highways england

A27
Arundel Bypass
Report on public consultation

Appendix D7.1

Spring 2018
Appendix D7.1 – Stakeholder responses
Community groups (part 1)

Arundel Bypass Neighbourhood Committee

www.arundelbypass.co.uk

15 October 2017

A27 Arundel Bypass consultation 2017: ABNC's response

I am writing on behalf of the Arundel Bypass Neighbourhood Committee to deliver our consultation response, and as part of that response, a major Evidence Report in five parts.

ABNC is a community group based in Binsted, with 30 years' experience of protecting this beautiful area from inappropriate bypass plans. We have 2500 supporters via our Petition (against Option 5A) and website, the great majority of whom are in Arun District in West Sussex.

1. **We strongly object to Option 5A**. Evidence showing why it should be rejected is given in our Evidence Report. In particular Evidence A is an analysis of the damaging impact Option 5A would have on the Special Qualities of the South Downs National Park at Binsted. Evidence C is a series of ecological reports showing that Option 5A is the most environmentally damaging option of them all. 100 per cent of our supporters object to this Option.
2. **We do not support Option 3.** Even though it is less damaging for Binsted, for communities and the environment than 5A, it is still extremely damaging. 75 per cent of our supporters object to it.
3. **We support the Option 1 alignment**. We believe this option minimizes the adverse impacts on the environment, rural communities and the National Park. Many of our supporters would prefer the wide single carriageway version of Option 1, called "New Purple", if the Secretary of State for Transport were to allow a non-dualled section in the route. We also note that Option 1 is the best option in terms of cost-benefit and that there would be substantial funds available for further anti-severance mitigation and a better Ford Road Roundabout solution. 80 per cent of our supporters support this option or a lower-impact version of it.

Opposition to Option 5A

Opposition to this very damaging option is widespread. The Binsted area is loved by many, not just the people who live here, as a unique area of peace and tranquillity, where the attractive National

Park countryside is easily accessible from points south and west without crossing the A27. A demonstration against Option 5A on 8 October was attended by 450 supporters. It is also opposed by all conservation organisations, who also object to Option 3 as well. ABNC's evidence Section E describes this opposition more fully.

The consultation and due process

We note with concern that Option 5A has been seriously mis-appraised in the current consultation due to erroneous statements and inadequate and misleading ecological, community, traffic, cost-benefit and landscape impact assessments. All of these combined have resulted in the gross understatement of its costs (especially mitigation), the overstatement of its benefits, and the understatement of its adverse impacts in the Appraisal Summary Table (AST).

Errors in the consultation materials about Binsted and Binsted Woods are enumerated in ABNC's Evidence Section B, and further errors in the Ecological Study Report are analysed in the critique included in ABNC's Evidence Section C. Section D (to follow) will detail the defects in the traffic data, the costs to the community and the defects in the cost benefit assessments.

As a result of information which is likely to have seriously misled consultees, the consultation itself is arguably invalid, biased, and unlawful. Respondents without pre-existing expert knowledge will have been unable to form an informed and balanced opinion about Option 5A, and therefore recommendations to support 5A by such bodies as West Sussex County Council, Arun District Council and Arundel Town Council are open to challenge.

Highways England has also failed to have regard to the Purposes of the South Downs National Park, as it is required to do under Section 52 of the Natural Environment and Rural Communities Act, 2006.

We ask Highways England to reject Option 5A. If it is chosen as the Preferred Route this result will be challenged on the basis that the consultation was faulty, as described above, and Highways England has not fulfilled its legal obligations.

Yours sincerely

Arundel Bypass Neighbourhood Committee

Response to Highways England's A27 Arundel Bypass consultation 2017

ABNC Evidence Section A: Unacceptable damage Option 5A would cause to the South Downs National Park's Special Qualities at Binsted

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Introduction and Executive Summary

ABNC is in sympathy with the many organisations who have rejected both Option 5A and Option 3 and pointed out that a new approach to traffic problems is needed, with improvement of opportunities to use other modes of transport such as bus, rail and trams, and greater connectivity for walking and cycling.

We also agree with those who have pointed out that greater road capacity at Arundel will add to the present very bad congestion problems at Chichester and Worthing. And we do not believe that a bypass at Arundel would greatly help 'rat-running' in the South Downs National Park, since drivers are avoiding the congestion at Worthing as well as at Arundel. A new bypass at Arundel would also increase traffic through the 'induced traffic' phenomenon and this would be likely to increase traffic in the South Downs eventually.

We are also in sympathy with those who would like to save the whole Arun Valley from damage from the bypass. Our ecological evidence in Section C shows that the whole area is much more species rich and biodiverse than has previously been realised. We do not wish to see the destruction of Tortington village which would suffer severely from both Options 3 and 5A.

However, the damage Option 5A would do at Binsted is so great, and the mis-appraisal of Option 5A in the consultation is so overarching, that ABNC has had to concentrate its response on defending Binsted and setting the record straight, rather than putting forward wider arguments.

Our evidence is as follows:

Executive Summary

ABNC Evidence A

The South Downs National Park's Special Qualities include culture, heritage, and 'distinctive towns and villages with a real pride in their area', as well as landscape, tranquillity, recreational enjoyment and biodiversity. ABNC's Evidence A shows that all these are present in Binsted and would be severely damaged by Option 5A. This is a significant planning impediment to Option 5A.

ABNC Evidence B

The errors and apparent bias in Highways England's consultation materials, which obscure the damage from Option 5A, are analysed in ABNC's Evidence Section B. For example:

- The impact on the community at Binsted is omitted or misdescribed. For instance, it is stated that Option 5A is 500m north of Binsted when the truth is that the nearest three houses are 75m from Option 5A.
- Information about Binsted Park, the historic parkland within Binsted woods, a heritage asset which Option 5A destroys, is omitted, and the name is wrongly used, so the damage is not apparent.
- Areas of Binsted Woods (100ha of high quality semi-natural broad-leaved woodland forming the western area of the Binsted Woods Complex LWA) are omitted on maps.
- It is incorrectly stated that none of the Options affect semi-natural broad-leaved woodland, when the truth is that the impact on Binsted Woods would be severe. 41 ha would be affected by destruction, severance and degradation.

ABNC Evidence C

The inadequacy of Highways England's consultants' Environmental Study Report is so severe that ABNC have obtained four reports from ecological consultants to correct this deficiency. They are:

- C1, a comparative table of damage to habitats and protected species from all the options, which shows that Option 5A is the most damaging option.
- C2, a mitigation table for Option 5A which suggests that the cost of mitigation and compensation for the irreplaceable habitats lost to Option 5A has been drastically under-estimated.
- C3, a major report on the ecological consequences of Option 5A. It shows that the Mid Arun Valley area is outstandingly biodiverse, and concludes 'Option 5A cannot be achieved without a severe and significant negative impact upon protected species and irreplaceable habitats.'
- C4 is a detailed critique of Highways England's Ecological Study Report. It highlights major errors and omissions and concludes that 'interested parties cannot possibly draw even the most fundamental conclusions based on such a lack of information'.

ABNC Evidence D

The faulty traffic modelling and misleading Cost Benefit figures given for 5A compound the errors and inadequacies described above. We have commissioned professional consultants to inform our response to these figures and this advice will follow as soon as possible.

ABNC Evidence E

Opposition to Option 5A is strong and growing. Walberton Parish Council stated Option 5A is 'anathema' to them. The Sussex Wildlife Trust has stated that damage to habitats and species from both Option 5A and Option 3 would be 'outrageous'.

The demonstration against Option 5A at Binsted on 8 October, attended by 450 supporters, showed that many people agree.

An account of the demonstration and the reasoning behind it is followed by an analysis of responses to the consultation by local groups, Parish Councils and conservation organisations. All are opposed to Option 5A, many are also opposed to Option 3.

This is followed by the present state of the Petition against Option 5A, with approaching 2,500 signatures.

Introduction

ABNC Evidence Section A analyses the damage that would be caused to the Special Qualities of the National Park at Binsted by Option 5A. As well as landscape, tranquillity, recreational enjoyment and biodiversity, the Special Qualities include communities, culture, heritage, and 'distinctive towns and villages with a real pride in their area'. All these are present in Binsted and would be severely damaged by 5A. As a place with a rare unity of village, tranquil countryside and majestic woods, Binsted would be destroyed by Option 5A.

Our expertise is based on local knowledge gathered over generations, especially during the last 30 years of working to protect this special and beautiful area.

1. How the evidence given in this paper relates to the Statutory Purposes, Duty, and Special Qualities of the National Park

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, Highways England has a legal obligation to have regard to the Purposes of the National Park, which are expressed in its Special Qualities, which in turn depend on the effective exercise of its statutory Duty.

The South Downs National Park Partnership Management Plan 2014-2019, p. 10, states: 'Our National Park Duty is to seek to foster the social and economic wellbeing of the local communities within the National Park in pursuit of our purposes.' The National Park's Statutory Purposes are:

Purpose 1: To conserve and enhance the natural beauty, wildlife and cultural heritage of the area.

Purpose 2: To promote opportunities for the understanding and enjoyment of the special qualities of the National Park by the public.

The Special Qualities, referred to in Purpose 2, listed in the South Downs National Park Partnership Management Plan, and detailed in the State of the South Downs National Park report, are:

1. Diverse, inspirational landscapes and breathtaking views
2. Tranquil and unspoilt places
3. A rich variety of wildlife and habitats including rare and internationally important species
4. An environment shaped by centuries of farming and embracing new enterprise
5. Great opportunities for recreational activities and learning experiences
6. Well-conserved historical features and a rich cultural heritage
7. Distinctive towns and villages, and communities with real pride in their area

Each Chapter except the last in this report is themed mainly on one of the 7 Special Qualities. In order to appreciate the effect of Option 5A on the Special Qualities, two major errors/omissions in Highways England's materials need correcting – their failure to include correct information about

Binsted village or Binsted Woods. Special Qualities 7 and 3 are therefore considered first. The others follow in numerical order.

2. Binsted and the National Park boundary

If it should be objected that Binsted is not entirely 'in' the National Park, and that therefore the National Park's Purposes, Duty and Special Qualities should not apply to it, it will become obvious from the pages that follow that Binsted as a place does demonstrate all the National Park's Special Qualities.

Ten dwellings in Binsted, out of 38, and approximately half of the old Parish of Binsted, are entirely within the National Park boundary. The boundary thus splits the village, against the normal guidelines for National Park boundaries. When a National Park is created, if a settlement is split by a proposed National Park boundary, inclusion or exclusion of the whole settlement depends (according to the normal guidelines) on consultants' analysis of how well the settlement fulfils the National Park designation criteria – landscape beauty, and exceptional opportunities for recreation.

In the South Downs National Park creation process the consultants Landscape Design Associates, in their report 'Area of Search for the South Downs National Park' (March 2001), stated that the whole area 'from Walberton to the River Arun' met the criteria for designation (natural beauty and exceptional opportunities for recreation) for the South Downs National Park. This includes the whole of the historic Binsted parish, and the west bank of the Binsted Rife valley up to Yapton Lane.

It is not entirely clear why the settlement of Binsted was left half in and half out of the National Park, nor whether the Countryside Agency, in drawing up the boundary, was influenced by the knowledge of an emerging Binsted option for the Arundel bypass, similar to 5A, at that time.[1] What is however clear is that, despite having been split by the final boundary, the whole of Binsted fulfilled the National Park designation criteria and manifests the Special Qualities.

Furthermore, the effect of Option 5A on the part of Binsted outside the Park boundary seriously damages the Special Qualities of the National Park within the Park boundary. The whole of Binsted is therefore included in the following discussion.

[1] For instance, South Coast Multi Modal Study, Halcrow Progress Note, 24 May 2002, 4.19, states 'A series of alternative alignments [for the Arundel bypass] south of Binstead Woods are being examined as part of the Strategy Development Plan. These avoid the National Park but may impact upon SCNI areas'. In April 2002 the Countryside Agency had drawn up its draft boundary which left out the outlying copses of Binsted Woods and hence parts of the SNCI. These were later added by the boundary decision of 2006.

Chapter 1 Impact of Arundel Bypass Option 5A on Binsted, a 'distinctive village' and a 'community with real pride in its area' (Special Quality 7 and Purpose 1)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 7 is 'Distinctive towns and villages and communities with a real pride in their area'. Option 5A would impact severely on the distinctive village of Binsted, and on its community which has real pride in its area. Purpose 1 is 'To conserve and enhance…the cultural heritage of the area'. Option 5A would not conserve and enhance Binsted's cultural heritage.

Binsted's village and community are hardly mentioned in Highways England's materials and when they are, the material is wrong or faulty. For instance, it is stated that Option 5A passes '500m north' of Binsted. The truth is that it winds through the length of the village, severing 4 houses from the others, with many houses close to the 200m line. Three houses in Binsted would be 75m from Option 5A where it is on a 7 to 9 metre embankment.

Below: the western half of Option 5A and houses in Binsted

A short description of Binsted is therefore needed to show that it is a 'distinctive' village. Binsted is a spread-out settlement of 38 houses, along a U-shaped lane. It has always been an isolated farming Parish, independent until the 1930s. Its layout reflects its geography: it is a peninsula, defined on three sides by marshy brooks, with its best agricultural land in the centre. Its central fields, on higher land – through which Option 5A would pass – were cultivated on a strip system in

mediaeval times, with different strips belonging to different owners. Pasture and hay meadows were close to the brooks on the edge of the Parish. The winding lane gave access to these. The surviving shape of the village therefore still reflects the geographically isolated, independent farming community it has been since Anglo-Saxon times. Before the Conquest it was the meeting place of the Binsted Hundred, or unit of administration, and the Hundred meeting place has recently been identified at Hundred House Copse.

The resulting feeling of ancientness, and of unity between village and the fields and woods, are much appreciated by those who live and work here and by the many visitors who walk, ride or cycle here or come to the Binsted Arts Festival or the Strawberry Fair. It is an integrated landscape, ideal for recreation, which provides 'solace' as one ABNC supporter said. This integrity would be ruined by Option 5A.

More of Binsted's distinctive qualities are described in the following chapters. This chapter gives background information to three main ways in which the inhabitants of the village take pride in their area. The first two make it possible for people to visit and enjoy it in new ways – the Strawberry Fair and the Binsted Arts Festival; the third, the planting schemes and surveying and volunteering activities, shows the care of the inhabitants of Binsted for the lovely countryside which surrounds them, and their desire to research it, improve it and regenerate it in ways which are in keeping with its history and characteristics.

a) The Strawberry Fair

The Strawberry Fair, Binsted's yearly fundraising event for the fabric of Binsted Church and charities, is in its 30th year. For the last four years over 1000 people have come to it and more than £7000 has been raised. Over the thirty years it has raised over £100,000. It is an old-fashioned country fair with plenty of games for children, lucky dip, bottle stall, Pimms tent, animals to pet, countryside interest stalls, strawberry and cream teas, produce, books, and lots of very high quality plants for sale donated by Walberton and Binsted nurseries. In 2017 it included for the first time a hand-made, wooden, low-risk children's ride called the 'Strawberry runner'. It's not expensive – still only £1 to get in, and children under 12 are free. It is a great way for the village to share its beautiful countryside. Two fields are used for parking, prepared each year by sheep being removed just in time. The barn, having been used for lambing earlier in the year, is cleaned and prepared.

The Pimm's tent is a welcoming splash of colour.

The Fair takes place in and around the Flint Barn, Binsted, a fine, well-conserved 19th century threshing barn.

Some of the great variety of nursery-grown plants that are one of the Fair's main attractions, in the yard of the Flint Barn. More plants are sold at the Fair from the Binsted Nursery premises on the other side of the Barn.

Although in 2017 the weather was wet, and it rained during part of the Fair, just as many people came as usual and over £7000 was raised.

Angie Teear's sheep are housed in a polytunnel next to the Barn and provide encounters with animals that are very popular with children.

The produce stall tends to sell out quickly.

Traditional musicians Tony Elphick, a resident of Binsted, with Will Duke and Steve Matcham.

b) The Binsted Arts Festival

The Binsted Arts Festival builds on the long-held attraction of Binsted and the wider Sussex countryside for artists and writers. It involves the local community and anyone with a feeling for these places in artistic activity, enjoyment and learning today, at locations in and around the village of Binsted.

The biographer Valerie Grove, author of *The Life and Loves of Laurie Lee*, came to Binsted in 2016 to speak about Lee in a talk titled, 'Writers and Binsted's Past'. Laurie Lee, poet, painter and memoirist, author of *Cider with Rosie*, had a long-standing love affair with Lorna Wishart of Binsted and wrote about their love in his diary and poems. The evening included a talk by Luke Jennings, author of the family and angling memoir *Blood Knots*, who spoke about 'Growing up in Binsted'. The same year an 'Art and Literature walk' led a group of 40 to some of the places mentioned in these works, with readings and a booklet of paintings by members of the Wishart family, Michael, Francis and Lorna herself, and Lorna's daughter with Laurie, Yasmin David, inspired by their surroundings. Works by members of the family were also on show at Forge Gallery, Walberton in a small exhibition. Details of the programmes are on www.binsted.org/arts-festival.

Valerie summed up the charm of this tiny village and its setting, between the hidden Binsted valley and the mass of untouched Binsted Woods: 'Binsted is a wonderful, mystical place, 'a little gem held in the past' as one of your competition poems put it, vitally important in the life story of Laurie Lee, many of whose poems were inspired here, and an extraordinary example of a parish unblemished by the modern world, with woodlands and wildflower meadows and the exquisite little Norman church, whose timeless quietness and beauty must surely be left undisturbed in the 21st century.'

The Art and Literature Walk visits the Madonna Pond to hear readings from 'Blood Knots' about Luke Jennings's attempts to catch a huge carp there as a boy, and from Laurie Lee's wartime diaries.

At Michael Wishart's grave in Binsted churchyard, attenders on the Art and Literature Walk hear a reading from his memoir,* High Diver*, about painting in the churchyard where the bones of old labourers, 'many of whom I had known and loved', sent up carpets of violets.

Alan Wheeler of the folk group Cotillion, in Binsted church, where the group gave a concert in 2016 called 'The long trip home' about working horses and oxen and the First World War. Binsted's 12th-century wall-painting can be seen behind him. It is said to be St Margaret of Scotland or possibly St Ambrose.

Janine Creaye's tree dressing workshop at Stable Cottage, Binsted in the 2017 Arts Festival.

The Arts Festival is funded partly by a grant from West Sussex County Council, partly by private donors, and partly by a Poetry Competition with an entry fee. It just covers its costs with a small surplus left over to fund the next Arts Festival.

An unusual event in 2017 was the 'Binsted laudate', a church service formed of a series of readings, hymns, a Psalm and two motets by Palestrina and Guerrero performed by local viol players and singers. This was so successful, with a packed church, that a further concert by the same players is planned for 2018. This time the guided walk was to the Iron Age earthwork in Hundred House Copse, and the newly identified Moot Mound or Anglo-Saxon meeting place, led by Dr Matt Pope of University College, London.

c) The Walberton Action Group and MAVES planting schemes

A parish-wide planting scheme by Walberton Action Group in 2003-5, with a grant of £30,000 from the Landfill Tax, led to trees and hedges being planted in locations throughout Fontwell, Walberton and Binsted. This work has been carried on in the past three years in Binsted by MAVES (www.maves.org.uk) with further planting, for instance of Black Poplars in wet areas, a section of a new hedge, and also the laying of the new hedges, some of them more than once. This work is done with the aid of National Park rangers and MAVES volunteers.[2] The thinking behind the plantings in Binsted was to make a better wildlife corridor between the only woodland areas that were separated, Hundred House Copse and the main block of Binsted Woods, by planting a hedge of native trees along Scotland Lane; to provide a shelter belt along Footpath 342 from the church to Binsted Woods, with some standard trees to grow up to take the place of the 600 elms that were

[2] See Chapter 6, Section 3, for information on MAVES' educational activities, and Chapter 2, Section 2 for some of the discoveries made by its wildlife surveys.

lost in Binsted's hedges in the 1960s; to provide standard trees along an existing hedge, Copythorn West Hedge, with a very high Ancient Woodland indicator count; and to provide replacement trees at Binsted Park to take over from the enormous ancient oaks there in due course.

The annotations on the aerial photograph show both the Walberton Action Group planting scheme of 2003-5, and the MAVES planting scheme of 2015-16.

(i) Walberton Action Group planting scheme 2003-5 and onwards (shown in green).

- At 'Trees 1', specimen trees including oaks planted alongside Binsted Lane East to act as succession to the huge oaks in Binsted Park.

- At '2 Hedge + Trees', hedge and specimen trees planted along the footpath from Binsted Church to Spinningwheel Copse; hedge has been laid once and is being laid again in the MAVES scheme. One third has been re-laid (2017).

- At 'Trees 3', specimen trees planted alongside Copythorn West Hedge, now part of the boundary of the South Downs National Park, to act as succession to the lone oaks in local hedgerows.

- South of '3 Trees' (not numbered), new woodland, hedge planting and specimen trees in Rectory Field, and new hedge planting east of Binsted Nursery.

- At '4 Hedges', a new hedge along Scotland Lane, part of the boundary of the South Downs National Park. This hedge has been laid in two sections by National Park rangers and MAVES volunteers. The first section was laid by in February 2015. The laying of the second section was carried out in 2016.

- At '5 Hedge + Trees', a new hedge plus specimen trees planted alongside the footpath which runs through the Strawberry Fair fields, and a copse in the north part of the field.

(ii) MAVES Community Planting Scheme 2015-16 (shown in yellow)

- Top of picture: hedge at Scotland Lane laid by SDNP volunteers in 2015 and 2016.

- Bottom of picture: new hedge planted with grant of 450 trees from the Woodland Trust in March 2016. Extension may be planted in future years in two stages subject to grant and landowner consent.

The Inspector's Report on the South Downs National Park boundary, 2006, para 7.862, accepted the suggested addition of the previously left-out parts of Binsted Woods and associated fields – leading to the National Park boundary as we know it today – with these words: 'Unlike other parts of the coastal plain, this area also benefits from the programme of landscape restoration work that has been undertaken in recent years. This work has strengthened key landscape elements such as the mature hedgerows that help to give the landscape a clear sense of place.'

He added: 'On balance I consider that this area at least meets the natural beauty criterion. It is also relevant to note that the local rights of way network allows the public to visit and enjoy this area. To my mind it is part of a wider tract that offers markedly superior recreational experiences.'

The initial planting scheme by Walberton Action Group was therefore part of the reason why those left-out areas of Binsted woods and their associated fields were included in the National Park. The other reasons were their natural beauty, the excellent access which the local rights of way allow to the National Park, and the 'markedly superior' recreational experience not just inside the added area but outside it.

These planting schemes demonstrate the 'pride in their area' felt by the Parish of Walberton and the village of Binsted who have gone through the necessary hard work to obtain grants to improve their much-loved countryside and have then continued to look after it and involve local volunteers in continuing to improve it. The wildlife corridors thus created feature often in the surveys of MAVES and are continuing to provide better habitats for wildlife.

Conclusion

Binsted is a 'distinctive village' with 'a sense of pride in its area'. If Option 5A was built, the Strawberry Fair and the Binsted Arts Festival would cease, and all four of the main WAG and MAVES hedge plantings would be destroyed. The 'markedly superior' recreational experience at Binsted noted by the Inspector as existing both inside and outside the National Park would be destroyed. Special Quality 7 would be severely damaged.

Chapter 2 Impact of Option 5A on a rich variety of habitats and biodiversity (Special Quality 3, Purpose 1)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 3 is 'A rich variety of wildlife and habitats including rare and internationally important species'. Purpose 1 is to 'To conserve and enhance…the wildlife of the area'. Option 5A would seriously damage Special Quality 3 at Binsted and be contrary to Purpose 1.

1. Binsted Woods: their true character, size and importance

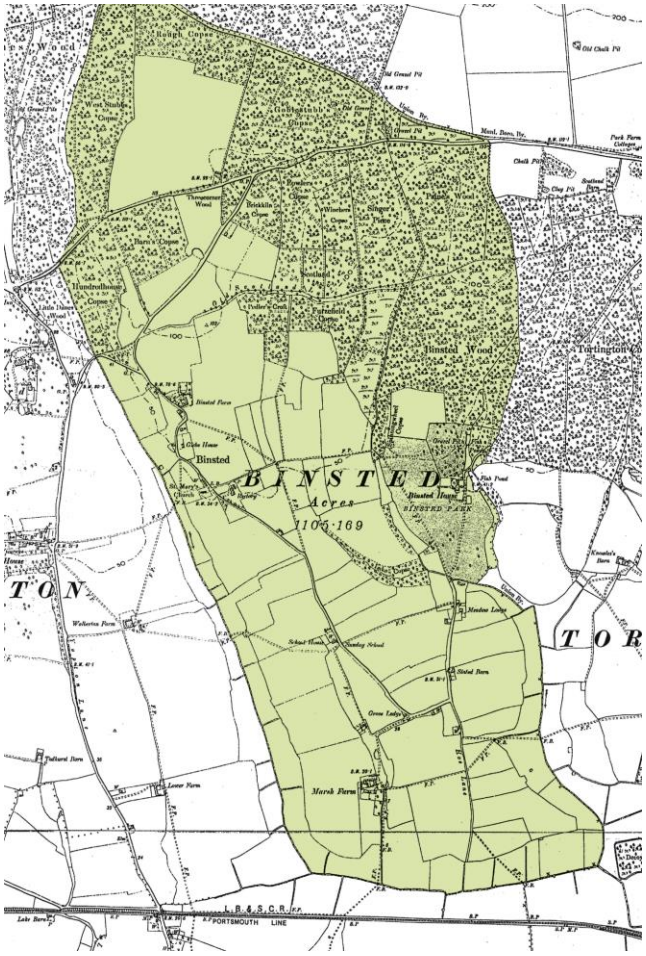
Binsted Woods are the 100ha of very high quality semi-natural broadleaved woodland forming the western section of the Binsted Woods Complex Local Wildlife Area. Information about the true size, character and value of Binsted Woods is very important in judging the damaging effects of Option 5A on the Special Qualities of the National Park at Binsted. Understanding the true nature of Binsted Woods is essential to appreciate the enjoyment of the National Park at Binsted, the impact of the views within, out of, and into the National Park, the popular use of the historic tracks and bridle ways, the reasons why there are such good learning experiences at Binsted, the motivation for the wildlife surveys of MAVES, and the other aspects of the area discussed below.

Highways England have given a very misleading impression of Binsted Woods in their consultation materials. Many of their maps include only woodland which meets the limited regulatory definition of Ancient Woodland – i.e. areas known to have been woodland since 1600. Highways England's obligation as a public body to give regard to National Park Special Quality 3 is not limited to woodland which meets the limited regulatory definition of 'Ancient Woodland'. Rather, it obligates consideration of the entirety of Binsted Woods as nationally important, high-quality, connected deciduous woodland. This obligation has not been met.

A correction to their misleading descriptions is needed. Binsted Woods comprise 100 hectares/250 acres of mainly oak and ash semi-natural woodland, now located entirely within the South Downs National Park, and unchanged in character for hundreds of years. Their importance has been recognised in a planning decision at the highest level. In a report conducted for comparison of previous A27 offline bypass proposals in 1992, very similar to those now being compared, the study for the then Department of Transport by the Environmental Assessment Unit of Liverpool University Limited stated that Binsted Woods are 'nationally important', and that their 'destruction or fragmentation' would 'substantially damage their national importance'. Binsted Woods have not changed since that 1992 report.[3]

[3] Environmental Assessment Unit of Liverpool University Limited, 'The Binsted Wood Complex: A brief appraisal of its conservation value and context', 1992. The 1992 report by EAULUL and the 1993 decision based on it must be known to Highways England, since the consultation brochure summarises the 1993 decision. They have seen fit to obscure or ignore the conclusions of the consultants' report, which are highly relevant in evaluating the damage caused by Option 5A.

Figure 1: Ordnance Survey map of 1880 with Binsted Parish highlighted. North of what is now the A27, and east of the Parish boundary, much of the woodland has become plantation woodland. The remaining semi-natural broadleaved woodland of Binsted Woods, together with the rest of Binsted, form a unique landscape area, very rich in wildlife.



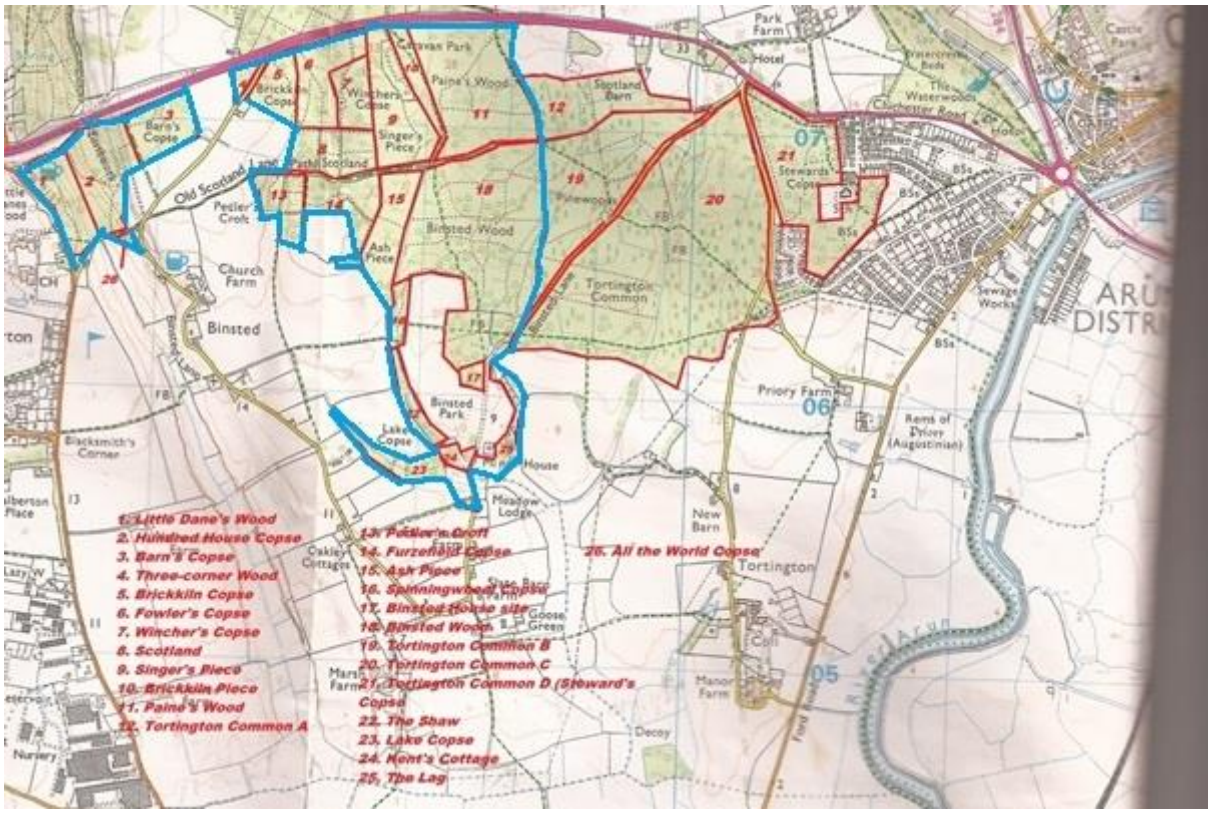
Binsted Woods comprises twenty woodland compartments, all of which consist of high quality semi-natural broadleaved woodland, with many 300-year-old trees and unusually varied woodland species. Some compartments do not meet the limited regulatory definition of 'Ancient Woodland'. But the entirety of Binsted Woods qualifies as Ancient Semi-Natural Woodland as far as its ecology is concerned – this was stated specifically in the 1992 report. In other words, they are just as species-rich as the designated Ancient Woodland areas which surround them.

As a unified area of woodland, Binsted Woods are of historic importance. They are integrated into the landscape. Within the old Binsted Parish, and south of the A27, the woodland of Binsted Woods is still a unified area of high-quality, broadleaved, semi-natural woodland as it was in 1880 – see the map at Figure 1 above. To the east, the woodland now changes to recovering conifer plantation on the Parish boundary. To the north it is now intensively managed plantation. Some compartments of Binsted Woods shown on the 1880 map as wood pasture have regrown as broadleaved semi-natural woodland, and are now just as ecologically rich as the Ancient Woodland which surrounds

them. More woodland has grown in the wet valleys with chalk streams enclosing Binsted Park – again, it is just as ecologically rich as the Ancient Woodland it adjoins. Together with the chalk streams it forms an irreplaceable habitat.

Binsted's Ancient Woodland flora are famous and people come every year to see the sheets of bluebells and thousands of orchids, mixed with wood anemones, stitchwort, native daffodils and fritillaries. The woodland edge areas at Binsted Woods are some of their best areas for wildlife, and also provide great opportunities for encounters with wildlife for walkers and residents. You are likely to see deer in the fields, hares have been seen recently, and butterflies are very abundant in the summer in the sunny woodland edge habitats.

Figure 2. Binsted Woods – outlined in blue – with copse names



The high-quality habitat of Binsted Woods may be contrasted with the recovering conifer plantation woodland at Tortington Common to the east. This contrast supported the 1993 Preferred Route choice of what is now Option 3, and protected the entirety of Binsted Woods well before they were incorporated into the National Park. Although the conifer woodland is regenerating, and the whole woodland area can now be seen as nationally important, this should not lead to the downgrading of Binsted Woods. Rather, the new situation adds to the arguments for not putting a bypass through any part of this woodland area at all, or its vital connected countryside.

The 1992 consultants' report considered that 'destruction or fragmentation' would 'substantially damage' the 'national importance' of Binsted Woods. Binsted Woods would be seriously damaged by Option 5A by through fragmentation as well as destruction. Approximately 20 hectares of prime quality, broadleaved Ancient Woodland would be cut off from the rest by Option 5A. These are

Little Dane's Wood and the remains of Hundred House Copse at the north end of Option 5A, and Lake Copse and the remains of The Shaw and The Lag at the south end. These areas of Binsted Woods are some of the richest in terms of wildlife. The damage to Binsted's very rich biodiversity, newly revealed by the surveys commissioned by the Mid Arun Valley Environmental Survey group (MAVES) especially in the last two years, would be great and irreversible.

The areas of Binsted Woods not cut off by Option 5A from the main block of the woods would be degraded. Approximately 15 hectares of prime quality broad-leaved woodland would be within 200m from Option 5A and would suffer from lights, noise, air pollution, road-kill, run-off, and changes to water levels.

Together with the assumed 6 hectares of woodland taken for Option 5A, and the 20 hectares cut off by the road, this gives a baseline figure of 41 hectares of Binsted Woods – nearly half their area - which would be severely affected by Option 5A. Option 5A would cut off the majority of dispersal routes for wildlife to the wider countryside to the south, fragment several areas of woodland some of which are humid and damp and support rare inverts and fungi, and have a negative impact on protected species.

2. Deficiencies in Highways England's consultation materials

This damage could not be deduced from the Highways England consultation materials, since the true character and importance of Binsted Woods are never made clear, and on many of their maps parts of Binsted Woods are not shown as woodland at all. Areas not designated as Ancient Woodland, in the limited regulatory definition, are simply left out. Highways England's consultation materials have, as a result, seriously misled consultation respondents.

See ABNC Evidence C3 for a consultant's major report on the damage that Option 5A would do, based on the new information from MAVES's surveys in the period 2015 to 2017, not used by Highways England, and ABNC Evidence C4 for a detailed critique of the shortcomings of the Highways England ecological reports According to the consultant's reports both options 5A and 3 would require green bridges to allow some wildlife to move through the landscape, but it is difficult to see how that would be possible with Option 5A, which would be on a 7 to 9 metre high embankment through Binsted Park and its surrounding woodland.

The purpose of Highways England's Preliminary Ecological Appraisal is stated to be to provide detailed baseline information on habitats and ecological features. This should have enabled Highways England's surveyors to assess the potential for habitats for protected species, identify potential ecological constraints and requirements for further surveys and mitigation. However, Highways England's failure to adequately perform the Phase 1 survey for the Option 5A route woefully underestimates the effect of this option on the area's biodiversity and wildlife.

Highways England's Ecological Impact Study is very superficial, makes incorrect statements, and does not give a true picture of the biodiversity in the area of Option 5A. As an example, the Study says no badgers were found – but the critique at ABNC Evidence C4 shows that the area is actually at saturation point for badgers with several major setts.

Below: badger diggings and badger latrine at the north end of Spinningwheel Copse, near the route of Option 5A

3. MAVES' surveys and some of its discoveries

The Mid Arun Valley Environmental Survey group (MAVES) formed in 2015 after it became apparent that the local area (from Binsted to the river Arun) had been under-surveyed in comparison with the area north of the A27, and that some of the wildlife records at the Sussex Biodiversity Record Centre have grid references that are inaccurate. MAVES' primary purpose is to collate documented data and to update that data through ecological field surveys. A few notable discoveries are given here. For full information see the consultant's report at ABNC Evidence C3.

a) Dormouse surveys

The Binsted Woods Complex LWA as a whole, including the nearby copses and shaws, contains approximately 300 dormouse monitoring boxes in four monitoring sites (Ash Piece, Paines Wood, and Lake Copse within Binsted Woods, and Noor Wood on Tortington Common) which are part of the National Dormouse Monitoring Programme (NDMP). They are monitored regularly and the records logged in accordance with the guidelines set by the People's Protection for Endangered Species (PTES) and Natural England. As a result MAVES' licensed dormouse handler has been able to provide practical training for students and ecologists to achieve their own dormouse handling licences. Continuing dormouse surveys have identified a new NDMP site which will be set up in 2018.

b) Bat surveys

MAVES bat surveys of 2016 and 2017 have been conducted by a leading professional UK authority on the species, who has recorded and trapped 13 different species, including 2 red listed Annex II species: Bechstein and Barbastelle. A data deficient species, Alcothoe, has also been trapped in the area. Trapping and radio tagging has identified roost sites widespread in the Binsted Woods Complex and surrounding copses and shaws, and demonstrates that bats forage widely across the

woods and their fringes in the area. The reports from 2016 and 2017 are available on MAVES' website, www.maves.org.

The UK supports only 17 species of bat. To find 13 of those species in inevitably brief surveys in the Binsted Woods Complex reflects Binsted's important wildlife habitat. The Highways England Environmental Impact Study reported only 5 species of bat in the Option 5A area, and even these are inferred from records in neighbouring areas such as Slindon, Poling and Arundel Castle, rather than using the professional MAVES study.

c) Mosses, invertebrates and beetles

Other professional surveys commissioned by MAVES include mosses, invertebrates and beetles. Notable results from 2016 and 2017 surveys include:

- Surveys in Binsted Rife, Lake Copse and Binsted Park revealed 61 species of moss and liverwort including three species listed on the Sussex Rare Species Inventory.
- A beetle survey of just two hedgerows and a linear arm of Lake Copse found 230 beetle species, including one Red Data Book species and eleven Nationally Scarce species – each location produced a beetle not previously recorded in Sussex.
- A general invertebrate survey in Binsted including footpaths 342, 338, 354 and Binsted Park recorded 249 species, including three Section 41 species (NERC 2006) and an additional nine nationally scarce species. Three of these species are also Red Data Book species. A further three species are listed on the Sussex Rare Species Inventory.

d) Rare bumble bee

The Section 41 Bumblebee species *Bombus ruderatus* was recorded along the newly-created hedgerow on footpath 354. This is the first record for this species that the surveyors are aware of in this part of West Sussex since the early 20th Century.

e) Harvest mice

A good population of Harvest Mice were found in just one section of a small field. Similar habitat is available in other areas with no barriers to dispersal and therefore the population is likely to be healthy. Further surveys are planned in 2018.

4. Effect of Option 5A on plant species and chalk streams

On the plant life of the area which would be affected by Option 5A, the consultants Wildlife Splash provided the following summary. 'Option 5A cuts through several narrow ancient wooded shaws that are packed with Ancient Woodland Indicator species (AWI's). It cuts through The Lag, an area of mature woodland (formerly classed as wood pasture), with scattered mature and veteran Oaks *Quercus robur* and a Hazel *Corylus avellana* understorey. The field layer is rich with AWI's such as

Butcher's-broom *Ruscus aculeatus*, Pignut *Conopodium majus*, Bluebells *Hyacinthoides non-scripta*, Primroses *Primula vulgaris* and Wood Speedwell *Veronica montana*. This gives way to wet flushes with localised willow growth around a braided stream.

'The next arm of woodland is The Shaw, much of which is Ancient Woodland, with numerous veteran Oak trees above Hazel coppice. The ground flora is rich and varied due its antiquity and the presence of a stream. AWI's are throughout with species such as Moschatel *Adoxa moschatellina*, Wood Speedwell and Hairy Wood-rush *Luzula pilosa*. Fritillaries *Fritillaria meleagris*, listed on the IUCN Red List as Vulnerable and also on the Sussex Rare Species Inventory (SxRSI), are growing at the north end of The Shaw. The uncommon Southern Wood-rush *Luzula forsteri* also grows in this area.

'Option 5A then cuts across arable field margins that have stands of Common Spotted-orchids *Dactylorhiza fuchsia,* and through the Copythorn Field west hedge which has over 100 non-woody species along the hedge-banks ranging from woodland to meadow species such as Sweet Violet *Viola odorata*, Wood Avens *Geum urbanum*, Perforate St. John's-wort *Hypericum perforatum* and Field Forget-me-not *Myosotis arvensis*.

'A major junction is proposed in Hundred House Copse and Little Danes Wood. This is an area of Oak and Ash *Fraxinus excelsior* woodland with numerous AWI's such as Bluebells, Opposite-leaved Golden-saxifrage *Chrysosplenium oppositifolium*, Wood Spurge *Euphorbia amygdaloides* and Wood Sedge *Carex sylvatica*. A chalk stream flows through the centre (Binsted Rife) and chalk springs have produced wet flushes with pockets of wet woodland, or Alder Carr *Alnus glutinosa*. In these areas the field layer is rich in flowering plants with hundreds of Early-purple Orchids *Orchis mascula*, Water Mint *Mentha aquatica*, Lesser Celandine *Ficaria verna*, Bittersweet *Solanum dulcamara* and woodland ferns of damp conditions such as Narrow Buckler Fern *Dryopteris Carthusiana*. Less common bryophytes also occur such as the frilly-leaved Woollywort *Trichocolea tomentella* (more common in the wetter west) and Flat Neckera *Neckera complanata,* a species of base rich conditons.

'The road would interfere with an irreplacable chalk stream network which feeds Binsted Rife and The Shaw. Binsted Rife is a chalk stream with species indicative of calcareous conditions such as Fan-leaved Water-crowfoot *Ranunculus circinatus*, which is declining throughout its range, Flowering-rush *Butomus umbellatus* and Mare`s-tail *Hippuris vulgaris*. The surrounding habitat is mosaic of fen and swamp habitat with uncommon species such as Whorl-grass *Catabrosa aquatica*, Blunt-flowered Rush *Juncus subnodulosus* and Fen Bedstraw *Galium Uliginosum*, all of which are listed on the Sussex Rare Species Inventory.

'This chalk stream network also flows into Lake Copse, an area of Ancient Woodland with a very rich ground flora. Species include Wood Anenome *Anenome nemorosa*, Hairy Brome *Bramopsis ramosa*, Giant Fescue *Schedonorus giganteus* and Bluebell *Hyacinthoides non-scripta* (all AWI's). There are also species associated with the stream and stream-fed ponds such as Yellow Iris *Iris pseudacorus*, Water Figwort *Scrophularia auriculata* and Pendulous Sedge *Carex pendula*.

'Option 5A, by crossing The Lag and The Shaw, would also interfere with these two streams. The stream through the Shaw feeds a pond at the southern end and the stream through the Lag feeds into Tortington Rife. Both have a good diversity of wetland which includes Frogbit *Hydrocharis*

morsus-ranae (IUCN Red List VU and SxRSI), which is also found in Binsted Rife, and Celery-leaved Buttercup *Ranunculus Sceleratus.*'

Binsted's chalk streams are part of a rare habitat described on the website of the Sussex Wildlife Trust: 'England has most of the chalk rivers in Europe. There are only around 35 chalk rivers between 20 to 90 km long in the whole of the UK. Chalk geology is rare worldwide. The Sussex chalk rivers and streams are therefore of global importance.'[4]

Conclusion

The area Option 5A would pass through is very rich in different species of wildlife and plant life – far richer than Highways England's misleading information, out-of-date desk study and inadequate field survey would suggest. Option 5A would be directly contrary to the National Park's Purpose 1, 'To conserve and enhance the natural beauty, wildlife and cultural heritage of the area'. It would seriously damage the National Park's Special Quality 3, which is 'a rich variety of wildlife and habitats' – amply supplied by the broad-leaved woodland of Binsted Woods, its outlying shaws and copses, and the linked countryside to the south and west.

[4] https://sussexwildlifetrust.org.uk/discover/around-sussex/wetland-habitats/chalk-streams.

Chapter 3 Impact on views into and out of the South Downs National Park (Special Quality 1, Purpose 1 and 2)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 1 is 'Diverse, inspirational landscapes and breathtaking views'. Purpose 1 includes 'To conserve and enhance the natural beauty…of the area'. Option 5A would seriously damage Special Quality 1, be contrary to Purpose 1 by its effect on the landscape, and be contrary to Purpose 2 by its effect on people's enjoyment of that landscape.

1. Binsted's landscapes

Binsted's landscapes are diverse, since they include not only the 100-ha semi-natural woodland of Binsted Woods, but the intricate links of their outlying copses with the countryside via hedges and shaws, streams and ditches, ancient sentinel trees and newly planted tree rows. Ten of the fields linked to the woods are included in the National Park.

They are inspirational: Michael Wishart's comment in his memoir *High Diver* (1977) that the entrance [on FP 342] into Binsted Park was a 'grand, upward slope, dotted with ancient trees', was followed by the comment 'Binsted Park epitomised the vanishing England of my youth'. It has not vanished yet. He mentioned hares moving through the silver grass: hares have recently been seen in Binsted very near Binsted Park.

The landscape of Binsted has also inspired the Binsted Arts Festival (2016, 2017, with 2018 planned), which includes a poetry competition related to aspects of the landscape. In 2016 the Festival included a walk 'The art and literature of Binsted Woods', with readings from other writers who have been inspired by Binsted – including the poet and memoirist Laurie Lee and the memoirist Luke Jennings.

The land form adds more diversity: the gentle slopes of Binsted's central fields – crossed by Option 5A, and mostly within the National Park – show that Binsted is on the lowest slopes of the dip slope of the Downs. While the scale of Binsted's landscape is intimate, the huge size and presence of Binsted Woods can be breathtaking, depending on the weather, the crops being grown, and the way you move towards and through them. If you are in the open fields of central Binsted the woods fill the horizon to the north-west, north and east, suggesting three quarters of a circle of woodland enclosing the walker.

This section shows some inspiring views available from Public Footpaths and lanes in Binsted, into and out of the National Park, and how they would be altered or disappear if Option 5A was built. The numbered viewpoints are shown on the accompanying map (see end of Chapter). All the photos are recent. Road outlines are approximate.

1. **Viewpoint 1: looking north-west from Binsted Lane East through Binsted Park. View within the National Park.**

Option 5A would cross the photo from left to right, on a 7-metre embankment, between the huge oak tree and Binsted Manor. The view of Binsted Park would be replaced by a view of Option 5A.

2. **Viewpoint 2: looking south from FP 342 on the north side of Binsted Park (with zoom). View within the National Park.**

Option 5A would be on a 9-metre-high embankment here where it crosses from Binsted Park over the small wooded stream valley, The Shaw. The view of Binsted Park would be replaced by a view of Option 5A.

3. Viewpoint 3: view from the Waymarker, where Footpaths 342 and 341 intersect, east towards Binsted Woods (with zoom). View within the National Park.

Footpath 342 as it approaches Binsted Woods runs alongside a new hedge, including new young trees, planted in 2005 by Walberton and Binsted volunteers to give shelter and better wildlife connections. The hedge included many new young trees to be left to grow up as 'hedge trees' to replace the hundreds of elms in hedges lost in Binsted in the 1960s. The hedge has already been laid once and the first third has been laid again in the winter of 2016-17.

The hedge was laid soon after planting and one-third of it (not in photo) was laid again in winter 2016-17, by MAVES volunteers with the assistance of National Park rangers.

Option 5A passes through the hedge on an embankment. Footpath 342 would be diverted and the new plantings lost. The view of Binsted Woods would be replaced by a view of Option 5A.

This planting, together with the new trees along Copythorn West Hedge, and the new hedge along Scotland Lane (planted in 2005 and laid in 2015 and 2016 by local volunteers and rangers), is a symbol of the pride the village of Binsted and the parish of Walberton feel about their surroundings and the care taken to improve them. All three plantings would be destroyed by Option 5A.

4. **Viewpoint 4: from Footpath 341, between the Waymarker and the woods, looking north towards Binsted Woods. View within the National Park.**

Footpath 341 would be cut off or diverted by Option 5A. Part of Copythorn West Hedge (the National Park boundary), which has over 20 Ancient Woodland indicator species, suggesting it is the remains of an old shaw, would be lost. The new young trees planted along Copythorn West Hedge in 2005 by Walberton and Binsted volunteers would be lost.

A nearer view of the same view, with a family from Bognor, who now come to walk in Binsted four times a week, standing on the point where Option 5A would pass through Copythorn field and cut off the footpath. This view would be replaced by a view of Option 5A.

5. Viewpoint 5: looking south-east from Scotland Lane as it approaches Binsted Woods. View into the National Park.

The stark outline of the gasometer at Littlehampton, just visible in the distance, emphasises the rural nature of the rest of the view, and the size of Binsted Woods, which at this point surround the viewer in three-quarters of a circle. The southward slope of the land towards the sea is a reminder that the old parish of Binsted is a peninsula extending into the marshy coastal plain.

Viewpoint 5 would disappear as Option 5A cuts through Scotland Lane.

6. Viewpoint 6: looking south in Binsted Lane (West) near the A27.

The avenue of trees, with Ancient Woodland indicator species, is probably the remains of an old shaw. It gives the atmosphere of the National Park as soon as you leave the A27. View within the National Park.

Option 5A would cut through this avenue of trees from left to right of the photo. At this point Binsted Lane would be on an overbridge. The avenue of trees would be lost.

7. Viewpoint 7: looking north from FP 341 as you cross the footbridge next to Binsted Nursery. View within the National Park.

In the first of the two photos above, more of the new hedge (2005) mentioned in 3 above can be seen, with the first section, recently laid, looking lower than the rest. The midpoint of Option 5A, on an embankment, is close to the midpoint of the hedge. Beyond is part of Binsted Woods.

Option 5A would cross both fields in the photo and replace views of Binsted Woods from FP 341 with views of Option 5A on an embankment.

8. Viewpoint 8. View east from Binsted Lane near St Mary's Church, across fields into the National Park.

The hedge with the row of young trees, visible crossing the photograph, is the National Park boundary.

Option 5A would cross the field beyond that hedge on an embankment. The view of Binsted Woods would be replaced by a view of Option 5A.

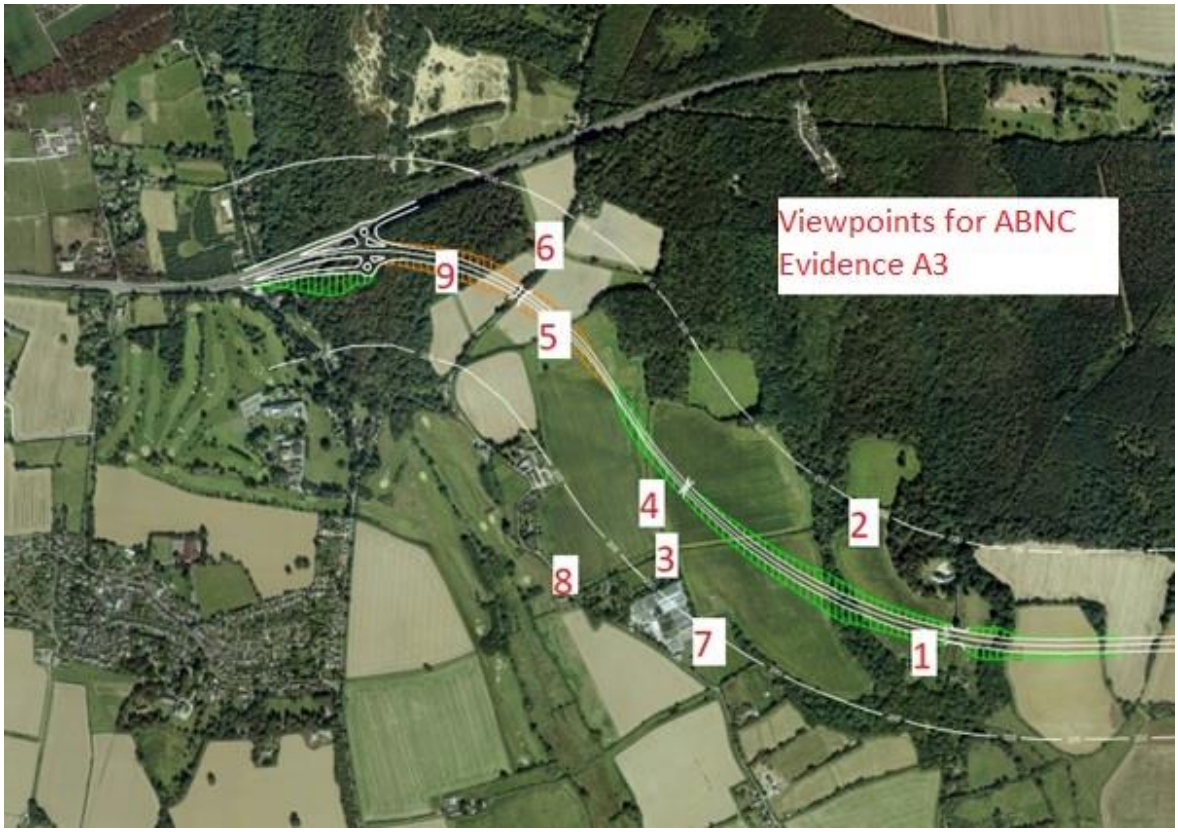
9. Viewpoint 9. View from FP 336 (a bridleway) looking west.

