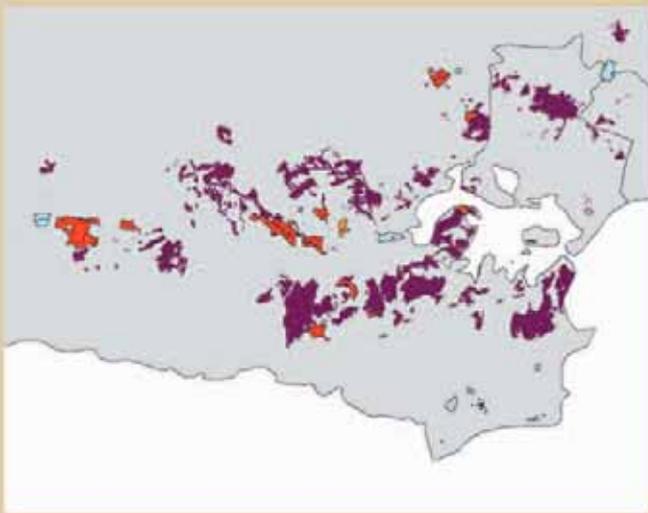
The potential to create priority habitat on each of the 1,300 active sites in England has been investigated using a model developed in a Geographical Information System (GIS) (see methodology). This process has identified all sites where each of

17 priority BAP habitats can be created according to geological, soil and hydrological conditions, and then prioritised this depending on proximity to existing fragments of the same habitat. Restoring sites adjacent to existing fragments of semi-natural habitats is the highest priority, because this offers the potential to expand and buffer the existing fragment, and potentially link more than one fragment together.

The potential areas of each priority habitat that could be created from mineral sites across England are huge (see table 2). For example,

over 50,000 ha of native woodland or almost 25,000 ha of lowland meadow are possible. Comparing these areas to the BAP habitat creation targets (for England by 2015) shows that the size of the contribution habitat creation on mineral sites could make is remarkable (see table 3).

Focussing efforts on 412 mineral sites within 1km of nine priority habitat types would see existing UK BAP habitat creation targets met, and significant progress made towards targets for native woodland and lowland calcareous grassland.



**Map 1**  
Existing lowland heathland patches in Dorset (from the RSPB's Heathland extent and potential project), alongside minerals sites where lowland heathland can potentially be created, and their relative priority.

- Key**
- Highest priority sites for lowland heathland creation – adjacent to existing habitat
  - High priority sites for lowland heathland creation – within 1 km of existing habitat
  - Mineral sites not suitable for lowland heathland creation
  - Existing fragments of lowland heathland

**Map 2**  
All mineral sites in England where one or more BAP habitats can be created.





**Mineral sites can make a substantial contribution to UK BAP targets**



**FROM TOP TO BOTTOM:  
Lowland heathland and  
natterjack toad.**

Andy Hay (rspb-images.com)

**Perfoliate penny-cress.** Peter Creed

**Table 2**

**Areas of habitat that could be created on minerals sites: total area; sites within 1 km; sites adjacent to existing habitat.**

Note: certain sites may be suitable for more than one habitat, so there will be some overlap. Native woodlands are considered together in the latest BAP revision – combining four previous habitat types.

Priority habitats	Potential area that could be created (ha)		
	Total	Within 1 km of existing habitat	Adjacent to existing habitat
Lowland dry acid grassland	9,326	5,607	2,477
Native woodland - combined	50,154	9,749	3,425
<i>Lowland beech and yew woodland</i>	10,320	1,332	327
<i>Upland mixed ashwoods</i>	2,319	228	217
<i>Upland oakwood</i>	17,583	2,206	334
<i>Wet woodland</i>	19,932	5,983	2,547
Lowland wood-pasture and parkland	10,494	3,791	1,183
Lowland calcareous grassland	3,697	2,105	1,033
Upland calcareous grassland	394	374	169
Lowland heathland	13,635	10,912	9,060
Upland heathland	2,613	1,944	1,564
Purple moor grass and rush pastures	11,337	1,587	213
Wet reedbeds	8,311	3,474	1,847
Coastal and floodplain grazing marsh	11,284	8,471	5,767
Saline lagoons	716	134	32
Lowland meadows	24,784	4,890	834
Upland hay meadows	1,222	183	0
Coastal vegetated shingle	260	194	194

**Table 3**

**Proportion of BAP habitat creation targets for England by 2015 that could be met by sites where existing habitat is within 1 km, or adjacent to site.**

Note: certain sites may be suitable for more than one habitat, so there will be some overlap.

