Opportunity Area mapping methodology

Aims

To define specific landscape scale areas where conservation action is likely to have the most benefit for biodiversity based on existing biodiversity interest and physical opportunities for enhancement.

Process

Several methodologies have been developed and implemented across the counties of the South East region to define areas of opportunity for biodiversity action. For those counties with very accurate and detailed habitat mapping, habitat suitability modelling has been developed and continue to be refined to identify opportunity areas (such as in Hampshire and Kent). For many of the counties this level of detailed habitat information is not yet available.

The following methodology is designed as a guidance document on how and where to draw the boundaries of opportunity areas. Each opportunity area will have its own characteristics, restraints and reasons for being, which will influence where to draw the line so the following should be used as a guide not a set of rules.

In considering where to draw the line on an opportunity area it is vital it is evidence based and to have access to countywide habitat data. The ideal situation would be to have GIS information for the whole county UKBAP habitats. Failing that county expert(s) that have a good understanding and knowledge of the location of the best areas for wildlife and natural habitats should be recruited to map out the best known areas.

Step-by-step

Concentrations of UKBAP habitat - much of the best areas of UKBAP habitat will already be within designated sites (SSSI, SPA, SAC, NNR, LWS etc), however, these site-based designations rarely take into account the landscape and connectivity or the potential of poorer quality areas that buffer these sites.

1. Use GIS to layer all the known UKBAP habitat resource and boundaries of existing designated sites to draw rough areas that link together obvious clusters of BAP habitat and designated sites which fall in obvious landscape areas e.g. lowland meadows in river valleys, wetland habitat complexes of eutrophic open water bodies, reedbeds, fens, swamps and wet woodlands or calcareous grassland and woodlands on steep chalk slopes etc.
2. For each area identified briefly note the BAP habitats and potential opportunity the selected area covers. (The things that characterise this landscape area).

3. These initial areas should primarily link landscape areas of similar character. Where available (and appropriate) the Landscape Descriptive Units (LDUs) could be used to draw this initial boundary. Where LDUs are not available best expert judgement is needed and further defined in steps 4- 6.

   The boundaries should encompass:
   - The main area of the BAP habitat that is typical of the landscape.
   - Land that is important for UKBAP and rare species that support their whole life cycle, such as where larval food plants grow, even if this is not BAP habitat.
   - the land between that links BAP habitat.
   - land which is important to buffer the habitat, which may be outside the area considered as part of the landscape.
   - land which has the potential for recreating the habitats typical of the landscape.

4. Therefore, the next step is to consider these UKBAP habitat (or designated site) clusters and whether the land around and between them can be used for the restoration or creation of UKBAP Habitat e.g. degraded BAP habitat, large scrub area, planted ancient woodland sites, seasonally inundated floodplain, suitable geology and slope etc. Not all the land around needs to be suitable restoration or matrix habitat, sometimes it is easier to look for land that is obviously not (urban, motorway, grade one arable) and exclude that. The direction and possible extent of habitat recreation or buffering is informed by further GIS layers:
   - UKBAP habitat inventories
   - Open space or Phase 1 habitat mapping - data that highlights potential opportunity such as non-BAP semi-natural habitats
   - Joint character areas (to be indicative only as often too large to be of use as a boundary area)
   - Aerial photographs
   - Topography
   - Soils (where available)
   - Hydrology (e.g. EA flood risk maps)
   - Expert knowledge capture

