Norfolk County Council

Addendum to Investigation Report: Flooding in Norfolk in Winter 2020/21

Report Reference: FIR066A

Report prepared by Mark Ogden, Nathalie Harris and John Mellows on 28 November 2022

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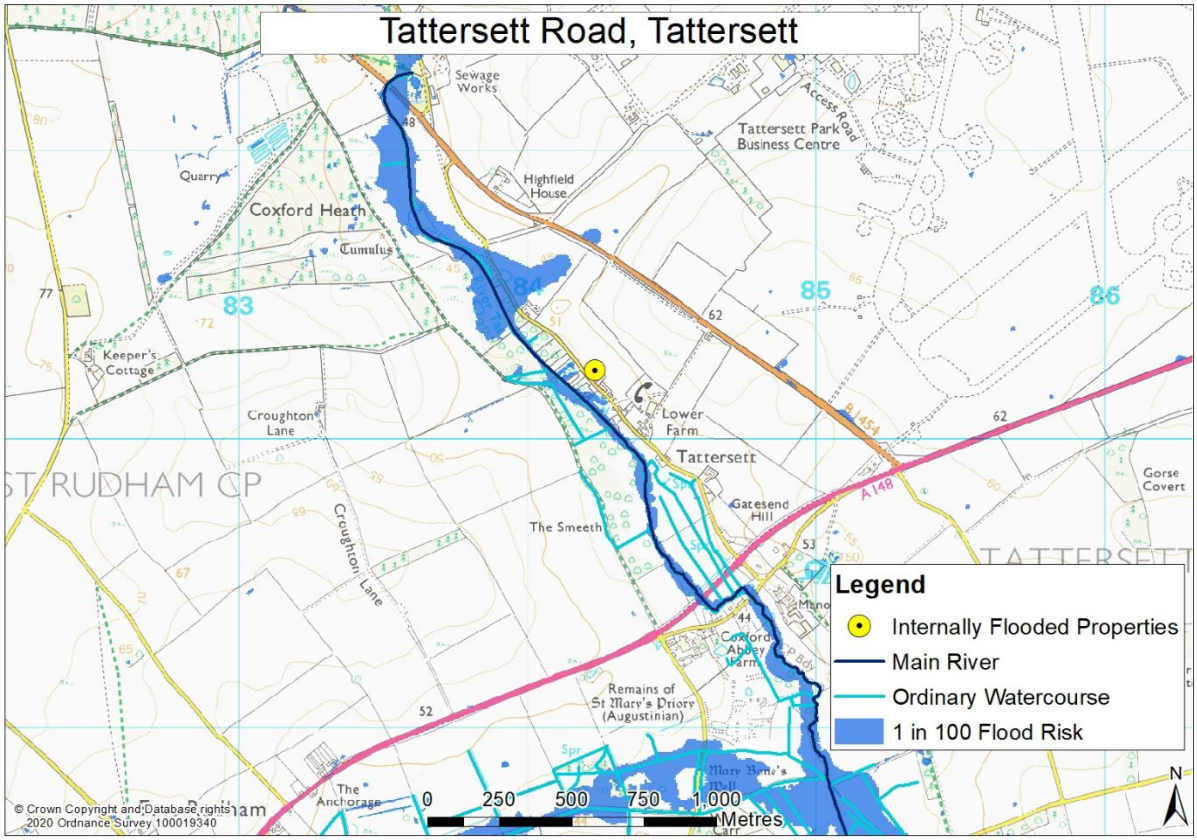
Introduction

This report is an addition to the original Flood Investigation Reports on the flooding that occurred across Norfolk on the 23 to 24 December 2020. The addition of this report is due to a number of properties having been reported as flooded to Norfolk County Council (LLFA) after the original report had been drafted and due to a number of instances of repeat flooding. A summary of the event and key recommendations can be found in the following FIR066 reports which have been published on the Norfolk County Council website:

1) Investigation Report into the flooding in Breckland District in Winter 2020-2021.
2) Investigation Report into the flooding in Broadland District during Winter 2020-2021.
3) Investigation Report into the flooding in Great Yarmouth Borough District in Winter 2020-2021.
4) Investigation Report into the flooding in King's Lynn & West Norfolk Borough in Winter 2020-2021.
5) Investigation Report into the flooding in North Norfolk District in Winter 2020-2021.
6) Investigation Report into the flooding in South Norfolk District in Winter 2020-2021.

North Norfolk District Council Area

Tattersett



Flood Incidents Within this Area

Within Tattersett one 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
01/02/2021	On the 01/02/2021 and again on the 15/02/2021 one property reported internal flooding on The Street, Tattersett. This incident was reported by a resident via an online flood report form on the 15/02/2021, (FWF/21/4170)	Norfolk County Council (Lead Local Flood Authority (LLFA)) visited affected residents to offer advice and to gather information after the incident. The Environment Agency assessed the capacity of their drainage system after the incident. Norfolk County Council (Highways) visited affected residents to offer advice and to gather information after the incident. Residents responded and pumped out 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 (LLFA) 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 Tattersett

Norfolk County Council (LLFA) has no previous reports of internal flooding in Tattersett.

Causes of Flooding 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 the following recommendations are made in three areas:

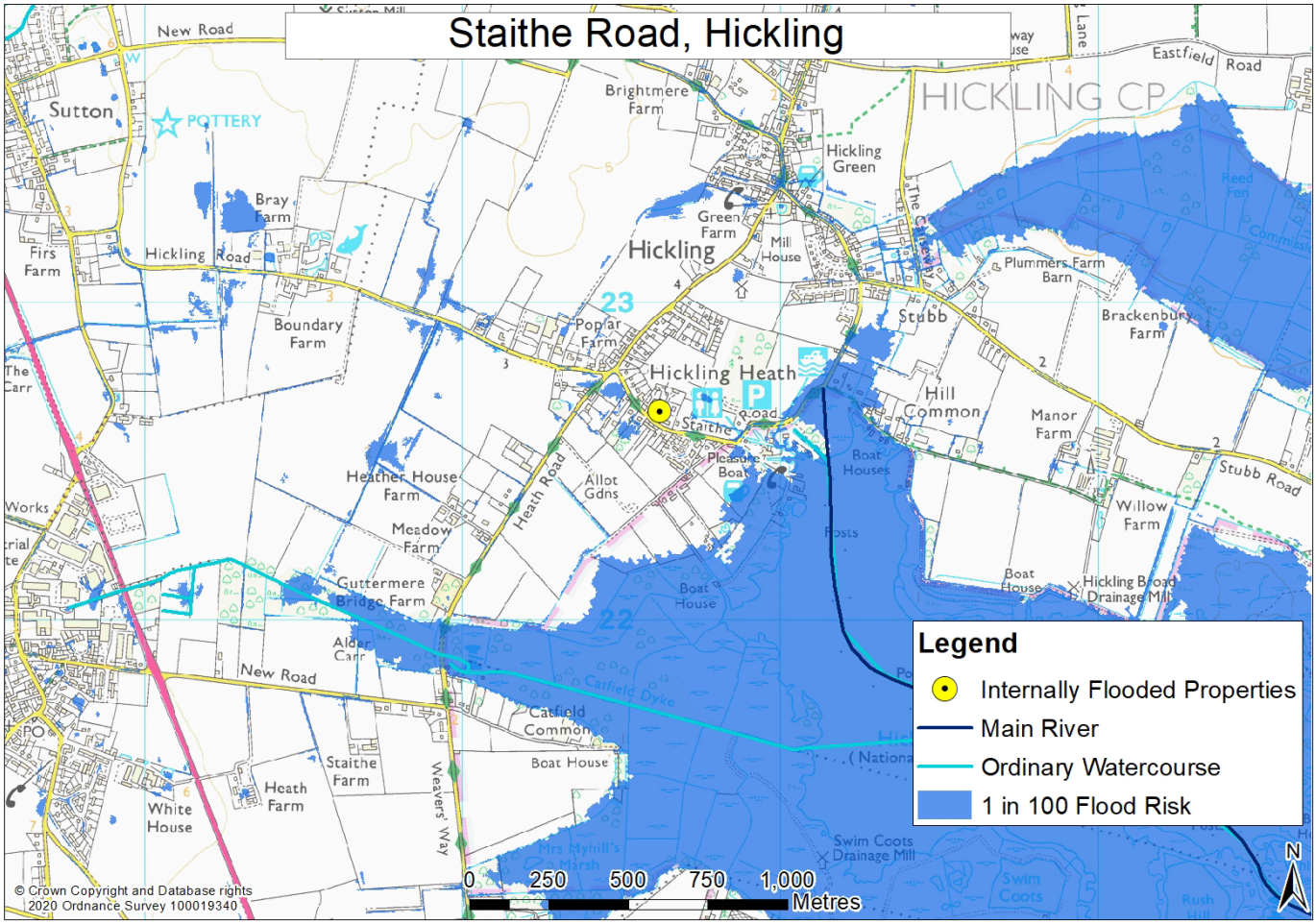
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
The Street, Tattersett, 01/02/2021 and 15/02/2021	A substantial amount of rain fell during the winter of 2020/21 onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. The flooding may have been exacerbated by high water levels in the river and high groundwater levels which were especially high. This may have caused the performance of other systems to decrease. Local observations witnessed the River Tat overtopped its banks leading to flood water ingress into the property.	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	Norfolk County Council (LLFA) Property owners

Hickling


Staithe Road, Hickling
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0 250 500 750 1,000
Metres
N
© Crown Copyright and Database rights 2020 Ordnance Survey 100019340
HICKLING CP
Hickling
Hickling Heath
Staithe
Sutton
Brightmere Farm
Hickling Green
Green Farm
Mill House
Bray Farm
Firs Farm
Hickling Road
Boundary Farm
Poplar Farm
Plummers Farm Barn
Brackenbury Farm
Stubb
Hill Common
Manor Farm
Stubb Road
Willow Farm
Boat Houses
Heather House Farm
Meadow Farm
Heath Road
Allot Gdns
Guttermere Bridge Farm
Boat House
Hickling Broad Drainage Mill
Alder Carr
New Road
Catfield Common
Staithe Farm
Heath Farm
White House
Weavers' Way
Swim Coots Drainage Mill
Eastfield Road
New Road
Reed Fen

Flood Incidents Within this Area

Within this area one 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
18/06/2021	On the 18/06/2021 one property reported internal flooding on Staithe Road, Hickling. This incident was reported by a resident via an online flood report form on the 21/06/2021, (FWF/21/4849)	Norfolk County Council (LLFA) 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 (LLFA) 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 Hickling rain gauge is within 2.5km of the incidents of flooding within this catchment. The rainfall data for the 18 June 2021 was analysed and indicated a return period of 1 in 2.6 (38% Annual Exceedance Probability (AEP)) for the rainfall event.

