

Horam Neighbourhood Plan Background Paper

Water management and flood risk



Horam Neighbourhood Plan Steering Group, September 2023

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1. Horam's hydrology, the water environment and flood risk



Figure 1 Horam Parish

- 1.1 Horam Parish, shown above, is bisected by the Waldron Ghyll, a principal tributary of the Cuckmere River, which runs north to south, ultimately reaching the sea at the Cuckmere Haven. Its route is highlighted red on the Upper Cuckmere Catchment Plan below, which also shows other tributaries of the river to the east and west of the Parish.

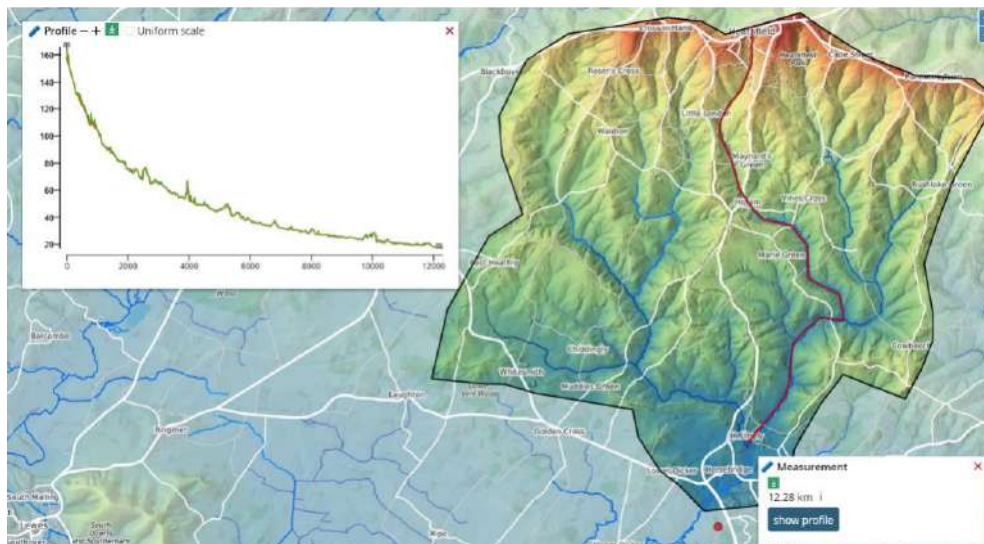


Figure 2 Catchment of the Upper Cuckmere (Courtesy of the Natural Flood Management Officer, High Weald AONB Unit)

- 1.2 The inset graph on the map shows the profile of the river from Heathfield down to Hellingly, just north of Hailsham. This profile contributes to the Waldron Ghyll being a “flashy” river, meaning that it can experience considerable increases in height over a very short period following heavy and/or prolonged rain.

- 1.3 This characteristic is exacerbated by the local geology and soils, with Clayey soils predominating, which impede drainage into the ground and increases run-off to watercourses.
- 1.4 The location of the Parish, and of Horam village, on this profile, as shown by the additional information below, is significant.

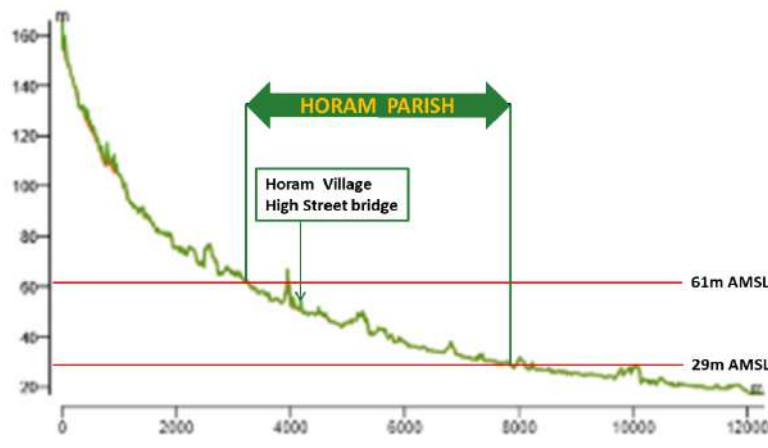


Figure 3 Profile of the Upper Cuckmere showing the position of the Parish and Horam (Courtesy of the Natural Flood Management Officer, High Weald AONB Unit)

- 1.5 In essence, waters flow quickly down the steeper terrain from the Heathfield Ridge to the north, slowing somewhat and gathering volume (with added water from smaller tributaries) as the Ghyll reaches Horam, creating more pressure on the capacity of the watercourse, which can result in flash flooding.
- 1.6 The respective sub-catchments of the upper Cuckmere River are shown on the map below. This highlights Horam village as a '*flood prone area*', as is the confluence of the Waldron Ghyll with the Cuckmere River at Grovebridge, its confluence with the Bull River just north of Hellingly, and Horsebridge.

