



Norfolk County Council

Investigation Report into the flooding in Kings Lynn & West Norfolk Borough in Winter 2020-2021

Report Reference: FIR066

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Contents

Investigation Report into the flooding in Kings Lynn & West Norfolk Borough in Winter 2020-2021.....	0
Executive Summary.....	1
Introduction.....	1
Flooding incidents and causes.....	1
Key recommendations.....	2
Justification for Flood Investigation	4
Flooding and flood risk in Brancaster.....	6
Flooding and flood risk within the River Burn catchment (South Creake and Burnham Market).....	11
Flooding and flood risk in Docking.....	20
Flooding and flood risk in Downham Market.....	24
Flooding and flood risk in Gayton	28
Flooding and flood risk in North Runcton	32
Flooding and flood risk in Sedgeford.....	36
Flooding and flood risk in Snettisham	40
Flooding and flood risk in South Wootton.....	44
Flooding and flood risk in Stradsett.....	48
Flooding and flood risk in Thornham.....	53
Flooding and flood risk in Walpole.....	57
Flooding and flood risk in Watlington	61
Flooding and flood risk in Welney.....	65
Appendix A - Key definitions and responsibilities.....	70

Executive Summary

Introduction

Flooding occurred across Kings Lynn and West Norfolk Borough during December 2020 and January 2021. Norfolk County Council has confirmed 26 incidences of internal flooding on this date which are covered in this report. We note that significantly more properties were flooded internally, based on reports from neighboring properties or risk management authority reports. However, due to the absence of direct and verifiable reports from property owners, the LLFA does not have the permission to include, hold or publish information for those properties where direct reports have not been submitted. Please note that the LLFA made extensive site visits and provided 'fliers' or letter drops to the majority of those affected by flooding. Any subsequent reports received will be investigated and published in an additional report.

Norfolk received an above normal amount of rainfall throughout December with a total of 1117.7mm rainfall, 204% of the Long-Term Average. For the purpose of this report and ease of presentation we have divided the report by parish, then sub catchment. In some cases a catchment map has been generated to show the proximity of the properties to overland flow paths, however, in areas of isolated flooding where the flooding does not relate to a flow path a catchment map has not been generated.

Flooding incidents and causes

The flooding that occurred in the locations listed below led to the internal flooding of 26 properties.

Location	Catchment	Number of affected properties
Brancaster	N/A	2
Burnham Market	River Burn	2
Docking	N/A	1
Downham Market	N/A	1
Gayton	N/A	1
North Runcton	N/A	1
Sedgeford	N/A	1
Snettisham	N/A	1
South Creake	River Burn	7
South Wootton	N/A	1
Stradsett	N/A	1

Location	Catchment	Number of affected properties
Thornham	N/A	2
Walpole	N/A	2
Watlington	N/A	2
Welney	N/A	1

Key recommendations

The recommendations set out in the report have been summarised below.

All Risk Management Authorities should;

- Communicate with affected residents where their assets have given rise to the flooding of properties.
- Review the appropriateness of their response to flooding.
- Determine the integrity and/or capacity of their assets and their maintenance where they have contributed to the flooding of properties to understand the systems role in accommodating rainfall events as well as mitigating flooding.

Property owners of affected properties should;

- Confirm the integrity, capacity and appropriateness of their property drainage
- Determine if works are needed to remove the risk posed by structures that form obstructions to flows.
- Determine if it is appropriate for them to protect their buildings through flood protection measures.
- Seek their own legal advice if they are concerned about the responsibilities and liabilities of themselves and/or others.
- All property owners should remove any inappropriate surface water connections to the foul sewer system and direct flows to alternative points of discharge where it doesn't increase flood risk.
- Should consider installing property protection measures. Residents can apply for a grant towards the cost of flood protection measures at this link

Norfolk County Council should;

- Work with partner organisations to identify funding for flood mitigation. This would include assessing the potential to install property level protection measures, reduce run-off and increase the attenuation of flood water to reduce the impacts of flooding. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait for measures to be approved through national funding schemes.

- Work with property owners to assess the road structure to identify if it could be amended to route flood water away from the affected properties to alternative points of discharge, or other solutions as practicable.
- Seek to remind riparian owners of their responsibility to undertake appropriate levels of maintenance to sustain the efficiency of the drainage systems.
- Communicate with local residents to advise them of the appropriate measures they could take to protect their property without prejudicing the rights and responsibilities of adjoining property holders
- Determine if works are needed to remove the risk posed by structures that form obstructions to watercourse flows and communicate with affected parties and riparian owners
- Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Anglian Water should;

- Work with partner organisations to identify the potential for managing the amount of surface water entering their drainage system in flood events.

Justification for Flood Investigation

The purpose of this report relates to Section 19 of the Flood and Water Management Act 2010. This legislation sets out that the County Council, in its role as Lead Local Flood Authority for Norfolk, should investigate the role and response of organisations to significant flooding incidents. Significant flooding is deemed to be those incidents that impact upon people, property and infrastructure.

The Norfolk Local Flood Risk Management Strategy Policy UC2 (Flood Investigation) sets out the thresholds the Lead Local Flood Authority will apply to its formal flood investigation role. This states an investigation will be undertaken where it is determined that;

- (a) There is ambiguity surrounding the source or responsibility for a flood incident, and/or;
- (b) There is cause to investigate the flood incident, due to either its impact, or consequence

In judging the impact or consequence of a flood event Norfolk County Council uses the criteria set out below;

- Any risk to loss of life or serious injury.
- One or more residential or business property flooded internally.
- One or more critical services/installations and vulnerable person's properties flooded internally; and/or rendered inoperable or their functions severely compromised due to the access to the premises being impassable; and/or resulting in a loss of service impacting on the local community.
- Any section of a national category 3 road or above made impassable due to flooding; and/or flooding to priority 1 and 2 gritting routes.
- Flooding adversely impacting a rail link by making it impassable.

In this instance it was deemed necessary to complete a formal investigation as:
[list reasons to justify investigation]

This impact met Norfolk County Council's threshold for triggering the undertaking of a formal flood investigation.

The flood investigation report aims to:

- provide a transparent and consistent review of recent flooding.
- identify those organisations and individuals who have responsibility to manage the causes of the flooding.
- identify what their response has been or will be to the flooding.
- make recommendations as to how the flood risk could be mitigated or reduced.
- provide new evidence of the level of risk faced by communities in Norfolk that can be used in current funding bids in support of flood mitigation schemes.

Mitigation measures include property level protection: reinstating lost drainage features: reviewing or increasing maintenance regimes and increasing the capacity of the drainage network.

The flood investigation report cannot:

- Resolve the flooding issues or provide designed solutions.
- Force authorities to undertake any of the recommended actions.

Flooding and flood risk in Brancaster



Flood incidents in Brancaster

Within Brancaster 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
23/02/2021	On the 23/02/2021 - 1 property was internally flooded on Butchers Lane, Brancaster. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 24/02/2021, (4475)	A resident carried out measures to minimise the impact of flooding during the incident.
17/02/2021	On the 17/02/2021 - 1 property was internally flooded on Butchers Lane, Brancaster. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 19/02/2021, (4228)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident. Anglian Water Services Ltd visited affected residents to offer advice and to gather information during the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in Brancaster.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets

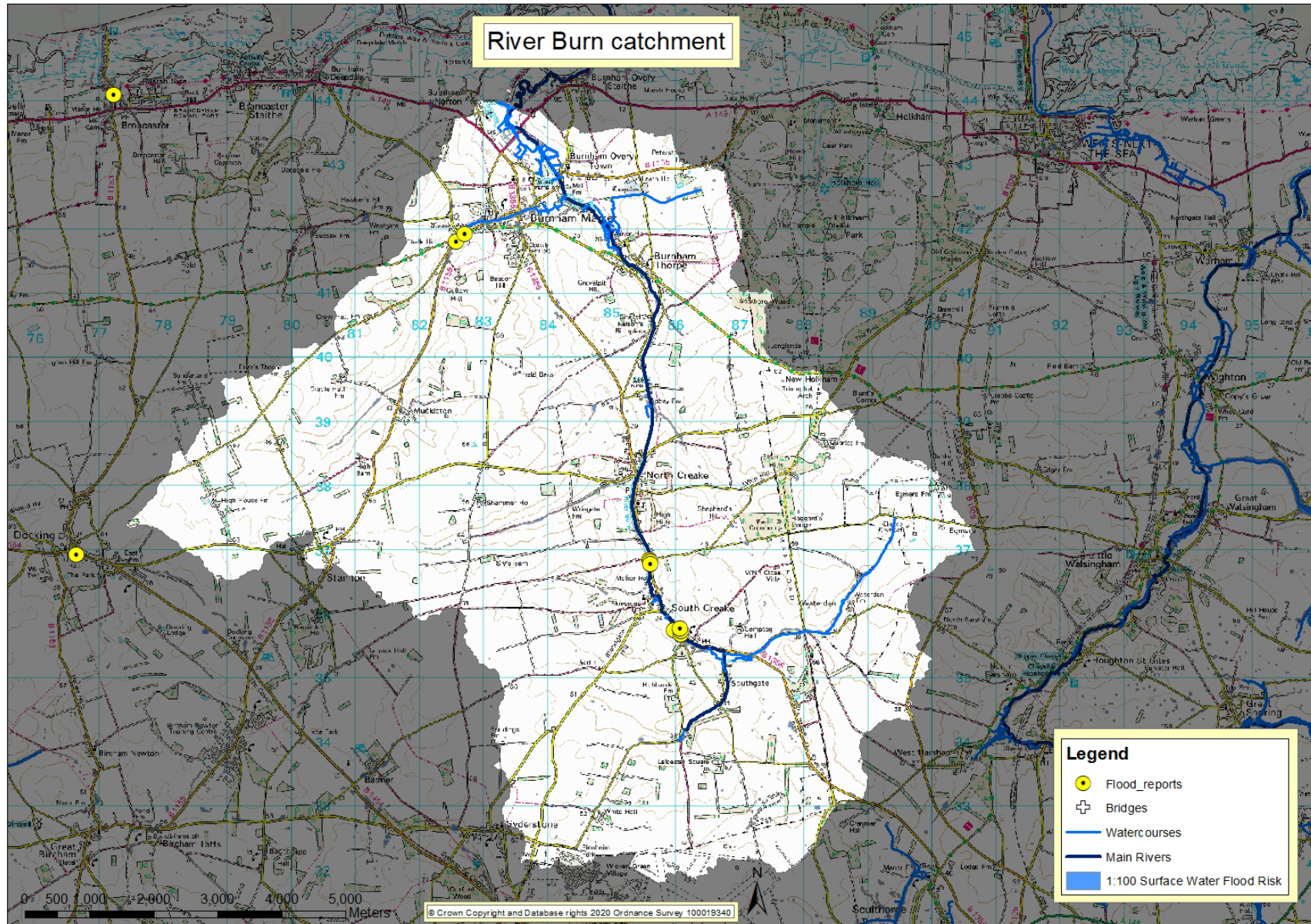
out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Butchers Lane</p> <p>Brancaster</p> <p>23/02/2021 & 17/02/2021</p>	<p>Unusually seasonably high groundwater levels in the area increased the level of risk of water inundation. Water seeped through the flooring and flooded the properties.</p> <p>Water was pumped from a neighbouring property into the drainage network. This overloaded the system and exacerbated the flooding at the affected properties.</p> <p>Minor development in close proximity to affected properties manages their surface water run-off in the form of soakaways which could have exacerbated the groundwater levels and directed flow towards affected properties.</p>	<ul style="list-style-type: none"> Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. 	<p>Property owners</p> <p>Norfolk County Council (LLFA)</p>

Flooding and flood risk within the River Burn catchment (South Creake and Burnham Market)



Description of catchment

The chalk-fed River Burn flows south to north through a low-lying rural catchment, passing through several small villages before discharging into the salt marshes of Holkham National Nature Reserve.