Priority habitats	BAP target (ha)	Proportion (%) of BAP target met by	
		Mineral sites within 1 km of existing habitat	Mineral sites adjacent to existing habitat
Lowland dry acid grassland	276	>100	>100
Native woodland	53,000	18	6
Lowland wood-pasture and parkland	120	>100	>100
Lowland calcareous grassland	8,426	25	12
Lowland heathland	7,600	>100	>100
Purple moor grass and rush pastures	151	>100	>100
Wet reedbeds	1,715	>100	>100
Coastal and floodplain grazing marsh	1,250	>100	>100
Saline lagoons	100	>100	32
Lowland meadows	256	>100	>100
Upland hay meadows	72	>100	0

# What is the current contribution?

Most active sites have an agreed end-use set in place. At present these are supporting the creation of only a fraction of the habitat extent that is possible. Details of the current end-use plans for each of the 1,300 sites collected from MPA allow comparison of what is possible with what is being achieved (see methodology).

The current contribution that mineral site end-use plans make to BAP targets is far below the potential contribution identified in this report for all but one of the priority BAP habitats identified (see table 4). There is therefore a substantial gap between what is possible, and what is being achieved (see figure 1).

Even the highest priority sites, those adjacent to existing semi-natural

habitat, are usually due to be restored to an alternative end-use (see table 5). These unique opportunities to buffer our remaining semi-natural habitat are being lost under the current system and should be re-examined in light of this report's findings.

## What end-uses are taking preference?

Agriculture is currently by far the most common end-use of mineral sites. Over 600 sites include agriculture as part (usually all) of their end-use. Forestry is relatively rare as an end-use, included on only 57 sites. Amenity is the third end-use recommended in *Minerals Planning Guidance 7*, and covers a broad range of options. Water sports, golf courses, fishing lakes and many other forms of recreation, are common.

Nature conservation is also considered an amenity end-use, and features in many end-use plans. However, nature conservation is taken to mean everything from a wildlife pond, hedgerow or small patch of woodland to large mosaics of priority BAP habitats such as wet grassland, wet woodland, reedbed and open water. We have shown that most opportunities to create large-scale priority habitats that contribute to BAP targets and provide real natural areas for people are being missed.

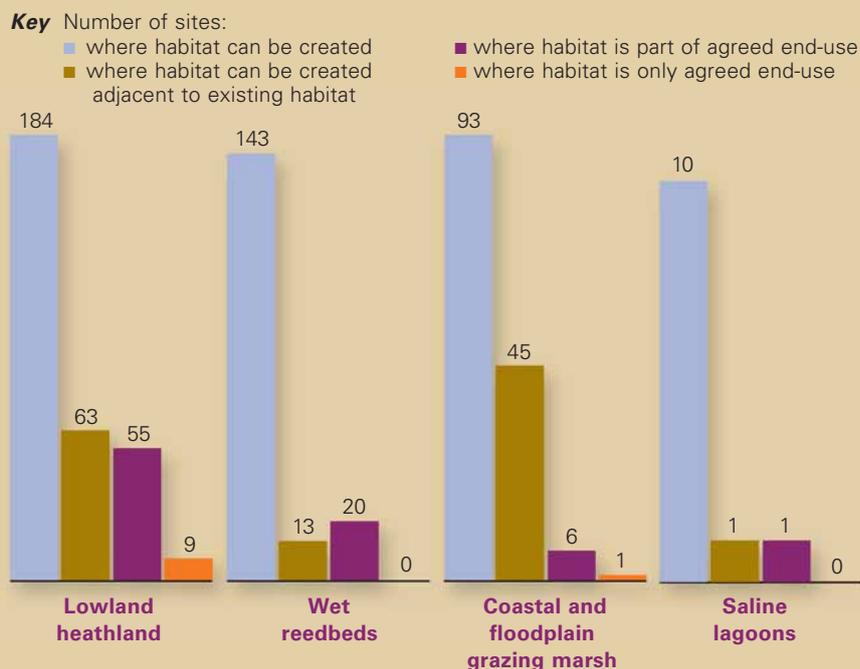
**The opportunity to make substantial contributions to UK BAP targets is not being achieved under current end-use plans**