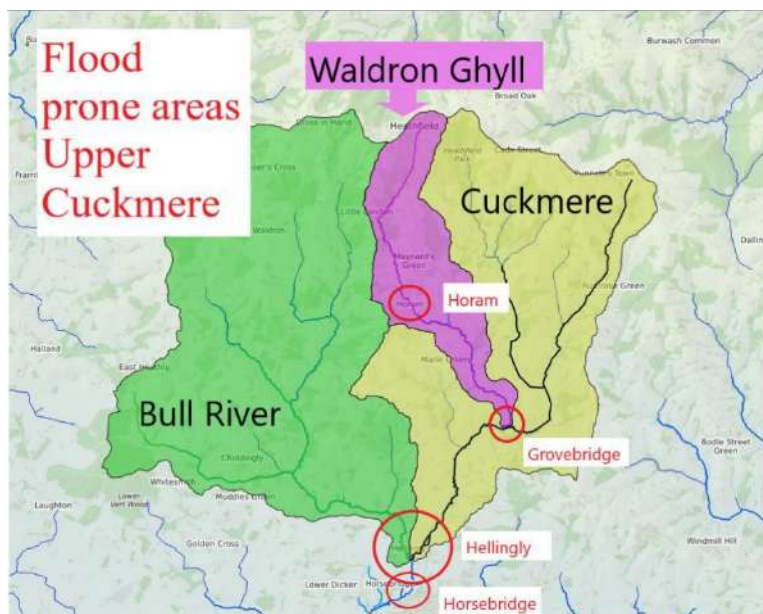


Figure 4 Sub-catchments of the upper Cuckmere River (Courtesy of the Natural Flood Management Officer, High Weald AONB Unit)

2. Local flooding concerns

- 2.1 Flooding is an increasing issue both globally and locally. Climate change is recognised as leading to more weather extremes and milder wetter winters, which will increase the frequency and extent of flooding.
- 2.2 Locally, one of the questions in the Residents' Questionnaire Survey on 'Policy ideas' in Autumn 2022 asked whether people agree that "*Development should avoid impacting on areas of flood risk*". Nearly 90% of respondents '*strongly agree*' while all the remainder '*agree*'.
- 2.3 It is evident that flooding is a significant concern in the Parish.
- 2.4 Concerns can be attributed to a range of flooding incidents. These relate to both flooding from watercourses, primarily the Waldron Ghyll, as well as other surface water flooding, notably with drainage systems not being able to cope with demand and overflowing, or being obstructed.
- 2.5 There are also many occasions where water simply pools in depressions of ground because the rainfall is too great for it to enter drains, watercourses or the ground quickly enough.
- 2.6 There are specific concerns in relation to surcharging of foul and combined drains, seemingly due to storm water infiltration to drains.
- 2.7 In parts of the Parish, flood risk is compounded by a high water table, notably in the low-lying river valleys, and the many underground springs in the area – from which the 'Hidden Spring Vineyard' in Horam takes its name.
- 2.8 There are local concerns about the impact of new developments (and to some degree other changes to land management) on the water table and the capacity of (storm and foul) drains and watercourses. New development has become an increasing concern as, although most of the settlements are on higher ground, over time, development has extended to lower levels. Also, further development on higher ground within the catchment, including upstream at Heathfield, creates more impermeable surfaces, which can result in increased run-off.

3. Assessment of flood risks

- 3.1 Considerable assessment of flood risks across Wealden is contained in the District Council's (WDC) [Strategic Flood Risk Assessment](#) (SFRA) prepared by JBA Consulting to inform the emerging Local Plan. This report, dated May 2022, is available on the WDC website.
- 3.2 The Environment Agency defines different levels of fluvial flood risk, meaning that from rivers and streams, through the identification of 'flood zones'. Land with a Low probability of flooding, being less than 0.1% in any given year, is categorised as being in Flood Zone 1; land with an annual probability of 0.1-1.0% is categorised as being in Flood Zone 2 (Medium probability), while land with more than a 1% annual probability of flooding is categorised as being within Flood Zone 3 (High probability)
- 3.3 The extent of the higher risk Flood Zones 2 and 3 in Horam Parish is shown on the current Environment Agency flood mapping, as indicated below.