The majority of the Burn is classed as an Environment Agency Main River, but other tributaries feed into the river such as Goose Beck in Burnham Market.

Flood Risk within the catchment

The flood risk from local sources (ordinary watercourses and surface run-off) and strategic sources (fluvial above 3 square km and the sea) of flooding within this catchment has been assessed. The number of properties at risk are set out in the table below for two different risk bandings, the 1 in 30 event and the 1 in 100 event. This assessment does not take into account flood risk from groundwater or reservoir failure.

Flood Risk Data Source	Critical Services	Residential	Non-residential
[a] Number of properties subject to surface water flood risk at 1 in 30 event:	1	14	0
[b] Number of properties subject to surface water flood risk at 1 in 100 event:	1	117	44
[c] Number of properties subject to flood risk from rivers and the sea at 1 in 30 event:	5	169	28
[d] Number of properties subject to flood risk from rivers and the sea at 1 in 100 event:	6	198	35
[e] Number of properties only subject to both flood risk from surface water and rivers and the sea (combined risk) at 1 in 30 event:	0	2	0
[f] Number of properties only subject to both flood risk from surface water and rivers and the sea (combined risk) at 1 in 100 event:	0	34	6

Flood incidents within this catchment

Within this catchment 9 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
01/02/2021	On the 01/02/2021 - 1 property was internally flooded on Burnham Road, South Creake. This incident was reported by	King's Lynn IDB carried out measures to minimise the impact of flooding during the incident.

Date of Incident	Incident as reported	What was the response to the flood incident
	<ul style="list-style-type: none"> a resident via email correspondence on the 3/03/2021, (4255) 	
20/01/2021	<p>On the 20/01/2021 - 1 property was internally flooded on Burnham Road, South Creake. This incident was reported by</p> <ul style="list-style-type: none"> a resident via email correspondence on the 20/01/2021, (3878) 	Anglian Water Services Ltd responded and pumped out during the incident.
19/01/2021	<p>On the 19/01/2021 - 1 property was internally flooded on Burnham Road, South Creake. This incident was reported by</p> <ul style="list-style-type: none"> a resident via email correspondence on the 4/03/2021, (4276) 	The Environment Agency carried out measures to minimise the impact of flooding during the incident.
06/02/2021	<p>On the 06/02/2021 - 2 properties were internally flooded on Front Street, South Creake. These incidents were reported by</p> <ul style="list-style-type: none"> a resident via an online flood report form on the 18/02/2021, (4225) a resident via an online flood report form on the 16/02/2021, (4127) 	<p>Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.</p> <p>Anglian Water Services Ltd responded and pumped out during the incident.</p>
19/01/2021	<p>On the 19/01/2021 - 1 property was internally flooded on Front Street, South Creake. This incident was reported by</p> <ul style="list-style-type: none"> a resident via an online flood report form on the 9/02/2021, (4088) 	A resident carried out measures to minimise the impact of flooding during the incident.
05/01/2021	<p>On the 05/01/2021 - 1 property was internally flooded on Back Street, South Creake. This incident was reported by</p> <ul style="list-style-type: none"> a resident via email correspondence on the 4/03/2021, (4261) 	Norfolk County Council (Highways) responded and pumped out during the incident.
06/02/2021	<p>On the 06/02/2021 - 1 property was internally flooded on Docking Road, Burnham Market. This incident was reported by</p>	<p>Anglian Water Services Ltd responded and pumped out during the incident.</p> <p>King's Lynn IDB responded and pumped out during the incident.</p>

Date of Incident	Incident as reported	What was the response to the flood incident
	<ul style="list-style-type: none"> a resident via email correspondence on the 19/02/2021, (4230) 	The Fire and Rescue Service responded and pumped out during the incident.
03/02/2021	<p>On the 03/02/2021 - 1 property was internally flooded on Church Walk, Burnham Market. This incident was reported by</p> <ul style="list-style-type: none"> a resident via an online flood report form on the 3/02/2021, (4072) 	<p>Norfolk County Council (Highways) responded and pumped out during the incident.</p> <p>Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information during the incident.</p> <p>The Environment Agency carried out measures to minimise the impact of flooding during the incident.</p>

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

The rain gauges did not measure any significant rainfall on these dates. However January was a wet month with an exceptionally high rainfall level. East Anglia as a whole received a total average rainfall of 192mm which is 182% of the Long Term Average. This continued into February which saw East Anglia receive 112% of the Long Term Average of rainfall. All groundwater indicator sites across the region reported exceptionally high levels.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding Church Walk or Docking Road, Burnham Market. The Lead Local Flood Authority has no previous reports of internal flooding in South Creake.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and

where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

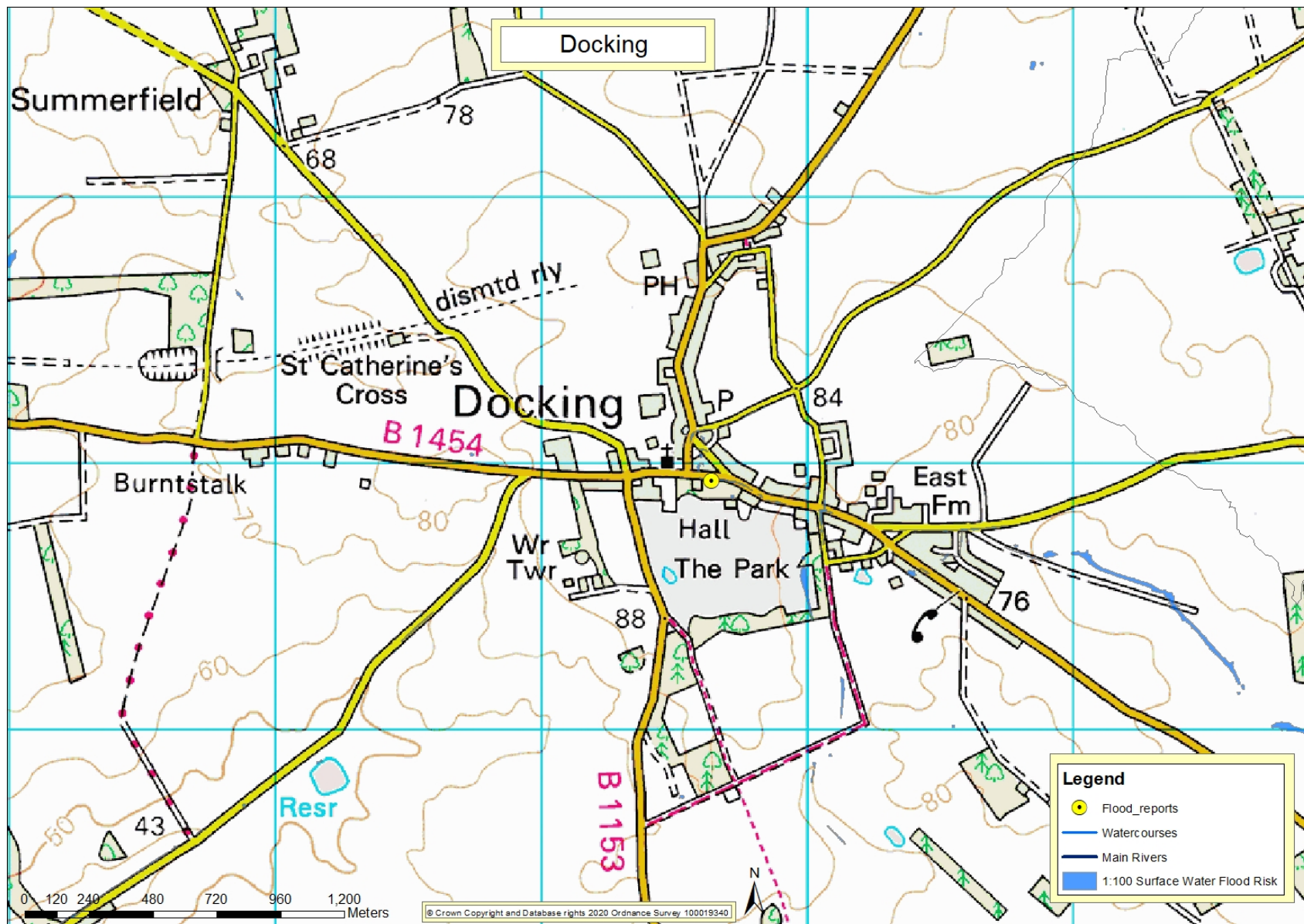
Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Burnham Road</p> <p>South Creake</p> <p>20/01/2021 & 01/02/2021 & 19/01/2021</p>	<p>Surface run-off from rainfall flowed off adjacent fields into the watercourse and river which were partially obstructed by high water levels downstream. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.</p> <p>Public sewer was also reported to be flooding indicating possible infiltration of groundwater via manholes (via keyholes) or direct ingress into pipes via misjointing.</p> <p>The flooding may have been exacerbated by high-water levels (flood flows) in the watercourse which was especially high. This may have caused the performance of other systems to decrease due to surcharged outfalls or worse suffer from reverse flows.</p>	<ul style="list-style-type: none"> Norfolk County Council will investigate with third parties a partnership funding solution to mitigate the risk experienced at this location. This could be either through submission of a bid to secure Partnership funding or through negotiation with other organisations and the local community. It is important to note this recommendation will be subject to the priorities and availability of resources of funders. It may be dependent on those property owners affected contributing towards a solution. Anglian Water should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events. This could include a range of measures e.g. Anglian Water to investigate sealing manholes or using low-leak lids where safe to do so. Checks should be undertaken to ensure that no residual flooding elsewhere in the system by sealing problem manholes. 	<p>Anglian Water</p> <p>Norfolk County Council (LLFA)</p> <p>Local landowners</p>