**Reed bunting.**

David Kjaer (rspb-images.com)



**Figure 1**  
The shortfall between the number of sites where habitat could be created and where it forms part, or all, of the current end-use plan.



**Table 4**

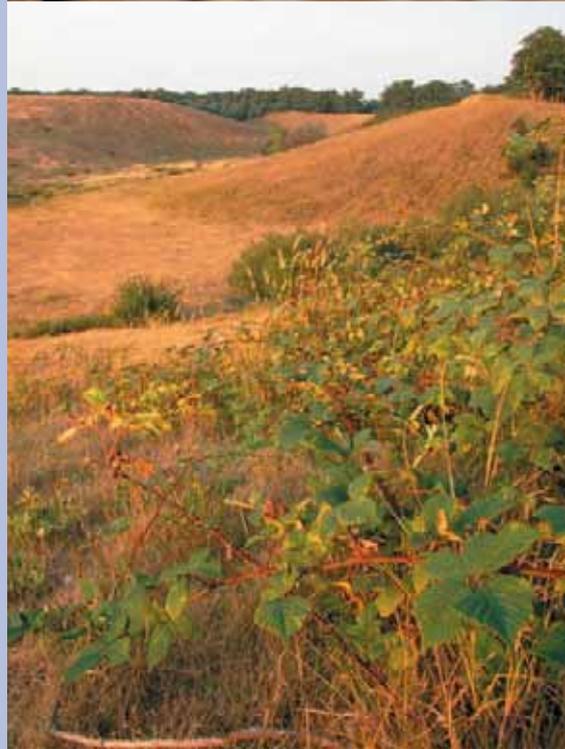
**The proportion of UK BAP targets that could be met by habitat creation on minerals sites and the proportion actually met by existing end-use plans where this is the only end-use.** Note: information from restoration plans is not specific enough to compare directly to priority BAP habitats in all cases. For example, lowland wood-pasture and parkland can only be compared to 'nature conservation woodland' and lowland meadows are compared to 'semi-natural grassland'. Where more than one end-use is recorded for a site, the area of each individual end-use could not be collated, and so these sites cannot be included here.

Priority Habitats	BAP target (ha)	Potential contribution to BAP target (%)	Current measurable contribution to BAP target (%)
Lowland dry acid grassland	276	>100	>100
Native woodland	53,000	95	0
Lowland wood-pasture and parkland	120	>100	67
Lowland calcareous grassland	8,426	44	2
Lowland heathland	7,600	>100	4
Purple moor grass and rush pastures	151	>100	0
Wet reedbeds	1,715	>100	0
Coastal and floodplain grazing marsh	1,250	>100	6
Saline lagoons	100	>100	0
Lowland meadows	256	>100	16
Upland hay meadows	72	>100	0

**Table 5**

**Numbers of sites adjacent to existing habitat for each habitat type, and of these, the number for which the same (or similar, see above) habitat is part or all of the agreed end-use plans.**

Priority Habitats	No. of sites where habitat can be created adjacent to existing fragment	No. of these sites where habitat is part of agreed end-use	No. of these sites where habitat is only agreed end-use
Lowland dry acid grassland	60	0	0
Native woodland	36	9	2
Lowland wood-pasture and parkland	24	3	0
Lowland calcareous grassland	24	5	2
Upland calcareous grassland	3	0	0
Lowland heathland	63	33	6
Upland heathland	50	14	10
Purple moor grass and rush pastures	1	0	0
Wet reedbeds	13	3	0
Coastal and floodplain grazing marsh	45	4	0
Saline lagoons	1	0	0
Lowland meadows	10	3	1
Upland hay meadows	0	0	0
Open water	57	20	3