Historic Flooding Incidents Within Hickling

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	This was the second time this property flooded in six months. For more information, please see Flood Investigation Report North Norfolk Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

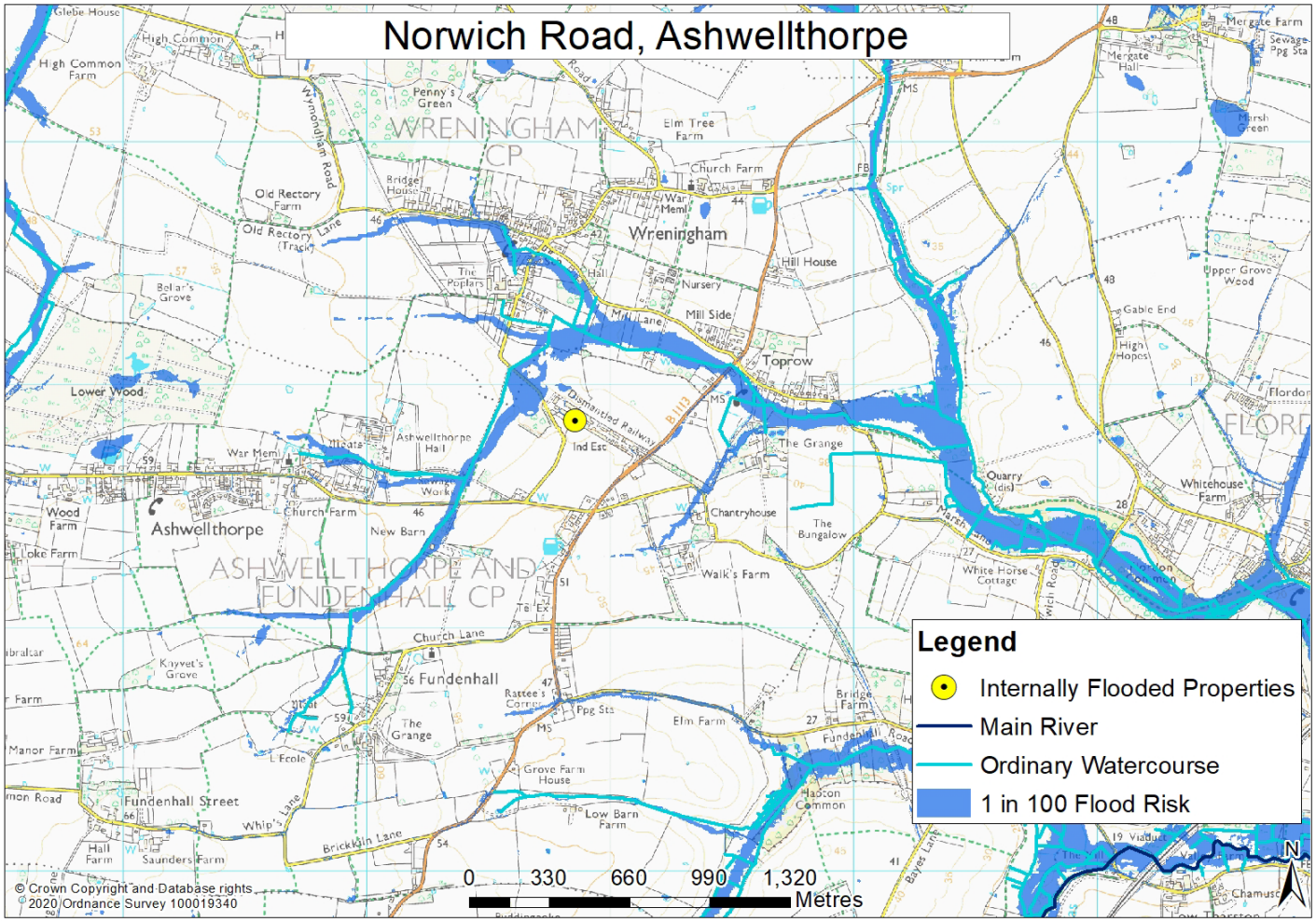
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council (LLFA) should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Staithe Road, Hickling 18/06/2021	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Runoff from significant rainfall was directed towards the surface water drainage network and the foul water drainage network. These flows could not be accommodated as the system was already overloaded. This caused the system to surcharge and flood water was directed towards the affected property.	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. Anglian Water should work with partner organisations to identify the potential for managing the amount or rate of surface water entering their foul drainage system in flood events.	Property owners Anglian Water Norfolk County Council (LLFA)

South Norfolk Council Area
Ashwellthorpe Industrial Estate



Flood Incidents Within this Area

Within this area one 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
03/07/2021	On the 03/07/2021 one property reported internal flooding on Ashwellthorpe Industrial Estate Norwich Road, Ashwellthorpe and Fundenhall. This incident was reported by a resident via email correspondence on the 04/07/2021, (FWF/21/4963)	Norfolk County Council (LLFA) 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 (LLFA) 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 Ashwellthorpe

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	This was the second time this property flooded in seven months. For more information, please see Flood Investigation Report: South Norfolk Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

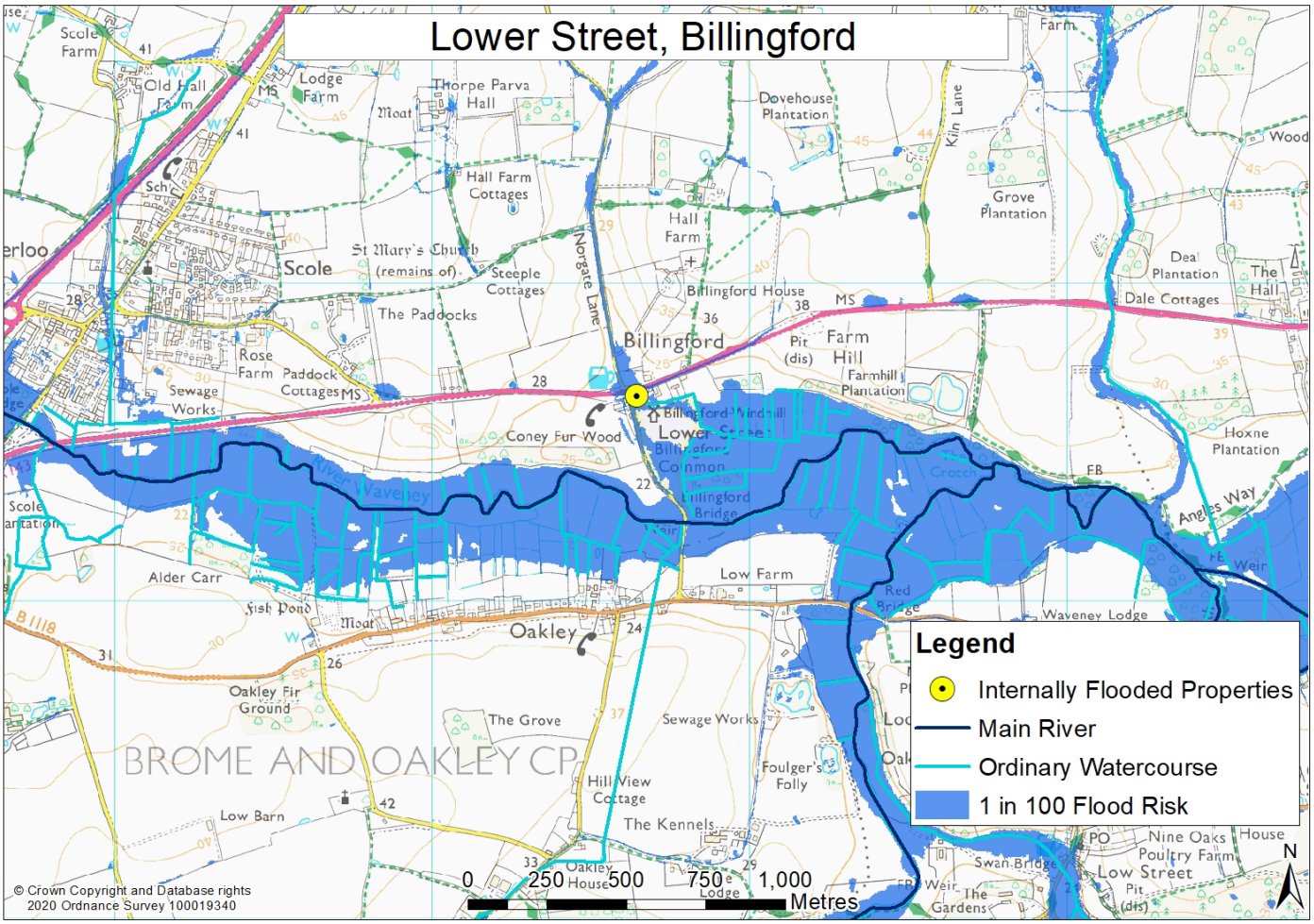
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Ashwellthorpe Industrial Estate, Norwich Road, Ashwelthorpe and Fundenhall, 03/07/2021	Surface runoff from rainfall flowed off adjacent fields and onto the accesses of affected properties that were situated lower than these features. The loss of pre-existing drainage features (ditches,) within the catchment exacerbated the flooding. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding.	Norfolk County Council (LLFA) and local landowners 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.	Norfolk County Council (LLFA) Local landowners

Billingford



Flood Incidents Within this Catchment

Within Billingford one 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 one property reported internal flooding on Lower Street, Billingford. This incident was reported by • a resident via an online flood report form on the 24/07/2021, (FWF/21/5321)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Billingford

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	Another property was flooded in Billingford during this event. Please see following link to Flood Investigation Report South Norfolk Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

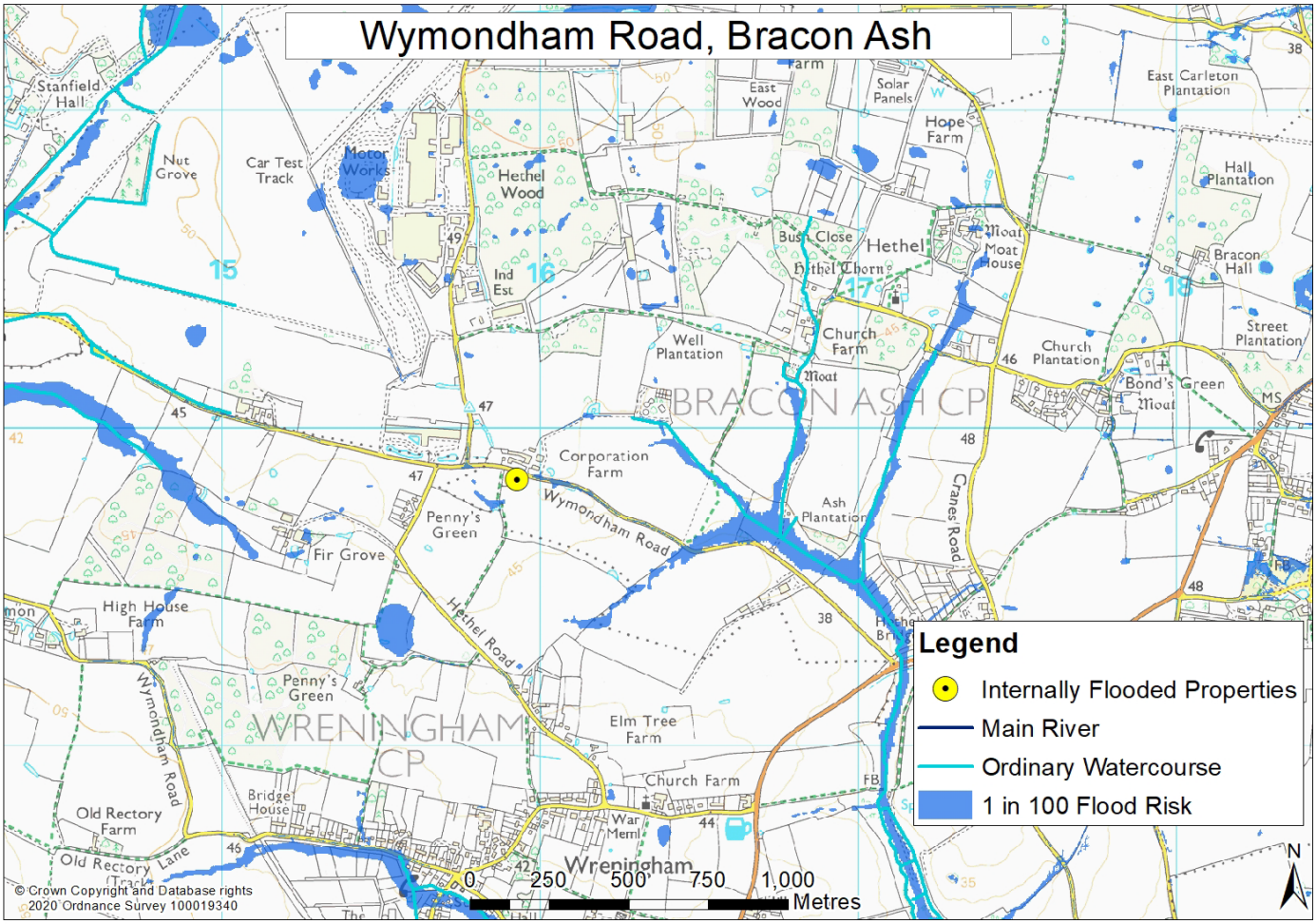
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Lower Street, Billingford, 23/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Surface runoff made its way into the surface water network. These flows could not be accommodated as the system was already overloaded. Surface runoff also made its way onto tracks and roads and flowed along the road network and onto the accesses of affected properties that were situated lower than these features.	Determine if works are needed to remove the risk posed by structures that form obstructions to flows and communicate with affected parties and riparian owners. Investigate culverts and identity if have capacity for flood flows. 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	Riparian owners Norfolk County Council (LLFA) Property owners

