

Appendix E – Summary of flood risk in the Yorkshire Dales National Park

The table below summarises the areas where there are notable flood risks within the National Park.

Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to Groundwater flood risk				Reservoir inundation risks	Historic, recorded flood events
				<25%	>=25% <50%	>=50% <75%	>=75%		
Eden and Esk	<p>The area consists of steeply sloping hills with clearly defined flow routes, with Flood Zones 2 and 3 mostly confined to narrow channels. The area generally slopes downhill from south to north with many small watercourses forming in the south of the area and flowing north, exiting the National Park along the northern boundary.</p> <p>In the west Lyvennet Beck flows north and is joined by Dalesbank Beck at Crosby Ravensworth. Flood Zone 3 remains confined to the channel through Crosby Ravensworth with some overtopping around Maulds Meaburn but with relatively few properties or roads shown to be at risk. Flood Zone 2 has a much greater flood extent with several properties shown to be at risk through Crosby Ravensworth and Maulds Meaburn.</p> <p>To the east of Lyvennet Beck, Asby Beck flows north where it is joined by an unnamed watercourse to the south of Great Asby and then by Bumeybeck Sike in the northern end of Great Asby. Flood Zone 3 is shown to remain confined to the channel through Great Asby, with some overtopping at Broammire Road to the north of Great Asby but no flood risk to properties in this area. Flood Zone 2 shows overtopping around the confluence of the unnamed watercourse and Asby Beck with flood risk to a small number of properties. There are small areas of overtopping onto a couple of roads within Great Asby and then a large area of overtopping around Broammire Road with several properties at flood risk.</p> <p>Waterhouses Beck flows to the east of Asby Beck with some flood risk to infrastructure around Water Houses and further north where it is joined by several small unnamed watercourses.</p> <p>Several watercourses form in the hills south of Ravenstonedale. At the southern end of Ravenstonedale, Lockholme Beck joins Artlegarth Beck which is then joined by Wyegarth Gill</p>	<p>The EA AIMS dataset shows there is an Embankment/Natural High Ground along both sides of Crosby Garrett Beck through the centre of Crosby Garrett, from the railway line in the south to St Andrew's Church in the north.</p>	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. Eden and Esk is predominantly rural with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Crosby Ravensworth – there is surface water flood risk along the main road through the centre of Crosby Ravensworth. There are also areas of low to medium surface water ponding around several properties, particularly in the southwest of the settlement. Great Asby – there is a low to high risk flow path along Banks View through Great Asby. There are also several flow routes and areas of surface water ponding affecting properties within the area, particularly the properties to the east of St Helen's Well and to the north of St Peter's Church. Ravenstonedale – the surface water flood risk in Ravenstonedale mainly follows the paths of the watercourses however there is an area of low to high surface water ponding and a low risk flow path along a couple of the roads in the centre of the settlement. Crosby Garrett – the surface water flood risk mainly follows the path of the watercourse through the centre of the town, however, there are couple of small areas of low risk surrounding properties in the south of the settlement. 	✓	✓	✓		None	<p>From the EA's Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> February 1978 – fluvial flooding due to channel capacity exceedance along Dry Beck. February 2004 – flooding (cause unknown) south of the confluence of Stone Gill and Scandal Beck at Ravenstonedale. January 2005 – fluvial flooding due to channel capacity exceedance along Dalebanks Beck and Lyvennet Beck at Crosby Ravensworth, Dry Beck at Dry Beck, Asby Beck at Great Asby, Lyvenett Beck at Maulds Meaburn and Stone Gill at Ravenstonedale. November 2009 – fluvial flooding due to channel capacity exceedance along Lyvennet Beck at Crosby Ravensworth. December 2015 - fluvial flooding due to channel capacity exceedance along Dalebanks Beck and Lyvennet Beck at Crosby Ravensworth, Asby Beck at Great Asby and Lyvenett Beck as well as flooding (cause unknown) at Dry Beck.

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	<p>and becomes Stone Gill. Flood Zones 2 and 3 both extend away from the channel around these confluences however the flood risk is shown to be limited to local roads with no properties at risk. Scandal Beck flows along the northern end of Ravenstonedale. Flood Zones 2 and 3 both extend away from the channel showing similar extents, with flood risk along Bleaflatt Lane and to a few properties. Tone Gill joins Scandal Beck to the north of Ravenstonedale. Flood Zone 3 remains confined to the channel around the confluence, but a number of roads and properties are shown to lie in Flood Zone 2.</p> <p>A number of small watercourses originate in the southwest of the area and flow around in a clockwise direction, joining the River Eden to the south of Aisgill Farm. The River Eden then flows north through the area. The path of the Eden is rural with flood risk limited to local roads and a couple of isolated properties. Kitchen Gill/ Thringill Beck originates to the east of the River Eden, joining the Eden south of Nateby. A small number of properties lie in Flood Zone 3 along Thringill Beck to the east of Nateby Road.</p>								
Lune	<p>The River Lune flows westwards across the north of the area with several small tributaries, particularly to the south. The Flood Zones extend away from the channel, particularly around the tributaries. There is flood risk to the A685 and smaller roads in several locations and a number of properties located in Flood Zone 3 in the west at Gaisgill. Rais Beck joins the River Lune just before it leaves the area and there are a small number of properties located within Flood Zone 3 at this confluence. Chapel Beck flows to the west of Rais Beck, before joining the River Lune to the west of the study area, with a small number of roads and properties located in Flood Zone 3 as it flows through Orton.</p> <p>The River Lune continues west into Tebay before flowing in a southerly direction before re-entering the study area after its confluence with Roundthwaite Beck and continuing in a southerly direction along the western</p>	<p>The EA AIMS dataset shows the following defences:</p> <ul style="list-style-type: none"> An embankment along the north bank of the River Dee from Gawthrop in the east to Graggs farm in the west An embankment along approximately 500m of the south bank of the River Dee to the east of Dent A wall along the south bank of Barbon Beck where it passes under Beckgate Road at Barbon An embankment along the east side of the Lune to the 	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. The Lune catchment is predominantly rural with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Dent – there is a low to high surface water flow path which follows Seeds Gill through the centre of the area. A number of properties are at surface water flood risk particularly around the junction of Main Street and Glebe Field. There is also a low to high risk flow path along Laning Road to the west of Dent with several properties along this road at risk. Gaisgill – there is low to medium flood risk along the road into Gaisgill from the east. There are also a couple of areas of low to high surface water ponding which may affect properties, particularly in the east. 	