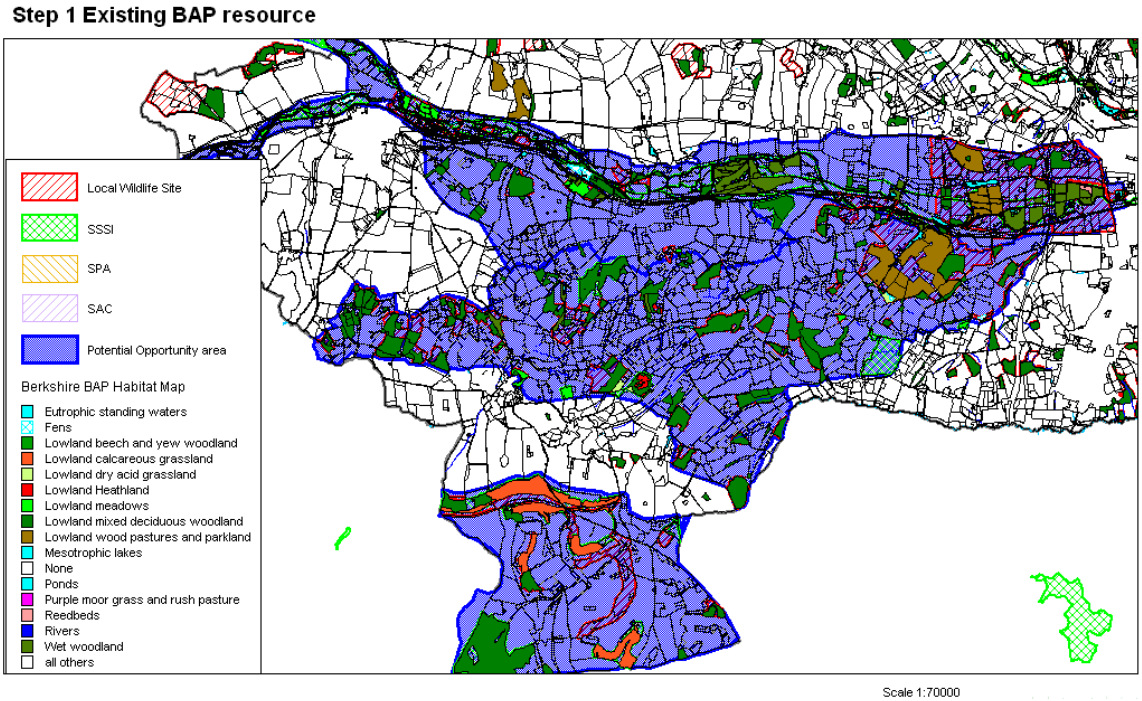

Figure 1. Step One to identify clusters of existing UKBAP habitat and designated sites

Potential for habitat restoration. Land with good potential to restore the main target habitats.

5. Underlay the landscape areas identified above with geology (bedrock, superficial and artificial if appropriate), topography (contours), hydrology (OS Landline or MasterMap water data), soil (if you have it) and floodplain maps.

6. The physiographic elements of the landscape in part dictate the natural features that occur there. The following are guidelines for broad landscapes.

Chalk and limestone landscapes

- For a chalk escapement include the land which is chalk grassland, is steep, is chalk and which, if adjacent to chalk grassland on the escarpment, can act as a buffer.
- Draw boundaries to field boundaries at the top and bottom escarpments wherever possible. This might mean some flatish land on the edge is included. If there is no suitable field boundary use the combination of slope and geology to decide the boundary.
- Narrow ridges between two valleys can be included if they have suitable geology for the restoration of habitats typical of the area.

See Figure 2, Inkpen and Warlbury Hills. The opportunity area boundary encompasses the steep chalk slopes of the escarpment and dipslope valleys and the chalk that lies on ridges between the valleys (the shallow clay valleys have been removed).