Bracon Ash


Wymondham Road, Bracon Ash
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
BRACON ASH CP
WRENINGHAM CP
Wymondham Road
Hethel Road
Corporation Farm
Penny's Green
Fir Grove
High House Farm
Old Rectory Farm
Old Rectory Lane
Bridge House
Elm Tree Farm
Church Farm
Ash Plantation
Cranes Road
Hethel
Hethel Wood
Well Plantation
Church Farm
Moat House
Bond's Green
Bracon Hall
Hall Plantation
East Carleton Plantation
Street Plantation
Church Plantation
Hope Farm
Solar Panels
East Wood
Nut Grove
Car Test Track
Motor Works
Ind Est
Stanfield Hall
Wreningham
0 250 500 750 1,000 Metres
N
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Flood Incidents Within this Area

Within this catchment one incidents 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 one property reported internal flooding on Wymondham Road, Hethel. This incident was reported by • a resident via an online flood report form on the 11/01/2021, (FWF/21/3744)	Norfolk County Council (LLFA) 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 (LLFA) 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 Hethel

Norfolk County Council (LLFA) has no previous reports of internal flooding in Hethel.

Causes of Flooding 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 the following recommendations are made in three areas:

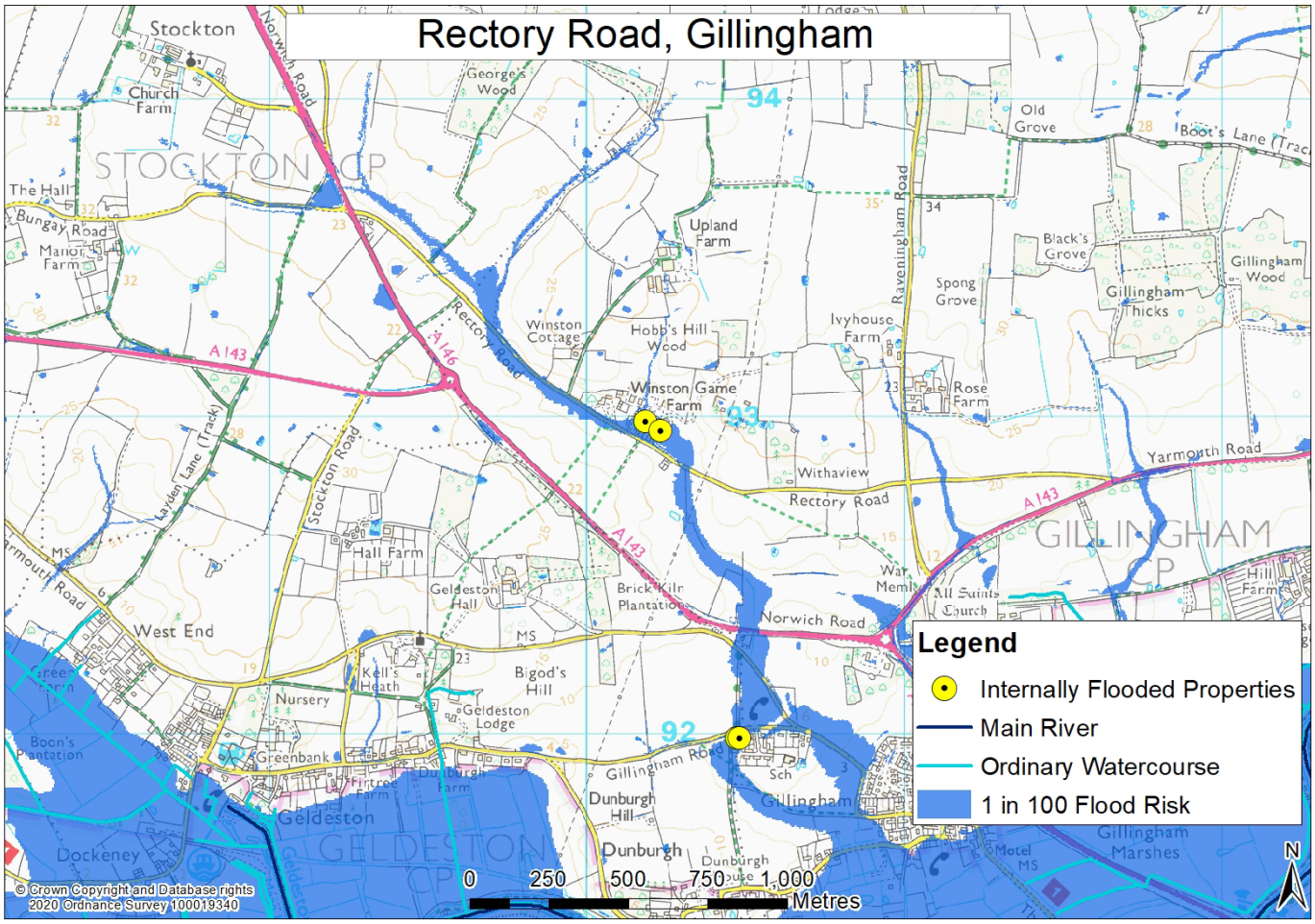
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Wymondham Road, Hethel 23/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. The surface water drainage system was partially obstructed by debris, silt or high water levels downstream. There also was evidence of unconsented works on within the land of the property that flooded. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected property.	The relevant landowners should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e. tree leaves or roots) at all times. The property owner should remove unconsented culverting	Landowners Property Owners Norfolk County Council (LLFA)

Gillingham


Rectory Road, Gillingham
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0
250
500
750
1,000
Metres
N
© Crown Copyright and Database rights 2020 Ordnance Survey 100019340
Stockton
Church Farm
STOCKTON CP
The Hall
Bungay Road
Manor Farm
George's Wood
Norwich Road
Upland Farm
Old Grove
Boot's Lane (Track)
Black's Grove
Gillingham Wood
Gillingham Thicks
Spong Grove
Ravenningham Road
Ivyhouse Farm
Hobb's Hill Wood
Winston Cottage
Winston Game Farm
Rose Farm
A143
A146
Rectory Road
Withaview
Yarmouth Road
Lawden Lane (Track)
Stockton Road
Hall Farm
GILLINGHAM CP
Geldeston Hall
Brick Kiln Plantation
War Meml
All Saints Church
Hill Farm
West End
Norwich Road
Kell's Heath
Bigod's Hill
Nursery
Geldeston Lodge
Boon's Plantation
Greenbank
Fir Tree Farm
Gillingham Road
Sch
Geldeston
Dunburgh Hill
Dunburgh
Dockeney
GELDESTON CP
Motel
Gillingham Marshes
93
94
92

Flood Incidents Within this Area

Within Gillingham four 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
24/12/2020	On the 24/12/2020 – two properties reported internal flooding on Rectory Road, Gillingham. These incidents were reported by: • A resident via an online flood report form on the 22/03/2021, (FWF/21/4298). • A resident via an online flood report form on the 18/06/2021, (FWF/21/4848).	Norfolk County Council (LLFA) assessed validity and impact of the flood report after the incident. A resident carried out measures to minimise the impact of flooding during the incident.
23/12/2021	On the 23/12/2020 – two properties reported internal flooding on The Boundaries, Gillingham. These incidents were reported by: • A resident via an email on the 15/01/2021, (FWF/21/3791). • A resident via an online flood report form on the 25/01/2021, (FWF/21/4092).	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Gillingham

The Norfolk County Council (LLFA) has no previous reports of internal flooding in Gillingham.

Causes of Flooding 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 the following recommendations are made in three areas:

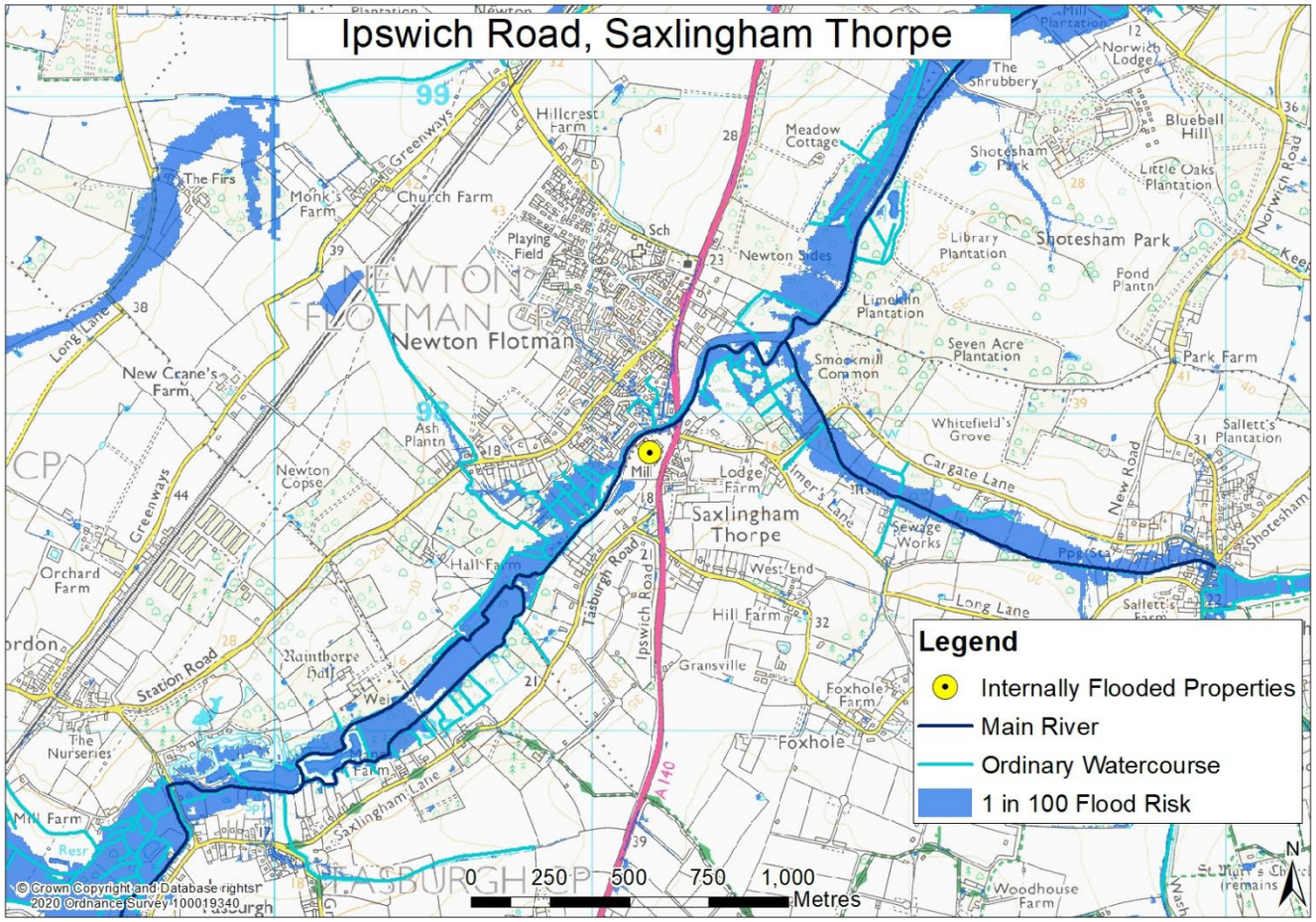
1) Risk Management Authorities should:
    - communicate with affected residents where their assets have given rise to the flooding of properties.
    - review the appropriateness of their response to flooding.
    - determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems role in accommodating normal rainfall events as well as mitigating flooding.