✓	✓	✓	✓	<p>The Lake (Ingleborough Estate) – follows the path of Clapham Beck, in a south westerly direction through Clapham</p> <p>Wyndhammere – only causes risk to the National Park during the Wet Day Scenario along the River Lune and its tributary to the north of Kirkby Lonsdale</p>	<p>From the EA’s Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> December 2015 – fluvial flooding at Lune due to channel capacity exceedance along Bowderdale Beck. February 2020 – fluvial flooding to the northeast of Clapham due to channel capacity exceedance along Clapham Beck and local drainage/surface water flooding to the southwest of Austwick. <p>From historic flooding incidents held by Cumbria County Council and North Yorkshire County Council:</p> <ul style="list-style-type: none"> December 2015 – property flooding in Sedbergh due to overtopping of the ordinary watercourses following a prolonged period of heavy rainfall and blockages. <p>North Yorkshire County Council have recorded flooding</p>

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	<p>edge of the area. Several isolated properties, farms and local roads are shown to be at flood risk from the River Lune. Further south the River Lune also causes flood risk to the B6257, the A684 and the A683. The A683 is particularly affected where tributaries from the east join the River Lune, including Smithy Beck and Abbey Beck.</p> <p>In the east of the area, several small watercourses originate in the hills and then flow west towards the River Lune. In the north, there are a couple of properties and roads located in Flood Zone 3 where Chapel Beck flows.</p> <p>Further south the River Rawthey flows in a south westerly direction towards the Lune. Where Hebblethwaite Hall Gill joins the Lune there are a couple of properties located in Flood Zone 3 and flood risk to the A683. As the River Rawthey flows to the south of Sedbergh the Flood Zones extend across a wide floodplain, however, the flood risk is mainly limited to local roads, the A683, a caravan park and a water treatment works. The River Rawthey then flows to the north of Holme where all properties are shown to lie within Flood Zone 3.</p> <p>Clough River originates by Black Hill to the east of the River Rawthey, flowing in a clockwise direction before flowing westwards to join the River Rawthey to the east of Sedbergh. Along the watercourse Flood Zones 2 and 3 show similar extents, with areas of the A684 and several isolated properties, particularly around Garsdale, located in Flood Zone 3.</p> <p>To the south of Clough River, the River Dee and its tributaries flow westwards to join the River Rawthey south of Sedbergh. In its upper reaches the Flood Zones are mainly confined to the channel with a small number of isolated properties and local roads shown to be at flood risk. Where Cowgill Beck flows south to join the River Dee at Cowgill, the floodplain extends further from the channel with several properties shown to lie in Flood Zone 3. Further west, where Deepdale Beck joins the River Dee, the floodplain extends further but this area is predominantly rural with few assets at</p>	northwest of Underley Garden School	<ul style="list-style-type: none"> Orton – there is an area of low to high surface water ponding on the B6360 to the south and a low to high risk flow path along the B6261 to the southeast. There are also a couple of areas of surface water ponding around properties in the west. Sedbergh – there is a surface water flow path to the north of Station Road which impacts several properties and other assets. There are also several isolated areas of surface water ponding across the area affecting properties, particularly between Fairholme Road and Bainbride Road and around the junction of Main Street and Palmers Hill and to the east of Loftus Hill. Holme – there is a surface water flow path through the centre of Holme with several properties surrounded by areas of low to medium risk. Cowgill – there are several low to high risk surface water flow paths flowing in a southerly direction affecting properties around Cowgill. Gawthrop – the surface water flow paths originate from the southwest along the watercourses flowing either side of Gawthrop, with large parts of the settlement shown to be at low to high flood risk. Barbon – there are a couple of isolated areas of low to medium risk surface water ponding affecting a couple of properties within the settlement. Ireby – there are low to medium surface water flow paths along several roads in the centre of Ireby. There are also areas of low risk surrounding properties in the northeast and southwest of the settlement. Thornton in Lonsdale – there is a low to high surface water flow path which flows in a south westerly direction through the settlement, with properties in the Inglewood Holiday Home Park surrounded by low to high flood risk. Ingleton – the northwest corner of Ingleton falls within the National Park. There is a low to high risk flow path along the road to the Ingleton Waterfall trails with a low risk area surrounding The Falls Café building. Casterton – there are a couple of isolated areas of low risk surface water ponding affecting a couple of properties within the settlement. 					<p>incidences in the following areas, however no details about the flood mechanisms or dates of these flood events were available:</p> <ul style="list-style-type: none"> Ingleton 	

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	<p>flood risk. To the west, Oliver Gill/Beck flows through Gawthrop where several properties are located in Flood Zone 3.</p> <p>Further south there are further tributaries of the River Lune which flow in a westward direction across the area, including Stockdale Beck, Abbey Beck and Barbon Beck. These areas are predominantly rural with flood risk limited to local roads and isolated properties, with a few properties to the north of Barbon also shown to be at fluvial flood risk.</p> <p>In the south of the area there are a number of further tributaries of the River Lune which do not join the main River until they are outside the study area, including Leck Beck, Ireby Beck, the River Twiss, the River Doe and Austwick Beck. These areas are mainly rural with the Flood Zones showing similar extents and remaining mostly confined to the channels, however there are several properties in Ireby and in the northern part of Ingleton located in Flood Zone 3 alongside other isolated properties and local roads.</p>								