This photo shows the view from the top of the Iron Age earthwork in Hundred House copse, which runs next to the Bridleway. One of the Ratpack Archers archery club's home-made targets can be seen in the shape of bees hanging from a tree. Below: the earthwork seen from below, again with the bee targets, to show its massive size.

The earthwork in Hundred House Copse is part of War Dyke, a late Iron Age bank and ditch which goes from the river Arun to the top of the Downs, then south through Binsted to Little Tortington Stream, enclosing an area thought to have been used for trading with the Romans.

Option 5A would destroy part of Hundred House Copse and most of the Iron Age earthwork south of the A27. Its massive proportions, and the fact that it is a double earthwork through much of Hundred House Copse, could no longer be seen. The bridleway, already cut by the A27, would disappear.

Conclusion: Option 5A would cause a major loss of inspirational views within, out of, and into the South Downs National Park.



Chapter 4 Impact of Option 5A on tranquil and unspoilt places (Special Quality 2, Purposes 1 and 2)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 2 is 'Tranquil and unspoilt places'; Purpose 1 is 'To conserve and enhance the natural beauty, wildlife and cultural heritage of the area'.

Binsted as a whole – roughly corresponding to the historic parish of Binsted – is a tranquil and unspoilt place, yet having many places with public access to which visitors come to enjoy the special qualities of this woodland edge of the South Downs National Park. The dualling of the A27 and the building of an embankment across the Binsted Rife Valley, which took place in 1970, cut off the northern 'triangle' of the parish and severed the parish from Slindon, with which it had historic links, such as children from Binsted walking to school in Slindon. But the remaining part of Binsted parish still feels unified and protected from the noise and traffic of the A27, because of

- the large size, density and enclosing shape of Binsted Woods,
- the intimate connection between Binsted Woods and the countryside at Binsted, and
- Binsted's geographical isolation on three sides by brooks and a deep valley.

If Option 5A went ahead, Binsted (the tranquil and unspoilt place) would no longer be protected by Binsted Woods; the intimate connection between woods and countryside would be lost; and instead of feeling unified and isolated, Binsted (the place) would be split in two by a dual carriageway.

People living in Binsted can enjoy this tranquillity and natural beauty all the time and therefore would be most affected by their loss. But the many visitors who come to enjoy those qualities would be affected too, and such visits are part of Purpose 2 of the South Downs National Park. This Chapter lists the main places with public access in Binsted where its tranquillity and unspoilt character can be enjoyed by visitors.

1. The Madonna Pond (also called Binsted Pond)

The Madonna Pond is within the National Park. It is one of the three ornamental ponds created as part of Binsted Park about 1800 by the owners of Binsted House. They dammed the stream that flows south through Binsted Woods, and created three ponds. Binsted House has now been replaced by a modern house near the pond, Binsted Manor. The northern pond is now hidden in the woods and the southern one is dry, but the central one, next to the un-made-up track section of Binsted Lane East, remains and is a much-loved beauty spot. A discreet bench made out of a large log, near the statue of the Madonna, put up by Walberton and Binsted volunteers, is used by visitors to contemplate the pond or eat picnics.

The statue of the Madonna was put up by Lorna Wishart, a Catholic, in memory of her mother in 1952. Originally it was a statue carved by herself, but was soon replaced by a plaster statue which was bricked in for safety. People sometimes leave flowers by the statue, or in the grill enclosing it. For some it is a place of pilgrimage, as can be seen from the label added to it on Google Earth, 'Something holy in the woods'.

Sheltered by the entire bulk of Binsted Woods from the noise of the A27, the Madonna Pond is a very unusual 'tranquil and unspoilt place'. The classic memoir by Luke Jennings, *Blood Knots: A Memoir of Fathers, Friendship and Fishing* (Atlantic Books, 2010, now published by Penguin), contains a dramatic scene in which the author describes how he nearly caught an enormous carp at the Madonna Pond during his 1960s childhood.

The Pond is also the source of many legends and ghost stories, known not just to Binsted villagers but to many others with a distant connection with the village. It is supposed to be bottomless; a coach and horses once drove into it and was never seen again; 'ghosts' in tall hats were seen near the ruins of the old Binsted House, beside the Pond, as it gradually became dilapidated in the decades following the 1940s. The ruins were a favourite place for children to play. There is a rumour of people having been killed during some religious conflict and hung in the trees.

The Pond would be cut off from the rest of the village by Option 5A. Its peace and tranquillity would be replaced by the roar of a dual carriageway on a high embankment less than 200m away.

2. Binsted Park south

Binsted Park is within the National Park. The south end of it can be seen and enjoyed from the un-made-up track, Binsted Lane East, running across the southern part. Cyclists on a regular route through here have to push the bike at this point. One regular user has told us that she always stops here to listen to the birds. It is a tranquil and unspoilt place.

Binsted Park was a favourite haunt of the amateur artist W.S.Rogers, hundreds of whose drawings of the area – made in the 1930s and 40s – are archived in the West Sussex Record Office. He came back to the Park again and again, drawing it mainly in the evening. The WSRO think that he was a solicitor's clerk who drew in the evenings after office hours.

Option 5A would completely destroy Binsted Park. The road line is shown on Highways England maps as 'passing through' the Park, on a 7 to 9 metre high embankment. On Highways England's video, a very wide embankment is shown (wider than on the exhibition maps), filling the Park, and two of the three houses in the Park would disappear under it. The remaining one – Binsted Manor – would have a 'balancing pond' for the new road in its garden.

Notably, Highways England's consultation materials have wrongly identified the Park. A viewpoint photo captioned 'Binsted Park' is of a metalled road entirely elsewhere, on Tortington Common. Other errors have stemmed from this such as a table stating that Binsted Park is 'outside' the scheme area. The name 'Binsted Park Ancient Woodland' (a fictitious entity) is used in places instead of 'Tortington Common'. See ABNC Evidence B for more details.

The south end of Binsted Park, showing the un-made-up access track (on the right, with many puddles) which means Binsted Lane is a 'no through road', keeping the Park a 'tranquil and unspoilt place'. Also shows young oak and ash trees planted by Walberton and Binsted volunteers in 2005 to take over from the enormous old oaks in the Park.

The Read family of Binsted House (seen in the background) enjoying their Park in about 1870. A descendant of the family still lives in Binsted Park and has a large archive of old photos showing them in the Park in various eras.

A drawing by W.S.Rogers titled 'Harvest in Binsted Park, July 27 1943'. View of the central curve of the Park from the north.

3. Binsted Park north

Footpath 342, which starts at Binsted Church, passes through the north end of Binsted Park. The gentle southward slope of the land gives a good view of the Park and its curving shape. Artist Michael Wishart wrote in his memoir *High Diver* (1977) of entering the Park along this path, that it was 'a grand, upward slope, dotted with ancient trees'. He said Binsted Park 'epitomised the vanishing England of my youth'.

The landmark ancient pollarded oak on the north edge of Binsted Park. It may date back to the time when this part of Binsted Park was known as Binsted Common before it was enclosed (c. 1800). Footpath 342 passes it on the way into the main block of Binsted Woods.

Deer seen from Footpath 342, crossing Binsted Park on the line of Option 5A.

Two more ancient oaks in the field called Broad Green (a Mediaeval assart taken from Arundel Forest), adjacent to the north edge of Binsted Park, visible from Footpath 342.

The north end of Binsted Park is a 'tranquil and unspoilt place'. Even if the footpath remained (the Option 5A plan changes its location) its tranquillity would be gone and the view to the south at this point would be of a dual carriageway on an embankment.

4. Footpath 342

Footpath 342 is a much-used route from Binsted Church to Binsted Woods. The section of it within the National Park was improved with a new hedge along most of its length planted by Binsted and Walberton volunteers in a parish-wide planting scheme in 2005.


Left: a third of the hedge, planted in 2005, along Footpath 342 was re-laid in winter 2016-17; right, the flourishing hedge and some of the new young trees, as you approach Binsted Woods. The hedge is within the National Park and in the path of Option 5A.

Footpath 342 as it approaches Binsted Woods is a tranquil and unspoilt place. It is directly in the path of Option 5A which would destroy the Footpath and the flourishing young hedge. Its tranquillity would be destroyed even if access was maintained by a diversion.

5. The Waymarker

The point where Footpaths 342 and 341 cross, on the boundary of the National Park, is a good place to sit and contemplate the tranquil, unspoilt rural surroundings and the view of Binsted Woods, which completely fill the skyline.

A good place to contemplate the beauty of the National Park: Binsted's Waymarker sculpture and bench, on the National Park boundary, at the crossing of FPs 341 and 342. The view would be replaced by a view of Option 5A.

A bench has been on this corner, available to the public, for 12 years and was recently joined by a piece of new public art, the Binsted Waymarker, a sculpture by Janine Creaye.

The waymarker's imagery includes animal and plant species found in the Binsted area (badgers, dormice, bumble bees, bryony, cornflower) and images of mythical beasts known as Knuckers. These were said to live in 'Knucker holes', small circular natural ponds on the coastal plain always full

of water and said to be bottomless. There is a 'Knucker hole' at Lyminster and another at Binsted, to the south beside the footpath from southern Binsted (Hoe Lane) to Tortington.

6. Scotland Lane

Scotland Lane, a mediaeval track from Binsted to Arundel more fully described in Chapter 7 (Impact on Historic Tracks and Footpaths, with map), is a tranquil and unspoilt place all along its length. It is used by the public both on foot and on horseback. The section through Binsted Woods and Tortington Common is within the National Park. The section approaching the woods from Binsted Lane (West) forms the boundary of the National Park.

Scotland Lane as it approaches Binsted Woods. View east from Scotland Lane near Binsted Lane (West).

Horses using Scotland Lane, which is also a bridleway. View north from Footpath 342.

Scotland Lane is now thought to be the main access track from the east to the newly identified Anglo-Saxon Moot Mound at Hundred House Copse. If you start from the Binsted Lane West end (where there is a small amount of parking), Scotland Lane starts with tree cover (including a very fruitful bullace tree) but then opens out to a sunny track leading towards Binsted Woods. This section is very good for observing flowers and butterflies in the summer. It then leads through the woods all the way to Arundel. From the section outside the woods, there are good views to the south over gently sloping land.

Scotland Lane would be cut in two by Option 5A and partially destroyed. Access would be diverted. The tranquil and unspoilt nature of the Lane would be destroyed.

7. Binsted Lane

Binsted Lane, starting at the A27 (at the Binsted turn-off) as Binsted Lane West, loops south then east round the settlement of Binsted, and eventually back through Binsted Park to the A27, becoming Binsted Lane East after it has been through Binsted Park. It has an un-made-up section in Binsted Park with deep potholes so it is a no through road for cars, and is signed as such at both ends – where it leaves the A27 at the west end, and where it diverges from Tortington Lane at the east end.

This means the whole lane, not just the two sections within the National Park, is 'tranquil and unspoilt'. It is a rural lane with scattered farmsteads and houses. There is little traffic, except for some traffic due to the Binsted Nursery site (near St Mary's Church) and Dave Chandler's agricultural machinery business. Meeting a tractor round the many bends of Binsted Lane is an added deterrent to traffic.

Horses in Binsted Lane just south of Oakley's Barn. All sections of Binsted Lane are peaceful and tranquil.

8. The Strawberry Fair field and Footpath 341

Aerial photo showing Binsted's 2016 Strawberry Fair just packing up. Option 5A would pass through the field to the left of the parking field, and Binsted Park, visible beyond it.

The peaceful and tranquil countryside of Binsted is part of the attraction which brings 1000 members of the public on a summer afternoon every year and raises funds for charity and for the fabric of St Mary's Church. It has raised over £100,000 in 30 years. If Option 5A was built the Fair would cease. A Public Footpath (341) forms the National Park boundary beside Binsted Nursery. The National Park boundary continues along two sides of the left-hand parking field shown.

9. St Mary's Church

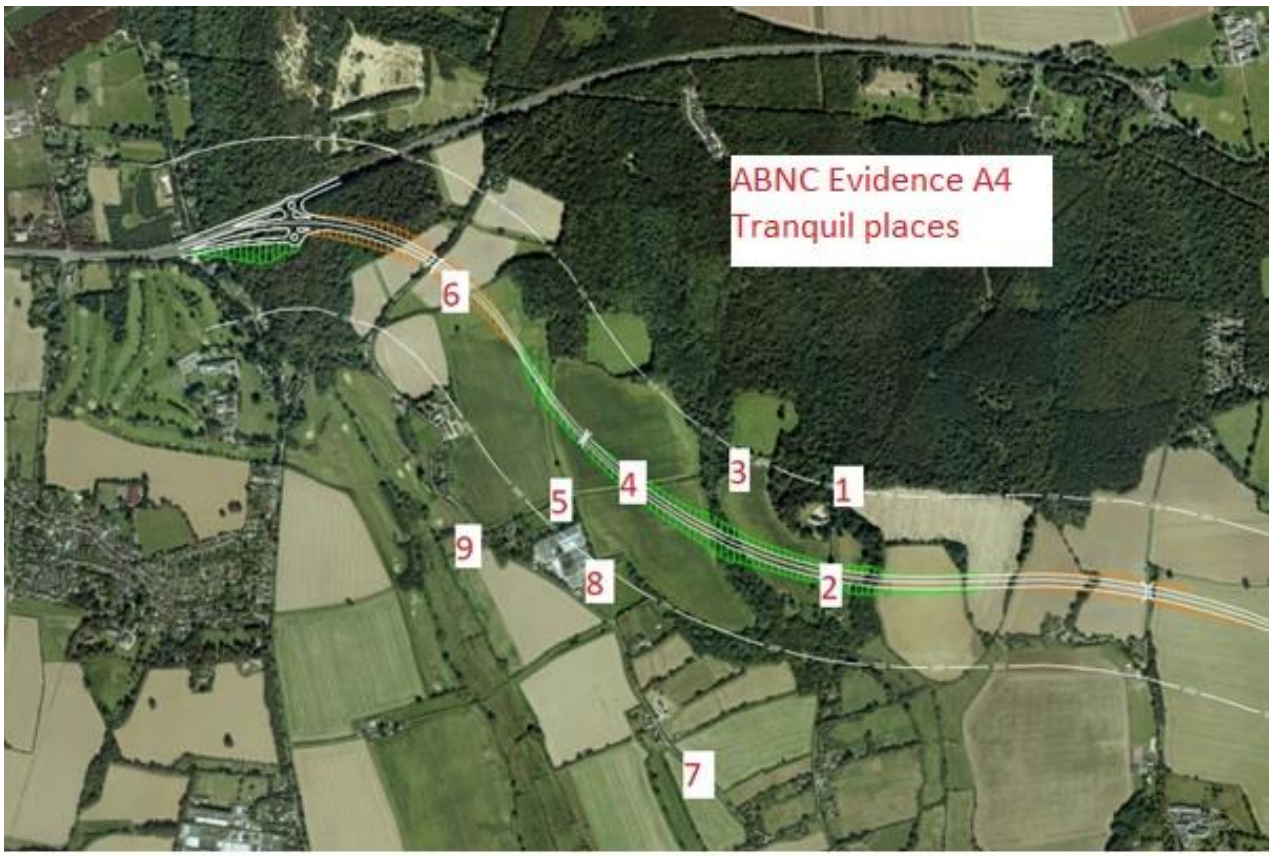
St Mary's Church, Binsted, is much valued for its peace and tranquillity. Its small but loyal congregation come to a service there once a month, and on Harvest, Christmas and Easter celebrations it is full. The Binsted Arts Festival uses it as a venue that seats 50-60 people.

St Mary's Church is 475m from Option 5A across open fields. This would ruin its setting and the congregation would disperse, probably leading to the church being declared redundant.

The Binsted Arts Festival would be likely to cease if Option 5A was built. The Arts Festival includes walks in Binsted which would no longer be pleasant if Option 5A was built. The beauty of Binsted's countryside is part of the attraction, and Binsted would no longer be beautiful. The community which organises the Arts Festival would disperse and the Arts Festival would cease.

Conclusion

Because of its effect on all these 'tranquil and unspoilt' places, and indeed on the rest of Binsted's landscape not listed here, Option 5A would be extremely damaging to Special Quality 2. It would not 'conserve and enhance' the natural beauty of Binsted's landscape and therefore would be against Purpose 1. It would take away the opportunities to 'enjoy' the Special Qualities of the National Park that at present exist at Binsted, freely available to the public, so would be against Purpose 2.



Chapter 5 Impact on homes and businesses (Special Quality 4 and National Park Duty)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 4 is 'An environment shaped by centuries of farming and embracing new enterprise'. Option 5A would seriously damage this Special Quality at Binsted.

Option 5A would also be contrary to the National Park Duty, 'To seek to foster the social and economic wellbeing of the local communities within the National Park in pursuit of our Purposes'.

1. Impact of Option 5A on homes in Binsted

'You don't see it. But you hear it, constantly. A raised road, four lanes, trucks, cars: it's tragic. A plague on this little place, under siege by a maddening local noise…Tranquillity is shrinking. People are forgetting what silence feels like.' This is a quotation from an article by the countryside writer Simon Ingram, writing in the Guardian on 28 August 2017.

His words about the small village of Wolthorpe-on-the-Hill, blighted by being next to the A1 in Cambridgeshire, would apply to Binsted village if Option 5A went ahead. Binsted's loss of 'tranquillity' would be especially 'tragic' because with its fields and woods, it is an area people come to from far and wide to enjoy its 'tranquillity', so not just the people living in the village, but many other people would be affected.

Visitors to Binsted might be able to find other areas further afield to enjoy 'tranquillity', but the inhabitants of Binsted would be trapped in their ruined village. Many would prefer to give up and move away rather than try to carry on surrounded by the remains of what was such a beautiful place. They would do this even though they would have to accept much lower prices for their property than they would have obtained before Option 5A.

Simon Ingram's words about the health effects of constant noise, quoted above about people working outside on the Binsted Nursery, point to another problem for many Binsted villagers. 'Noise might, should, be the next big environmental thing: it's blamed for learning disorders, hypertension, insomnia, dementia.' Some of Binsted's inhabitants are in poor health already – for instance, from strokes, Parkinsons' disease, and dementia. If they were also 'under siege' from 'maddening local noise', this would increase their problems.

The inhabitants of Binsted know they are very lucky to live in such a beautiful, historic place and do their utmost to share it with other people, through events such as the Strawberry Fair and the Binsted Arts Festival. If there was no beautiful, peaceful village landscape to share, these initiatives would cease. Organising these events is hard as people have to take time out of their busy lives, but

it is also rewarding because everyone knows each other and the events strengthen the social links between villagers. Once they ceased, the 'social wellbeing' (mentioned in the National Park 'Duty') of the village would be severely worsened.

The impact of Option 5A on listed buildings in Binsted is discussed in detail in Chapter 8. In order to appreciate the devastating effect on Binsted of Option 5A it is necessary to know the distance from the road of houses close to it that are not listed. These are:

1. Kent's Cottage, in Binsted Park, is 75 metres from Option 5A.
2. Manor House, in Binsted Park, is 70 metres from Option 5A.
3. Binsted Manor, in Binsted Park, is 75 metres from Option 5A.

These three houses, at present in a unique setting within the remnant parkland of the old Binsted House, are so close to the road that they would be severely blighted. Two of the houses belong to families active in many village groups. One belongs to someone whose family has lived in Binsted Park since the 1600s and who has a large archive of historic photos.

4. Foxes Cottages, three attached cottages near the A27 in Binsted Lane West, are 280 metres from Option 5A. Two families living there take part in helping with village events.
5. Ashurst/Glentham House, at the junction of Binsted Lane West with Hedgers Hill, is 225 metres from Option 5A. The smaller house in the Ashurst precinct is 275 metres from Option 5A.
6. Mill Ball, in Binsted Lane West near the barn where the Strawberry Fair is held, is 340 metres from Option 5A. The owners play a large part in organising village events.
7. The Old Rectory and Stable Cottage, two houses opposite St Mary's Church on the Rectory site, are 330 metres from Option 5A. The owners play a large part in organising village events.
8. Mount Pleasant, two cottages next to Church Farmhouse, are 330 metres from Option 5A.
9. The Black Horse pub is 300 metres from Option 5A.
10. St Mary's Church, God's house, is 475 metres from Option 5A.

The ten houses listed above as nos. 4-9 are separated from Option 5A by open fields. The impact of Option 5A on them would be very serious indeed – even in Highways England's terms, it would have a 'Very Large Adverse' effect.

These 13 houses, together with the 10 listed buildings discussed in Chapter 8, make up 23 of the 38 houses in Binsted. The other 15 houses would, like listed buildings Marsh Farm and Thatched Cottage, be further from the road, but would be adversely affected by losing their setting in the existing beautiful and historic village of Binsted, by the village's severance (four houses would remain cut off from the rest), and by the destruction of the village's peace and tranquillity, its landscape and its connection with the National Park.

2. Impact of Option 5A on businesses based in Binsted

Binsted is a good example of a formerly solely farming community, 'shaped by centuries of farming', partly within the National Park, which has diversified and 'embraced new enterprise' without compromising the character of the village and landscape, meeting National Park Special Quality 4.

Option 5A would badly affect the present fulfilment of Special Quality 4 by Binsted's businesses.

Option 5A would have a severe damaging impact on the two largest businesses in Binsted, Binsted Farms (with arable and pasture both within and without the National Park, and 250 acres of woodland within the National Park) and Binsted Nursery (with its Binsted site bordered by the National Park boundary). Smaller businesses would also be affected, including a pub, a kennels and planned holiday accommodation.

a) Binsted Farms Ltd

Harvesting in Glebe Field, Binsted

Luke Wishart, who farms most of the land in Binsted, wrote the following statement about how Option 5A would affect his farm. 'This farm amounts to about 1000 acres in total but this includes 250 acres of woodland. The farm is currently run as an arable unit with 650 acres in crops.

'The effect of the imposition of proposed route 5A on the farm will be very great. There would be a loss of 80-100 acres of valuable cropped land being about 15 per cent of the total cropped area. This would have a heavy impact on the profitability of the company.

'The severance of the small fields which would result from the imposition of 5A would add to our costs in transport, but also due to their small size would make some almost redundant for modern large-scale farming.

'Route 5A would cut across many field boundaries destroying many well-established hedges and leaving in its wake a number of small fields not suitable for large modern agricultural machinery. There will also be severance for much of the land east of the proposed route. The underpass

proposed for Binsted Lane (West) would be the only access to all the fields east of the 5A route and this is very much north of our present access.

'The proposed underpass on Binsted Lane (West) would have to be high enough to allow the passage of large combine harvesters which currently are about 15ft high and 9ft wide, but are expected to become larger in the future, to allow access to these isolated fields.

'All the above factors would have a bad effect on the future economic viability of this company and will jeopardise its long-term future. 'All this would be inevitable if this route (5A) was the only route for the bypass. However there are two other options which would avoid all the problems outlined above, and avoid all damage to this well-established farming unit.'

Option 5A's route runs through the 5 main agricultural fields in the centre of Binsted.

Copythorn field (north of FP 342), within National Park

Church Lane field (south of FP 342), within National Park

Glebe Field (west of FP 341), the field between Church Farmhouse and Option 5A

Foxes field (north of Scotland Lane), within National Park

Horse Meadow field (northeast of Hundred House Copse), within National Park

All these fields, the bulk of the farm, would be cut in two or have a substantial portion cut off. It is difficult to see how the farm would remain viable.

b) Binsted Nursery

Mike Tristram of Tristram Plants, who owns both Binsted Nursery and Walberton Nursery, with several sites in the area, wrote the following statement about Binsted Nursery.

'Binsted Nursery was started by two Binsted families to grow herbs and other garden plants in 1978. The Binsted Lane site is now a small part of its production, but a vital one because the young plants – without which half its £3m turnover would not happen – are propagated in a range of indoor and outdoor special facilities here. Construction dust and highway exhaust could therefore impact severely on this business, which employs up to 80 people every season.

'A severe impact on Binsted Nursery would impact badly also on the larger business groups of which it is an integral part, www.tristramplants.co.uk, and www.farplants.co.uk, and on its local suppliers. Option 5A poses a threat to this business, which would be worsened if the route came any further south. Binsted Nursery is a supporter of the Arundel A27 Forum and believes that Option 1, or a wide single version of it, would be sufficient improvement to meet the A27 transport needs and best value for money.'

Another impact would be the much more unpleasant working conditions for those working at Binsted Nursery. At present they are within a beautiful, quiet, unpolluted countryside area. If 5A went ahead, the nursery site would be under 200m from the road, subject to noise and pollution, which would affect people working outside (up to 20 people on this site during part of the season).

The change in working conditions might make it more difficult to recruit staff. The noise could have a deleterious effect on the workers' health. The article by Simon Ingram, quoted above, said of

Wolthorpe-on-the-Hill, a small village next to the A1: 'Noise might, should, be the next big environmental thing: it's blamed for learning disorders, hypertension, insomnia, dementia.'

c) Binsted Sheep Farm

Angie Teear has a small family shepherding business based in the fields around the Flint Barn, Binsted. It is here that she does her lambing and shearing, sleeping in a shepherd's hut or caravan overnight to do so. This is a physically stressful activity where every hour's sleep that can be snatched between lambings must be taken. It would become unsustainable with the noise of the A27 from Option 5A.

Some of Angie Teear's sheep next to the National Park boundary near Flint Barn, Binsted: Option 5A would go through the field behind the hedge on a high embankment

d) Binsted Holidays Business – on hold because of Option 5A

Flint Barn, Binsted, where village events are held including the Strawberry Fair and Harvest Supper, needs for its future maintenance some sustainable source of income in between these events. It has a commenced permission to be converted for holiday accommodation (which would still allow the village events to take place), as a 'new enterprise', diversification from Binsted Nursery. Works were however suspended, and cannot recommence until the Arundel A27 scheme is resolved with either Option 1 or Option 3.

Flint Barn, Binsted: since this picture was taken, the Barn now has new wooden doors making more events possible

The nascent holiday business on the edge of the National Park is blighted by Option 5A; it would not be viable if Binsted's tranquillity is destroyed. The owners have plans to expand the holiday opportunity in Binsted in the future on another part of the nursery site if the Special Qualities of Binsted in the National Park are retained and the Arundel Bypass is not put through Binsted. There is a shortage of quality furnished accommodation offering National Park experience in Arun District, to which the Binsted area belongs.

e) Bee Bee Kennels

Darren Mills, who runs Bee Bee Kennels in Binsted Lane, said that Option 5A would have 'a dramatic effect on our business here at Bee Bee Kennels. Many of our customers bring their dogs to us because of the location, to have their dogs looked after in a quiet part of Sussex away from main roads. The fact that we can happily walk the dogs up the lane to the woods without crossing main roads, puts many customers minds at rest while they are away on holiday. Also quite a few customers walk their dogs down to us through Binsted woods because many dogs don't like car journeys.'

Access to the woods might be maintained for dog-walking but it would be through an underpass under the dual carriageway at Binsted Park (if an underpass is built), instead of, as now, through beautiful countryside. If the 'no through road' in Binsted Park was removed by an underpass, the lane would have much more traffic on it.

f) The Black Horse Pub

The Black Horse Pub is a free house owned by Clive and Victoria Smith, with a busy trade and a reputation for good cooking and fine beer. Its website is at www.theblackhorsebinsted.com. It has a large garden, well planted by the Smiths, which looks out onto the beautiful Binsted valley. This northern part of the valley has been well looked after by the Avisford Hilton's golf course since 1996. Although the pub faces away from Option 5A, the noise of the road (300m away) would badly affect the pleasantness of sitting in the pub garden and would affect its popularity.

Binsted's Black Horse pub in its magnificent setting. Option 5A would go through the fields seen in the photo between the pub and the woods.

Other businesses that would be affected include Dave Chandler, an agricultural contractor who often brings large vehicles into Binsted Lane and would be affected by the size of the proposed underpass near the present A27, and the Church Farm Old Dairy business units, in the 1920s 'model farm' buildings at Church Farm, which include an artist and a second-hand book dealer. Church Farm is 190m from Option 5A. The present tranquil setting for their small business activities would be destroyed.

Taking all the above into account, Option 5A would be directly contrary to the National Park 'Duty' to 'seek to foster the social and economic wellbeing of the local communities within the National Park in pursuit of our purposes'. Far from 'fostering the social and economic wellbeing of the local community', Option 5A would have a severely damaging effect on both.

Option 5A would seriously impair Special Quality 4, 'An environment shaped by centuries of farming and embracing new enterprise'.

Houses in Binsted and Option 5A. 41 houses are shown, though the usual number quoted for houses in the village is 38. This is because one dwelling is not a house (temporary accommodation at Littlewoods Nursery) and two dwellings at The Oaks, next to the proposed junction, are not yet in contact with the village.

Chapter 6 Impact of Arundel Bypass Option 5A on recreational and learning opportunities in Binsted and Binsted Woods (Special Qualities 5 and 7)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 5 is 'Great opportunities for recreational activities and learning experiences'. Special Quality 7 is 'Distinctive towns and villages, and communities with real pride in their area'. Option 5A would seriously damage these two Special Qualities in Binsted.

The special qualities people can enjoy and learn about in Binsted also include 'Tranquil and unspoilt places (SQ2), 'A rich variety of wildlife and habitats' (SQ3), 'An environment shaped by centuries of farming and embracing new enterprise' (SQ4), and 'Well-conserved historical features and a rich cultural heritage' (SQ6).

1. The Binsted Strawberry Fair

Binsted's yearly fund-raising event has been held annually since 1987. For the last four years over 1000 people per year have attended the Fair which as well as being very enjoyable provides many different learning activities. The Fair is based at the Flint Barn, Binsted. Each year it donates its takings partially to local charities and partially for the upkeep of the fabric of Binsted Church. In 2017 the Fair raised £7000.

There are village fete standards such as sales of books, bottle tombola, bric-a-brac, and ices. More unusual are the herbs, shrubs and perennials on sale. The Fair always includes stalls with animals for children to encounter such as sheep, ponies, donkeys, turkeys, chicks, owls. Traditional craft demonstrations include cane chair making, pole lathe turning, and traditional witches' broom-making, and in 2016 and 2017 children could learn how to make Bird Feeders from natural materials gathered in Tortington Common, part of Binsted Woods Local Wildlife Site.

Binsted Strawberry Fair, with the new children's ride in the centre

The countryside interest stands are another Strawberry Fair speciality. CPRE, MAVES, the Sussex Wildlife Trust, South Downs Society, the South Downs National Park Rangers, and Worthing Archaeological Society all have educational and informative displays.

Impact of Option 5A on the Strawberry Fair would be: it would cease to take place. The area would no longer be beautiful or attractive to those wanting to enjoy the countryside and learn about it, and the strong community which organises it would disperse.

2. The Binsted Arts Festival

The Binsted Arts Festival (2016 and 2017, with 2018 in planning) provides learning experiences for those attending its events, mainly talks, concerts and art workshops. The talks have included countryside themes such as poets' views of Sussex and the National Trust estate at Slindon, and the cultural past of the area.

Each year the Arts Festival has included a guided walk in Binsted, in 2016 on 'The art and literature of Binsted Woods', and 2017 on the archaeology of the area, concentrating on the newly identified Anglo-Saxon Moot Mound and the regionally important, little studied Iron Age earthwork, both in Hundred House Copse. These walks were over-subscribed, with 40 accepted on the first walk and 30 on the second, and people on the waiting list.

In the left-hand photo below the walk is crossing the route of Option 5A on Footpath 342, next to the new hedge planted by Walberton Action Group in 2005. The Iron Age earthwork shown in the right-hand photo is of regional importance but has not yet been researched or studied, apart from one small excavation near Binsted church. It extends north-south throughout Binsted. The part remaining in Hundred House Copse is large and still impressive; further south it has largely been ploughed out in the fields.

Below: 'Art and literature of Binsted Woods' walk in 2016 crosses the route of Option 5A; archaeology walk led by Dr Matt Pope of University College London studies the Iron Age earthwork in 2017. The earthwork would be partially destroyed by Option 5A.

The earthwork is part of a system of banks and ditches around Arundel and Chichester now known as 'territorial oppida'. The earthwork extends onto the Downs where it joins another earthwork which descends to the river Arun – the two together are known as War Dyke. It is thought the 'oppida' were combined with watercourses to define a trading area with the Romans before the Roman invasion. The most intact remaining section of the earthwork, which has been protected by its position in woodland, would be partially destroyed by Option 5A.

Impact of Option 5A on the Binsted Arts Festival would be: it would cease to take place. The area would no longer be beautiful or attractive enough to make people want to come to it. The strong community which organises it would disperse.

3. MAVES and its volunteers

The Mid Arun Valley Environmental Survey group (www.maves.org.uk) formed in 2015 after it became apparent that the local area had been under-surveyed in comparison with the area north of the A27, and that some of the wildlife records at the Sussex Biodiversity Record Centre grid references are inaccurate. MAVES' primary purpose is to collate documented data and to update that data through professional ecological field surveys and local reporting.

In itself, this has been and will continue to be a learning experience – researching the wildlife richness of the area including Binsted, Tortington and the Arun valley flood plain.

MAVES is run by a committee of people from Arundel and Binsted. It both commissions professional wildlife surveys and encourages experienced amateur enthusiasts and local residents to send in records of wildlife sightings as well as organising conservation activities such as hedge laying.

In association with the National Park Rangers Volunteer Service, MAVES has been involved in the laying of two hedges planted by Walberton Action Group in 2003-5. The hedge at Old Scotland Lane (footpath 338) took 2 years to lay and now provides a rich wildlife habitat including the Nationally Scarce snail-hunting beetle *Drilus flavescens*. The laying of the hedge at Footpath 342 (locally known as "Muddy Lane") from Binsted Church to Spinningwheel Copse was started in February 2017 and will to take a further 2 years to complete.

The Walberton Action Group project also included planting new trees in Binsted Park, and along Copythorn West Hedge, to take over eventually from the big oaks in the Park and the hedge elms lost in the 1960s.

In 2016, MAVES volunteers planted the first third of a new mixed tree and hedge in south Binsted on footpath 354 thanks to a grant by the Woodland Trust and Binsted Nurseries Ltd. They have also removed non-native invasive plant species such as Parrots Feather and Himalayan Balsam from local ponds and organised a general litter picking project in the village.

Left: The new hedge on the north side of Scotland Lane – planted in 2005 by Walberton Action Group - after laying by MAVES volunteers and National Park rangers in 2015. Right: the hedge in summer 2017. It would be destroyed by Option 5A. View east towards Binsted Woods.

Planting the new hedge in south Binsted.

MAVES has benefited from association with local universities and colleges whose students have conducted surveys for final year projects in this area, including dormice distribution and badger home ranges. Their data has been included in the ecological reports that MAVES published in October 2016 and March 2017, and which can be downloaded from the website at www.maves.org.uk.

MAVES has also organised a series of winter and spring talks in Binsted and Arundel in 2016 - 2017 which were well supported by the local communities. Continuing the educational theme in the area, MAVES is in the very early stages of planning ecological learning opportunities with one of the local

primary schools. It is hoped that this will give the local children the opportunity to widen their knowledge and experience of the wildlife in this area through field trips and classroom study.

The impact of Option 5A on MAVES would be: surveys and volunteer activities would cease. The effect on the rich wildlife MAVES has now revealed would be devastating and those who love the area would not want to continue to record it. The community which organises it would disperse.

4. The archery course at Barn's Copse and Hundred House Copse

Archery is an unusual form of countryside recreation for which Binsted Woods form the only possible location over a very wide area. Peter Parker, Club Secretary, states: 'When the club was started 17 years ago, we looked from Brighton to Chichester and as far north as Billingshurst for land to rent. Apart from the woods in Binsted, all we were offered was a patch of woodland 20 yards wide by 60 yards long. I cannot see that that this has changed as woodland is getting harder to find.'

The use of the woods for this does do some harm to their ecological value, due to the presence of people in the woods. Hundred House Copse was singled out by the 1992 bypass comparison report by Environmental Assessment Unit of Liverpool University as having a high number of Ancient Woodland Indicator species. But this harm is reversible in the long term once the woods cease to be used for archery. For more details see www.ratpackarchers.co.uk. Youtube videos of two of the three archery courses are on www.youtube.com/watch?v=l0EWPRg7lYI and www.youtube.com/watch?v=K9msYDd-GfE.

Below: a target in Barn's Copse among the bluebells; an archer in Barn's Copse

Peter Parker explained the impact of the proposed Option 5A on the club: 'We currently have 3 courses, Red, Blue and Green. Each course is about 10 acres and each course contains 42 targets. Looking at the latest drawings from Highways England at the Yapton Junction, it shows that the Blue Course is totally destroyed. We would also lose about a quarter of the Green Course. Also most road building has an exclusion area around it whilst it is being built.

'This means that the club would fold, if route 5A is chosen, as we could not expect our members to wait around for 3 or 4 years until they could shoot again. Archery, like any sport, is all about practice, so most members would find another club, or give up archery. Another consideration is that if we lose one third to one half of our courses, we would be expected to reduce the club fees. This may make the club no longer financially viable and again we would fold. This would be a great loss to the Field Archery community as the next nearest courses are Petersfield or the Isle of Wight.' The club has 70 members and is part of a nationwide organisation.

The archers love the ancient dead trees and abundant Ancient Woodland flowers in Binsted Woods and have produced some postcards using their photographs. Below is one of them.

The impact of Option 5A on the archery club would be: the club would fold and the activities would cease.

5. Forest Knights' courses in Binsted Woods

Forest Knights, with regular courses and events in Binsted Woods near Foxes Cottages, in the South Downs National Park, specialises in teaching wilderness skills, and a deeper understanding and appreciation of the natural environment, to people of all abilities. They put on courses in bow-making, bushcraft, first aid, winter survival, fire lighting, spoon carving, foraging, field archery and warrior arts, cooking in the wild, greenwood working, bodging and pole lathe construction. For more information see www.forestknights.co.uk. Forest Knights run activities for groups wanting to experience the beauty of the ancient woodland and learn practical conservation skills in a safe and peaceful setting.

Wayne Jones, leader of the enterprise, states: 'Forest knights have been teaching nature awareness, Bushcraft and practical conservation courses within Binsted Woods for the last 15 years. Our courses are attended by people from all areas of the country and from all walks of life. We work with schools and colleges teaching young people the benefits of the outdoors. We have achieved lasting positive changes in young people's lives, improving their self-confidence and social skills through team work, challenging them to put away their phones and learn about the natural world and the flora and fauna around them. With the increase in mental health issues within society the positive

effect of Learning self-reliance and resilience through our range of courses cannot be overstated. Binsted woods is an ancient woodland with a wealth of wildlife and plant species that deserved to be protected for future generations to enjoy.

'The 5A route would have a catastrophic effect on my business in Binsted woods. The disruption caused by the construction and routing of the A27 route 5A would mean we could no longer use this location as our primary venue for nature based activities. The increased traffic noise and disruption to the wildlife would mean we would be forced to seek an alternative venue.'

People attending Forest Knights courses in Binsted Woods

Impact on Forest Knights of Option 5A: they would have to cease their countryside activities in Binsted Woods.

Conclusion

The first three recreational and learning opportunities listed above are organised by local people who want to provide opportunities for others to enjoy this beautiful area and to learn more about it. If Bypass Option 5A went ahead, it is likely the Strawberry Fair, the Arts Festival, and the activities of MAVES would cease.

Two learning experiences based in Binsted Woods, one part of a nationwide club providing an unusual kind of countryside recreation (Ratpack Archers) and the other a commercial enterptise providing unusual woodland-based learning experiences (Forest Knights), would cease.

The cumulative effect of all these impacts would be a major loss of recreational experiences and opportunities for learning in and near to the South Downs National Park, directly contrary to Purpose 2, and with a damaging impact on Special Quality 5 especially and also on Special Qualities 2, 3, 4 and 6.

Chapter 7 Impact on historic tracks, footpaths, lanes and bridle ways (Special Quality 5, Purpose 2)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 5 is 'Great opportunities for recreational activities and learning experiences'. Option 5A would have a seriously damaging effect on recreational enjoyment of the National Park by residents of the wider region, including Walberton, Fontwell, Barnham, Yapton, Ford, Bognor, Flansham, Felpham, Arundel and Littlehampton, because of its effect on Public Rights of Way.

Three important, very well used footpaths, two of them also historic tracks, are severely affected by Option 5A. They are Scotland Lane, Footpath 342, and Footpath 341.

1. Scotland Lane

Scotland Lane (Old Scotland Lane in the map below) is a historic track. It dates from at least the mediaeval period, probably earlier, as it is likely to have been an access track to the Anglo-Saxon Moot Mound, recently identified in Hundred House Copse and Field (see Chapter 9). Hundred House Field is the field shown on this map to the left of the name 'Old Scotland Lane' with the Iron Age earthwork in it running almost north-south. The Moot Mound is to the west of the earthwork, abutting it, partly within Hundred House Copse. An article about this new discovery will appear in *Sussex Archaeological Collections* in December.

Scotland Lane was once thought by Ivan Margary, the Roman Road expert, to be part of the Roman Road from Chichester to Arundel, but the Roman Road has now been shown to run due east-west further north through Binsted Woods, and to meet Scotland Lane at its eastern end.

Scotland Lane forms the boundary of the South Downs National Park where it crosses from the main block of Binsted Woods to the western block containing Little Dane's Wood, Hundred House Copse and Barn's Copse. It is a good place for seeing birds and butterflies. It contains a large bullace (wild plum) tree that is covered with masses of fruit every year.

Scotland Lane

Scotland Lane (on right of photo) as it nears the main block of Binsted Woods, with part of the hedge laid in 2015-16. Photo: August 2016. This view would be obliterated by Option 5A.

The impact of Option 5A on Scotland Lane would be severe. Option 5A passes through it. Access would be maintained by diversion and an overbridge, but the pleasure of walking, riding and cycling in such a beautiful landscape would be lost.

2. Footpath 342

Footpath 342 is a historic track running from Walberton to Arundel. It dates back to at least the 18th century when the bridge over the Binsted Rife was recorded as Kenimore Bridge.

Footpath 342

The section between Binsted Lane and the South Downs National Park boundary, left of the blue dot, is now a farm track, also in daily use by dog walkers. It is now known as Muddy Lane but until the 20th century it was called Church Lane, as it was the route by which the residents of Binsted House, in Binsted Park, went to Binsted church. Until recently it has not officially been part of the Public Footpath, but it now has a West Sussex County Council footpath sign pointing along it at the

point shown by the blue dot. At the point shown by the blue dot, the path enters the South Downs National Park.

The Waymarker

The above photo shows the new Waymarker sculpture by Janine Creaye installed in February 2017 beside the point where Footpath 341 crosses Footpath 342, on the National Park boundary. Its location is shown by the blue dot on the map section above. The Waymarker is a sculpture with Green Man and nature motifs, of plants and animals that are found in Binsted, including the protected species badgers and dormice, and a rare blue cornflower, recently found in the adjacent field. Images of the imaginary beast known as a Knucker, said to live in Knucker holes such as the ones at Binsted and Lyminster, are also included.

The bench at this footpath crossing – in place since 2005 - provides a good place to sit and contemplate the beauty of the surrounding countryside. It commands a good view of the enormous mass of Binsted Woods (100 ha) which entirely fills the view to the north, east and south. It is also a good place to see the young trees and new hedge along Footpath 342, planted by Walberton Action Group in 2005. The National Park 'Shared Identity' image is carved into the bench.

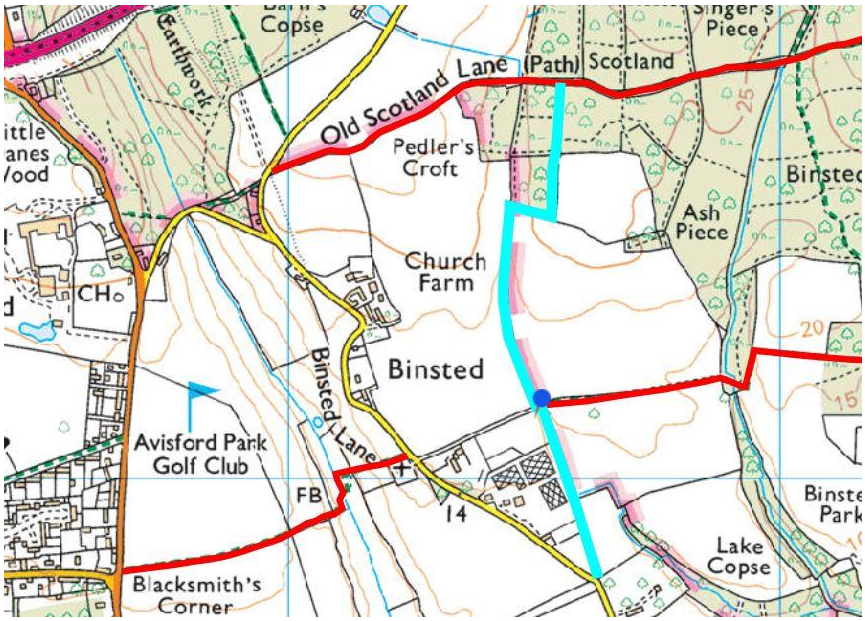
The view from this viewpoint would be replaced by a view of Option 5A on an embankment crossing the open fields between Footpath 341 and Scotland Lane. Peace and tranquillity would be replaced by the noise of a dual carriageway and the exhaust of its traffic fumes.

The impact on footpath 342 would be severe. Option 5A passes through it. Access is proposed to be maintained by a diversion, but the pleasure of walking, riding and cycling in such a beautiful landscape would be lost.

3. Footpath 341

Footpath 341 is a much-used path connecting the above two historic tracks. With Footpath 342 it forms the easiest access to Binsted Woods for many people, as there is some limited car parking at Binsted Church. The footpath forms the boundary of the South Downs National Park up to the point where it meets the woods.

Footpath 341, marked in blue



Footpath 341. This photo shows the undulating nature of the ground level in Binsted, which is on the lowest part of the dip slope of the South Downs. The footpath would be obliterated by Option 5A.

4. Importance of these footpaths to walkers from as far away as Bognor

As well as providing access for local people in Binsted and Walberton, these footpaths are used by people from Fontwell, Barnham, Yapton, Ford, Bognor, Flansham, Felpham, Arundel and Littlehampton for access to the National Park and to Binsted Woods and Tortington Common.

As well as access by car, with some parking in Binsted Lane, the three footpaths described above link to other footpaths to provide level access to the National Park and Binsted woods for walkers and cyclists from a wide area, without using a car, or crossing a major road. They connect to footpaths along the River Arun which means they are also accessible from Littlehampton.

In a typical recent conversation with a family with a dog on Footpath 341, they said they come from Bognor at least four times a week to walk in Binsted. An ABNC supporter from Bognor said that Binsted village and Binsted Woods had provided him with 'solace' for the last 7 years since moving here.

5. Binsted Lane West and Binsted Lane East

Binsted Lane is called Binsted Lane West from the junction with the A27 signed 'Binsted' round to Binsted Park, and Binsted Lane East from Binsted Park up to where it joins Tortington Lane, which joins the A27.

The lane is quiet because the section through Binsted Park is an un-made-up road and impassable to normal cars. Binsted Lane West and East provide part of a scenic through route for cyclists (having to push in Binsted Park) to Arundel and beyond. It is also used by horse riders. One cyclist who uses this route has said she always stops in Binsted Park to listen to the birds. Option 5A goes through Binsted Park and destroys it.

Cyclists in Binsted Lane outside the Old Rectory opposite St Mary's Church.

Impact of Option 5A on Binsted Lane West and East: while access to houses would be maintained by an overbridge and possibly an underpass, the lane would no longer be a peaceful, tranquil and scenic route for cyclists, walkers and riders.

Conclusion: Option 5A would have a severely damaging impact on all the historic tracks, lanes, paths and bridle ways described above. It would have a severely damaging impact on Special Quality 5.

Chapter 8: Impact on Listed Buildings (Special Qualities 6 and 7, Purpose 1)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 6 is 'Well-conserved historical features and a rich cultural heritage'. Special Quality 7 includes 'Distinctive towns and villages'. Purpose 1 is 'To conserve and enhance…the cultural heritage of the area'. There are 10 buildings listed Grade 2 in Binsted, 6 of which are close to Option 5A. There are 3 'Buildings and structures of character', a local authority listing. Option 5A would seriously damage Special Quality 6 and 7, and be contrary to Purpose 1, at Binsted by its effect on listed buildings.[5]

1. Morley's Croft.

Morley's Croft is probably 17th century. A small gamekeeper's cottage on Binsted Lane just before it dips down into Binsted Park through woodland and becomes Binsted Lane East. National Grid Reference: SU 99217 05598.

HE: Sensitivity: 'Substantial. The house is located within an agricultural setting which makes a substantial contribution to the understanding and appreciation of the significance of the asset.' Magnitude of Impact: 'Major adverse. The contribution of the setting of the cultural heritage asset

[5] Information on listed buildings is from www.historicengland.org.uk/listing/the-list. Highways England comments from Environmental Study Report Appendix B, Table B47. The headings are 'Sensitivity of setting', 'Magnitude of harm/impact', 'Significance of effect' and 'Duration of effect'.

to its significance will be significantly reduced due to the close proximity of the asset to the proposed scheme.' Comment about rural tranquillity in Meadow Lodge entry not added though it applies equally. Significance: Large/Very Large adverse. Permanent.

Morley's Croft is 275 metres from Option 5A.

2. Meadow Lodge, on Binsted Lane opposite Morley's Croft.

Listed as early 19th century but the owner, an architect, thinks the interior is 18th century. 'Modillion eaves cornice…glazing bars intact'. National Grid Reference: SU 99250 05585.

HE: Sensitivity: 'Substantial'. Comment as for Morley's Croft. Magnitude of Impact: Major Adverse, but adds: '…the sense of rural tranquillity will be effectually lost due to the close proximity of the asset to the proposed scheme.' Significance: 'Large/Very Large adverse.' Permanent.

Meadow Lodge is 275 metres from Option 5A.

3. St Mary's Church.

12th century, with a wallpainting of c. 1180, Mainly Norman, restored by Sir Thomas Jackson in 1867. Wall-painting of 1180 circa in the splay of a window in north wall. Open timbered roof without ceiling below it. 'Very attractive small church, little restored'. National Grid Reference: SU 98231 06020.

St Mary's Church has a stained glass window by Henry Holiday and a Cosmati tile pavement in the chancel similar to one in Westminster Abbey, both put in at the time of the 1867 restoration.
St Mary's Church is used for services once a month by the parish of Walberton and Binsted. Its congregation is attracted by its rural setting and if Option 5A were chosen it is likely the congregation would disappear and the church would become redundant. It is the only public space in Binsted and is used for talks and for the Binsted Arts Festival. The reverend Henry Lewis, vicar of Binsted at the time of the restoration, largely paid for the restoration and also built what is now the Old Rectory for himself and his large family, whose descendants still live in the village.

HE: Sensitivity: 'Substantial. The house [sic] is located within an agricultural setting which makes a substantial contribution to the understanding and appreciation of the significance of the asset.' Magnitude of impact: 'Major adverse'. Significance: 'Large/Very Large adverse.' Permanent.

St Mary's Church is 475 metres from Option 5A across open fields. Option 5A would be in the fields between the church and Binsted Woods and destroy the attraction of the area to its loyal congregation who have a service once a month. Without them the church is likely to become 'redundant'.

4. The Glebe House.

18th century or earlier. 'Stringcourse. Hipped thatched roof.' National Grid Reference: SU 98144 06204. HE: Sensitivity: 'Substantial'. Magnitude: 'Major adverse'. Same comment as for Church Farmhouse. Significance: 'Large/Very Large adverse'. Permanent.

The Glebe House is 345 metres from Option 5A.

5. Church Farmhouse, 18th century.

'Two storeys and attic. Five windows. Two dormers. Red brick. hipped tiled roof. Glazing bars intact. Doorway up five steps with iron handrail and banister on each side and flat hood on brackets and door of six fielded panels.' Church Farmhouse also has outbuildings of the same date, and additional farm buildings built in the 1920s in the 'model farm' style. National Grid Reference: SU 98132 06407.

