3.0 Issues affecting the integrity of European Sites

3.1 At the screening stage all the initial 9 options were assessed as to whether they were likely to have a significant effect upon the European sites. Now the options have been refined to three potential growth scenarios for higher housing numbers it is possible to assess the impacts of these against the conservation objectives for each site. The screening process has been used to help identify the 3 scenarios to help minimise the impacts that might occur on each site. For example some development components close to Cannock Chase were deemed to potentially affect the integrity of Cannock Chase SAC and therefore these were excluded from the potential scenarios.

3.2 This section reviews the issues which have a significant influence on the integrity of European sites in the region (as summarised in Table 2) identified by the previous HRA for the Phase 2 Revisions of the WMRSS and through subsequent consultation with the Environment Agency, Natural England and Countryside Council for Wales. This section sets out background trends of these issues to provide the basis for determining whether the options would exacerbate any existing adverse trends or change environmental conditions such that site integrity might be comprised.

Environmental Change	European site	Issues for further consideration
Local deposition of air pollutants caused by traffic emissions	Cannock Chase SAC; Fenn's, Wixhall, Bettisfield, Wem and Cadney Mosses SAC; Peak District Dales SAC, South Pennine Moors SAC, Peak District Moors (South Pennine Moors Phase 1) SPA West Midland Mosses SAC, Midlands Meres and Mosses Phase 1 and 2 Ramsar sites.	Those parts of sites within 200 m of a major road may be at risk from increased acidification and nitrogen deposition, causing changes in terrestrial plant communities for which the sites have been designated. This problem is worse on sites which already have acid soils and have little buffering capacity. Predicting whether traffic levels will increase and then establishing whether this will translate into increased levels of deposition on a site is difficult.
Diffuse air pollution effects on aquatic interests	Brown Moss SAC, West Midland Meres and Mosses Phase 2 Ramsar.	Generally dilution effects mean that air pollution has negligible influence on aquatic interests. Surface runoff and groundwater pollution is normally a far more significant factor affecting aquatic sites.
Diffuse air pollution	Cannock Chase SAC, Downton Gorge SAC, Fenns, Wixhall, Bettisfield, Wem and Cadney Mosses SAC, Peak District Dales SAC, South Pennine Moors SAC, The Stiperstones and the Holley SAC, West Midlands Mosses SAC, Wye Valley Woodlands SAC, Peak District Moors SPA, South Pennine Moors Phase 2 SPA, Midland Meres and Mosses Ramsar Phase 1 and 2.	A number of sites are currently over their critical loads for acid and nitrogen deposition. Any further increase in background levels of diffuse air pollution could have cumulative effects and exacerbate an adverse situation. Measures need to be explored for reducing air emissions in the region to reduce/stabilise background levels of air pollution.

Environmental Change	European site	Issues for further consideration
Water quality effects from a direct increase in run-off from hard standing and pollution from water treatment infrastructure.	Cannock Extension Canal SAC; River Clun SAC, Midland Meres and Mosses Ramsar phase 1 & 2; Pasturefields Salt Marsh SAC; River Mease SAC; River Wye SAC; Severn cSAC, SPA & Ramsar	Capacity of existing wastewater infrastructure to deal with additional homes needs to be considered, especially during flood events. Some sites require local/specific management solutions. However scope for SUDS should be considered for upstream housing and other developments.
Land Use Change and Fragmentation –Impacts on Protected Species outside the designated site	Cannock Chase SAC; Fens Pool SAC; Wye Valley and Forest of Dean Bat site SAC; River Wye SAC; River Mease; River Dee and Bala Lake SAC site; and Wye Valley Woodlands SAC	Growth in recreational use potentially requiring supporting infrastructure or facilities in future; other sites depend on supporting habitat outside protected area boundary.
Water abstraction resulting in lowered water tables/ levels	Fenn's, Wixhall, Bettisfield, Wem and Cadney Mosses; River Clun SAC; River Dee and Bala Lake SAC, Severn Estuary cSAC, SPA and Ramsar, River Mease SAC, Cannock Chase SAC, River Wye SAC, Midlands Meres and Mosses Phase I & II Ramsar, Humber Estuary SAC and Ramsar, Humber Flats and Marshes SPA, Brown Moss SAC, West Midland Mosses SAC	Increased abstraction arising from housing and economic development
Disturbance, or damage/erosion caused by recreation/amenity use	Cannock Chase, SAC, Cannock Extension Canal SAC, Fenn's Wixhall, Bettisfield, Wem and Cadney Mosses SAC, River Wye SAC, Peak District Dales SAC, South Pennine Moors SAC, Peak District Moors (South Pennine Moors Phase I) SPA, South Pennine Moors Phase 2 SPA, Midlands Meres and Mosses Phase I Ramsar site, Midlands Meres and Mosses Phase 2 Ramsar site; Severn Estuary Ramsar and SPA sites;	These sites are currently adversely affected to a degree by recreational pressure and are at risk from an increase in households and improved accessibility in the region. The pathways by which recreational pressure impacts each site needs to be examined to understand the mechanisms by which further risk can be avoided in the RSS.