Ribble	<p>The Ribble area generally slopes downhill from north to south with the River Ribble flowing in a southerly direction through the area from where it starts at Ribblesdale. The area along the Ribble is rural, with flood risk limited to a couple of isolated properties, until the Ribble reaches Horton in Ribblesdale, where a small number of properties are located in Flood Zone 3. Flood Zone 2 extends further than Flood Zone 3 along the west bank of the River Ribble but no further properties are shown to be at flood risk. Downstream, the floodplain widens considerably where Horton Beck joins the River Ribble with several local roads, the railway line and a number of properties around Helwith Bridge located in Flood Zone 3.</p> <p>There are several tributaries of the River Ribble which flow in a south-westerly direction from the hills in the east to join the River Ribble, including Thorn Gill, Cam Beck, Horton Beck and Stainforth Beck. The area to the east is steep sided with the Flood Zones showing similar extents and remaining mostly confined to the channel. Where</p>	The EA AIMS dataset shows there is an embankment along the south bank of the River Ribble where it flows west towards the B6479 south of Horton in Ribblesdale.	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. The Ribble catchment is predominantly rural with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Horton in Ribblesdale – there is an area of low to high risk surface water ponding on Cragg Hill Road, south of its junction with Station Road (B6479) with low risk around a couple of properties to the east of Cragg Hill Road. Stainforth – surface water flow path through Stainforth where Stainforth Beck flows, with low risk across most of the settlement with areas of medium to high risk surrounding several properties to the north of the Beck. Selside – there is low to high surface water flood risk around properties either side of Selside Beck with a low risk flow path extending north along the west side of the railway line and surrounding a property. 	✓	✓	✓	✓	None	<p>From the EA's Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> February 2020 – fluvial flooding along the southwest boundary of the area due to channel capacity exceedance along the River Ribble, north of Scalber Force due to channel capacity exceedance of Stockdale Beck, east of Top Rays Hill due to channel capacity exceedance along Hull Pot Beck and east of News Head Hill due to channel capacity exceedance along Cam Beck. Local drainage issues/surface water flooding in several areas: across the fields to the northwest of Helwith Bridge, to the west of Silverdale Meadow and in the fields east of the railway between Stainforth and Langcliffe. <p>From historic flooding incidents held by Cumbria County Council</p>

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	<p>Stainforth Beck flows through Stainforth there are several properties and roads located within Flood Zone 3. There is a considerable increase in flood extent for Flood Zone 2 with several further properties at risk of flooding.</p> <p>There are also a small number of tributaries which flow east from the west of the area to join the River Ribble. Most of these are too small to be included within the fluvial mapping but Selside Beck flows east through Selside with several properties located within Flood Zone 3.</p>							<p>and North Yorkshire County Council:</p> <ul style="list-style-type: none"> February 2020 – floodwaters surrounded Horton in Ribblesdale due to overtopping of watercourses in the area 	
Aire and Calder	<p>Malham Tarn lies in the north of this area where Malham Beck originates, which joins Gordale Beck at Malham to form the River Aire. The River Aire then flows in a southerly direction through the area. In the upper areas, the flood zones remain mostly confined to the channel with limited assets at flood risk. There are some properties located within Flood Zone 3 where Malham Beck flows through Malham, with further properties at risk in Flood Zone 2. Further downstream along the River Aire, the area remains predominantly rural with flood risk mostly confined to isolated properties and local roads. There are also a couple of properties on the east side of Airton located in Flood Zone 2 where this extends slightly further than Flood Zone 3. The flood zones extend further from the channel in the south of the area but few assets are at flood risk due to the rural nature of the area.</p> <p>There are a number of tributaries of the River Aire, flowing from both the west and east. Whilst the flood extents remain mainly confined to the channels there is some flood risk to small settlements. Where Kirkby Beck flows east to join the River Aire at Kirkby Malham there are several properties located in Flood Zone 3. Where Otterburn Beck flows east to join the River Aire in the south of the catchment there are several properties located in Flood Zone 3 and a couple of further properties in Flood Zone 2 where this extends further east of the channel.</p> <p>Eshton Beck and its tributaries flow through the area in a southerly direction to the east of the River Aire before it</p>	<p>The EA AIMS dataset shows the following defences:</p> <ul style="list-style-type: none"> Natural High Ground along both sides of Embsay Beck/Haw Beck along most of its length from Pasture Road in the north to where it joins Eller Beck north of Skipton in the south. Embankment at Eller Beck Slow Release Dam Natural High Ground along both sides of Eshton Beck for a length of approximately 200m upstream of the National Park Boundary near Gargrave Natural High Ground along both sides of the River Aire where it flows along the southern boundary of the National Park 	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. Aire and Calder is a predominantly rural area with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Malham – a low to high risk surface water flow path follows the path of Malham Beck flowing in a southerly direction through the settlement. There are a couple of low risk areas which extend west around a couple of properties and the low risk extent on the east also reaches a number of properties. Airton – there are two low to high risk surface water flow paths through Airton, one to the north and one to the south both flowing in an easterly direction. These flow paths mainly impact on roads in the area, including Watery Lane and Hellifield Road, but also impact upon a number of properties. Kirkby Malham – there is a low to high risk flow path which flows in an easterly direction through the settlement and impacts a number of properties, particularly along Main Street. Otterburn – the surface water flow paths through Otterburn mainly follow the paths of Otterburn Beck and Dowber Sike, flowing in a southerly direction. Along the east side of Otterburn Beck there is a low risk of flooding to most of the properties. Flasby – the main surface water flow path follows Flasby Beck flowing in a south westerly direction through the area, with a number of surface water flow paths flowing into this main route. This flow path extends east as far as the properties 	✓	✓	✓	✓	<p>Malham Tarn – follows the path of Malham Beck, before diverting west along a track, re-joining Malham Beck by Malham Cove. It then continues to follow the path of Malham Beck through Malham and then follows the path of the River Aire. In the Wet Day scenario, the flood extent also extends east along a couple of tributaries of the River Aire (Tarn Dike and Gordale Beck).