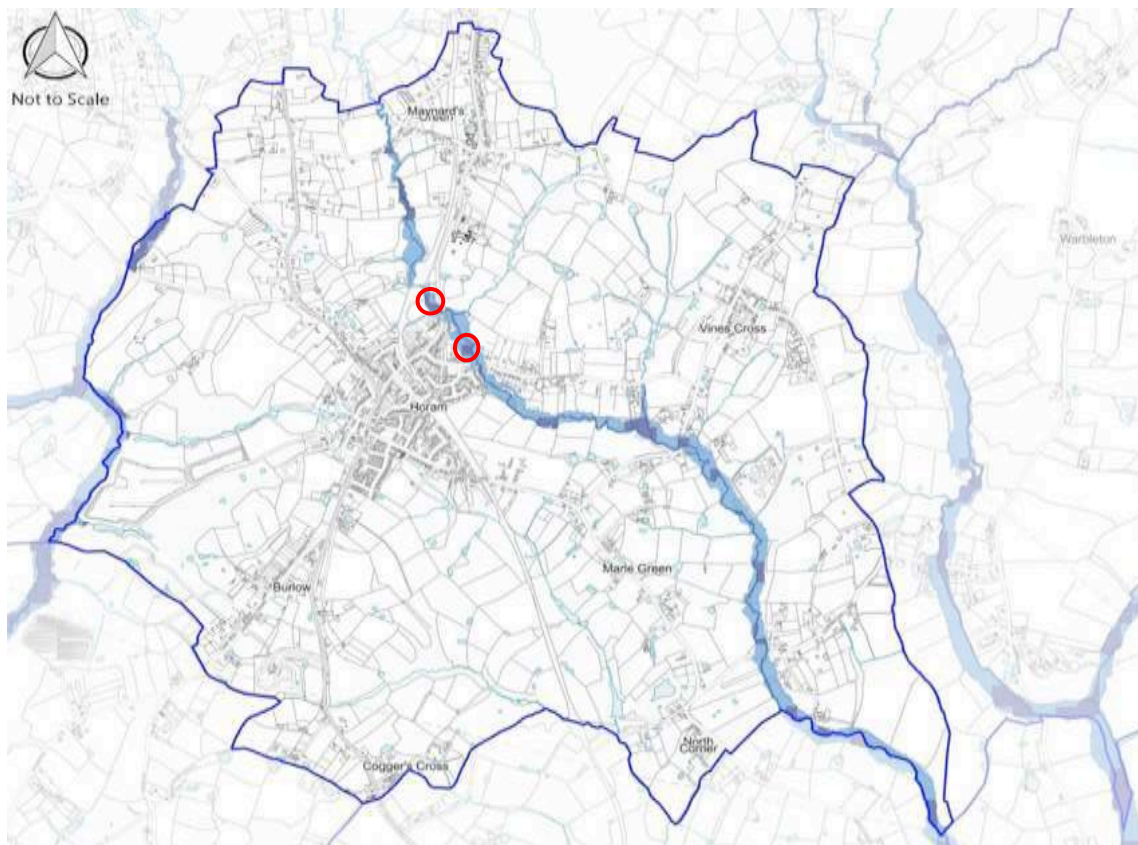


Figure 5 Horam Parish showing Flood Zones 2 and 3

- 3.4 It can be observed – and local knowledge confirms - that the areas of most serious and/or persistent flooding (darker blue shading) are almost all at or immediately upstream from where the watercourse is bridged by a road, track or footpath.

- 3.5 Within built-up area of Horam, it can be seen that fluvial flooding spreads out upstream of Stream Farm Bridge and Horeham Bridge (shown by red circles on Figure 5). Figure 6a below also shows this more clearly. In effect, the bridges restrict flows along the stream course, which together with the higher level of the road than adjacent land, causes blocking and upstream flooding. This has been acknowledged by both the Environment Agency and Wealden District Council's drainage officer (Mr Palmer) in discussions following the 2000 Flood.
- 3.6 It follows that, unless the capacity of such bottlenecks can be increased, or requisite upstream flow attenuation measures introduced, any additional run-off upstream of them would increase flood risk in those areas.
- 3.7 In addition, it should also be appreciated that the identified Flood Zones relate to current fluvial flood risk. They do not take into account surface water, sewer or groundwater flooding, nor do they consider climate change.
- 3.8 The two maps below (available on Environment Agency's website) illustrate the additional risks of surface water flooding from all sources at Horam, relative to that from fluvial flooding as reflected by Flood Zones 2 and 3:

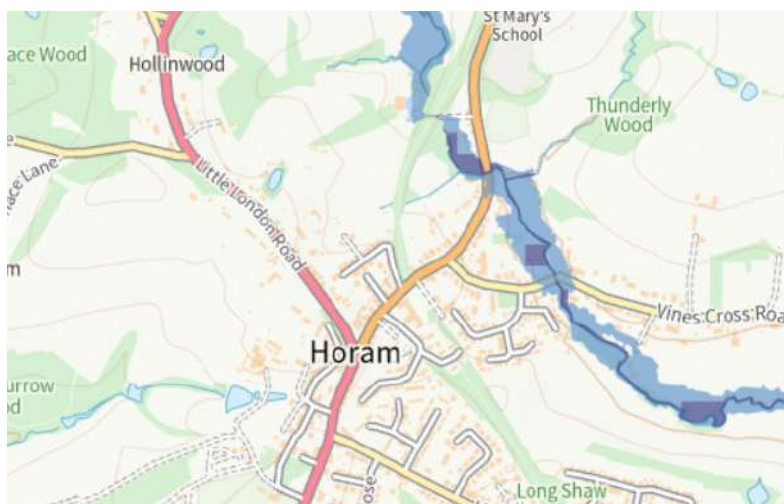


Figure 6 (a) Area subject to fluvial flood risk;

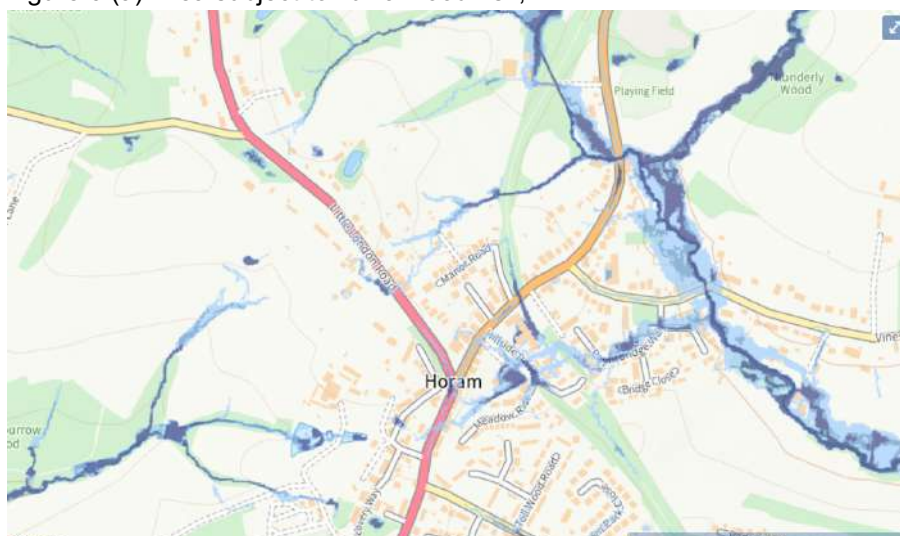


Figure 6 (b) Area subject to risk of surface water flooding

- 3.9 East Sussex County Council's record of documented fluvial, pluvial, surface water and sewer flood events are shown in the Wealden Strategic Flood Risk Assessment (SFRA), an extract of which is reproduced below. The location of Horam is shown by the black circle.