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Front Street 06/02/2021 & 19/01/2021</p> <p>Back Street 05/01/2021</p> <p>South Creake</p>	<p>Surface run-off from rainfall flowed off adjacent fields and made its way onto the highway. It then flowed along the road network and onto the accesses of affected properties that were situated lower than these features.</p> <p>Local observations witnessed the river overtopped its banks leading to flood water ingress into the affected properties.</p> <p>Infiltration from groundwater and run-off from rainfall was directed towards the surface water and foul drainage networks. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected properties.</p>	<ul style="list-style-type: none"> • Anglian Water should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their drainage system in flood events. This could include a range of measures e.g. Anglian Water to investigate sealing manholes or using low-leak lids where safe to do so. Checks should be undertaken to ensure that no residual flooding elsewhere in the system by sealing problem manholes. • Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. • Amendments should be made to neighbouring land to ensure water is not directed towards properties. 	<p>Anglian Water</p> <p>Norfolk County Council (LLFA)</p> <p>Property owners</p>

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Docking Road, 06/02/2021</p> <p>Church Walk, 03/02/2021</p> <p>Burnham Market</p>	<p>Infiltration from groundwater and run-off from rainfall was directed towards the ordinary watercourse. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected properties.</p> <p>Surface run-off from rainfall and underground springs flowed off adjacent fields and the highway and onto the accesses of affected properties that were situated lower than these features.</p> <p>A culvert in the watercourse created a pinch point and caused the water to overtop and flow down the highway towards the affected properties.</p> <p>Run off was directed towards an attenuation pond. This attenuation/ pond feature has no exceedance flow system. This caused the pond to overtop and direct flood water towards the affected properties.</p>	<ul style="list-style-type: none"> Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Norfolk County Council should investigate installing a positive outfall in the pond into the ordinary watercourse. Review if it is possible to link the pond to the Goose Beck more formally, along with exceedance flow paths, which may be able to be re-routed through the doctor's surgery site, which is to be redeveloped to housing. A detailed camera and GPS survey of the culverts should be undertaken to record its condition and precise route / location. Trash screen on Goose Beck should be replaced with a sloping screen to aid maintenance Norfolk County Council should review options for an NFM scheme to store water at the top of the goose beck. Overland flows should also be reviewed as part of this project. 	<p>Property owners</p> <p>Norfolk County Council (LLFA)</p> <p>Norfolk County Council (Highways)</p> <p>Parish Council</p> <p>Environment Agency</p> <p>Internal Drainage Board</p>

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
		<ul style="list-style-type: none"> • Norfolk County Council Highways should review road cambers as part of the repair work necessary to ensure cambers are used as much as possible to divert water away from properties. • Environment Agency should review main river maintenance required in this location and the rivers risk rating. • Environment Agency should review repairs required to spillway. • Internal Drainage Board should maintain the low level drainage system and to review condition proactively ahead of flooding season. 	

Flooding and flood risk in Docking



Flood incidents in Docking

Within Docking 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
14/01/2021	On the 14/01/2021 - 1 property was internally flooded on Chequers Street, Docking. This incident was reported by <ul style="list-style-type: none"><li data-bbox="507 680 890 786">• a resident via an online flood report form on the 18/01/2021, (3845)	Norfolk County Council (Highways) carried out maintenance work to the highway drainage system after the incident. This included a survey of the highway drainage system which established that the drainage system serving the highway was not discharging into the properties cellar. A resident carried out measures to minimise the impact of flooding during the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding on Chequers Street, Docking.

Causes of flooding within the catchment and recommendations

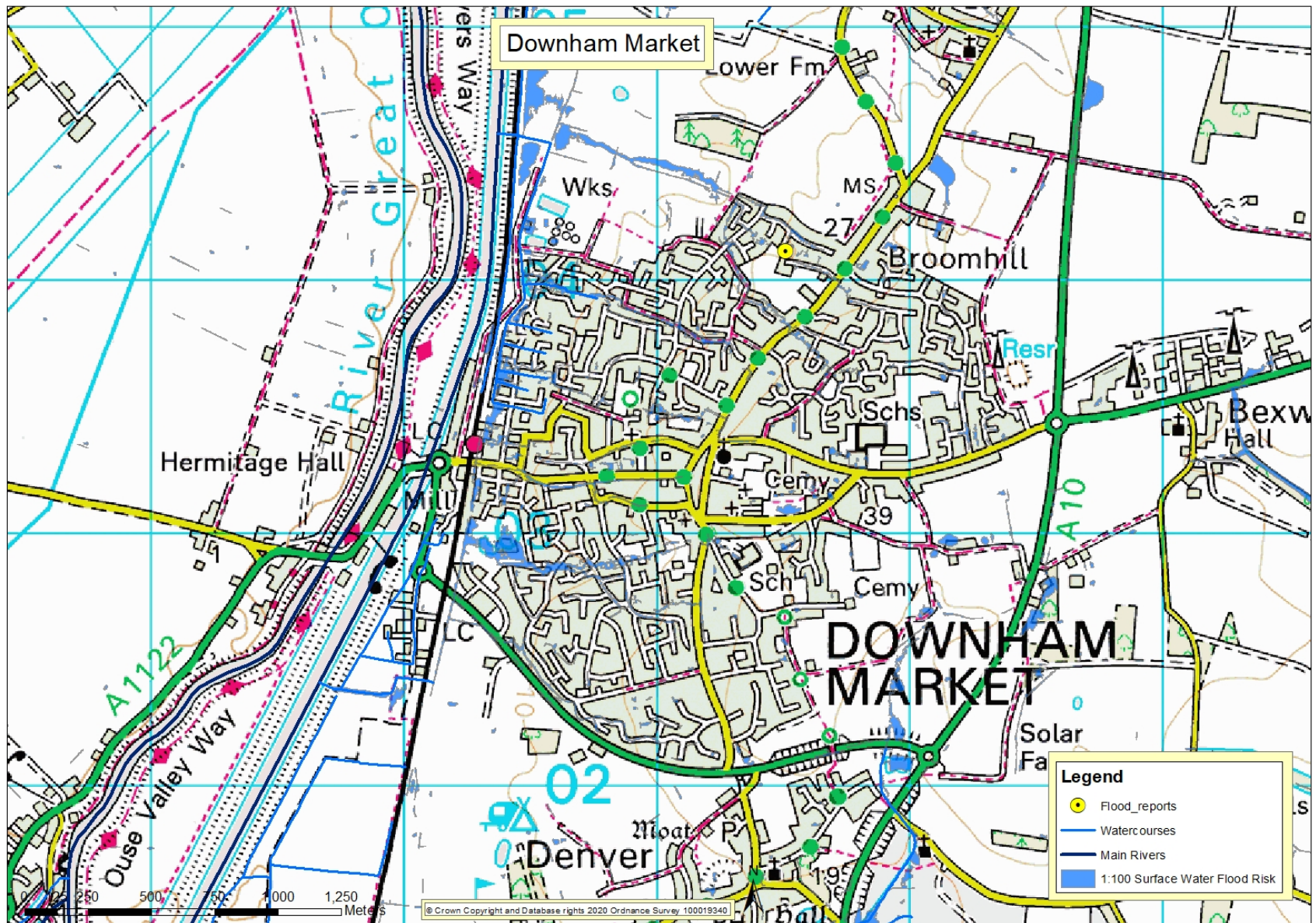
The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Chequers Street Docking 14/01/2021</p>	<p>It was suggested by the affected resident that the highway surface water drainage system was damaged and this caused water to make its way in to affected property via the cellar.</p> <p>Unusually seasonably high groundwater levels in the area increased the level of risk of water inundation to underground structures such as cellars, basements etc.</p>	<ul style="list-style-type: none"> Norfolk County Council should carry out maintenance works on their system and identify if there is any connection to the property affected. (Since the event NCC have carried out investigations in relation to their drainage system) Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. 	<p>Norfolk County Council (LLFA)</p> <p>Property owner</p> <p>Norfolk County Council (Highways)</p>

Flooding and flood risk in Downham Market



Flood incidents in Downham Market

Within Downham Market 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
23/12/2020	On the 23/12/2020 - 1 property was internally flooded on Kingfisher Road, Downham Market. This incident was reported by <ul style="list-style-type: none">• a District Councillor via email correspondence on the 3/02/2021, (4073)	The Borough Council of King's Lynn and West Norfolk visited affected residents to offer advice and to gather information during the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding on Kingfisher Road, Downham Market.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.

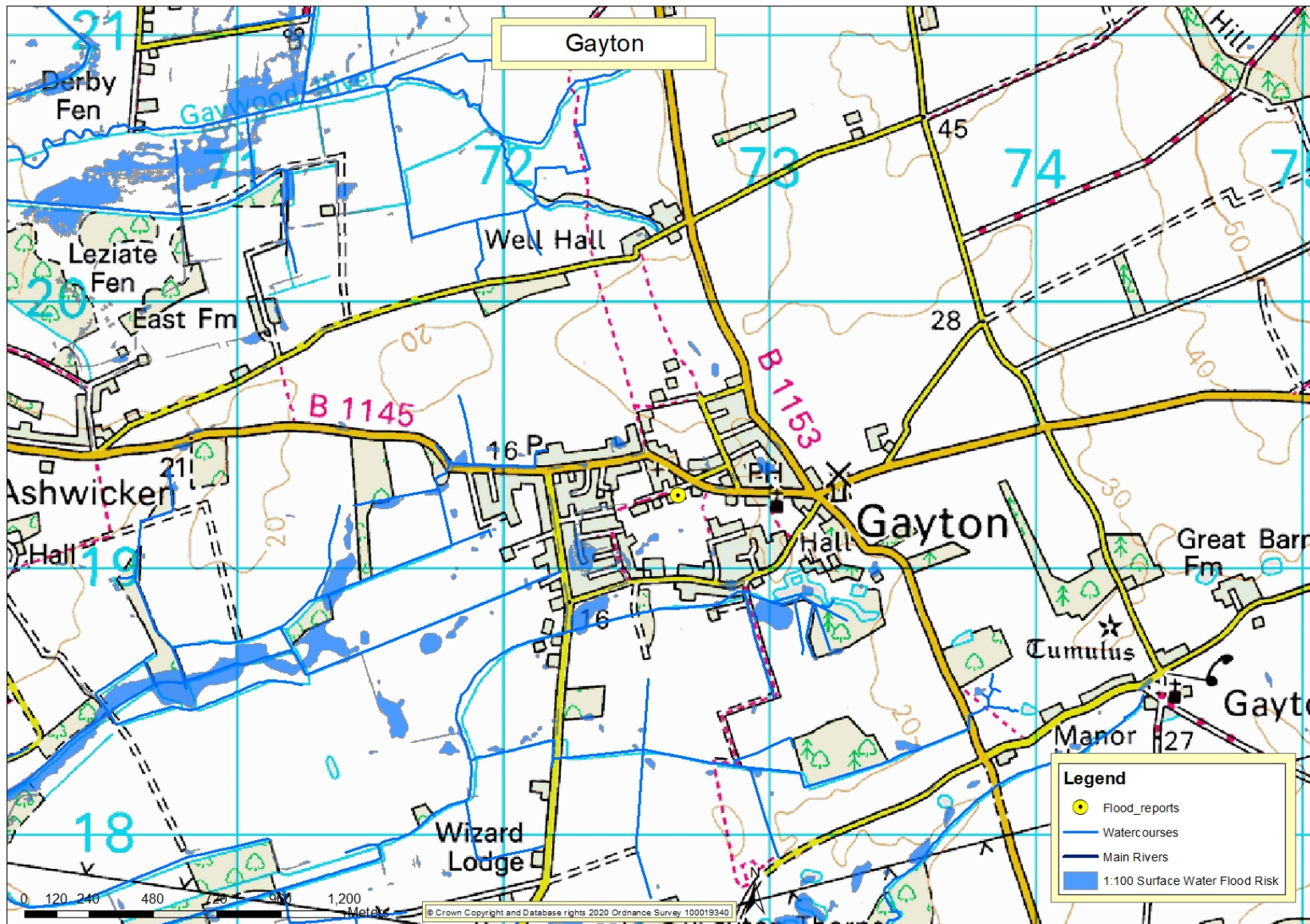
- review the appropriateness of their response to flooding.
- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.