</p> <p>Winterburn Reservoir – follows the path of Winterburn Beck, with a wide floodplain around Winterburn, and then follows Eshton Beck southwards. It then flows southwest along Eshton Road to the south of Eshton as well as continuing along Eshton Beck.</p> <p>Embsay Reservoir – follows the path of Embsay Beck southwards towards its confluence with</p>	<p>From the EA's Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> February 2020 – areas of local drainage issues/surface water flooding downstream of Malham Tarn, around Bark Hill and in Tarn Side Pastures. Fluvial flooding due to channel capacity exceedance on the eastern edge of Great Close Mire north of Gordale Beck. Fluvial flooding in the south of the area due to overtopping of Otterburn Beck. Fluvial flooding due to channel capacity exceedance along Eshton Beck to the north of the Leeds and Liverpool Canal and along Ray Bridge Lane to the west. Fluvial flooding due to channel capacity exceedance along the River Aire to the southeast of Kirkby Malham. February 2002 – fluvial flooding along Eshton Beck north of the Leeds and Liverpool Canal at Gargrave. October 2000 – fluvial flooding along both sides of Eshton Beck to the north of the Leeds and Liverpool Canal at Gargrave due to channel capacity exceedance. Fluvial flooding along Malham Beck at Malham along the west bank of the Beck from Malham Smithy in the north to Malham Methodist Church in the south and along the east bank from opposite Malham Smithy in the south up to the Riverside Barn in the north. Fluvial flooding along both sides of the River Aire from Green Gate to the east of Kirkby Malham in the north to where

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	<p>joins the River Aire to the south of the study area. At the confluence of Heber Beck and Bordley Beck there are a couple of properties located within Flood Zone 3. Further downstream, the flood zones are mainly confined to the channels with limited flood risk to local roads. There are considerable differences between Flood Zones 2 and 3 around the confluence of Eshton Beck and Flasby Beck at Eshton. This flood risk mostly affects rural areas and local roads but there are several properties along the east side of Flasby Beck in Flasby which are located in Flood Zone 2.</p> <p>In the east of the area, Eller Beck and Embsay Beck flow south through the area. There are a few properties located within Flood Zone 3 in the western parts of Embsay with a few further properties located in Flood Zone 2 along Skipton Road and Wood View.</p>		<p>along the eastern bank. To the west of the watercourse there are some isolated areas of low risk ponding around properties.</p> <ul style="list-style-type: none"> Embsay – there are a number of low to high surface water flow paths through Embsay with large areas of surface water surrounding properties particularly in the west along Brackenley Lane, Brackenley Drive, Brackenley Close and Brackenley Avenue. Rylstone – there is a low to high risk flow path following Town End Beck in the north of the area which affects a number of properties north of Raikes Lane. There are a number of areas of low risk surrounding properties between Raikes Lane and Back Lane. There is also a low to high area of surface water flooding across Green Lane and surrounding buildings to the southeast of Green Lane. 					<p>Eller Beck and then continues to follow Eller Beck. The flood extent extends west of Embsay Beck across the western side of Embsay, with further flood risk in this area for the Wet Day scenario.</p> <p>Coniston Hall Lake – this reservoir is located outside the area to the south and only impacts upon the site in the Wet Day Scenario, where it merges with the flood extent from Malham Tarn and follows the path of the River Aire.</p>	<p>the River Aire leaves the National Park in the south.</p> <p>North Yorkshire County Council have recorded flooding incidences in the following areas, however no details about the flood mechanisms or dates of these flood events were available:</p> <ul style="list-style-type: none"> Airton Malham
Wharfe and Lower Ouse	<p>The River Wharfe is the main watercourse in this area which originates in the northwest and flows in a south easterly direction until it leaves the area to the north of Addingham.</p> <p>The upstream reaches of the River Wharfe and its tributaries are steep and rural with flood risk confined to a narrow floodplain. The first settlement is at Hubberholme where a couple of properties are located within Flood Zone 3.</p> <p>The floodplain widens as the River Wharfe continues in a south easterly direction and is joined by Cray Gill. Upstream of the River Wharfe, Cray Gill flows through Cray where a couple of properties are located in Flood Zone 3.</p> <p>Downstream of Cray Gill, the floodplain of the River Wharfe widens, with a considerable increase in Flood Extent for Flood Zone 2 as it passes west of Buckden but the flood risk does not extend as far as the settlement.</p> <p>Further downstream, Cam Gill Beck flows in a south westerly direction through Starbotton to join the River Wharfe. There are a few properties in Starbotton located in Flood Zone 3 with several more at risk in Flood Zone 2 which</p>	<p>The EA AIMS dataset shows there is Natural High Ground along both sides of the River Skirfare from its origin at the confluence of Cosh Beck and Foxup Beck to its confluence with the River Wharfe. There is also an Embankment/Natural High Ground along the River Wharfe from Hubberholme in the north to where it leaves the area in the south.</p>	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. The Wharfe catchment is a predominantly rural area with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Halton Gill – there is a low to high risk surface water flow path that follows the path of Halton Gill Beck around the east and south of the settlement with a low risk of flooding to a couple of properties in the south of the settlement. Hubberholme – there is a low to high risk surface water flow path flowing in an easterly direction through the settlement, with the low risk of flooding extending north across Stubbing Lane and south onto Dubb’s Lane. There is also an area of low to high surface water ponding impacting a property to the north of the settlement. Cray – there are two low to high risk surface water flow paths flowing in a south easterly direction through Cray, one to the northeast and one through the centre, following the path of the unnamed tributary of Cray Gill. Flood risk is confined to a few properties around the central flow path and one property to the south of the upper flow path. 	✓	✓	✓		<p>Grimwith Reservoir – follows the path of the River Dibb/Barben Beck south until it reaches the River Wharfe and then follows the path of the River Wharfe south. Settlements affected include Burnsall, Appletreewick and Bolton Abbey.</p> <p>Upper and Lower Barden Reservoirs – follows the path of Barden Beck in a south-eastwards direction and then joins the River Wharfe and continues to follow the path of this watercourse.</p> <p>Chelker Reservoir – this reservoir is located outside of the study area to the south, however, the resulting flood extent merges with those from Grimwith</p>	<p>From the EA’s Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> Autumn 2020 – fluvial flooding along Dubb’s Lane to the northwest of Bucken due to channel capacity exceedance along the River Wharfe. February 2020 – fluvial flooding in several areas of the catchment due to channel capacity exceedance. Local drainage issues/surface water flooding in several areas of the catchment. March 2019 – fluvial flooding along the River Wharfe at Bolton Abbey. February 2002 – fluvial flooding due to overtopping of defences along the River Wharfe at Bolton Abbey. Autumn 2000 – fluvial flooding due to overtopping of defences along large areas of the River Wharfe from Kettlewell in the north through to where the River Wharfe leaves the area in the south. January 1995 – fluvial flooding due to overtopping of defences along large areas of the River Wharfe from Hubberholme in the north through to where the River