Table 2: Issues affecting conservation objectives of European sites Source of site base data and issues affecting integrity in relation to RSS Phase 2: *Ursus Consulting Ltd & Treweek Environmental Consultants (2007) Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands*

Air Quality

Sites Affected

3.3 The screening report identified a number of European sites where site integrity depends on appropriate air quality. It also identified diffuse air pollution as an existing threat to the integrity of sites in the region and concluded that components of options or scenarios would be likely to increase concentrations of certain air pollutants.

LSE	Sites affected
Local deposition of air pollutants caused by traffic emissions changing the plant species composition of vulnerable vegetation.	Cannock Chase SAC; Fenn's, Wixhall, Bettisfield, Wem and Cadney Mosses; Peak District Dales SAC, South Pennine Moors SAC, West Midland Mosses SAC
Diffuse air pollution effects on aquatic interests, for example acidification of water.	Brown Moss SAC
Diffuse air pollution affecting sites over their critical loads.	Cannock Chase SAC, Downton Gorge SAC, Fenns, Wixhall, Bettisfield, Wem and Cadney Mosses SAC, Peak District Dales SAC, South Pennine Moors SAC, The Stiperstones and the Holleys SAC, West Midlands Mosses SAC, Wye Valley Woodlands SAC, Peak District Moors SPA, South Pennine Moors Phase 2 SPA, Midland Meres and Mosses Ramsar Phases 1 and 2.

Table 3: Summary of Sites Potentially Affected by Air Pollution. Source of site base data and the likely significant effects of sites in relation to RSS Phase 2: *Ursus Consulting Ltd & Treweek Environmental Consultants (2007) Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands*

Water Quality

Sites affected

3.4 The sites for which possible water quality impacts were identified as a result of the Phase 2 Revision and the additional nine housing options at the screening stage are identified below. An adverse impact on the integrity of the Cannock Extension Canal SAC has been ruled out as a result of consultation with Natural England. Similarly impacts on Fens Pools, the River Clun SAC and were discounted within the HRA of the Phase 2 Revisions.

LSE	Sites affected
Impacts on water quality caused by surface water run-off, including sedimentation	Severn Estuary cSAC, SPA and Ramsar sites, River Mease SAC; River Wye SAC; Midlands Meres and Mosses Phase 1 and 2 Ramsar sites.
Pollution during flood events	Pasturefields Salt Marsh SAC
Concentration of pollutants or contaminants due to reduced/low flow	Severn Estuary cSAC, SPA and Ramsar sites, River Wye SAC; River Mease SAC
Lack of water treatment capacity	Severn Estuary cSAC, SPA and Ramsar site, River Wye SAC, River Mease SAC, River Usk SAC. River Clun SAC.

Table 4 Sites for which water quality impacts are possible Source of site base data and the likely significant effects of sites in relation to RSS Phase 2: *Ursus Consulting Ltd & Treweek Environmental Consultants*

*(2007) **Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands***

Water Supply and Hydrology

Sites affected

3.5 The screening stage identified further water abstraction and use associated with Phase 2 Revision and the additional nine housing options for several sites as summarised in Table 5 below.