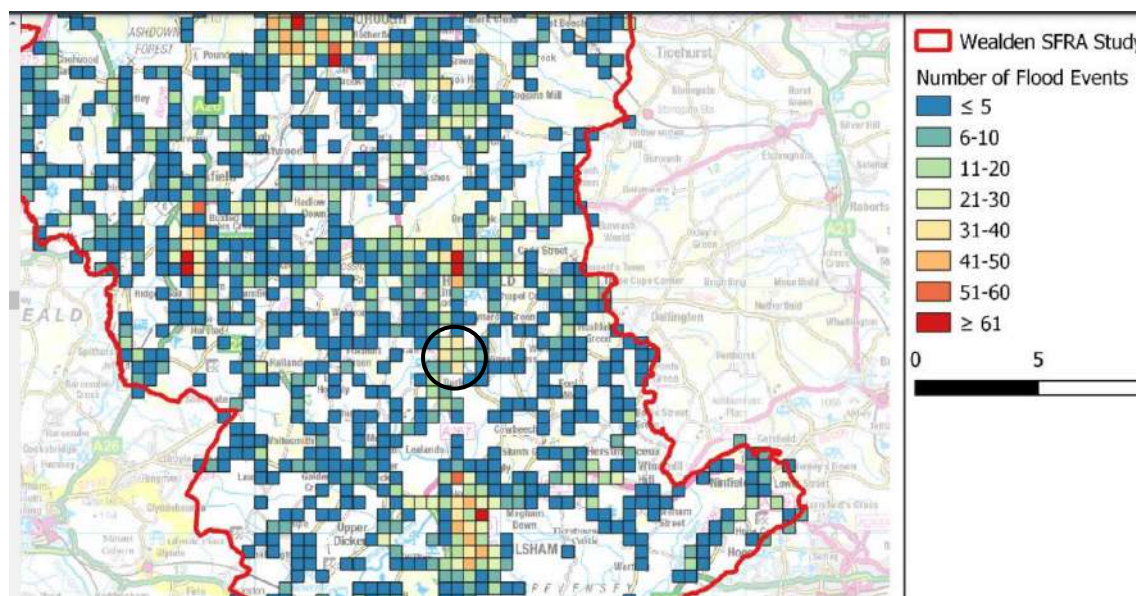


Figure 7 Documented flood events in Wealden (WDC, SFRA)

- 3.10 While there have been more incidents from all sources at the towns, for its size, Horam is seen to be vulnerable when taking account of all flooding sources.
- 3.11 Specific information in relation to incidents of flooding relating to public foul, combined or surface water sewers is recorded by Southern Water. For confidentiality reasons, this data is available only on a postcode basis. The information, for between January 2011 and April 2021, is shown on Figure 5-2 of the Wealden SFRA, an extract of which is reproduced below.

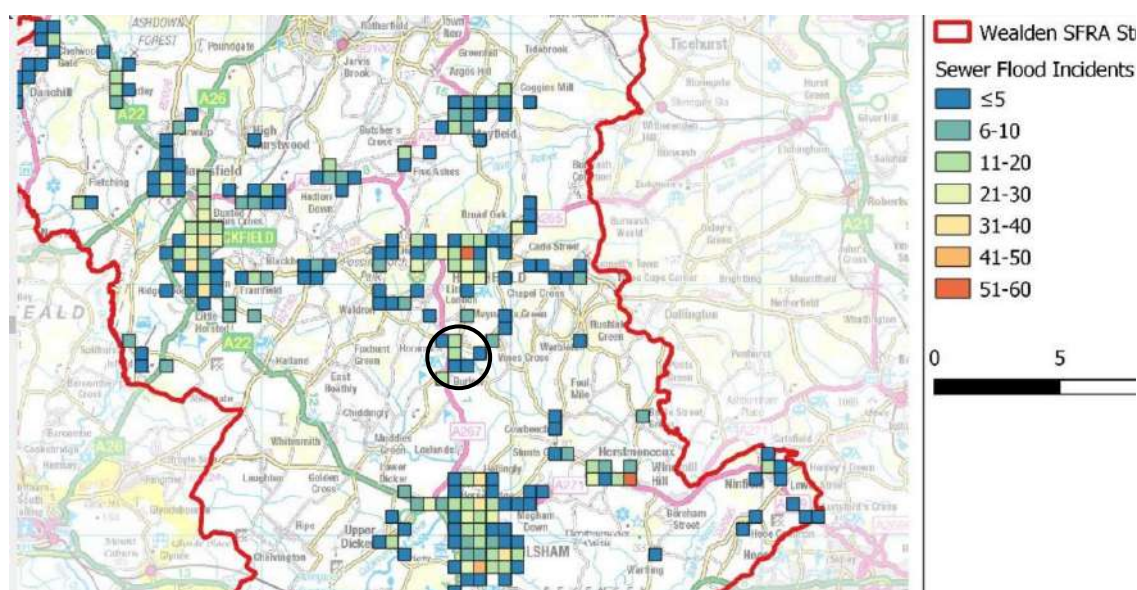


Figure 8 Sewer flooding incidents in Wealden (WDC, SFRA)

- 3.12 The other local concern relates to the high water table. The [Wealden SFRA](#) identifies large areas of Wealden that are areas of groundwater concern, particularly in the fluvial river basins where high water tables can lead to groundwater flood risk. (see paragraphs 134-137) Groundwater vulnerability maps can be found on [Defra's interactive mapping](#).
- 3.13 Depending on the height of the water table at the location of the proposed development site, restrictions may be placed on the types of Sustainable Drainage Systems (SuDS) appropriate to certain areas of the Parish.
- 3.14 Of course, the extent of historic and current flood incidents is not necessarily an accurate basis for predicting future flooding, as does not take account of ongoing climate change.
- 3.15 The impacts of climate change have been mapped separately for the SFRA (in its Appendix H). At a site-specific scale, in the absence of modelling surface water flood risk with climate change uplifts, the Wealden SFRA advises that the 0.1% annual probability (1,000-year) surface water flood extent, available at <https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsww>, can be used as an indication of climate change.
- 3.16 In effect, climate change means that areas of the Parish that are already identified as being at risk will be at an increased risk in future, and that the frequency of flooding will increase in such areas.