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	<p>extends much further south into the settlement.</p> <p>The next settlement to the south is Kettlewell, through which Kettlewell Beck flows in a westerly direction to join the River Wharfe. Flood Zones 2 and 3 show similar extents throughout Kettlewell with a number of properties shown to be at risk.</p> <p>Downstream of Kettlewell, the River Skirfare joins the River Wharfe. Upstream along the River Skirfare the area is predominantly rural, however, there are a few properties at risk along the south side of Hesleden, the southwest of Litton, the northwest of Arncliffe and the southwest of Hawkswick. The Wharfe then continues in a southerly direction through Kilnsey and Conistone. A few properties to the south of Kilnsey are located in Flood Zone 3 where How Gill joins White Beck which flows parallel to the River Wharfe at this location, whilst Flood Zone 2 extends as far as the eastern boundary of Kilnsey. Several properties through the centre of Conistone are shown to be at flood risk, with Flood Zones 2 and 3 showing similar extents.</p> <p>The River Wharfe then continues in a south easterly direction, flowing between Threshfield and Grassington. The floodplain does not extend as far as the main settlements with the flood risk limited to local roads and isolated properties. There are a few properties in the south end of Threshfield which are located in Flood Zone 3 where Threshfield Beck flows in an easterly direction through the south of Threshfield to join the River Wharfe.</p> <p>To the south of Threshfield a number of watercourses form in the hills, flowing in a northerly direction to join the River Wharfe. Linton Beck flows in a northerly direction through Linton where there are a couple of properties located in Flood Zone 3 either side of the Beck and a couple more properties in Flood Zone 2 which extends slightly further either side of the Beck. At the confluence of Captain Beck and the River Wharfe to the north of Linton there are a number of properties along Linton Falls located in</p>		<ul style="list-style-type: none"> Buckden – there is a low to high risk surface water flow path which flows west through the settlement following the path of Buckden Beck. There are several properties in the south end of the settlement that are at a risk of surface water flooding. Starbotton – there is a low to high risk flow path which flows through the north of the settlement following the path of Cam Gill Beck, with several properties along the north of the beck at flood risk. There is also an area of low surface water flood risk around a few properties in the south of the settlement. Kettlewell – there is a low to high risk surface water flow path which flows west through Kettlewell, following the path of Kettlewell Beck. Several properties located both north and south of the Beck are shown to be at flood risk. There is also a low risk flow path which extends along Far Lane in the north of the settlement. Conistone - there is a low to high risk surface water flow path which flows west through Conistone following the path of a track. This flow path causes flood risk to several properties in the centre of Conistone. Grassington – there is a low to high risk surface water flow path along Main Street through the centre with several surrounding properties at low to medium risk. There are several other properties and roads across Grassington at a low risk of flooding. In the southeast of the settlement, there is low to high risk to properties along Hardy Meadows, Barden Fell View and Aynham Close. Threshfield – there is a low to high risk surface water flow path which flows to the south of Threshfield, following the path of Threshfield Beck, with some properties in the south located at flood risk. There are also areas of surface water ponding in the northeast of Threshfield with flood risk to several properties. Long Ashes Park – there is low to medium surface water flood risk along most of the roads within the Long Ashes Park, with some low flood risk to properties across the park. Linton – there is a low to high risk surface water flow path which follows the path of Linton Beck through the centre of Linton, with a low risk of flooding to a couple of properties. There is also an area of low to 				<p>and the Barden Reservoirs and follows the path of the River Wharfe.</p>	<p>Wharfe leaves the area in the south.</p> <ul style="list-style-type: none"> February 1991 – fluvial flooding due to overtopping of defences along the River Wharfe from Appletreewick in the north through to where the River Wharfe leaves the area in the south. January 1982 – fluvial flooding due to overtopping of defences along the River Wharfe from east of Drebley in the north through to Bolton Abbey Caravan Club in the south and then also from the Cavendish Pavilion down to where the River Wharfe leaves the area in the south. <p>North Yorkshire County Council have recorded flooding incidences in the following areas, however no details about the flood mechanisms or dates of these flood events were available:</p> <ul style="list-style-type: none"> Kettlewell 	

Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to Groundwater flood risk				Reservoir inundation risks	Historic, recorded flood events
				<25%	>=25% <50%	>=50% <75%	>=75%		