FROM TOP TO BOTTOM:  
**Heath tiger beetle and  
 Sandy Heath Quarry.**

AndyHay (rsps-images.com)

**Active workings at Lydd quarry.**

David Kjaer (rsps-images.com)



## Why isn't this potential being met?

Although some fantastic habitat creation schemes are taking place on mineral sites this is far from widespread. There is, therefore, a real need to share experience and expertise and to disseminate best practice. The need for such an approach has been highlighted in stakeholder feedback during seminars held as part of the RSPB Minerals Restoration Potential (MRP) project. Communication between all involved in mineral site restoration needs to improve in order to increase benefits for nature and local communities.

The specific factors preventing habitat creation will vary regionally, and even from site to site. However, some factors are relevant on a national scale, and these were investigated in a survey carried out as part of the RSPB MRP project. The responses of over 140 mineral planners, operating companies and nature conservation organisations highlighted blocks

preventing habitat creation on mineral sites at a national scale.

Nature conservation is 'almost always' considered when deciding the end-use for a minerals site by 70% of respondents (n=73). However, this consideration is not being translated into habitats that would maximise benefits for wildlife. Techniques for habitat creation on mineral sites have developed in recent years, and all kinds of habitats can now be created. However, there remains a gap in understanding about the scope of possibilities in nature conservation. Although small scale features such as hedges and ponds have a value, it is the restoration of priority UK BAP habitats that will make the biggest difference both to national targets and to the enhancement of local communities.

Four main issues emerged from the survey as the most likely reasons acting to prevent nature conservation



**ABOVE: Bullfinch.**

Mark Hamblin (rspb-images.com)

**RIGHT: Minerals planners, industry and nature conservation representatives working together at a stakeholder seminar as part of the Minerals Restoration Potential project.**

Alice Davies (RSPB)



from being a more common end-use of mineral sites. Mineral planners, operating companies and nature conservation organisations all highlighted the same factors:

- **Lack of support from the landowner** (24%, n=30)

The proportion of sites worked whilst leased from a landowner varies between mineral planning authorities. Where this is the case, however, the landowner exerts a very strong degree of influence in deciding the end-use of a site (landowners are the most influential factor in deciding an end-use for 25% of planners and 21% of operators). Showing how habitat creation can provide an income through a variety of funding sources, and the public benefit of doing so, may help overcome this reticence.

- **Inadequate financial return from a conservation end-use** (18%, n=22)

and,

- **Difficulty in securing long-term conservation management of the site** (12%, n=15)

Nature conservation is not perceived to produce a direct income in the way that other end-uses such as agriculture or formal recreation do, and this may well influence landowners' limited support for nature conservation. However, in many cases habitat creation is less expensive than restoration to agriculture, for example, as in many cases it requires less land-forming and other inputs.

Securing long-term conservation management is dependent on the security of long-term funding. However, costs of long-term management can be met through a variety of means, including agri-environment payments or funding secured by an operator, and there is a strong economic case for doing so.

- **Proximity to airfield (threat of bird strike)** (10% n=13)

All new mineral extraction proposals within 13 km of an active airfield must take the potential risk of bird strike to aircraft into account when deciding an end-use. This is for good reason; birds can cause serious damage to aircraft if they collide.

Decisions on what constitutes an acceptable end-use will ultimately be made by the MPA, following consultation with the appropriate aerodrome. The particular risks associated with an extraction proposal and its afteruse will be assessed on a case-by-case basis. However, in many instances, BAP habitats which do not attract birds likely to present a bird strike risk can provide ideal solutions.



**Financial concerns and the threat of bird strike to aircraft seem to be the strongest factors preventing habitat creation on mineral sites**

**College Lake Wildlife Centre,  
Buckinghamshire.**

Jim Asher (BBOWT)

## How do we achieve this vision?

The minerals industry is already making some contribution to UK BAP habitat creation targets, but, as this report shows, the potential contribution is enormous.