- Property owners of affected properties should seek their own legal advice.

- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Kingfisher Road Downham Market 23/12/2020</p>	<p>Surface run-off from rainfall made its way onto private tracks and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.</p>	<ul style="list-style-type: none"> Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. 	<p>Landowners Norfolk County Council (LLFA)</p>
<p>Kingfisher Road Downham Market 23/12/2020</p>	<p>Water was directed from an adjacent piece of land that was previously permeable but has been altered into a private impermeable drive.</p>	<ul style="list-style-type: none"> The adjacent neighbouring property owners could consider opportunities to route flood water on the private road away from affected properties to alternative points of discharge, or other solutions as practicable. 	<p>Property owners</p>

Flooding and flood risk in Gayton



Flood incidents within Gayton

Within Gayton 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
28/01/2021	On the 28/01/2021 - 1 property was internally flooded on Vicarage Lane, Gayton. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 1/02/2021, (4103)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

RAINFALL DATA TO BE ADDED.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding on Vicarage Lane, Gayton.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

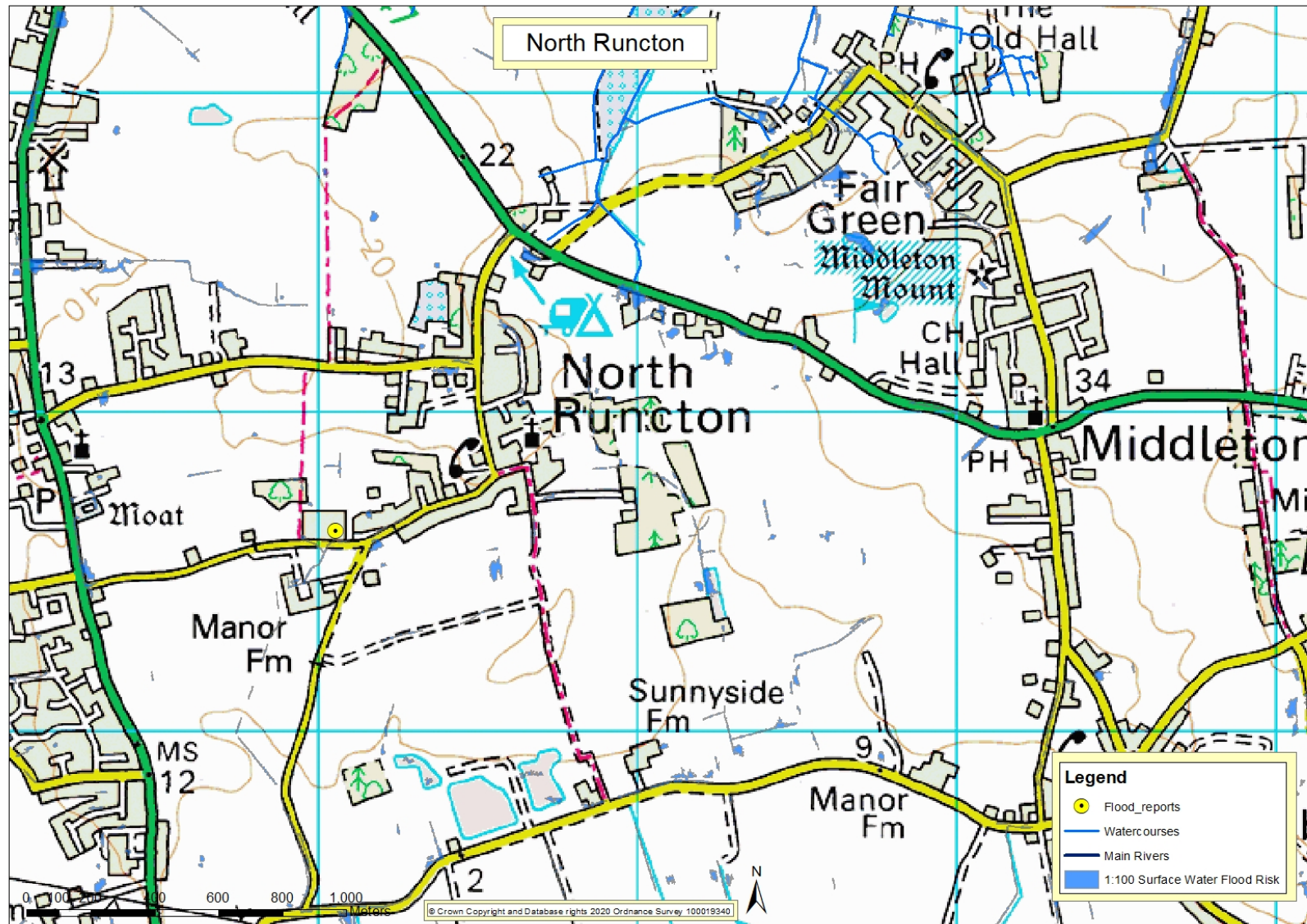
Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.

- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
Vicarage Lane Gayton 28/01/2021	The flood Water entered via below ground structures (i.e. basements and cellars).	Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. Property Owners should consider the potential to retrofit permeable areas and other methods of small scale sustainable drainage systems.	Norfolk County Council (LLFA)

Flooding and flood risk in North Runcton



Flood incidents in North Runcton

Within North Runcton 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
19/01/2021	On the 19/01/2021 - 1 property was internally flooded on Chequers Lane, North Runcton. This incident was reported by <ul style="list-style-type: none">the Fire and Rescue Service via an electronic report on the 15/02/2021, (4198)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in North Runcton.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.

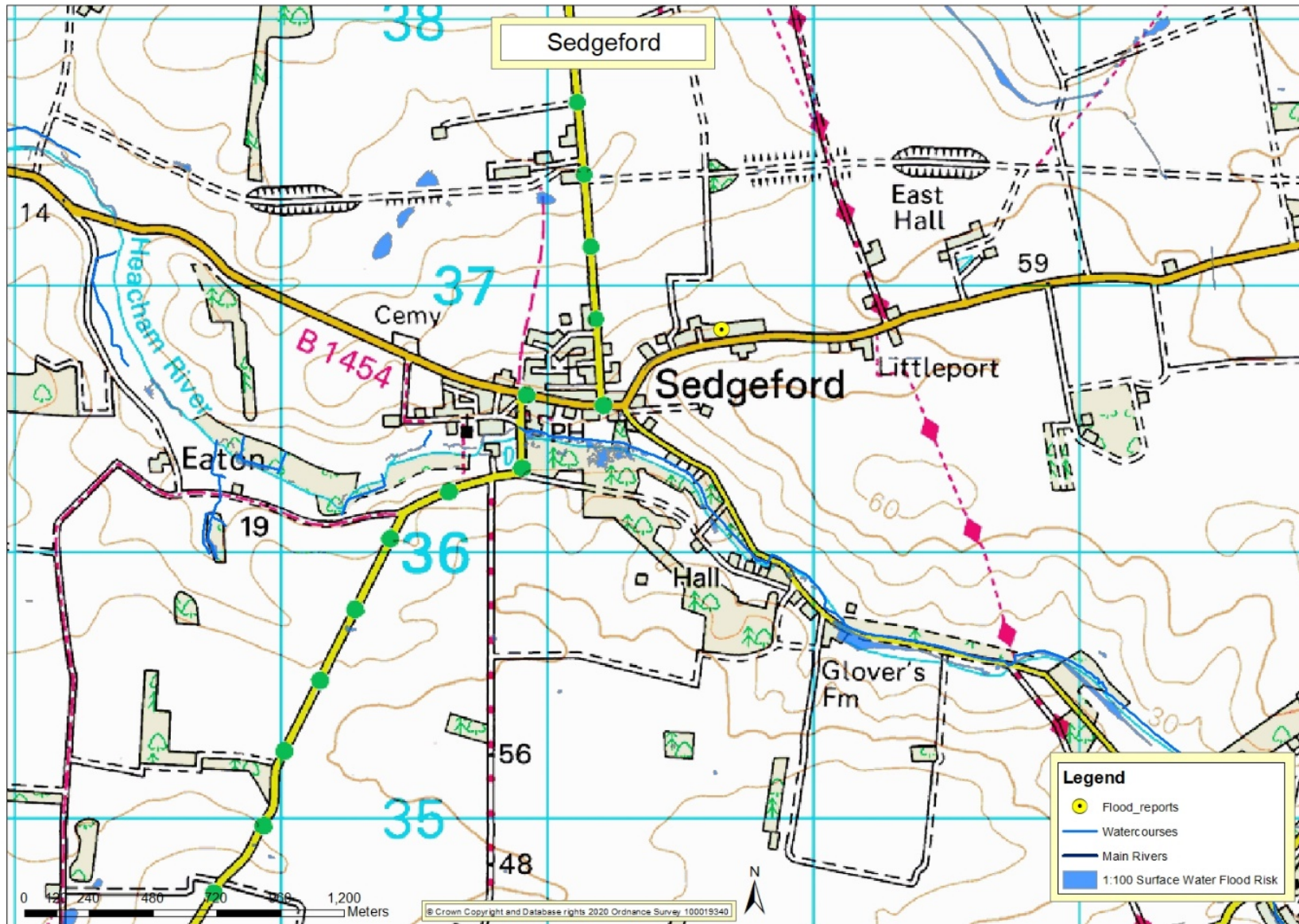
- review the appropriateness of their response to flooding.
- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.