	<p>Flood Zone 3 with a couple of further properties located in Flood Zone 2.</p> <p>Downstream of Linton, Hebden Beck flows in a southerly direction through Hebden to join the River Wharfe with a few properties in the east located in Flood Zone 3. Downstream of the confluence, the River Wharfe flows past Burnsall where several properties are located in Flood Zone 3 with further properties located in Flood Zone 2 where it extends further west into the settlement.</p> <p>Downstream of Burnsall, there are several further tributaries which join the River Wharfe, including Barben Beck, Fir Beck, Gill Beck and Barden Beck, however these areas are predominantly rural with flood risk confined to isolated properties and local roads.</p> <p>In the south of the area, Kex Beck flows in a south westerly direction through Beamsley to join the River Wharfe. There are a few properties located in Flood Zone 3, with Flood Zone 2 showing a similar extent.</p>		<p>high risk surface water ponding to the east of the settlement which also causes risk of flooding to a property.</p> <ul style="list-style-type: none"> • Burnsall – there is a low to high risk flow path to the east of Burnsall where the River Wharfe flows, with the low risk extending slightly into the settlement and encroaching to a couple of properties. There is also a low to high risk flow path flowing along the west of Burnsall and then through the south of Burnsall to join the River Wharfe, with low to high flood risk along the B6160 and to a couple of properties next to the watercourse. • Appletreewick – there is a low to medium risk flow path through the east of the settlement with low to medium risk also extending east along the main road. There are a few properties surrounded by a low risk of flooding, particularly to the north of the main road. • Bolton Abbey – there is a low to high risk flow path flowing in an easterly direction to the north of the settlement with flood risk across the B6160 and a couple of properties to the north of the settlement. • Beamsley – there is a low to high risk surface water flow path through the settlement following the path of Kex Beck, with the low risk of flooding extending to a couple of properties adjacent to the beck. • Hebden – there is a low to high risk flow path to the east of Hebden, following Hebden Beck, with a couple of properties along the beck at a low risk of flooding. There is also a low to high risk flow path flowing east through the north of the settlement towards Hebden Beck, with flood risk to a number of properties to the west of High Green. There is also a low risk of flooding along Hebden Road (B6265). • Hesleden – there is a low to high risk surface water flow path along the south of the settlement, following the path of Hesleden Beck with the low risk extent extending north to a couple of properties in the south of the settlement. • Litton – there is a low to high risk flow path through the centre of Litton, following the path of Potts Beck. There is also low to medium flood risk along the main street through the centre of the settlement, with a couple of properties surrounded by low flood risk. • Arncliffe – there is a low to high risk flow path to the west of the settlement 						

Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to Groundwater flood risk				Reservoir inundation risks	Historic, recorded flood events
				<25%	>=25% <50%	>=50% <75%	>=75%		
			<p>following the path of Cowside Beck and then to the north of the settlement following the River Skirfare, with the low risk extent extending to a couple of properties in the west and north. There are also some isolated areas of low risk around a number of properties across the area.</p> <ul style="list-style-type: none"> Hawkswick - there is a low to high risk flow path following the path of the River Skirfare to the south of the settlement with a couple of properties and the roads to the north and south of the river at flood risk, particularly in the 1000-year event where the flood extent increases considerably either side of the river. 						
Wensleydale	<p>The River Ure originates in the west of this area, flowing slightly west before flowing in an anticlockwise direction and flowing in an easterly direction through the area until it leaves the area between West Witton and Wensley.</p> <p>In the upstream reaches of the River Ure, the flood risk is mainly confined to the channel with relatively few assets at flood risk.</p> <p>The first settlement along the River Ure is at Hawes. There are a number of tributaries which join the River Ure around this area, including Widdale Beck, Hardraw Beck and Gayle Beck.</p> <p>To the west of Hawes lies Appersett, where Widdale Beck joins the River Ure. Several properties are shown to lie in Flood Zone 3 here, with Flood Zone 2 affecting several further properties in the south.</p> <p>Gayle Beck flows in a northerly direction through Gayle and then Hawes to join the River Ure. There are a number of properties located in Flood Zone 3, particularly along Gayle Lane near its junction with Harker Hill and along either side of Gayle Beck through Hawes. Flood Zone 2 shows a similar extent through Gayle with a few further properties at risk to the west of the Beck. At Hawes there are many further properties at risk in Flood Zone 2, both sides of the Beck.</p>	<p>The EA AIMS dataset shows there is an Embankment/Natural High Ground/Engineered High Ground along both sides of Widdale Beck and then the River Ure from its confluence with Widdale Beck south of Appersett in the west through to where it leaves the National Park in the east.</p>	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. Wensleydale is predominantly rural with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Gayle - there is a low to high risk surface water path which flows north along the western side of Gayle towards the unnamed tributary of Gayle Beck resulting in low to high risk to several properties along Harker Hill. There is also a surface water flow path following the path of Gayle Beck, with medium to high risk to a couple of properties along The Wynd and low risk to several properties either side of the watercourse, including along Bence, Beckstones and Gayle Lane. Hawes - there are several low to high surface water flow paths which flow in a northerly direction through Hawes which pose a flood risk to several properties, including those along Gayle Lane, Tufty Hill and Burtersett Road. In the 1000-year event the flood extent covers large parts of the northern areas in Hawes with several properties at risk. Burtersett - there is a low to high risk surface water flow path which flows north along the west side of Burtersett, with low surface water risk surrounding a couple of properties in the west of Burtersett. Countersett - a low to high risk surface water flow path flows to the north of Countersett, following the path of an unnamed watercourse, with flood risk to 	✓	✓	✓	✓	<p>Thornton Steward Reservoir is located outside the National Park and the flood extent only reaches the border of the National Park during the Wet Day Scenario where the flood extent follows the path of the River Cover to the eastern boundary of the National Park.</p>	<p>From the EA's Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> October 2020 - fluvial flooding around the confluence of Gayle Beck and the River Ure to the north of Hawes due to channel capacity exceedance along the River Ure. Local drainage issues/surface water flooding along the west side of Burnt Acres Road south of the confluence of Gayle Beck and the River Ure. February 2020 - areas of fluvial flooding along several watercourses in the area due to channel capacity exceedance. Also, several areas of local drainage issues/surface water flooding across the catchment. January 1995 - fluvial flooding along the River Ure due to overtopping of the flood defences from its confluence with Widdale Beck in the west through to where the watercourse leaves the study area in the east. January 1982 - fluvial flooding along the River Ure due to overtopping of the flood defences from Cobbles Hill in the west through to Aysgarth in the east. 1937 - fluvial flooding along the River Ure due to channel capacity exceedance from its confluence with Lockshaw Gill in the west through to Aysgarth in the east.

Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to Groundwater flood risk				Reservoir inundation risks	Historic, recorded flood events
				<25%	>=25% <50%	>=50% <75%	>=75%		
	<p>Further east, the floodplain extends considerably around the confluences of Grange Beck and the River Bain with the River Ure. To the south of the River Ure, Marsett Beck flows in a north easterly direction through Marsett where a few properties along the north of the settlement lie in Flood Zone 3. Marsett Beck continues in a northerly direction becoming Crooks Beck and then the River Bain at Semer Water. The River Bain flows in a northerly direction through the eastern side of Bainbridge with a number of properties located in Flood Zone 3 along both sides of the river. Flood Zone 2 shows a similar extent to Flood Zone 3.</p> <p>To the east, Paddock Beck flows in a southerly direction to join the River Ure. A small number of properties to the southwest of Askrigg are located in Flood Zone 3 with further properties in Flood Zone 2, which extends further west. To the east of Paddock Beck, Newbiggin Beck also flows in a southerly direction towards the River Ure. Flood Zones 2 and 3 show relatively similar flood extents with most of the properties in Newbiggin situated within Flood Zone 3.</p> <p>Continuing east, the flood extent extends further from the River Ure, however, the area remains rural with flood risk limited to isolated properties, local roads and the A684. A small number of properties are located in Flood Zone 3 to the north of Aysgarth. In this area, Flood Zone 2 extends further than Flood Zone 3 but results in no additional properties at flood risk.</p> <p>Bishopdale Beck flows in a north westerly direction through the area joining the River Ure by Hestholme Farm, which is located in Flood Zone 3. Upstream of this confluence the flood risk from Bishopdale Beck is confined to local roads and isolated properties. Walden Beck, which joins Bishopdale Beck just upstream of its confluence with the River Ure, flows north along the eastern side of West Burton where there are a few properties located in Flood Zone 3, with a couple of further properties in Flood Zone 2 which extends slightly further west.</p>		<p>the northern most property in the settlement.</p> <ul style="list-style-type: none"> Bainbridge – there is a low to high risk surface water flow path along the east side of Bainbridge following the River Bain, with a number of smaller flow paths flowing into this main flow path with flood risk along the A684 to the east and Newkin Road to the west. There is also flood risk surrounding several properties along these roads. There is also a flow path heading in a north easterly direction around the northwest of the settlement with low to medium risk surrounding several properties along this route. There are also a number of isolated areas of surface water ponding affecting a couple of properties in the south of the settlement. Askrigg – there is a low to high risk surface water flow path following the path of Askrigg Beck in the north of the settlement, which presents flood risk to Moor Road and Leyburn Road as well as several properties along these roads. There is also a low to medium risk flow path along Station Road, Main Street and Silver Street in the south of the settlement, with low risk surrounding several properties in this area. There are further areas of isolated surface water ponding surrounding a number of properties on the north side of Mill Lane. Newbiggin – there is a low to high risk surface water flow path through the centre of the settlement following the path of Whit Beck however this is not shown to impact upon any properties. There is low to medium risk along the roads in the eastern part of the settlement with a number of properties surrounded by flood risk in the 1000-year event. There are also some properties at the western side of the settlement which are at flood risk during the 1000-year event. West Burton – there is a low to high risk surface water flow path following the path of Walden Beck to the east of the settlement. There is flood risk to a number of roads in the northeast of the settlement including Eshington Lane and the B6160. Carlton – there are a number of isolated areas of low to medium surface water risk across Carlton, particularly in the east of the settlement along Howden Bank, and several properties are surrounded by a 					<p>North Yorkshire County Council have recorded flooding incidences in the following areas, however no details about the flood mechanisms or dates of these flood events were available:</p> <ul style="list-style-type: none"> Askrigg Bainbridge Hawes West Burton West Witton 	

Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to Groundwater flood risk				Reservoir inundation risks	Historic, recorded flood events
				<25%	>=25% <50%	>=50% <75%	>=75%		
	The River Cover flows in a north easterly direction from its source in the south of the area until it joins the River Ure just outside of the area to the north of East Witton. The floodplain is predominantly rural with flood risk from both the River Cover and its tributaries mainly restricted to local roads and isolated properties. The largest settlement is West Scafton where Great Gill flows through the east of the settlement in a northerly direction. There are a small number of properties located in Flood Zone 3.		<p>low risk of flooding. There are also two low to high risk surface water flow paths in the east of the settlement following the paths of Micklethwaite Gill and Cat Gill with flood risk to a few properties neighbouring these Gills.</p> <ul style="list-style-type: none"> West Scafton – there are low to high risk surface water flow paths flowing in a northerly direction through West Scafton following the path of Great Gill and its unnamed tributary. There is medium to high risk along High Lane and a couple of properties near the watercourses with several further properties at risk during the 1000-year event. Carperby – there are several isolated areas of low to high risk surface water ponding around Carperby, particularly in the west where a couple of roads and several properties are impacted. There are also areas of low to medium risk in the centre of the settlement, along the main road and surrounding several properties, particularly to the north of this road. Aysgarth – there is a low to high risk surface water flow path along the eastern edge of the settlement causing flood risk along the A684 and to a couple of properties on the eastern edge of the settlement. There is also an area of low to high risk surface water ponding impacting a couple of properties to the north of the village green. West Witton – there is a low to high risk surface water flow path through West Witton following the path of the unnamed watercourse. This branches into several flow paths through the settlement, with most properties shown to be affected by surface water, particularly in the 1000-year event. 						