Our vision is for large-scale mosaics of appropriately sited, priority BAP habitats. These would make space for wildlife, allowing populations of plants and animals to expand and

become robust in the face of challenges. The same areas would provide natural space important for people to relax and enjoy time away from the intensity of modern life. They would contribute hugely to the UK BAP habitat creation targets, and benefit public health and local economies. The enthusiasm and expertise to create high-quality priority BAP habitat of this kind

already exists, as these case studies show. However, change is needed and we believe the following recommendations will help make this vision real:



### Case study: Needingworth

Needingworth quarry covers 975 ha of land in Cambridgeshire, making it one of the largest sand and gravel extraction sites in the UK. The restoration proposed in the original planning application submitted in 1994 was almost entirely for restoration to arable agriculture, based on a presumption that the land was of high agricultural quality (Grade 3a). However, Needingworth is now set to be a nature reserve, of which 460 ha is to become reedbed; enough to meet 40% of the UK BAP target for that habitat.

Change began when the Ministry of Agriculture Fisheries and Food (MAFF) surveyed the site and found that the soil was a lower quality than previously anticipated. At the same time, during the consultation stage, the RSPB, Cambridgeshire Wildlife Trust and the Wildfowl and Wetlands Trust highlighted the opportunity to create a wetland of national and arguably international importance at the site. ARC (now Hanson) committed to undertake a feasibility study for the proposed wetland restoration as part of a Section 106 agreement. Public meetings and consultation helped generate overwhelming support for the project. The public were given the opportunity to put forward their views and ideas on the restoration proposals and to influence modifications to the final plan. With 32 km of public access footpaths and cycle paths within the site, Needingworth will become a major asset for the local community.

Following the feasibility study and public engagement, a decision was taken to change the restoration plans, and a new planning application was approved by Cambridgeshire County Council in 1999. This project received the Royal Town Planning Institute Award for Planning Achievement in 2000, and was nominated for the 2002 European Planning Awards. The site is being progressively restored by Hanson and passed to the RSPB for long-term management.

**TOP: The site before extraction.** Norman Sills (RSPB)

**MIDDLE: The same view following extraction and in the early stages of restoration.** Sophie Leadsom (RSPB)

**BOTTOM: The developing reedbeds fenced to protect grazing by wildfowl.** Alice Davies (RSPB)

## Securing long-term management

There is a strong economic case for habitat creation as an end-use of mineral sites. Firstly, it can be less costly to restore to a priority habitat than to some other end-uses. It also offers a cost-effective means of contributing to the UK BAP, since the land is already disturbed and must be restored to some form of land-use by the operating company.

Secondly, whilst some nature conservation may not return a direct income, there are wider economic reasons, including public health and quality of life, that mean securing funding to ensure habitat creation as an end-use and its long-term management make good sense.

There are a number of options available to support long-term management of habitat created on minerals sites:

- continued financial support from the operating company
- Landfill Tax Credits Scheme
- Aggregates Levy Sustainability Fund
- Local Authority funding streams
- Environmental Stewardship agri-environment support.

Of these, financial support from operating companies is most commonly practiced. This can be secured as a planning obligation at the application stage (as a Section 106 Agreement), or through management agreements. Local policy outlining how to secure such commitment has been put in place in Oxfordshire (see case study), successfully facilitating funds and encouraging nature conservation as an end-use of mineral sites. This model should be adopted by Mineral Planning Authorities across England.

Aggregates Levy Sustainability Funds, Landfill Tax Credits Scheme and Environmental Stewardship agri-environment support are currently not widely used as sources of funding. Their use in funding ongoing habitat management should, however, be encouraged through a revised minerals planning statement, updating advice in the current *Mineral Planning Guidance 7*.