4. Flood risk approach for Horam

- 4.1 Managing and where possible reducing flood risk is a national issue; hence, approaches to it are well covered in the [National Planning Policy Framework](#) (NPPF, July 2021). This sets out that development should avoid higher flood risk areas, stating states that:

“inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere. (NPPF para. 159)

- 4.2 This should be done by applying a ‘Sequential Test’ to ensure that land at the lowest risk of flooding is considered first. Firstly, land at the lowest risk of flooding from all sources, should be considered for development; i.e. land in Flood Zone 1 with no surface water or other sources of flood risk. Also, the impacts of climate change over the lifetime of the development should be taken into account when considering actual and residual flood risk.

- 4.3 While the basic premise is that development should not increase flood risk, national policy and guidance also promotes seeking betterment in appropriate contexts. NPPF paragraph 161c) refers to: *“using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management);”*

- 4.4 In addition, the NPPF establishes the principle of not impacting on flood risk beyond sites:

‘When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere.’ (Paragraph 167)

- 4.5 Given the clear evidence that Horam is susceptible to flooding, the District Council is expected to strictly apply the Sequential Test when considering its local plan development strategy, giving consideration to both the individual and cumulative impacts of potential schemes in, or impacting on, flood risk the Parish.

- 4.6 NPPF paragraph 161 also contains the following expectations which are particularly relevant locally:

- *safeguarding land from development that is required, or likely to be required, for current or future flood management*
- *using opportunities provided by new development and improvements in green and other infrastructure to reduce the causes and impacts of flooding*
- *making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management.*

4.7 Similarly, the PPG on Flood Risk and Coastal Change highlights, specifically in the context neighbourhood planning at paragraph 15, that, where appropriate, plans:

- *be able to demonstrate how flood risk to and from the plan area/ development site(s) will be managed, so that flood risk will not be increased overall, and that opportunities to reduce flood risk, for example, through the use of sustainable drainage systems where appropriate, are included in the plan/order.*

4.8 Under the heading “Reducing the causes and impacts of flooding”, paragraph 62 of this PPG states:

In addition to the broad policy aim of securing net gains across each sustainable development objective, all Plans should make as much use as possible of opportunities presented by new development to reduce the causes and impacts of flooding, through the use of natural flood management techniques wherever they would be effective.

4.9 Of particular relevance locally, paragraph 64 of the PPG draws attention to the part that natural flood management techniques can make to “reduce the causes and impacts of flooding”.

4.10 As the Horam Neighbourhood Plan is not making development allocations, application of the Sequential Test is a matter for Wealden District Council, as local planning authority. However, its policy approach may provide a locally appropriate framework for seeking to prevent, and reduce, flood risks, with particular regard to local issues and the opportunities, including by natural flood management, to help address these.

4.11 This approach aligns with the [National Flood and Coastal Erosion Risk Management Strategy for England](#) (2020). This provides an overarching framework to tackle flooding and coastal erosion looking ahead to 2100 to address the challenge of climate change. Of note, its key measures include:

- Seeking nature-based solutions towards flooding and erosion issues
- Integrating natural flood management into the new Environmental Land Management scheme
- Maximising the opportunities for flood and coastal resilience as part of contributing to environmental net gain for development proposals.

4.12 A new [National Policy Statement for Flood and Coastal Erosion Risk Management](#) was published alongside the Strategy. One of its five key commitments is ‘*Managing the flow of water to both reduce flood risk and manage drought.*’ This may be applied locally, particularly though opportunities for “Natural Flood Management”.

4.13 In fact, the Environment Agency’s (2009) Catchment Flood Risk Management Plans states:

For Horam, Hellingly and Grovebridge: Flood frequency may increase slightly in the future as a result of climate change. The impact of this could be reduced by increasing flooding in appropriate areas upstream.

- 4.14 East Sussex County Council is designated as the Lead Local Flood Authority (LLFA). The current [East Sussex Flood Risk Management Strategy](#) divides the county into 4 distinct drainage categories or Drainage Risk Areas, based on surface water flood risk, groundwater flood risk, water table levels, as well as the different ground conditions present, and their ability to drain surface water. Those applicable to Horam Parish are shown in Figure 9 overleaf.
- 4.15 These Drainage Risk Areas, and the specific standing advice associated with them, should be used to inform the preparation of drainage strategies within development proposals, so that appropriate Sustainable Drainage System (SuDS) techniques are implemented.
- 4.16 The Strategy helpfully identifies areas where an improvement in greenfield run-off rates should be sought in order to minimise the downstream surface water flood risk, as well as highlighting where infiltration is unlikely.
- 4.17 This fine-grained information should inform the consideration of proposals for development in the Parish, and across the County, both in terms of Local Plan preparation and the determination of planning applications.