HE: Sensitivity: 'Substantial'. Magnitude: 'Major adverse. The contribution of the setting of the cultural heritage asset to its significance will be significantly reduced due to the close proximity of the asset to the proposed scheme.' Significance: 'Large/Very Large adverse'. Permanent.

Church Farmhouse is 190 metres from Option 5A.

6. The Royal Oak Inn/The Oaks (now a private house)

The Royal Oak Inn, C19. Two storeys. Three windows. Painted brick. Wide stuccoed stringcourse. Modillion eaves cornice. Slate roof. Glazing bars intact. Doorway with pilasters and pediment. National Grid Reference: SU 97482 06786.

HE: Senstivity: 'Substantial'. Magnitude of Impact: 'Minor Beneficial…likely to improve the asset's economic viability [as a public house].' Significance: 'Slight/Moderate Beneficial.' Permanent.

Although a public inn and restaurant until 2012, this building was then converted to two private residences called The Oaks. Highways England's reference to it as a public house shows that no one verified its status on the ground for at least the last five years. The impact on the private residence would not be 'beneficial' in the least.

The Royal Oak/The Oaks is 25 metres from Option A and might not survive the building of the junction. The appropriate HE comment would have been 'Very Large Adverse, Permanent'.

7. Thatched Cottage, Hoe Lane.

A 'C16 timber-framed cottage, refaced with red brick, cobbles and stone. Hipped thatched roof.'

Thatched Cottage has two pieces of sculpture built into the wall, a 'Green man' face and a 'beard'. These are said locally to be Roman and to have been found in 'the Minchins', local name for Minchins Copse, now Winchers Copse. An expert at Fishbourne Roman Villa has said they are more likely to be Renaissance. They were on the cottage by c.1840 as shown by an old photo.

National Grid Reference: SU 99251 05134.

This 16th-century cottage is omitted from Highways England's table B47 on the impacts of Option 5A, though its setting would be affected by the severance of Binsted village and the destruction of the village's peace and tranquillity, its landscape and its connection with Binsted Woods and the National Park. Thatched Cottage is 735 metres from Option A.

8. Marsh Farmhouse, off Binsted Lane to the south.

This 16th-century farmhouse has 'Chequered work of knapped flints and stone with red brick dressings. Stepped brick chimney breast on base of stone and flints at both ends.' Marsh Farmhouse has been the family home of the Wishart family, landowners in Binsted, since the 1920s. Ernest Wishart, founder of the publishers Lawrence and Wishart, lived there, as did his wife Lorna Wishart, a charismatic Bohemian well known for her liaisons with the poet Laurie Lee and the painter Lucien Freud. Her son Michael Wishart was a painter and writer, author of the memoir *High Diver,* 1976. National Grid Reference: SU 98897 04878.

This 16th-century farmhouse is omitted from Highways England's table B47 on the impacts of Option 5A, though its setting would be affected by the severance of Binsted village and the destruction of the village's peace and tranquillity, its landscape and its connection with Binsted Woods and the National Park. Marsh Farmhouse is 1035 metres from Option 5A.

9. Beam Ends (now Quince Cottage).

'C16 timber-framed building with the timbering exposed at the west end of the first floor with plaster infilling but mostly refaced with red brick. Thatched roof. Casement windows. Two storeys. Three windows.' National Grid Reference: SU 97743 06443. HE: Sensitivity: 'Substantial'. Magnitude of impact: 'Minor adverse. Due to intervening development it is unlikely the proposed Scheme will be seen from the asset. However noise and air pollutants are likely to increase.' Significance: 'Slight/Moderate adverse.' Permanent. Beam Ends is 385 metres from Option 5A.

10. Swiss Cottages.

'One building. L-shaped mid C19 building in imitation of a timber-framed building. Two storeys. Six windows. Ground floor faced with cobbles set in galletting. Above red and white bricks with ornamental panels of timbering, the north west wing tile-hung with a gable over with scalloped bargeboards. Tiled roof. Casement windows. South wing has three gabled dormers and three porches with sloping tiled roofs.' National Grid Reference: SU9771606428.

HE: Sensitivity: 'Substantial.' Magnitude of impact: 'Minor adverse.' Same comment as for Beam Ends. Significance: 'Slight/Moderate adverse'. Permanent.

Swiss Cottages is 400 metres from Option 5A.

11. 'Buildings and structures of character'.

Three of Binsted's houses are on the Arun District Council list of 'Buildings and Structures of Character', adopted 2005, fulfilling criteria 2 to 5 of the list. They are The Old Rectory, Grove Lodge, and Bramble Barn. Criterion 2 is that buildings be 'Extremely good examples of traditional or established style, or unusual type'. The Old Rectory is of unusual type: it was built about 1865 by the Reverend Henry Bones (later Lewis), who funded the 'restoration' of Binsted Church in the 1860s, and is in an unusual 'High Church' style with a stained-glass window, a Gothic-style front door with heavy metal-work, use of different coloured (red and blue) bricks to make a pattern throughout the façade, and a stone memorial plaque. The Old Rectory is 340m from Option 5A.

12. Conclusion

Option 5A would have a 'Large/Very Large Adverse' impact on the first five houses listed above, according to Highways England. To this would have to be added 'The Oaks', 25m from the road, assessed wrongly by Highways England as having a 'beneficial' impact from Option 5A. The effect on the others would also be serious, because their setting would be affected by the severance of Binsted village and the destruction of the village's peace and tranquillity, its landscape and its connection with Binsted Woods and the National Park.

The Oaks and Swiss Cottages, both listed, are within the National Park, and two other listed houses, Morley's Croft and Meadow Lodge, are just outside the National Park boundary.

Binsted's 10 listed buildings and 3 'Buildings and structures of character' together make up a third of the village's houses. These are examples of 'well-conserved historical features' and 'rich cultural heritage' (Special Quality 6).

In total, the character of Binsted, one of the 'distinctive towns and villages' mentioned in Special Quality 7, would be seriously damaged by Option 5A. For the damage to non-listed homes and businesses in Binsted, see Chapter 5.

Chapter 9 Impact of Arundel Bypass Option 5A on Historic Landscape and Important Heritage Assets (Special Qualities 6 and 7, Purpose 1)

Highways England has a duty to take into consideration that the South Downs National Park is a protected landscape under Section 62 of the Environment Act. When undertaking any activity which may have an impact on the designated area, it has a duty to have regard to the Statutory Purposes of the National Park. These include promoting opportunities for 'understanding and enjoyment of the Special Qualities of the National Park by the public' (Purpose 2).

Special Quality 6 is 'Well-conserved historical features and a rich cultural heritage'. Purpose 1 is 'To conserve and enhance…the cultural heritage of the area'. Option 5A would impact severely on Binsted's historic landscape and its historical features, some of which are little-known or recently discovered. Together these form a rich cultural heritage.

The historic landscape features in Binsted which would be most affected by Option 5A are:

1. The Iron Age earthwork in Hundred House Copse, part of War Dyke (a scheduled earthwork), regionally important and not yet formally addressed: Option 5A would cut through the best-preserved part.
2. The Roman Road from Chichester to Arundel, recently discovered through the LiDAR project of the South Downs National Park: Option 5A would cut through it. It is fragmentary but a section near Havenwood is due to be scheduled.
3. The Anglo-Saxon Moot Mound at Hundred House field/Hundred House Copse, recently identified through the LiDAR project of the South Downs National Park: Option 5A would effectively destroy it, and would certainly destroy its landscape context, which can now be seen as a 'Landscape of Governance', including the access track, Scotland Lane, which would be cut in two by Option 5A.
4. The two mediaeval tile kilns in Binsted, excavated in 1963 and 2005.
5. Binsted's history as an isolated farming parish, geographically a peninsula and independent for centuries: Option 5A would cut it in two.
6. Binsted Park, a 'pocket park' created about 1800, recommended for conservation (including its setting) by the South Downs Integrated Landscape Character Assessment: Option 5A would destroy it and its setting.

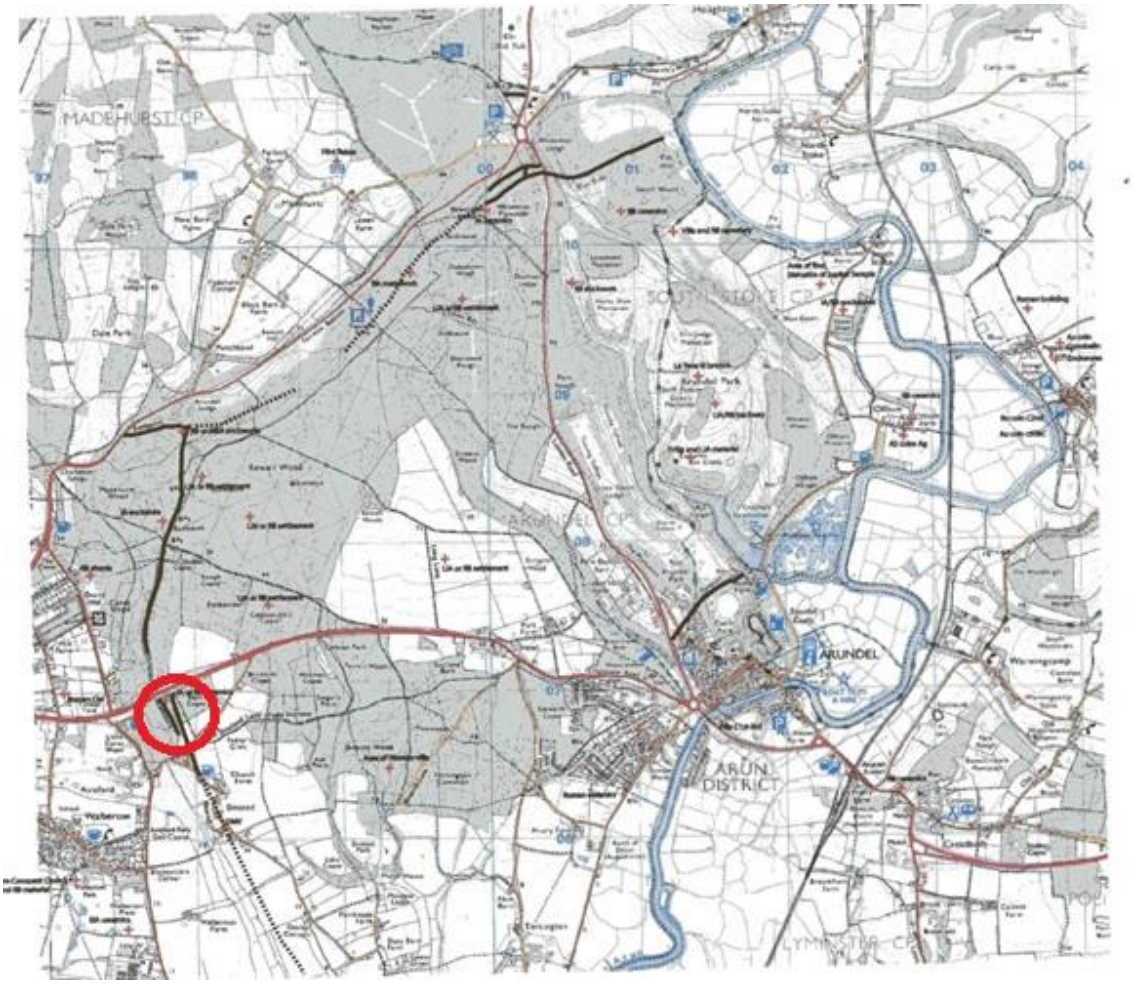
1. The Iron Age earthwork in Hundred House Copse

The longitudinal earthwork, a massive ditch and bank, is of great regional significance, although it is not yet scheduled or documented. The earthwork extends north to south throughout Binsted Parish, including through the garden of the Black Horse Pub and under St Mary's Church. The section outside the woods been mostly ploughed out and is only visible as a low earth bank. The most impressive and intact remaining section of the earthwork, which has been protected by its position in woodland, would be partially destroyed by Option 5A.

The earthwork is thought to be late Iron Age, and connected to the late Iron Age enclosures within Gobblestubbs Copse, north of the A27, recently excavated by Worthing Archaeological Society. The earthwork extends onto the Downs where it joins another earthwork which descends to the river Arun – the two together are known by archaeologists as War Dyke. War Dyke is part of a system of banks and ditches around Arundel and Chichester now known as 'territorial oppida', which it is thought were combined with watercourses to define a trading area with the Romans before the Roman invasion. The earthwork at Binsted went south as far as what was then the floodplain, to join Little Tortington Stream, which flows into the Arun.

The section of War Dyke from the top of the Downs down to the Arun is scheduled. Details are on https://historicengland.org.uk/listing/the-list/list-entry/1002983. Part of that section of War Dyke consists of two parallel earthworks. The section of War Dyke in Hundred House copse also has a section with two parallel earthworks. As the Historic England website says, 'Further archaeological remains survive in the vicinity of this monument: some…are scheduled but others are not because they have not been formally assessed.' This applies to the Binsted section of War Dyke.

Map showing the system of Iron Age earthworks (black and dotted black lines) known as War Dyke, joining the loops of the river Arun to enclose an area. Red ring shows the section in Hundred House Copse, Binsted. Source: David McOmish of English Heritage, 2007.



If Option 5A is built, opportunities for further research would be lost. The part of War Dyke that would be destroyed is the part that has two parallel ditches and banks – similar to the section at the top of the Downs with two parallel ditches and banks. These may have been 'entrances' to the defended area or have some other meaning not yet known. It would be unfortunate for research into the Iron Age and early British trade with the Romans to lose the best-preserved part of the Binsted section of the earthwork before it has been properly assessed, and lose the opportunity to make further discoveries about its meaning and function.

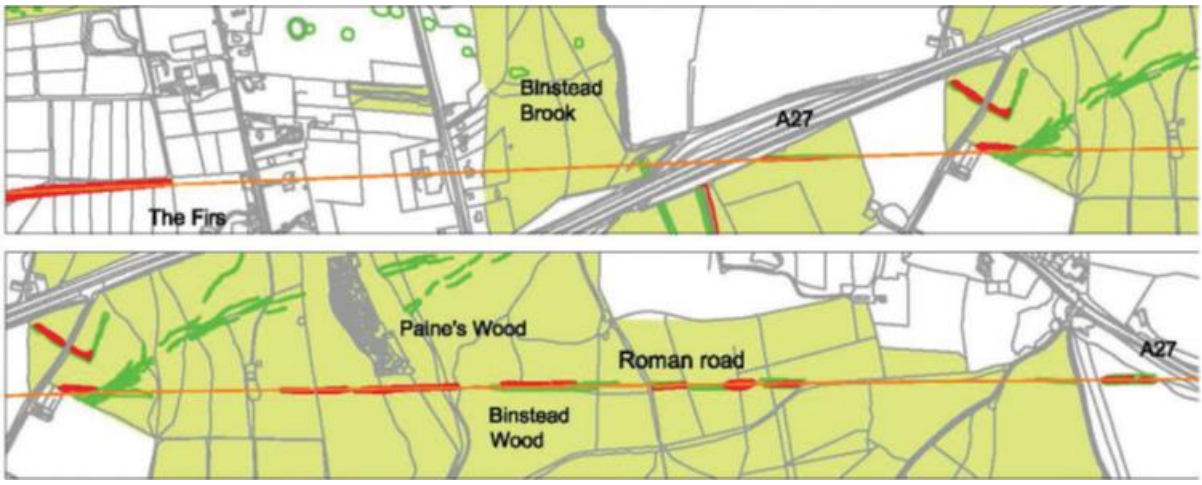
Impact of Option 5A on the Iron Age earthwork: the double section in Hundred House copse, which has been well preserved by being in woodland, would be destroyed.

2. The recently discovered Roman Road from Chichester to Arundel

The South Downs National Park's 2015-16 project called 'Secrets of the High Woods', based on new LiDAR imagery which can be digitally adjusted to remove obscuring woodland, yielded three major discoveries. The first was the existence of Celtic field systems throughout the wooded area of the Downs, covering far more land than had previously been suspected. The second was the true route of the Roman Road from Chichester to Arundel. The third, discussed below, is the Anglo-Saxon Moot Mound at Binsted.

A new report, 'The High Woods from above National Mapping Programme', by E. Carpenter, F. Small, K. Truscoe and C. Royall on www.research.historicengland.org.uk states that the Roman Road is not visible at crossing of Binsted Brook (n. of A27), but 'The remains of the road are visible again immediately east of the dual carriageway in Barns Copse'.

Below: Map strips showing the Roman Road from Chichester to Arundel, the section through Binsted. Source: Historic England, 'South Downs National Park: The High Woods from above National Mapping Programme'. Ditches are green and banks red.



On p. 121 of the Report the Roman Road's importance is explained: 'More extensive but relatively well-defined sites with a national significance include the fragmented remains of the Chichester to Arundel Roman Road. This is a road that has long been speculated to have existed since the 1940s (Margary) but for which evidence has only been identified during this project. These remains have

evidential value but their survival as earthworks allows them to function as a visible link with the past connecting communities with Roman Britain.'

Impact of Option 5A on the Roman Road: Part of Barns Copse would be cut into by Option 5A. The Roman Road remains there are outside the actual 5A area but are likely to be lost through road construction. More research is needed about how the Roman Road crossed the Binsted valley. The junction for Option 5A would destroy possible evidence about this with its large new embankment across the valley.

3. The recently identified Anglo-Saxon Moot Mound at Hundred House Copse/Hundred House field

The LiDAR images which revealed the Roman Road also showed a dome-like hillock in Binsted, which has now been identified as the meeting place of the Anglo-Saxon Binsted Hundred. Before the Norman Conquest, Hundreds were units of land like present-day Districts, which administered the countryside through a system of courts. Binsted Hundred, named after the village, and later called Avisford Hundred, stretched from the top of the Downs down to the sea. But where did people meet? The names Hundred House Copse and Hundred House Field had suggested it was near there, but the hillock had never been noticed before – possibly because it is partly within the woods.

The Moot Mound shows all the recognised features of open-air meeting places: it is a 'promontory' on the edge of a steep hill, a 'hollow way' runs up the hill next to it, and it is near to an Iron Age earthwork, parish boundaries, and the east-west Roman Road from Chichester to Arundel. The steep valley could have been used to improve audibility by large numbers of people. The same meeting place may have been used for courts connected with Arundel Forest. Ancient ash coppice stools on the lower level of the mound, which could be 800 years old, may be a fuel source for the two later Mediaeval tile kilns near the site.

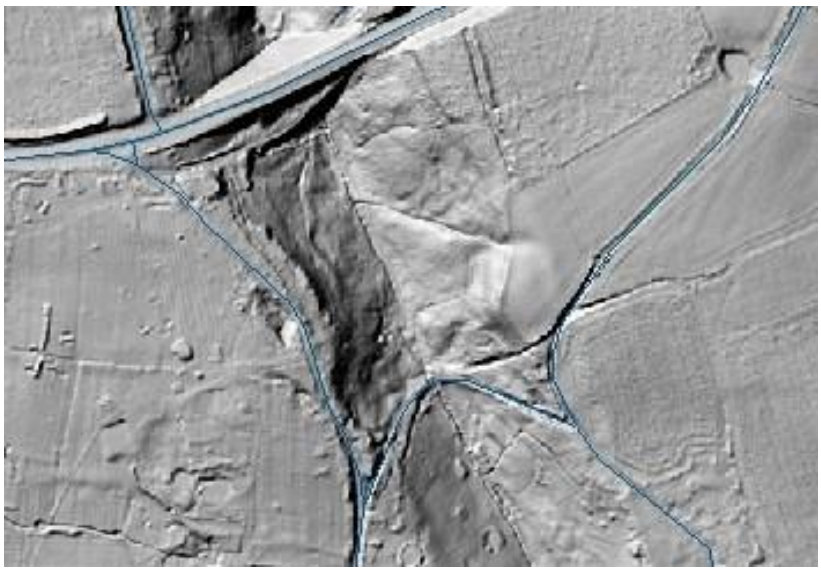
The Moot Mound discovery means that the whole of Binsted's landscape can be seen in a new light, as a 'landscape of governance'. This includes access tracks such as Scotland Lane, other access roads, Binsted valley and the Iron Age earthwork.[6]

A fuller description of the Binsted mound, with references, 'The Hundred meeting place at Binsted, near Arundel: likely site identified', by Emma Tristram, will appear in Sussex Archaeological Collections in December 2017. The article is based on the criteria listed in Baker, J., and Brookes, S. 2015, 'Identifying outdoor assembly sites in early medieval England', *Journal of Field Archaeology* 40, no.1, 3–21, with the approval of Professor Brookes.

[6] The 'Landscapes of Governance' project, 'Assembly sites in England 5th-11th centuries: A three-year interdisciplinary research project bringing archaeology, place-names and written sources together in a national study of early medieval assembly sites', is based at University College London. See http://www.ucl.ac.uk/archaeology/research/projects/assembly.

A large grove of notable veteran coppiced ash trees now forms part of the mound. From their dimensions, these are likely to be at least 800 years old and may date back to the time of the mediaeval tile kilns in Binsted, as a fuel source for the kilns.

Below: Excerpt from Environment Agency LiDAR image of Binsted, showing the hollow way and probable moot mound above the triangle formed by Binsted Lane, Hedgers Hill and Scotland Lane.



One of the ancient coppiced ash trees on the Binsted Moot Mound.

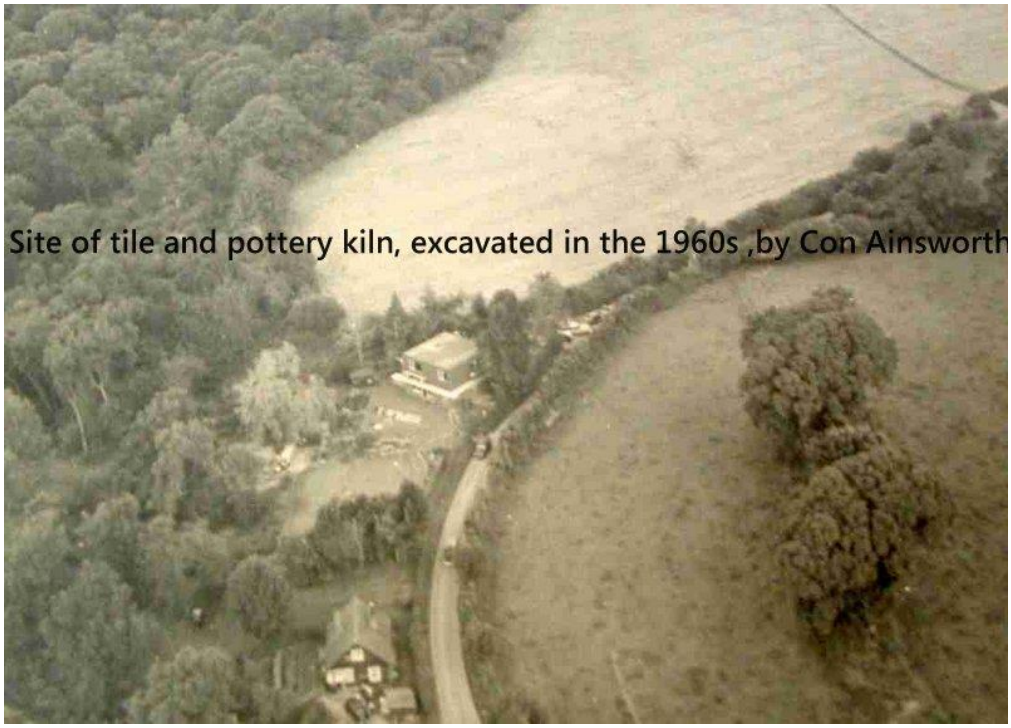
Impact of Option 5A on the Moot Mound: The Mound is outside the actual Option A area but very close to it and it is likely to be lost because of road construction.
Option 5A would severely damage Binsted's 'landscape of governance'.
The ancient ash trees on the Mound are at risk from road construction if Option 5A was built.
Option 5A would separate the Mound (if it survived) from the Roman Road remains.

4. Binsted's Mediaeval tile kilns

Below: Worthing Archaeological Society's 2005 dig at the second Mediaeval tile kiln in Binsted, in the field opposite the Black Horse pub (in background).

In 1963 the archaeologist Con Ainsworth excavated a mediaeval tile kiln in the garden of the house now known as Glentham House (after being named Ashurst for several years) on the corner of Binsted Lane West and Hedgers Hill, within the National Park.

Below: aerial view of the 1963 Mediaeval tile kiln dig at Tyghler's (later Glentham House), Binsted. This photo, taken to show the dig, also shows the 'dome-like hillock' (in the upper field) recently identified as the Moot Mound for Binsted Hundred.



The approximately one million sherds from that excavation, preserved by Worthing Museum, are now being sorted and researched by Worthing Archaeological Society. The Society has a particular link with Binsted. One of its members has made collating all the different maps and information of the Binsted area the subject of her Masters Degree. Since 2002, Worthing Archaeological Society has carried out at least nine digs in or near Binsted.

The Society have excavated a second Mediaeval tile kiln in the field opposite the Black Horse pub (2005); a small Roman villa on the west bank of the Binsted rife (2006-9); a late Iron Age enclosure north of the A27 in Gobblestubbs Copse (2006, 2015 and 2016); and another enclosure in Rough Copse (2017). The digs at Gobblestubbs Copse, inspired by Con Ainsworth's digs there in the 1970s, have helped interpret Binsted's Iron Age earthworks.

Impact of Option 5A on the Mediaeval tile kilns: both tile kilns are in a good state of preservation under the ground. Both are outside the footprint of Option 5A, but Option 5A would affect the whole connected complex of archaeological remains – Roman Road, Moot Mound, Iron Age earthwork, 'landscape of governance', Mediaeval tile kilns, and coppice of ancient ash trees on the Moot Mound which may have been a fuel source for the kilns.

5. Binsted Parish

Binsted was an independent Parish for centuries, from the time when the system of Parishes began in the mid-Anglo-Saxon period, to 1937 when it joined with Tortington – to be detached again and joined to Walberton in 1985. In the 18th century it built its own 'Poor House' next to the church, demolished in the 1920s. It raised taxes from its parishioners and supported its poor.

The settlement at Binsted which became the Parish was defined partly because of its geography – it is a peninsula on gently sloping ground, isolated by marshy brooks on the west, south and east sides, and with woodland to the east and north. Like many longitudinal parishes it contains different types of land, higher ground on the foothills of the Downs, woods on the heaviest clayey soils, good land for cultivation in the centre of the parish, and some of the marshy plain.

The central agricultural fields – where Option 5A, if built, would go through the Parish – are the richest land for cultivation. They are the remains of the Mediaeval 'common field', farmed in strips with different owners. Because of this, Binsted Lane has its meandering U-shape avoiding the central rich land and providing access to the pasture and hay meadows nearer to the brooks.

Consolidation of villages into 'village centres' (known as nucleation) took place from the 9th century – but it never happened in Binsted. So here you can look back through history to a time before villages clustered round a green. This sense of history and 'time-depth' is part of Binsted's attraction and feeling of unity.[7]

[7] 'The process of nucleation was largely completed before the mid 9th century'; Tom Williamson, *Shaping Mediaeval Landscapes*, Windgather Press, 1998, pp. 90-2. P. 67: 'Nucleation was a Middle Saxon, rather than a Late Saxon, phenomenon'.

Because the old Parish still feels like a separate unit, cut off by the Binsted Valley to the west, Binsted has a very marked identity encompassing more than just the houses of the village. The village is the whole place – houses, church, barn, fields, woods, trees, water, undulating land, steep valley. There is no sharp dividing line between houses and 'countryside', unlike the more recent pattern of villages clustered round a 'village green'.

See Chapter 2, Section 1 for a map of the historic Binsted Parish.

Impact on the historic Binsted Parish from Option 5A: Binsted Parish would be cut in two and its unity destroyed.

6. Binsted Park

The name 'Binsted Park' applies to the ancient parkland of Binsted House, within Binsted Woods. It is a 'heritage asset'[8] as historic parkland, created about 1800 by the Read family of Binsted House, and is also one of the most beautiful areas of the woods. One of its huge, ancient oak trees – included in the Park when it was created, by removing woodland around it – still stands and dominates the Park. Others remain round the edge.

Binsted Park

The South Downs Integrated Landscape Character Assessment (2011), planning guidance for the South Downs National Park, states: 'The smaller parklands of Halnaker Park, Dale Park and Binsted Park, although not listed in English Heritage's Register, also make an important contribution to the character of the area' (Wooded Estate Downland, B.1.4).

[8] Binsted Park is stated to be a 'heritage asset', numbered MWS2354, in table B26, in Appendix B to Highways England's Environmental Study Report. This is the only time it is correctly mentioned, but in that table it is incorrectly stated to be 'outside' the scheme area when it is not only inside it but destroyed by it.

Binsted Park is beautiful and much loved. Amateur artist W.S.Rogers, a clerk who lived in Arundel, came back to it again and again and made a series of drawings of it in the 1930s and 40s which are now in the West Sussex Record Office. Descendants of the family who made the Park still live in it, and are related to the families who lived in the Rectory in the 19th century, and the Pub in the 1960s.

An extraordinary series of factual errors in Highways England's consultation materials have managed to make Binsted Park disappear. A longer discussion of the related errors about Binsted Park is included in ABNC's Evidence Section B. The main points are:

1. The real Binsted Park is nowhere correctly described. A viewpoint photo captioned 'Binsted Park' is of a metalled road on Tortington Common.
2. The name Binsted Park is erroneously applied to other areas multiple times. Highways England appear to think it is another name for Tortington Common.
3. A fictitious entity, 'Binsted Park Ancient Woodland', is mentioned several times. Tortington Common appears to be meant.

Impact of Option 5A on Binsted Park: Binsted Park and some of the woodland surrounding it and forming its setting would be destroyed. This fact is obscured in Highways England's consultation materials by the above combination of errors and omissions.

Conclusion

The above evidence shows that Option 5A would destroy many of Binsted's 'well-conserved historical features' in landscape terms – Binsted Park, the unity of the ancient Parish, its 'landscape of governance', part of the little-known Iron Age earthwork War Dyke, part of the newly discovered Roman Road, and possibly also the newly identified Moot Mound.

The damage to Special Quality 6 of the National Park from Option 5A would be substantial. It would also affect Special Quality 7, 'Distinctive towns and villages, and communities with a real pride in their area.' Option 5A would not fulfil Purpose 2, 'Conserve and enhance the cultural heritage of the area'.

Chapter 10 Comparative impacts of Options 5A and 3 on the Special Qualities: Option 5A is much more damaging

This comparison discusses only the western sections of Options 3 and 5A, as it is only the western part of the bypass which offers a distinct comparison of routes. Although our evidence shows that 5A is more damaging, please note that this is NOT an endorsement by ABNC of Option 3 which is itself extremely damaging.

Since both these offline Arundel Bypass routes would have devastating consequences to the 'social and economic wellbeing' of the community of Tortington, south of the National Park boundary, Tortington village is not included in these comparisons.

Tortington village itself shows many of the National Park's Special Qualities and is included in the statement by Landscape Design Associates in March 2001 that the area 'from Walberton to the river Arun' met the designation criteria. It is notable that Option 5A would devastate two communities – Binsted and Tortington – while Option 3 would only devastate one.

Special Quality 1:

'Diverse, inspirational landscapes and breathtaking views'.

Binsted is a diverse and inspirational landscape. It has inspired art, poetry and an Arts Festival (see www.binsted.org/art and www.binsted.org/poetry). Tortington Common is entirely woodland without views – except from the edge of the woodland – and has no similar inspirational influence.

For Special Quality 1, Option 5A is more damaging than Option 3.

Special Quality 2:

'Tranquil and unspoilt places'.

Option 5A, being mainly on a high embankment in Binsted, would ruin many tranquil and unspoilt walks on Binsted's many footpaths, through the changing scenes of Binsted Woods and the countryside they link to, and many other tranquil and unspoilt places. Examples are:

- One favourite tranquil spot, the Madonna Pond, on the edge of the woodland-surrounded parkland of Binsted Park, with historic links to the rest of the village, would be 200m from Option 5A where it is on a 7 to 9 metre embankment. Its tranquillity would be lost and its bench (put in place in 2005 by a community group) would no longer be a pleasant place to visit.
- Binsted Park itself, another favourite tranquil spot with historic links to the rest of Binsted village, accessible by footpaths to the south and north, would be destroyed by Option 5A passing through it.
- The new Waymarker sculpture, a symbol of local pride and culture, at the crossing of Footpaths 341 and 342, enhances the bench that has been in place for 12 years, ideal for contemplating the National Park and Binsted Woods. Its view would be replaced by a view of Option 5A on an embankment – no longer a tranquil and unspoilt place.

There are no equivalent places on Tortington Common though walks on its many footpaths are at present tranquil and unspoilt. Option 3 would be in a cutting within woodland and hence less dominant in the surroundings. Option 5A is even more damaging than Option 3 to Special Quality 2.

Special Quality 3:

'A rich variety of wildlife and habitats, including rare and nationally important species'.

Binsted Woods (the 100 hectares of semi-natural broadleaved woodland forming the western part of the Binsted Woods Complex) contain a very rich variety of wildlife and habitats, including rare and nationally important species.

A recent comparison by ecological consultants of the damage which would be caused by Options 3 and 5A shows that despite destroying less woodland than Option 3, Option 5A is more damaging ecologically (see ABNC Evidence C1). Some of the reasons are:

- The parts of Binsted Woods severed by Option 5A are superb quality Ancient Semi-Natural Woodland at Hundred House Copse and Lake Copse, amounting to 20 hectares.
- Six hectares would be taken by Option 5A and at least 15 hectares of the remaining high quality semi-natural woodland would be degraded. Altogether 41 hectares, nearly half the area of Binsted Woods, would be lost or badly affected.
- Option 5A would sever several chalk streams which drain Binsted Woods, and are part of a rare and irreplaceable habitat. This would affect rare species further down those streams such as the south end of Binsted Rife which contains a rare Flushed Fen habitat.
- Binsted Woods and the surrounding countryside support many rare species: for instance, 13 of the UK's 17 bat species have been found in one short survey at the west end of Binsted Woods. Three are Notable Species, two are 'Annexe 2'.
- Ongoing surveys by MAVES (www.maves.org.uk) show that dormice and water voles are found in Binsted's fields, hedges and ponds. Dormice are a European Protected Species and water voles are a National Protected Species.
- Many species need to forage, breed or hibernate in areas outside the woods and their ranges would be cut off by Option 5A.

Option 5A would be even more damaging than Option 3 to Special Quality 3.

Special Quality 4:

'An environment shaped by centuries of farming and embracing new enterprise'.

Binsted, shaped by centuries of farming, has an active and diverse farming and business community. Its land-based contemporary enterprises include:

- Bee Bee Kennels
- The Black Horse pub
- The fruit, honey and eggs smallholding at Mill Ball
- The Flint Barn, which is the main lambing site of West Sussex Shepherding Service
- Flint Barn holiday accommodation business which is on hold because of the bypass threat
- An agricultural vehicle contractor
- Binsted Nursery
- Binsted Farms
- Forest Knights wilderness skills courses within Binsted Woods

The farm is unlikely to remain viable with Option 5A because its five main fields are severed. Other businesses might be badly affected or fold.

Option 5A is much more damaging than Option 3 to Special Quality 4.

Special Quality 5:

'Great opportunities for recreational activities and learning experiences.'

Walking, riding and cycling opportunities are good in both Binsted and Tortington Common. The range of other recreational activities and learning experiences at Binsted includes:

- The Binsted Arts Festival, now in its 3rd year.
- The Binsted Strawberry Fair, now in its 30th year.
- The field archery club within Binsted woods (www.ratpackarchers.co.uk).
- The learning activities of MAVES (www.maves.org.uk), including professional and volunteer wildlife surveys, hedge planting and laying, training of dormouse handlers, projects involving four universities, and volunteer activities such as removing invasive species.

There are now further recreational and learning activities within Tortington Common such as the educational and health-related visits provided by the owners of Noor Wood, in the path of Option 3. But overall, the range of recreational activities and learning experiences at Binsted is greater.

Option 5A is even more damaging than Option 3 to Special Quality 5.

Special Quality 6:
'Well-conserved historical features and a rich cultural heritage.'

Binsted has 10 listed buildings including St Mary's church, with well-attended regular services and special festivals at Rogation, Harvest, Easter and Christmas. People are attracted by its tranquillity and its historic landscape setting. These would disappear and the church might become redundant. The setting of the listed buildings would be severely affected.

Binsted's cultural heritage includes rich archaeological and landscape remains:

- Worthing Archaeological Society have performed 9 digs in Binsted since 2005 and one member has made Binsted the subject of an MSc thesis.
- Two mediaeval tile kilns, a Roman villa, an Iron Age earthwork and Iron Age enclosures in Binsted form a connected archaeological landscape which would be destroyed by Option 5a.
- An Anglo-Saxon Moot Mound, the meeting place of the pre-Conquest Binsted Hundred, has recently been identified in Binsted, which means Binsted's landscape can now be seen as a 'landscape of governance', including access paths and the steep valley. The Moot Mound might be destroyed by Option 5A and the 'landscape of governance' would be severed.
- Binsted Park, the curving 'pocket park' created in about 1800, still with its ha-ha, pond and huge ancient trees, surrounded by woodland and a lovely historic feature, would be destroyed by Option 5A.
- Binsted's historic Parish, independent until the 1930s, still sharply defined by its geographical features and boundary streams, would be cut in two by Option 5A.

There are no equivalent features or heritage on Tortington Common.

Option 5A is much more damaging than Option 3 to Special Quality 6.

Special Quality 7:
'Distinctive towns and villages, and communities with a real pride in their area.'

Binsted is a distinctive village, mentioned in the Domesday Book, with remarkable 'pride in its area'.

- Its community published its own Millennium Book, 'Binsted and Beyond', in 2002, funded with a Heritage Lottery grant of £5,000, still in print.
- The 2003-5 planting scheme throughout Walberton and Binsted led to the planting of two new hedges in Binsted (on Footpath 342 and Scotland Lane), new standard trees in two hedges and at Binsted Park, the bench at the Madonna Pond, and other enhancements of the landscape, funded by a Landfill Tax grant of £30,000.
- The work of MAVES, as well as wildlife surveys, talks and volunteer activities, has carried on this initiative with repeated laying of the new hedges with volunteers and National Park rangers, and planting part of a third new hedge. Both these initiatives show 'real pride in our area'.
- The community which gets together each year to organise the Strawberry Fair for fundraising (partly for the church's upkeep) also organises a Harvest Supper each year and sometimes a barn dance in the Flint Barn. The community is a very important part of Binsted as a place. It is one of the local communities whose 'social and economic wellbeing' the SDNPA has a duty to foster.

Option 5A would scatter this community and there would no longer be anything to be proud of in the ruined village and landscape of Binsted.

This Special Quality does not apply to Tortington Common. Howeveer some woodland owners there are active in engaging with the surrounding communities of Binsted, Arundel and Tortington.

Option 5A is far more damaging to Special Quality 7 than Option 3.

Conclusion

Option 5A is far more damaging than Option 3 to the National Park's Special Qualities. Nevertheless Option 3 is also extremely damaging and ABNC does not advocate it.

Conclusion to ABNC Evidence A

The above evidence demonstrates that Option 5A would severely damage all seven of the South Downs National Park's Special Qualities at Binsted. It also demonstrates that Option 5A would have an even more damaging effect on the Special Qualities than Option 3.

The damage to the Special Qualities at Binsted would include damage to community, culture and heritage as well as damage to landscape, opportunities for recreation, tranquillity, and biodiversity. The community of Binsted, a 'distinctive village' and a 'community with real pride in its area' (Special Quality 7) would be severely damaged.

Up to 18 homes would be close enough to the new road to severely affect quality of life because of noise and exhaust/air pollution. The rest of the village would lose its beautiful setting closely linked to the Downs, at the foot of the dip slope, and closely linked to Binsted Woods which radiate out into the countryside. Binsted's great learning opportunities, charitable fund-raising, and artistic activities would be curtailed, and much of its historical, archaeological and cultural heritage – still being researched and providing new discoveries – would be destroyed.

The damage would include damage within and to the setting of the National Park. The present good linkage between the National Park and populated areas to the west and south, providing many good walking, riding and cycling routes through beautiful countryside, and to the remainder of the National Park, would be replaced by a dominating dual carriageway, mostly on a high embankment, slicing through the landscape with no relationship to the underlying countryside except one of bringing destruction, severance, noise and pollution.

This destruction and damage would be so great that ABNC considers it would heavily outweigh any perceived benefit from Option 5A of drawing traffic down from other roads within the National Park. With rising traffic levels, partly caused by the new bypass and partly by the major increase in housing development in the area, traffic in the National Park would be likely to grow in the long term in any event. No new road remains free of congestion for long, and as soon as the new road became congested, rat-running in the South Downs National Park would increase again.

Even if the perceived benefit of reducing traffic in the National Park did take place, achieving this gain would not make up for the loss of a beautiful area with hundreds of years of history going back to Anglo-Saxon times, which demonstrates every one of the National Park's Special Qualities.

Arundel Bypass Neighbourhood Committee

Response to Highways England's A27 Arundel Bypass consultation 2017

ABNC Evidence Section B: Errors and bias in Highways England's consultation materials which obscure the damage from 5A

Contents

Introduction: Five areas of errors in the consultation materials

ABNC Evidence Section B contains detailed analysis of five areas of the errors and bias in Highways England's consultation materials. The general trend of the errors, omissions and mis-statements is to obscure the damage that Option 5A would do.

The errors enumerated here are those detectable by a non-specialist reader with knowledge of the area. Further errors in the Environmental Impact Report requiring specialist knowledge to rebut are enumerated in the Critique by consultants Wildlife Splash at ABNC Evidence C4. Again the general trend is to underestimate the damage caused by Option 5A.

Errors, omissions and unconvincing arguments in the traffic and cost benefit figures, with a general trend to obscure the disbenefits of Option 5A and overestimate its benefits, are enumerated in ABNC Evidence D.

Executive Summary

1. Factual errors about the impact of Option 5A on the community of Binsted

The section on 'Effects on Communities' in the Environmental Study Report states Option 5A is '500m north' of Binsted.

Incorrect. Three houses in the village at Binsted Park are 75m away from Option 5A, and 4 are cut off from the rest. One listed house is under 200m, two under 300m, and two under 400m from Option 5A. Five other houses are under 300m, five more are under 400m from Option 5A.

The 'Conclusions' section to the Environmental Impact Report says 5A will 'adversely affect people and communities…east of Binsted.' No mention is made of the impact on Binsted itself.

2. Factual errors about Binsted Park

Binsted Park, ancient parkland within Binsted Woods, is directly in the path of Option 5A and destroyed by it. But Highways England's information has made this damage disappear. A viewpoint labelled 'Binsted Park' is of a metalled road on Tortington Common. A table states Binsted Park is 'outside' the scheme area. There are many other related naming errors.

3. Factual errors about Binsted Woods in the consultation as a whole

- The true size, character and quality of Binsted Woods are never mentioned.

They are a large area, 250 acres/100 hectares, of 'nationally important' broadleaved woodland – as stated by consultants comparing bypass routes in 1992. Option 5A would destroy parts of them and fragment others. Highways England have failed to make it clear that the 'Binsted Woods Complex SNCI' (now Local Wildlife Area) comprises two distinct blocks, Tortington Common in the east and Binsted Woods in the west, and that 5A destroys the integrity of Binsted Woods.

- Misleading visual aids.

Important maps omit areas of Binsted Woods, making them look like unconnected copses. These misleading maps are used as base maps for many other maps, compounding the misinformation.

- Major error in national publicity: the consultation's 22/8/17 launch press release erroneously says Option 5A passes 'between Binsted Woods and the National Park'.

Impossible, since Binsted Woods are in the National Park. This mistake implies there is no damage to either. This mistake has been corrected on the Highways England website but the mistaken version is still current – this error was repeated in television news reports of the 'Save Binsted' demonstration on 8 October.

4. Factual errors about Binsted Woods in the Environmental Study Report

- Environmental Study Report (8.6.6.) states Tortington Common is 'All Semi-Natural'.

Incorrect. Much of Tortington Common is 'Plantation on an Ancient Woodland Site' whereas Binsted Woods are 'Ancient Semi-Natural Woodland'. The distinction, important in planning terms, is never described.

- Environmental Study Report (8.6.6.) states Option 3 would 'Bisect Binsted Wood'.

Incorrect. A route similar to Option 3 was chosen in 1993 to preserve Binsted Woods from the Bypass. Option 3 would bisect Tortington Common not Binsted Woods. 'Binsted Wood' is not a correct name for either of the two areas.

- Table 8.5 in the Environmental Study Report states all Options have 'no significant impact' under 'Semi-Natural Broadleaved Woodland'.

Incorrect. Option 5A destroys Semi-Natural Broad-Leaved Woodland in two places in Binsted Woods and has a 'significant impact' on the rest of Binsted Woods through fragmentation and degradation.

5. Other examples of errors in the consultation materials

- Table inserted from a different project.

A table of 'target notes' at Appendix D of the 'Preliminary Environmental Assessment' is about King's Lynn Power Station.

- Error in consultation brochure.

P. 28 states the impact of Option 1 is 'Major adverse' as it leads to loss of Ancient Woodland from 'Binsted Wood Complex' and 'Rewell Wood Complex'. Option 1 only affects the short, degraded woodland strips beside the existing route. This must be 'Minor Adverse'.

- Error in main map of routes.

Key shows a line of purple dots = Public Rights of Way. On the actual map, a line of purple dots is used for the National Park boundary.

There are many other errors in the consultation materials.

1. Factual errors about the impact on the community of Binsted

The effect on the community of Binsted is never made clear in Highways England's consultation materials. Further, some serious errors suggest that the impact of 5A on Binsted village is far less damaging than it is.

a) Incorrect statement that Option 5A is 500m north of Binsted

The section 'Effects on Communities' in the Environmental Study Report has a section 'Community Severance'. Para 12.4.19 states that Option 5A is 500m north of Binsted.

Incorrect. Binsted is an ancient form of village in which the houses remained spread out round the richest fields, instead of being clustered in a village centre. The incorrect statement in 12.4.19 about the distance from Option 5A to Binsted disguises the true damage that Option 5A would do to the community of Binsted. It winds through the village splitting some houses from others and destroying its setting. Option 5A goes through the community of Binsted separating 4 houses (3 at Foxes Cottages, one at Binsted Manor) from the other 34, and running much closer than 500m to 18 houses, 8 of them listed, and the Black Horse pub.[1] The following table show distances from Option 5A to the closest homes in Binsted.

1. 'The Oaks' (which was the Royal Oak public house and is incorrectly assessed as still being a pub), two dwellings (Grade II listed), is 25m from Option A.
2. Three houses in Binsted Park would be 75m from Option A where it would loom over them on a 7 to 9 metre high embankment.
3. Church Farm (Grade II listed) is 190m from Option A.
4. Ashurst/Glentham House, at the junction of Binsted Lane West with Hedgers Hill, is 225 metres from Option 5A. The smaller house in the Ashurst precinct is 275 metres from Option 5A.
5. Morley's Croft and Meadow Lodge (both Grade II listed) are 275m from Option A which would loom over them on a 7 to 9 metre embankment.
6. Foxes Cottages, three attached cottages near the A27 in Binsted Lane West, are 280 metres from Option 5A.
7. The Black Horse pub is 300 metres from Option 5A.
8. The Old Rectory, a 'Building of character', and Stable Cottage, are 300m from Option A.
9. Mount Pleasant, two cottages near to Church Farmhouse, are 330 metres from Option 5A.
10. Mill Ball, in Binsted Lane West near the barn where the Strawberry Fair is held, is 340 metres from Option 5A.
11. Glebe House (Grade II listed) is 345m from Option 5A.
12. Swiss Cottages (Grade II listed) is 345m from Option 5A.
13. Beam Ends (now Quince Cottage, Grade II listed) is 385m from Option 5A.

[1] The usual count of 38 houses in the village does not include 'The Oaks' (not yet in contact with the village) or 'Littlewoods Nursery' (temporary accommodation). Because 'The Oaks' is mis-appraised by Highways England as having a 'benefit' from Option 5A (despite its conversion from a public house to private dwellings 5 years ago), it is included in this table.

Houses in Binsted and Option 5A: it is incorrect to say Option 5A is 500m north of Binsted.

b) Omission of Binsted and communities to the West from the 'Permanent adverse effect' list

The Environmental Study Report has a section 16, 'Conclusions', about 'Permanent adverse effects', which omits the 'permanent adverse effect' on the community of Binsted. In 16.2.80 it states that Option 5A 'will adversely affect people and communities located…east of Binsted', but does not recognize the adverse effects on the community of Binsted itself.

The full quotation at 16.2.80 is: 'People and Communities – This option [5A] will have a mixed effect on People and Communities. It will realise significant benefits for MTs using the A27, as this option would be likely meet [sic] forecast demand in the long term. However, this offline option will involve significant land take from agricultural land, which is an irreplaceable resource. It will also potentially result in adverse effects on farm businesses located in this area. This option will have a permanent adverse effect on Billycan Camping as the route runs through its footprint, and may [sic] result in it ceasing to be a viable commercial business. During construction and operation, this option will also adversely affect people and communities located south of Arundel, and east of Binsted [sic], who will be subject to increased noise effects, resulting in adverse effects on health and well-being.'

It is extremely biased to mention the effect on, for example, Billycan Camping, but not the effect on the community of Binsted. The paragraph states that Billycan Camping may 'cease to be a viable commercial business' because of Option 5A, but so may several businesses in Binsted – including Binsted Farms, the Forest Knights wilderness skills courses, and several others cited in ABNC Evidence A, Chapter 8.

2. Factual errors about Binsted Park

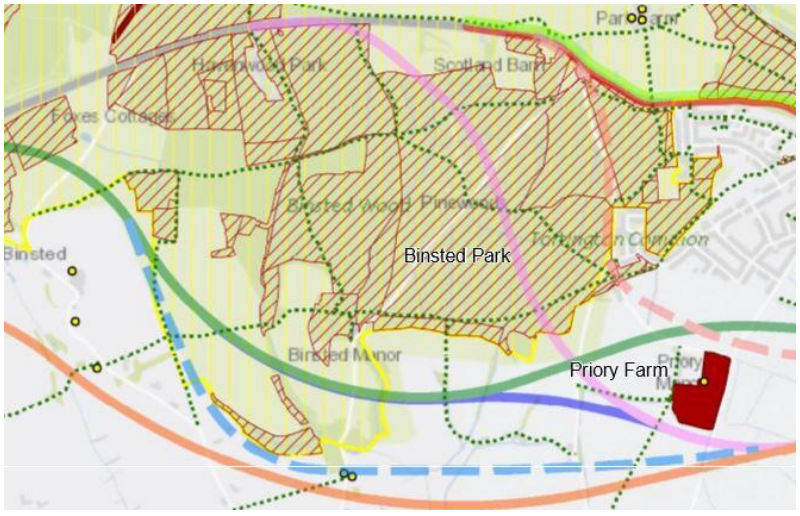
Binsted Park, ancient parkland within Binsted Woods, is directly in the path of Option 5A and is destroyed by it. But Highways England materials hide this damage due to a combination of related naming errors. A viewpoint incorrectly labelled 'Binsted Park' is of a metalled road on Tortington Common. The name 'Binsted Park' incorrectly appears over part of Tortington Common. A table incorrectly states Binsted Park is 'outside' the scheme area. There are many other related errors.

As Binsted Park and part of its surrounding woodland would be destroyed by Option 5A this is an extraordinary and very misleading combination of errors, covering up that destruction.

a) Name shown in wrong location

Below: True location of Binsted Park: over the wood-enclosed remnant parkland of Binsted House, as shown on West Sussex County Council's interactive map, 2010

Below: Highways England's erroneous location of the name 'Binsted Park' over part of Tortington Common, instead of over the Binsted Park parkland (labelled Binsted Manor here): Environmental Study Report, Appendix A, Figure 7.2, 'Landscape Context'. The error is repeated in Figure 6.1.



b) Viewpoint photo of wrong place

A true photo of the historic parkland at Binsted Park.

Below: Highways England's viewpoint photo captioned Binsted Park (Environmental Study Report Figure 7.9, titled 'Viewpoint 6, Binsted Park'). It is not a photo of Binsted Park but of part of Tortington Lane.

c) Reference to Binsted Park in planning guidance not mentioned

The South Downs Integrated Landscape Character Assessment, 2011 (planning guidance for the National Park) refers to Binsted Park as making 'an important contribution to the character of this area' in the same way as Halnaker Park and Dale Park.

In the 'Wooded Estate Downland' section, Paragraph B1.4, it states: 'The great landed estates at Arundel, Goodwood, and West Dean, established in the 18th century, are a key feature of this character area. All three are listed on English Heritage's Register of Historic Parks and Gardens. …The smaller parklands of Halnaker Park, Dale Park and Binsted Park, although not listed on English Heritage's register, also make an important contribution to the character of this area.'