European site	Water supply issue identified during screening
Brown Moss SAC	The site is currently not affected by abstractions but the additional housing may push the Staffordshire and Shropshire water resource zone into deficit by the end of the plan period through additional abstractions.
West Midland Mosses SAC	Increased housing development is likely to create water deficit problems, though not currently known to what extent this would affect sites.
Cannock Chase SAC	Current water abstraction may be affecting the site hydrology, and this is currently under investigation by the Environment Agency. Further housing development may create additional pressures on this resource.
Fenn's, Wixhall, Bettisfield, Wem and Cadney Mosses SAC	The active mires depend on high water tables and continued peat formation processes. Much of the site has been affected by peat extraction in the past, with associated drainage problems from afforestation and agricultural activities on the edge of the peat body.
Humber Estuary SAC and Ramsar Humber Flats and Marshes SPA	Severn Trent's WRMP predicts a deficit in water for the East Midlands WRZ and therefore new schemes are suggested. The Humber Estuary receives water from the Trent which in turn is a key resource for the West Midlands. Therefore the increased housing in the West Midlands would put further demands for further abstraction, which depending on where this would be undertaken, could have the potential to effect the River Trent and therefore the Humber.
Pasturefields Salt Marsh SAC	Site is vulnerable to abstractions from the underground aquifer.
River Clun SAC	A reliable fast flow of cool water is required by the freshwater pearl mussel *Margaritifera margaritifera*, so increased abstraction increased summer months may be to the detriment of the species.
River Dee and Bala Lake SAC	All aquatic features of this site require suitable flow conditions to maintain favourable status. The Dee is already affected by falling groundwater levels and this may be affected by increased abstraction levels. Significant effects are conditional on water supply/quality issues, which are unclear.
River Mease SAC	All aquatic features of this site require suitable flow conditions to maintain favourable status. As competition for water resources is high in the region, high predicted levels for household growth could have a likely significant effect.
River Wye SAC	All aquatic features of this site require suitable flow conditions to maintain favourable status. Abstraction for new housing development under the RSS could have significant effects on the integrity of the SAC. The River Wye has been recognised through the Environment Agency's (EA) National Environment Programme and is subject to a review of licences and consents under the Habitats Directive which could affect future resource availability.
River Usk SAC	Any increase in housing through the RSS Phase 2 and the additional housing options 3, 6 and 9 in Herefordshire could increase the demand on Welsh Water for additional water supplies. Depending on how Welsh Water meets the

European site	Water supply issue identified during screening
	demand for additional water will determine whether there would be any requirement for abstraction from the Usk catchment.
Severn Estuary cSAC Severn Estuary SPA Severn Estuary Ramsar	Reduction in water flows in the Severn may affect the extent of habitats and estuarine communities and has the potential to adversely effect qualifying features especially migratory fish such as include Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla Anguilla.* The Severn system is under considerable pressure for water supply and there may be future tension between providing water supply for new housing and maintaining minimum flows. The Habitats Directive review of the Severn Estuary could result in additional environmental needs, bringing forward the need for additional flow support for the River Severn.
Midlands Meres and Mosses Phase I Ramsar	Site comprises multiple component parts in different locations. Some may be prone to water supply pressures, depending on their location.[5]
Midlands Meres and Mosses Phase 2 Ramsar	Site comprises multiple component parts in different locations. Some may be prone to water supply pressures, depending on their location.[6]

Table 5: European sites identified as at risk from altered water supply Source of site base data and issues identified during screening in relation to RSS Phase 2: *Ursus Consulting Ltd & Treweek Environmental Consultants (2007) Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands*

Disturbance Caused by Recreation/ Amenity and Tourism

Sites affected

3.6 LSEs due to disturbance associated with recreation and tourism were identified for the following sites at the Screening Stage:

Site name	Impacts
Cannock Chase SAC.	Site already surrounded by development and a popular area and focus for outdoor activities. More than 1 million visitors a year at present. Approximately 58% of the Area of Outstanding Natural Beauty (AONB) is open access, with a variety of activities taking place, from walking to horse-riding. The fragility of some of the habitats is noted in the management plan, with a focus on encouraging access to more robust areas suggested as a means of reducing pressure on habitats such as open heathland. Future increases in visitor numbers could require additional infrastructure.
Cannock Extension Canal SAC.	A degree of disturbance is desirable in terms of maintaining habitat for floating water-plantain (Joint Nature Conservation Committee site notification), where low levels of boat traffic have suppressed the growth of emergent vegetation, whilst allowing open-water plants to flourish. Increased levels of boat disturbance may cause a decline in the population of open-water plants, as well as reducing water quality. Use could go up due to increasing local population.