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

3) Norfolk County Council should:
    - incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Rectory Road, Gillingham, 24/12/2020 The Boundaries, Gillingham, 23/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Surface runoff made its way into the surface water network. These flows could not be accommodated as the system was overgrown or lost and required clearing or reinstating. Surface runoff also made its way onto tracks and roads and flowed along the road network.	The relevant landowners and riparian owners should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e. tree leaves / roots) at all times. Overgrown, silted or lost sections of watercourse should be cleared and reinstated 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.	Property / Landowners Riparian owners Norfolk County Council (LLFA)

Saxlingham Thorpe



Flood Incidents Within this Area

Within this Saxlingham Thorpe one 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 one property reported internal flooding on Ipswich Road, Saxlingham Thorpe. This incident was reported by: A resident via an online flood report form on the 15/07/2021, (FWF/21/5253)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Saxlingham Thorpe

Norfolk County Council (LLFA) has no previous reports of internal flooding in Saxlingham Thorpe.

Causes of Flooding 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 the following recommendations are made in three areas:

1) Risk Management Authorities should:

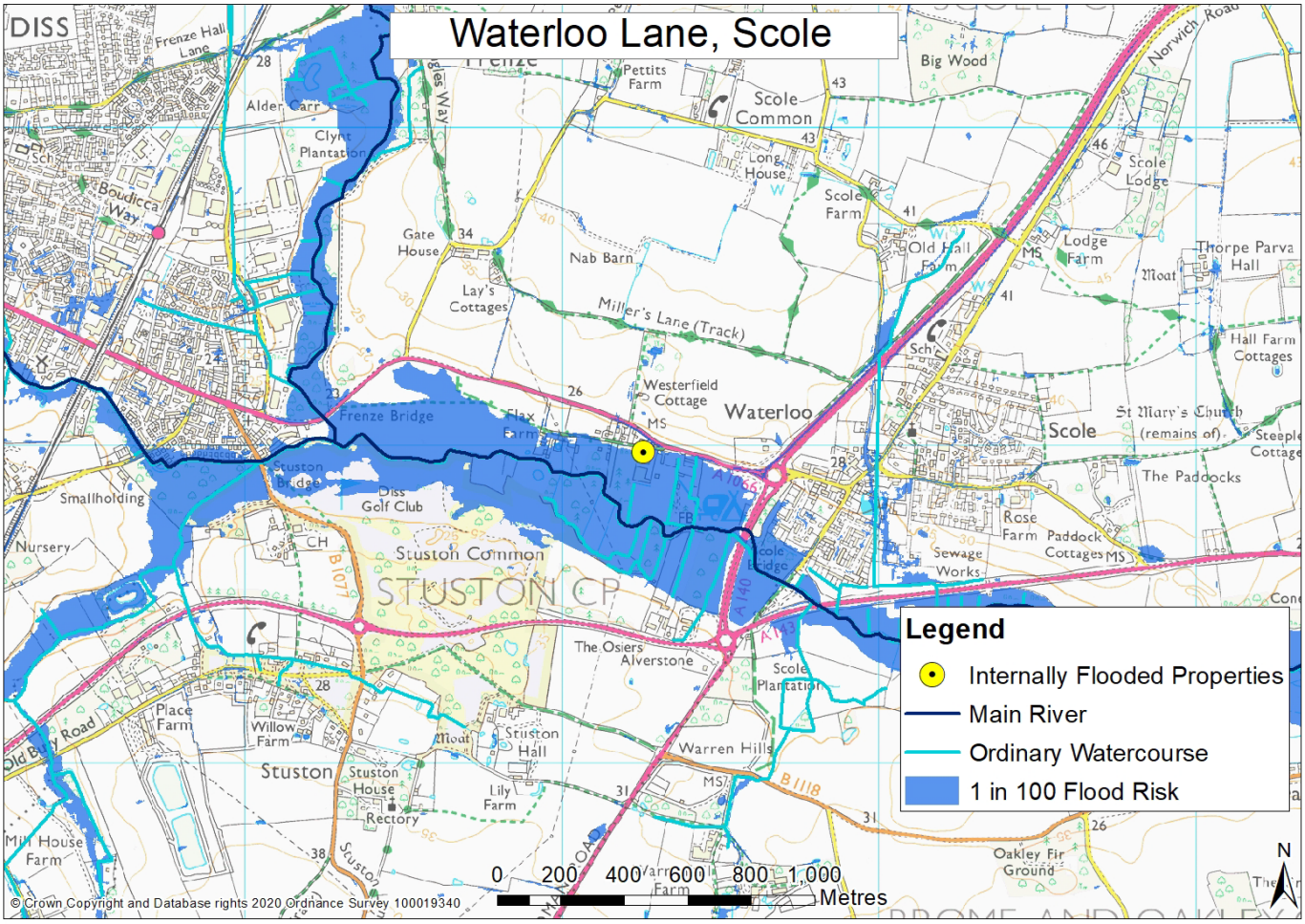
- Communicate with affected residents where their assets have given rise to the flooding of properties.
- Review the appropriateness of their response to flooding.
- Determine the integrity and/or capacity of their assets where they have contributed to the flooding of properties to understand the systems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

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

3) Norfolk County Council should:
   - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
   - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Ipswich Road, Saxlingham Thorpe, 24/12/2020	Local observations witnessed the River Tas overtopped its banks leading to flood water ingress into the property. The flooding may have been exacerbated by high water levels in the river and high groundwater levels which were especially high. This may have caused the performance of other systems to decrease.	Property owners should protect their buildings through flood protection measures where appropriate. The Environment Agency should continue to review its maintenance programme using a risk based approach. Riparian owners are encouraged to maintain watercourses applying for a Flood Risk Activity Permit where necessary.	Property owners Environment Agency Riparian owners Norfolk Rivers Internal Drainage Board

Scole


Waterloo Lane, Scole
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0 200 400 600 800 1,000
Metres
N
© Crown Copyright and Database rights 2020 Ordnance Survey 100019340
DISS
Frenze Hall Lane
Alder Carr
Clyft Plantation
Boudicca Way
Gate House
Nab Barn
Lay's Cottages
Miller's Lane (Track)
Pettits Farm
Scole Common
Long House
Scole Farm
Big Wood
Norwich Road
Scole Lodge
Old Hall Farm
Lodge Farm
Thorpe Parva Hall
Moat
Hall Farm Cottages
Westerfield Cottage
Waterloo
Scole
St Mary's Church (remains of)
Steeple Cottage
The Paddocks
Rose Farm Paddock Cottages
Sewage Works
Frenze Bridge
Flax Farm
Stuston Bridge
Diss Golf Club
Smallholding
Nursery
Stuston Common
STUSTON CP
The Osiers
Alverstone
Scole Plantation
Warren Hills
Place Farm
Willow Farm
Stuston
Stuston Hall
Stuston House
Rectory
Lily Farm
Mill House Farm
Oakley Fir Ground
Oakley Farm
B1077
B1118
A140
A1066

Flood Incidents Within this Area

Within this catchment one incident of internal flooding has 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 one property reported internal flooding on Waterloo Lane, Scole. This incident was reported by a resident via a telephone call on the 16 December 2021, (FWF/22/6174)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Scole

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
29/07/2018	External Flooding to one property
25/06/2016	Six properties were flooded internally.

Causes of Flooding 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 the following recommendations are made in three areas:

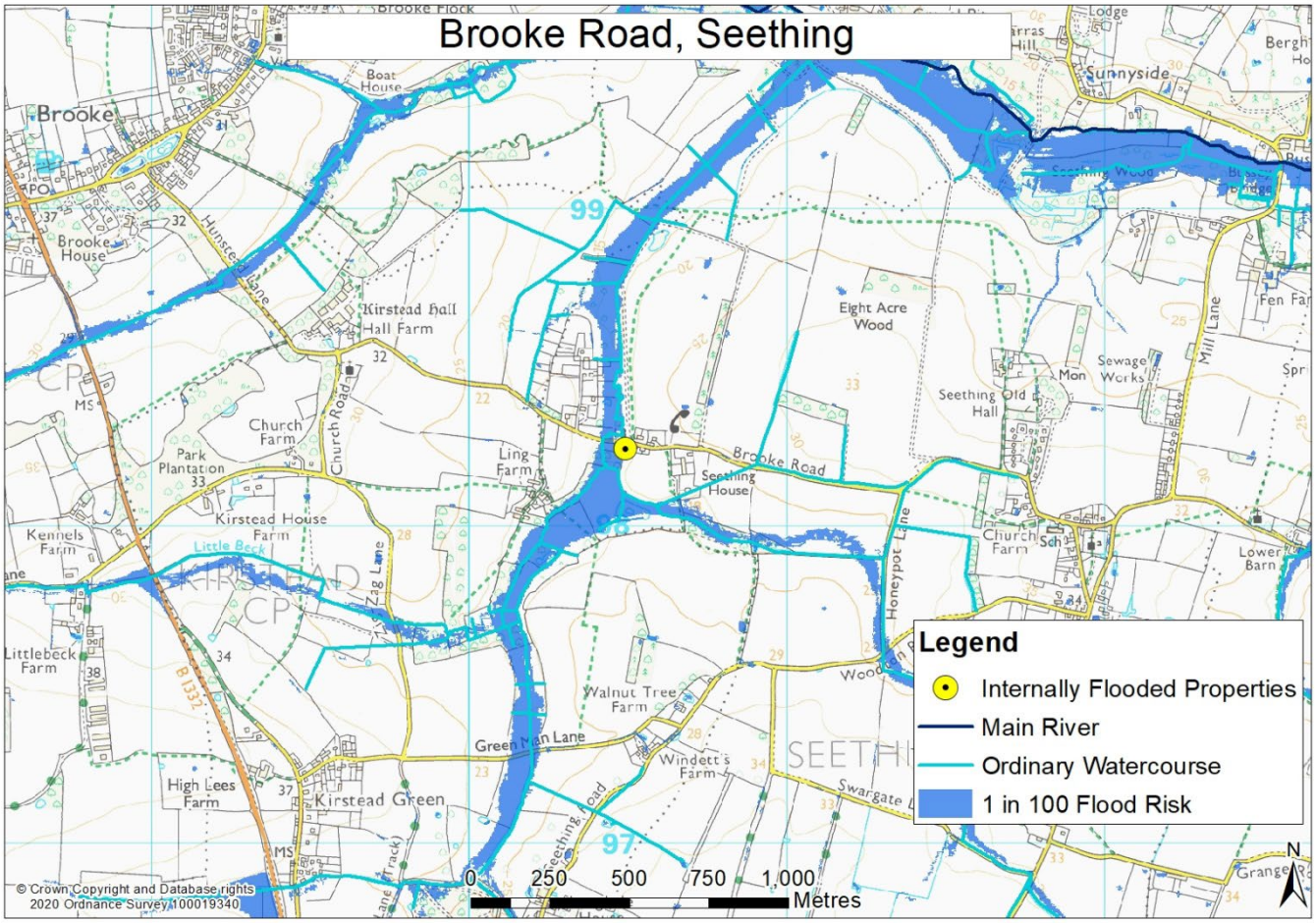
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Waterloo Lane, Scole, 23/12/2020	The river was obstructed by high water levels downstream and debris. This caused flooding at the affected properties.	The relevant property owners should instigate a regular regime of maintenance to ensure the watercourse is free from obstruction. Property owners should protect their buildings through flood protection measures where appropriate Environment Agency will communicate with local residents of properties known to have flooded internally to investigate options for managing flood risk. This may need to be dependent on those property owners affected contributing towards a solution.	Land owners Property Owners Environment Agency