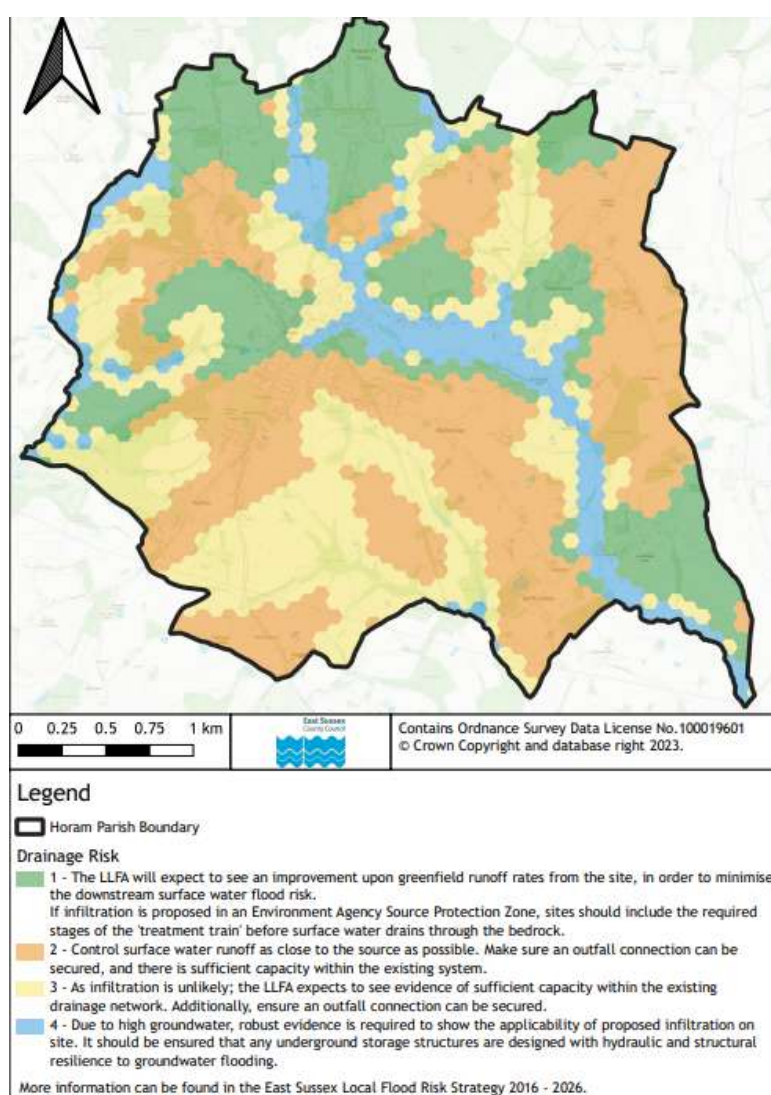


Figure 9 Drainage Risk Areas in Horam Parish (ESCC Flood Risk Management Strategy)

General principles for addressing flood risk concerns

- 4.18 The above strategies align with the broadscale findings of the [Wealden SFRA](#), which highlights that fluvial flood risk poses a threat to Horam (Summary, page iv; para 120, 302) and that climate change is likely to increase flood frequency and the impact of a flood event from the River Cuckmere with a given probability is also likely to become more severe, as water depths, velocities and flood hazard increase. (See Table 4-1 and para 107)
- 4.19 It follows that any development in these areas should seek to contribute to work that reduces wider flood risk in Horam and the catchment of the Waldron Ghyll.
- 4.20 Overall, given the existing and likely future vulnerability to flooding, it is considered both reasonable and necessary that development in the Heathfield – Horam – Hellingly areas should seek to contribute to reducing flood risk in the catchment of the Waldron Ghyll/Bull River/Cuckmere River, especially at the vulnerable areas identified on the Catchment Plan on page 4 above, including Horam and Hellingly villages.
- 4.21 The SFRA also sets out ‘principles for new developments’ to be applied when allocating land or seeking permission for development. Those most relevant to managing flood risk in Horam Parish, as shown by the above evidence review, and which should also be applied locally are:
- The Sequential and, where appropriate, the Exception Test must be applied
 - The risk from all sources of flooding must be considered, using the most up to date flood risk data and guidance
 - Ensure that the development does not increase flood risk elsewhere
 - Enhance the natural river corridor and floodplain environment through new development.
 - Developments should demonstrate opportunities to create, enhance and link green assets, having regard to flood risk and biodiversity/ ecology and the use the land for amenity and recreational purposes.
 - Where possible, developers should identify and work with partners to explore all avenues for improving the wider river corridor environment.
 - Consider and contribute to a wider flood mitigation strategy and measures.
 - Wherever possible, developments should seek to help reduce flood risk in the wider area, e.g. by contributing to a wider community scheme or strategy for strategic measures, such as defences or natural flood management or by contributing in-kind by mitigating wider flood risk on a development site.
- 4.22 Based on the above overview and assessment, the Neighbourhood Plan provides an opportunity to identify a strategy, at a community scale, to managing flood risks, the key elements of which are to:

- a) Ensure that all development is able to manage peak run-off on-site to the degree that at least mirrors the pre-existing greenfield run-off rate
- b) Promote measures that slow down water infiltration and run-off, including appropriate forms of SuDS and natural flood management, and complementary actions, as elaborated upon below
- c) On a precautionary basis, focus any major development downstream of the Stream Farm and Horeham Bridges, given their physical restrictions on watercourse capacity and accepted causes of flooding
- d) Ensure that all development is able to manage run-off on-site to the degree that at least mirrors the pre-existing greenfield run-off rate
- e) Expect any larger developments to have a holistic greenspace strategy that 'makes space for water' in a way that provides multi-functional benefits to flood risk, biodiversity, amenity and recreation
- f) Expect any larger (major) developments to contribute towards the implementation of a Natural Flood Management strategy, to help manage flood risk within the Upper Cuckmere catchment (as shown on page 3)