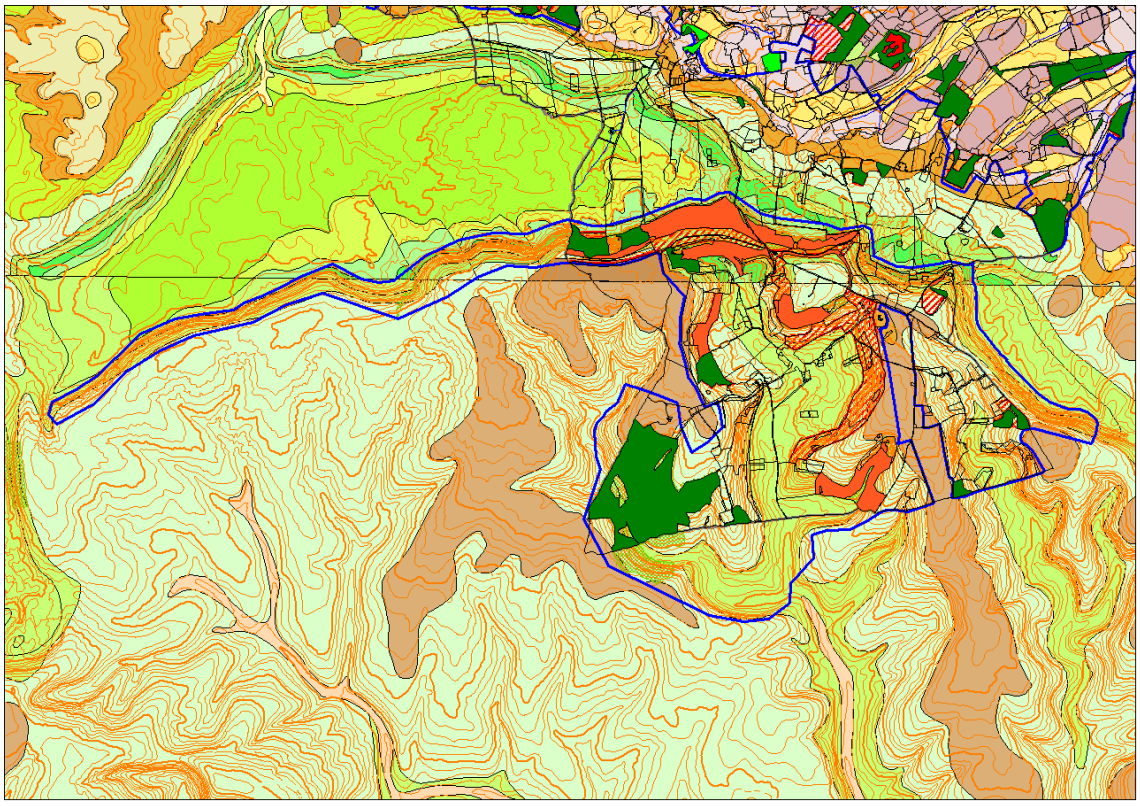

Figure 2. Geology (bedrock and superficial), topography and UKBAP habitat used to identify and select limits of an opportunity area; this opportunity area extends over the county boundary.

Heathland and acid plateaux

- For heathland include all suitable land with the right acidic geology (bedrock and superficial), acidic and low nutrient soils around the existing resource of heathland, acid grasslands, mires and possible PAWS or plantation that can be restored to heathland.

Riverine landscapes

- For river valleys include those areas with lowland meadows, wet grasslands, fens and reedbeds, gravel pits and adjacent areas that flood regularly, floodplain maps can be used to define the extent of possible restoration zone. This is an opportunity mapping exercise so also include areas proposed for mineral extraction.
- Exclude the higher drier edges of wider river valleys that rise gently from the river unless these support UKBAP priority habitat or might be subject to mineral extraction. Contour lines can be useful for drawing boundaries.
- Extensive sections of river valleys that support little or no BAP habitat should not be included even if they link target areas. Once the target areas are sorted out these areas can be considered.