- Property owners of affected properties should seek their own legal advice.

- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Chequers Lane North Runcton 24/12/2020</p>	<p>Infiltration from groundwater was directed towards the surface water drainage network. These flows could not be accommodated as the system was already overloaded.</p> <p>Due to the saturation of soils localised ground conditions caused groundwater to seep into the property via the floors.</p>	<p>Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. Property Owners should consider the potential to retrofit permeable areas and other methods of small scale sustainable drainage systems.</p>	<p>Property owner</p>

Flooding and flood risk in Sedgeford



Flood incidents within Sedgeford

Within Sedgeford 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
06/02/2021	On the 06/02/2021 - 1 property was internally flooded on Docking Road, Sedgeford. This incident was reported by <ul style="list-style-type: none">the Fire and Rescue Service via an electronic report on the 15/03/2021, (4347)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident. The Fire and Rescue Service responded and pumped out after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in Sedgeford.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

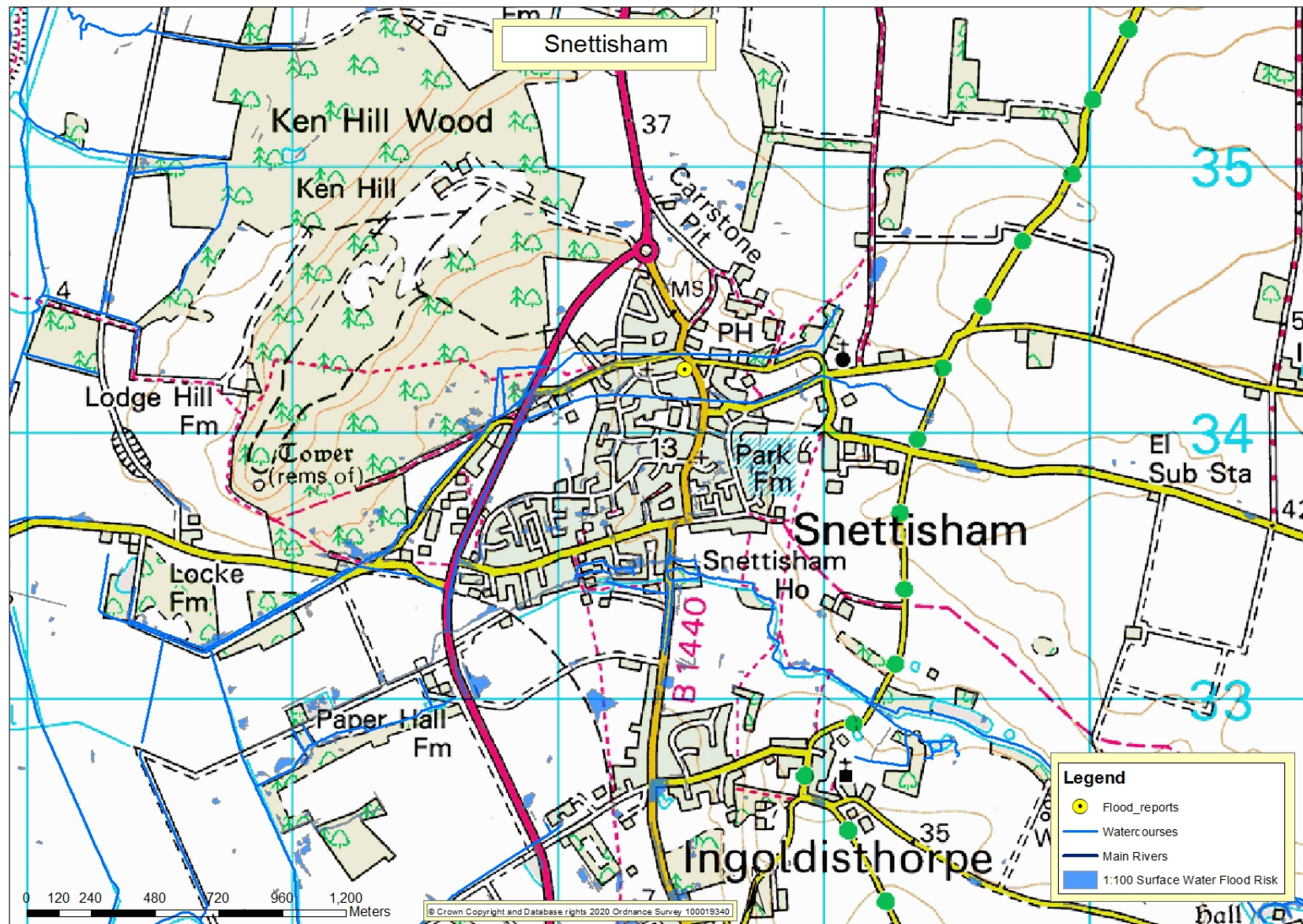
Following flooding to people, property and infrastructure

- Risk Management Authorities should

- communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
Docking Road Sedgeford 06/02/2021	Surface run-off from rainfall flowed off adjacent fields and onto the accesses of affected properties that were situated lower than these features.	<ul style="list-style-type: none"> • Amendments should be made to neighbouring land to ensure water is not directed towards properties. • Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. 	Local landowner Norfolk County Council (LLFA)

Flooding and flood risk in Snettisham



Flood incidents in Snettisham

Within Snettisham 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
07/02/2021	On the 07/02/2021 - 1 property was internally flooded on Lynn Road, Snettisham. This incident was reported by <ul style="list-style-type: none">a resident via email correspondence on the 11/02/2021, (4078)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding on Lynn Road, Snettisham.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

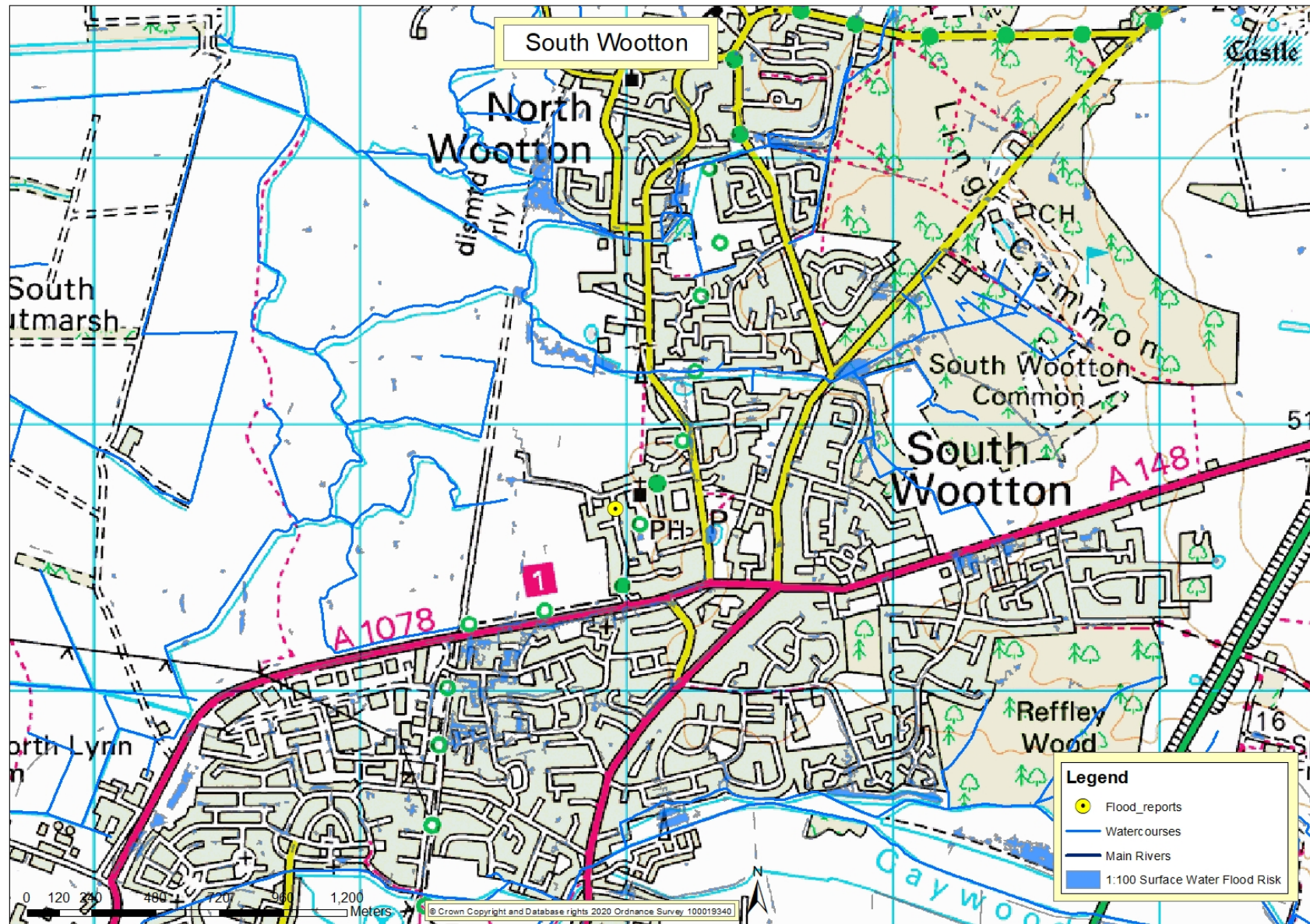
Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.

- review the appropriateness of their response to flooding.
- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
Lynn Road Snettisham 07/02/2021	The flood Water entered via below ground structures e.g. basements. This was due to the significantly high ground water levels from saturated soil/	<ul style="list-style-type: none"> Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council (LLFA) will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. Property Owners should consider the potential to retrofit permeable areas and other methods of small scale sustainable drainage systems. 	Norfolk County Council (LLFA) and property owner

Flooding and flood risk in South Wootton



Flood incidents within South Wootton

Within South Wootton 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
25/01/2021	On the 25/01/2021 - 1 property was internally flooded on Hall Lane, South Wootton. This incident was reported by <ul style="list-style-type: none">a District Councillor via email correspondence on the 2/02/2021, (4049)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in South Wootton.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.