4.23 In line with Wealden SFRA's recommendations, specific attention is given to natural flood management below.

Natural Flood Management (NFM)

- 4.24 Given the terrain and landscape and flashy nature of the ghylls, the local area is suited to the use of NFM measures to mitigate the effects of extreme rainfall events and the most damaging impacts of flooding. This may be done by either providing for the temporary storage of water, such as in low-lying areas next to watercourses, and then releasing it back into the river system, or drains – known as attenuation – or by limiting the flow along watercourses.
- 4.25 In both cases (and also applicable to SuDS – see below), the objective is to reduce the risk of flooding by flattening the peak flows over the lifetime of new development. This is illustrated by the diagram below.

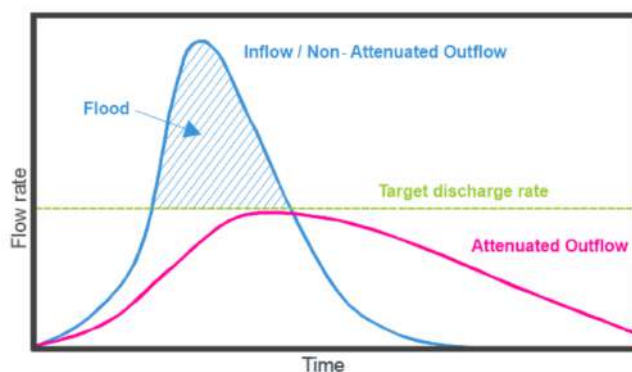


Figure 10 Target water flow profile from attenuation (Courtesy of the Natural Flood Management Officer, High Weald AONB Unit)

- 4.26 “Leaky dams” may slow the flow of watercourses, effectively holding back some water, as well as helping to capture sediment and debris. It can operate on feeder streams through smaller interruptions in flow and with larger interventions on bigger watercourses downstream. Both can be used in combination as part of a coordinated approach. In all cases, securing the material is critical, as the force of fast-flowing and/or larger volumes of water could dislodge material and add to the debris carried downstream.
- 4.27 Flood storage areas, usually where streams have low-lying land adjacent or close to them, of which there are more opportunities in downstream stretches, with the capacity to store large volumes of water for gradual release. It may involve shallow scraping to form a pond or water meadow, which can create attractive areas for wildlife. Ponds in particular may integrate readily with the landscape character.
- 4.28 The most suitable locations are woodlands, as occasional, short-term flooding does not cause real damage to the woodland flora, with ‘Wet Woodlands’ being characteristic of the Weald. Open, low-lying land adjacent to watercourses, where flood waters can safely overspill for short periods, may also be appropriate. Potential areas of opportunity for Natural Flood Management are shown indicatively on Figure 11 below.

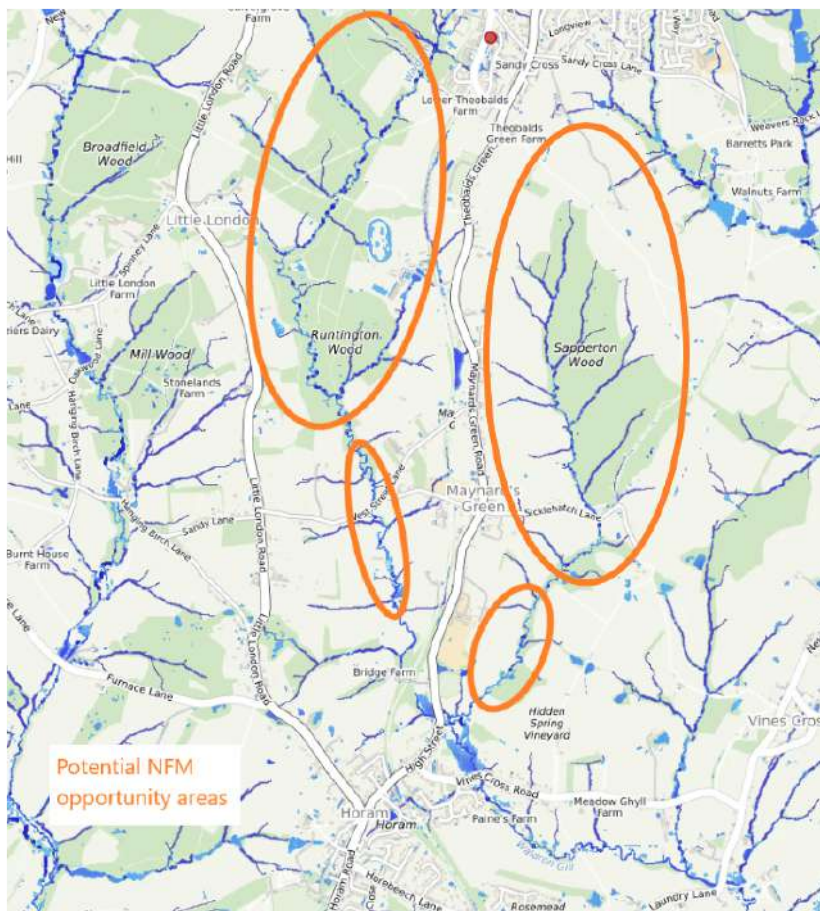


Figure 11 Potential opportunity areas for Natural Flood Management (NFM). [NB Some of these are outside of the Neighbourhood Plan area and will be subject to discussion and testing with partner organisations.]