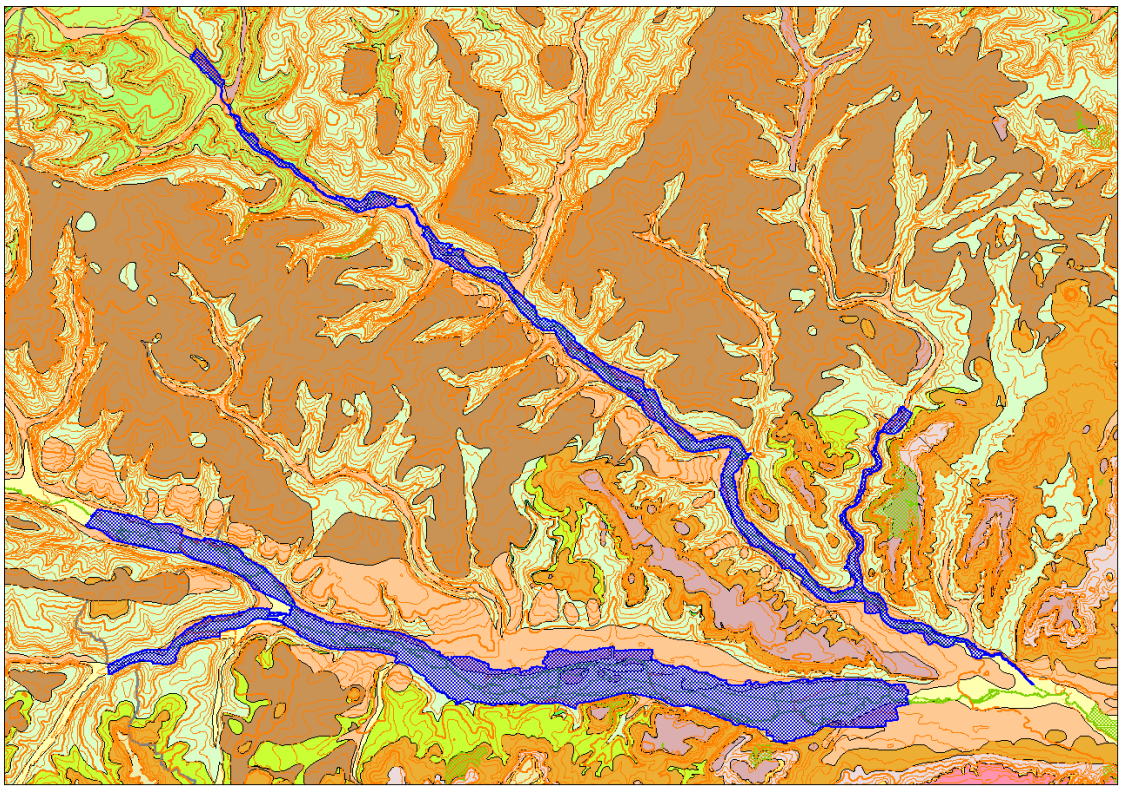

Figure 3. Extent of two river valleys, the Kennet and Lambourn. The steepness of the Lambourn valley limits the extent of the opportunity area, whereas the Kennet has a wider network of flood meadows and wet woodland habitat however large areas support little biodiversity so have been excluded.

Wooded landscapes

- For large woodlands or woodland complexes a 50-100 metre buffer is sensible. Usually there will be no suitable field boundary to follow.
- Separate areas of similar landscape split by another feature such as a river valley can be treated as a single target area.
- You probably should not create a target area around every cluster of small scattered woodlands (this does not mean that you are going to stop looking after your small woodlands). In Kent the opportunity map evidence data only included ancient woodlands over 5 hectares. You might like to highlight older, larger woodlands when looking for clusters and drawing target area boundaries. Woodland can also be useful to define target areas where other habitats are important but not extensive.

7. Exclude any areas that do not have the potential to be improved/enhanced including existing BAP habitats that are surrounded by land that is unlikely to be improved (e.g. large urban settlements, industrial sites, grade 1 agricultural land) or will act as a barrier to the habitats of importance in that area. For example, do not link two grassland slopes on either side of a river valley if that valley bottom has no biodiversity or potential to enhance or buffer the slopes. As a general rule, land greater than four field units apart

with no relevant biodiversity features, or potential to support biodiversity or form part of the functional connectivity of the landscape should not be included.

8. Sites of a non typical habitat in an adjacent landscape can be included. Therefore a marsh at the bottom of the slope can be included as long as it is essentially continuous or, if there is a gap, the land between is suitable for extending the marsh.
9. Potential also includes land under any agri-environment and woodland schemes and these should be incorporated into the appropriate opportunity area if the options will enhance the area for the principle habitat types.

Important areas for UKBAP, rare and scarce species.