Seething


Brooke Road, Seething
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0
250
500
750
1,000
Metres
N
© Crown Copyright and Database rights 2020 Ordnance Survey 100019340
Brooke
Sunnyside
Kirstead Hall
Hall Farm
Eight Acre Wood
Seething Old Hall
Sewage Works
Mill Lane
Church Road
Church Farm
Park Plantation
Ling Farm
Brooke Road
Seething House
Kirstead House Farm
Kennels Farm
Little Beck
Zag Lane
Honeypot Lane
Littlebeck Farm
B1332
Walnut Tree Farm
Green Man Lane
Windett's Farm
High Lees Farm
Kirstead Green
Seething Road
Swargate
Lower Barn
Grange
99
97

Flood Incidents Within this Area

Within Seething one 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 one property reported internal flooding on Brooke Road, Seething. This incident was reported by a resident via an online flood report form on the 22/01/2021, (FWF/21/3886)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Seething.

Norfolk County Council (LLFA) has no previous reports of internal flooding in Seething.

Causes of Flooding 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 the following recommendations are made in three areas:

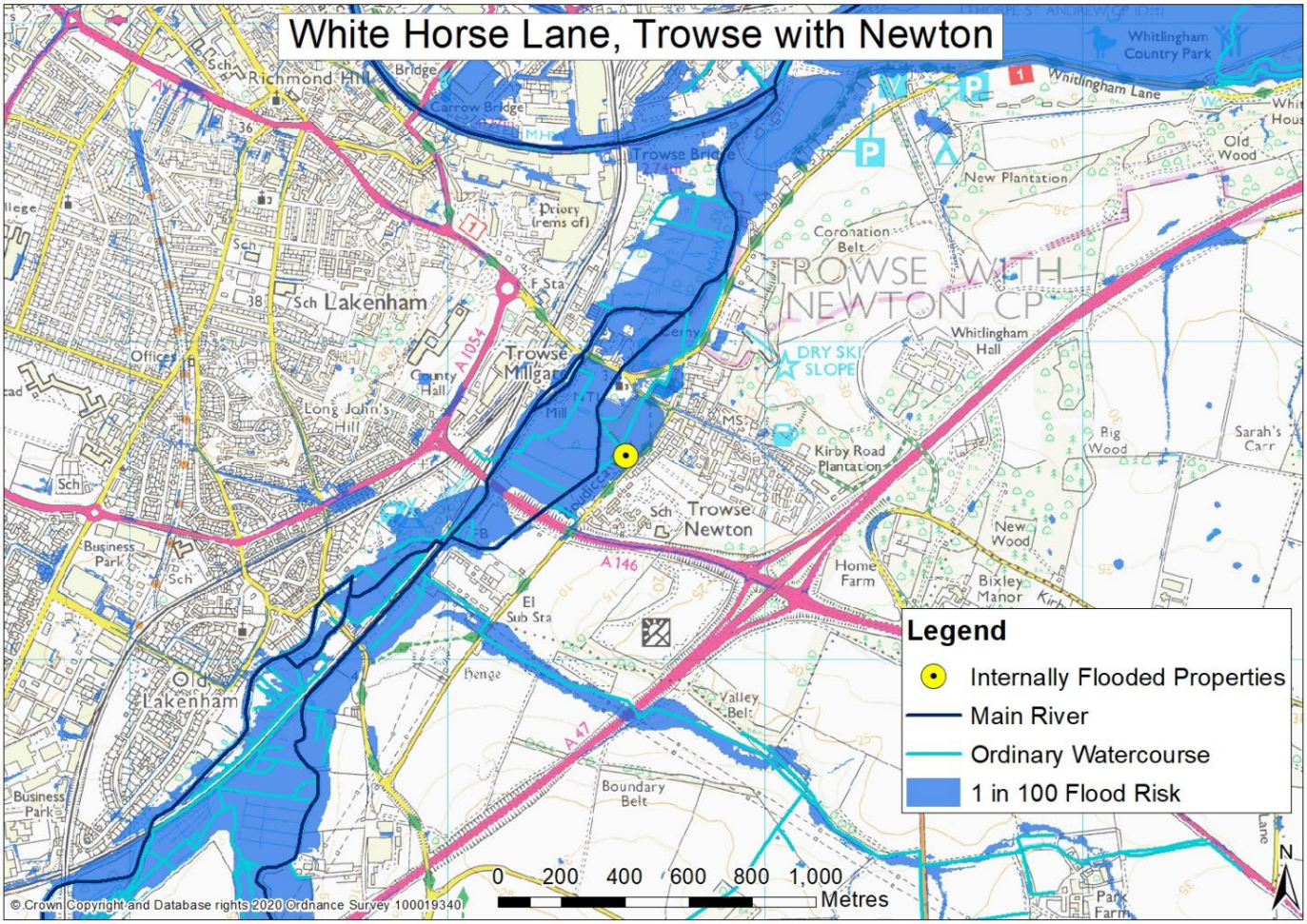
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Brooke Road, Seething, 24/12/2020	A substantial amount of rain fell on the 23-24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Runoff from rainfall was directed towards the ordinary watercourse network. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected properties. Surface runoff also flowed off adjacent fields, onto highway and flowed along the road network into the accesses of affected properties that were situated lower than these features.	The relevant landowners should instigate a regular regime of maintenance to ensure the watercourse system is free from obstruction (i.e. tree leaves/roots) at all times. 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.	Landowners Riparian owners Norfolk County Council (LLFA)

Trowse with Newton



Flood Incidents Within this Area

Within Trowse with Newton one 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 one property reported internal flooding on White Horse Lane, Trowse with Newton This incident was reported by a resident via an online flood report form on the 26/08/2021, (FWF/21/5543)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Trowse with Newton

Norfolk County Council (LLFA) has no previous reports of internal flooding in Trowse with Newton.

Causes of Flooding 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 the following recommendations are made in three areas:

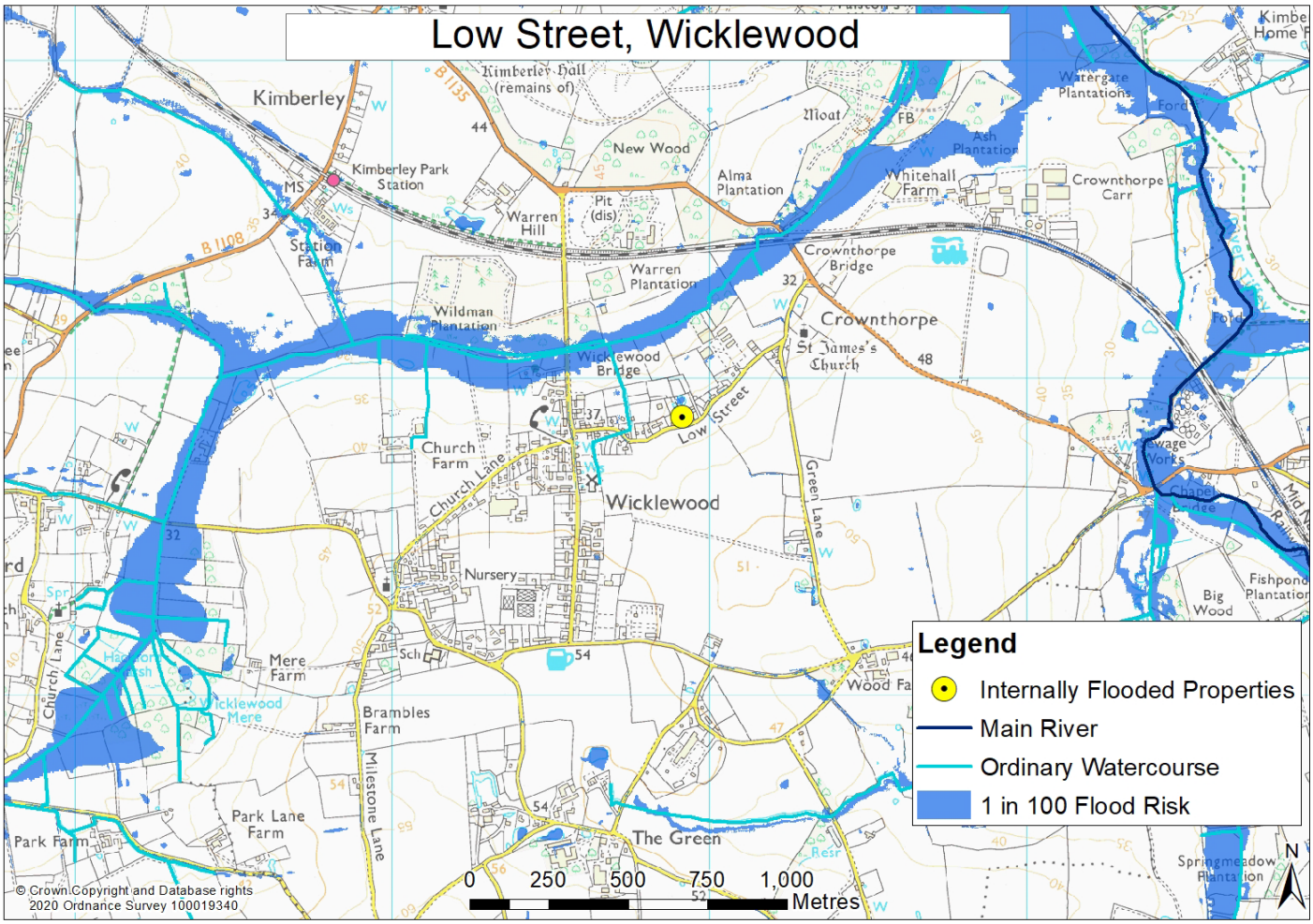
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
White Horse Lane, Trowse with Newton, 24/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Runoff from significant rainfall was directed towards the surface water drainage network and rivers. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected properties. The flooding may have been exacerbated by high water levels in the river and high groundwater levels which were especially high. This may have caused the performance of other systems to decrease. The flooded property is within an existing area prone to fluvial (Flood Zone 3) and pluvial flood risk.	Property owners should protect their buildings through flood protection measures where appropriate. Environment Agency and Internal Drainage Board to communicate with local residents of internally flooded properties to investigate options for managing flood risk. This may be dependent on those property owners affected contributing towards a solution. The Environment Agency and Internal Drainage Board should continue to review their maintenance programme using a risk based approach. Riparian owners are encouraged to maintain watercourses applying for a Flood Risk Activity Permit where necessary.	Property owners Environment Agency Norfolk Rivers Internal Drainage Board Riparian Owners

Wicklewood


Low Street, Wicklewood
Kimberley
Kimberley Hall (remains of)
Kimberley Park Station
New Wood
Alma Plantation
Moat
Whitehall Farm
Crownthorpe Carr
Warren Hill
Pit (dis)
Warren Plantation
Crownthorpe Bridge
Crownthorpe
St James's Church
Wildman Plantation
Wicklewood Bridge
Low Street
Church Farm
Church Lane
Wicklewood
Green Lane
Nursery
Mere Farm
Wicklewood Mere
Brambles Farm
Milestone Lane
Park Lane Farm
Park Farm
The Green
Sewage Works
Chapel
Big Wood
Springmeadow Plantation
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0 250 500 750 1,000
Metres
N
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Flood Incidents Within this Area

Within Wicklewood one 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 one property reported internal flooding on Low Street, Wicklewood. This incident was reported by a resident via an online flood report form on the 18/01/2021 (FWF/21/3819)	A resident carried out measures to minimise the impact of flooding during the incident. Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Wicklewood

Norfolk County Council (LLFA) has no previous reports of internal flooding on Low Street, Wicklewood.