This description of Binsted Park in national planning policy is omitted by Highways England.

d) Error in table listing Binsted Park as a 'heritage asset' outside the scheme area, when it is not only within it but destroyed by it

Appendix B of the Environmental Study Report does mention Binsted Park (and also Binsted House, though it has been replaced by a new house called Binsted Manor) in a table of 'heritage assets', as they have HER reference numbers. They are listed in a table under Option 5. No such table is provided for Option 5A although 5A has the same effect on 'heritage assets' in Binsted as Option 5. Binsted Park is listed as 'Park – Binsted House'.

However, Binsted Park is listed in this table as 'outside the scheme area', when it is not only within the area of Option 5A but destroyed by it.

Below: Arundel Bypass Environmental Study Report Appendices, Appendix B, Table B26, 'Non-designated heritage assets within 200m Study Area (Option 5)' lists Binsted House and 'Park-Binsted House', i.e. Binsted Park, as 'outside' the scheme area – actually both are inside it.

HER Ref Number	Name	Sensitivity	Historical Period	Inside or Outside the Scheme Area
MWS4224	Lynchets and Path, Upper Broomhurst Farm	Local	Late Medieval	Outside
MWS2301	Site of building in Binsted Wood	Local	Late Medieval	Inside
MWS6979	Binsted House	Local	Industrial	Outside
MWS4192	Boundary Bank. Spinningwheel Copse	Local	Post-medieval	Outside
MWS4191	Boundary Bank, Tortington Common	Local	Post-medieval	Outside
MWS2354	Park - Binsted House	Local	Industrial	Outside
MWS4186	Small Plantation, Tortington Common	Local	Post-medieval	Outside
MWS11901	Knowels Barn Historic Outfarm,	Local	Industrial	Outside
MWS4363	Causeway Feature, Priory Farm	Local	Post-medieval	Outside
MWS2989	Arundel Towermill	Local	Industrial	Outside

e) Error in using the name 'Binsted Park Ancient Woodland' for the woodland of Binsted Woods and Tortington Common

Environmental Study Report, para 16.2.95 states: 'The main constraints which would affect development of offline options are as follows…the nature conservation of **Binsted Park Ancient Woodland**, west of Arundel'. There is no such thing as' Binsted Park Ancient Woodland'. Binsted Park is not woodland at all, but remnant parkland, with many parkland features (ha-ha, fishponds, ancient trees). It is surrounded by woodland. Highways England probably mean the Binsted Woods

Complex west of Arundel, i.e. Binsted Woods and Tortington Common. They have completely obscured the real Binsted Park, the remnant parkland enclosed by Binsted Woods.

This list of damage at 16.2.95 also includes 'the sensitivity of people living in areas south of Arundel, south of Binsted Park, and west of Binsted to noise'. Presumably, 'Binsted Park' is erroneously used again here to refer to the woodland of Binsted Woods and Tortington Common.

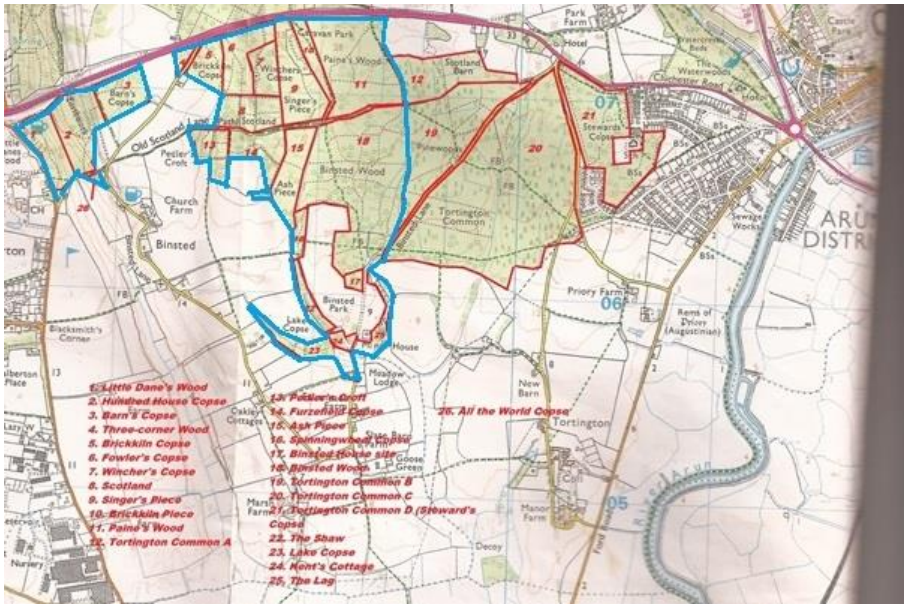
No mention is made of the sensitivity to noise of people living in the real Binsted Park, where there are three houses which would be only 75m from Option A, looming over them on a 7 to 9m-high embankment. No mention is made of people living in the village of Binsted (38 houses) and their sensitivity to noise.

16.2.99 also uses the name Binsted Park wrongly. 'All of the offline options, except 5B, include some land taken from Binsted Park Ancient Woodland'. There is no such thing. Again something like 'The woodland of Binsted Woods and Tortington Common' is meant.

Related naming errors: 'Binsted Woods', 'Binsted Wood', 'Binsted Park' and 'Binsted Park Ancient Woodland' are all incorrect names used by Highways England when the whole Local Wildlife Area consisting of Binsted Woods and Tortington Common is probably meant.

Until Tortington Common was added to the then Binsted Woods Complex SNCI in 2003, the SNCI contained only Binsted Woods and the southernmost strip of Tortington Common. Once the whole of Tortington Common had been added, this led to people using the words 'Binsted Woods' to refer to the whole woodland area. This is incorrect as Binsted Woods form only part (though the larger part) of the Binsted Woods Complex LWA. Another related error is to call the whole area 'Binsted Wood'. Binsted Wood, without the s, is a smaller woodland parcel within Binsted Woods.

Another related error by Highways England is to call the LWA 'Tortington Common/Binsted Woods' on maps, with the words 'Tortington Common' over Binsted Woods and 'Binsted Woods' over Tortington Common. Binsted Woods are outlined in blue on the map below.



3. Factual errors and omissions about Binsted Woods in the consultation as a whole

The consultation materials fail to state the true size, character and quality of Binsted Woods. They are a large area, 100 hectares or 250 acres, of 'nationally important' broadleaved woodland – as stated by consultants comparing bypass routes in 1992. They are wholly within the National Park. Their quality is so good that in 1993 the decision was taken to make what is now Option 3 the Preferred Route, although it destroyed more woodland. This difference in quality between the two areas of woodland – Binsted Woods and Tortington Common - still exists although both areas are now in the South Downs National Park, and Tortington Common is now regenerating.

The true character of Binsted Woods as superb quality, connected, broad-leaved, semi-natural woodland, deeply integrated into its surrounding countryside, has to be understood to evaluate the damage Option 5A would do. Option 5A would sever, destroy and damage 41 hectares of Binsted Woods – nearly half their acreage. This damage is not apparent from 'a glance at a map', which suggests that Option 5A is less damaging than Option 3 because it destroys less woodland.

Option 5A destroys woodland at the north-west and south-east areas of Binsted Woods, where they enclose parts of Binsted village. Binsted Woods' historical and landscape context, facing Binsted and forming an essential part of it, entirely within the old Binsted Parish, would be destroyed by Option 5A. So would the beauty of the village of Binsted, partly in the woods – and hardly mentioned (except erroneously) in Highways England's consultation materials, though a few notes on the effect on listed buildings are tucked away in the small print.

Important maps in Highways England's materials omit areas of Binsted Woods, making them look like unconnected copses – see (d) below. These misleading maps are used as base maps for many other maps, compounding the misinformation. These and many other errors work together to hide the damage that Option 5A would do to Binsted Woods.

For a detailed analysis of the massively damaging ecological impact which Option 5A would have on Binsted Woods and their linked habitats, see ABNC Evidence C3, an Impact Assessment of the ecological damage from Option 5A, and C4, a professional critique of Highways England's Environmental Study Report. Evidence C also includes a comparative table assessing the damage to habitats and protected species from the three Options (C1), which shows Option 5A to be the most damaging option – even more damaging than Option 3.

a) Major error in national publicity

As well as misrepresenting the true shape and importance of Binsted Woods throughout its consultation materials, Highways England made a major error in its opening press release (22.8.17), suggesting that Binsted Woods are not even within the South Downs National Park. This press release was read on television and social media and hence seen nationwide. It reads: **'**Option 5A: A new dual-carriageway following the same route as option 3 between Crossbush junction and Ford Road. From Ford Road the route continues west passing **between the South Downs National Park and Binsted Woods**, rejoining the existing A27 at a new junction near Yapton Lane.'

Binsted Woods are entirely within the South Downs National Park. This error could make people believe Option 5A will do no damage to either Binsted Woods or the National Park, when in fact it

would damage both. The error was eventually corrected on the Highways England website, but by then many people will have gained the erroneous impression that Option 5A does not damage Binsted Woods, chosen it, and sent in their consultation responses. No correction statement was sent to the media. The error was repeated on national TV news about the 'Save Binsted' demo on 8 October.

b) The real impact of Option 5A: substantially damaging Binsted Woods' 'national importance'

The 1992 planning decision at the highest level, which rejected the bypass route through Binsted because of Binsted Woods' 'national importance', is highly relevant to the new consultation on two routes very similar to those compared in 1992. Very little about Binsted Woods has changed since 1992, and they have recently become better understood as a very rich ecological area because of the surveys of MAVES since 2015.

Even though the situation has changed at Tortington Common, with its continuing regeneration after the hurricane damage of 1987, what the consultants said in 1992 of Binsted Woods still remains true: 'Destruction or fragmentation' would 'substantially damage the national Importance' of Binsted Woods.

Option 5A would destroy woodland within Binsted Woods at Hundred House Copse, the Shaw, and the Lag, and fragment from the rest of the woods the remaining area of Hundred House Copse; Little Dane's Wood; Lake Copse; and the remaining areas of the woodland enclosing Binsted Park, the Shaw and the Lag (if any remained). This amounts to both destruction and fragmentation.

c) The species-richness of areas of Binsted Woods not defined as 'Ancient Woodland'

Highways England have focussed on the limited regulatory definition of 'Ancient Woodland' (wooded since 1600), rather than the real quality of the woods. Highways England have not realised that the areas of Binsted Woods that are not defined as 'Ancient Woodland' (i.e. wooded since 1600) are just as species-rich and requiring protection as the areas that are.

The Department of Transport's 1992 report comparing a route like Option 5A with a route like Option 3 acknowledged this, when it stated of Binsted Woods: 'It should be noted that whilst a number of woodland compartments are at most 200 years old, and therefore cannot be regarded as Ancient Semi-Natural Woodland, the flora in these compartments are locally rich and include a number of uncommon species'.[2]

This possibility, that woodland defined as not 'Ancient Woodland' (in the limited regulatory definition) can be as rich ecologically as woodland defined as 'Ancient Woodland', has been known since at least 1992 and is confirmed by new research. If the period of clearance is short, or if the woodland is adjacent to woodland defined as Ancient Woodland, the woodland can regain Ancient Woodland characteristics and species more quickly than is generally realised, for instance, within

[2] Environmental Assessment Unit of Liverpool University Limited, 'The Binsted Wood Complex: A brief appraisal of its conservation value and context', 1992.

100 or 200 years. Both conditions – the short open period and the presence of adjacent Ancient Woodland - are true of the parcels of Binsted woods not designated as 'Ancient Woodland'.

Above: red and white fritillaries,* Fritillaria meleagris*, in a part of The Shaw, Binsted Woods, that is not defined as 'Ancient Woodland' (in the limited regulatory definition). The Shaw – partly designated Ancient Woodland - is in the path of Option 5A.

These flowers appear nowhere else in Binsted Woods. This backs up the statement by Dr Tony Whitbread of the Sussex Wildlife Trust that woodland not defined as 'Ancient Woodland' can have a richer flora.

All of the parcels of Binsted Woods, whether or not designated as 'Ancient Woodland', are species-rich and provide habitat for unusual species essential to the National Park's biodiversity, requiring them to be given due regard in the route selection process. This has not been done.

Rethinking Ancient Woodland by Gerry Barnes MBE and Tom Williamson, University of Hertfordshire Press 2015, points out the problems with the Ancient Woodland definition. One is that it leads to seeing woodland quality in black and white and rejection of what is not designated – exactly as has happened in Highways England's consultation.

Another is the implication that woodland not designated Ancient Woodland is not 'ancient'. Parts of Binsted Woods may be 1000 years old or more, have had a short period as a wood pasture or furze field, and been mapped during that period. Those parts are not defined as 'Ancient Woodland' according to the limited regulatory definition (wooded since 1600), although they are extremely 'Ancient' in the usual sense of the word.

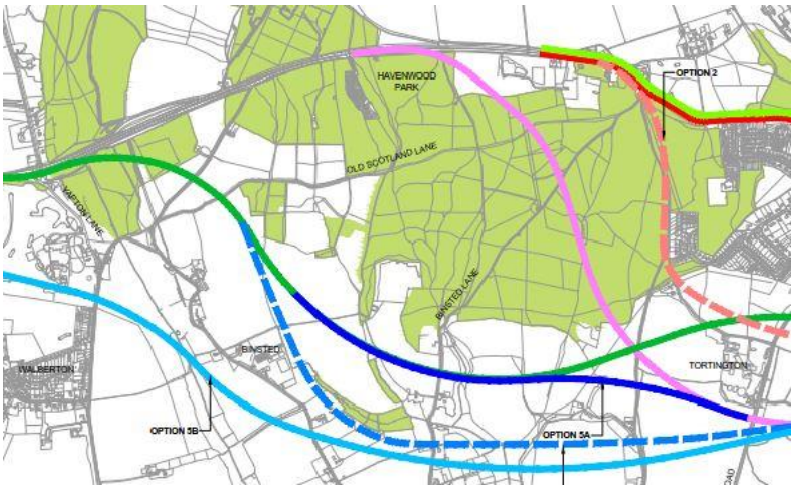
d) Highways England's misleading maps

Many of Highways England's maps simply leave out those parts of Binsted Woods not designated as Ancient Woodland, or give a visual effect that completely disguises Binsted Woods' shape, connectedness and value.

Figure 1. What's really there. The true outline of the Binsted Woods as shown on the 'Deciduous Woodland Priority Habitat' map published by Natural England on magic.gov.uk. Red circles indicate woodland omitted in many of Highways England's maps for the consultation.

For instance, Highways England's map at Figure 2 (below) leaves out woodland not defined as 'Ancient Woodland' (wooded since 1600), without explanation. Several valuable sections of Binsted Woods are missing, making them appear to be a scrappy collection of bits of woodland, not joined together.

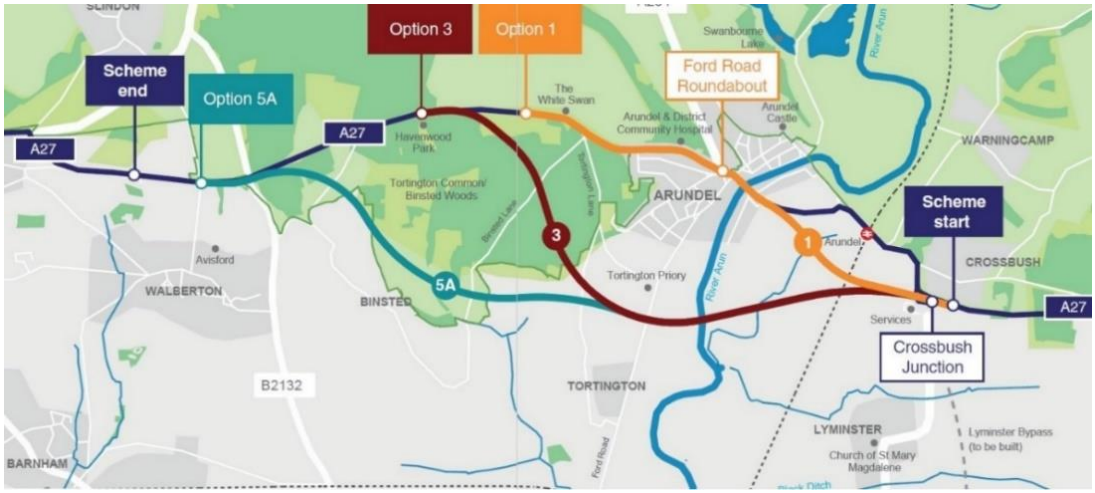
Figure 2: map of routes in Highways England's Environmental Impact Report Appendix Fig. 7.2, with woodland omitted. The upper omission suggests far less woodland than is there in reality. The lower omission is of woodland in the path of Option 5A.



This problem appears again in the main, general map of the routes (Figure 3). Here some attempt is made to show designated 'Ancient Woodland' and other woodland, according to the limited regulatory definition, but the outline of Binsted Woods is nothing like the real outline of the woods and suggests much less woodland than is really there. This is reused many times as a base map.

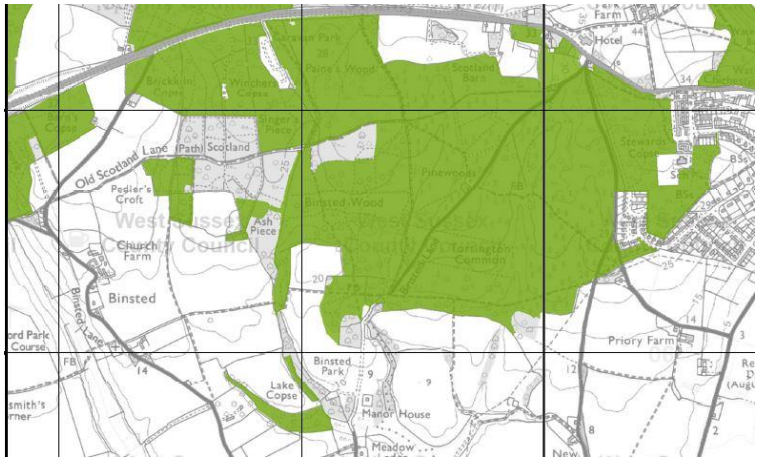
The slightly different green shown for woodland not classified as Ancient Woodland, according to the limited regulatory definition, is confusing – still worse, its boundary bears no relation to the real woodland boundary, and shows woodland in many places that are really fields. It does not look like a woodland outline. Still more confusing is the third green used for the National Park. *The result is that the true outline of the woods is not shown on this vital map.*

Figure 3: Highways England's main general map of routes not showing the true outline of the woodland at Binsted traversed by Option 5A. Reused many times as a base map.



The map that is the basis of Highways England's misleading maps is the revised Ancient Woodland Inventory for West Sussex, Binsted Woods and Tortington Common section (Figure 4 below). Green indicates woodland classified by the AWI as 'Ancient Woodland' – in the limited regulatory definition.

Figure 4: Section of the Revised Ancient Woodland Inventory for West Sussex, with green showing 'Ancient Woodland' in the limited regulatory definition. The areas of Binsted Woods not defined as 'Ancient Woodland' are as high quality as the rest in ecological terms.



The areas of Binsted Woods not classified as Ancient Woodland are as high quality as the rest in ecological terms, and Section 62 of the NERC Act requires them to be considered according to their ecological value, not limited to that definition. The only effect of the Ancient Woodland definition is the likely cost of required mitigation measures, which may explain Highways England's preference to ignore the habitat and biodiversity contribution of all of Binsted Woods.

e) Erroneous woodland outline used in many other maps

The erroneous woodland outline used by Highways England shown above (Figure 2, Figure 3) is used by them in many other maps. It is used in Technical Appendix F1, Option 5A GA Plans; Appendix F2, Option 5A Stats; Appendix F3, Option 5A Drainage; Appendix F4, Option 5A NMU Proposals; Environmental Study Report Appendix A, Figs. 6.1, 7.1, 8.1, 8.2, 9.1, 11.1, 13.1, and in Preliminary Ecological Appraisal Appendix A Fig. 1. One more example is given here:

Figure 5: Erroneous woodland outline used again in Appendix F4 and in many other places

By their constant reiteration of their erroneous woodland outline – which would suggest to anyone looking at these maps that those areas shown as white space are not woodland at all – Highways England have made the true mass, size, and importance of Binsted Woods disappear.

f) The importance of the true shape of Binsted Woods: landscape, community and history

The erroneous shapes of Binsted Woods, as shown on many of Highways England's maps, next to the solid block of Tortington Common, also hide the landscape importance of Binsted Woods. They hide the true massiveness of Binsted Woods and the way they protect Binsted village from the noise of the A27.

They also hide the fact that Binsted woods, 250 acres of semi-natural broad-leaved woodland, mostly oak and ash, are historically united – all within the old Binsted Parish, now Walberton Parish, and all part of land owned by the Wishart family since the 1920s. They contain 20 separate woods, each with its own name and history, but they share a grand, mysterious character with many huge fallen trees, some regrowing from horizontal.

The erroneous Highways England maps also hide the historical outlines with much to tell about the past. The actual shape of Binsted Woods shows historical facts – assarts. These are two fields, square in shape, nearly surrounded by woodland, which were carved out of the woodland when it was part of the mediaeval Arundel Forest. If parts of Binsted Woods are left out on a map, as Highways England have done, one 'assart' field disappears, reducing the significance of the other so that it does not look like an assart – whereas with two, the interpretation is obvious.

g) No distinction in the consultation materials between different types of Ancient Woodland

As well as using the Ancient Woodland category to downgrade Binsted Woods by making parts of them 'disappear', the Highways England reports ignore the fact that there are two types of 'Ancient Woodland': 'Ancient Semi-Natural Woodland', i.e. not obviously planted (ASNW), and 'Plantation on an Ancient Woodland Site' (PAWS). Binsted Woods are largely the first type, Tortington Common is largely the second type. See Figure 6 below.

Both ASNW and PAWS have legal protection, but failing to mention the difference between them hides the true character and value of Binsted Woods. Binsted Woods are very different from the mainly regenerating conifer plantation of Tortington Common, and as broad-leaved woodland much more valuable ecologically. The challenge of mitigating effectively for Ancient Semi-Natural Woodland, even if it was considered possible, is much greater than mitigating for PAWS.

The omission of any characterisation of the difference between Binsted Woods and Tortington Common, together with the erroneous woodland outlines used throughout the consultation materials by Highways England, would make many respondents unfamiliar with the area think Option 5A would be least damaging, even if they were trying to consider the effect on the woodland. The truth is the opposite. See ABNC Evidence C1 for a comparative table showing that Option 5A is even more damaging than Option 3 to habitats and protected species.

Figure 6: 'Ancient Woodland' in Binsted Woods and Tortington Common, in the limited regulatory definition, published by Natural England on magic.gov.uk. This shows Binsted Woods as mainly 'Ancient Semi-Natural Woodland' (vertical green stripes) and Tortington Common as mainly 'Plantation on an Ancient Woodland Site' or PAWS (horizontal red stripes).

3. Factual errors about Binsted Woods in Highways England's Environmental Study Report

Further errors by Highways England include the erroneous statements that Tortington Common is 'All Semi-Natural', and that all Options have 'no significant impact' under 'Semi-Natural Broad-Leaved Woodland'. The latter error is a gross under-statement of the very serious impact Option 5A would have on the semi-natural broadleaved woodland of Binsted Woods.

a) Environmental Study Report (8.6.6.) states Tortington Common is 'All Semi-Natural'.

This is incorrect. In fact, much of Tortington Common is 'Plantation on an Ancient Woodland Site' (PAWS) whereas Binsted Woods are mostly 'Ancient Semi-Natural Woodland' (ASNW). The distinction is never discussed or its importance analysed.

b) Table 8.5 in the Environmental Study Report incorrectly states all Options have 'no significant impact' under 'Semi-Natural Broadleaved Woodland'.

Under 'semi-natural broad-leaved woodland' all options are marked with an X for 'no significant impact'. **This is incorrect**.

- The impact on Hundred House Copse is very significant. It is semi-natural broadleaved woodland, designated as Ancient Woodland, an important wet valley habitat, and in the 1992 Department of Transport report was found to contain a high number of Ancient Woodland indicators. It would be partially destroyed by the junction for 5A, cut off from the rest of Binsted woods, and its unusual chalk stream woodland would be severely damaged.
- The impact on woodlands known as The Shaw and the Lag is very significant. Both are semi-natural broadleaved woodland. Part of the Shaw is designated Ancient Woodland. Though relatively small, these woods enclose the heritage asset of Binsted Park and form part of its setting, and are essential connector corridors between the Lake Copse Ancient Semi-Natural Woodland and the main block of Binsted Woods. They would be partially or wholly destroyed by Option 5A.
- Significant areas of the 'nationally important' woodland at Binsted Woods, amounting to 20 hectares, would be fragmented from the rest by Option 5A– including the remains of Hundred House Copse, Little Dane's Wood and Lake Copse.

In the words of the 1992 consultants' report, this is 'destruction or fragmentation', which would 'substantially damage the national importance' of Binsted Woods, which are entirely Semi-Natural Broadleaved Woodland. This is a very significant impact.

c) Environmental Study Report (8.6.6.) states Option 3 would 'Bisect Binsted Wood'.

- **This is incorrect**. Binsted Wood is one of the 20 compartments within Binsted Woods. It is not bisected by Option 3.
- Even if 'Binsted Wood' is being used incorrectly for Binsted Woods, Binsted Woods are not bisected by Option 3, indeed a similar route was chosen in 1993 as the Preferred Route to preserve Binsted Woods (the woodland west of Tortington Common).

- 'Binsted Wood' may be used erroneously here instead of 'The Binsted Woods Complex'. When Tortington Common was added to the Binsted Woods Complex SNCI (now Local Wildlife Site) in 2003, 'The Binsted Woods Complex' became a correct way of referring to Binsted Woods and Tortington Common together. It is incorrect to call the whole area of woodland 'Binsted Woods' or 'Binsted Wood'.

A true statement here would be 'Option 3 would bisect the Binsted Woods Complex LWS. It would almost entirely avoid Binsted Woods (mostly Ancient Semi-Natural Woodland) and pass through Tortington Common which is mostly a PAWS.' Thus not only is the adverse impact of 5A understated, but the adverse impact of Option 3 is overstated.

d) Further errors and inconsistencies in the Environmental Study Report

8.4.14. The Binsted Woods Complex Local Wildlife Site (previously known as a Site of Nature Conservation Interest or SNCI) is described. It consists of Binsted Woods and Tortington Common. Highways England states that 'Oak…dominates the canopy'. This is true of Binsted Woods, but not of Tortington Common.

8.4.14. Highways England quotes (not citing a source) the Binsted Woods Complex SNCI description which states 'Early purple orchids…are counted in thousands in Ash Piece'. Ash Piece, a woodland parcel within Binsted Woods, is another example of the potential for outstanding species-richness of an area not defined as Ancient Woodland. Ash Piece is one of the areas of Binsted Woods which is not designated as Ancient Woodland and hence is left out on many of Highways England's maps. The description suggests it is valuable, the map omission (incorrectly) that it is not.

Table 16.1 scores Option 3 as 'minus 3' for effect on Landscape and Option 5A as 'minus 2'. This is incorrect. Option 5A has a far greater effect on landscape as much of it is in open fields and on an embankment 7 to 9 metres high, and the area where Binsted Woods intersect with the countryside is destroyed. Option 3 is in a cutting through Tortington Common. Option 3 impact is overstated, Option 5A impact is understated.

4. Other examples of errors in the consultation materials

a) Table inserted from a different project

The extremely low quality of ecological appraisal underlying the assessment of 5A is well illustrated by an error in the Preliminary Ecological Appraisal, Appendix D (part of the Environmental Study Report). A table of 'target notes' forms this Appendix. It is not about this scheme at all but about a scheme at Kings Lynn Power Station.

b) Factual error and contradiction in the consultation brochure

The consultation brochure states on p. 28 that the impact of Option 1 is 'Major adverse' as it leads to loss of Ancient Woodland from 'Binsted Wood Complex' and 'Rewell Wood Complex'. But Option 1 only affects the short, already degraded woodland strips along either side of the existing route. This should have been scored as 'Minor Adverse'.

There is also an important contradiction between p. 28, which states that Option 1 will have slight effects on landscape, soils, noise and hydrology, and p. 26, which states that all options will have similar adverse impacts on nature conservation, heritage, landscape, soils, noise and hydrology. The statement on p. 26 is clearly wrong.

c) Major error in key to Highways England main map of routes ('Regional Improvement Programme A27 Arundel bypass options')

The main Highways England map of routes uses a line of purple dots for the National Park boundary, as in the excerpt below.

However, the key for the main Highways England map of routes shows a line of purple dots as depicting Public Rights of Way. This means that neither Public Rights of Way, nor the National Park boundary, are correctly depicted on this all-important map that is the basis of the whole consultation.

This error means that respondents to the consultation have a misleading impression of both the position and number of Public Rights of Way in the Option 5A area. They also gain a misleading impression of what is included in the South Downs National Park. Both are matters which might influence their judgement on Option 5A.

d) Inconsistent estimates of Ancient Woodland lost to 5A

Para 3.2.15 of the Environmental Study Report states that 18 hectares of Ancient Woodland would be taken by 5A. Para 8.7.20 states that Option 5A would result in the permanent loss of approximately 13 hectares of Ancient Woodland in the north-west corner of the Binsted Woods Complex LWS. Para 7.7.47 states that Option 5A would take up to 6 ha of Ancient Woodland.
To quote David Sawers, chairman of the Kingston and East Preston Preservation Society, who noted this inconsistency in his response to Highways England: 'This last figure is used on p. 29 of the Brochure. However, one cannot accept this figure with confidence when two other figures are quoted in the report, and there appears to be some uncertainty about the relationship between the route of this option and the features of the landscape'.

Conclusion

With omissions and erroneous statements Highways England have obscured the true impact of Option 5A on the community of Binsted. With omissions, erroneous statements and misleading maps they have obscured the true quality and 'national importance' of Binsted Woods, and obscured the true impact of Option 5A on Binsted Woods.

Highways England's obligation to have regard to National Park Special Quality 3 – 'A rich variety of wildlife and habitats' – is not limited to woodland which meets the limited regulatory definition of 'Ancient Woodland'. Rather, it obligates consideration of the entirety of Binsted Woods as nationally important, high-quality, connected deciduous woodland. Highways England have not met this obligation.

These errors about the impact of 5A on the community, on landscape and on Binsted Woods, together with ecological and traffic mis-appraisal (see ABNC Evidence C and D), mean that Option 5A has been grossly mis-appraised. This has misdirected the responses of consultees.

Arundel Bypass Neighbourhood Committee

Response to Highways England's A27 Arundel Bypass consultation 2017

ABNC Evidence Section C: Analysis by ecological consultants of the true effects of Option 5A

Contents

Introduction

C1: A comparative table of damage to habitats and protected species which shows that Option 5A is the most damaging option

C2: A mitigation table which shows that the cost of mitigation and compensation for Option 5A has been drastically under-estimated

C3: A major report on the ecological consequences of Option 5A. It concludes that 'Option 5A cannot be achieved without a severe and significant negative impact upon protected species and irreplaceable habitats – the biodiversity of the Mid Arun Valley.'

C4: A critique of Highways England's Ecological Impact Report. It highlights major errors and omissions and concludes that 'Interested parties cannot possibly draw even the most fundamental conclusions based on such a lack of information.'

Because the evidence in this section is so comprehensive, we are repeating here as an Introduction the 'Conclusions' to C3, the major report on the ecological consequences of Option 5A. It states that the Mid Arun Valley is of outstanding biodiversity and such areas 'should be ring-fenced for protection', also that 'the online option is by far the least damaging option and planners are legally obliged to take this into account when making their decisions'.

CONCLUSIONS [TO ABNC EVIDENCE C3]

A SUMMARY

6.1 Surveys within the Mid Arun Valley over the past two years have shown the area to support an exceptional number S41 Habitats and Species of Principal Importance for the conservation of biodiversity. A summary of the site attributes is as follows:

- A total of 14 S41 Habitats, which cover the majority of the area.
- An assemblage of bats that is likely to be of National Importance.
- An assemblage of invertebrates that could be of National Importance.
- An assemblage of birds that could be of National Importance.
- Known high populations of protected species that are likely to be of Regional Importance such as Dormouse, Harvest Mouse, Common Toad, Grass Snake, Common Lizard, Slow Worm and Adder.
- Populations (extent unknown) of species also likely to be of Regional Importance such as Water Vole, Brown Hare, European Eel and Hedgehog.
- Habitat with the potential to support Otter and Great Crested Newt.
- A very high population of Badger, which is likely to be of Local Importance.

6.2 Areas such as this should be 'ring-fenced' for protection. The Mid Arun Valley does not just support populations of one or two protected species, but thriving populations of most protected species.

6.3 In this, it is an unusual area, for much of the British countryside is impoverished, and large areas usually support just a handful of habitats which do not include a range of S41 Habitats of Principal Importance.

6.4 Assemblages and habitats such that seen in the Mid Arun Valley are a remnant of a far more connected countryside with less intensive farming. There are few remaining areas such as this and therefore there is no appropriate mitigation or compensation for such outstanding biodiversity.

MITIGATION

Direct habitat loss

6.5 Mitigation measures usually consider the direct loss of habitat that would disappear beneath a given feature i.e. direct habitat loss. In this instance there are a number of indirect impacts and impacts that will not be realised until the longer term as follows:

- The quality of the habitat such as the wet seepage woodland in Hundred House Copse / Little Danes Wood that would be altered / destroyed due to the road. These habitats are irreplaceable.
- The fragmentation of woodland leaving small remnants that will gradually lose their wildlife interest and value such Barns Copse, The Lag and The Shaw.

- The severance of two chalk streams, which support rare and threatened species and are irreplaceable.
- The impact upon the stream and ditch network, the ponds fed by this system and the areas of adjacent and integrated lowland fen, reedbed, swamp and marshy grassland.

An integrated landscape for protected species

6.6 The Mid Arun Valley forms a continuation of an exceptionally diverse river corridor that is relatively uninterrupted from the middle of Sussex as far as the English Channel. It is the presence of good quality habitats, the proximity to other good quality habitats such as the Arun Valley Special Area of Conservation, the Arundel Park SSSI and the Arundel Wildfowl and Wetlands Trust Reserve and the lack of barriers to dispersal that has resulted in the diverse range of species observed in the Mid Arun Valley area.

6.7 The course of the River Arun with a margin of associated floodplain grassland can be traced from the coast to its origin in mid Sussex with very few barriers. This, when compared to other mid-Sussex rivers such as the Adur and the Ouse, provides a corridor that is largely uninterrupted by urban areas and major road networks.

6.8 This uninterrupted landscape feature, that is of immense importance to wildlife, should be preserved in an area with such a high human population density.

Loss of dispersal corridors for protected species

6.9 There are 11 habitat corridors from the Binsted Woods Complex linking to the surrounding habitats and subsequently linking the surrounding habitats to each other and further afield. This forms an important integrated network of habitat linkages.

6.10 Mitigation will not provide crossings for all 11 corridors which will have a negative impact on species that rely on moving across the landscape on a seasonal or diurnal basis. Protected species that would occupy both woodland and open habitats and use these habitat linkages are as follows:

- Badger, birds and bats – move across the landscape on a daily basis for foraging.
- Common Toad – move across the landscape in order to access ponds to breed and then spend most of their life cycle terrestrially in damp grassland, woodland, shaws and copses.
- Reptiles, particularly Adder and Grass Snake, move several kilometres across a given landscape from hibernation sites to breeding and foraging grounds.
- Hedgehogs routinely travel up to 2 km per night to forage.
- Dormice will use the corridors primarily for dispersal to find new areas of habitat.
- Water Voles are largely restricted to the use of 'wet' corridors across the landscape.
- Invertebrates follow corridors in order to colonise other areas and to search for food plants.

6.11 Mitigation does not compensate for habitat fragmentation and even when green bridges and culverts are constructed there is little evidence that these are compensatory.

6.12 Ree *et al.* 2007 reviewed 123 papers on the effectiveness of mitigation methods for animals crossing roads. Most studies demonstrated that most measures designed to increase the permeability of roads for wildlife were successful at the level of the individual animal (i.e. an animal was found using it).

6.13 However, the extent to which the population benefits from a successful crossing is unclear. They say that there is insufficient information and analysis in the majority of studies to evaluate whether these structures increase the viability of the population to an acceptable level.

Habitat fragmentation

6.14 The problems with habitat fragmentation and the importance of habitat connectivity and corridors has increasingly been a focus for planning and action, culminating in the national 'Making Space for Nature' Lawton report (2010).

6.15 During the launch of this report Professor Lawton said "There is compelling evidence that England's collection of wildlife sites are generally too small and too isolated, leading to declines in many of England's characteristic species. With climate change, the situation is likely to get worse.

6.16 This is bad news for wildlife but also bad news for us, because the damage to nature also means our natural environment is less able to provide the many services upon which we depend. We need more space for nature".

6.17 The 2010 Lawton report promotes four essential principles for future nature conservation in the UK: bigger, better, more, and joined-up.

6.18 Local populations of a given species will be scattered across the Mid Arun Valley and beyond. At some locations and may become extinct for a number of reasons such as localised flooding, drying, freezing, predation etc.

6.19 Many species have very limited dispersal abilities and so without the ability to move about the landscape and recolonize such areas, populations would disappear from these patches and eventually from the larger area. Landscape scale extinction would then occur.

6.20 The interruption of these large and secure populations in the Mid Arun Valley is likely to have very real cumulative impacts on regional populations. The area will likely become impoverished in comparison to its current status.

PLANNING POLICY

6.21 Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation (ODPM, 2005) states that:

> The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities

> should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests, which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

6.22 Table 4, Section 5 shows that there are 5 Section 41 Habitats of Principal Importance that cannot be replaced; ancient deciduous woodland, wet woodland, chalk streams, stream fed / spring fed ponds and lowland fen. In addition, the veteran trees will take 100's of years to replace and so should be deemed irreplaceable.

6.23 Some of these habitats found within the Mid Arun Valley are quite unique to the area such as seepage wet woodland, spring fed ponds, chalk streams and lowland fen contributing disproportionally to the unique biodiversity of the area.

6.24 Under PPS9, Local Planning Authorities have the following responsibility

> to ensure that Internationally, Nationally, Regionally and Locally Important Sites, Ancient Woodlands, other Important Natural Habitats and Networks of These Habitats are not lost or degraded as a result of development unless the need for and benefits of the development outweigh the impacts that it is likely to have. Local Planning Authorities should use conditions and/or planning obligations to mitigate harm and ensure conservation/enhancement of the site's biological or geological interest.

6.25 Minimal surveys (with the exception of invertebrates) over the last two years have shown that the area is incredibly diverse and has concluded that the woodland is of National Importance and other habitats collectively of Regional Importance, and it likely holds Nationally Important groups of certain species.

6.26 This survey and a review of the requirements of protected species has shown that mitigation will not be possible for all groups and that Option 5A cannot be achieved without a severe negative impact upon this biodiversity.

6.27 Widening of the existing carriageway will have notably less impact than a 'green' route. The road is already in place and has been for some time. It will require the following [in comparison with Options 3 and 5A]:

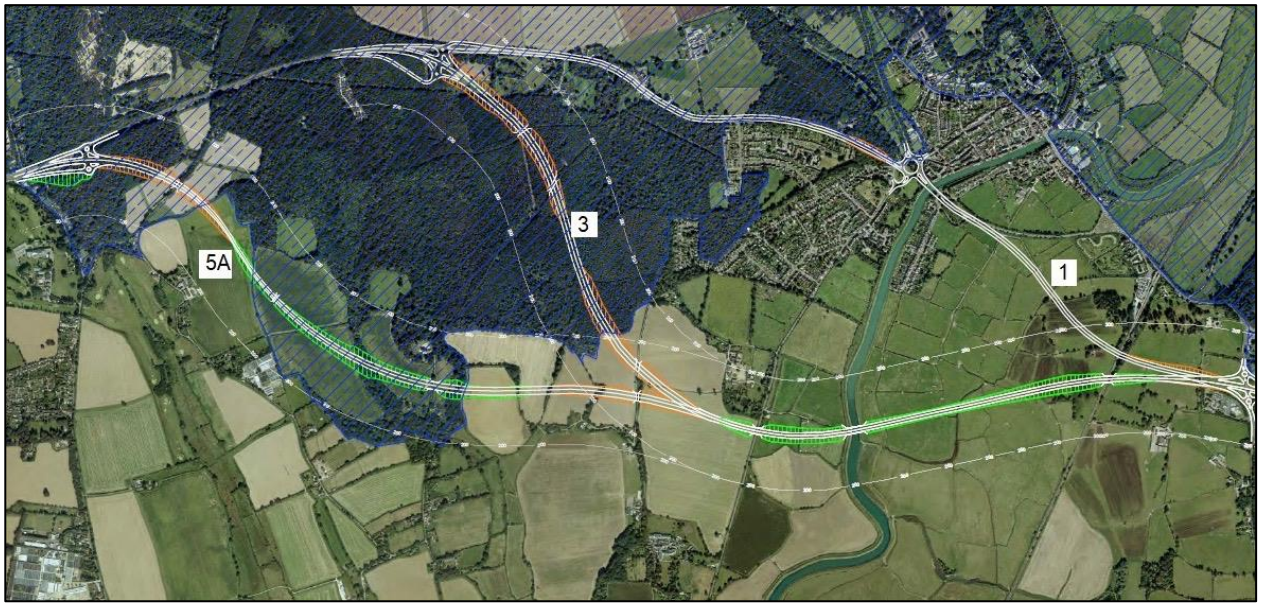
- Felling of fewer trees and those that would require felling are along the edge of the road and therefore do not generally constitute good quality habitat.
- Less land grab – much of which would be existing road verges and poor quality habitat.
- Less severance of habitat and habitat corridors / flight lines.
- The loss of irreplaceable habitat would be restricted to the edge of ancient woodland. Certainly not the loss / severe degradation of potentially six irreplaceable S41 Habitats of Principal Importance that Option 5A would cause.
- The Binsted Woods Complex LWS would remain the biggest block of woodland to the south of the A27 and would be able to function in an integrated way with its surrounding habitat.

6.28 The online option is ecologically by far the least damaging option and planners are legally obliged to take this into account when making their decisions.

The A27

Route Options

Impact Comparison Table



Wildlife Splash
Green Oak Lodge
East Street
Mayfield
East Sussex TN20 6TZ

Tel: 01435 872641
Mob: 07941 274423
wildlifesplash@live.co.uk

INTRODUCTION

This comparison of the A27 route options has been produced by MAVES in order to inform our response to the current consultation as regards the potential ecological impact of each route option.

This work is informed by two years of surveys carried out by a number of ecologists in the Mid Arun Valley area. With the exception of a stream and ditch network, only 'important' habitats, such as Ancient Woodland and Section 41 Habitats of Principal Importance as well as protected species are used in this assessment.

METHODS

For each route Option each habitat category is compared to the other two Options with factors such as relative size, relative quality and relative impact taken into account. A score of 0, 3, 6 and 9 is then allocated with 0 being no impact and 9 being the highest relative impact on a significant habitat, species or species assemblage.

All species and habitats considered have been recorded in the area (unless otherwise specified). Ten habitats and twelve species or species groups have been evaluated.

The habitat score is purely on the habitat and the intrinsic qualities of that habitat i.e. quality / whether it is replaceable, and the perceived magnitude of the impact upon that habitat. The 'impact' column gives additional details of how the loss or disruption of these habitats will impact upon protected species; however, this is not taken into account within the habitat score and is written in *italics.*

The scores for species are allocated in exactly the same way as that used for habitats with an explanation for each given.

This scoring system has been developed as a simple indicative method for the purpose of evaluating the combined effects of numerous differences between the ecological impacts of the three Options. It is not a substitute for detailed engagement with our full report.

RESULTS

The results are given in the table below and show that Option 5a is the most damaging to the species and habitats in the Mid Arun Valley, closely followed by Option 3. Option 1, though still damaging, is significantly less so.

Options 1 and 3 have fewer habitats than Option 5a, seven and eight respectively. In order to adjust for this discrepancy, the given score can be taken as a fraction of 10 and multiplied up to give an equivalent score for the 10 habitats considered in Option 5a. Option 1 would score 34.3 (24 x 100 ÷ 70) and Option 2 would score 67.5, though giving the same overall ranking.

Route Option	Habitats score	Species score
Option 1	24 (34.3)	60
Option 3	54 (67.5)	93
Option 5a	78	108

Option 1 scores lower and damage scores impact more on dynamic habitats that tend to be more replaceable. Option 3 scores highly, has slightly fewer habitats, but they are inherently highly valuable and irreplaceable. Option 5a scores highly and whilst it impacts less on irreplaceable habitat (by area) it does devastate the habitat matrix and dispersal corridors in turn impacting on species distribution and potentially long-term viability of some populations.

Habitat and species comparison table

Habitat / species	Option	Impacts / explanation	Score
Ancient woodland	Option 1	Smallest woodland loss with a slightly different species assemblage due to 'edge' woodland along the road and will therefore support a good range of species from different habitats. General diversity likely to be high though the potential for 'notable' or rare species low.	3
	Option 3	Largest area of direct habitat loss. Divide the largest block of woodland along the Sussex coastal plain into two; *impact 13 known bat species - will create a barrier across bat foraging grounds; create a barrier between known Bechstein's bats roost sites (Tortington Common and Stewards Copse); impact on 13 bat species foraging within the large block of woodland and surrounding area; traverse areas of breeding Dormice, traverse area of good Adder habitat; destroy habitat with high invertebrate diversity*.	9
	Option 5a	Slightly higher loss than Option 1 but good quality woodland with a smaller amount of road 'edge'. Road will divide the block of woodland to the west in two leaving a fragment sandwiched between two major roads that will ultimately lose species within due to fragmentation; impact an area of chalk spring fed wet woodland to the south due to junction damaging hydrology and woodland type / quality; *impact 13 known bat species - create a barrier between bat foraging grounds; create a barrier between Alcathoe roosts; isolate a major Badger sett between two roads; traverse Dormouse breeding habitat.*	6
Wet / deciduous woodland (HPI)	Option 1	Very small area of woodland loss along current A27.	3
	Option 3	No additional woodland loss.	0
	Option 5a	Additional good quality wet and dry woodland lost in The Lag and The Shaw.	9
Floodplain grassland (HPI) & associated ditches	Option 1	Loss of floodplain grassland. Fragment large expanse of floodplain grazing marsh / ditches; *impact of roads on breeding birds, Hare & some invertebrates; barriers for protected species moving across the landscape - Water Vole and European Eel, Otter if present.*	9
	Option 3	Loss of floodplain grassland (slightly larger area). Fragment large expanse of floodplain grazing marsh / ditches; *impact of roads on breeding birds, Hare & some invertebrates; barriers for protected species moving across the landscape - Water Vole and European Eel, Otter if present; road through major winter roost site for swans.*	9
	Option 5a	Loss of floodplain grassland (slightly larger area). Fragment large expanse of floodplain grazing marsh / ditches; *impact of roads on breeding birds, Hare & some invertebrates; barriers for protected species moving across the landscape - Water Vole and European Eel, Otter if present; road through major winter roost site for swans.*	9
River corridor (HPI)	Option 1	Small amount of habitat lost; some local disruption though there should be no long-term impact; *potential disruption to Otter if in area.*	0
	Option 3	Larger amount of habitat lost; *possible loss of rare plants; potential disruption to Otter if in area; impact of additional bridge to low-flying species such as swans; bridge just to north of large area of reedbed important for birds.*	3
	Option 5a	Larger amount of habitat lost; *possible loss of rare plants; potential disruption to Otter if in area; impact of additional bridge to low-flying species such as swans; bridge just to north of large area of reedbed important for birds.*	3
Hedgerows & ancient shaws (HPI)	Option 1	Loss of scrubby, very gappy hedgerow along A27 and 5 short gappy hedgerows / scrub lines.	3
	Option 3	Cuts through 1 gappy field hedge and 4 roadside hedges - Ford Road / Tortington Lane – *impact on breeding birds and Tortington Lane hedgerows serving as wildlife corridor from woodland - reptiles, amphibians, Hedgehog and possibly bats.*	6
	Option 5a	Cuts 5 hedges as above; also 3 species rich / 'important' hedgerows along the west side of Binsted Woods Complex and 3 ancient shaws radiating from the south – *impact breeding birds (including Nightingale in shaws), corridors for bats, Dormouse (possibly breeding in shaws), reptiles, amphibians, hedgehogs, invertebrates across large landscape area.*	9

Habitat / species	Road Option	Impacts / explanation	Score
Chalk streams (HPI)	Option 1	None.	0
	Option 3	None.	0
	Option 5a	1st originates in Hundred House Copse - stream and spring fed. 2nd originates in Sandy Hole Pond (spring-fed). Ist is Binsted Rife - *supports lowland fen HPI / rare plants SxRSI, RDB / Water Vole / reptiles / amphibians / foraging bats / less common birds i.e. Snipe.*	9
Streams and ditches	Option 1	Only those associated with floodplain grassland.	0
	Option 3	1st feeds into the Madonna Pond, 2nd into Tortington Rife, 3rd appears to feed ponds in Tortington.	9
	Option 5a	Additional to chalk streams. 1st feeding into ponds, 2nd feeds into wet Woodland and Tortington Rife along with 3rd. 4th possibly ponds in Tortington 2nd, 3rd and 4th cut off lower than Option 3.	9
Ponds (some HPI)	Option 1	There may be a scrape or ephemeral pond lost.	3
	Option 3	Potential to lose a number of stream-fed ponds. Madonna pond, 2 ephemeral wet woodland ponds, ponds in Tortington. *Madonna Pond - 1000's Toads breeding.*	9
	Option 5a	Potential to lose 2 (possibly more) ponds in Binsted, 2 ephemeral wet woodland ponds and possibly some ponds in Tortington.	6
Veteran Trees (HPI)	Option 1	Quantity unknown. Possibly several along A27.	3
	Option 3	Likely many within Binsted Woods Complex.	9
	Option 5a	Exact locations not calculated but many veteran trees in Hundred House Copse, The Shaw and notable trees in The Lag.	9
Lowland fen / swamp (HPI)	Option 1	None.	0
	Option 3	None.	0
	Option 5a	Distinctive habitat important at County Level (in association with chalk stream) with very little fen left. Loss / degradation of habitat due to junction severing stream and interfering with geology.	9
Badger	Option 1	Possibly setts in woodland to north of A27. If present some possible sett disruption though not territories.	6
	Option 3	Possibly setts throughout centre of woodland. If present territories would likely extend across proposed road corridor.	6
	Option 5a	Sett in path of road; sett to north of road in area of woodland to be fragmented between 2 roads. Known territories traversing path of road.	9
Bats	Option 1	Barrier already in existence.	3
	Option 3	Barrier between known Bechstein bats' roosts; barrier stopping bat foraging; barrier to bat dispersal through woods - 13 spp. found including 2 Annex II species and Alcathoes (only known maternity roosts in 3 counties).	9
	Option 5a	Barrier between known Alcathoes' roosts; barrier between woodland blocks - main woodland and Hundred House Copse and main woodland and Lake Copse, The Shaw and The Lag (combined); barrier to bats coming from surrounding villages to forage in high quality woodland habitat i.e. Serotines from Barnham.	9
Birds - wetland	Option 1	A barrier across the floodplain grassland may negatively impact wintering wildfowl and breeding birds.	6
	Option 3	A barrier across the floodplain grassland may negatively impact wintering wildfowl and breeding birds; road through a major swan winter roost (200-300); bridge adjacent to large area of reedbed with potential to support Bittern.	9
	Option 5a	A barrier across the floodplain grassland may negatively impact wintering wildfowl and breeding birds; road through a major swan winter roost (200-300); bridge adjacent to large area of reedbed with potential to support Bittern.	9
Birds	Option 1	Removal of trees - woodland edge. Small loss of farmland.	3
	Option 3	Major disruption - carriageway through centre of deciduous / coniferous woodland. Larger loss of farmland.	9

Habitat / species	Road Option	Impacts / explanation	Score
Birds contd.	Option 5a	Major disruption - carriageway through 3 areas of woodland and ancient shaws. Largest loss of farmland.	9
Dormouse	Option 1	Some possible disturbance along edge of Dormouse breeding areas.	3
	Option 3	Destruction of woodland known to be Dormouse breeding habitat. Disruption of dispersal ability through woodland.	9
	Option 5a	Destruction of 2 areas of woodland known to support breeding Dormouse; isolation of two areas of known Dormouse breeding habitat from main population. Major barrier between large Dormouse population and ability to disperse across the landscape.	9
Reptiles	Option 1	Some destruction of habitat - possibly all 4 common species in area.	6
	Option 3	Destruction of greater area of habitat - possibly all 4 common species in area. Destruction of known good Adder habitat in Binsted Woods Complex.	6
	Option 5a	Destruction of habitat for all 4 species of common reptiles; barrier to dispersal from hibernation to foraging / breeding areas; loss of dispersal corridors across greater landscape.	9
Water Vole	Option 1	Major barrier across Water Vole habitat.	9
	Option 3	Major barrier across Water Vole habitat.	9
	Option 5a	Major barrier across Water Vole habitat.	9
Brown Hare	Option 1	Causes a barrier with a low number of fields.	3
	Option 3	Causes a barrier with a high number of fields – forced into smaller area; road casualties.	9
	Option 5a	Causes a barrier with a high number of fields – forced into smaller area; increased road casualties.	9
Common Toad	Option 1	May be breeding in some of the floodplain grassland ditches.	6
	Option 3	May be breeding in some of the floodplain grassland ditches; road through hibernation sites forming barrier to breeding sites; possible disruption of ditches feeding into the Madonna Pond and Tortington Rife which are two major breeding sites.	6
	Option 5a	May be breeding in some of the floodplain grassland ditches; forms a barrier between two major breeding sites; is adjacent to two major breeding sites therefore will have high number of mortalities during breeding season; forms a barrier between breeding and hibernation sites; possible disruption to ditch feeding into Tortington Rife. Loss of corridors across landscape.	9
Harvest Mouse	Option 1	Edge habitat available along river corridor and some ditches.	6
	Option 3	Edge habitat available along river corridor and some ditches / field edges; possible but not so likely in wayleaves in woodland.	6
	Option 5a	Known large area of habitat in marshy grassland to south of route and suitable habitat to north of route; major barrier to dispersal.	9
Hedgehog	Option 1	Small amount of habitat loss; some disruption to movement.	6
	Option 3	Major habitat loss; major barrier to movement through woodland and to fringing areas.	9
	Option 5a	Some habitat loss; major severance of foraging corridors; major severance to dispersal corridors across landscape.	9
Invertebrates	Option 1	Some removal of mature trees / dead wood; some loss of habitat.	3
	Option 3	Significant removal of mature trees / dead wood known to support rare beetles; loss of corridors across floodplain; loss of corridors through woodland.	6
	Option 5a	Significant removal of mature trees / dead wood known to support rare beetles; loss of wet woodland; loss / degradation of wetland; loss of much good quality ‘edge’ habitat; loss of corridors across floodplain; loss of corridors through woodland; loss of corridors across greater regional landscape.	9

C. Draft note – Potential Mitigation Requirements for Option 5A.

Habitats here which cannot be re-created include ancient woodland, but also lowland fen mosaic / chalk stream / wet woodland / veteran trees. There is an obligation to avoid these areas or to demonstrate that they will not be impacted. If no alternative, mitigation is multiplied up with the 'uniqueness' of habitat.