10. The concentrations of UKBAP species should be used to primarily confirm the opportunity areas already identified as these will largely coincide with areas with concentrations of semi-natural habitat. County wide species surveys and incidental records should be used in preference to designated site surveys due to the obvious biases in the later.
11. Use a selection of UKBAP species that are known to occur within your county and pick a sample of those that are (a) very habitat-faithful species e.g. chalk grassland butterflies and flora or heathland reptiles where you would expect the majority of species to be captured and the mapping to cover 80-90% of the records. For (b) ubiquitous/mobile species such as brown hares and raptors the percentage recorded in the opportunity map will relate to the percentage of land covered, the aim would be to ensure more records occur within opportunity areas than by chance alone.
12. Note that this opportunity mapping process will <u>not</u> identify areas for farmland birds, arable wildflowers or ubiquitous mobile species. However, where these species are found in abundance in close proximity to an identified opportunity area these field units should be considered for inclusion (to be discussed with consultees) as it likely relates to good land management and will act as buffer habitat.

First draft report and methodology

The maximum area of the county covered by opportunity area is likely to be ~ 30% and the minimum ~ 15% with a minimum of known BAP habitat included within the opportunity map (variable for different habitats see Table 1). The counties of this region vary greatly in the percentage of land cover in designated sites and UK BAP habitat resource so it is not possible to set specific limits on the land cover that should be accounted for in opportunity areas. Instead, please see the compatibility standards for the way in which we hope to unite the county maps into a regional opportunity map.

For each area there should be an accompanying description (in MS Word) of the principal habitat resource it includes, reasons for selection and why the boundary is where it is and potential opportunities described for use in the next stage of the consultations, see the Consultation Methodology for examples used in Berkshire and Oxfordshire. This should include information on:

1. Brief Opportunity Area Description: where it is, major land holdings and/or designated sites it contains.
2. Joint Character Area/Landscape Descriptive Units: if applicable
3. Landscape Types: if there are several list them
4. Geology: list the bedrock primarily and, if used to determine the area, the superficial and artificial geology as well.
5. Topography: Note whether this is for example a plateau, valley or dip slope area or if the landscape is not defined by the topography. Note if the boundary relates to particular contour lines.
6. Biodiversity: list all the UKBAP habitat the area contains referring to any designated sites and note if the boundary relates to their distribution and buffered areas. Also outline any UKBAP species of particular note that occur in the area or that this area is important for (e.g. 40% of the county's breeding population of bittern are found here)
7. Targets: State the main opportunities, related to the UKBAP habitats listed, that occur in the area. This does not have to be exhaustive but gives an indication of why and how the opportunity area was identified.

Additionally there needs to be a full account of the mapping methodology used and the steps undertaken to generate the map, a list of the digital datasets with version dates, and description of any specific rules used, and why, when creating the maps.

Habitat types

Where there have been in depth discussions and decisions made about the local BAP habitat targets then these should guide the mapping process. These should be used to check the percentage of existing habitat resource the opportunity mapping covers and have bearing on the extent of potential land within the opportunity areas for the restoration, re-creating and enhancing targets. Alternatively, the following list of UKBAP habitats to be considered and as a guide the percentage resource that was covered by the opportunity mapping in Berkshire and Oxfordshire is given below.

It is not anticipated that the data will be available to able to map to the new UKBAP priority habitats (such as ponds, traditional orchards and all rivers) at this stage.

Table 1. UKBAP habitats to include in the opportunity maps

UK BAP Habitat	Comments
Eutrophic standing water	ESW can be found in a variety of landscapes and can be man-made. Those associated with flood plains, potential mineral extraction zones and existing river valley and reedbed & fen areas should be included where possible. Berks and Oxon included ~ 80 - 85%
Chalk Rivers	Most chalk rivers in the south east are SSSI and large stretches are rich for biodiversity. Therefore, a large percentage should be included in the opportunity map. Berks included 100%
Fen communities	Fens habitats are biodiversity hot spots and should be a major part of the wetland and river valley opportunity areas. However many smaller spring fed fens may be scattered throughout the landscape. Berks and Oxon included 90 - 95%
Purple moor grass and rush pasture	As with the other habitats associated with wetland areas there is often a great opportunity to restore and recreate habitat where linked to flood prevention and alleviation Berks included 96%
Floodplain & coastal grazing marsh	As above Berks and Oxon included 95 - 100%
Reedbeds	Reedbeds may also be associated the large areas of standing water and potential to extend or enhance may be limited by the surrounding land use. Berks and Oxon included 65 – 90%
Lowland heathland	Small resource of lowland heathland left in the South East makes this a priority habitat and where it remains tends to be in a protected site so the majority of it should be covered by this mapping. Berks and Oxon included 85 - 100%
Lowland acid grassland	Commonly associated with lowland heathland. Berks and Oxon included 85 - 98%
Lowland calcareous grassland	Berks and Oxon included 80 - 100%
Lowland meadows	Berks and Oxon included 80 - 90%