Causes of Flooding 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 the following recommendations are made in three areas:

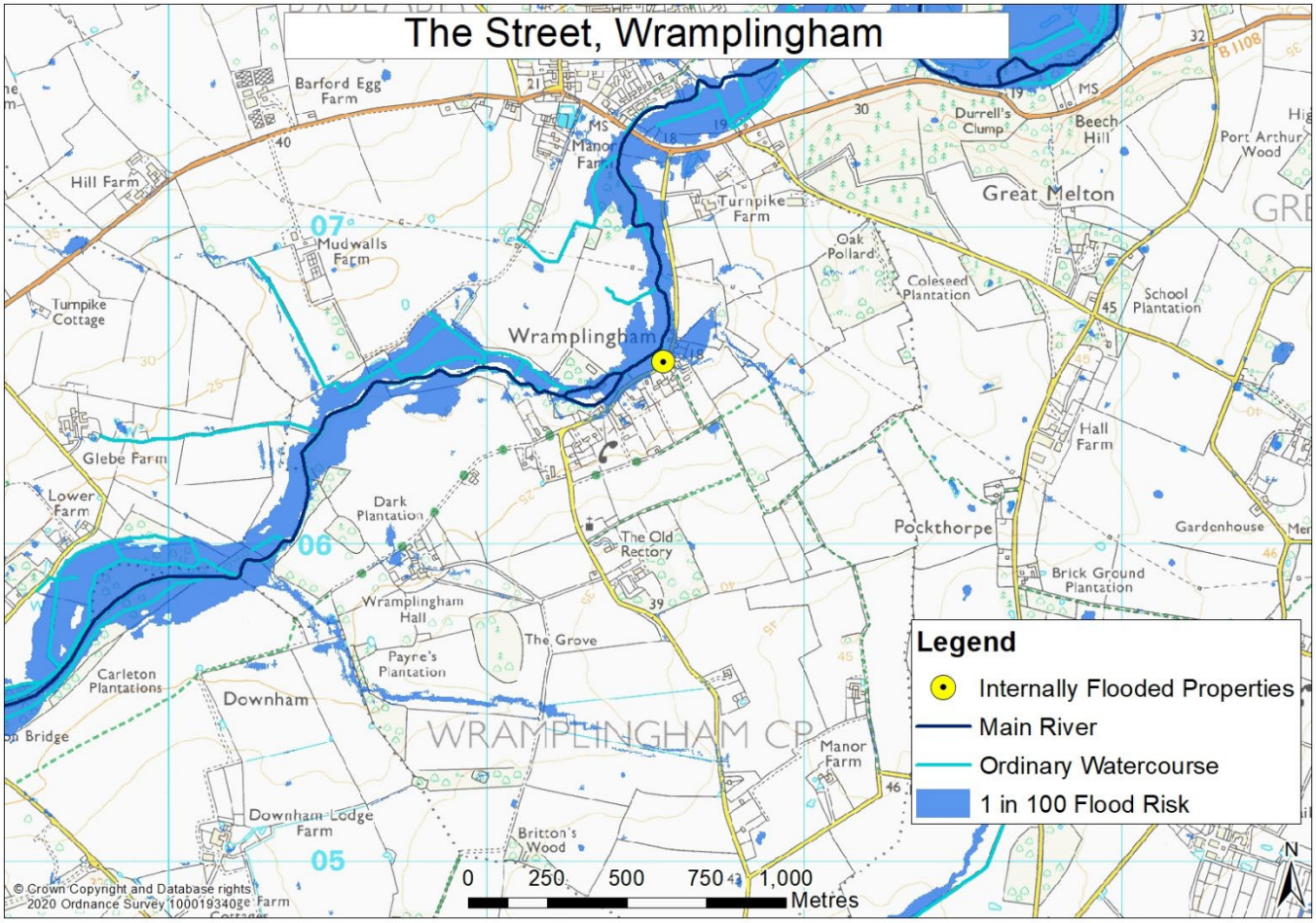
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Low Street, Wicklewood, 23/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Surface runoff flowed off adjacent fields, onto highway and flowed across the road into the accesses of the affected property that was situated lower than these features.	Amendments should be made to the management of neighbouring land to ensure water is not directed to other properties. Norfolk County Council (LLFA) could assist with this. 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.	Landowners Property owners Norfolk County Council (LLFA)

Wramplingham



Flood Incidents Within this Area

Within this catchment one 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 one property reported internal flooding on The Street, Wramplingham. This incident was reported by a resident via email correspondence on the 20/04/2021, (FWF/21/4463)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Wramplingham

Norfolk County Council (LLFA) has no previous reports of internal flooding in Wramplingham.

Causes of Flooding 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 the following recommendations are made in three areas:

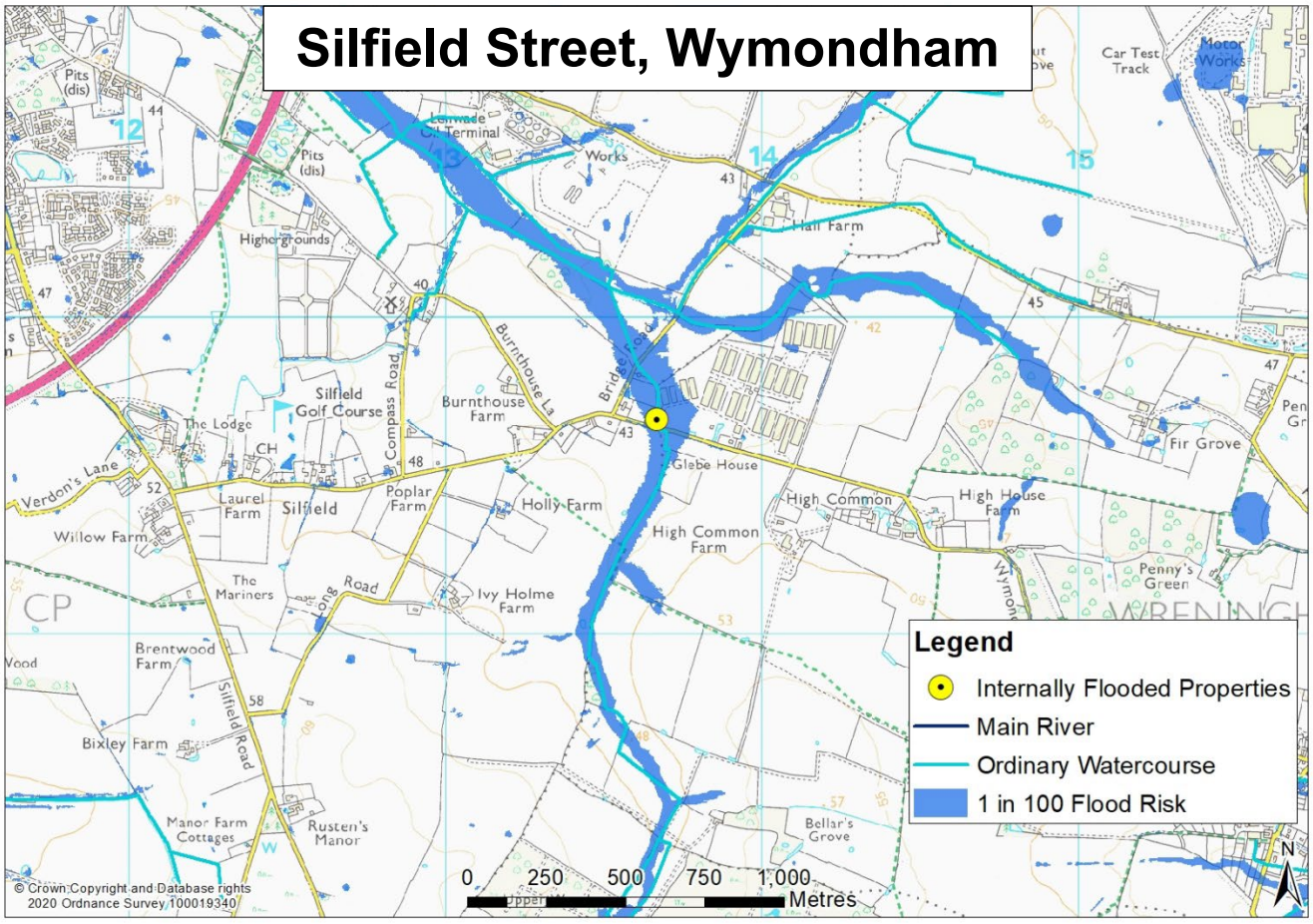
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
The Street, Wramplingham, 24/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Runoff from significant rainfall was directed towards the surface water drainage network EA Main River. These flows could not be accommodated as the system was already overloaded. This directed flood water towards the affected properties. The flooded property is within an existing area prone to fluvial (Flood Zone 3) and pluvial flood risk	Review and confirm operational response for flood events of this calibre and associated drainage infrastructure and implement to a wider action plan. Environment Agency will communicate with local residents of properties known to have flooded internally to investigate options for managing flood risk. This may need to be dependent on those property owners affected contributing towards a solution. Alternatively, property owners could carry out their own measures where funding is not forthcoming or residents are unwilling to wait.	Environment Agency Norfolk Rivers Internal Drainage Board Property Owners

Wymondham


Silfield Street, Wymondham
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0 250 500 750 1,000
Metres
© Crown Copyright and Database rights 2020 Ordnance Survey 100019340
Silfield Golf Course
Burnthouse Farm
Burnthouse La
Bridle Road
Compass Road
Glebe House
Hall Farm
High Common
High Common Farm
High House Farm
Fir Grove
Penny's Green
Holly Farm
Poplar Farm
Laurel Farm
Silfield
Willow Farm
Verdon's Lane
The Lodge
CH
The Mariners
Long Road
Ivy Holme Farm
Brentwood Farm
Silfield Road
Bixley Farm
Manor Farm Cottages
Rusten's Manor
Bellar's Grove
Higher Grounds
Works
Car Test Track
Motor Works
Pits (dis)
CP
N

Flood Incidents Within this Area

Within Wymondham one 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 one property reported internal flooding on Silfield Street, Wymondham. This incident was reported by a resident via an online flood report form on the 4/02/2021, (FWF/21/4061)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Wymondham

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2021	Several properties were flooded in Wymondham during this event. Please see Flood Investigation Report South Norfolk Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