Figure 12 Example of leaky wooden dams recently installed in Sapperton Wood

Sustainable Drainage Systems (SuDS)

- 4.29 The use of Sustainable Drainage Systems (SuDS) is at the heart of national water management policy, particularly to reduce the pressure on built drainage systems. SuDS are a nature-based solution to drainage problems, which can vary from installing permeable surfaces to creating rain gardens to building attenuation ponds, to capture water and then filter it slowly into the ground.
- 4.30 The NPPF (2021) states that: *‘Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate’* (Paragraph 169).
- 4.31 The Government and East Sussex County Council, as the LLFA, provides valuable guidance on the use of SuDS, including:
- [C753 CIRIA SuDS Manual](#) (2015)
 - [Non-Statutory Technical Standards for SuDS, DEFRA](#) (2015)
 - [Water. People. Places: A guide for master planning sustainable drainage into developments](#), The Lead Local Flood Authorities of the South East
 - [Guide to Sustainable Drainage Systems in East Sussex](#), ESCC (2015)
 - [SuDS Decision Support Tool for Small Scale Development](#), ESCC (2017)

- 4.32 The Department for Environment, Food, & Rural Affairs (DEFRA) has recently announced that SuDS will become mandatory by 2024, thereby implementing Schedule 3 to The Flood and Water Management Act 2010. It will firstly undertake a consultation regarding how to implement the new policy.
- 4.33 Pending the outcome off this technical consultation, it is clear that SuDS should continue to be strongly promoted as part of new developments, in line with current national and local policies, to manage surface water. SuDS may also help address local run-off issues.
- 4.34 As a potentially significant landscape feature in themselves, in designing SuDS every effort should be made for them to be compatible with and contribute to local landscape character. A useful synopsis of SuDS' potentials is contained in the Design Study, undertaken by AECOM. This document, which forms an appendix to the Neighbourhood Plan, also contains design guidance on water management.
- 4.35 In some instances, ground conditions do not favour certain forms of sustainable drainage and can lead to ground saturation and ponding, combining with surface water flooding. In particular, infiltration SuDS are not effective in high groundwater areas and areas with impermeable geologies, although attenuation measures can work in high groundwater areas if designed and built correctly.
- 4.36 Also, in designing SuDS, the steep topography and flashy nature of the streams mean that downstream impacts of development need to be very carefully considered.

Complementary actions

- 4.37 Targeted woodland planting can slow water across the landscape. More generally, tree and hedge planting help to reduce run-off by absorbing more water. The creation of wetlands can both mitigate run-off rates and boost biodiversity. Encouragement may also be given to sensitive agricultural practices, such as ploughing parallel with contours, to similarly reduce flows.

5. Proposed water management and flood risk strategy

- 5.1 An outline policy appropriate for inclusion in the Horam Neighbourhood Plan, giving effect to the principles and approaches identified in national and local guidance in a manner relevant to local circumstances, was included in the Draft Horam Neighbourhood Plan for consultation.
- 5.2 The policy received substantial local support (See Regulation 14 Consultation Statement), but has been amended somewhat to take account of comments, mainly by Wealden District Council. East Sussex County Council, as Lead Local Flood Authority, had been engaged in its drafting, and had no further comments to make at the formal consultation stage.

Water management and flood risk strategy

1. The existing network of rivers and streams, associated flood plains and other areas of flood risk in the Neighbourhood Plan area shall be conserved and protected through:
 - a) applying the sequential test to development proposals in order to avoid unnecessary development within areas at risk of flooding (defined as Flood Zones 2 and 3 as identified by the Environment Agency and any other areas which are vulnerable having regard to flooding from other sources, including areas at risk from surface water flooding);
 - b) promoting enhancements to the ecological and green spaces as well as their flood management function.
2. Proposals for development should demonstrate that:
 - a) there is adequate water drainage infrastructure to serve the development, with separate surface water and foul systems, which ensure that surface water does not enter the foul system and that there is no surcharging of foul drainage;
 - b) there will be no adverse impacts from flood risk, including of surface water flood risk, on adjoining and downstream land.
3. Any new development must ensure peak run-off rates are not increased and, where possible, reduced, by:
 - a) suitable mitigation measures in the light of potential impacts of climate change over the lifetime of the development;
 - b) suitable Sustainable Drainage Systems (SuDS) are incorporated, which accords with prevailing guidance, including that in the HDG, and respond positively to the character of the area; and
 - c) in respect of major developments:
 - i) incorporating surface water management measures into a holistic greenspace strategy that also provides practicable benefits to biodiversity, amenity and recreation; and

ii) seeking to achieve a reduction in peak run-off rates, as far as reasonably practicable, in respect of proposals located upstream of the Stream Farm and Horeham Bridges.

- 5.3 The supporting text to policies will make suitable reference to relevant sources of information, as reviewed above.
- 5.4 With the local need to manage flood risk, the recent evidence of Natural Flood Management measures being undertaken locally, as well as the national recognition of their effectiveness (see the Government [Evaluation Report](#)), it is proposed that this is further promoted locally.

Project

The Parish Council is supportive of appropriate Natural Flood Management areas being introduced in the Upper Cuckmere catchment, and specifically in that of the Waldron Ghyll, to assist in reducing the risk of flooding in the Parish and elsewhere downstream, including at Hellingly. The Parish is keen to explore opportunities with the Lead Local Flood Authority, Environment Agency and other delivery partners, as well as neighbouring Parish Councils.