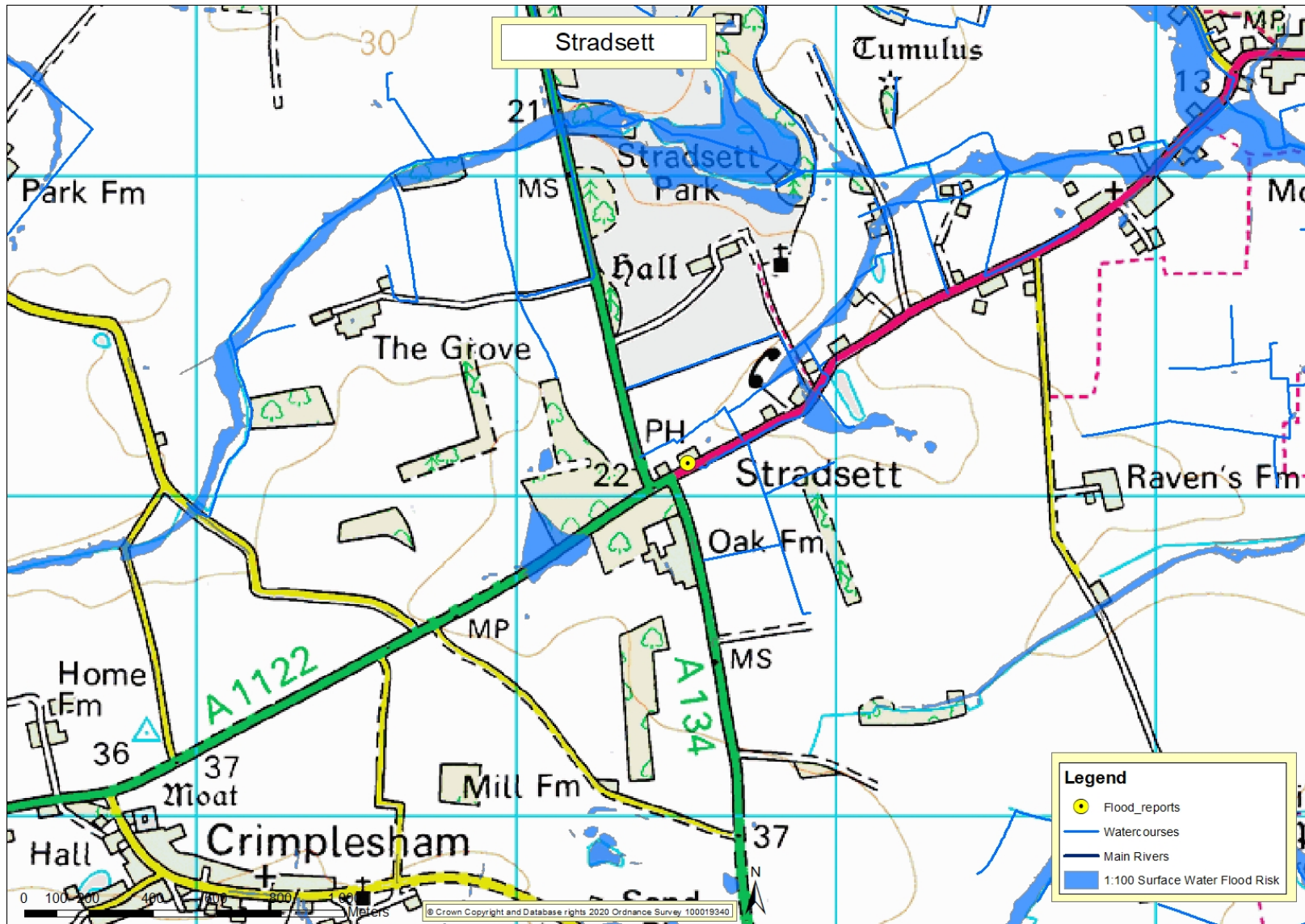
- review the appropriateness of their response to flooding.
- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.

- Property owners of affected properties should seek their own legal advice.

- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Hall Lane South Wooton 25/01/2021</p>	<p>The watercourse was partially obstructed by structural failure. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.</p> <p>Due to the saturation of soils localised ground conditions caused run-off to be directed quickly from where it fell as rain to the areas of flooding.</p>	<ul style="list-style-type: none"> Norfolk County Council could support the resident in identifying the integrity of the watercourse/surface water system and the property owners and this with riparian responsibilities should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e. tree leaves/roots) at all times. 	<p>Norfolk County Council Riparian owners</p>

Flooding and flood risk in Stradsett



Flood incidents in Stradsett

Within Stradsett 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
24/12/2020	On the 24/12/2020 - 1 property was internally flooded on Downham Road, Stradsett. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 31/01/2021, (3747)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in Stradsett.

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

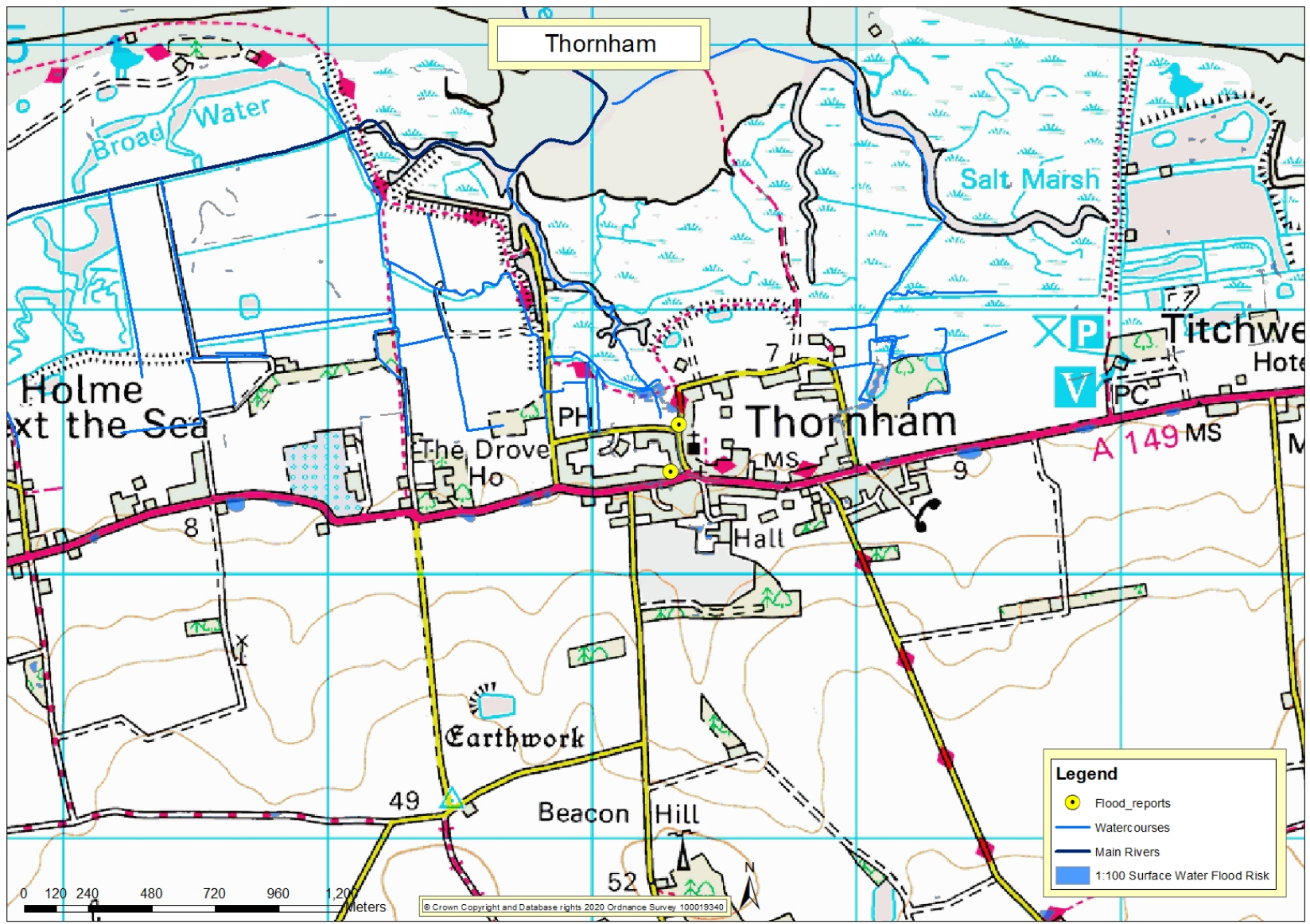
- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.

- review the appropriateness of their response to flooding.
- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Downham Road Stradsett</p>	<p>The highway surface water drainage system network was fully obstructed debris. This [reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.</p> <p>Run-off from rainfall was directed towards the surface water/foul drainage network. These flows could not be accommodated as the system was already overloaded. The system currently discharges into a pond which was in of itself at significantly high levels but it is not clear if this is just due to groundwater levels or the lack of maintenance of the pond that the system discharges into.</p> <p>Due the saturation of soils localised ground conditions caused run-off to be directed quickly from where it fell as rain to the areas of flooding.</p> <p>Due the saturation of soils localised ground conditions caused run-off to be</p>	<ul style="list-style-type: none"> Norfolk County Council (Highways) will review the capacity & level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified. Norfolk County Council (LLFA) will determine an appropriate maintenance regime in line with the risk identified and communicate with affected parties and riparian owners. Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. 	<p>Norfolk County Council (Highways)</p> <p>Norfolk County Council (LLFA)</p> <p>Property owners</p>

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
	directed quickly from where it fell as rain to the areas of flooding.	Property Owners should consider the potential to retrofit permeable areas and other methods of small scale sustainable drainage systems.	

Flooding and flood risk in Thornham



Flood incidents in Thornham

Within this catchment 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
02/02/2021	On the 02/02/2021 - 1 property was internally flooded on High Street, Thornham. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 1/03/2021, (4264)	Norfolk County Council (Lead Local Flood Authority) Norfolk County Council assessed validity and impact of the flood report after the incident.
25/01/2021	On the 25/01/2021 - 1 property was internally flooded on Church Street, Thornham. This incident was reported by <ul style="list-style-type: none">a resident via email correspondence on the 5/03/2021, (4268)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident. A resident carried out measures to minimise the impact of flooding during the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in Thornham.