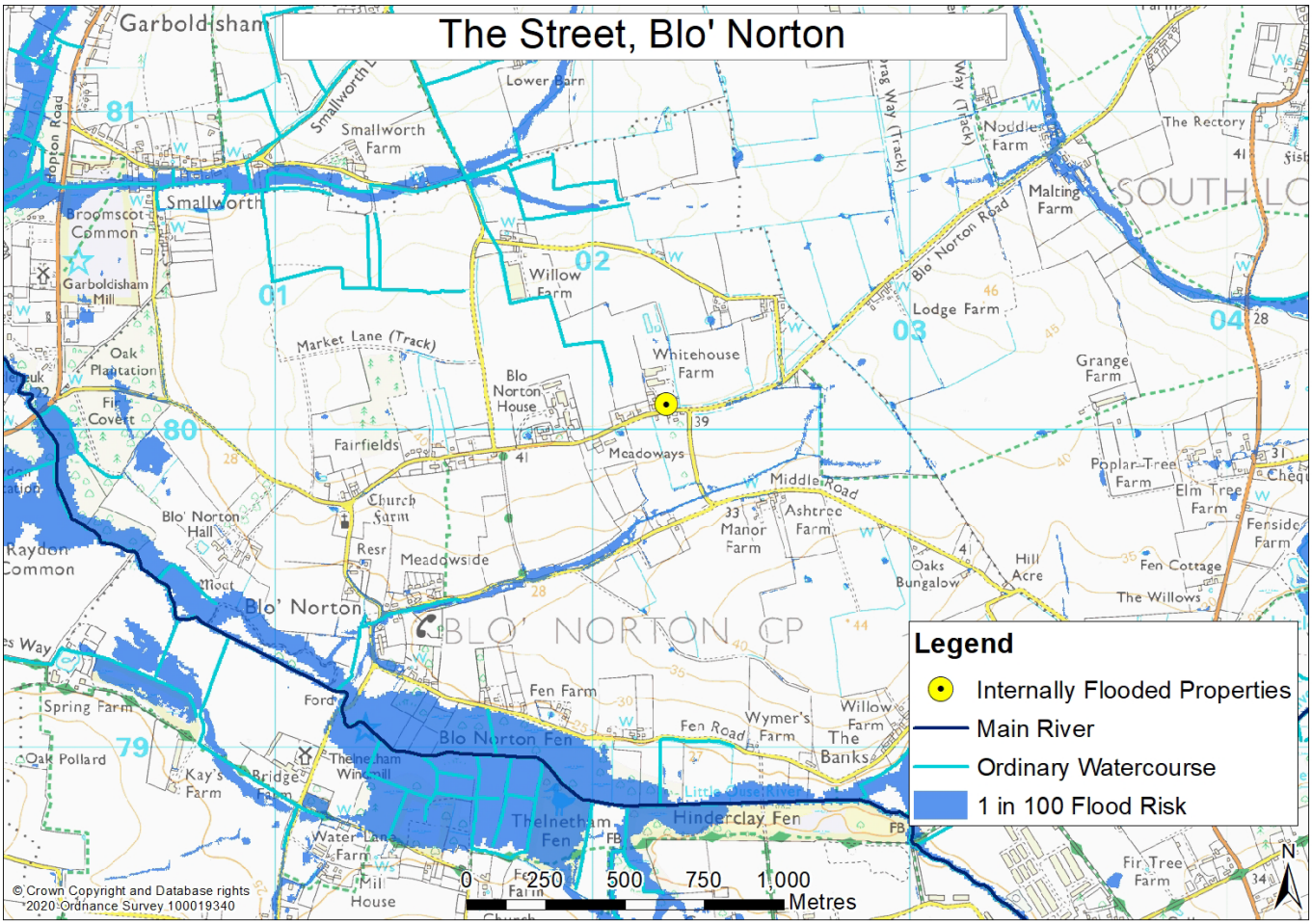
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Silfield Street, Wymondham 23/12/2020	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Runoff from rainfall was directed towards the ordinary watercourse network. These flows could not be accommodated as the watercourse was overgrown, silted or lost and required clearing and reinstating. The surface water drainage system has historically been modified and amended with various sized culverts. This has created several pinch points within the system that struggle to allow free flow.	The relevant landowners and riparian owners should instigate a regular regime of maintenance to ensure the system is free from obstruction (i.e. tree leaves or roots) at all times. Overgrown, silted or lost sections of watercourse should be cleared and reinstated 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.	Landowners Riparian owners Norfolk County Council (LLFA)

Breckland District Council Area
Blo’ Norton



Flood Incidents Within this Area

Within Blo' Norton one 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 one property reported internal flooding on The Street, Blo' Norton. This incident was reported by a resident via an online flood report form on the 9/07/2021, (FWF/21/5234)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Blo' Norton

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	Several properties were flooded in Blo' Norton during this event. Please see Flood Investigation Report: Breckland Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

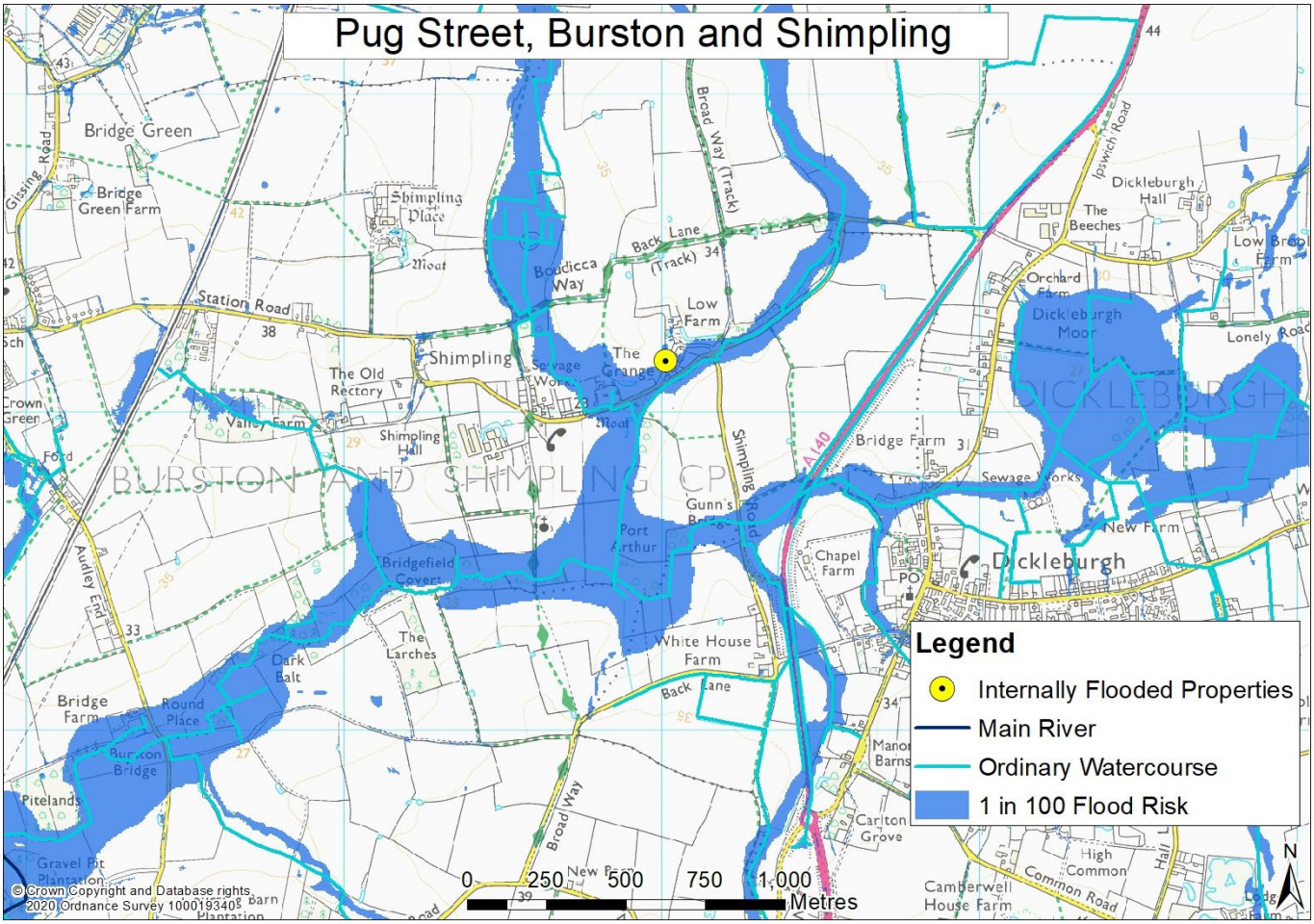
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
The Street, Blo' Norton, 24/12/2020	A substantial amount of rain fell on the 23-24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. The surface water drainage system was partially obstructed by debris, silt or high water levels downstream. Surface runoff also flowed off adjacent fields, onto highway and flowed along the road network into the affected properties that were situated lower than these features.	The relevant landowners should instigate a regular regime of maintenance of the surface water network (including private culverts under the highway) to ensure the system is free from obstruction (i.e. tree leaves or roots) at all times. 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.	Landowners Riparian owners Property owners Norfolk County Council (LLFA)

Burston and Shimpling



Description of Catchment

Small headwater catchment (6km^2) that flows North to South from Tivetshall. This watershed joins up with the Gissing Catchment in Shimpling before heading towards Frenze. The catchment is largely rural and the main risk areas are Dickleburgh Road in Shimpling.

Flood Risk Within the Catchment

The flood risk from local sources (ordinary watercourses and surface runoff) and strategic sources (fluvial above three km^2 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 (3.33% AEP) event and the 1 in 100 (1% AEP) 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 (3.33% AEP) event:	0	1	0
[b] Number of properties subject to surface water flood risk at 1 in 100 (1% AEP) event:	0	3	0
[c] Number of properties subject to flood risk from rivers and the sea at 1 in 30 (3.33% AEP) event:	0	4	0
[d] Number of properties subject to flood risk from rivers and the sea at 1 in 100 (1% AEP) event:	0	0	0

Flood Incidents Within this Catchment

Within this catchment one 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 one property reported internal flooding on Pug Street, Burston and Shimpling. This incident was reported by a resident via email correspondence on the 25/07/2021, (FWF/21/5322)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Burston and Shimpling

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	Several properties were flooded in Shimpling during this event. Please see Flood Investigation Report South Norfolk Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

1) 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.