Habitat / species	Potential impacts / considerations	Potential additional mitigation requirements
Woodland quality including Ancient Woodland	Consideration is currently given to quantity not quality of woodland: • AW: Hundred House Copse (HHC) and Little Dane's Wood (LDW) with springs, seepages and areas of Alder carr are of infinitely greater quality than 'edge' woodland along carriageway and possibly plantation woodland of Option 3 • Unique geology considered to be significant at county level in HHC / LDW – not assessed • Impact on block of AW woodland at Barns Copse that will be sandwiched between two major carriageways and become too small to function as useful woodland and will ultimately degrade and lose interest. This should therefore be included in loss of woodland calculations • Fragmentation of Ancient Woodland at The Shaw – has a high number of veteran trees and an important element of the woodland as a 'whole' – not considered. Some additional AW loss here with embankments and surrounding works area. • Destruction of wet woodland areas including AW – The Shaw, The Lag, Lake Copse that exceed other areas of woodland in diversity of invertebrates – especially when they also have notable and veteran trees (important for invertebrates) as in these three areas	Construction of road will lead to separation of 20Ha of Ancient Woodland, which will deteriorate in quality due to fragmentation and isolation. Island biogeography models demonstrate a gradual loss of species in relation to size. This is not accounted for but should be added to areas of ancient woodland lost and degraded. Construction of major junction in HHC and LDW will have a major impact on geology and watercourses as well as the woodland. The actual junction is likely to be far more costly than anticipated due to geological features such as unconsolidated gravels. As the habitat (wet seepages and springs arising from geology and giving rise to wet woodland and chalk streams) is irreplaceable it must be demonstrated that there will be no impact on these features. If this is not possible then a less damaging option or a different design should be chosen.
Chalk streams (lowland fen) HPI's	Unique geology considered to be significant at a county level would be severely Impacted with potential changes in drainage patterns due to junction at HHC and LDW. 2 chalk streams feed into Binsted Rife and Lake Copse and ultimately Tortington Rife. Binsted Rife Valley supports lowland fen (HPI), which is uncommon in the county and restricted to fragments. Binsted Rife Valley also supports rare plants and invertebrates, Water Vole, Red and Amber List birds and has the potential to provide habitat for Otter	Major junction with associated embankment at HHC & LDW would require major underground culvert for chalk stream originating to north. Additional culvert required beneath area of embankments where Option 5A crosses west hedgerow at Copythorn Field. Chalk stream and associated fen habitat, rare plants irreplaceable. The ability to not impact upon these habitats should be demonstrated prior to any final decision. If this is not practicably possible, then this area should be avoided

C. Draft note – Potential Mitigation Requirements for Option 5A.

Habitats here which cannot be re-created include ancient woodland, but also lowland fen mosaic / chalk stream / wet woodland / veteran trees. There is an obligation to avoid these areas or to demonstrate that they will not be impacted. If no alternative, mitigation is multiplied up with the 'uniqueness' of habitat.

		due to its importance, as mitigation for the potential loss is not possible.
Streams and ditches	These are additional to the chalk streams • 1st feeding into The Shaw and ponds in Binsted village • 2nd feeds into The Lag wet woodland and Tortington Rife along with the 3rd • 4th possibly feeds into ponds in Tortington • Additional 2 subsidiary drainage streams / ditches feeding into main streams and ditches to west of Arun and separate to those associated with floodplain grassland. The network of ponds and ditches leading down to the Arun floodplain is dependant upon this continued flow	6 culverts required – many associated with cuttings / embankments
Ponds	2 (possibly more) ponds in Binsted, 2 ephemeral wet woodland ponds and possibly some ponds in Tortington	Ponds lost if culverts fail and would require recreation – though stream-fed / seepage fed ponds cannot be readily re-created
Hedgerows and ancient shaws (HPI)	Option 5A cuts through 3 species rich / 'important' hedgerows along the west side of Binsted Woods Complex – and three ancient shaws radiating from Tortington Common	Mitigation for loss of 'important' hedgerows and mitigation for impact on ancient shaws. Hedgerows can be mitigated for with the planting of more species rich hedgerows. However, ancient Shaws with their veteran trees (not all recorded) are not replaceable
River Corridor (HPI)	Proposed bridge to be situated less than 20m to the north of a large area of reedbed with impact on breeding birds. Reedbed is a habitat of principal importance and this is likely the largest area in the Mid Arun Valley	Potential impact to be investigated with breeding bird surveys Added impact on Mute Swans – already know to be hit by cars on current bridge across Arun (see bird mitigation)
Veteran Trees	Targeted areas have not been surveyed along Option 5A, however there are many veteran trees in Hundred House Copse, The Shaw and notable trees in The Lag. Option 5A appears to avoid published (so far) locations of veteran trees	Habitat irreplaceable – veteran trees should therefore be avoided
Badger	Known impacts include: • One sett destroyed; one sett sandwiched between two roads • Road crosses 2 possibly 3 territorial foraging areas at western end. Possibly more at	Mitigation would require excluding Badgers from works area and sett creation for that destroyed. Mitigation should include the provision of underpasses or other

C. Draft note – Potential Mitigation Requirements for Option 5A.

Habitats here which cannot be re-created include ancient woodland, but also lowland fen mosaic / chalk stream / wet woodland / veteran trees. There is an obligation to avoid these areas or to demonstrate that they will not be impacted. If no alternative, mitigation is multiplied up with the 'uniqueness' of habitat.

	Tortington end though not investigated • Multiple road kills due to high numbers of Badgers in the area with territories crossing new road pathway Territories have only been searched for around Binsted and not to the east of the area	methods of crossing for Badgers at strategic points to enable access to foraging areas. Barriers should be placed along the carriageway to prevent high numbers of individuals being killed
Bats	Known impacts include: • High impact on 13 species of bats using area in and around Binsted Woods Complex • Barrier between known Alcathoes' roosts • Barrier between woodland blocks - main woodland and HHC and main woodland and Lake Copse, The Shaw and The Lag (combined) • Barrier to bats known to be coming from surrounding villages to forage in high quality woodland habitat i.e. Serotines from Barnham.	Requirement to survey all trees with features that may support roosting bats that are to be removed. This will be numerous in the ancient shaws, The Lag, The Shaw and HHC / LDW Surveys to assess most important flight paths for siting of green bridges – possibilities as follows: Green bridge between HHC and main block of woodland to allow Alcathoes to continue moving between roosts (and any other species to be found with Phase 2 bat surveys) Green bridge between main block and The Shaw/The Lag / Lake Copse if these areas are important to bats which they most likely are (again to be assessed with Phase 2 targeted bat surveys).
Birds	Impact on birds from farmland, wetland and woodland. Particular impact on low-flying species that are killed on roads – Barn Owl (4 breeding sites in Binsted) and Mute Swan – major roost for hundreds of swans in fields each side of and adjacent to Ford Road directly south of Option 5A. Nightingales recorded in ancient shaws – destruction and fragmentation of habitat. Numerous declining farmland birds in the area. Floodplain grassland important for birds using the entire Arun corridor and linked to Arun Valley Special Area of Conservation to the north.	Mitigation for Barn Owls is the erection of Owl boxes elsewhere (though does not stop them from being killed in Mid Arun Valley area) Swans – low flying – already found dead on occasion on the bridge across the Arun – greater impact due to proximity of major roost location Mitigation for birds is to not disturb them whilst breeding and usually includes the creation of additional habitat and enhancement of habitat i.e. scrub, scrapes, species rich hedgerows etc. However, the bird species count is such that the mitigation would likely be ineffective in comparison to the impact of Option 5A on

C. Draft note – Potential Mitigation Requirements for Option 5A.

Habitats here which cannot be re-created include ancient woodland, but also lowland fen mosaic / chalk stream / wet woodland / veteran trees. There is an obligation to avoid these areas or to demonstrate that they will not be impacted. If no alternative, mitigation is multiplied up with the 'uniqueness' of habitat.

		the undisturbed corridor
Dormouse	Destruction of 2 areas of woodland known to support breeding Dormouse and isolation of two areas of known Dormouse breeding habitat from main population. Major barrier between large Dormouse population and ability to disperse over the greater area.	Translocation of Dormice from breeding areas in pathway of road. Crossings linking key dispersal corridors to allow continued dispersal from woodland. Creation of additional suitable Dormouse nesting habitat.
Great Crested Newt	Not yet found in area but no targeted surveys have been undertaken and this is the most difficult of the newt species' to find. If present, Option 5A would likely cause a barrier for GCN dispersing from terrestrial habitat to breeding locations	Mitigation would involve any pond creation for those destroyed (depending upon impacts on ditch network) and corridors for dispersal
Otter	Just moving into the county and the Mid Arun Valley provides potential nesting habitat such as along Binsted Rife, parts of Tortington Rife and the area of Reedbed	Mitigation cannot be assessed at present as it would amount to the potential loss of suitable habitat
Reptiles	Destruction of habitat for 4 species of reptiles, barrier to dispersal from hibernation to foraging / breeding areas. Road kills expected to be significant as a high populations of all four 'common' reptiles in the area	Translocation of reptiles in pathway of road to suitable habitat with low population. Crossings to allow dispersal across the landscape. Barriers to stop high numbers of reptiles being killed.
Common Toad (S41 species)	• Option 5A forms a barrier between breeding sites in the Madonna Pond and Tortington Rife from each other and terrestrial habitat • Very high numbers of Toads in the area of the proposed road as it is adjacent to a number of breeding locations around Binsted - so high potential for road kill • Other ponds around Tortington not assessed • Additional impact on watercourse network feeding these areas	Impact requires mitigation which would allow Toads to migrate to ponds / ditches to breed - such as underpasses along Option 5A in key locations Barriers to prevent Toads being killed on the road trying to reach ancestral breeding sites as the population is so high and as Toads will cross roads in their 1000's to reach breeding sites as demonstrated near Lewes
European Eel (S41 species)	This species has been recorded at Lake Copse showing it uses the watercourses in the Mid Arun Valley. The effectiveness (or not) of culverts will impact on this species	All watercourses to remain viable and connected by means of culverts
European	The main impact will be loss of corridors for this species as it forages up to 2 km per night and	Green bridges across the road and barriers to protect

C. Draft note – Potential Mitigation Requirements for Option 5A.

Habitats here which cannot be re-created include ancient woodland, but also lowland fen mosaic / chalk stream / wet woodland / veteran trees. There is an obligation to avoid these areas or to demonstrate that they will not be impacted. If no alternative, mitigation is multiplied up with the 'uniqueness' of habitat.

Hedgehog (S41 species)	therefore the possibility of being killed on the road	Hedgehogs from being killed on the road
Brown Hare (S41 species)	A species of uninterrupted open habitats. One has been killed this year along Binsted Lane despite it being an incredibly quiet road. There is likely to be much road kill and ultimately it is likely to disappear from the Mid Arun Valley to the west of the Arun	Mitigation should be in the form of barriers to prevent road kill
Harvest Mouse (S41 species)	Proposed route cuts through field with potential to support Harvest Mouse (present in a nearby field) and corridors for dispersal across the landscape. It has been found on both sides of the proposed road.	If in this field it would require translocation to another suitable area that does not support this species, with access to other suitable areas in case there was a change in management. Corridors across the road would be required for dispersal.
Invertebrates	A high number of nationally scarce and S41 invertebrates in the area with much of the importance lying in the habitat mosaic across the valley, dead wood (in veteran trees and fallen), wet woodland and wetland. These areas will be compromised by Option 5a.	If destroyed the wet woodland cannot be recreated / replicated nor can the 'standing' dead wood habitat. These areas should be avoided.
Water Vole	Known to be in Binsted Rife, ponds to the south of Binsted Rife and possibly around Lake Copse. Other watercourses including ditches across grazing marsh not investigated. The area is an important continuation of corridor for Water Vole along the Arun and to Chichester Harbour – this species has been found in locations in surrounding habitats and so Option 5A may: • Impact directly on the ability of Water Vole to move across the landscape • Impact indirectly with the deterioration / loss of streams, ditches and ponds	Culverts required beneath all ditches / watercourses to allow dispersal. Culverts required in all streams and ditches feeding through woodland as this supplies water to Binsted Rife and Tortington Rife and other smaller ditches / streams and ponds.

C. Draft note – Potential Mitigation Requirements for Option 5A.

Habitats here which cannot be re-created include ancient woodland, but also lowland fen mosaic / chalk stream / wet woodland / veteran trees. There is an obligation to avoid these areas or to demonstrate that they will not be impacted. If no alternative, mitigation is multiplied up with the 'uniqueness' of habitat.

Barriers along Option 5A carriageway

Barriers along roads are not usual but it is considered that barriers would be necessary to stop high numbers of deaths on the road as there are so many legally protected and S41 species in the area. Common Toad ancestral breeding sites are on either side of the Option 5A footprint, Badger setts and territories are within the footprint and across it as are Brown Hare territories. Hedgehogs forage up to 2 km nightly and other species such as Grass Snake and Adder will move several kilometres on a seasonal basis to find optimum breeding, foraging and hibernating sites. Great Crested Newt, if present, will disperse up to 500 m from terrestrial habitats to good breeding sites also.

Impact

of the

Arundel Bypass Option 5A

on the Mid Arun Valley:

Assessment using current data 2015-2017

Wildlife Splash
Green Oak Lodge
East Street
Mayfield
East Sussex TN20 6TZ

wildlifesplash@live.co.uk

CONTENTS

EXECUTIVE SUMMARY

- The A27 Arundel Improvements Scheme 'Option 5A', whose western end passes through the landscape of Binsted to re-join the A27 near its junction with Yapton Lane, was first made public by Highways England, alongside Options 3 and 1, on their website at the commencement of the Public Consultation on 22nd August 2017.
- The ecological desk study data used to develop and present this Option did not include MAVES' 2015-17 data as to what has actually been found in this previously under-surveyed area. This led to many significant omissions and errors of fact and judgement in the Preliminary Ecological Appraisal used for the Consultation.
- This report has been commissioned by the Arundel Bypass Neighbourhood Committee to assess the ecological impact of Option 5A including impacts which would not have been known to Highways England from earlier data.
- The aim of this report is to appraise the potential impacts of Option 5A using the most recent data only, which has been collated over the past two years.

The Mid Arun Valley

- The Mid Arun Valley supports fourteen Section 41 Habitats of Principal Importance for the conservation of biodiversity.
- The Mid Arun Valley supports bats, Badger, birds, Dormice, Adder, Grass Snake, Slow Worm, Common Lizard and Water Vole all of which receive legal protection. It supports Brown Hare, European Eel, European Hedgehog, Common Toad and Harvest Mouse, all of which are Section 41 Species of Principal Importance for the conservation of biodiversity.
- With the exception of Badger, which is widespread and common, the populations are considered to be of Regional Importance. Some populations, such as bats, invertebrates and birds may even reach National Importance with further surveys.
- The Mid Arun Valley supports high populations of newts and may support Great Crested Newt. It has areas of suitable habitat for breeding Otter.
- Option 5A cuts through two areas of the Binsted Woods Complex that are within the South Downs National Park and a Local Wildlife Site, as well as parkland and arable farmland.

Section 41 habitat impacts - woodland, hedgerows & veteran trees

- The major junction at the western end of the woodland will impact upon an area of ancient woodland comprising a wet woodland mosaic with chalk springs and seepages. This S41 Habitat of Principal Importance is not replaceable with woodland planting. This is not included in the loss of ancient woodland figures.
- The major junction at the western end of the woodland will leave two isolated fragments of woodland. One will be 'sandwiched' between two major carriageways and is likely to degrade over time and lose many species. This is not included in the loss of ancient woodland figures.

- Option 5A will sever the unusual 'W' pattern of woodland at the southern edge of the South Downs National Park. This comprises areas of Section 41 Habitats such as wet woodland, ponds and notable / veteran trees, much of which is irreplaceable.

- Option 5A will sever eleven habitat corridors radiating from the Binsted Woods Complex on the west side of the Arun. Three of these corridors are ancient shaws with streams. Eight of these corridors are hedgerows of which three are likely to be 'important' under the 1997 Hedgerow Regulations. One supports over 100 species of ground flora. Hedgerows such as this are irreplaceable.

- Option 5A will destroy a high number of notable and veteran trees found in areas of woodland in the National Park and tree-lines and ancient shaws. This S41 Habitat cannot be replaced in a lifetime.

Section 41 habitat impacts – chalk streams, watercourses, ponds & lowland fen

- Option 5A would disrupt the network of watercourses / ditches that drain the higher land of the Binsted Woods Complex. Some of these watercourses originate in the chalk bedrock draining the South Downs, and two are chalk streams. These are Section 41 Habitats and are irreplaceable.

- The major junction planned at the western end of Option 5A is on the stream / seepage system of the largest chalk stream. This would break the geological situation where saturated gravels carry water from the South Downs.

- This would have impacts on the Binsted Rife Valley which supports uncommon lowland fen and swamp communities which are S41 Habitats, and rare plants such as Blunt-flowered Rush, Fen Bedstraw and Whorl-grass which are all scarce in the county. The Red Data Book Frogbit (listed as Vulnerable) is also in Binsted rife (and Tortington Rife).

- Protected species such as such as Water Vole and Grass Snake and uncommon birds such as Snipe (Amber List), bats and Nationally Scarce invertebrates have all recently been recorded in this area.

- A second chalk stream originates at Sandy Hole Pond, which is likely fed from an underground spring. It flows through Lake Copse where there are ponds and ancient woodland with a high diversity of beetles (including one Red Data Book species and 8 Nationally Scarce / Notable species) of wet and dry woodland.

- The remaining streams feed into Tortington Rife and into a network of ditches and ponds throughout the area. Additionally, variations in geology / soil type in some areas has created a number of different habitats such as wet woodland, swamp and reedbed and marshy ground.

- Due to these features, some of these areas are unmanaged or seldom managed and therefore of importance to wildlife. Disruption of this system is likely to have a negative impact on Harvest Mice, Water Vole, invertebrates and breeding birds such as Marsh Tit (Red List) amongst many others.

- Many ponds are directly fed by the streams and ditches and so these may disappear with the destruction / disruption of the land drainage system.

Section 41 habitat impacts – floodplain grassland, reedbed and river corridor

- The floodplain grazing marsh is part of a corridor from the coast and along the Arun into mid Sussex to areas such as Pulborough Brooks, Amberley Wildbrooks and Waltham Brooks. Option 5A will

cause a direct loss of this habitat and present a barrier across the floodplain grassland and associated drainage ditches with ribbons of reedbed.

- Option 5A will result in a small amount of river corridor habitat being lost and possibly rare and uncommon plant species.

Section 41 habitat impacts – overview

- A total of ten S41 habitats will be negatively impacted upon by Option 5A, of which five are irreplaceable and one (veteran trees) takes well over one hundred years to replace. It is considered that the entire Binsted Woods Complex is of National Importance, and that the entire system of seepages, springs, chalk streams, wet woodland, Binsted Rife Valley and spring-fed ponds is of County Importance. The integral landscape is irreplaceable.

Protected species impacts – Badger and bats

- Option 5A will destroy one Badger sett and isolate another between two busy carriageways. It will form a barrier through two, possibly three Badger territories. The road will have a high adverse impact on this species. Only the western part of the area has been assessed for this species.

- Thirteen species of bat have been recorded in the Binsted Woods Complex, including the very rare Alcathoe bat and Bechstein's bats and Barbastelles, which are Annex II species. Option 5A would result in the loss of oak woodland in three areas which is important to foraging Bechstein's bats.

- Option 5A would form a barrier between Alcathoe maternity roosts which are in the main block of woodland and that to the west. It would sever flight lines between the main block of woodland and that to the west. It would form a barrier between the main block of woodland and the arms of woodland to the south.

- Option 5A will cut off commuting corridors for bats roosting within the Binsted Woods Complex and foraging elsewhere, and those that roost elsewhere and forage in and around the Binsted Woods Complex such as Serotines from Barnham.

- The bat population is of at least Regional and may prove to be of National Importance. Option 5A will have a high adverse impact on many bat species.

Protected species impacts – birds

- Option 5A cuts through a major swan winter roosting site adjacent to the River Arun, supporting 200-300 birds each year for over 50 years.

- Option 5A is adjacent to four Barn Owl nesting sites in Binsted; it cuts through an ancient shaw with breeding nightingales; and the proposed bridge across the Arun is just to the north of a large area of reedbed that may support Bittern (Amber List) and Marsh Tit (Red List).

- The number and diversity of birds is such that the Mid Arun Valley populations, when considered as part of the green corridor through the county, may be of National Importance. Option 5A will have a high adverse impact on groups of birds that are suffering the highest declines such as farmland and wetland species and those that are low-flying such as Barn Owl and swans.

Protected species impacts – Dormice, reptiles & Water Vole

- The Binsted Woods Complex is part of the National Dormouse Monitoring Programme. Option 5A will destroy three areas of woodland known to support breeding Dormice. It will sever corridors that allow this species to disperse from a sizable breeding and important core population to smaller woodlands, copses, shaws and outgrown hedgerows within the Mid Arun Valley and beyond, thus impacting on population stability across the landscape.
- Option 5A will likely have a high adverse impact on the stability of the Dormouse in the Mid Valley Area and beyond.
- Although Option 5A will directly destroy some areas of reptile habitat, the worst impact will be on those that travel furthest, Grass Snake and Adder, because Option 5A will sever the habitat linkages particularly from prime woodland hibernation sites to foraging and breeding areas.
- A major barrier across this landscape is likely to result in high direct mortality and a gradual decrease in the population sizes of all four reptiles.
- Water Vole has been recorded at low densities in the area. Option 5A will create an additional road across the floodplain grassland and alter the hydrology of the watercourses to the north of the floodplain grassland. Wetland habitats in Sussex are at 'critical' and yet they are regularly being destroyed, damaged and fragmented by developments such as this.
- Water Vole will likely suffer a high adverse impact, and alteration of this habitat and the ability of this species to disperse effectively may well result in the loss of Water Vole from the Mid Arun Valley area.

Impacts - UKBAP / S41 species

- The Brown Hare is known to be across the farmland in the Binsted area and is likely to be across the entire Mid Arun Valley area. The adverse impact is expected to be high for this species, as it has been shown to have high mortality rates on roads. It may become locally extinct in the area as a result of Option 5A.
- Option 5A is extremely close to and separates two major Common Toad ancestral breeding sites – the Madonna Pond and Tortington Rife. Option 5A will have a direct negative on Common Toad by dissecting the interconnected terrestrial and wetland habitat resulting in high fatalities. This is likely to have a high adverse impact on the Mid Arun Valley population of Common Toad.
- Hedgehogs have been recorded in the woodland and along footpaths. Option 5A is likely to have a high adverse impact on Hedgehogs which commonly travel up to 2 km per night foraging.
- A good population of Harvest Mouse has been found in a field to the south of Option 5A. There is suitable habitat throughout the area and this species has been recorded in the Binsted Woods Complex to the north of the proposed route of Option 5A. This will sever dispersal corridors and is likely to have a high adverse impact on this species.
- Mitigation measures, such as green bridges and underpasses, will not be effective and stem the flow of the loss of species from the area as a result of a major carriageway without barriers to prevent protected mammals, amphibians and reptiles crossing the road.

Impacts - invertebrates

- The mosaic of habitats and rare habitats such as wet woodland, veteran trees and wetland together with sheltered 'edge' habitats has resulted in a very high diversity of invertebrates. Two of the invertebrate surveys carried out demonstrate this. A general invertebrate survey found 551 species (including 28 Nationally Scarce species, 3 S41 species and 6 Red Data Book species). A survey of Lake Copse and 2 hedgerows found 230 beetle species including 10 Nationally Scarce species and 3 species new to Sussex.
- Twenty-seven species of butterfly are consistently recorded each year, which includes the Purple Emperor (IUCN Red List – Near Threatened), Dingy Skipper and White Admiral, which are both Section 41 Species.
- The diversity of invertebrates is such that, with continued new findings, or surveys of the floodplain areas, it may be that the status is elevated to National Importance.
- Option 5A would have the highest adverse impact in areas of wet woodland with streams and seepages which have high numbers of notable invertebrates. It would also impact on the dead wood habitat that yielded a high number of saproxylic invertebrates, which is our rarest invertebrate group. These habitats are non-replaceable / non-replicable, or take hundreds of years to replace and therefore cannot be mitigated for.

Avoidance of western block of woodland

- The possibility of placing the western end of Option 5A between the two blocks of woodland would have a high negative impact on both woodlands, a chalk spring-fed pond and chalk stream, Dormice, commuting bats, Alcathoe bats commuting between nursery roosts, Hedgehogs and Badgers.
- This was considered in 1993 by the then Secretary of State to be unacceptable. It was reasoned that in time the Yapton Lane junction would be redesigned to be similar to that currently proposed, with its associated ecological harm. This would therefore ultimately lead to an escalation in long-term damage to the environment.

Habitat corridors

- The Mid Arun Valley supports thriving populations of most protected species and a high number of S41 Habitats. Compared with most areas of the British countryside the diversity in this area is outstanding.
- The Mid Arun Valley forms a continuation of an exceptionally diverse river corridor that is relatively uninterrupted from the middle of Sussex to the English Channel. It is the presence of good quality habitats, the proximity to other good quality habitats and the lack of barriers to dispersal that has resulted in the diverse range of species observed in the Mid Arun Valley area.
- The 11 habitat corridors from the Binsted Woods Complex link to the surrounding habitats and subsequently link the surrounding habitats to each other and further afield. This forms an important integrated network of habitat linkages.

Mitigation and fragmentation

- Proposed mitigation is primarily concerned with the direct loss of ancient woodland due to compensation costs. There is no account given to degradation, fragmentation and the loss of irreplaceable S41 habitats such as chalk streams and veteran trees.
- Mitigation does not compensate for this habitat fragmentation and even when green bridges and culverts are constructed there is little evidence that these are compensatory.
- The problems with habitat fragmentation and the importance of habitat connectivity and corridors has increasingly been a focus for planning and action, culminating in the national 'Making Space for Nature' Lawton report (2010). The report promotes four essential principles for future nature conservation in the UK: bigger, better, more, and joined-up.
- The interruption of these large and secure populations in the Mid Arun Valley is likely to have very real cumulative and significantly adverse impacts on Regionally and possibly Nationally Important populations. The area will likely become impoverished in comparison to its current status.
- If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused (PPS9).
- This survey has demonstrated that effective mitigation will not be possible, and that Option 5A cannot be achieved without a severe and significant negative impact upon protected species and irreplaceable habitats – the biodiversity of the Mid Arun Valley.

1 INTRODUCTION

BACKGROUND TO THE STUDY

1.1 The A27 Arundel Improvements Scheme 'Option 5A', whose western end passes through the landscape of Binsted to re-join the A27 near its junction with Yapton Lane, was first made public by Highways England, alongside Options 3 and 1, on their website at the commencement of the Public Consultation on 22nd August 2017.

1.2 The ecological desk study data used to develop and present this Option did not include MAVES' 2015-17 data as to what has actually been found in this previously under-surveyed area. This led to many significant omissions and errors of fact and judgement in the Preliminary Ecological Appraisal used for the Consultation.

1.3 This report has been commissioned by the Arundel Bypass Neighbourhood Committee (ABNC) to assess the ecological impact of Option 5A including impacts which would not have been known to Highways England from earlier data.

AIMS

1.4 The aims of this survey are as follows:

- To collate the most relevant and up to date data from two years of survey work in the Mid Arun Valley
- To use the current data to assess the likely impacts on Option 5A on protected species and Habitats of Principal Importance.

THE MID ARUN VALLEY

1.5 The Mid Arun Valley landscape is one of ancient semi-natural woodland, floodplain grassland, small grassy and tussocky fields, arable fields with wide, grassy margins, valley streams surrounded by swamp, fen and marsh and a scatter of ponds and ancient trees. These habitats are both linked and separated by a network of wet ditches, streams, shaws, hedgerows and treelines.

1.6 A network of streams and ditches, some arising in springs and seepages with their origin being the South Downs, drains the northern part of the area. These mostly arise within and extend from the Binsted Woods Complex where they eventually meet with the drainage ditches dissecting the floodplain grassland.

1.7 The Binsted Woods Complex is a Local Wildlife Site and situated within the South Downs National Park. This woodland block and much of the surrounding habitat comprises fourteen different Section 41 Habitats of Principal Importance for the conservation of biodiversity.

1.8 It has excellent connectivity to similar habitat along the Arun, Local Wildlife Sites (LWS), a privately owned wildlife site and Sites of Special Scientific Interest (SSSI). This has resulted in an extremely high number of rare and threatened species in the area.

OPTION 5A

1.9 The proposed route of Option 5A traverses over 5 km of this countryside and an approximation of the route to the west of the Arun is shown in Figure 1.

Figure 1: *The proposed route of Option 5A to the west of the Arun*

1.10 The proposed road would sever connections between the woodland and the surrounding interlinked mosaic of habitats having a negative impact on a large number of protected species that rely on this very habitat mosaic for survival.

1.11 The Binsted Wood Complex (LWS) would, in effect, become an 'island' sandwiched between two main roads with a disproportionately small area of fringing habitat. The proposed road would cut through the floodplain grassland and create a second major barrier across the habitat mosaic.

2 METHODS

HABITAT SURVEYS

Phase 1 habitat survey

2.1 Much of the Phase 1 habitat survey was completed in 2015 / 2016 (Thompson 2016). Further surveys were completed in 2017 and this report collates all the information gathered during two years of survey.

2.2 Phase 1 surveys followed the standard methodology (JNCC, 2010). In summary, this comprised walking over the survey area and recording the habitat types, species and boundary features present.

2.3 In addition, the habitats within the survey area were assessed for their potential to support legally protected or otherwise notable flora and fauna. Where species were seen or heard these were recorded.

2.4 Where suitable habitat was identified on site, a search was conducted for signs indicating the presence of protected species such as droppings, burrows, tracks and evidence of feeding. In some cases this resulted in further specialist surveys being undertaken.

Recording notable trees

2.5 Trees have been categorised according to diameter at breast height (DBH), which generally serves as a good indication of age. Size classifications used are shown in Table 1. Many trees that have been recorded as 'notable', due to the fact that they have not reached a size to indicate truly significant age, are none-the-less extremely old and have veteran features that are of importance to wildlife.

2.6 The tree locations have been recorded with hand-held GPS devices. The locations of the trees therefore may be accurate within a 5-10 m range.

Table 1: *Classification sizes for notable trees*

DBH - metres	Classification
1 – 1.4	Notable
1.5 – 1.6	Veteran
1.7 +	Ancient

ADDITIONAL SURVEYS

2.7 A number of specific surveys have been undertaken by professional ecologists, experts and county recorders as follows:

- Bats – Daniel Whitby (AEWC), 2016 and 2017;
- Badger – Dominic Walding (undergraduate project) supervised by Dr Dawn Scott;

- Beetles – Dr Katherine Grove 2016;
- Birds – David and Heather Hart 2015, Ben Knight 2017;
- Butterflies – John Knight 2017;
- Botanical surveys – Frances Abraham, Nick Sturt and other members of the Sussex Botanical Recording Society;
- Dormouse – Ian Powell as part of the National Dormouse Monitoring Programme;
- Dormouse - James Burford (undergraduate project) supervised by Dr Dawn Scott;
- Fungi – Bill Young 2016;
- Harvest Mouse - Sam Buckland, Lucy Groves and Ian Powell, 2016;
- Invertebrates – Mike Edwards with Peter Hodge and Graeme Lyons, 2016 and 2017;
- Invertebrates – Nathalie Guerln 2015 and 2017; and
- Freshwater invertebrates – Bill Young 2015 and 2016.

2.12 Additional to the 'targeted' surveys, records have been collated on an 'ad hoc' basis from interested parties, local residents, woodland owners and Arundel residents.

Survey data

2.13 Data collated for this report has been taken from a number of different surveys as outlined in Section 2.7 and referenced in Section 7. Data additonal to these reports is available on request in an excel spreadsheet.

Use of nomenclature

2.14 Plant nomenclature in this report follows Stace (2010) for native and naturalised species of vascular plant.

2.15 For all species the scientific name is given once and then not repeated again. Some of the rarer invertebrates do not have a 'common' name and so, in these cases, just the specific name is used.

3 RESULTS

HABITATS

3.1 The habitat survey considers the entire survey area across the Mid Arun Valley and shown in the Phase 1 habitat map in Appendix 1. This is an extremely diverse landscape comprising an interconnected mosaic of habitats, many of which are Section 41 Habitats of Principal Importance (formerly Priority Habitats). The following habitats have been recorded in the survey area:

- ancient semi-natural woodland;
- woodlands and shaws;
- hedgerows;
- notable and veteran trees;
- orchard;
- plantation woodland;
- ruderals and scrub;
- scattered trees and tree-lines;
- arable field margins;
- grassland;
- lowland meadow;
- chalk streams;
- drainage ditches and streams;
- ponds;
- lowland fen, swamp and reedbed
- coastal and floodplain grazing marsh; and
- river corridor.
-

Ancient semi-natural woodland

3.2 The Binsted Woods Complex is a complex of woodland sites and is the largest area of woodland to the south of the A27 along the West Sussex coastal plain. The site supports ancient woodland, conifer plantation, species-rich pasture and ancient tracks. This mixture of habitats coupled with the geology has resulted in the extremely diverse flora resulting in its Local Wildlife Site designation.

3.3 The woodland varies greatly in nature, though the main National Vegetation Communities found are W10 *Quercus robur – Pteridium aquilinum – Rubus fruticosus* woodland with localised areas of W8 *Fraxinus excelsior – Acer campestre – Mercurialis perennis* woodland and small pockets of W16 *Quercus* spp. – *Betula* spp. – *Deschampsia flexuosa* woodland.

3.4 The main canopy species are Pedunculate Oak *Quercus robur* and Ash *Fraxinus excelsior* with localised stands of tall Birch *Betula* spp. and occasional Beech *Fagus sylvatica* and Hornbeam *Carpinus betulus*. The structure of the woodland is extremely variable with a shrub layer sometimes dominated by over-stood coppiced Hazel *Corylus avellana* with Sweet Chestnut

Castanea sativa in places or with dense thickets of Holly *Ilex aquifolium* and even vigorous growth of Field Maple *Acer campestre*.

3.5 Areas of plantation woodland are also interesting with coniferous species giving way to deciduous woodland with the ground flora forming a mosaic of species of acidic and more base rich communities. Species such as Yellow Pimpernel *Lysimachia nemorum* and Enchanter's-nightshade *Circaea lutetiana* are growing alongside plants and bryophytes of acidic conditions such as Tormentil *Potentilla erecta* and bryophytes such as *Polytrichastrum formosum* and *Hypnum jutlandicum.*

3.6 In some small openings the vegetation would best be described as lowland heath with open areas dominated by Bracken *Pteridium aquilinum* and associates such as Heather *Calluna vulgaris.*

3.7 The field layer is dissected by streams, banks, craters and ancient tracks and is, in places, breathtakingly diverse, particularly around Furzefield Copse and the western end of the woodland, extending into Ash Piece. Stands of Bluebells *Hyacinthoides non-scripta* are intermixed with a great variety of woodland plants including less common species such as Southern Wood-rush *Luzula forsteri* and Orpine *Sedum telephium* as well as a range of species indicative of ancient woodland.

3.8 There are localised flushes of wet woodland, particularly in Hundred House Copse and Little Danes Wood where there are pockets of Alder carr surrounding chalk springs. Here the community moves towards the more unusual W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland. The field layer is rich in flowering plants and bryophytes with a hundreds of Early-purple orchids *Orchis mascula* and less common bryophytes such as *Trichocolea tomentella* (more common in the wetter west) and *Neckera complanata*, a species of base rich conditons.

3.9 Another extremely interesting pocket of wet woodland is in Tortington Common forming a small area of W4 *Betula pubescens – Molinia caerulea* woodland. The ground flora is dominated by Purple Moor-grass *Molinia caerulea* with associates such as Sphagnum mosses, sedges (of acidic substrates) and Cross-leaved Heath *Erica tetralix* beneath a canopy dominated by Downy Birch *Betula pubescens*.

3.10 More robust species in the field layer include ten species of ferns from a variety of habitats including Narrow Buckler-fern *Dryopteris carthusiana* found in wet woodland and fens; Soft Shield-fern *Polystichum setiferum*, which is a moderate calcicole; and Polypody *Polypodium vulgare*, a rhizomatous species of well-drained, predominantly acidic substrates.

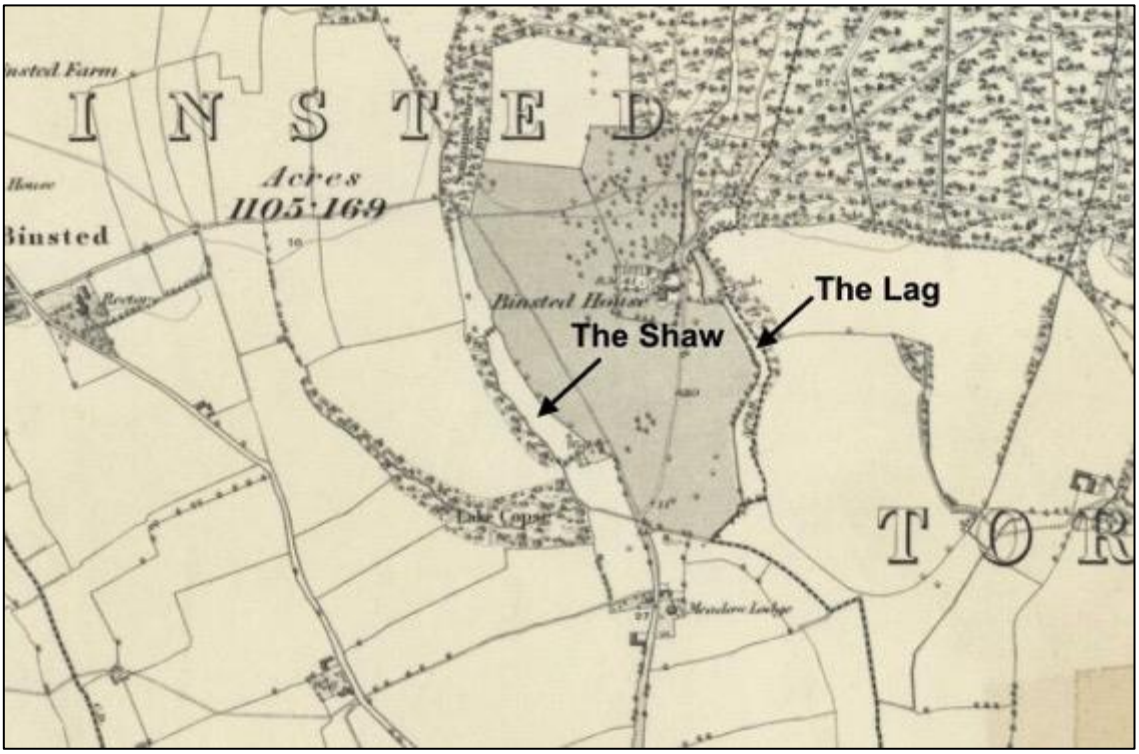
3.11 There is great variation in the size classes of trees, but there are some stands dominated by mature Pedunculate Oak (with a diameter of 0.9 m – 1 m) and some ancient Ash and Sweet Chestnut coppice stools as well as a scatter of notable, ancient and veteran trees throughout, but particularly frequent around Lake Copse and The Shaw where Pedunculate Oak and Ash trees frequently have a trunk diameter of over 1.4 m.

Woodlands and shaws

3.12 Wooded corridors (shaws) radiate out from the Binsted Wood Complex across the surrounding countryside and, on occasion, these widen into small pockets of woodland. Many support a diverse assemblage of native species and good numbers of mature, notable and veteran Oaks.

3.13 The Shaw and The Lag are remnants of ancient woodland (shown in Figure 2), now in-filled and forming woodlands, radiating from the Binsted Woods Complex. Together with Lake Copse all three areas of woodland follow watercourses and, as such they have features such as wet flushes, ponds and winter wet areas with localised growth of Grey Willow *Salix cinerea* and a wetland ground flora. They form a distinctive and very diverse woodland feature of the Mid Arun Valley.

Figure 2: *The Shaw and The Lag in 1876*



Map taken from a copy of Sussex LXII (includes: Aldingbourne; Barnham; Eastergate; Walberton; Yapton.) Surveyed: 1875 to 1876 and published: 1880

3.14 These wooded areas tend to have a good shrub layer and a high number of Ancient Woodland Indicators such as Butcher's-broom *Ruscus aculeatus*, Pignut *Conopodium majus*, Primrose *Primula vulgaris* and Hart's-tongue *Asplenium scolopendrium.*

Hedgerows

3.15 Hedgerows heavily dissect the landscape to the south of the Binsted Wood Complex and that surrounding the village of Binsted. They are less frequent towards the eastern side of the survey area though they follow Tortington Lane and Ford Road.

3.16 Approximately sixty hedgerows were surveyed of which nearly half supported an average of four or more woody species in a 30 m stretch. A third of the hedgerows surveyed qualify as 'Ancient and / or species-rich hedgerows' of which at least half would classify as 'important' under the Hedgerow Regulations 1997.

3.17 The hedgerows surveyed support a good range of woody species with Hawthorn *Crataegus monogyna*, Hazel and Blackthorn *Prunus spinosa* being the most frequently occurring species. Other species include Field Maple *Acer campestre*, English Elm *Ulmus procera*, Ash and Pedunculate Oak as well as those indicative of base-rich soils such as Spindle *Euonymous europaeus*, Wayfaring-tree *Viburnum lantana* and Guelder-rose *Viburnum opulus*.

3.18 Many of the hedgerows have standard trees including notable and veteran trees, and some have some old coppiced stools of Hazel. Woody climbers such as Dog-rose *Rosa canina* and Field-rose *Rosa arvensis* also contribute to the structure and diversity of the hedgerows.

3.19 The main structure of the hedgerows ranges from clipped and dense to overgrown and defunct and becoming invaded by Bramble. Other hedgerows have developed into tree-lines with natural shrub invasion at the base of the trees. Approximately half of the hedgerows surveyed had features of importance to wildlife such as banks, ditches and standard trees.

3.20 The hedgerows along the existing A27 are very gappy and infilled with dense stands of Bramble. In places they are reduced to scattered overgrown shrubs / scrub with species such as Hawthorn and Blackthorn.

Notable / veteran trees

3.21 A total of 180 notable trees were recorded in the Mid Arun Valley area (though there are many more), of which 125 were classified as notable, 30 as veteran and 25 as ancient. Such trees are throughout the landscape, some in the Binsted Woods Complex, others in the shaws extending from the woodland and many in fields and hedgerows.

3.22 The most frequently occurring species are Pedunculate Oak occurring as single-stemmed trees and Ash, which is usually multi-stemmed. Other species include Beech, Sweet Chestnut, Hazel, Field Maple and, uncommonly a single tree of Wild Cherry *Prunus avium.*

3.23 It must be noted that the trees have been classified purely on size and of the 125 notable trees recorded approximately 90 % do have 'veteran' features of importance to wildlife such as dead wood, lifted bark, holes and water filled hollows.

Orchard

3.24 There are three orchards within the Mid Arun Valley area, one of which at Lake Copse has 350 trees of mixed varieties in sheep-grazed grassland. Another is in Tortington to the west of Tortington Manor.

3.25 The orchard at Meadow Lodge is smaller with older trees of Apple *Malus sylvestris s.l*., Pear *Pyrus communis s.l.* and Cherry *Prunus* sp., again in grassland that is occasionally grazed by sheep. Some of these trees have hollows and are gnarled and twisted.

Plantation woodland

3.26 Small stands of plantation woodland are scattered throughout the area such as around the golf course at SU 97824 06489, SU 981 060, SU 98054 05917, SU 98162 06036 and SU 98039 06316. These tend to be reasonably young and support species such as Ash, Field Maple, lime *Tilia* sp., cherry *Prunus* sp., Hornbeam and Pedunculate Oak.

3.27 The field layers support mostly robust herbaceous species such as Cow Parsley *Anthriscus sylvestris* and Red Campion *Silene dioica* with species indicative of nutrient enrichment such as Common Nettle *Urtica dioica*. Woodland plants occur in areas near mature woodland or hedgerows and include Lords-and-Ladies *Arum maculatum*, Dog's Mercury *Mercurialis perennis* and ferns such as Hart's-tongue.

3.28 Other small wooded areas are scattered around such as at SU 98478 06057 and at Marsh Farm (SU 98936 04834). The largest area of plantation woodland is just to the north of the railway line at SU 99023 04455 around the reservoirs. This is mixed deciduous woodland that is approximately 15 years old with a very varied field layer.

Scattered trees

3.29 Aside from notable, veteran and ancient trees, trees are scattered throughout the area mostly in hedgerows and some smaller trees in hedgerows / scrub lines along the A27. Species include Ash, Pedunculate Oak and Wild Cherry. Some of the tree lines around Binsted Village support mature trees of Pedunculate Oak with a trunk diameter of 0.7 m to 0.9 m, which will serve as the next generation of veteran trees.

3.30 Some trees are reasonably young such as those along the hedgerows at grid references SU 98451 06330 and SU 98691 06171. There are also clusters of trees that have been planted around the golf course and in small fields such as those at grid references SU 98502 06073, SU 98637 05961 and SU 99361 05429, the last of which includes a range of fruit trees.

3.31 As part of a Mid Arun Valley Environmental Survey MAVES community project, Black Poplar *Populus nigra* saplings have been planted at Noor Wood SU 997064, Manor House SU 993060, Meadow Lodge SU 993056, Kents Cottage SU 990057 and Mill Ball SU 989056 and SU 987056.

Ruderals and scrub

3.32 Ruderals are scattered throughout the area, mostly forming small stands in copses or at the edges of arable fields. The most common species are Common Nettle, Curled Dock *Rumex crispus* and Broad-leaved Dock *Rumex obtusifolius*.

3.33 Ruderals and scrub are found along the margins of the existing A27 where they are intermixed with grassland and woodland species.

3.34 Pockets of scrub mostly dominated by Bramble and Grey Willow are scattered throughout the area along ditches, fence lines and field corners. Bramble is also found infilling gaps in hedgerows.

Arable field margins

3.35 Many of the arable fields have wide margins of up to 20 m supporting a good range of vegetation. Some areas have tall rough grassland with robust plants such as Cow Parsley and Common Nettle. Other areas support a good range of smaller grassland herbs such as Smooth Tare *Vicia tetrasperma*, White Clover *Trifolium repens*, Cut-leaved Crane`s-bill *Geranium dissectum*, Common Mouse-ear *Cerastium fontanum*, Lesser Stitchwort *Stellaria graminea* and Lesser Trefoil *Trifolium dubium*.

3.36 Orchids such as Common Spotted-orchid *Dactylorhiza fuchsii* and Early-purple Orchid are locally abundant. The fields themselves support occasional arable weeds such as Common Poppy *Papaver rhoeas*, Red Dead-nettle *Lamium purpureum* and Cornflower *Centaurea cyanus*, which is scarce in Sussex and listed on the Sussex Rare Species Inventory (SxRSI).

Grassland

3.37 The grassland surveyed ranged from a sward mostly dominated by Perennial Rye-grass *Lolium perenne* to damp grassland and rough tussocky grassland. The most common communities are MG7 *Lolium perenne* leys and related grasslands and, in damper areas MG10 *Holcus lanatus-Juncus effusus* rush-pasture.

3.38 In some areas where herbaceous species are more frequent, the grassland approaches the NVC type MG6 *Lolium perenne-Cynosurus cristatus* grassland, although this is patchy in extent. Other fields are seldom-managed rough grassland of the NVC type MG1 *Arrhenatherum elatius* grassland with a good number of herbaceous species.

3.39 A damp field to the west of Tortington Rife has damp grassland intermixed with wetland species with a reasonably diverse assemblage including Common Knapweed *Centaurea nigra,* Yarrow *Achillea millefolium* and Cut-leaved Crane's-bill *Geranium dissectum* alongside wetland species such as Wild Angelica *Angelica sylvestris* and Hemlock Water-dropwort *Oenanthe croccata.*

Lowland Meadow

3.40 A species-rich field is on the outskirts of Arundel adjacent to Steward's Copse. It supports a diverse assemblage of herbaceous species such as Eyebright *Euphrasia nemorosa*, Autumn Hawkbit *Scorzoneroides autumnalis,* Common Bird's-foot-trefoil *Lotus corniculatus* and Red Bartsia *Odontites vernus.* It is most similar to the NVC type MG5 *Cynosurus cristatus – Centaurea nigra grassland.* This is an old meadow assemblage and a S41 Habitat of Principal Importance.

Chalk streams

3.41 Binsted Rife is a chalk stream fed from the drainage of the South Downs. As a consequence aquatic and emergent species indicative of calcareous conditions are present such as *Ranunculus circinatus* Fan-leaved Water-crowfoot, which is declining throughout its range, Flowering-rush *Butomus umbellatus* and Mare`s-tail *Hippuris vulgaris.*

3.42 An additional chalk stream originates above the ground at Sandy Hole Pond, at the edge of Binsted Lane by Barns Copse. This tracks along boundaries, disappearing beneath the ground

for a stretch along Copythorn Field west hedge. It passes through Lake Copse woodland feeding a pool and a large pond and continues along ditches in the area.

3.43 The influence of the chalk is visible in Sandy Hole Pond due to the abundance of the Nationally Scarce and Sussex Scarce (SxRSI) Water Soldier *Stratiotes aloides*, a species indicative of calcareous water, but is soon lost presumably due to the influence of the local geology.

Drainage ditches and streams

3.44 Ditches and streams are throughout the area with some originating in the South Downs, others draining the Binsted Woods Complex and possibly with some influence from the South Downs. and others surrounding the River Arun.

3.45 Generally, the vegetation along the ditches is variable with some areas dominated by reedbed, others with robust species such as Hemlock Water-dropwort and Great Willowherb *Epilobium hirsutum*. Others are poached by cattle leaving bare mud for colonisation by less common species such as Whorl-grass *Strigosa Paraphilias* (SxRSI).

3.46 Streams flow through the distinctive three arms of woodland extending to the south of the Binsted Woods Complex. The Shaw and The Lag are fed from ditches / watercourses traversing the Binsted Woods Complex.

3.47 The Lag (and possibly The Shaw) feed into Tortington Rife, which supports a good range of aquatic and emergent species including Frogbit *Hydrocharis morsus-ranae*, listed on the Sussex Rare Species Inventory (SxRSI), Celery-leaved Buttercup *Ranunculus sceleratus* and Water Mint *Mentha aquatica*.

3.48 The ditches that dissect the floodplain grassland were not surveyed due to lack of access.

Ponds

3.49 A great diversity of ponds litter the landscape and vary from those that are winter wet seasonal ponds in woodland and in fields to large permanent ponds with a good diversity of species. Several of the ponds in the Binsted Woods Complex are heavily shaded and lack wetland vegetation, although there are ponds within the woodland that hold water all year and support aquatic, emergent and water margin vegetation.