Lowland mixed deciduous woodland	Scattered, small, ancient semi-natural woodland may be a priority in some counties rather than the full priority BAP woodlands. In which case it should be noted which woodland type is being selected and why. Berks and Oxon included 65-75%
Wood pasture and parkland	Parklands are often adjacent to urban settlements or in prime agricultural landscapes and may be isolated from other BAP resource as a result. The opportunities or such areas need to be considered (in may be to just enhance the existing resource). Berks and Oxon included 55-75%
The following UK BAP habitats should be considered for those areas with coastal habitats.	
Coastal vegetated shingle	
Coastal sand dunes	
Saltmarsh	
Saline lagoons	
Maritime cliff and slope	

Compatibility Standards for the Regional Opportunity Mapping

Each county in South East England has different resources in terms of habitat data, personnel, amount, diversity and geographic spread of biodiversity and it is therefore appropriate to apply different opportunity mapping methodologies to different counties. Compatibility standards can help us to create a regional opportunity map without having to apply a single standard opportunity mapping methodology across the region. It also makes sense not to discard the good work that has already been done to create County Opportunity maps in the South East. The following compatibility standards have been prepared, against which you can test you opportunity mapping, to see whether it is compatible with other maps in the South East.

1. You should have a written methodology

The mapping work undertaken to select the opportunity areas must be clear, accountable and reproducible.

2. Every opportunity area identified must contain some existing UKBAP habitat

See Table 1 for the list of habitats that should be included in the opportunity mapping. A site that is likely to support UK BAP habitat in the future (e.g. after minerals extraction) but does not have any existing BAP resource should not be selected as an opportunity area (not sure if that is true but willing to be told otherwise). Note that this process is intended to be dynamic and updated when further information and conservation work has taken place.

3. The boundary of each opportunity area should follow an identifiable feature

The opportunity areas should in general follow a land form that is appropriate or defines the character of the opportunity area. An ideal starting point is the landscape description Unit (LDU) boundaries where these are already available across the county. Alternatively, the boundaries of the selected opportunity area should follow a feature boundary from an appropriate underlying base map e.g. a contour line, floodplain, geology (bed rock, superficial or artificial) or soils map. Part of the decision making process will be to consider the opportunity of land parcels adjacent to existing UKBAP habitat or designated sites and so the inclusion or exclusion of OS Master Map toids, or part of toids, should be informed by geology, topography, soils or land use.

For example, if the opportunity area is in a river floodplain the EA flood risk maps could be used to draw the extent of suitable hydrological features to support the

BAP resource and buffering and enhancing of the site. Alternatively the contour lines at the edge of the river valley where the valley sides reach a certain slope.

4. GIS generated opportunity maps should be knowledge proofed and changes made as a result of consultation should be documented

Each county opportunity map generated should have a wide consultation process with county experts from within nature conservation organisations, local BAP partnerships and key individuals. This process will ensure buy-in for a wide range of partners that will take the work forward and ensure the areas identified actually represent the best landscape scale opportunities of the county. These consultation sessions and the outcomes/resultant changes to the opportunity map must be clearly documented.

5. The opportunity map should be tested against the distribution of UKBAP species, both sedentary and ubiquitous

Although the opportunity map is based in UKBAP habitat resource it is useful to test that these areas sufficiently cover known populations of UKBAP species. Some species are associated with specific habitats and fairly sedentary so should have the majority of records within the opportunity areas. Other more ubiquitous species are unlikely to be so restricted to BAP habitats may highlight much of the semi-natural opportunity areas that could be included.