Causes of flooding within the catchment and recommendations

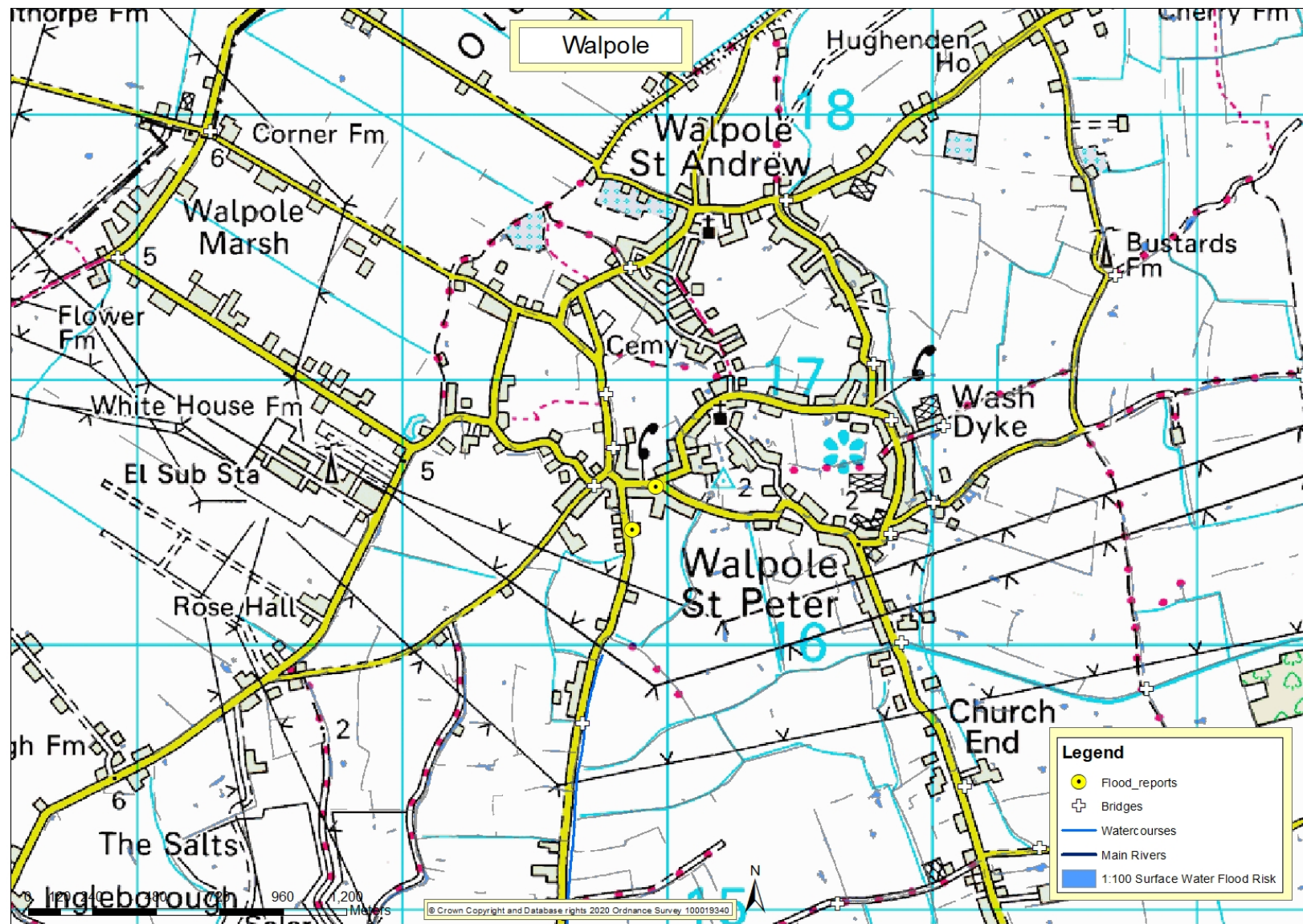
The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>High Street, 02/02/2021</p> <p>Church Street, 25/01/2021</p> <p>Thornham</p>	<p>Unusually seasonably high groundwater levels and surface run-off from rainfall were directed towards the foul drainage network. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected properties.</p>	<p>Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps.</p>	<p>Property owners</p> <p>Norfolk County Council (LLFA)</p>

Flooding and flood risk in Walpole



Flood incidents in Walpole

Within Walpole 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
23/12/2020	On the 23/12/2020 - 1 property was internally flooded on West Drove North, Walpole. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 16/02/2021, (4130)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.
23/12/2020	On the 23/12/2020 - 1 property was internally flooded on Walnut Road, Walpole. This incident was reported by <ul style="list-style-type: none">a District Councillor via email correspondence on the 5/02/2021, (3742)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident. A resident carried out measures to minimise the impact of flooding after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding on West Drove North or Walnut Road, Walpole.

Causes of flooding within the catchment and recommendations

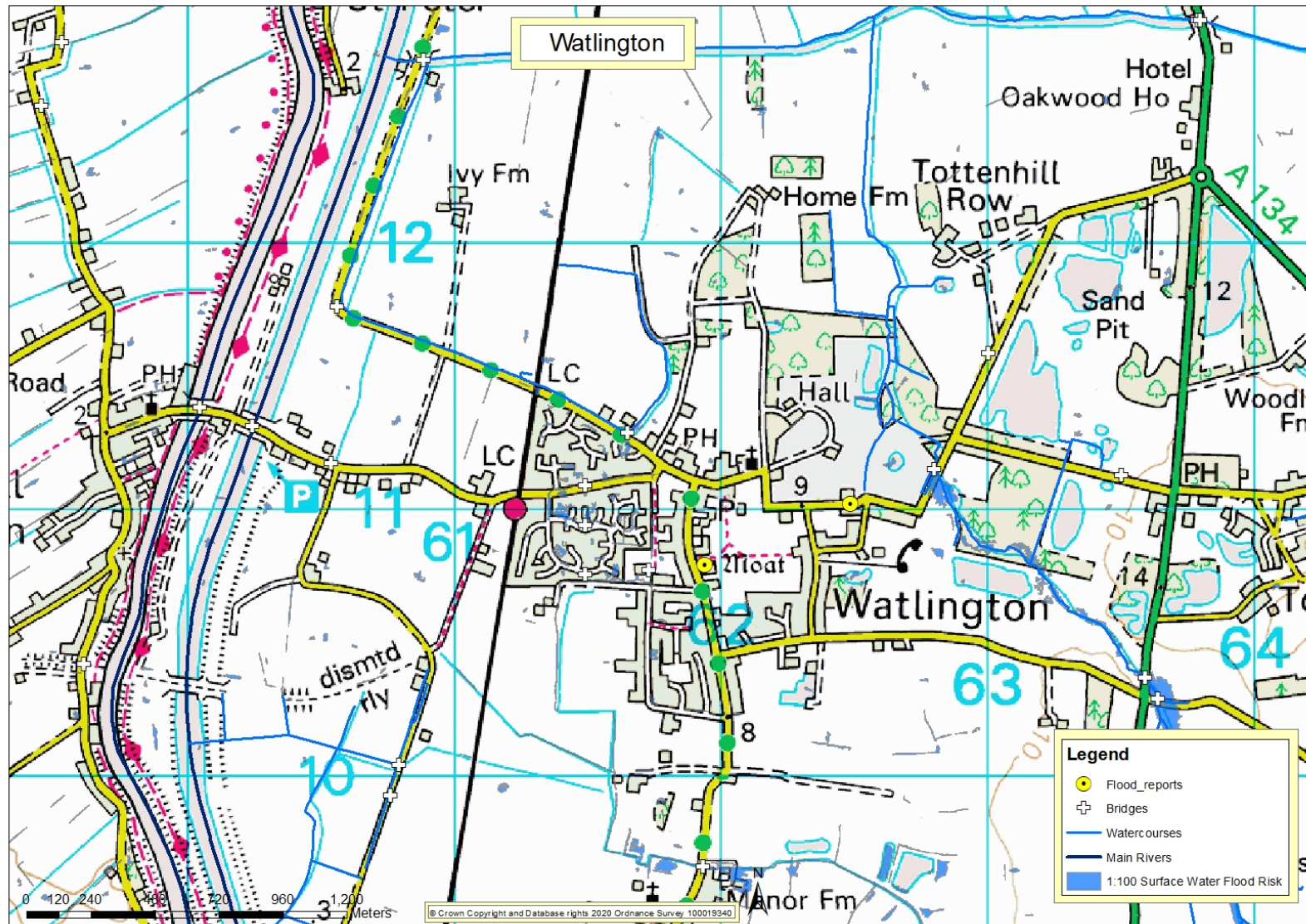
The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>West Drove North</p> <p>Walpole</p> <p>23/12/2020</p>	<p>Surface run-off from rainfall flowed off adjacent fields and into the surface water drainage network. These flows could not be accommodated as the network was already overloaded. Local anecdotes observed infilling of the drainage network.</p>	<ul style="list-style-type: none"> • Amendments should be made to neighbouring land to identify the potential; for managing the amount or rate of surface water entering the drainage system during flood events. • Norfolk County Council should investigate the ditch infilling and work with landowners to ensure free flow in the watercourse. 	<ul style="list-style-type: none"> • Local landowners • Norfolk County Council (LLFA)
<p>Walnut Road</p> <p>Walpole</p> <p>23/12/2020</p>	<p>Run off from rainfall was concentrated along overland flowpaths and pooled at a low point on which the affected property is positioned.</p> <p>Rainfall was directed into the surface water system causing it to surcharge in the garden of the affected property.</p>	<ul style="list-style-type: none"> • The property owner could confirm, where possible, the existence of any connections to a wider drainage network. This work should seek to confirm where the drainage network conveys flows to. 	<ul style="list-style-type: none"> • Property owner

Flooding and flood risk in Watlington



Flood incidents in Watlington

Within Watlington 2 incidents of internal flooding have been assessed as part of this investigation. These incidents are detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
21/01/2021	On the 21/01/2021 - 1 property was internally flooded on Downham Road, Watlington. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 6/02/2021, (4071)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.
21/01/2021	On the 21/01/2021 - 1 property was internally flooded on Lynn Road, Watlington. This incident was reported by <ul style="list-style-type: none">a resident via a flood questionnaire received on the 23/03/2021, (4344)	A resident carried out measures to minimise the impact of flooding after the incident. Anglian Water visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in Watlington..