3.50 A number of ponds are around Binsted Village and Tortington Village in gardens. Others are in wet woodland or adjacent to woodland. A winter-wet field pond is to the east of Tortington Rife and many of the woodland ponds appear to be ephemeral in nature.

3.51 Only the ponds to the west of the survey area around Binsted could be accessed for survey. A good range of aquatic and water-margin species are present including the Nationally Scarce and Sussex Scarce Water Soldier (Sandy Hole Pond), and the less common Bogbean *Menyanthes trifoliata* (Madonna Pond).

3.52 Other aquatic vegetation includes less common duckweeds such as Greater Duckweed *Spirodela polyrhiza* and Ivy-leaved Duckweed *Lemna trisulca*. Emergent / water margin species include Lesser Bulrush *Typha angustifolia*, Cyperus Sedge *Carex pseudocyperus* and Water-plantain *Alisma plantago-aquatica.*

Lowland fen and swamp

3.53 Binsted Rife has a wide range of National Vegetation Classification communities. It is a mosaic of rush pasture, damp grassland, swamp and lowland fen communities where the ground is permanently or seasonally very wet. The northern end of the rife is extremely diverse with the main community, MG10 *Holcus lanatus-Juncus effusus* rush-pasture, interrupted by mosaics of various communities such as S5 *Glyceria maxima* community, S6 *Carex riparia* swamp, S7 *Carex acutiformis* swamp and S14 *Sparganium erectum* swamp, all forming mostly single-species stands. These communities sometimes fringe the rife itself, though the main community along the watercourse is S4 *Phragmites australis* swamp and reedbeds.

3.54 Intermixed with this there are some more diverse areas that are more accurately described as lowland fen, with communities such as S26d *Phragmites australis-Urtica dioica* tall-herb fen, *Epilobium hirsutum* sub-community and S28b *Phalaris arundinacea* tall-herb fen, *Epilobium hirsutum-Urtica dioica* sub-community. These communities are extremely diverse with a good range of associates such as Lesser Water-parsnip *Berula erecta,* Ragged-robin *Silene flos-cuculi*, Bog Stitchwort *Stellaria alsine*, Cuckooflower *Cardamine pratensis*, Celery-leaved Buttercup, Wild Angelica, False Fox-sedge *Carex otrubae*, Water Forget-me-not *Myosotis scorpioides* and Plicate Sweet-grass *Glyceria notata.*

3.55 This vegetation grades into short grassland on higher ground up the banks, with some small areas of relatively species-rich rabbit-grazed grassland of the NVC type MG6 *Lolium perenne-Cynosurus cristatus* grassland.

3.56 At the southern end of the rife, the robust swamp vegetation gives way to a shorter sward and the rush grassland becomes less dominant. Here the main communities are MG7d *Lolium perenne – Alopecurus pratensis* grassland, MG13 *Agrostis stolonifera-Alopecurus geniculatus* grassland, S19 *Eleocharis palustris* swamp and S22 *Glyceria fluitans* water-margin vegetation.

3.57 Whorl-grass*,* listed on the SxRSI, was found in the muddy margins of two ditches and the Nationally Scarce aquatic Frogbit *Hydrocharis morsus-ranae* was found within the rife. Fen Bedstraw *Galium uliginosum*, also listed on the SxRSI, was growing amongst the wetland vegetation.

3.58 A marshy field to the west of Tortington Rife supports a good diversity of flowering plants intermixed with areas of reedbed of the NVC types S4 *Phragmites australis* swamp and reedbeds and S7 *Carex acutiformis* swamp. The fields to the south of this lack the diversity but are very wet with areas of swampy vegetation variously dominated by *Carex nigra* Common Sedge and *Carex disticha* Brown Sedge.

Reedbed

3.59 Linear areas of reedbed are throughout the Mid Arun Valley along ditches, which, on occasion extend into fields, such as reedbed found in the marshy field to the west of Tortington Rife, fields around the reservoirs and pockets of reedbed along the Arun.

3.60 A particularly large area of reedbed is on the east side of the Arun. This is fringed with salt-marsh vegetation dominated by Sea-purslane *Atriplex portulacoides* adjacent to the river.

3.61 The reservoirs to the south of Binsted Rife are fringed with a wide margin of reedbed vegetation of the NVC type S4 *Phragmites australis* swamp and reedbeds. Other wetland associates include Great Willowherb, Hemlock Water-dropwort*,* Common Fleabane *Pulicaria dysenterica* and Hard Rush *Juncus inflexus.*

3.62 This vegetation grades into tall, species-rich grassland of the NVC type MG1e *Arrhenatherum elatius* grassland, *Centaurea nigra* sub-community and stands of tall herbaceous species and ruderals. Species indicative of more base-rich conditions, possibly due to the chalk origin of the water, include Southern Marsh-orchid *Dactylorhiza praetermissa,* Weld *Reseda luteola* and Wild Parsnip *Pastinaca sativa.*

Coastal and floodplain grazing marsh

3.63 The floodplain grazing marsh extends along the Arun with smaller areas along Binsted Rife where it forms a mosaic, in part, with the lowland fen, swamp and reedbed habitat. It also extends along Tortington Rife.

3.64 The grazing marsh has not been surveyed to the east of the Ford Road where it surrounds the River Arun and is dissected by drainage ditches. It is often the case in such habitats that the drainage ditches hold the main botanical interest.

River corridor

3.65 The margins of the River Arun support species of brackish conditions including frequent Sea Aster *Aster tripolium,* Sea Beet *Beta vulgaris* subsp. *maritima* and Sea-purslane *Atriplex portulacoides*. Other species found on an occasional basis include Sea Plantain *Plantago maritima* and Sea Arrowgrass *Triglochin maritima* and the Nationally Scarce Marsh-mallow *Althaea officinalis.*

3.66 Much of the upper margin and flood defence bank is dominated by rough vegetation, largely composed of typical species of coarse coastal grassland, such as Wild Carrot *Daucus carota,* Bristly Oxtongue *Helminthotheca echioides,* Mugwort *Artemisia vulgaris* and Common Fleabane. Less common species include Corn Parsley *Petroselinum segetum*. Grasses include False Oat-grass *Arrhenatherum elatius,* Sea Couch *Elytrigia atherica* and Meadow Barley *Hordeum secalinum* with scattered stands of Common Reed *Phragmites australis.*

3.67 The path along the west side of the bank has a varied and colourful grassland flora, which includes locally frequent Common Broomrape *Orobanche minor*. Occasional patches of damp mud support plants of brackish habitats such as Divided Sedge *Carex divisa* (NS, SxRSI, S41 Species of Principal Importance)*,* Saltmarsh Rush *Juncus gerardii*, Reflexed Saltmarsh-grass *Puccinellia distans,* Common Saltmarsh-grass *Puccinellia maritima,* sea-spurreys *Spergularia* spp., and Hard-grass *Parapholis strigosa.*

PLANTS AND FUNGI

Fungi

3.68 Twenty-three fungal species have been recorded in the Mid Arun Valley with numerous records that cannot be assigned to species with a rigorous level of confidence.

3.69 Within this list the Zoned Rosette *Podoscypha multizonata* is a Section 41 Species of Principal Importance and also listed on the Sussex Rare Species Inventory (SxRSI), found in Binsted Park and the *Violet Webcap Cortinarius violaceus* (SxRSI) was found in Tortington Common.

3.70 The woodlands and shaws are considered to have the potential to support an important assemblage of fungi.

Notable plant species

3.71 The following notable species, listed in Table 2, have been found in the Mid Arun Valley. They are all on the Sussex Rare Species Inventory and two are Red Data Book species.

Table 2: *Notable plant species found in the Binsted area in 2015-2017*

Common Name	Latin Name	Location	Status	SxRSI
Blunt-flowered Rush	*Juncus subnodulosus*	Binsted Rife		
Box	*Buxus sempervirens*	Binsted Wood	NR	
Cornflower	*Centaurea cyanus*	Arable field		
Divided Sedge	*Carex divisia*	Banks of Arun	NS / S41	
Fen Bedstraw	*Galium uliginosum*	Binsted Rife		
Fritillary	*Fritillaria meleagris*	Binsted Park	NS/RDB VU	
Frogbit	*Hydrocharis morsus-ranae*	Binsted & Tortington	RDB VU	
Ivy-leaved Crowfoot	*Ranunculus hederaceus*	Binsted Rife		
Marsh-mallow	*Althaea officinalis*	Banks of Arun	NS	
Narrow-leaved	*Lathyrus sylvestris*	Binsted		
Royal Fern	*Osmunda regalis*	Binsted		
Water-soldier	*Stratiotes aloides*	Sandy hole pond	NR	
Whorl Grass	*Catabrosa aquatica*	Binsted Rife		

3.72 In addition the following noteworthy local and / or uncommon species species have been recorded in the area:

- Orpine *Sedum telephium* – Several patches in Binsted Woods – it is an uncommon ancient woodland indicator, though no longer classified as Nationally Scarce as it was in 1992.
- Southern Wood-rush *Luzula forsteri* - found in Binsted Woods and near the east end of Muddy Lane is a less common species only occurring in the south.
- *Luzula forsteri x pilosa = L.* x *borreri.* This is a local species and was recorded at Tortington Common.

- Bogbean *Menyanthes trifoliata*. This species has decreased in south east England because of the drainage of wetlands in both historic and recent times. It grows in the Madonna Pond.
- Thin-spiked Sedge *Carex strigosa* – found in Steward's Copse. There has been a noteworthy decline of this species in Sussex and Kent.
- Adder's-tongue *Ophioglossum vulgatum.* This rhizomatous, deciduous fern was found growing abundantly in a damp field by Tortington Rife. It is a found on mildly acidic to base-rich soils in open woodland, meadows and damp pastures but has been lost from many lowland sites due to intensification of agriculture and land drainage.

Non-native invasive species

3.73 The following non-native invasive species were recorded in the area.

- Rhododendron *Rhododendron ponticum* found growing in the Binsted Wood Complex in several areas.
- Cherry Laurel *Prunus laurocerasus* recorded growing near the Madonna Pond and in Hundred House Copse.

3.74 Rhododendron, is listed on Schedule 9 of the Wildlife and Countryside Act 1981. As such, it is illegal to plant or otherwise knowingly cause these species to grow in the wild or spread to adjacent land owned by others.

3.75 Cherry Laurel is listed as an invasive species in Sussex. Its growth form and impact on wildlife is very similar to that of Rhododendron, forming dense thickets and excluding all other species from woodlands.

PROTECTED SPECIES

Badger

3.76 Badger *Meles meles* activity is extremely high in the area with numerous records of excavation, foraging signs, latrines and Badger crossing roads.

3.77 Active setts have been confirmed in the Barns Copse, The Shaw, along Binsted Rife and Fowlers Copse. Smaller setts, possibly outliers, have been recorded in a garden in Binsted and near Tortington Rife.

Bats

3.78 Bat trapping and tagging surveys have been carried out in the last two years by AEWC (Whitby 2016, 2017) within the Binsted Woods Complex. These surveys have confirmed presence of the following species:

- Barbastelle *Barbastella barbastellus*
- Serotine *Eptesicus serotinus*

- Alcathoe bat *Myotis alcathoe*
- Bechstein's bat *Myotis bechsteinii*
- Brandt's bat *Myotis brandtii*
- Daubenton's bat *Myotis daubentonii*
- Natterer's bat *Myotis nattereri*
- Whiskered bat *Myotis mystacinus*
- Noctule bat *Nyctalus noctula*
- Common Pipistrelle *Pipistrellus pipistrellus*
- Nathusius's Pipistrelle *Pipistrellus nathusii*
- Soprano Pipstrelle *Pipistrellus pygmaeus*
- Brown Long-eared bat *Plecotus auritus*

3.79 This list includes Bechstein's bat and Barbastelles, which are Annex II species. Eight species of bat may have maternity colonies within the Binsted Woods Complex as pregnant females were found.

3.80 A Bechtein's maternity colony is located in the southern part of Torrington common with a count of 26 bats emerging during a survey in 2016. Two additional roost sites for this species were found in Steward's Copse.

3.81 Locally breeding female Alcathoes were caught in 2016 and roosts identified through tagging one individual. In 2016 / 2017 roosts were found in Tortington Common and Binsted Woods.

3.82 A new maternity colony of Serotine bats has been confirmed in Barnham to the south west of the Binsted area using several buildings for roost sites. During the surveys a number of Serotine bats were observed commuting from the west following hedgerows and woodland edges indicating that these bats are likely foraging in the Binsted Woods Complex.

Birds

3.83 A total of 84 species of birds have been recorded within the Mid Arun Valley of which 16 are Birds of Conservation Concern (BoCC) Red-listed species and 20 are Amber-listed species. A total of 15 of the birds recorded have Biodiversity Action Plans and 6 are also Schedule 1 species.

3.84 Many of the less common species have had numerous sightings such as Mistle Thrush *Turdus viscivorus* (Red List), Song Thrush *Turdus philomelos* (Red List), Linnet *Carduelis cannabina* (Red List), Nightingale *Luscinia megarhynchos* (Red List), Yellowhammer *Emberiza citrinella* (Red List), Cuckoo *Cuculus canorus* (Red List), Grey Wagtail *Motacilla cinerea* (Red List) and Meadow Pipit *Anthus pratensis* (Amber List).

Dormouse

3.85 Paines Wood, Ash Piece and recently Noor Wood (Tortington Common), are part of the National Dormice Monitoring Programme (NDMP). Good (though fluctuating) populations of Dormice *Muscardinus avellanarius* have been recorded consistently at Paines Wood and Ash Piece for fifteen years. Dormice and their nests are now routinely recorded at Noor Wood, within which nest boxes were erected when it was added to the programme in 2015.

3.86 In 2016 Lake Copse and The Shaw were added to the National Dormouse Monitoring Programme and Dormouse nests have already been found in both arms of woodland, as was expected, due to the ideal habitat.

3.87 In 2017 Manor House and Meadow Lodge were added to the National Dormouse Monitoring Programme. A confirmed Dormouse nest has been recorded at Meadow Lodge.

Great Crested Newt

3.88 Smooth Newt *Lissotriton vulgaris* and Palmate Newt *Lissotriton helveticus* have both been recorded in high numbers throughout the area.

3.89 Great Crested Newts *Triturus cristatus* have not been found in the ponds that have been explored around Binsted Village, though no targeted surveys have been undertaken. However, there is much suitable habitat in the area such as Binsted Rife, Tortington Rife and ponds around Tortington.

Reptiles

3.90 All four species of 'common' reptiles have been recorded in the Mid Arun Valley in the last two years. These species have all declined dramatically and are therefore given protection wherever they occur.

3.91 There have been no targeted surveys for reptiles and the following are 'ad hoc' sightings from ecologists and residents.

- Common Lizard *Zootoca vivipara* – this species is widespread in the area with many sightings in the last two years basking along field edges, in rough grassland, in gardens on logs.
- Slow Worm *Anguis fragilis* – this species has been seen around Binsted and in woodland clearings around Tortington Common.
- Grass Snake *Natrix natrix* – there have been many sightings of Grass Snake throughout the area such as damp rough grassland to the north of the railway line, basking along the edge of Tortington Lane, in woodland clearings in Tortington Common, The Shaw, The Lag and Binsted Rife.
- Adder *Vipera berus* – has been seen in Binsted at the edge of the nursery and basking in the garden at the southern end of The Shaw. This species also occupies the mosaic of wet and dry habitat in the Binsted Woods Complex around Tortington Common.

UKBAP priority species / SPI – Brown Hare

3.92 The European Brown Hare *Lepus europaeus* was recorded near Lake Copse in 2016 and has also been recorded in Ford.

3.93 In 2017 there have been three recordings in and around Binsted, one of which was a dead Hare killed by a car on Binsted Lane.

UKBAP priority species / SPI – Common Toad

3.94 Common Toad *Bufo bufo* is widespread throughout the area with sightings throughout the Mid Arun Valley. Ponds and ditches are throughout the Binsted and Tortington area and it is possible that many more than could be surveyed may support Common Toad.

3.95 An estimated one thousand plus Common Toads were seen breeding in Madonna Pond in March 2017. Strings of toad spawn were found during a survey (March 2017) in a garden pond at the southern end of The Shaw and tadpoles were found in a garden pond at the southern end of Lake Copse, The Shaw and The Lag.

3.96 The latter pond is in close proximity to Tortington Rife where thousands of Common Toad tadpoles were recorded in the spring of 2016.

UKBAP priority species / SPI European Eel

3.97 The European Eel *Anguilla anguilla* has been recorded in Lake Copse at Binsted and the Black Ditch at Lyminster (Thompson 2016).

UKBAP priority species / SPI – European Hedgehog

3.98 Field signs for European Hedgehog *Erinaceus europaeus* have been recorded for a 300 m stretch along Muddy Lane in the north part of Binsted. There is also a separate sighting for Hedgehog along Muddy Lane.

3.99 Hedgehog faeces have been recorded in Noor Wood which is in Tortington Common.

UKBAP priority species / SPI – Harvest Mouse

3.100 A survey in one of the suitable locations for Harvest Mouse *Micromys minutus*, a field to the west of Tortington Rife, was undertaken in 2016 by Sam Buckland, Lucy Groves and Ian Powell in October 2016. A total of eleven nests were found throughout the field.

Water Vole

3.101 In 2015 spot checks were carried out for Water Vole *Arvicola amphibius* feeding remains and latrines. Feeding remains and latrines were found along Binsted Rife at SU 9839 0453 and at the reservoirs to the south of Binsted Rife at SU 98698 04497. Additionally, potential burrows were observed on an island in the larger reservoir (SU 98740 04490). Possible Water Vole footprints were observed at Lake Copse (SU 98828 05782) and the distinctive sound of a Water Vole dropping into water was heard.

Invertebrates - butterflies

3.102 A total of 179 records for butterflies have been submitted within the last 2 years which does not include any of the targeted invertebrate surveys that have been undertaken.

3.103 This amounts to 28 species which include the Purple Emperor *Apatura iris* (IUCN Red List – Near Threatened), Dingy Skipper *Erynnis tages* and White Admiral *Limenitis camilla* which are both Section 41 Species of Principal Importance under the NERC Act (2006).

Invertebrates – beetles

3.104 A beetle survey was conducted at Lake Copse, and two nearby field hedges in May to October (Grove 2016).

3.105 The survey found 230 beetle species, including one Red Data Book species and 10 Nationally Scarce species. Moreover, each location also produced a beetle not previously recorded in Sussex.

3.106 Dr Grove is familiar with the area having previously recorded beetles in the Binsted Woods Complex (2006) where 400 species from 46 different families including 25 Nationally Notable species and 2 Red Data Book species were found.

Invertebrates - general

3.107 In 2016 / 2017 Mike Edwards led an invertebrate survey sampling a number of invertebrate groups in Little Danes Wood, Binsted Rife, the western edges of the Binsted Woods Complex, and an area in Binsted Village.

3.108 A total of 551 species were recorded which includes 29 Nationally Scarce species, 3 Section 41 species (NERC 2006) and 6 Red Data Book Species such as *Dorycera graminum, Andrena bucephala, Limnophila pictipennis and Limonia masoni*.

3.109 In just two hours of collecting (22.08.15), a local entomologist, Nathalie Guerin, found 130 invertebrate species along the edge of Binsted Rife including approximately 29 hoverflies, 29 bugs, 18 beetles and a variety of other groups such as gall flies, bumblebees and bush crickets. It also included a Section 41 Species of Principal Importance, two Nationally Notable hoverflies *Volucella inanis* and *Volucella zonaria* and a Nationally Scarce Beetle *Anthocomus fasciatus*.

3.110 In a half-day sampling session (17.06.17) in Noor Wood Tortington Common, Nathalie Guerin found 87 species including hoverflies, moths, weevils, shieldbugs, flies and beetles. Many species were associated with Oaks and one Nationally Notable species, *Ampedus elongantulus,* a click beetle, was found together with a Nationally Scarce moth species and two Local species.

Invertebrates - aquatic

3.111 During a three-minute standard net in water freshwater sampling survey undertaken in Binsted Rife (07.07.16 Bill Young) seventeen genera were found. Simpson's Diversity Index was used to measure the diversity of the rife. This method of measuring species richness takes evenness as well as diversity into account and gave an index of 8 indicating that Binsted Rife supports a diverse assemblage of aquatic invertebrates.

Invertebrates - moths

3.112 Two moth-trapping exercises were carried out in 2016. A survey at Lake Copse at SU 990 057 (29.07.16) found 47 moth species including one Section 41 Species of Principal Importance, the Yellow-tail *Euproctis similis*.

3.113 An additional survey relatively nearby at SU 986 065, along the hedgerow bounding the south of Scotland field (06.08.16), found 40 moth species. This included 6 Section 41 Species of Principal Importance including Ghost Moth *Hepialus humuli* and Rosy Rustic *Hydraecia micacea* and 4 with Local status such as Rosy Footman *Miltochrista miniata.*

Invertebrates - Odonata

3.114 Twelve species of dragonfly and damselfly have been recorded in the Mid Arun Valley. This includes the Azure Damselfly *Coenagrion puella*, the Broad-bodied Chaser *Libellula depressa* the Brown Hawker *Aeshna grandis*, the Southern Hawker *Aeshna cyanea* and the less common White-legged Damselfly *Platycnemis pennipes.*

Invertebrates - miscellaneous

3.115 The Stag Beetle *Lucanus cervus*, a Section 41 Species of Principal Importance due to significant National (and European) declines, was recorded in Binsted Woods in 2015. This species also requires wood that is the texture of balsa, but at ground level.

3.116 The Glow-worm, *Lampyris noctiluca*, is another iconic beetle in the area. This is frequently seen along Old Scotland Lane and is observed yearly in a garden in Binsted at the southern end of The Shaw. Although this species is not listed as rare, it is not common.

4 EVALUATION

HABITATS

4.1 The Mid Arun valley comprises a rich mosaic of habitats, fourteen of which are Section 41 Habitats of Principal Importance for the conservation of biodiversity (shown in Appendix 2). The habitats that will be directly impacted upon are evaluated.

Ancient semi-natural woodland

4.2 This is a large block of extremely diverse woodland, which constitutes three S41 Habitats of Principal Importance – *lowland deciduous woodland, wet woodland* and *lowland heath*. (The latter will not be impacted by Option 5A).

4.3 The Binsted Woods Complex is a complex of woodland sites and is the largest area of woodland to the south of the A27 along the Sussex coastal plain. It is the size of this woodland that enables it to support such a diverse and viable range of protected species, many of which rely on the surrounding habitats as well in order to survive.

4.4 A 1992 assessment by the Environmental Advisory Unit Ltd. noted that over 250 plant species had been found in the past, with the wooded areas holding between 150 and 170 plant species. This was put to the test in 2015 by recorders from the Sussex Botanical Recording Society who found a total of 261 native species, which includes 53 Ancient Woodland Indicator species (past surveys have found 52).

4.5 The woodland has a high number of mature, notable and veteran trees and a high number of areas within the Binsted woodland complex hold Tree Protection Orders (TPO's) including a block in Little Danes Wood, one at Brickkiln Piece and a number of areas around Steward's Copse.

Woodland and ancient shaws

4.6 These areas of woodland are classified as S41 Habitats of Principal Importance *lowland deciduous woodland* and *wet woodland*.

4.7 They provide important reservoirs of ancient woodland species and this enables colonisation of such species in the younger blocks of plantation woodland. They serve as habitat linkages / green corridors and provide nesting habitat for farmland birds and Dormice. In 2016 three Nightingales were heard singing in one such area of woodland at SU 9976 0587.

Hedgerows

4.8 All the hedgerows in the area comprise native woody species and, as such, classify as S41 Habitats of Principal Importance.

4.9 The range of hedgerow structure is from trimmed and dense to tall and overgrown with dense stands of Bramble. This provides excellent habitat for a range of farmland birds in the area such

as Linnet, Tree Sparrow *Passer montanus*, Yellowhammer and Turtle Dove *Streptopelia turtur* all of which are Red List species.

4.10 Many have ancient woodland indicator species such as Butchers Broom and Primrose. Standard trees are frequent in the hedgerows and many of these are classed as veteran or notable with features of considerable value to wildlife.

4.11 The hedgerows provide extremely important corridors radiating out from the Binsted Woods Complex and across the landscape.

Notable / veteran trees

4.12 Notable and veteran trees are classified as S41 Habitats of Principal Importance within the category *wood pasture and parkland*.

4.13 They are important for the features that they display with progressive aging, providing habitat for many organisms, known as 'veteran features'. The tree is progressively colonised by fungi that change the nature and condition of the wood resulting in an accumulation of dead woody tissue. This often results in the shedding of branches which in turn may result in branch cavities, shattered branch ends, loose bark, sap runs, a range of rot types and eventually the hollowing of the tree. The fruiting bodies and mycelia of saproxylic fungi may in turn be colonised by specialised invertebrates.

4.14 As the tree ages the number of specialist niches increases, each with a diverse food web. Due to the decrease in the number of such trees and the clearing and tidying of dead wood, many of these species are very rare. Such saproxylic invertebrates have limited powers of dispersal, and so the greater the length of time a group of trees have persisted in an area, the greater the chance that this habitat has been colonised by such species.

4.15 Another group to make use of these trees is the bats. Many species roost under bark, in crevices and in hollows. Such trees may also be used for maternity roosts and hibernation. The high numbers of tree-roosting bats in the Mid Arun Valley, is, in part, attributable to the abundance of these trees.

Arable field margins

4.16 The more species rich arable field margins would be classified as a S41 Habitat of Principal Importance.

4.17 All arable field margins provide a transition from bare ground to dense vegetation supporting a range of flowering plants and grasses and collectively covering a significant area. This, in turn provides a food source and cover for a diversity of vertebrates and invertebrates.

4.18 Arable field margins are life-lines and corridors that allow mammals, reptiles and amphibians to move across the landscape.

Chalk streams

4.19 Chalk streams classify as S41 Habitats of Principal Importance within the category *aquifer-fed naturally fluctuating water bodies*.

4.20 Binsted Rife is fed from drainage of the South Downs and is surrounded by a mosaic of lowland fen, swamp and wetland vegetation. It is one of the most diverse and unusual habitats in the area and a remnant of wetland habitat that is becoming scarce in the county.

4.21 A second chalk stream originates at Sandy Hole Pond and traverses the landscape above and below ground along field edges and into the Lake Copse woodland. Although calcareous in origin, this influence is mostly lost along its course.

Drainage ditches and streams

4.22 The streams and ditches vary widely in nature and therefore have the potential to support a wide range of species (both plant and animal) across the landscape.

4.23 The streams traversing areas of woodland alter the local environment, sometimes with wet marshy areas and braiding. This is reflected in a more diverse ground flora and humid conditions ultimately resulting in localised increases in biodiversity.

4.24 The streams and ditches provide riparian corridors through the landscape, allowing ease of movement for species such as such as Water Vole, European Eel and potentially Otter.

Ponds

4.25 A number of ponds, particularly those that are species rich, of ancient origin or support protected species, would be classified as S41 Habitats of Principal Importance.

4.26 Ponds, both ephemeral and permanent, throughout the area collectively support a high number of plant species. Sandy Hole Pond and ephemeral pools within Hundred House Copse and Little Danes Wood are unusual being calcareous; fed from chalk springs / seepages.

4.27 Several of the ponds are marked on the 1880 Ordnance Survey map (Sheet LXII) and, as such, have provided a continuous habitat for well over one hundred years enabling them to be used by generations of species. Examples are that they are now important breeding sites for Common Toad, watering holes for Badgers and foraging areas for bats.

4.28 Ponds are generally known to accumulate more species with age, and because individual ponds vary significantly in their species composition, overall they often contribute more to local biodiversity than rivers or other habitats.

Lowland fen and swamp

4.29 Lowland fen and swamp communities are S41 Habitats of Principal Importance under *lowland fen*.

4.30 They have declined in extent due to land drainage schemes. However, there are pockets of good quality habitat in the area, particularly along Binsted Rife and to the west of Tortington Rife.

4.31 This habitat is uncommon in Sussex, particularly with an assemblage of associated rare plants intermixed with those of calcareous origin.

Reedbed

4.32 Reedbed is a S41 Habitat of Principal Importance. The most notable area is to the east of the Arun, and considered to be noteworthy due to its large size.

4.33 The ribbons of reedbed along the ditch network link this habitat providing cover and habitat for a range of protected species.

Coastal and floodplain grazing marsh

4.34 This is a S41 Habitat of Principal Importance and forms part of a contiguous corridor of open habitat along the River Arun from the middle of Sussex right down to the coast through the Climping Gap.

4.35 This, when compared to other mid-Sussex rivers such as the Adur and the Ouse is largely uninterrupted by urban areas and major road networks.

River corridor

4.36 The river corridor is a S41 Habitat of Principal Importance and supports a number of rare plant species.

4.37 The banks along this stretch of the Arun have mostly been artificially enforced, though there are scattered communities of interest such as a sizable area of reedbed on the east side, smaller areas of reedbed along its length and small areas of saltmarsh vegetation.

Important habitats

4.38 The Binsted Woods Complex, due to its diversity of woodland types as well as plants, fungi, bryophytes and invertebrates, together with a high number of protected species, is considered to be of National Importance.

4.39 The calcareous streams, springs and seepages and associated features such as Alder carr and lowland fen, resulting from the unique geology, are considered to be of County Importance.

Other habitats

4.40 Habitats such as ruderals and scrub, pockets of grassland and scattered trees are throughout the area, as they are the general countryside. They are immensely important to protected species forming protective cover, habitat for breeding birds, corridors and refuges in a farmed landscape. These habitats are however readily replaceable, though the numerous corridors they provide are not.

PROTECTED SPECIES

Badger

4.41 Badgers are protected under the Protection of Badgers Act (1992); the Wildlife and Countryside Act of 1981 (and as amended). As such it is an offence to willfully take, kill, injure a Badger.

Under the Protection of Badgers Act (1992), their setts are also protected against obstruction, destruction, or damage in any part, and the animals within a sett cannot be disturbed.

4.42 The Badger population is extremely high in the area due to a good range of habitat types. Higher and drier land, optimal for sett building is juxtaposed with low lying damp grassland and arable fields throughout the area offering excellent foraging opportunities.

4.43 Badger sett-building activity has been observed in quite open habitat on narrow sloping pasture in the Binsted Rife valley which may be due to a very high population density and / or a lack of disturbance in the area.

Bats

4.44 All species of bat present in the UK receive full protection under The Conservation of Habitats and Species Regulations 2010, and the Wildlife and Countryside Act 1981 (as amended).

4.45 A number of bat species, Barbastelles, Bechsteins's bats, Noctule, Soprano Pipistrelle and Brown Long-eared bat are UKBAP priority species that have been adopted as Species of Principal Importance in England under Section 41 of the NERC Act (2006).

4.46 The four rarest British bat species are listed in Annex II of the Habitats Directive (adopted in 1992). For species listed in Annex II of the Habitats Directive, core areas of their habitat must be protected under the Natura 2000 Network and the sites managed in accordance with the ecological requirements of the species.

4.47 The local area is known to be important for bats for extensive surveys have been conducted at Slindon National Trust estate over a number of years to identify the species present and study the Barbastelle colony discovered there.

4.48 Thirteen bat species amounts to fractionally below three quarters of the entire British species, but given the landscape, habitats and small amount of survey effort, more species may be present. Bats will roost in a variety of habitats such as mature trees, buildings and bridges.

4.49 The presence of two Annex II bat species within the Binsted Woods complex, one of which, Bechstein's bat, with a confirmed maternity roost in Tortington Common, gives the area potentially qualifying criteria for a Special Area of Conservation (SAC) and possibly Nationally Important status, particularly if a Barbastelle maternity colony were found or additional bat species.

4.50 The surveys have demonstrated that the area is littered with trees with features suitable for roosting bats such as hollowing, splits, cracks, woodpecker holes and rot holes. The full extent of these trees present in the Binsted Wood Complex and throughout the landscape has only just been touched upon and certainly not recorded.

4.51 The landscape provides an ideal dark area for foraging. Open spaces within the Binsted Wood Complex such as the wayleave, Old Scotland Lane and small clearings in Tortington Common as well as the woodland edge, woodland extensions such as Lake Copse, The Lag and The Shaw and the shaws extending from the woodland to the south of Tortington Common, provide ideal sheltered foraging habitat in areas of still air.

4.52 The low-lying floodplain landscape with the river, water bodies, wet ditches and damp fields surrounded and sheltered by hedgerows and tree-lines attracts insects such as midges, moths and micro-moths. This abundant habitat is readily accessible, for the numerous hedgerows, scrub-lines and tree-lines provide flight-lines and protective cover whilst foraging.

4.53 This landscape provides a variety of roost sites and foraging areas relatively close together and a dense commuting network with no barriers to dispersal. This combination of factors means that there are likely to be lower metabolic demands on commuting bats and lower predation, which would result in increased breeding success and therefore stable populations – hence the good diversity of bat species.

4.54 These initial baseline surveys clearly show that this is an important area for bats, with two Annex II species present and several other rare or threatened species including the recently discovered Alcathoe bat. Bats can be used as indicators of biodiversity and show that this is an ecologically important area.

4.55 The Mid Arun Valley including the Binsted Woods Complex, smaller copses, shaws, farmland, fen, wetland and traditional old buildings covers a large area, which requires a thorough and complete set of bat surveys across all habitats and different areas throughout the year to build up a picture of bat species using the site.

Birds

4.56 Breeding birds are protected by the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is an offence to intentionally kill, injure or take the birds or their eggs, or to intentionally destroy or disturb a nest, when it is in use or being built.

4.57 Many bird species are listed as being UKBAP priority species and have subsequently been adopted as Species of Principal Importance (SPI) for the conservation of biodiversity in England, in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. A proportion of UK birds are Birds of Conservation Concern, Red List or Amber List species.

4.58 A high number of birds have been recorded within the last two years and the area, as a whole, is known to have an extremely high diversity of birds with just under a third of the British total in a relatively small area of the Mid Arun Valley (Thompson 2016). There are a number of reasons for this high species diversity as follows:

- The diversity of habitats of which many are either Section 41 Habitats and / or in environmental stewardship schemes. This has resulted in a good mix of farmland, wetland and woodland species with a good representation of birds of prey such as Buzzard *Buteo buteo*, Barn Owl *Tyto alba* (Schedule 1) and Tawny Owl *Strix aluco* (Amber List).
- The damp fields and network of ditches provide aerial forage for summer visitors such as Swallows Hirundo rustica, Swifts *Apus apus* (Amber List) and House Martins *Delichon urbica* (Amber List). Undisturbed buildings, barns and stables provide nesting opportunities.
- The farmland supports large numbers of winter visitors such as Redwings *Turdus iliacus*

and Fieldfares *Turdus pilaris* and declining species such as Linnet and Yellowhammer (all Red List species).

- The river Arun provides hunting corridors for the Hobby *Falco subbuteo* and nesting opportunities for Kingfishers *Alcedo atthis* (Amber List), which are both Schedule 1 species.
- Undisturbed, scrubby woodland above dense and tall vegetation is ideal for Nightingales (Red List).
- The vast area of floodplain grassland is of importance to a wide range of wetland species; many of which have declined substantially and therefore have various layers of protection.
- The juxtaposition to the Arun Valley SNCI, which comprises extensive wetlands, supporting breeding wintering birds, waders and wildfowl such as Snipe *Gallinago gallinago* (Amber List) and Lapwing *Vanellus vanellus* (Red List and Schedule 1), which also breed in the Mid Arun Valley area.
- The proximity of the Arundel Wetlands Centre which provides a haven for a high number of passage waders and the landscape linkage from the coast through the Mid Arun Valley area and along the Arun into mid Sussex to areas of the Arun Valley such as Pulburough Brooks, Amberley Wildbrooks and Waltham Brooks. These form the Arun Valley Special Protection Area for rare and threatened birds (SPA).
- A high number of species recorded in the SPA have been recorded in the Mid Arun Valley (Thompson 2016), and this uninterrupted corridor may contribute to the high numbers of birds in the area and may be of importance to the bird populations.
- The extensive reedbeds of the Arundel Wildfowl and Wetlands Trust reserve and along the River Arun and ditches extending into the Mid Arun Valley are a major stronghold of breeding Reed Warblers *Acrocephalus scirpaceus* in west Sussex (recorded repeatedly in the Mid Arun Valley). This is an important species for the Cuckoo (Red List), which is frequently heard in the spring and a brood parasite of this species.

4.59 The British Trust for Ornithology (BTO) has conducted annual bird surveys on the same square kilometer at Marsh Farm for approximately twenty-five years (1989 – 2013). While farmland birds underwent massive declines in the wider countryside, the number of birds and species of birds recorded at Marsh Farm stayed constant with sixty-four species recorded during the first year and sixty-three during the last.

4.60 It is considered that the integrated landscape offers ideal breeding and foraging opportunities for a great range of birds of different habitats.

Dormouse

4.61 Dormice receive full protection under The Conservation of Habitats and Species Regulations 2010, and the Wildlife and Countryside Act 1981 (as amended). Dormouse is a UKBAP priority species and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act (2006). The UK holds 25% of world population of Dormice.

4.62 The landscape lends itself to a strong Dormouse population due to the large and uninterrupted block of woodland with a varied canopy and dense shrub layer in places. During an initial

scoping survey in 2015 it was thought that the landscape is ideal for dispersal with arms of woodland and shaws extending from the main woodland of the Binsted Woods Complex, which are linked to the wider landscape by outgrown and undermanaged hedgerows and tree-lines. Pockets of woodland litter the landscape and all have a variety of species providing a varied food source that would be able to support viable populations of Dormouse.

4.63 Dormouse monitoring was therefore extended through some of these areas and this initial assessment has proved to be correct with Dormice dispersing from the Binsted Woods Complex through The Lag and The Shaw. Dormice can also disperse through the linked canopy between the main block of the Binsted Woods Complex into Hundred House Copse to the west.

4.64 In 2015 / 2016 Brighton University undergraduate student James Burford undertook a project whereby the habitat suitability for Dormouse throughout the Binsted Woods Complex was calculated. The Complex was divided into similar parcels of woodland and a suite of habitat factors, based on the current literature and those associated with the most frequently occupied nest boxes in Ash Piece and Paines Wood since recording began (fifteen years ago).

4.65 Variables included scrub and canopy cover, dead wood availability, species diversity and connectivity. Based on the environmental parameters selected, all the other woodlands in the Binsted Woods Complex had higher Habitat Suitability Index (HSI) scores than Ash Piece and Paines Wood, with the exception of one area of pinewoods. From this and the results of the additional monitoring, it can be inferred that Dormice will be present throughout the Binsted Woods Complex.

4.66 Given the size of the woodland and the connectivity across the Mid Arun Valley landscape with Dormice proven to be dispersing, the Binsted Woods Complex may well be an important source population for the surrounding areas.

Great Crested Newt

4.67 Great Crested Newts are fully protected by both the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010. The species is a European Protected Species, a UKBAP priority species and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act (2006).

4.68 The pond and ditch network provide ideal habitat for Great Crested Newt. Great Crested Newt has been recorded 850 m from the area, and as there are presently no barriers to dispersal, there is the possibility that this species could be breeding in the Mid Arun Valley

Otter

4.69 Otters are classed as European Protected Species (EPS) under The Conservation of Habitats and Species Regulations 2010, and the Wildlife and Countryside Act 1981 (as amended). It is therefore an offence to deliberately or recklessly kill, injure or disturb an Otter. It is an offence to obstruct access to or to destroy an Otter breeding site.

4.70 Otter is a UKBAP priority species and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act (2006). Otter is also a Sussex BAP and listed on the SxRSI.

4.71 Eurasian Otter populations throughout Western Europe declined over the 20th Century due to bioaccumulation of pesticides. Since the introduction of legislation to ban / restrict such chemicals and to improve water quality this species is beginning to recover.

4.72 Otter is thought to be just beginning to extend its range across the Hampshire border into Sussex and there have been unconfirmed sightings in this catchment. There are undisturbed areas that are ideal for holt construction such as around Binsted Rife and areas of wet woodland.

Reptiles

4.73 Reptiles are protected under the Wildlife and Countryside Act of 1981 (and as amended), making it an offence to intentionally kill, injure, sell or advertise to sell any of the native species of reptile in the UK.

4.74 All reptiles are UKBAP priority species and have been adopted as Species of Principal Importance in England under Section 41 of the NERC Act (2006).

4.75 Four species of reptile are frequently seen in the area – Adder, Grass Snake, Slow Worm and Common Lizard. These species require the good diversity of habitat structure that the Mid Arun Valley landscape provides such as areas of lush grassland for hunting (and ditches and ponds for Grass Snake hunting), field edges, hedgerows and ditches for dispersal corridors, banks and arable field margins for basking and abundant mammal burrows and gaps beneath tree roots within hedgerows, shaws and woodland for hibernation.

4.76 Reptile populations are thought to be extremely high in the area as there are frequent sightings both in exceptionally good reptile habitat such as around Binsted and Tortington Rifes and Tortington Common and in other areas such as arable field margins, hedgebanks and other ‘edge’ habitats throughout the survey area.

Water Vole

4.77 Water Voles are protected under the Wildlife and Countryside Act of 1981 (and as amended), making it an offence to intentionally kill, injure any individual or recklessly damage, destroy or obstruct access to any structure or place which Water Voles use for shelter or protection or disturb Water Voles while they are using such a place

4.78 The Water Vole is a UKBAP priority species and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act (2006).

4.79 The Mid Arun Valley area has an extensive interconnected ditch network with scattered ponds. Although some of the ditches are ephemeral in nature, many remain wet throughout the year offering suitable habitat. Moreover, there are ditches and ponds that are undisturbed by large grazing animals in key areas of lush fringing and surrounding habitat such as along Binsted Rife, along Tortington Rife and ditches / reservoirs to the north of the railway line.

4.80 These areas offer a more complex habitat than just a linear network of ditches, with breeding refuges for Water Voles where they are less likely to be predated upon by American Mink.

UKBAP priority species / SPI – Brown Hare

4.81 The European Brown Hare is a species of an open landscape where it occupies arable fields and pasture, both abundant in the Mid Arun Valley area. It is not usually seen unless disturbed for it is a nocturnal species spending most of the day in small depressions in the grass known as forms.

4.82 It has been seen around the Binsted area, but is likely to be present across the entire Mid Arun Valley landscape.

UKBAP priority species / SPI – Common Toad

4.83 A high and likely ancestral breeding population of Common Toad was found centred around Binsted though other suitable areas such as ponds in Tortington, Binsted Rife and the ditch network were not investigated for this species.

4.84 These are linked by numerous corridors in the form of the rough grassland along field edges and hedgerows, tall wetland vegetation fringing the numerous ditches and the areas of swamp, fen and marshy vegetation providing ideal damp refuges. Parts of the Binsted Woods Complex, Lake Copse, The Lag and The Shaw also provide excellent habitat that will remain damp all year.

4.85 Amphibians require both aquatic and terrestrial habitats in order to breed and survive. Favoured terrestrial habitats are those that are likely to stay damp during the hottest days and the driest seasons providing moist refuges in which to shelter such as rotting wood, tussocks of vegetation, logs and accumulations of leaf litter.

4.86 It is likely that Common Toad, along with other amphibians, use much of the landscape across the Mid Arun Valley and could be present in significant numbers.

UKBAP priority species / SPI – European Eel

4.87 European Eel elvers migrate along the coastline and into our Sussex river estuaries in order to grow. After 5–20 years in fresh water, the eels become sexually mature and they begin their migration back to the Sargasso Sea to spawn. The connectivity of the landscape is demonstrated by the presence of this species in the lake in Lake Copse and a ditch in Lyminster (Thompson 2016).

UKBAP priority species / SPI – European Hedgehog

4.88 The woodland and habitat linkages with shaws, scrubby tree-lines, outgrown hedgerows and unkempt field margins provide excellent Hedgehog habitat. Moreover, the presence of this species is a good indicator of the abundance of ground-dwelling invertebrates and of varied habitat features, such as hedges and copses (Reeve, 1994) as found in the Mid Arun Valley.

4.89 Various studies indicate that Badger predation is one of the main causes of Hedgehog mortality (Doncaster *et al.,* 1992, Hof and Bright 2010). However, it appears probable that the habitats in the Mid Arun Valley have the diversity and complexity to support viable populations of Hedgehogs despite the known high population of Badgers.

UKBAP priority species / SPI – Harvest Mouse

4.90 This species has shown a continual and steep decline since the 1970's attributable to habitat loss (Battersby 2005). However there are corridors and pockets of suitable habitat throughout the Mid Arun Valley.

4.91 Just one location, a field adjacent to Tortington Rife, was surveyed for Harvest Mice in 2016, though there are additional significant areas of excellent habitat along Binsted Rife, land to the north of the train line and along the river corridor. Other pockets of suitable habitat in the form of tall rough grassland and bramble bound the arable fields and provide suitable dispersal corridors across the landscape.

4.92 This species has been shown to disperse through the area, for a Harvest Mouse nest has previously been recorded in a wayleave in the Binsted Woods Complex.

Invertebrates - landscape

4.93 The mosaic of habitats across this landscape has the potential, which has been demonstrated by surveys, to support a wide variety of invertebrates. This diversity provides numerous interfaces such as woodland edges, grassy hedge banks adjacent to bare arable land, lush wetland vegetation adjacent to short grassland.

4.94 Interfaces (ecotones) are more species and number-rich than extensive areas of similar-structured habitat. This reflects the juxtaposition of the availability of warmth (exposure to sun), humidity (many insect larvae have major problems with desiccation, but want to be warm to grow quickly) and food resource (botanical diversity - which relates back to the first two resources).

4.95 The whole landscape scores very well on interfaces, and it also has other particularly important good quality habitats such as the presence of seepage / streams in woodland and much dead wood habitat.

Invertebrates – dead wood habitat

4.96 Dead wood is an extremely important invertebrate habitat and is abundant in the Mid Arun Valley in the Binsted Woods Complex, Lake Copse, The Shaw and narrower shaws, tree-lines and hedgerows.

4.97 In the course of Dr Grove's 2016 survey of Lake Copse and two nearby hedgerows, 52 saproxylics (dependent on dead or decaying wood) were identified, and this was measured against the Saproxylic Quality Index (SQI).

4.98 The SQI rates the importance of the dead wood habitat, a habitat that is becoming scarcer as rotten branches on trees are removed for safety reasons. Despite the small area covered by this survey, many species found were uncommon or even rare, and they produced a high score on the SQI.

4.99 The overall SQI score of 434 places Binsted about halfway down the list of sites recorded in Southern England. At the top, with a rating of about 850, are sites such as the New Forest and

Windsor Forest, while Petworth Park is only just above Binsted. Most of these sites are much bigger and have been studied for much longer.

Invertebrates – a comparison with other important sites

4.100 When compared to other good quality sites with similar recording effort the invertebrate diversity in the Mid Arun Valley is extremely high as shown in Table 3.

Table 3: *A comparison of the Mid Arun Valley invertebrate diversity*

Site	Year	Days	Species number
Mid Arun Valley – partial LWS	2016 / 17	13	551
Midhurst Downs – set of small sites on conservation land – much in SSSI	2016	14	570
Ebernoe Common - LWS	2016	14	565

4.101 The high diversity can, in part be attributed to the mosaic of habitats present, the abundant 'edge' habitat providing ecotones, plentiful dead wood habitat, and the less common wet woodland with seepage / stream and pond habitats.

Invertebrates - butterflies

4.102 The heterogeneous landscape is ideal for butterflies, which require sometimes specific food plants, shelter from strong winds and warmth. The pockets and ribbons of open species rich habitat, the woodland rides, wayleaves and open glades, the field margins such as those around Binsted Park, Tortington Rife and Binsted Rife, the southern margin of the Binsted Woods Complex with sheltered shaws / tree lines / hedgerows and the low lying area between the banks of the Arun and the drainage ditch running alongside provide ideal butterfly habitat.

4.103 Despite data from *The State of the UK's Butterflies* (2015) showing significant and sustained decreases in abundance and occurrence of both habitat specialist and generalist species of butterfly, the Mid Arun Valley area appears to be showing good diversity and abundance of species.

4.104 This is demonstrated in the butterfly recordings that have been consistent from 2015 to 2017 with 27 species recorded in 2015 and a total of 28 species recorded in 2017. This compares well with Arundel Park SSSI, which supports 25 breeding species of butterfly.

5 IMPACTS

HABITATS

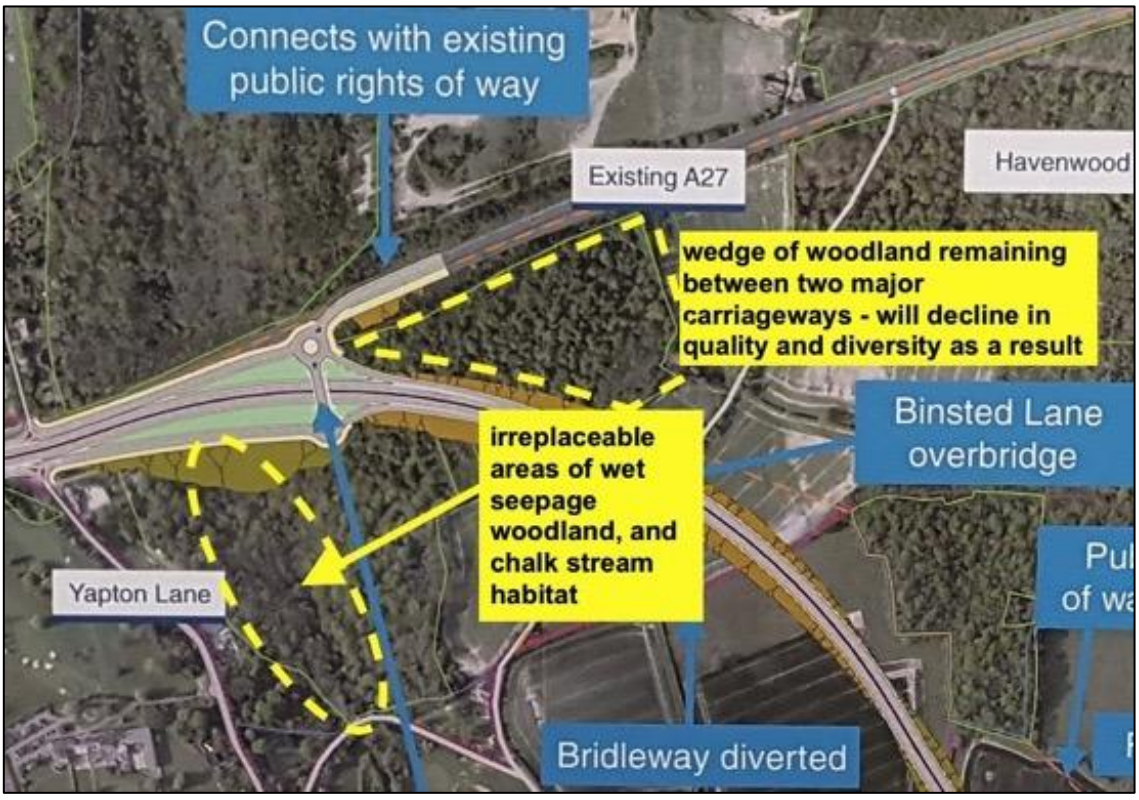
Ancient semi-natural woodland

5.1 All areas of woodland are within the South Downs National Park and are included in the Binsted Woods Complex Local Wildlife Site. Broad-leaved deciduous woodland and wet woodland are section 41 Habitats of Principal Importance and Option 5A will traverse and destroy / degrade a mosaic of wet and dry woodland in Little Danes Wood and Hundred House Copse (shown in yellow in Figure 3).

5.2 Hundred House Copse and Little Danes Wood are a mixture of Ash and Oak woodland. However in areas of springs and seepage the community moves towards W7 *Alnus glutinosa – Fraxinus excelsior – Lysimachia nemorum* woodland.

5.3 Wet woodland combines elements of many other ecosystems and, as such, is important for many taxa. The high humidity favours bryophyte growth and the number of invertebrates associated with Alder, birch and willows, is very large. Two Red Data Book flies and a Nationally Scarce beetle were found by Mike Edwards (2017) in this woodland.

Figure 3: *Areas of woodland that will be destroyed or degraded*



5.4 This habitat is extremely diverse and has species indicative of the chalk influence. This habitat cannot be created elsewhere with tree planting, and the road will lead to the loss of rare

invertebrates, uncommon bryophytes and the stands of hundreds of Early-purple orchids associated with the habitat.

5.5 Moreover, it is stated that 6.6 ha of ancient woodland will be lost (WSP Parsons Brinckerhoff 2017), yet this does not take into account the quality of the woodland (which is extremely high). It also does not take into account the fact that the block of woodland that will remain to the north of Option 5A (Barns Copse) will be severely degraded due to becoming a fragmented 'wedge' of woodland sandwiched between two major carriageways (also shown in yellow in Figure 3).