[5] Natural England (12th July 2007) Screening Workshop, Per Comm
[6] Natural England (12th July 2007) Screening Workshop, Per Comm

Site name	Impacts
Fenn's, Wixhall, Bettisfield, Wem & Cadney Mosses SAC.	Trampling and erosion of vegetation.
Fens Pools SAC.	Possible disturbance to great crested newts caused by angling, which could increase with local housing development.
Peak District Dales SAC; South Pennine Moors SAC.	Well-used popular destinations. Trampling and erosion of sensitive vegetation, additional air pollution and deposition from traffic (most access is via car). Existing pressures already high.
River Wye SAC.	Recreation and tourism are increasing in the area. With respect to the SAC, visitors using the Wye Valley AONB and the Wye Valley Walk are increasing. Walking, cycling, horse-riding and water sports are the main recreational uses affecting the Wye and its catchment. The motorway network (M5, M50 and M4) makes the Wye easily accessible to people from the South West, the Midlands and South and Mid Wales. Damage to designated water crowfoot communities and other species (including otter) caused by increased recreational use of the River itself (physical damage and disturbance).
Peak District Moors (South Pennine Moors Phase I) SPA; South Pennine Moors Phase 2.	Disturbance to breeding bird populations. Ground nesting birds would be particularly sensitive.
Midlands Meres and Mosses Phase I and Phase 2 Ramsar site.	Possible damage to sensitive vegetation if visitor numbers increase significantly.
Severn Estuary Ramsar & SPA.	Disturbance of birds by walkers and boats.

Table 6: European sites identified as at risk from increased tourism and recreation Source of site base data and the likely significant effects of sites in relation to RSS Phase 2: *Ursus Consulting Ltd & Treweek Environmental Consultants (2007) Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands*

Land Use Change and Fragmentation –Impacts on Protected Species outside the designated site

Sites Affected

3.7 Populations of species are not necessarily entirely restricted to designated sites and depend on undesignated land to meet their habitat requirements. Supporting habitat may be located adjacent to a European Site or some distance from it. Bats and otters, for example, may range over considerable distances to meet their habitat requirements. Changes in land use around sites can also affect the quality of habitat within them by affecting levels of disturbance, pollution and the availability of colonisers (e.g. to maintain plant communities).

Site	LSE
Fens Pool SAC	Great crested newt populations for which the site is designated use land outside the site as part of their wintering habitat. Loss of this land would affect the viability of the populations.

Site	LSE
River Wye SAC	The HRA of the Phase 2 RSS identified land use change that could lead to secondary impact upon water quality. Levels of sediment important to crayfish, so gross land use changes affecting sediment loading, quality of sediment and oxygen levels would be detrimental. Impacts of pesticides on crayfish, fish fry and *Ranunculus* bed is detrimental, often even at low concentrations. Also an increase in local traffic could lead to an increase in mortality within the local otter populations.
Wye Valley and Forest of Dean Bat Sites and the Wye Valley Woodlands SAC	Bat populations forage for several km outside their roost sites. Changed land use within this zone can affect the viability of the populations.
River Dee and Bala Lake SAC	There may be a possible cumulative adverse effect on integrity through an increase in traffic levels having a knock on effect on otter deaths from road traffic accidents.
River Mease SAC	Possible increase in mortality to river's otter population from increased road traffic.

Table 7: Sites for which land use change or fragmentation of habitat outside their boundary might affect their integrity Source of site base data and the likely significant effects of sites in relation to RSS Phase 2: *Ursus Consulting Ltd & Treweek Environmental Consultants (2007) Habitats Regulations Assessment of the Phase II Revision of the Regional Spatial Strategy for the West Midlands*