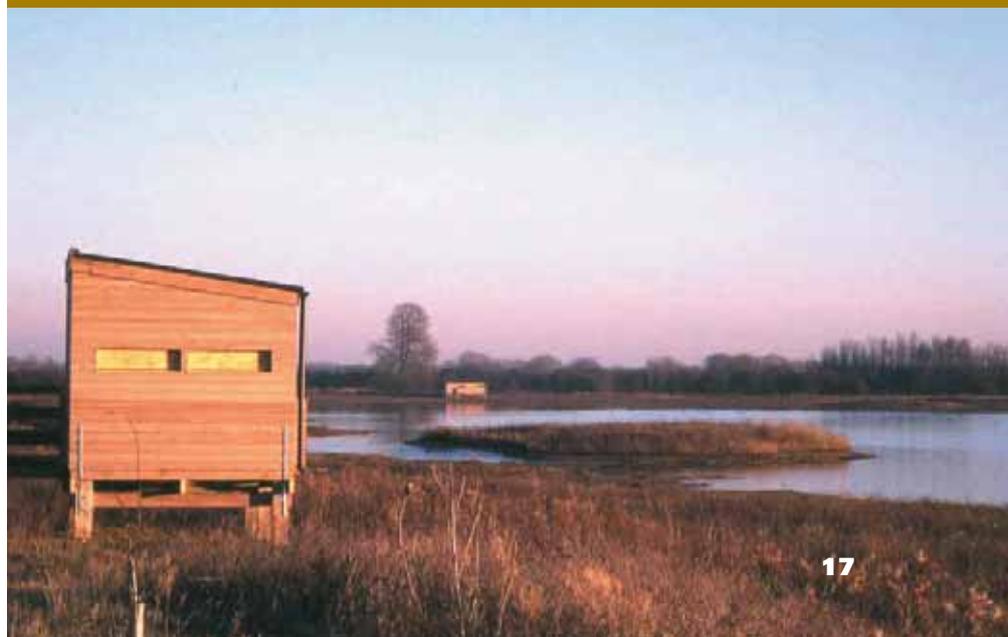
By securing long-term conservation management of sites, and increasing the financial return from a nature conservation end-use through financial provision, habitat creation will become a more appealing end-use to both mineral planning authorities and landowners.

### Case study: Financing long-term management of sites in Oxfordshire

Oxfordshire County Council have an innovative means of ensuring enduring long-term financial provision to secure the conservation management of mineral sites. The Minerals Local Plan includes policies that define how operators should provide long-term funding as a prerequisite to receiving planning permission.

Two sites within the Lower Windrush Valley Project area, near Witney, illustrate how this works. At Standlake Common, managed by SITA, a percentage levy per tonne of extracted mineral has been ring-fenced for management of the site. At Rushey Common, Smiths of Bletchendon have agreed a detailed plan with the authority to ensure direct management of the site over 20 years. In both cases, this has allowed the creation of mosaics of wetland and grassland habitats with the security of guaranteed management into the future.

**Standlake Common nature reserve.** Alison Hopewell



## Bird strike: a risk assessment based approach

Restoration plans for mineral sites within safeguarding zones around airfields will be scrutinised for their potential to increase the risk of bird-strike to aircraft. 54% of active sand and gravel workings occur within safeguarding zones<sup>13</sup>, and extracting minerals in river floodplains inevitably leads to wet restoration of some description.

The assessment of risk of bird strike brought by a new extraction should not be regarded as a block to habitat creation, rather it should

enable end-uses that don't add to the background risk. The creation of predominantly dry, or even wet (eg reedbed) habitats of high biodiversity value, should, if planned well, not increase the risk to aircraft.

The current risk elimination approach of some safeguarding authorities means opportunities to create high quality habitat, without increasing bird-strike risk, are being missed unnecessarily. A case by case assessment of risk, and early dialogue between stakeholders, can enable creative solutions to be agreed, and should be adopted across the country (see case study).

## Ensuring planning policy support

Habitat creation on mineral sites should be supported at all levels of the planning system. *Planning Policy Statement 9: Biodiversity and Geological Conservation* (PPG9) and accompanying guidance encourages the enhancement of biodiversity, including the 'restoration or creation of new priority habitats'<sup>16</sup> through Regional Spatial Strategies (RSSs) and Local Development Frameworks (LDFs).