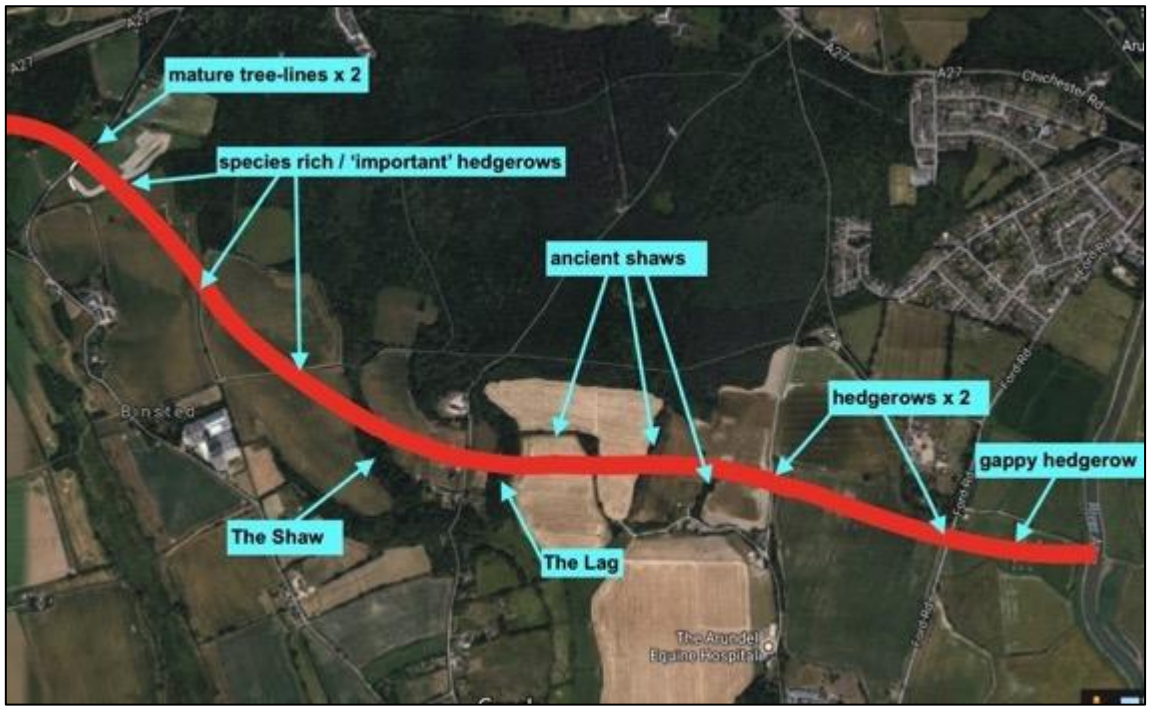
Woodland

5.6 The Shaw is partly ancient woodland and The Lag is wet woodland (formerly classified as wood pasture). Both areas of woodland have a number of veteran trees, are S41 HPI's and within the Binsted Woods Local Wildlife Site and the South Downs National Park. The woodlands are shown in Figure 4.

5.7 The Shaw and The Lag are mosaics of wet and dry woodland with ponds, streams and braided streams supporting a wide diversity of species including ancient woodland indicators and rare plants such as Fritillaries, (listed on the IUCN Red List VU, SxRSI), the uncommon Southern Wood-rush and Wych Elm *Ulmus glabra*, an important food plant for the White-letter Hairstreak *Satyrium w-album*, a UKBAP and S41 species that could well be present.

5.8 These habitats will be directly lost and fragmented by Option 5A resulting in a disproportional impact to the woodland. The mosaic of habitats that result from the antiquity of the landscape and the watercourses cannot be replicated by tree planting elsewhere.

Figure 4: *Ancient shaws, hedgerows and mature tree lines radiating from the Binsted Woods Complex*



5.9 The ‘W’ shape of these three arms of woodland is an iconic landscape feature of the Mid Arun Valley and irreplacable.

5.10 Additional very narrow strips of woodland or ancient shaws, present on the 1876 OS map Sussex LXII, radiate from the south of the Binsted Woods Complex at Tortington Common and are shown in Figures 2 and 4. These have notable and veteran trees and support a range of less common nesting birds. Due to their antiquity the habitat is irreplaceable.

Hedgerows

5.11 Hedgerows are S41 Habitats of Principal Importance. Option 5A would sever eight hedgerows and two mature tree-lines shown in Figure 4.

5.12 Three of the hedgerows are classified as species-rich of which two, and possibly the third, would be classified as ‘Important’ under the 1997 Hedgerow Regulations.

5.13 One of these hedgerows is the Copythorn Field west hedge. This hedge has 20 woody species, 90 herbaceous species, 12 sedges, rushes and grasses and 2 ferns. Such hedgerows provide habitats for a diversity of invertebrates that may live in ditches, burrow into banks or be associated with herbaceous plants.

5.14 Option 5A would sever these corridors and change the properties (i.e. humidity, dust, airborne pollutants etc.) of the immediately surrounding hedgerow / shaw / tree-line areas. These factors would have negative impacts on protected and notable species from Dormice to moths.

Notable and veteran trees

5.15 Ancient, veteran and notable trees are a feature of the Mid Arun Valley landscape and are throughout the area, particularly in the woodlands and shaws.

5.16 There are a number of trees that appear to be in the pathway of Option 5A, particularly in The Shaw and Hundred House Copse / Little Danes Wood / Barns Copse.

5.17 Veteran trees support rare fungi, invertebrates and protected species such as bats. They provide a particular series of niches of immense importance to wildlife that cannot be replicated. This habitat is irreplaceable in a human life-time.

Arable field margins

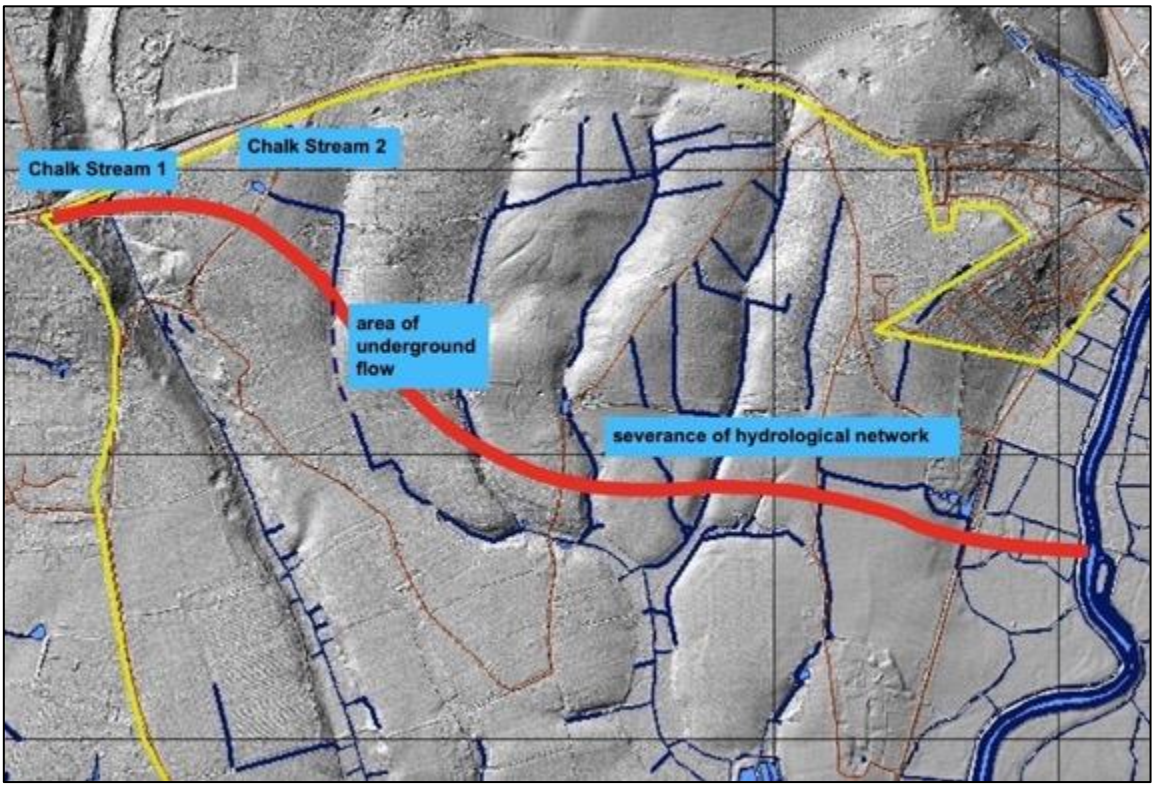
5.18 The main importance of the arable field margins is that they complement the hedgerows and provide habitat and a network of corridors across the landscape for a number of protected species.

Chalk streams

5.19 Option 5A would disrupt the network of watercourses / ditches that drain the higher land of the Binsted Woods Complex. Some of these watercourses originate in the chalk bedrock draining the South Downs. Although the full extent is unknown, two have been identified as chalk streams.

5.20 The extent of the severance / interruption / disruption of the drainage system throughout the entire Mid Arun Valley area is shown in Figure 5 where the approximate course of Option 5A has been superimposed on a LIDAR (Light Detection and Ranging) image.

Figure 5: *The Mid Arun Valley stream network on a LIDAR image*



Chalk Stream 1

5.21 The first chalk stream follows the boundary between the two woodlands with the valley clearly seen on the LIDAR image (Figure 5). The source is drainage from the South Downs and there are also springs in the woodland, presumably from the same source.

5.22 A major junction is planned right on the stream / seepage system itself. This would break the geological situation where saturated gravels are carrying water from the South Downs.

5.23 This would have enormous implications in terms of road run-off and balancing ponds, which then have very large effects upon the seepage system and its water quality. The proposed cutting is likely to drain the woodland the 'wrong way' for the natural drainage pattern.

5.24 Ultimately this could result in the loss / deterioration of the Binsted Rife Valley chalk stream with additional impacts on the integrated ditch network and the surrounding mosaic of lowland fen and swamp habitat.

Chalk stream 2

5.25 The second chalk stream originates at Sandy Hole Pond, which is likely fed from an underground spring.

5.26 This stream flows at times of high rainfall and in the winter along natural boundaries. The dashed line shown in Figure 5 is where it disappears beneath the ground for a stretch along the Copythorn Field west hedge.

5.27 It then flows through the Lake Copse woodland where there is a pond, pooling and marshy areas keeping the woodland humid.

5.28 This woodland is particularly important for invertebrates, for Dr Grove recorded 96 beetle species in this woodland in 2016 with a different assemblage in the wetter areas. This included one Red Data Book species and 8 Nationally Scarce / Notable species.

5.29 The chalk streams and the integrated surrounding habitats are all Section 41 Habitats of Principal Importance and are irreplaceable.

Streams and ditches

5.30 Severance / rerouting of the remaining streams / watercourses will have far reaching impacts. There are four main additional watercourses that feed through, from west to east on Figure 5, The Shaw, The Lag and two narrower ancient woodland shaws.

5.31 These streams feed into Tortington Rife and into a network of ponds throughout the area. Additionally, variations in geology / soil types in some areas has created a number of different habitats such as braiding of the stream in The Lag, marshy ground at the southern end of The Shaw and swamp communities in fields to the west of Tortington Rife.

5.32 Due to these features, some of these areas are unmanaged or seldom managed and therefore of importance to wildlife. Disruption of this system is likely to have a negative impact on Harvest Mice, Water Vole, invertebrates and breeding birds such as Marsh Tit (Red List).

5.33 The ditch and pond network throughout the Mid Arun Valley could be lost fully / partially or subjected to differing water regimes. It is also likely to suffer from pollutants from the proposed road.

Ponds

5.34 Many of the ponds are directly fed by the streams and ditches and so these may disappear with the destruction / disruption of the land drainage system.

5.35 The pond and ditch networks serve as corridors and stepping-stones for dispersal throughout the wider landscape, which would be blocked or impeded by the presence of another road through such a diverse area.

5.36 There will also be indirect and less immediately apparent impacts on the ponds (and the stream / ditch network), for the proximity to a major road is likely to cause a degree of deterioration due to nitrates and particulates with the potential to change the species composition. Such deposition has been shown to have an impact for a distance of 200 m from the source (Bignal *et al*. 2008).

Lowland fen and swamp

5.37 The loss / alteration / pollution of the Binsted Rife chalk stream will threaten the surrounding lowland fen and swamp habitat, which comprises a good quality mosaic habitat with fen and swamp communities intermixed with grazing marsh.

5.38 This habitat supports uncommon communities such as the National Vegetation classification type S28b *Phalaris arundinacea* tall-herb fen, which is extremely species rich in places with uncommon species such as Blunt-flowered Rush and Fen Bedstraw (both on the SxRSI).

5.39 It also supports less common species such as those indicative of calcareous conditions including Fan-leaved Water-crowfoot, which is declining throughout its range, Flowering-rush, Mare`s-tail and Whorl-grass (SxRSI).

5.40 There will also be an impact on protected species such as Water Vole, Grass Snake, uncommon birds such as Snipe (Amber List), bats and invertebrates.

5.41 There can be no mitigation for this S41 Habitat, for it is not only wetland habitat but it has a calcareous influence reflective in some of the species found. It is irreplaceable.

Reedbed

5.42 Reedbed is a S41 Habitat and areas will be lost and degraded due to the likely impact on the stream network. Additionally ribbons of reedbed corridors along ditches will be severed.

5.43 The largest reedbed in the area is just to the south of the proposed bridge. The siting of the bridge will degrade the quality of this reedbed and likely impact upon the species therein.

Floodplain grazing marsh

5.44 The floodplain grazing marsh (S41 Habitat) is part of a corridor from the coast and along the Arun into mid Sussex to areas such as Pulborough Brooks, Amberley Wildbrooks and Waltham Brooks.

5.45 Option 5A will cause a direct loss of this habitat and present a barrier across the floodplain grassland and associated drainage ditches with implications as to the viability of protected species in the area.

River corridor

5.46 Option 5A will result in an area of river corridor habitat being lost with the possible loss of rare plants.

5.47 The bridge over the river is just to the north of a large area of reedbed that is likely to be of importance to breeding birds.

Summary

5.48 Table 4 gives a summary of the habitats that will be impacted upon by Option 5A and the severity of the impact. It also gives an indication as to whether the habitats are replaceable.

Table 4: *Habitat impact summary table*

Habitat	Status	Extent lost	Replaceable	Timeframe
Ancient woodland	HPI / LWS	Stated 6.6 ha but greater area lost / degraded / fragmented	No	n/a
Woodland	HPI	2 main areas	No	n/a
Hedgerows	HPI	8	Yes	5 – 30 years
Notable / veteran trees	HPI / some in LWS	unknown	Yes	100 + years
Chalk Streams – (aquifer fed water bodies)	HPI / part in LWS	2 streams	No	n/a
Streams and ditches – (possibly aquifer fed water bodies and some reedbed)	Part in LWS	4 main streams	No	n/a
Ponds – spring and stream fed	HPI	3 possibly more	No	n/a
Lowland fen (and swamp)	HPI	Potential loss of Binsted Rife Valley	No	n/a
Reedbed	HPI	Loss along river corridor and ditches	Yes	few
Floodplain grassland	HPI	Area lost and dissected	Yes	n/a
River corridor	HPI	None	n/a	n/a

PROTECTED SPECIES

Badger

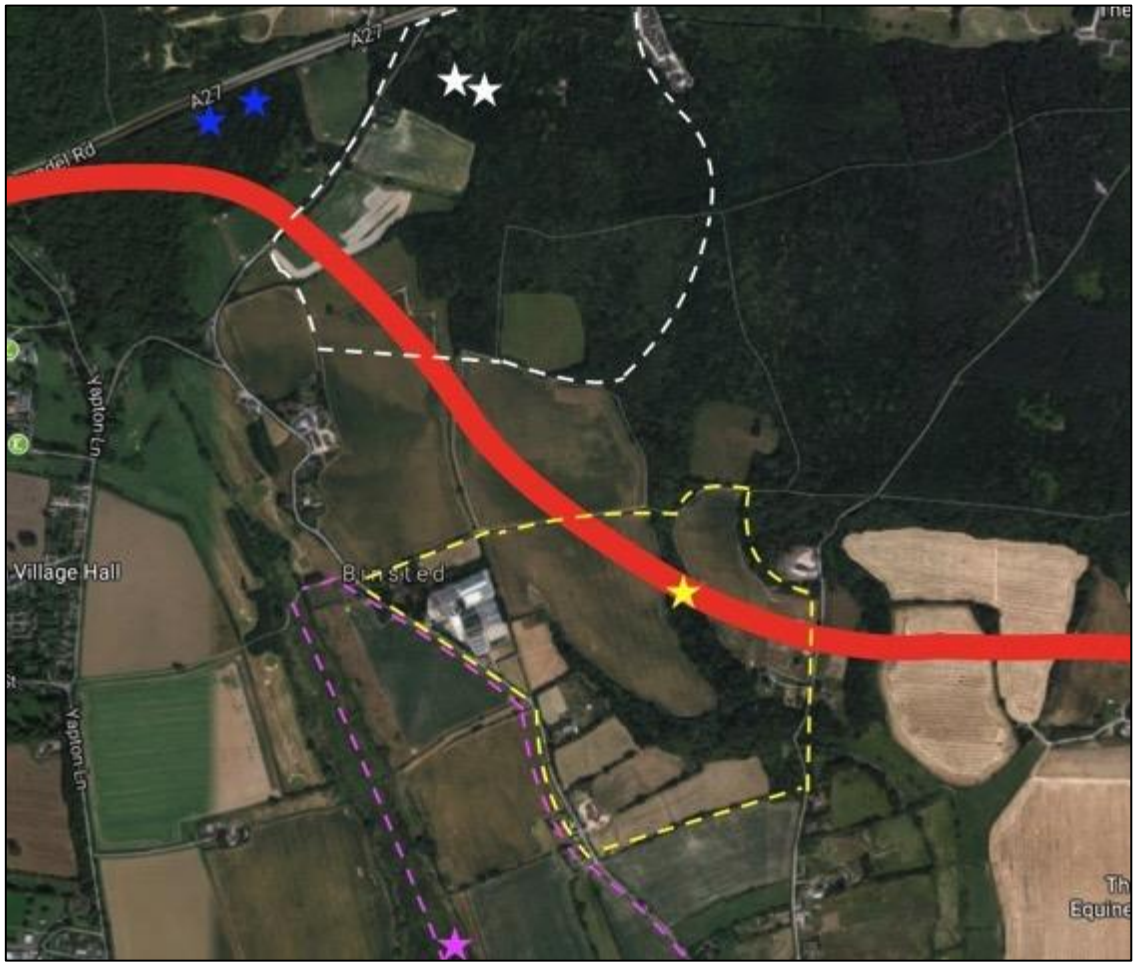
5.49 The locations of setts and an estimate of territory size attained by bait marking (Dominic Walding 2016) is shown in Figure 6. Different territories are shown in different colours with 'stars' marking the approximate sett locations.

5.50 The sett in The Shaw will be destroyed by Option 5A and two territories are in the path of the proposed road.

5.51 Mitigation will be required in the form of excluding Badgers from the sett to be destroyed (The Shaw) and providing an artificial sett if there is no other sett available within the territory.

5.52 Given that the Badger population is extremely high mitigation will be required to ensure that this species can cross the road safely. This would be achieved by the provision of purpose-built underpasses and badger-proof fencing to stop individuals being killed. It is important that such underpasses are located on or close to existing badger paths.

Figure 6: *Badger setts and territories in the pathway of Option 5A*



Bats

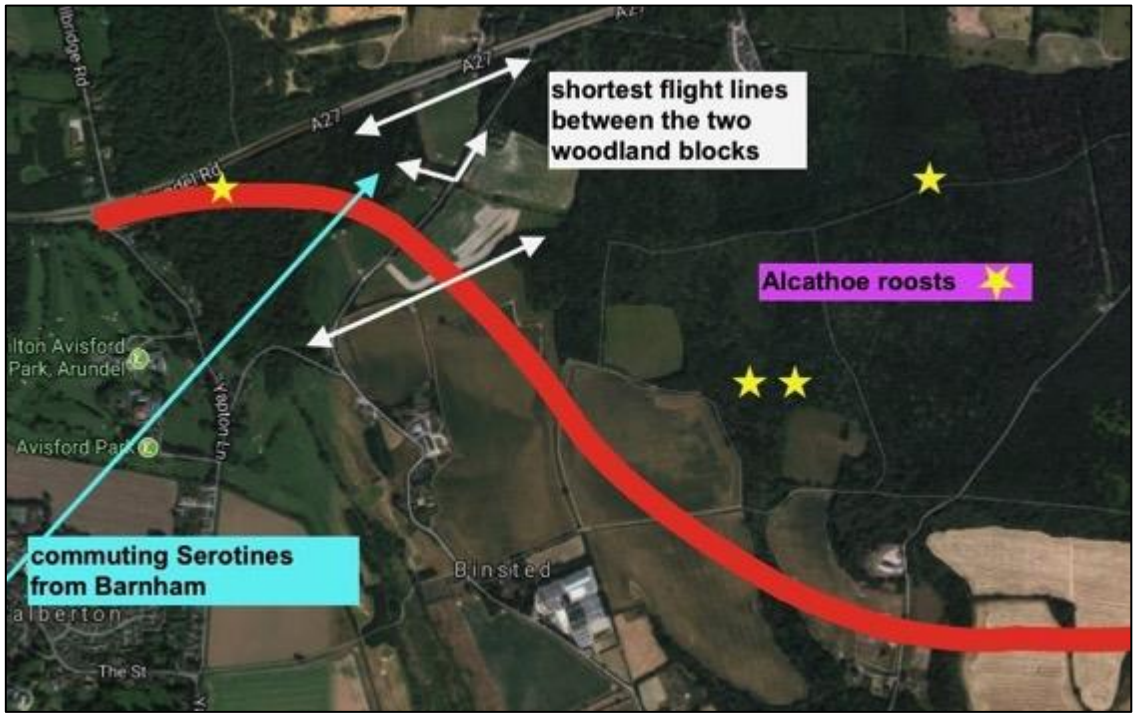
5.53 The movements of bats appear to be throughout the Binsted Woods Complex including the block of woodland to the west (Hundred House Copse / Barns Copse / Little Danes Wood). Flight lines in the form of tree-lines and hedgerows readily connect the two blocks of woodland (shown in Figure 7). Option 5A would sever all these corridors.

5.54 Alcathoes, a UKBAP priority species, is the rarest species found, with maternity roosts discovered in both blocks of woodland (Figure 7). Alcathoes maternity roosts have only been found in 3 counties and this is the most southern known colony in the UK. Option 5A would sever links between the roosts.

5.55 Serotines are one of our less common species, occurring mainly south of a line drawn from The Wash to South Wales. It roosts in buildings and tends to feed on larger invertebrates such as chafers. Option 5A will impact upon this species commuting from its roost sites in Barnham.

5.56 Option 5A will result in a loss of foraging habitat for Bechstein's bats, (three roosts found to date) which is predominantly mature native woodland, notably Oak woodland, which will be lost in The Shaw and Hundred House Copse / Little Dane's Wood.

Figure 7: *Alcathoe roosts and flight lines*



5.57 Barbastelles are known to be roosting in the woodland with a roost found at the western side. It is possible that more roosts are throughout the woodland as Barbastelles are tree roosting specialists and more commonly found in old woodland roosting in veteran / damaged trees.

5.58 Barbastelles are known to forage over a wide area utilising both woodlands and farmland / floodplains for foraging, and so Option 5A will present a barrier between roosting and foraging areas.

5.59 A number of bat species have been found flying in The Shaw in the location of Option 5A including Natterers bat, Alcathoes, Brown Long-eared and Nathusius Pipistrelle. This route would sever these foraging corridors and habitat linkages.

5.60 Based on the limited bat data collated to date, the highest impact of Option 5A will be on Alcathoes. This species uses a lot of maternity roosts and there are likely to be more in the woodlands.

5.61 Given the importance of this woodland to a range of bat species, including some of our rarest species, Option 5A would require mitigation and enhancements to ensure connectivity is maintained between the blocks of woodland. Suitable mitigation would be the construction of underpasses or green bridges in the path of existing flight lines.

5.62 Mitigation would also require that artificial lighting is not used along the carriageway as most bat species, including Bechstein's bats, will avoid lit roads.

Birds

5.63 The extent on the impact of birds is impossible to quantify due to unknowns such as the extent of the loss and degradation of habitat that would be expected from Option 5A such as the ditch network, Binsted Rife swamp and fen.

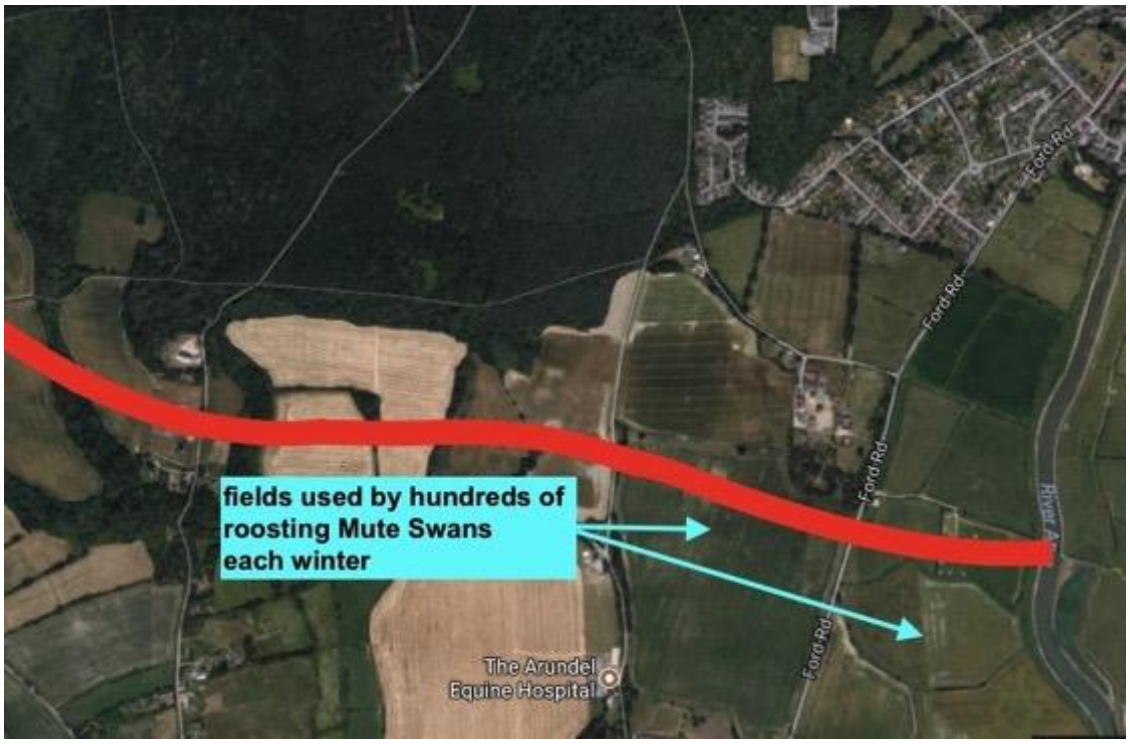
5.64 Option 5A is likely to have a high adverse impact on birds of the open country such as farmland birds; a group that have suffered the most severe declines. It is likely to have a high adverse impact on other groups of birds such as wildfowl and wetland species and low-flying species.

5.65 Option 5A is likely to have a high adverse impact on the Barn Owl, which is known to have four breeding sites in and around Binsted. This is a low, slow flying species affected by collisions with vehicles. Option 5A is likely to sever important foraging areas from nesting sites and increase the risk of death and injury from vehicle collisions.

5.66 Option 5A traverses one field and is adjacent to another that have been used by swans Mute Swan *Cygnus olor* (Amber List) and likely Bewick's Swan *Cygnus columbianus* (Amber List), as a wintering roost area for over 50 years if not more.

5.67 Swans are routinely seen scattered throughout the fields, shown in Figure 8, in their hundreds (200 – 300 estimated) in the spring and autumn. Arundel residents describe the sight thus 'as though the fields were strewn with hundreds of white tissues.'

Figure 8: *Roosting site for two to three hundred swans*



5.68 These are low-flying birds, which succumb to road deaths on the current bridge. There is likely to be a much-increased risk of this with the proposed road within such close proximity to this roost site.

5.69 The additional bridge is also likely to escalate the number of swans killed by roads at such crossings as they fly along the Arun.

5.70 The proposed bridge is adjacent to a large area of reedbed (Figure 9), which has the potential to be used by rare species such as Bittern *Botaurus stellaris* (Amber list) due to its isolated location. The potential for other birds and protected species has not been investigated due to lack of access.

Figure 9: *A large area of reedbed adjacent to proposed additional bridge siting*

5.71 Much of the negative impact on birds will be 'invisible' due to a decrease in breeding numbers near roads. A 5-year research programme at Harvard University (Forman *et al*. 2002) concluded that birds might be strongly affected by traffic volume or changes in volume. With traffic of 15,000–30,000 cars per day (a two-lane highway), both bird presence and breeding were decreased for a distance of 700 m. A heavy traffic volume of ≥ 30,000 vehicles / day saw bird presence and breeding reduced for a distance of 1200 m from a road.

5.72 The Mid Arun Valley is part of a corridor from the coast and along the Arun into mid Sussex to areas such as Pulborough Brooks, Amberley Wildbrooks and Waltham Brooks. These form the Arun Valley Special Protection Area (for rare and threatened birds) with very high numbers of over-wintering waterfowl. All these species have been recorded in the Mid Arun Valley area (Thompson 2016) and the impact of increased infrastructure in this area would be difficult to quantify.

5.73 The bird diversity and the number of birds in the Mid Arun Valley area is at least of Regional Importance and could well be of National Importance, particularly if considered with the 'green corridor' of wetland and wildfowl species.

5.74 Mitigation for birds is usually concerned with the immediate destruction of breeding habitats and the creation of nesting sites for the more widespread species. It does not take the wider issues into account.

Dormouse

5.75 Dormice are known to be breeding throughout the Binsted Woods Complex, with Figure 10 showing the exact locations of where Dormice or Dormice nests have been found. The population is considered likely to be key to sustaining Dormice in the surrounding areas and therefore of Regional Importance.

5.76 Option 5A will have a direct impact on this species by traversing three areas of woodland that support breeding Dormice, Hundred House Copse, The Shaw and the Lag.

5.77 Option 5A will sever corridors that allow this species to disperse from a sizable breeding and important core population in the Binsted Woods Complex to smaller woodlands, copses, shaws and outgrown hedgerows within the Mid Arun Valley and beyond.

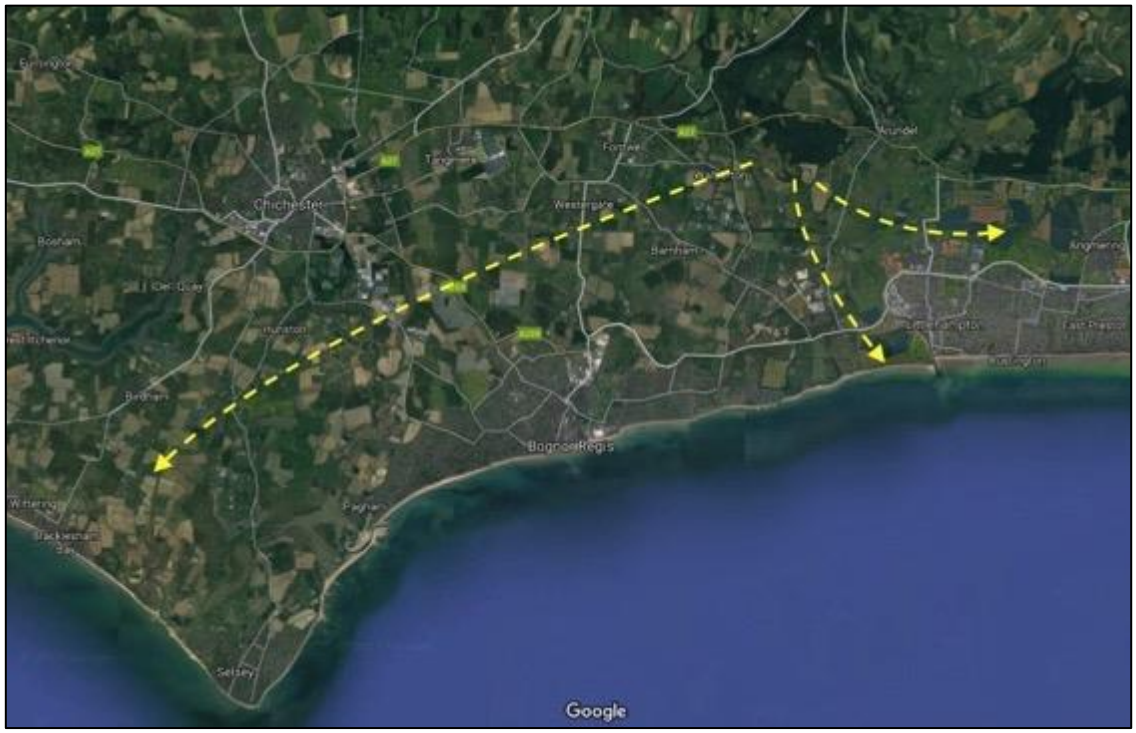
Figure 10: *Known breeding locations for Dormice in the Binsted Woods Complex*

5.78 The Binsted Woods Complex is the biggest and only continuous and sizable block of woodland in the area and along the coastal plain to the south of the A27. Figure 11 shows its size and importance for Dormice in the wider area.

5.79 The Severance of the dispersal corridors, that may lead as far as the Climping Gap, Angmering and Chichester harbour, would potentially have high adverse impacts on the regional population of Dormice.

5.80 A range of protected species as well as Dormice, such as reptiles, amphibians and small mammals are likely to use these corridors across the landscape.

Figure 11: *Potential regional dispersal corridors for Dormice from the Binsted Woods Complex*



Great Crested Newt

5.81 If this species is not in the area then it may have undergone a local extinction at some point in the past, and there is no good reason why this species cannot once again occupy the suitable habitat in the Mid Arun Valley area.

5.82 However, Option 5A will pose significant barriers to dispersal for Great Crested Newt, for it will no longer be able to access all the water bodies and terrestrial habitat that are currently available.

Otter

5.83 There are a number of undisturbed areas within the Mid Arun Valley that would offer excellent locations for Otter holts. The best areas are Binsted Rife, land to the west of Tortington Rife, land to the north of the railway line and pockets of wet woodland.

5.84 Option 5A, by severing the network of watercourses feeding these streams and ditches, is likely to change the hydrology of the entire area and have a negative impact upon these sites.

5.85 This will have a negative impact on Otters, if in the area, as there are so few undisturbed and suitable potential nesting sites for this species in this part of the county.

Reptiles

5.86 The mosaic of habitats found in the Mid Arun Valley is ideal for reptiles and therefore the populations of all four species in the area is believed to be extremely high and of Regional Importance.

5.87 Reptiles routinely move across areas of landscape and, particularly Grass Snake, will traverse large areas of in order to search for suitable breeding sites, productive foraging locations and suitable hibernation sites.

5.88 Standard mitigation would include removal of all reptiles from the road development and a Temporary Amphibian / Reptile Fence to be installed along the entire carriageway in order to keep individuals away from works while in progress.

5.89 However, Option 5A will sever the habitat linkages (shown in Figure 4), particularly from prime woodland hibernation sites to foraging and breeding areas. A major barrier across this landscape is likely to result in high direct mortality and a gradual decrease in the population sizes of all four reptiles.

Water Vole

5.90 Option 5A will create an additional road across the floodplain grassland and alter the hydrology of the watercourses to the north of the floodplain grassland. Wetland habitats in Sussex are at 'critical' and yet they are regularly being destroyed, damaged and fragmented by developments such as proposed Option 5A.

5.91 The current bypass has several culverts through which Water Voles can potentially traverse. However, these also serve as ‘pinch points’ where Water Vole may be open to higher levels of predation. The proposed road would provide another set of pinch points with a relatively small area of floodplain grassland sandwiched between two roads. This is likely to increase predation and decrease dispersal to negligible levels.

5.92 Ditch networks, though cited as being ‘ideal’ habitat for Water Voles, only provide marginalized wetland habitats within strict linear confines, allowing efficient Mink predation. The more complex habitat in parts of the Mid Arun Valley area, with the wetland surrounding Binsted Rife, the fields to the west of Tortington Rife, the reservoirs to the south of the area and the woodland around Lake Copse, currently provide refuges for the species.

5.93 Water Vole has been found at low levels, which may be due to predation from Mink. However, as the wider population is so fragile, the presence of Water Vole in the Mid Arun Valley is considered to be of Regional Importance.

5.94 Alteration of this habitat and the ability of this species to disperse effectively will have a high adverse impact and may well result in the loss of Water Vole from the Mid Arun Valley area.

UKBAP priority species / SPI Brown Hare

5.95 The Brown Hare is known to be across the farmland in the Binsted area and is likely to be across the entire Mid Arun Valley area considered to be of Regional Importance.

5.96 Brown Hare has been shown to have high mortality rates on roads, to avoid habitats fragmented by large roads and to be found in far lower abundances in areas with large roads (Roedenbeck and Vosser 2008).

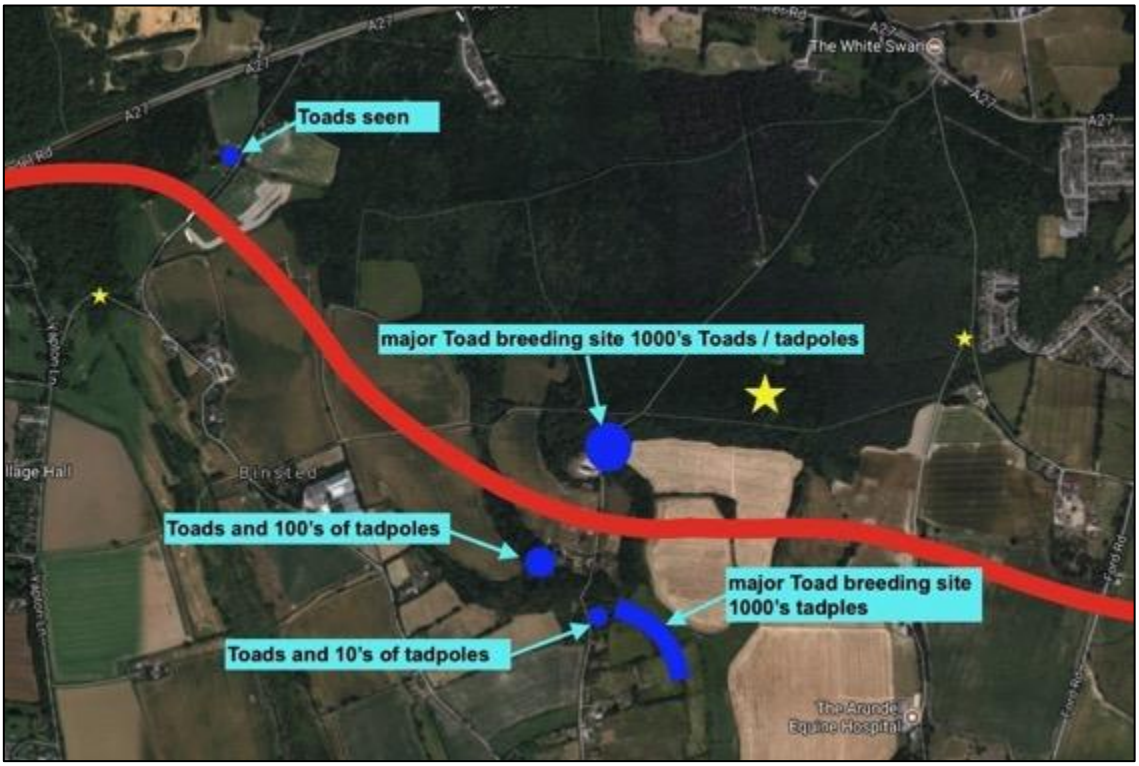
5.97 Option 5A is likely to have a high adverse impact on the known population of Brown Hare in the area to the extent that it may be lost.

UKBAP priority species / SPI Common Toad

5.98 The Common Toad population appears to be high and the locations of this species within the last two years are shown in Figure 12. The smaller yellow stars are where Common Toad has been seen crossing roads, and the larger yellow star is where they are routinely seen in substantial numbers in woodland with a wet flush (Noor Wood).

5.99 It is likely that additional Common Toad breeding sites are in the area such as Binsted Rife, the ponds around Tortington and other wet ditches. The population is likely to be of Regional Importance.

Figure 12: *Common Toad locations*



5.100 Common Toad habitually migrates to ancestral breeding ponds each year. They follow the same route, regardless of what gets in their way, which would lead to potentially high fatalities on the proposed road thereby impacting on the local population year on year.

5.101 Option 5A will have a high adverse impact upon Common Toad by cutting across the watercourses that feed into some of the ponds and ditches that are used for breeding.

5.102 Option 5A will have a high adverse impact on Common Toad by dissecting the interconnected terrestrial and wetland habitat resulting in high fatalities. This is likely to have a high adverse impact on the Mid Arun Valley population of Common Toad.

5.103 Mitigation would be dependent upon the location and number of Common Toad breeding sites in and around the woodland and the way in which they utilize the landscape. Underpasses / bridges would be required in order to facilitate access to ancestral breeding sites. Additionally the creation of breeding sites to replace those lost would also be required.

5.104 However, it is still likely that without barriers, high numbers of Common Toad would be killed on the proposed road.

UKBAP priority species / SPI European Eel

5.105 The movement of fish, such as the European Eel, may be impeded by the presence of an additional road cutting through a high number of ditches.

5.106 Any action that threatens the stream and ditch network in the area would have an adverse impact upon this species in the Mid Arun Valley.

5.107 Fish passage can be blocked by improperly functioning stream culverts or by a lack of them, creating an often-impassable barrier. Schaefer *et al.* (2003) reported that culverts restricted movement of the Darter *Percina pantherina*, a North American fish.

UKBAP priority species / SPI European Hedgehog

5.108 The population density of Hedgehogs is unknown in the Mid Arun Valley. However, due to the continuing decline of this species, it is considered that the Mid Arun Valley offers an uninterrupted landscape for Hedgehogs to persist. The population is therefore considered to be of Regional Importance.

5.109 Option 5A will impact on this species by creating a barrier to dispersal across the landscape and likely have a high adverse impact. Mitigation will likely be ineffective unless barriers are used to prevent high road kill numbers.

UKBAP priority species / SPI – Harvest Mouse

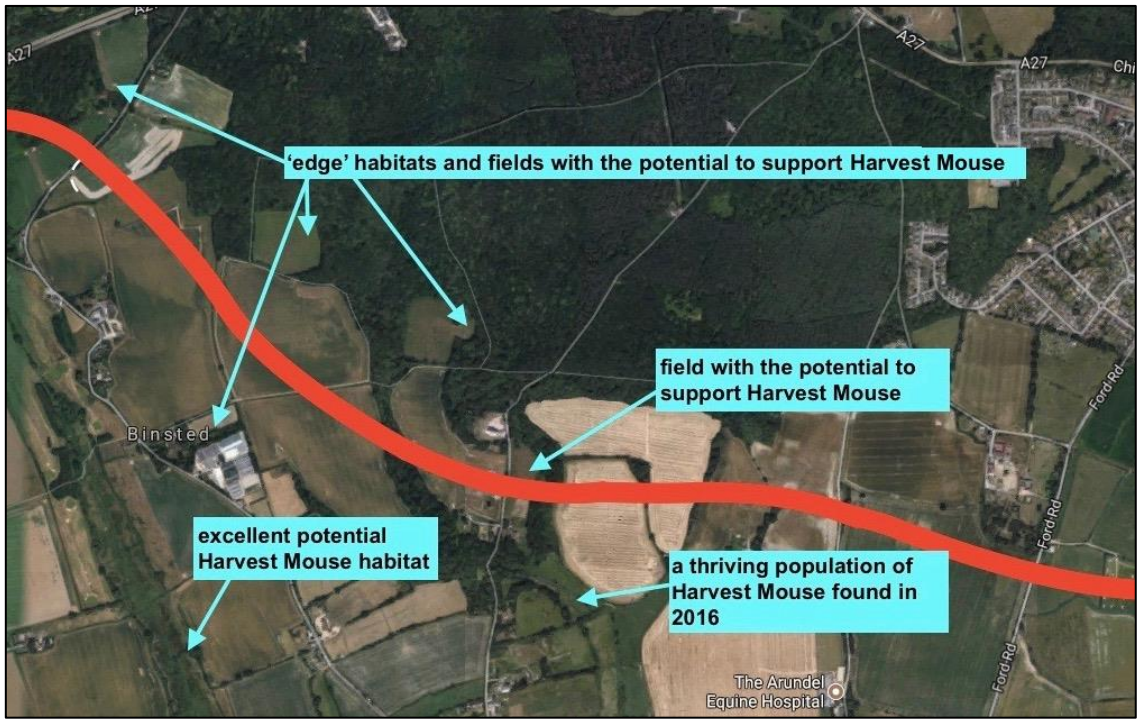
5.110 Suitable habitat for Harvest Mouse is to the north and south of Option 5A. One such area was surveyed and found to support a good population of this species (shown in Figure 13). The population of this declining species is considered to be of Regional Importance.

5.111 Habitat corridors of rough grassland and scrub along field edges, hedgerows and ditches link areas of suitable habitat.

5.112 Figure 13 shows that the areas of potential Harvest Mouse habitat and the ‘edge’ habitat and corridors for movement will be severed by Option 5A. Option 5A may also result in a

deterioration of habitat for this species due to the potential loss of seldom managed rough and marshy grassland. There will likely be a high adverse impact for Harvest Mouse.

Figure 13: *Harvest mouse population and some other suitable locations*



Invertebrates

5.113 The invertebrate diversity is high across the areas of the landscape surveyed to date. The east part of the landscape has not been surveyed. Key areas that are of importance to invertebrates are shown in Figure 14. This does not include the main block of woodland, which has not been surveyed since 2006 (Grove 2006).

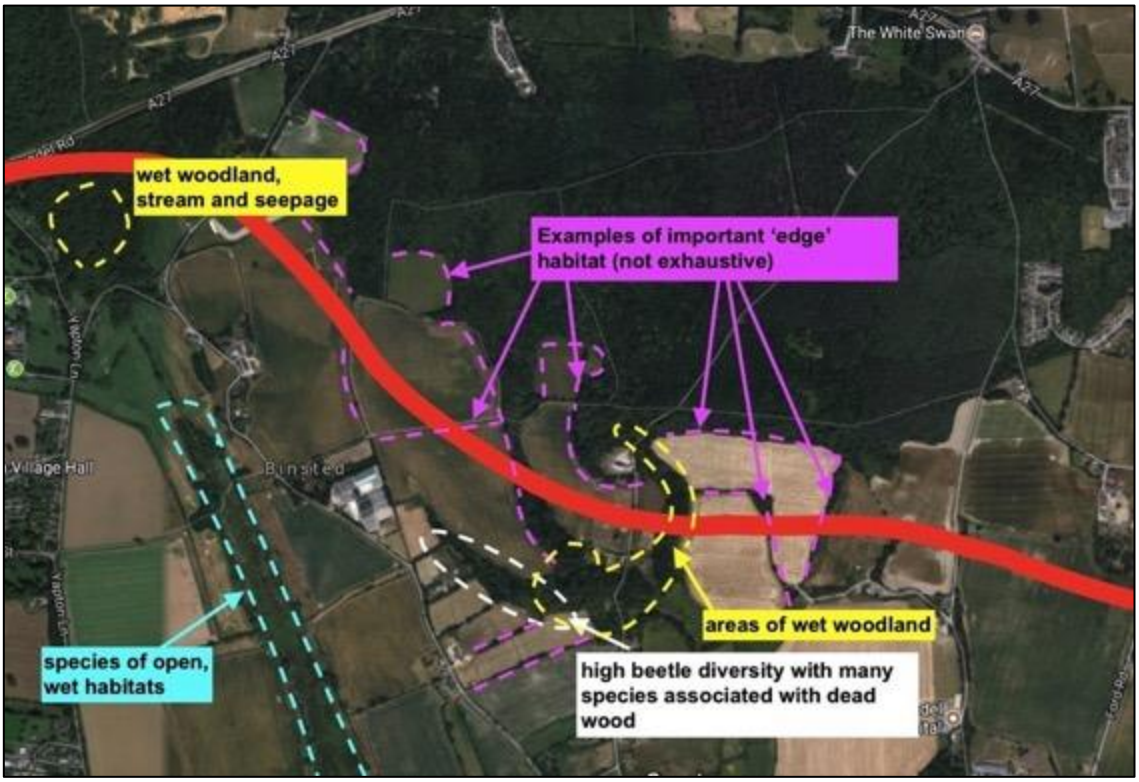
5.114 Option 5A would have the highest adverse impact in areas of wet woodland with streams and seepages. These areas are non-replaceable / replicable and therefore cannot be mitigated for.

5.115 Option 5A would result in the loss of a good quantity of dead wood habitat (both standing and fallen) in mature trees in The Shaw, The Lag and Hundred House Copse / Little Danes Wood. This habitat is not replaceable even in the mid or long term and so cannot be mitigated for.

5.116 The functioning of the area as a 'whole' with its high invertebrate diversity (on a par with Ebernoe and an SSSI) cannot be mitigated for. The high numbers and diversity of invertebrates together with significant numbers of Nationally Scarce and Red Data Book species would put invertebrates, as a collective whole, on a level of at least Regional, if not National Importance.

5.117 There are many hidden impacts for invertebrates such as roads forming barriers to dispersal and causing high direct mortality found in dragonflies by Soluk *et al*. 2011. Other problems highlighted in a *Buglife* report include attraction to artificial lights, ovipositing on artificial surfaces, disruption to feeding, disruption to breeding and disruption to moving across the landscape (Bruce-White and Shardlow 2011).

Figure 14: *Areas of importance to invertebrates*



5.118 Such factors have contributed to the widespread decline of key groups such as dragonflies and damselflies, butterflies and moths and cannot be mitigated for. Their decline will have knock-on effects on the birds, bats and mammals, which depend on them for food, and is a reflection of the continuing and widespread degradation of our environment.

SUMMARY

5.119 The Mid Arun Valley supports a wide representation of protected, rare and declining species. Table 5 gives a summary together with the 'importance' of the species / groups based on Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines.

5.120 It is felt that due to the nature of the development, the way in which most species utilize the landscape, and the potential disproportional negative effects on surrounding habitats, that the adverse impact on most protected, rare and threatened species and groups will be very high.

5.121 The populations of bats, birds and invertebrates within the Mid Arun Valley could prove to be of National Importance with further surveys, given the initial survey findings.

Table 5: *Summary of adverse impacts of Option 5A on protected species*

Species	Confirmed presence	Importance	Direct Impact – breeding sites	Impact - movement	Impact - overall
Badger	Y	Local	Yes	High	High
Bats	Y x 13 spp.	Regional / National	Yes	High	High
Birds	Y	Regional / National	Yes	Medium	High
Dormouse	Y	Regional	Yes	High	High
Great Crested Newt	N	N / A	Unknown	High	High
Otter	N	N / A	Unknown	Medium	High
Reptiles	Y x 4 spp.	Regional	Unknown	High	High
Water Vole	Y	Regional	Unknown	Medium	High
Common Toad	Y	Regional	Yes	High	High
Brown Hare	Y	Regional	Unknown	High	High
European Eel	Y	Regional	No	High	High
Hedgehog	Y	Regional	Unlikely	Medium	Medium
Harvest Mouse	Y	Regional	Possibly	Medium	High
Invertebrates	Y	Regional / National	Yes	Medium	High (some groups)

AVOIDANCE OF HUNDRED HOUSE COPSE

5.122 Superficially, the impact on ancient woodland at Hundred House Copse, Little Danes Wood and Barns Copse together with the impact on one of the chalk streams (Binsted Rife) could be avoided with a roundabout joining Option 5A to the current A27 in between the two blocks of ancient woodland.

5.123 This would separate the two woodland blocks and leave Hundred House Copse isolated from the main woodland block. This would still have severe impacts on Dormice, commuting bats, Alcathoe bats commuting between nursery roosts, Hedgehogs and Badgers.

5.124 It would degrade and likely destroy Sandy Hole Pond, originating from a chalk spring, and sever the remainder of the chalk stream that leads from the pond to Lake Copse and Tortington Rife.

5.125 The road would be extremely close to the west side of the main block of woodland, degrading and more severely impacting on the varied ‘edge’ woodland habitat that currently is of high quality due to the fact that it is bounded by fields.

5.126 This option was considered in 1993 by the then Secretary of State to be unacceptable. It was reasoned that in time it would be altered to the Yapton Lane junction as currently proposed, with its associated ecological harm.