Swaledale	<p>A number of small watercourses originate in the west of this area, becoming Birkdale Beck which flows east through the area until its confluence with Great Sleddale Beck where it becomes the River Swale. The River Swale then continues in an easterly direction until it flows out of the area near Richmond.</p> <p>In the western upstream areas, there are no settlements and flood risk remains confined to the channels. Where Hood’s Bottom Beck meets Whitsundale Beck at Ravenseat the flood risk extends over a wider floodplain and</p>	The EA AIMS dataset shows there is an Embankment/Natural High Ground along both sides of the River Swale from Guning Lane in the west through to the west of Richmond in the east where the River Swale leaves the area.	<p>Surface water in the area follows the topography, flowing downhill from the surrounding slopes mainly following the path of the main watercourses and their tributaries and the roads in the area. Swaledale is predominantly rural with relatively few assets at flood risk; however, there are also a number of built up areas where there is a flood risk to properties and infrastructure:</p> <ul style="list-style-type: none"> Keld – there is a low to medium risk surface water flow path which flows in a north easterly direction through Keld with several properties surrounded by flood risk. 	✓	✓	✓	✓	None	<p>From the EA’s Recorded Flood Outlines Shapefile:</p> <ul style="list-style-type: none"> February 2020 – fluvial flooding at several locations along the River Swale due to channel capacity exceedance, including at Low Row and Reeth. Fluvial flooding in a couple of areas along Gunnerside Beck due to channel capacity exceedance. Local drainage issues/surface water flooding in a number of areas along the River Swale, including around Fremington and Grinton and at Low Row.

Area	Fluvial flood risk	Existing defences	Surface water flood risk	Susceptibility to Groundwater flood risk				Reservoir inundation risks	Historic, recorded flood events
				<25%	>=25% <50%	>=50% <75%	>=75%		
	<p>part of the farm is located in Flood Zone 3.</p> <p>Heading east the flood risk remains mostly confined to the channel with only a few isolated properties and local roads at flood risk. There are continual areas of risk along the B6270 as it runs parallel to the River Swale between Great Ash Gill and Stonesdale Beck.</p> <p>Where Straw Beck and its tributaries join the River Swale at Muker there are a couple of properties which border on Flood Zone 2, which extends further than Flood Zone 3 along the north side of Straw Beck. Further upstream, Thwaite Beck flows along the south side of Thwaite where several properties are located in Flood Zone 3.</p> <p>Further east along the River Swale, the flood extent starts to extend across a wider area with some flood risk to roads and the occasional property. The first larger settlement is Gunnerside, where Gunnerside Beck flows through in a southerly direction to join the River Swale. Several properties and roads in Gunnerside are located in Flood Zone 3.</p> <p>There are further roads and isolated properties at risk before the next main settlements at Reeth and Fremington, which is around the confluence of Arkle Beck and the River Swale. Around the confluence there are considerable differences between the extents of Flood Zone 2 and Flood Zone 3. There are a few properties in the east of Reeth and the west and south of Fremington which lie within Flood Zone 3 with considerably more properties located within Flood Zone 2, particularly across Fremington. To the southeast of Fremington, lies Grinton, where Grinton Gill joins the River Swale. The majority of properties within this settlement are located within Flood Zone 3, with Flood Zone 2 showing a similar extent.</p> <p>To the east of Grinton there are no further settlements along the River Swale until it leaves the area, although there is some flood risk to local roads and the A6108.</p>		<ul style="list-style-type: none"> Muker – there is a low to high risk surface water flow path in the north of Muker, encroaching on a couple of properties. There is also an area of low to high surface water ponding in the west to the north of The Old School. There are also a couple of low to high risk flow paths to the west of the area with a couple of properties surrounded by flood risk. Gunnerside – the surface water flood risk through Gunnerside remains mostly confined to Gunnerside Beck, with a couple of properties on the east side of the Beck at a low risk of flooding to the south of Gunnerside. Reeth – there are several areas of isolated surface water flood risk across Reeth, including an area of low to high risk ponding affecting a couple of properties on Place Hill and a low to high risk flow path along the B6270, heading west and affecting several properties. Fremington – there is low to high surface water flood risk along the B6270 which runs through Low Fremington. There is also low to high flood risk surrounding several properties along either side of this road. Grinton – there is a low to high risk surface water flow path which flows in a northerly direction following the path of Grinton Gill. There is a low risk of flooding along the road to the west of the Gill and a low to medium risk along the B6270. A number of properties are at a low risk of flooding particularly along the west side of the Gill. Low Row and Feetham – there are several surface water flow paths flowing in a south easterly direction through Low Row and Feetham with several properties at flood risk, particularly in the 1000-year event. 					<ul style="list-style-type: none"> July 2019 – fluvial flooding along Shaw Beck at Stang Lane and at Reeth, Freminton and Grinton where Arkle Beck and Grinton Gill join the River Swale. The fluvial flooding was a result of channel capacity exceedance. October 2000 – flooding along either side of Arkle Beck around Reeth and Fremington. The cause of this flooding is unknown. January 1995 – fluvial flooding along the River Swale due to overtopping of the defences from Muker in the west to where the river leaves the National Park in the east. <p>From historic flooding incidents held by Cumbria County Council and North Yorkshire County Council:</p> <ul style="list-style-type: none"> July 2019 – flooding of properties and roads in High and Low Fremington, Grinton and Reeth due to a combination of overtopping of watercourses and surface water runoff from the surrounding hills. Summer 1986 – flooding across Swaledale and Arkengarthdale due to heavy rainfall resulting from Hurricane Charley. <p>North Yorkshire County Council have recorded flooding incidences in the following areas, however no details about the flood mechanisms or dates of these flood events were available:</p> <ul style="list-style-type: none"> Low Row Whaw 	