Local authorities are advised in PPG9 to 'identify any areas or sites for the restoration or creation of new



## Case study: Reducing bird strike risk in Surrey

The skies above Surrey are extremely busy with commercial air traffic with two of the world's busiest airports (Heathrow and Gatwick) and several other significant airfields nearby. Here, the Mineral Planning Authority, Surrey County Council, has developed a close relationship with BAA, consulting them on all planning applications for mineral sites after-use as conflicts of interest can arise, particularly regarding the risk of bird-strike. However, these can be resolved to a positive outcome, by assessing restoration plans on a case-by-case basis.

As an aerodrome operator, BAA has a statutory responsibility to ensure that their aerodromes and surrounding airspace are safe at all times for use by aircraft. However this does not preclude the creation of suitable priority BAP habitats which will not attract birds likely to present a bird strike risk. Priority BAP habitats can be created which do not attract large or flocking birds and an early dialogue, such as that between Surrey County Council and BAA, can provide results which are acceptable to both parties.

LEFT: **Reedbed.** Andy Hay (rspsb-images.com)

BELOW: **Aircraft taking off.** instockphoto.com

**Securing long-term management, managing the risks of bird strike and better planning policy support will help us achieve our vision**



priority habitats which contribute to regional targets' in their LDFs. Mineral sites provide an opportunity to identify areas for priority habitat creation, and policies to support creation and management of priority habitats on these sites can be set out in the LDF.

Minerals and Waste Development Frameworks (M&WDFs) are the strategic mineral planning documents replacing Minerals Local Plans. They provide an opportunity to identify and secure appropriate habitat creation on mineral sites at the proposed allocations stage. The earlier in the planning process that habitat creation potential of a site is

agreed, the easier it is to implement it successfully and secure its long-term management. Both the M&WDF and LDF offer the potential to integrate habitat creation on mineral sites into landscape-scale habitat restoration projects, like those envisaged by the RSPB in Futurescapes<sup>3</sup>.

*Mineral Planning Guidance 7: Reclamation of Mineral Workings* (MPG7) was published in 1996. Knowledge, techniques and demands for different land-uses have changed, and much of the document is no longer fit for purpose. By updating the definition of nature conservation to include

large-scale priority BAP habitat creation, recognising the potential contribution to targets and formally linking mineral sites as a means of delivering them, the revised minerals policy statement could go a long way in providing support to our vision.



### Case Study: The Swale and Ure Washlands Project

The floodplains of the rivers Swale and Ure contain vast quantities of sands, gravels and clays laid down by receding ice-sheets during the last Ice Age. This mineral resource has been quarried since before records began, and numerous active quarries dot the landscape today. Historically this area supported a diverse wetland environment – as evidenced by the extensive damp grasses, sedges and reeds found in paleo-archaeological records as a distinctive component of its intrinsically rich landscape. The Swale and Ure Washlands project takes a visionary approach to using the restoration of mineral sites in the area to recreate some of this lost landscape.

At the heart of delivering this vision is the Minerals Site After-Use Strategy. This document is designed to support the production of the North Yorkshire Minerals and Waste Development Framework, by being adopted as a Supplementary Planning Document. The strategy describes how sites within the area can be restored to maximise benefits for biodiversity and people. By combining the support of operating companies, statutory bodies and the mineral planning authority a very real opportunity to create a wonderful landscape that integrates communities and wildlife is being realised.

**TOP: Nosterfield Quarry, Tarmac.**  
Alice Davies (RSPB)  
**RIGHT: Nosterfield nature reserve.**  
Alice Davies (RSPB)





## Conclusions

Habitat creation as an end-use of mineral sites:

- can achieve so much more for biodiversity – making a substantial contribution to BAP habitat creation targets
- is an opportunity to give back something to local communities – a natural space filled with wildlife, enhancing mental and physical well being and improving quality of life
- can make economic sense – benefiting local economies, public health and as a cost-effective means of contributing to the UK BAP.