5.127 This option would therefore ultimately lead to an escalation in long-term damage to the environment.

6 CONCLUSIONS

A SUMMARY

6.1 Surveys within the Mid Arun Valley over the past two years have shown the area to support an exceptional number S41 Habitats and Species of Principal Importance for the conservation of biodiversity. A summary of the site attributes is as follows:

- A total of 14 S41 Habitats, which cover the majority of the area.
- An assemblage of bats that is likely to be of National Importance.
- An assemblage of invertebrates that could be of National Importance.
- An assemblage of birds that could be of National Importance.
- Known high populations of protected species that are likely to be of Regional Importance such as Dormouse, Harvest Mouse, Common Toad, Grass Snake, Common Lizard, Slow Worm and Adder.
- Populations (extent unknown) of species also likely to be of Regional Importance such as Water Vole, Brown Hare, European Eel and Hedgehog.
- Habitat with the potential to support Otter and Great Crested Newt.
- A very high population of Badger, which is likely to be of Local Importance.

6.2 Areas such as this should be 'ring-fenced' for protection. The Mid Arun Valley does not just support populations of one or two protected species, but thriving populations of most protected species.

6.3 In this, it is an unusual area, for much of the British countryside is impoverished, and large areas usually support just a handful of habitats which do not include a range of S41 Habitats of Principal Importance.

6.4 Assemblages and habitats such that seen in the Mid Arun Valley are a remnant of a far more connected countryside with less intensive farming. There are few remaining areas such as this and therefore there is no appropriate mitigation or compensation for such outstanding biodiversity.

MITIGATION

Direct habitat loss

6.5 Mitigation measures usually consider the direct loss of habitat that would disappear beneath a given feature i.e. direct habitat loss. In this instance there are a number of indirect impacts and impacts that will not be realised until the longer term as follows:

- The quality of the habitat such as the wet seepage woodland in Hundred House Copse / Little Danes Wood that would be altered / destroyed due to the road. These habitats are irreplaceable.

- The fragmentation of woodland leaving small remnants that will gradually lose their wildlife interest and value such Barns Copse, The Lag and The Shaw.
- The severance of two chalk streams, which support rare and threatened species and are irreplaceable.
- The impact upon the stream and ditch network, the ponds fed by this system and the areas of adjacent and integrated lowland fen, reedbed, swamp and marshy grassland.

An integrated landscape for protected species

6.6 The Mid Arun Valley forms a continuation of an exceptionally diverse river corridor that is relatively uninterrupted from the middle of Sussex to the English Channel. It is the presence of good quality habitats, the proximity to other good quality habitats such as the Arun Valley Special Area of Conservation, the Arundel Park SSSI and the Arundel Wildfowl and Wetlands Trust Reserve and the lack of barriers to dispersal that has resulted in the diverse range of species observed in the Mid Arun Valley area.

6.7 The course of the River Arun with a margin of associated floodplain grassland can be traced from the coast to its origin in mid Sussex with very few barriers. This, when compared to other mid-Sussex rivers such as the Adur and the Ouse, provides a corridor that is largely uninterrupted by urban areas and major road networks.

6.8 This uninterrupted landscape feature, that is of immense importance to wildlife, should be preserved in an area with such a high human population density.

Loss of dispersal corridors for protected species

6.9 There are 11 habitat corridors from the Binsted Woods Complex linking to the surrounding habitats and subsequently linking the surrounding habitats to each other and further afield. This forms an important integrated network of habitat linkages.

6.10 Mitigation will not provide crossings for all 11 corridors which will have a negative impact on species that rely on moving across the landscape on a seasonal or diurnal basis. Protected species that would occupy both woodland and open habitats and use these habitat linkages are as follows:

- Badger, birds and bats – move across the landscape on a daily basis for foraging.
- Common Toad – move across the landscape in order to access ponds to breed and then spend most of their life cycle terrestrially in damp grassland, woodland, shaws and copses.
- Reptiles, particularly Adder and Grass Snake, move several kilometres across a given landscape from hibernation sites to breeding and foraging grounds.
- Hedgehogs routinely travel up to 2 km per night to forage.
- Dormice will use the corridors primarily for dispersal to find new areas of habitat.
- Water Voles are largely restricted to the use of ‘wet’ corridors across the landscape.
- Invertebrates follow corridors in order to colonise other areas and to search for food plants.

6.11 Mitigation does not compensate for habitat fragmentation, and even when green bridges and culverts are constructed, there is little evidence that these are compensatory.

6.12 Ree *et al.* 2007 reviewed 123 papers on the effectiveness of mitigation methods for animals crossing roads. Most studies demonstrated that most measures designed to increase the permeability of roads for wildlife were successful at the level of the individual animal (i.e. an animal was found using it).

6.13 However, the extent to which the population benefits from a successful crossing is unclear. They say that there is insufficient information and analysis in the majority of studies to evaluate whether these structures increase the viability of the population to an acceptable level.

Habitat fragmentation

6.14 The problems with habitat fragmentation and the importance of habitat connectivity and corridors has increasingly been a focus for planning and action, culminating in the national 'Making Space for Nature' Lawton report (2010).

6.15 During the launch of this report Professor Lawton said "There is compelling evidence that England's collection of wildlife sites are generally too small and too isolated, leading to declines in many of England's characteristic species. With climate change, the situation is likely to get worse".

6.16 "This is bad news for wildlife but also bad news for us, because the damage to nature also means our natural environment is less able to provide the many services upon which we depend. We need more space for nature".

6.17 The 2010 Lawton report promotes four essential principles for future nature conservation in the UK: bigger, better, more, and joined-up.

6.18 Local populations of a given species will be scattered across the Mid Arun Valley and beyond. At some locations and may become extinct for a number of reasons such as localised flooding, drying, freezing, predation etc.

6.19 Many species have very limited dispersal abilities and so without the ability to move about the landscape and recolonize such areas, populations would disappear from these patches and eventually from the larger area. Landscape scale extinction would then occur.

6.20 The interruption of these large and secure populations in the Mid Arun Valley is likely to have very real cumulative impacts on regional populations. The area will likely become impoverished in comparison to its current status.

PLANNING POLICY

6.21 Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation (ODPM, 2005) states that:

> The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place. Where a planning decision would result in significant harm to biodiversity and geological interests, which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

6.22 Table 4, Section 5 shows that there are 5 Section 41 Habitats of Principal Importance that cannot be replaced; ancient deciduous woodland, wet woodland, chalk streams, stream fed / spring fed ponds and lowland fen. In addition, the veteran trees will take 100's of years to replace and so should be deemed irreplaceable.

6.23 Some of these habitats found within the Mid Arun Valley are quite unique to the area such as spring / seepage wet woodland, spring fed ponds, chalk streams and lowland fen contributing disproportionally to the unique biodiversity of the area.

6.24 Under PPS9, Local Planning Authorities have the following responsibility

> to ensure that Internationally, Nationally, Regionally and Locally Important Sites, Ancient Woodlands, other Important Natural Habitats and Networks of These Habitats are not lost or degraded as a result of development unless the need for and benefits of the development outweigh the impacts that it is likely to have. Local Planning Authorities should use conditions and/or planning obligations to mitigate harm and ensure conservation/enhancement of the site's biological or geological interest.

6.25 Minimal surveys (with the exception of invertebrates) over the last two years have shown that the area is incredibly diverse and has concluded that the woodland is of National Importance and other habitats collectively of Regional Importance, and it likely holds Nationally Important groups of certain species.

6.26 This survey and a review of the requirements of protected species has shown that mitigation will not be possible for all groups and that Option 5A cannot be achieved without a severe negative impact upon this biodiversity.

6.27 Widening of the existing carriageway will have notably less impact than a 'green' route (i.e. a route that destroys tracts of unspoilt habitat). The road is already in place and has been for some time. It will require the following:

- Felling of fewer trees and those that would require felling are along the edge of the road and therefore do not generally constitute good quality woodland habitat.
- Less land grab – much of which would be existing road verges.
- Less severance of habitat and habitat corridors / flight lines.
- The loss of irreplaceable habitat would be restricted to the edge of ancient woodland. Certainly not the loss / severe degradation of potentially six irreplaceable S41 Habitats of Principal Importance that Option 5A would cause.

- The Binsted Woods Complex LWS would remain the biggest block of woodland to the south of the A27 and would be able to function in an integrated way with its surrounding habitat.

6.28 The online option is ecologically by far the least damaging option and planners are legally obliged to take this into account when making their decisions.

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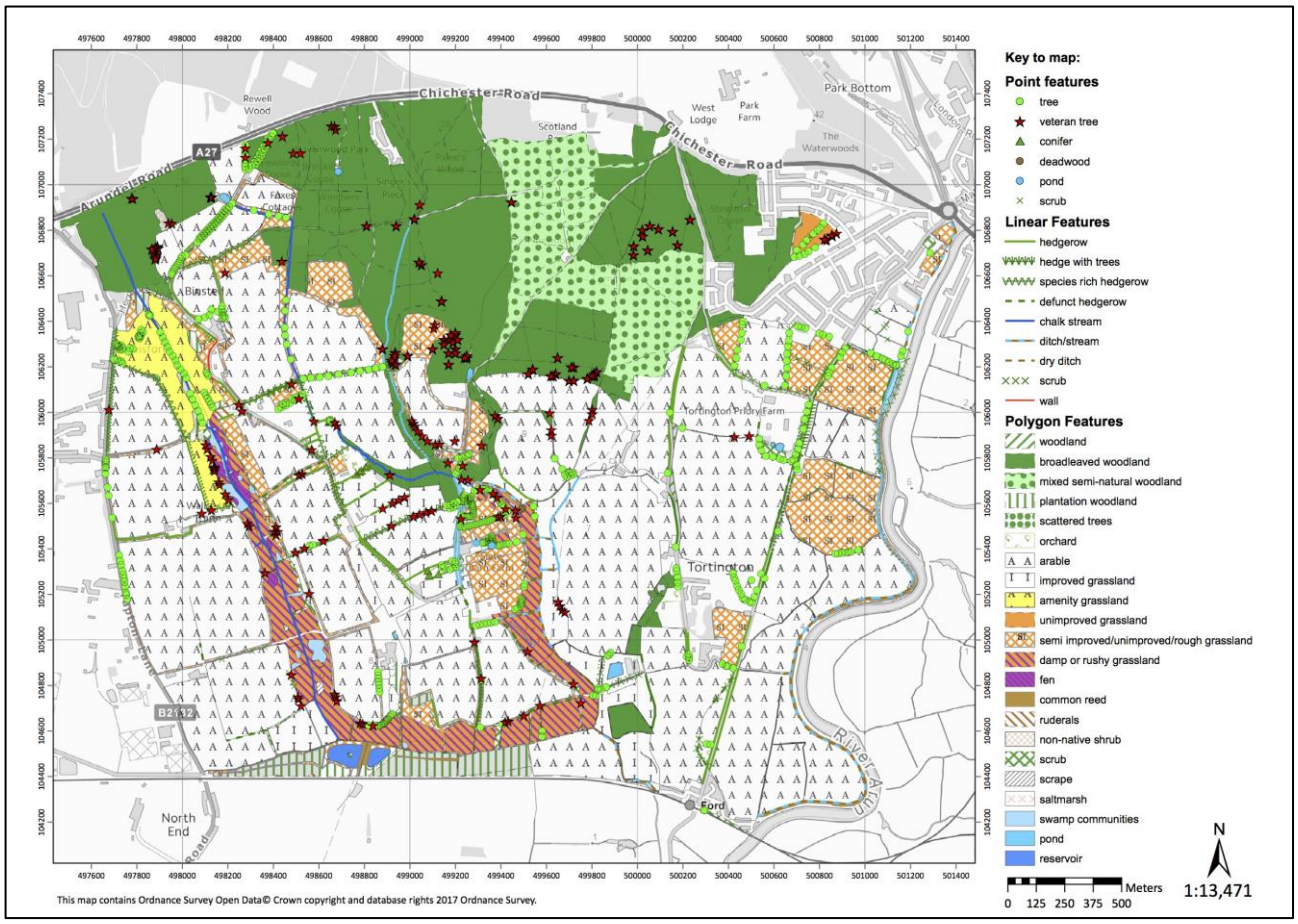
APPENDIX 1 PHASE 1 HABITAT MAP



APPENDIX 2 PRIORITY HABITATS

Habitat	Description
Arable field margins	The field margin is the area between the crop and the field boundary providing a vital haven for the many farmland species that have declined over recent years due to agricultural intensification. Tall vegetation offers cover for a range of species such as small mammals and birds, and the flowering plants provide a nectar source for a range of invertebrates.
Chalk stream	A chalk river or stream is a watercourse that flows across chalk bedrock, and/or is influenced by local chalk geology. All chalk rivers are fed from groundwater aquifers, which means they have clean, clear water and relatively stable water temperatures. These unique conditions support a rich diversity of wildlife including important fish populations such as Brown Trout, native Crayfish and many other specialist species. Binsted Rife is a chalk stream.
Coastal and floodplain grazing marsh	Grazing marsh is periodically inundated pasture, with ditches that maintain the water levels, containing standing brackish or fresh water. Sites may contain seasonal water-filled hollows and permanent ponds with emergent swamp communities. This habitat is important for wading birds and the drainage ditches support a wide range of flowering plants and invertebrates as well as a number of fish species. Mammals such as Water Vole and Otter may use the ditches. The aims of the Sussex Biodiversity Action Plan for this habitat include maintaining the condition and the extent of the existing resources of coastal and floodplain grazing marsh in Sussex with no net loss.
Lowland fen	Lowland fens are permanently waterlogged wetlands, which receive water and nutrients from soil, rock and groundwater as well as rainfall. This habitat supports a wide diversity of flowering plants and associated invertebrates, as seen along Binsted Rife. It has declined dramatically.
Hedgerows	The UK Biodiversity Action Plan (2007) defines a hedgerow as any boundary line of trees or shrubs over 20 m long and less than 5 m wide, and where any gaps between the trees or shrub species are less than 20 m wide. All hedgerows consisting predominantly (i.e. 80 % or more cover) of at least one woody UK native species are included in this Section 41 Habitat. Specific aims for S41 Habitat include maintaining the net extent of hedgerows and the numbers of hedgerow trees.
Lowland mixed deciduous woodland	Lowland mixed deciduous woodland now only covers 1-2 % of its original range and has declined by around 40 % since 1935. These woodlands are home to almost half of the world's Bluebells and are important for wide range of birds including Nightingales and Spotted Flycatchers as well as hibernating amphibians and reptiles. It is also the main stronghold of the protected Dormouse, once widespread, but now extinct from around half of its former haunts. Sussex is one of the most wooded parts of lowland Britain with ancient woodland covering approximately 10 % of the county. Much of this woodland is ancient in origin with a continuous woodland cover since at least 1600 AD. Such woodland has a wealth of features of historical and archaeological importance little altered by modern cultivation or disturbance. The soils retain their ancient features such as mycorrhizal fungi and the diversity of fungi, bryophytes, plants and invertebrates can be exceptionally rich. The BAP mainly focuses on the protection, expansion and restoration of woodlands in Sussex.

Habitat	Description
Wet woodland	Wet woodland combines elements of many other ecosystems and as such is important for many taxa. The high humidity favours bryophyte growth. The number of invertebrates associated with Alder, birch and willows, is very large. Even quite small seepages may support craneflies such as *Lipsothrix errans* and the endemic *Lipsothrix nervosa*. Wet woodland provides cover and breeding sites for otters *Lutra lutra*.
Lowland heathland	Heathland is a largely open landscape occurring on impoverished, acidic soils and is often a mosaic of bare ground, acid grassland, gorse, bracken, bog and scattered trees. A diversity of invertebrates is found with rare species including wasps, beetles and spiders. Several uncommon birds thrive on heathland including Nightjar and Stonechat.
Lowland Meadow	Unimproved neutral grassland, including hay meadows, known under the National Vegetation Classification system as MG5 grassland, was once the ubiquitous type of old meadow and pasture in the English lowlands. Since the late 1960's it has sustained large losses due to drainage, ploughing and re-seeding and from the use of high rates of fertilisers. There is now less than 6,000 ha remaining in England. The fields at Steward's Copse are this NVC type.
Ponds	Ponds are important because they have declined in number, and yet they are home to over 1000 native species. Priority ponds are those that have habitats or species of high conservation importance, or they may be recognised for their age, rarity or type.
Reedbed	Reedbeds are amongst the most important habitats for birds in the UK. They support a distinctive breeding bird assemblage including 6 nationally rare Red List Birds including Bittern, Marsh Harrier, Cetti's Warbler and Bearded Tit. They provide roosting and feeding sites for migratory species and are used as roost sites for several raptor species in winter. Five GB Red Data Book invertebrates are also closely associated with reedbeds including Red Leopard Moth *Phragmataecia castanaea* and a rove beetle *Lathrobium rufipenne*.
Saltmarsh	Saltmarsh vegetation consists of a limited number of halophytic (salt tolerant) species adapted to regular immersion by the tides. Saltmarsh constitutes an important resource for wading birds and wildfowl.
Traditional orchard	Traditional orchards are areas of land on which a range of fruit trees are managed in a low intensity way. The bark is suitable for a wide range of bryophytes and lichens and the dead and decaying wood is important for invertebrates and fungi. Holes and crevices in old trees provide habitat for bats and nest sites for birds such as Redstart and Bullfinch.
Wood pasture and parkland / veteran trees	Many parks were established in medieval times for aesthetic reasons, to provide grazing for farm animals or deer and to provide wood from pollarded trees. In later centuries, new landscaped parks were created from these medieval parks or by enclosing ordinary farmland. Typically wood pasture consists of veteran trees with wide, spreading crowns growing in a matrix of grazed grassland. The trees have often been pollarded; this management technique extends their life and creates rot holes and crevices, which are used by bats, hole-nesting birds and invertebrates. Rotten wood within ancient tree trunks supports saproxylic invertebrates (those that rely on dead wood for all or part of their life cycle) and are amongst the most threatened group of species in Europe.

APPENDIX 3 WILDLIFE POLICY

The Wildlife and Countryside Act 1981 (as amended)

Schedule 1

*A*pplies to all wild birds where it is an offence:

- to take, damage or destroy a nest whilst it is being built or in use
- to kill, injure or take any wild bird (subject to certain exceptions)
- to take or destroy the egg of any wild bird.

It is also an offence to disturb any wild bird listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)

- while it is nest building
- at a nest containing eggs or young
- to disturb the dependant young of any such bird.

Schedule 5

For animals fully protected under Schedule 5 which includes, the hazel dormouse, great crested newt, all bats, water voles, otters, smooth snake, sand lizard and natterjack toad. It is an offence:

- to intentionally kill or injure or take these species
- to intentionally or recklessly damage or destroy or obstruct access to any structure or place which a species uses for shelter or protection, at any time even if the animal is not present.
- to intentionally or recklessly disturb whilst it is occupying a place which it uses for shelter or protection.

Adder, grass snake, common lizard and slow worm are protected from being killed or injured and the white- clawed crayfish is protected from being taken.

Schedule 8

Specific species of plants listed in Schedule 8 are protected. It is an offence: to intentionally pick, uproot or destroy a wild plant listed in Schedule 8.

Schedule 9

Invasive non-native species are listed under Schedule 9. It is an offence:

- to plant or otherwise cause to grow in the wild.
- If soils are contaminated by invasive non native plant species it becomes classified as
- '*controlled waste*' under the Environmental Protection Act 1990 (England, Wales & Scotland),
- and must be disposed of accordingly.

The Conservation of Habitat and Species Regulations 2010

Schedule 2 applies to all European Protected Species (EPS) which included all bat species, great crested newts, dormice, otters, sand lizards, smooth snake and natterjack toad. The protection afforded is overlapping but separate from the Wildlife and Countryside Act 1981 (as amended)

The Protection of Badgers Act 1992

Under this Act it is an offence to intentionally or recklessly interfere with a badger sett by:

a) damaging a sett or any part of one
b) destroying a sett
c) obstructing access to any entrance of a sett
d) disturbing a badger when occupying a sett

Where interference with a badger sett cannot be avoided during development, a licence from Natural England should be applied for.

The Natural Environment and Rural Communities Act 2006 and The Biodiversity Duty

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 40 of the Act requires all public bodies to have regard to biodiversity conservation when carrying out their functions. This is commonly referred to as the 'biodiversity duty'.

Section 41 of the Act requires the Secretary of State to publish a list of habitats and species which are of 'principal importance for the conservation of biodiversity.' This list is intended to assist decision makers such as public bodies in implementing their duty under Section 40 of the Act. Under the Act these habitats and species are regarded as a material consideration in determining planning applications. A developer must show that their protection has been adequately addressed within a development proposal.

The UK BAP

This was published in 1994 to comply with obligations under the Convention on Biological Diversity (The Biodiversity Treaty, 1992). It described the UK's biological resources and committed to developing detailed plans to conserve these recourses i.e. Habitat Action Plans and Species Action Plans. The most up to date targets and actions, including latest progress reports, for UK HAPs and SAPs can be viewed on the DEFRA website17. Running parallel to this, Local Planning Authorities (LPAs) promoted habitat and species conservation at a county and district/borough level through their development of Local BAPs (LBAPs).

Since the publication of these BAPs, new strategies and frameworks have resulted in the devolvement of biodiversity issues and changes in the terminology used to describe these habitats and species in England. This has been brought about through the replacement of the previous England Biodiversity Strategy with Biodiversity 2020: A Strategy For England's Wildlife and Ecosystem Services (2011) and the replacement of the UK BAP itself with the UK Post-2010 Biodiversity Framework (2012).

All previous UK BAP species and habitats are still of material consideration in the planning process but are now referred to as Habitats and Species of Principal Importance for the Conservation of Biodiversity in England as listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The promotion of priority habitats and species in LBAPs are also of material consideration in the planning process.

In addition to the now redundant national BAP, BAPs were are also produced at the county level. The Sussex BAP is managed by the Sussex Biodiversity Partnership. The aims and objectives of the Sussex BAP are to reflect national targets for habitats and species of principal importance, translate them at a local level and to integrate the needs of species and habitats within landscape-scale delivery.

Red Data Book (RDB)

The IUCN RDB criteria reflect the level of threat of extinction that a species faces and are based on population declines (in contrast to the previous RDB criteria, which were based on restricted distribution) (Cheffings and Farrell 2005). Those species that fall into the top categories of CR (critically endangered), EN (endangered) and VU (vulnerable) all have a high risk of extinction in the wild and declining population size of >80% over last 10 years for CR, >50% for EN and >30% for VU.

National status

Species highlighted in the survey as notable species were selected because they fall into one of the following categories:

- Nationally Rare is defined as species that are found in 15 or fewer hectads.
- Nationally Scarce (also termed Nationally Notable) relates to species that occur in between 16 and 100 10km squares throughout Britain.
- Nationally Notable A are species found in 16 to 30 hectads.
- Nationally Notable B are species found in 31 to 100 hectads.
- Local is a status sometimes used for species found in 101 to 300 hectads.
- Sussex Rare Species Inventory (SxRSI) lists species that are rare in Sussex or those that are declining locally.

Birds of Conservation Concern

Every five years the population statuses of the 247 species of bird that are regularly found in the UK are reviewed. There are three lists – Red, Amber and Green - into which each species is placed. The status decisions are based on several factors which include: the species' global and European conservation status; recent and historical decline; whether it is a rare breeder; if it is only confined to a few sites in the UK; and if the species is of international importance.

- Red List species are those that are Globally Threatened according to IUCN criteria such as those whose population or range has decline rapidly in recent years.

- Amber List species are those with Unfavourable Conservation Status in Europe such as those whose population or range has declined moderately in recent years; rare breeders; and those with internationally important or localized populations.
- Green List species do not fit any of the above criteria, although some are still protected by law.

Document Information

Report title:	The Mid Arun Valley 2015 – 2017 current data to asses the impact of the Arundel bypass Option 5A
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Wildlife Splash Limited has prepared this report, with all reasonable skill, care and diligence within the terms of the Contract with the client.

Surveys and research have been conducted to the best of our ability during the given timeframe. However, no method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. We disclaim any responsibility to the client and others in respect of any matters outside the reasonable scope of works.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

ACKNOWLEDGEMENTS

Whilst the concrete front of development advances through the Sussex Countryside, members of MAVES, locals, Arundel residents and those from further afield continue to discover and document the amazing diversity of wildlife that makes the Mid Arun Valley hum with life. Without knowing what life we have we cannot fight to protect it.

A big thank-you to all the landowners of the Mid Arun Valley area who have given us all a free reign over the area at all times of day and night.

We would like to thank all those who have very generously made donations to MAVES in order to fund this very important work:

South Downs National Park Authority
Brooklands
Woodlands.co.uk
Noor Wood
The Woodland Owners of Tortington Common
Arundel Agenda 21

A Critique of the

A27 Arundel Improvements Environmental Study Report 2017

Wildlife Splash
Green Oak Lodge
East Street
Mayfield
East Sussex TN20 6TZ

Tel: 01435 872641
Mob: 07941 274423
wildlifesplash@live.co.uk

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EXECUTIVE SUMMARY

- Wildlife Splash Ltd. was commissioned by MAVES (Mid Arun Valley Environmental Survey) to undertake an extended ecological survey of the Mid Arun Valley area and to collate data from professional ecologists and county recorders as well as informed locals. This has been on-going since the beginning of 2015 and as a consequence the area is known extremely well.

- This report is commissioned by MAVES on behalf of Arundel Bypass Neighbourhood Committee (ABNC) to highlight concerns about the lack of and the inaccurate information presented in the Preliminary Ecological Appraisal (WSP / Parsons Brinckerhoff 2017), which has informed and fed into the Arundel Improvements Environmental Study Report revision 5 (June 2017).

- The Mid Arun Valley supports thirteen bat species (found to date), four species of reptiles, Dormice, Brown Hare, Hedgehog, Common Toad, Newts, Badger and a good diversity of notable bird and invertebrate species.

- All these species rely on the integrated landscape and move around the area on a diurnal or seasonal basis. The corridors from the Binsted Woods Complex such as hedgerows and shaws, are integral to the functioning of the Mid Arun Valley landscape. Much of this information is omitted in the Environmental Study Report, which is specifically commissioned to help inform the different route options.

- The extended Phase 1 survey was undertaken between the 12th and 14th January 2016. This is the worse time of year to survey as no plants are visible, and, with the exception of birds, protected and notable species are mostly hibernating. The scope for additional data (informing the 'extended' part of the survey) in January is extremely limited.

- The data search (comprising information on species in the area held at the Sussex Biodiversity Record's Centre) is two years out of date extending from 2005 to 2015. This is unacceptable as the latest records are the most relevant.

- Surveys were conducted from a car, aerial maps and public footpaths. This may explain why it only took 3 days to complete a field survey over such a large area. This is poor for such an important project in a species rich landscape, a good proportion of which is within the South Downs National Park.

- The survey has failed to mention / explain the impacts upon an important drainage network through the Binsted Woods Complex, including springs and seepages originating in the South Downs and two chalk streams which are Section 41 habitats of principal importance (NERC 2006). This drainage system supports rare habitats and protected species throughout the area within and beyond the woodland that will be impacted upon by Options 3 and 5 to varying degrees.

- The narrow extent of the survey area has largely omitted the impact on the wider landscape. There is no mention that the bridge across the Arun required for Options 3 and 5 is less than 20 m from the largest area of remaining reedbed along the river corridor. This

is likely to impact upon rare bird species of such habitats, such as Bittern, that may not feed / breed in proximity to a major carriageway.

- The farmland is described as 'intensive' and likely to support a common assemblage of birds. This does not accurately describe the landscape or the birds, for species such as Linnet *Linaria cannabina* (Red, UKBAP), Hedge Sparrow *Prunella modularis* (Amber), Reed Bunting *Emberiza schoeniclus* (UKBAP) and Skylark *Alauda arvensis* (Red UKBAP) are frequently seen and heard.

- Further surveys for Dormice, invertebrates and Badger were considered unnecessary in the preliminary ecological appraisal. However, this has been reconsidered since that report (March 2017) and now surveys are recommended. This does not inspire confidence in the field ecologists.

- The majority of hedgerows are described as very gappy with limited commuting opportunities for Dormice. This is simply wrong with numerous intact hedgerows, shaws (not mentioned) and tree-lines (not mentioned) throughout the landscape providing excellent corridors for Dormice and other species. This important commuting network across the landscape should have been noted.

- Option 3 is said to be the most damaging for Dormice as it cuts through ideal Dormouse habitat. Yet Option 5A cuts through two woodland areas of Dormouse habitat (recorded in both areas), which the report has failed to mention.

- Otter is described as being 'relatively widespread across Sussex' and therefore if present in the survey area it is unlikely to be significant at the County level. Otter is considered largely absent from Sussex with just one or two sightings. This shows a fundamental lack of local knowledge.

- Despite stating that there are multiple records of UKBAP species such as Hedgehog, Brown Hare, and Harvest Mouse throughout the study area in areas that intersect or immediately border all Scheme Options there is no recommendation for further surveys.

- The impact on reptiles only considers direct loss of habitat. Their movement across the landscape is not taken into account.

- It is stated that the majority of the ponds and ditches are considered likely to be ephemeral and therefore not ideal for Water Vole. This is not necessarily the case and would have been evident had the survey been completed at an appropriate time of year.

- No signs of Badger were observed during the survey and so in the preliminarily ecological survey report it was suggested that no further surveys are necessary for this species. The Badger population is probably at carrying capacity with field signs throughout the area, which would have been observed had the survey been completed appropriately.

- Option 5A will destroy a major sett, sandwich another sett between two roads and cut another sett off from foraging grounds which is likely to result in high numbers being killed.

- It is considered that Option 3 will have an adverse effect significant at the County level for invertebrates. However, it is considered that other options may have an equally significant

adverse effect. This is not helpful. No mention is given to Option 5A traversing The Lag, The Shaw, Binsted Park and Hundred House Copse with the high proportion of veteran trees, streams, flushes, ponds and abundant edge habitat; all ideal for rare invertebrates.

- Five out of the thirteen bat species present are mentioned in the report. Had an up to date data search been commissioned, then useful information on the location of rare Annex II bat species such as Bechsteins and Barbastelles could have helped to inform the survey.
- There is a mention of veteran trees from a tree search (which was current - 2017), but the many veteran / notable trees in The Shaw, Barns Copse and Hundred House Copse, some of which are in the direct route of Option 5A and very visible in January from footpaths, are not mentioned.
- Bats and Dormice are only briefly mentioned as dispersing across the landscape but with no specific impacts or suggestions of how the different route options would impact upon this movement. Many species move across the landscape on a diurnal or seasonal basis. Moreover, dispersal is an important part of life strategy for each and every species. This is not considered.
- A range of standard options are offered for mitigation that have little relevance due to the paucity of data and useful information given at this point. Biodiversity offsetting and monitoring to inform future projects is also mentioned.
- Ultimately, it is concluded that all options would have a significant adverse effect up to County level. This is not particularly helpful when considering the size of the project and the potential negative impacts on wildlife.
- Interested parties cannot possibly draw even the most fundamental conclusions based on such a lack of information
- Data collated by professional ecologists is available for Highways England and WPA on the MAVES website and ultimately at the Sussex Biodiversity Records Centre. This data has been ignored.

1 INTRODUCTION

Background to the study

1.1 Wildlife Splash Ltd. was initially commissioned by MAVES (Mid Arun Valley Environmental Survey) on behalf of Arundel Bypass Neighbourhood Committee (ABNC) to undertake an extended ecological survey of the Mid Arun Valley. This has been on-going since early 2015 and, as a consequence the area is known extremely well.

1.2 Surveys undertaken on behalf of MAVES by Wildlife Splash Ltd. and a number of other professionals such as Daniel Whitby (bats) and Mike Edwards (invertebrates) have been made available on the MAVES website and forwarded to Highways England to inform their initial decisions on the routing of the A27.

1.3 Highways England have also commissioned their own preliminary ecological survey from WSP / Parsons Brinckerhoff.

The purpose of this report

1.4 This report is commissioned by MAVES on behalf of ABNC to highlight concerns about the lack of and the inaccurate information presented in the Preliminary Ecological Appraisal (WSP / Parsons Brinckerhoff 2017), which has informed and fed into the Environmental Study Report revision 5 (June 2017).

1.5 Throughout this report examples are given from both these documents with the relevant paragraph number. The Environmental Study Report revision 5 is referred to as ‘ESR 2017’ and the Preliminary Ecological Appraisal as ‘PEA 2017’. Any blocks of text lifted directly from either of these reports is presented in *italics.*

2 THE LACK OF / INACCURATE INFORMATION

Survey methodology

2.1 It is stated that the extended Phase 1 survey was undertaken by two suitably experienced ecologists between 12th and 14th January 2016. (PEA Para. 8.2.6).

2.2 Only the most basic of surveys can be undertaken in January. It is certainly the worst time of year to record anything that would come into the 'extended' part of that statement as few plants are visible, and, with the exception of birds, protected and notable species are hibernating. The scope for additional data in January is extremely limited.

2.3 Para 3.2.1 (PEA 2017) states that *Protected and notable species records were reviewed for the period 2005 to 2015 (a 10 year historical data set).*

2.4 To take a data search that is 2 years out of date for such a major project, when it is to help inform preliminary views on least damaging route options and levels of mitigation that will be required is unacceptable. The convention is to consider data for the previous 10 years but clearly the most up to date data has greater relevance – i.e. 2016 and 2017. This has not been done.

2.5 The basic description of some of the options is flawed. An example being *Option 5A includes the western half of Option 5 and the eastern half of Option 3 with a short section of route (approximately 500m) that links the two together. Option 5A will cross farmland bordered by a network of ditches and hedgerows.*

2.6 The streams and ditches, though shown on the Phase 1 map, apart from a very broad mention of '*a network of ditches'* are not explained in the text and do not appear to be taken into consideration. Option 5A will cut through 2 chalk streams (Section 41 habitats of principal importance (S41 HPI)), one of which is Binsted Rife. This will have an additional impact on lowland fen habitat and associated rare and threatened species.

2.7 In addition to the chalk streams (the origin of which are the South Downs) there are a number of streams and ditches (that may be partially fed from springs and seepages from the South Downs) that arise and flow through the Binsted Woods Complex and out into the open countryside. These support area of wet woodland (S41 HPI) and ponds to the south of the proposed Option 5A. These are not mentioned and the impact, again of rare and threatened species, is not explained.

2.8 Option 3 cuts through 3 main streams that feed into Tortingon rife, the Madonna Pond and possibly ponds at Tortington, again with impacts on protected species. These are not explained.

2.9 The hydrology is an important part of the landscape and many legally protected species such as Water Vole, bats, reptiles (and possibly Great Crested Newt if present) are dependent upon this habitat. In addition a number of Section 41 habitats of principal importance, species of principal importance and nationally scarce species are dependent upon this habitat.

2.10 There is no mention of the fact that Option 5A cuts through shaws and arms of woodland (The Shaw and The Lag) radiating out from and included within the Binsted Woods Complex and the South Downs National Park. Part of the Shaw is ancient woodland and the Lag is classified as wood pasture (though now woodland). There is also no mention that Option 5A cuts through an area of ancient parkland (Binsted Park) with veteran trees.

2.11 Due to the fact that the Phase 1 survey has considered / mapped a narrow corridor, which may well be far wider than specified in places with embankments, and associated work areas, a complete picture of the impact is not given. The bridge across the Arun that will be required for Options 3 and 5 will be at the northern edge of an area of salt marsh vegetation grading into the largest area of reedbed along this part of the river corridor with likely impacts of rare birds such as Bittern. Again, this habitat of principal importance is not mentioned.

2.12 Para 8.2.18 quotes the CIEEM (Chartered Institute of Ecology and Environmental Management) and states the importance of *ecological integrity* which is defined as *"The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified" (Office of the Deputy Prime Minister 2005).*

2.13 However, the Phase 1 mapping was completed only along the corridors of the proposed road options and not the entire landscape which would be required in order to usefully assess its functioning as a whole. The Phase 1 survey was completed from public footpaths and utilised Ordnance Survey maps, aerial photos and a car in order to map habitats. This is far from ideal for such an important project in a species rich landscape, a good proportion of which in within the South Downs National Park.

Birds

2.14 Para 8.4.59 (ESR 2017) *states that the majority of intensive farmland in the Survey Area is likely to support a common assemblage of birds of no more than Local value.*

2.15 'Intensive' does not accurately describe the farmed landscape, a proportion of which is in stewardship schemes. There are networks of small fields and privately owned fields that receive occasional management and support species such as Harvest Mice. There are orchards and wetlands with pockets of fen. These are bounded by ancient tree-lines, shaws and hedgerows. The arable farmland generally has large field borders ideal for foraging birds, invertebrates and reptiles.

2.16 Moreover, the integrated landscape has not been taken into account with the surrounding habitats and the linked green corridor of farmland and reserves along the River Arun.

2.17 A survey in the Binsted area of the farmland (2015 Hart and Hart) found 58 species of birds (mostly of farmland and open country) including 16 amber and 4 red-listed species. These include Hedge Sparrow *Prunella modularis* (Amber), Linnet *Linaria cannabina* (Red, UKBAP), Reed Bunting *Emberiza schoeniclus* (UKBAP), Skylark *Alauda arvensis* (Red UKBAP), Hobby *Falco subbuteo* (Schedule 1), Spotted Flycatcher *Muscicapa striata* (Red, UKBAP). This would likely put the farmland, at more than Local value.

Dormice

2.18 Para 8.4.73 (ESR 2017) states that *the majority of hedgerows appeared very gappy with limited commuting opportunities. Occasional hedgerows including those adjacent to Ford Road and Tortington Lane exhibited fewer gaps and were considered to provide suitable foraging and commuting opportunities for hazel dormouse.*

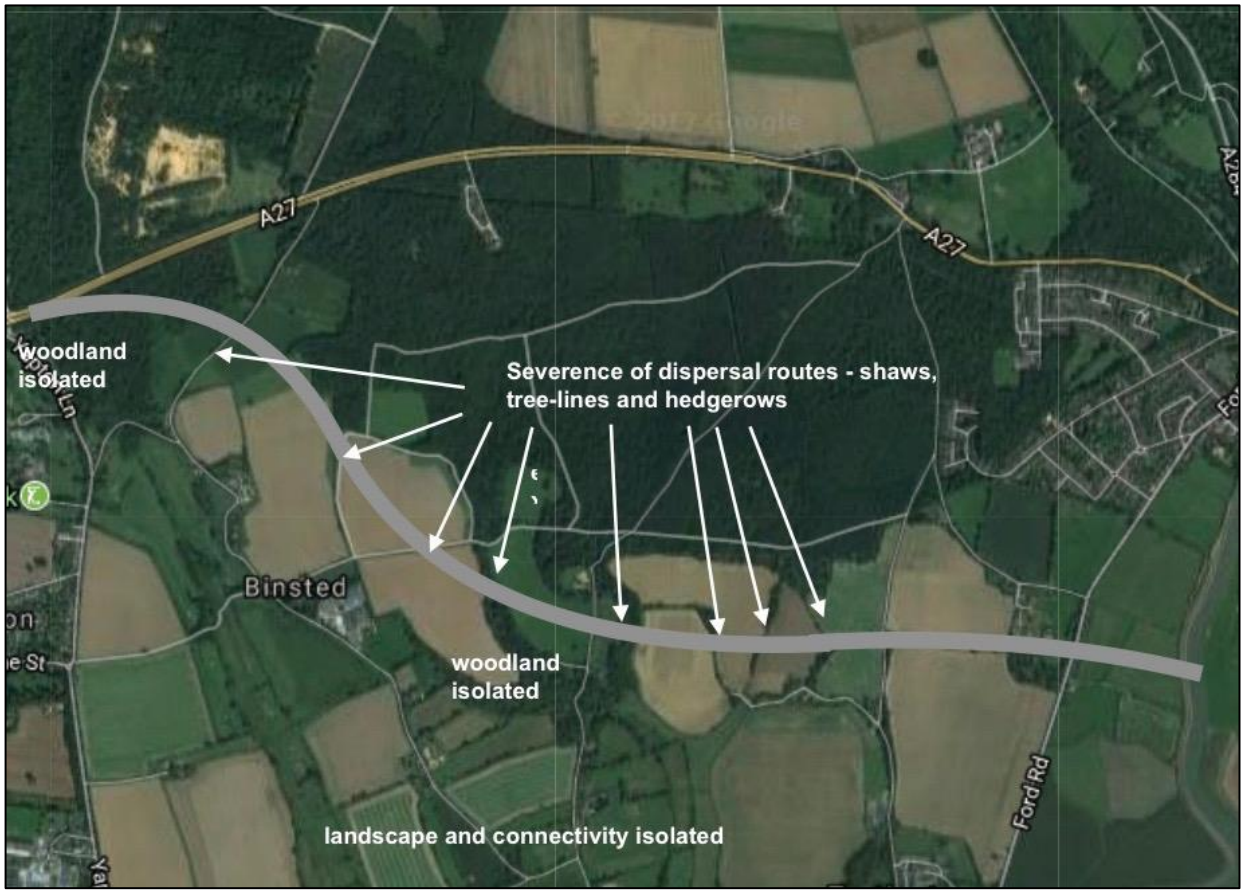
2.19 A walk around the entire site would reveal shaws, hedgerows and tree-lines throughout the entire landscape that are suitable for dispersing Dormice and not just around Tortington Lane and Ford Road. The majority of hedgerows are not gappy and three days to survey an area of this size is not sufficient.

2.20 A detailed PEA survey would have highlighted the linkages / wildlife corridors from Binsted Woods Complex south through Lake Copse, The Shaw and The Lag (shown in Figure 1) linking with further hedgerows, tree-lines and corridors to woodland to the south of Binsted Rife.

2.21 A detailed PEA survey would have shown the corridors from the main area of the Binsted Woods Complex to the smaller block of woodland to the west – Hundred House Copse and Barns Copse also shown in Figure 1.

2.22 Severing these corridors will have a disproportional impact on movement of protected species across the landscape. This is not mentioned.

Figure 1: The numerous habitat linkages from the Binsted Woods Complex



2.23 Para 8.7.52 (ESR 2017) states that *Option 3 has the highest potential for a significantly adverse effect given the extensive loss of Ancient Woodland which is a high quality dormouse habitat.*

2.24 This is not necessarily the case for Option 5A will cut through the Shaw and Hundred House Copse which support breeding Dormice having a direct impact. Option 5A will sever intact hedgerows that link the greater part of the Binsted Woods Complex to both of these areas.

2.25 It is therefore misleading to make statements such as this. Option 5A is likely to be equally, if not more damaging than Option 3 for this species.

2.26 The Binsted Woods Complex provides a source population for this species and there is evidence of dispersal through the wider landscape down through the Shaw and the Lag – areas that will be severed by Option 5A.

2.27 Having stated that Dormice may be important at the *Local* level para 8.4.74 (ESR 2017) states that if *a very large population were found to be present in the large Ancient Woodlands which are present in the Survey Area this may be of a higher value as it may act as a core population area increasing the resilience and viability of more marginal dormouse habitats in its vicinity.*

2.28 Dormice are rarely in 'large' populations but they are throughout the Binsted Woods Complex, Hundred House Copse and arms of woodland radiating from the woodland i.e. The Shaw, which would be directly impacted upon by option 5A and Lake Copse, which would be isolated from the main block of woodland.

2.29 This consideration of dormice greatly diverges from the Phase 1 survey (PEA 2017) (appended to the ESR 2017 document), which states in Para 5.4.1 that the *following protected and notable species are considered highly unlikely to be directly or indirectly adversely impacted by the proposed development and are not considered further* – one of which is the Dormouse.

Otter

2.30 Para 8.7.54 (ESR 2017) states that disturbance of Otter using waterways may result in *severance of otter movement routes – particularly those associated with the River Arun where bridge crossings are proposed. These impacts are likely to lead to a significantly adverse effect on otter conservation status. Given that otter is a relatively widespread species in Sussex and that English otter populations are on the increase, these impacts are unlikely to be significant at the County level.*

2.31 Otter is not at all widespread in Sussex. Otter is considered largely absent from Sussex and there is hope that it is just coming in across the Hampshire border with one or two sightings only. Therefore if Otter were within the survey area it would be of immense importance. This shows a fundamental lack of local knowledge.

UKBAP species

2.32 Para 4.2.107 (PEA 2017) states that *the desk study identified multiple records of hedgehog (Erinaceus europaeus), brown hare (Lepus europaeus) and harvest mouse (Micromys minutus) throughout the study area, particularly in Binsted Wood, Paines Wood and Rewells Wood which intersect or immediately border all Scheme Options.*

2.33 Para 8.7.61 (ESR 2017) gives a list of species for which further surveys are required. However, UKBAP species that are all present in the area: Brown Hare, Hedgehog, Harvest Mouse and Common Toad are all omitted. All four of these UKBAP species have been recorded in the last 12 months in the survey area. Given that there are multiple records for these species bordering all scheme options, why are no further surveys recommended?

2.34 The road options are likely to have negative impacts on UKBAP species; an example being that Option 5A will sever breeding sites (such as the Madonna Pond and Tortington Rife) from hibernation and foraging sites of Common Toad. This is not even touched upon.

Reptiles

2.35 Para 8.7.43 states that with the exception of 0A and 0B *other scheme options all involve large losses of potential reptile habitat*.

2.36 There is abundant reptile habitat in the survey area and so habitat loss would not necessarily have the greatest impact on reptiles. There is no suggestion of the very real impact of habitat severance, particularly with Options 3, 5A and 5B. These options would leave the Binsted Woods Complex isolated from the surrounding habitat thus prohibiting the seasonal movement of reptiles across the landscape from hibernation (woodland) to foraging grounds (wetland, fields and headlands).

Water Vole

2.37 Para 8.4.86 (ESR 2017) states that *the majority of ponds and ditches were considered likely to be ephemeral, drying up for most of the year. In addition, many ditches particularly those running parallel to the A27 carriageway were considered to provide very limited foraging opportunities given the absence of suitable aquatic and marginal vegetation*.

2.38 Water Vole has been found in Binsted Rife and in ponds at the south of the area adjacent to the railway. Had the data search been up to date this would be known and had the survey been more thorough or conducted at a more suitable time of year, then it would have been concluded that many of the ponds and ditches do not dry up in the summer months.

Badger

2.39 Para 8.4.91 (ESR 2017) states *that no incidental evidence of badger field signs (hairs, latrines, dung pits, snuffle holes, mammal paths or scratching posts) or setts were recorded during the Phase 1 Habitat Survey*. However, no thorough survey was undertaken owing to land access constraints.

2.40 This is also a time of year issue as the survey was conducted when Badgers are least active. Moreover, due to the lack of field signs Badger was originally written off in the P1 survey in Para 5.4.1 (PEA 2017) along with Dormice and invertebrates.

2.41 There is an incredibly high Badger population in the survey area with abundant field signs.

2.42 Option 5A would directly destroy a major sett in the Shaw. It would also sandwich a sett in Hundred House Copse between two roads and sever it from foraging grounds. Road deaths would be extremely high.

Invertebrates

2.43 Para 4.2.100 (PEA 2017) states that *notable invertebrates species recorded in the desk study* [out of date] *are likely to be associated with the following Phase 1 Habitat types: broad-leaved semi-natural (ancient) woodland, semi-improved grassland (particularly that which is of floodplain grazing marsh HPI quality) and running and standing water.*

2.44 The report omitted to mention the rare invertebrates associated with veteran trees some of which are in The Shaw, Binsted Park and Barns Copse and Hundred House Copse, through which Option 5A will traverse. Barns Copse also has a chalk stream that feeds into Binsted

Rife that would be severely impacted upon by option 5A. The arable field headlands adjacent to hedgerows also provide ideal sheltered habitat (ungrazed) for invertebrates.

2.45 Moreover, Para 8.7.37 (ESR 2017) states that scheme option 3 would likely result in an adverse effect significant at the County level given the loss of Ancient Woodland. Other scheme options may result in an effect, which would be significant at up to the County level.

2.46 Yet the original PEA disregarded any impacts on invertebrates stating that it would be *considered highly unlikely to be directly or indirectly adversely impacted by the proposed development and are not considered further.*

2.47 There is no reasonable explanation as to why these are taken into account having been assessed as not important in the March PEA report along with Badger and Dormice. It incites a lack of confidence in the ecologists carrying the field surveys at a sub-optimal time of year and using an out of date data search.

Bats

2.48 Para 4.2.48 (PEA 2017) states that the *desk study records for confirmed or likely bat roosts were identified for five bat species. These were common pipistrelle (Pipistrellus pipistrellus), soprano pipistrelle (Pipistrellus pygmaeus), brown long-eared (Plecotus auritus), serotine (Eptesicus serotinus) and barbastelle (Barbastella barbastellus).*

2.49 Had an up-to-date desk study been requested then it would have been confirmed that there are 13 species within the Binsted Woods Complex alone, including two rare Annex II species Bechsteins and Barbastelles. This would have helped to inform likely mitigation requirements, as green bridges are extremely costly.

2.50 Para 8.7.9 (ESR 2017) states that *It is not possible to definitively conclude that there will be 'no likely significant effects' on the ecological integrity of these European Sites (SACs). This is because (although unlikely) it may be possible that there are Bechstein's bats or barbastelle bat populations in the vicinity of the Survey Area, which may be of supporting value to these SACs.*

2.51 Judgments / comments such as this should be refrained from as it likely biases the view of the reader – especially given that both species are present.

Veteran trees

2.52 Para 4.2.11 (PEA 2017) states that *nine scattered veteran oak trees were recorded within a field towards the western extent of the Survey Area, directly north of the A27 carriageway, adjacent to Park Farm Road.*

2.53 There is no mention of the many veteran / notable trees in The Shaw, Barns Copse and Hundred House Copse, some of which are in the direct route of Option 5A. There is no mention of the numerous veteran trees in the Binsted Woods Complex.

Proposed mitigation

2.54 It is suggested that *re-establishing connectivity between habitats affected by road construction and incorporation of features within the detailed design which would restore connectivity for protected species whose habitat has been fragmented by the road* (ESR 2017).

2.55 This is having specifically taken the trouble to state in Para 8.2.19 (ESR 2017) based on CIEEM's interpretation of guidance set out in the EC Habitats Directive, that 'conservation status' is determined by*: 'the sum of influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area" (CIEEM, 2006: p. 37).*

2.56 Bats and Dormice are only briefly mentioned as dispersing across the landscape but with no specific impacts or suggestions of how the different route options would impact upon this movement. Many species move across the landscape on a diurnal or seasonal basis. Moreover, dispersal is an important part of life strategy for each and every species. This is simply not considered. Numerous connections will be severed with option 5A and a significant block of woodland will be cut off with option 3.

2.57 There is a suggestion that if woodland is lost then the creation of new woodland will result in an overall increase in size of the surrounding woodland network, which would improve woodland connectivity within the wider landscape by connecting isolated and fragmented woodland parcels, thereby enhancing wildlife corridors.

2.58 This is, again, very general with no specific examples given of woodland fragment creation such as Option 5A turning Lake Copse, The Shaw and The Lag, all incredibly species rich, into woodland fragments and turning Hundred House Copse and Barns Copse into fragments, one of which would be very small and bounded by the old A27 and the new A27. These can all be seen in Figure 1. Option 3 would divide this large block of woodland in two. It would be far more beneficial to the conservation of species in the area to avoid fragmentation in the first place.

2.59 The table within Para 8.6.5 (ESR 2017) states that the same amount of ancient woodland will be lost in Option 5 and Option 5A (6.06 ha). Para 8.7.20 then contradicts Para 8.6.5 (ESR 2017) by stating that *Options 5 and 5a would likely result in the permanent loss of approximately 13ha of Ancient Woodland habitat towards the north-west corner of Binsted Wood Complex.* This has already been stated as a loss of 6.06 ha and therefore rather confusing.

2.60 A range of standard options are offered for mitigation that do not really mean much due to the paucity of data and useful information given at this point. Biodiversity offsetting and monitoring to inform future projects is also mentioned.

2.61 Paras 8.7.14 – 8.7.21 (ESR 2017) conclude that all route options will have significant adverse impacts *at up to the County level.* No attempt at differentiation is given because the survey is ill informed due to the time of year undertaken, lack of information about the movements of protected species at a landscape scale, lack of consideration of the creation of habitat fragmentation and lack of knowledge of which species are in the area.

3 CONCLUSION

3.0 Ultimately, it is concluded that all options would have a significant adverse effect up to County level. This is not particularly helpful when considering the size of the project and the potential negative impacts on wildlife.

3.1 Major impacts have mostly been ignored such as the following:

- The differing levels of habitat fragmentation that each option will produce. Habitat fragmentation has one of the most serious impacts on the long-term viability of species resulting in isolated populations that, with environmental and demographic stochasticity, are in danger of local extinctions.
- The impact of Options 3 and 5 severing a hydrological system upon which two chalk streams (Option 5A), associated streams and ditches, areas of wet woodland and a number of ponds depend.
- The differing severance of existing corridors that each option will produce. This will impact upon the ability of species to disperse across the landscape. There is little information given on how the protected species mentioned in the report move across the landscape or are dependent upon moving across the landscape on a diurnal or seasonal basis for survival. A few examples being bats for daily foraging, Grass Snake movement to hibernation sites, breeding sites and foraging grounds and Common Toad and newts use of ponds just to breed and terrestrial habitats to live and feed.

3.2 Highways and other interested parties cannot possibly draw even the most fundamental conclusions based on such as lack of information

3.3 Data collated by professional ecologists is available for Highways England and WPA on the MAVES website and ultimately at the Sussex Biodiversity Records Centre. This data has been ignored.

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