Causes of flooding within the catchment and recommendations

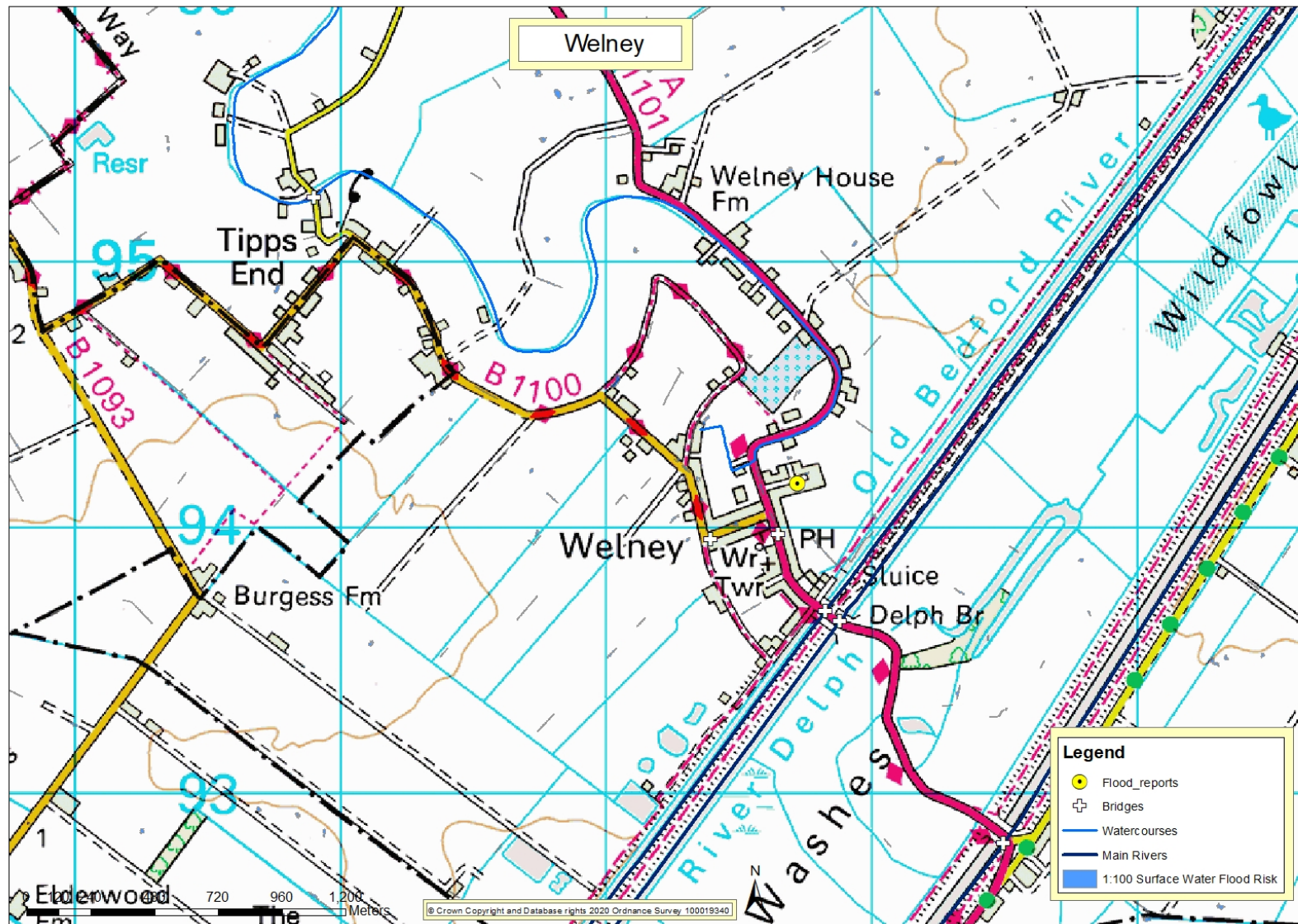
The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.
 - review the appropriateness of their response to flooding.
 - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Downham Road Watlington 21/01/2021</p>	<p>The foul drainage system was overloaded causing it to surcharge inside the affected property.</p>	<ul style="list-style-type: none"> • Anglian Water] will review the capacity & level of maintenance required to sustain the design efficiency of their drainage systems that serve the flooding location in line with the risk identified. Anglian Water should assess whether the capacity of the current system is able to provide protection that aligns with British standards. This may require a survey of the system being undertaken. 	<ul style="list-style-type: none"> • Anglian Water

Flooding and flood risk in Welney



Flood incidents in Welney

Within Welney 1 incident of internal flooding has been assessed as part of this investigation. This incident is detailed in the table below.

Date of Incident	Incident as reported	What was the response to the flood incident
23/12/2020	On the 23/12/2020 - 1 property was internally flooded on Chestnut Avenue, Welney. This incident was reported by <ul style="list-style-type: none">a resident via an online flood report form on the 23/12/2020, (3244)	Norfolk County Council (Lead Local Flood Authority) visited affected residents to offer advice and to gather information after the incident.

Recent rainfall within the catchment

This report seeks to draw on rainfall data to ascertain the intensity of the rainfall events experienced in the catchment that led to the flooding. This analysis is useful in assessing (in broad terms) if the design capacity of drainage systems within the affected areas was exceeded.

Norfolk County Council has sought to use data from rain gauges where incidents of flooding are located within a 2.5km radius of the instrumentation. This distance meets the requirements of British Standards and aims to capture localised rainfall patterns. Where there is no available data within this radius this will be stated.

There were no rain gauges within 2.5km of the incidents of flooding within this catchment.

Historic flooding incidents within the catchment

The Lead Local Flood Authority has no previous reports of internal flooding in Welney..

Causes of flooding within the catchment and recommendations

The findings of the investigation are detailed on the following pages. The first table details the causes that led to flooding within the catchment as well as when and where they were experienced. It also sets out which Risk Management Authorities have responsibility to help manage the causes of the flooding. The second table sets out recommendations to mitigate the causes and impacts of the flooding experienced within this catchment.

Following flooding to people, property and infrastructure

- Risk Management Authorities should
 - communicate with affected residents where their assets have given rise to the flooding of properties.

- review the appropriateness of their response to flooding.
- determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.
- Property owners of affected properties should seek their own legal advice.
- NCC should
 - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment (“PFRA”).
 - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Who has responsibilities to manage the cause(s) of the flood?
<p>Chestnut Avenue</p> <p>Welney</p> <p>23/12/2020</p>	<p>The flood water entered the property through low thresholds at entrances.</p> <p>Seepage of groundwater onto above-ground structures (i.e. roads/private forecourts) was reported to a depth of approximately 7cm.</p>	<p>Property owners should protect their buildings through flood protection measures where appropriate. Norfolk County Council will communicate with local residents to advise them how they may apply for grants available. These grants are subject to a funding application. Property owners could also carry out their own measures where funding is not forthcoming or residents are unwilling to wait. Mitigation measures that can be installed in the property to reduce the impact of flooding could include tanking basements & installing sump pumps. Property Owners should consider the potential to retrofit permeable areas and other methods of small scale sustainable drainage systems.</p>	<p>Norfolk County Council (LLFA)</p>

Disclaimer

Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, we cannot guarantee that the contents will always be current, accurate or complete.

This report has been prepared as part of Norfolk County Council's responsibilities under the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by Norfolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

Norfolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and Norfolk County Council expressly disclaims responsibility for any error in, or omission from this report arising from or in connection with those opinions, conclusions and any recommendations.

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to the County Council highlighting flooding to properties at a street level.

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Appendix A - Key definitions and responsibilities

What is flooding?

Section 1 of the Flood and Water Management Act 2010 states that: “Flood” includes any case where land not normally covered by water becomes covered by water. In addition, this section adds the caveat: “But “flood” does not include – (a) a flood from any part of the sewerage system, unless wholly or partly caused by an increase in the volume of rainwater (including snow and other precipitation) entering or otherwise affecting the system, or (b) a flood caused by a burst water main (within the meaning given by Section 219 of the Water Industry Act 1991).”

What is internal and external flooding?

For the purposes of this report, properties that have internally flooded are those where it is considered that water has entered the fabric of the building;

- Basements and below ground level floors are included.
- Garages are included if in the fabric of the building. Garages adjacent or separate from the main building are not included.
- Occupied caravans are included but not tents.

External flooding included those properties where water has entered gardens or surrounding areas which restricts access, affects the highway or where flooding has disrupted essential services to the property such as sewerage. For businesses this includes those where the flood waters are directly preventing them trading as usual.

What is Local Flood Risk?

Local Flood Risk is defined by the Flood and Water Management Act 2010 as being flood risk from surface runoff, groundwater and ordinary watercourses.

- ‘Surface runoff’ means rainwater (including snow and other precipitation) which is on the surface of the ground (whether or not it is moving) and, has not entered a watercourse, drainage system or public sewer.
- ‘Groundwater’ means all water which is below the surface of the ground and in direct contact with the ground or subsoil.
- ‘Ordinary Watercourse’ means a watercourse that does not form part of a main river and includes a reference to a lake, pond or other area of water which flows into an ordinary watercourse.

What is a Catchment?

To aid the investigation process and, for ease of presentation, the incidents of flooding have been grouped within this document based on hydrological catchments. The purpose of viewing flooding incidents based on catchments reflects the reality that flooding does not respect the administrative boundaries of water management organisations. Hydrological catchments catch water and discharge it at locations known as outlets. Individual hydrological catchment boundaries are usually formed by ridges of surrounding higher ground, which separate the lower lying areas at a line known as a watershed.

Roles and Responsibilities of Risk Management Authorities

Below is a short summary of those groups and Risk Management Authorities ("RMAs") that have a role in managing flooding within Norfolk. The listing of responsibilities includes those duties or powers that directly relate to managing the flood incidents or consequence. All RMAs have a duty to cooperate with other RMAs.

1. Norfolk County Council (as Lead Local Flood Authority)

- Duty to investigate significant flooding from any source.
- Duty to maintain a register of structures or features which affect flood risk from all sources.
- Power to undertake works to manage flood risk from surface run-off and groundwater.
- Powers to regulate activities on ordinary watercourses outside of Internal Drainage Board areas.
- Duties as a Category 1 Responder for Emergency Planning and the Fire & Rescue Service.

2. District Councils

- Powers to undertake works on ordinary watercourses outside of IDB areas.
- The Local Planning Authority for their District area and determine the appropriateness of developments and their exposure and effect on flood risk.
- Duties as a Category 1 Responder for Emergency Planning.

3. Internal Drainage Boards ("IDBs")

- A duty to act in a manner consistent with the national and local strategies and guidance when exercising FCERM functions.
- Duty to act in a manner consistent with Local Flood Risk Management Strategies when exercising other functions that may affect flood risk.
- Powers to regulate activities on ordinary watercourses within IDB areas.
- Exercise a general power of supervision over all matters relating to the drainage of land within their district.
- Powers to undertake works on ordinary watercourses within IDB areas.

4. Highway Authorities (Norfolk County Council / Highways England)

- Powers to undertake works to manage water on the highway and to move water off the highway.
- Enforcement powers to unauthorised alterations, obstructions and interferences with highway drainage.
- Have responsibilities for culverts vested in the highway. Currently NCC discharges its responsibilities associated with bridges and culverts (whether as owner or highway authority) through the inspection of condition (undertaken by the Bridges team) and through maintenance activity (delivered on a as needs basis by the relevant Highways area team).

5. Water Companies

- Undertake cost beneficial capital schemes to alleviate or eliminate flooding where the flood event is associated with a failure of their assets.
- Duty to provide, improve, maintain and operate systems of public sewers and works for the purpose of effectually draining an area.
- Are responsible for flooding from their foul, combined and surface water sewers, and from burst water mains.
- Maintain 'At Risk Registers' for Ofwat that record properties that have flooded from public foul, combined and surface water sewers and that are at risk of flooding again.
- Water companies respond to reports from the public of flooding associated with their assets and determine an appropriate response in line with their standards or customer service.
- Duties as a Category 2 Responder for Emergency Planning.

6. Riparian Owners

- Duty of care towards neighbours upstream and downstream, avoiding any action likely to cause flooding.
- Entitled to protect their properties from flooding.
- May be required to maintain the condition of their watercourse to ensure that the proper flow of water is unimpeded.