The RSPB vision is of targeted large-scale habitat creation on many more minerals sites, benefiting wildlife and people. This report has identified some recommendations that will help to achieve this vision, and these are set out below:

## Recommendations

- 1 Securing funding for long-term management will unlock many more opportunities by making nature conservation a more attractive option to landowners. Guidance must be provided to facilitate this through local planning policies (including for minerals) and a revised MPS on reclamation of sites.
- 2 Regional and local planning policies and site allocations should support habitat creation on mineral sites.
- 3 *Minerals planning guidance 7: Reclamation of mineral workings* is no longer fit for purpose and must be reviewed by DCLG in the next two years, with full stakeholder engagement.
- 4 Appropriate habitat creation can be a solution to the identified problem of bird-strike. A risk assessment approach must be taken by safeguarding authorities and Mineral Planning Authorities.

FROM TOP TO BOTTOM:

**Old Moor nature reserve.** Andy Hay (rspb-images.com)

**New habitat offers communities an opportunity for recreation.**

David Levenson (rspb-images.com)

**Stone curlew.** Chris Knights (rspb-images.com)

# Background

The Minerals Restoration Potential project began in January 2005 with funding through the Minerals Industry Research Organisation (MIRO) as part of the Department for Communities and Local Government's (DCLG) Sustainable Land-Won and Marine-Dredged Aggregate Minerals Programme. The project set out to understand the contribution the minerals industry could make to UK BAP habitat creation targets, and to begin to address delivery of this potential contribution. Two outputs will be produced before the project ends in March 2007, the first of which is this advocacy report. The second output will be the interactive website 'After Minerals', launched in late February 2007 and aimed primarily at mineral planners, operating companies and nature conservation organisations. This will allow access to information on each of the 1300 active mineral sites in England, showing the habitat(s) that can be created there, advice on creating them, and case studies of real-life restorations.

## Methodology

The results presented in this report originate from two areas of work within the Minerals Restoration Potential project: the GIS modelling of habitat potential, and a survey of mineral planners, operating companies and nature conservation organisations.

## The GIS model

A GIS database of the 1300 active mineral sites (defined as those where working is actively taking place) in England was created by collecting data from 98 Mineral Planning Authorities during 2005. This information on extent of active planning permission, end-use of the site and whether extraction intercepted the water table, supplemented data licensed from the British Geological Survey (BGS).

Four other sets of data were used in the model:

- Soilscales data licensed from NSRI
- BAP habitat inventories downloaded from English Nature and the RSPB's Heathland Extent and Potential dataset
- Land-use within a 1 km buffer of each of the 1,300 sites: semi-natural habitat digitised from aerial photographs
- Joint Character Areas (JCA) downloaded from English Nature.

Habitat creation experts built up a matrix of ecological parameters defining conditions under which each of 17 priority BAP habitats would be physically possible. The model was built in ArcGIS 9.1 around this matrix of mineral type, soil type, hydrological conditions and broad bio-geographic zones (using JCAs). First, the model used the parameters to find sites where each habitat was physically possible. Some sites had the potential to support more than one priority BAP habitat type. There is therefore some overlap between the areas of habitat that can be created.

The model then went on to prioritise sites, based on proximity to existing patches of the same habitat, as shown below:

- Priority 1: mineral site adjacent to existing fragment of the semi-natural habitat
- Priority 2: mineral site within 1 km of existing fragment of the semi-natural habitat
- Priority 3: mineral site within 5 km of existing fragment of the semi-natural habitat
- Physically possible: mineral sites with suitable conditions within broad bio-geographic zone of the semi-natural habitat.

## The survey

The survey set out to investigate blocks preventing nature conservation from being a more common end-use of mineral sites. Structured phone interviews with a group of core stakeholders allowed investigation of some of the key areas preventing nature conservation. This information was used by the RSPB's Market Research team to create an unbiased questionnaire for each of three audience groups: mineral operating companies, mineral planners and nature conservation organisations and ecologists. The questionnaire was printed and sent out by post to over 400 contacts. A total of 143 responses were received – and the results of these were collated and analysed.

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