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

3) Norfolk County Council should:

- Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
- Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

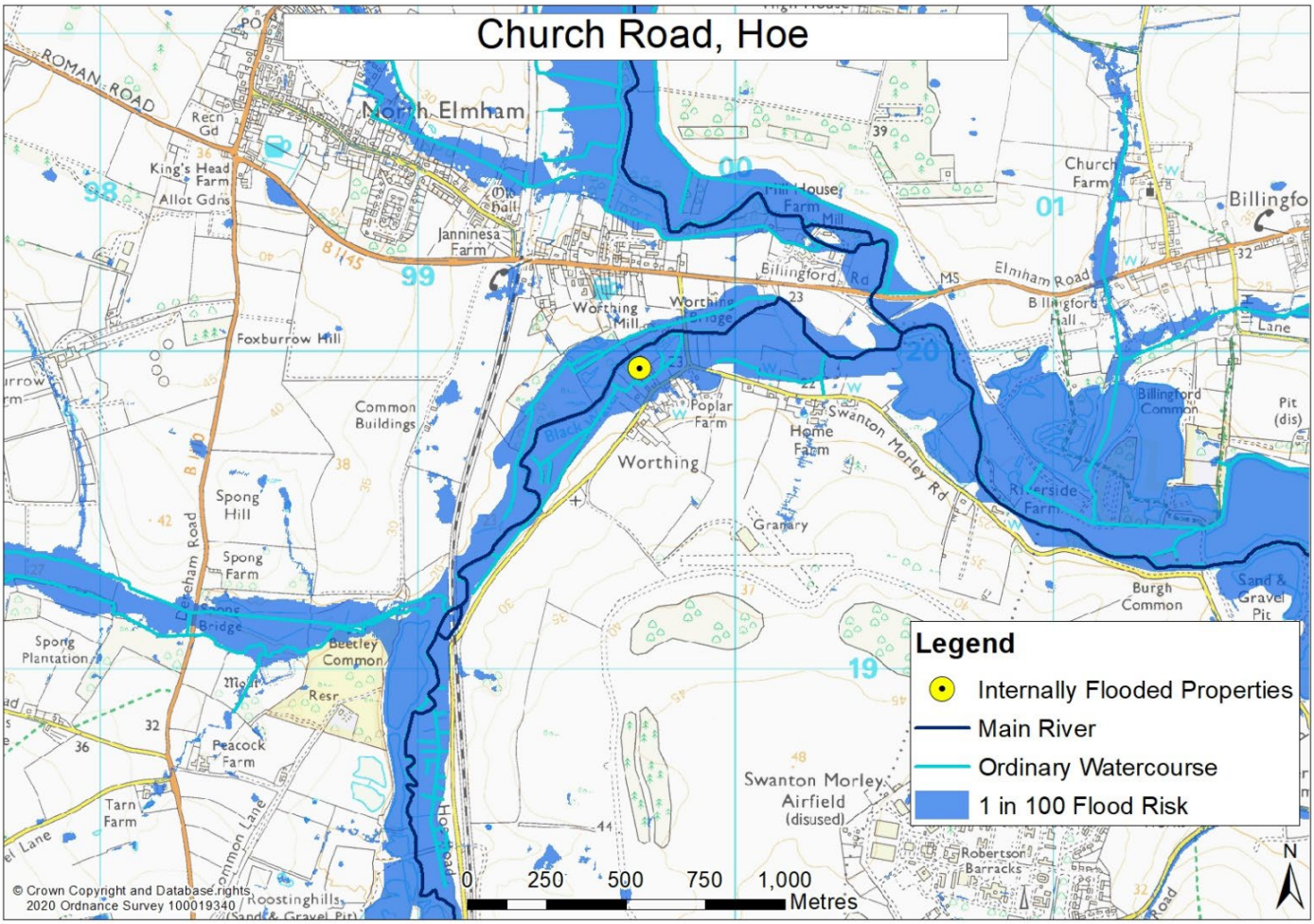
Causes of flooding	Recommendations	Risk Management Authority/individual with Relevant Flood Risk Roles
A substantial amount of rainfall fell on the 23 December onto a catchment with preceding high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the local watercourses Local observations witnessed local watercourses breaching and leading to the flooding observed in Pug Street/Low Common during the event on 23 December. 1) The Patten Watercourse was overtopping its bank(s) alongside Dickleburgh Road and Moor Rd leading to fast moving flood water in the road and private land flowing south east, through Shimpling. The road acted as conduit and essentially became the Patten watercourse. 2) Runoff from significant rainfall was concentrated along overland flow paths on which the affected properties are positioned on or adjacent to. 3) Significant rainfall and flooding from ordinary watercourses was concentrated on the highway. Vehicles using the highway passed through the flood water causing it to wash towards the affected properties. The volume of flooding into Dickleburgh Road and surrounding areas may have been exacerbated by the Dickleburgh Road culvert restricting flow through this section of the Patten watercourse near Pug Street.	Determine if works are needed to remove the risk posed by structures that form obstructions to flows and communicate with affected parties and riparian owners. Investigate/ or model culverts and identity if it they have capacity. Asset owner or Riparian owners to consider reinstating and/or increasing size of piped watercourses and/or providing additional surface water storage that may currently offset constrictions.	Waveney Lower Yare and Lothingland Internal Drainage Board Riparian Owners

Causes of flooding	Recommendations	Risk Management Authority/individual with Relevant Flood Risk Roles
The surface water drainage system network was likely hydraulically obstructed by high flood flows in the Patten watercourse. This reduced the efficiency of the upstream drainage system to remove surface water runoff in the road which also likely added to the flooding at the affected properties. Road gullies were also noted to be heavily silted however this was observed post event.	Review the inspection and maintenance schedule of all surface water drainage assets within the adopted Highway.	Norfolk County Council (Highways)

Causes of flooding	Recommendations	Risk Management Authority/individual with Relevant Flood Risk Roles
Surface runoff from rainfall flowed off adjacent fields and towards natural lows and areas of flooding. The flood water entered the properties through low thresholds at entrances and air bricks.	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.	Property owners Norfolk County Council (LLFA)

Causes of flooding	Recommendations	Risk Management Authority/individual with Relevant Flood Risk Roles
Partial blockages were identified at several locations along Patten Watercourse, especially downstream of Upper Street. Large in channel trees were trapping debris leading to reduced flow capacity. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.	Review maintenance responsibilities for watercourse and its associated drainage infrastructure and implement to a wider action plan. Review access arrangements for inspection and maintenance of watercourses. The relevant organisations or /property owners to undertake riparian duties and undertake a regular regime of maintenance to ensure watercourses are free from obstruction (i.e. tree leaves/ or roots and other foreign objects) at all times.	Waveney Lower Yare and Lothingland Internal Drainage Board Landowners

Worthing and Hoe



Flood Incidents Within this Area

Within this catchment one 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 one property reported internal flooding on Church Road, Hoe. This incident was reported by a resident via an online flood report form on the 27/08/2021, (FWF/21/5565)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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.

One of the incidents (100%) of internal flooding in this catchment are within 2.5km of a rain gauge.

Between 2pm on the 23 December 2020 and 2am on the 24 December 2020 (12 hour period) a total of 34mm of rainfall fell, equivalent to a 1 in 3 (33% AEP) event.

Historic Flooding Incidents Within the Catchment

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	Several properties were flooded during this event. Please see Flood Investigation Report: Breckland Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

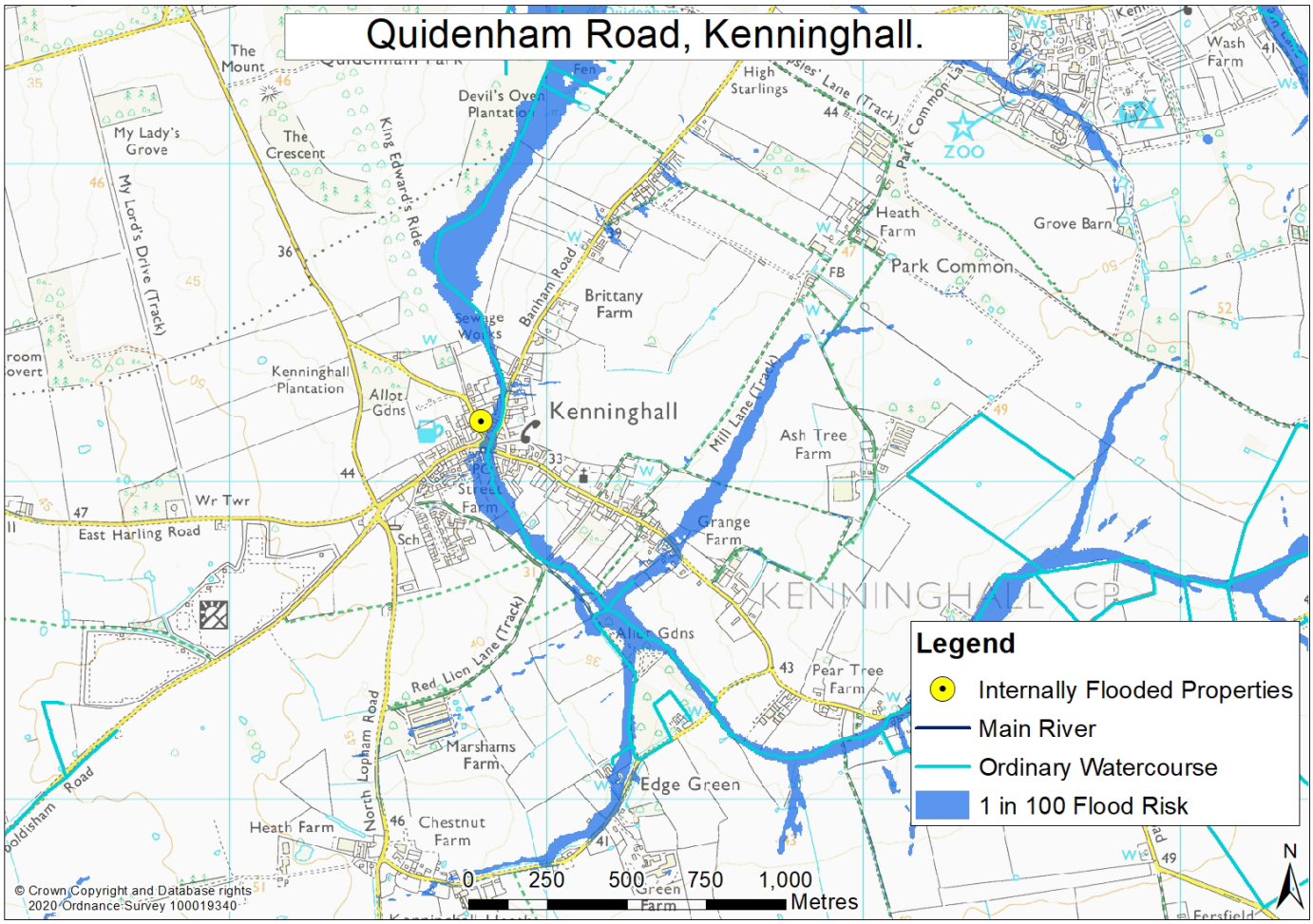
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Church Road, Hoe and Worthing 24/12/2020	The volume of the water in the Wendling Beck resulted in the inundation of the floodplain upstream (to the south west) of Worthing, along Hoe Road. This water flowed through the village, returning to the Wendling Beck downstream of the mill	Riparian owners should be encouraged to maintain watercourses The Environment Agency are progressing a project to investigate what could be cost beneficial and technically feasible to reduce the flood risk to the village of Worthing The Environment Agency should continue to review its maintenance programme using a risk based approach. Riparian owners are encouraged to maintain watercourses applying for a Flood Risk Activity Permit where necessary	Property owners Environment Agency

Kenninghall



Flood Incidents Within this Area

Within this catchment one 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 one property reported internal flooding on Quidenham Road, Kenninghall. This incident was reported by a resident via an online flood report form on the 21/06/2021, (FWF/21/4851)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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.

A substantial amount of rainfall was recorded at an unverified tipping bucket gauge in Kenninghall. A total of 54mm was captured in 12 hours which equates to a 1 in 20 (5% AEP) event for this watershed. River levels at Quidenham, some 3km downstream recorded peak flows on the afternoon of the 24 December higher than the Great Flood of 1968 (see executive summary), this both indicated the severity of the event (approximately 1 in 50 fluvial return period or 2% AEP) and a short time to peak (flashy response) in the catchment of approximately six hours which is usually uncommon for winter storms indicating just how saturated the catchment was prior to the 23 December. (*return periods based on data collected from Environment Agency rain gauges and FEH13 Depth Duration Frequency curves).

Historic Flooding Incidents Within Kenninghall

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	Several properties were flooded in Kenninghall during this event. Please see Flood Investigation Report Breckland Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

1) 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.

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

3) Norfolk County Council should:
   - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
   - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

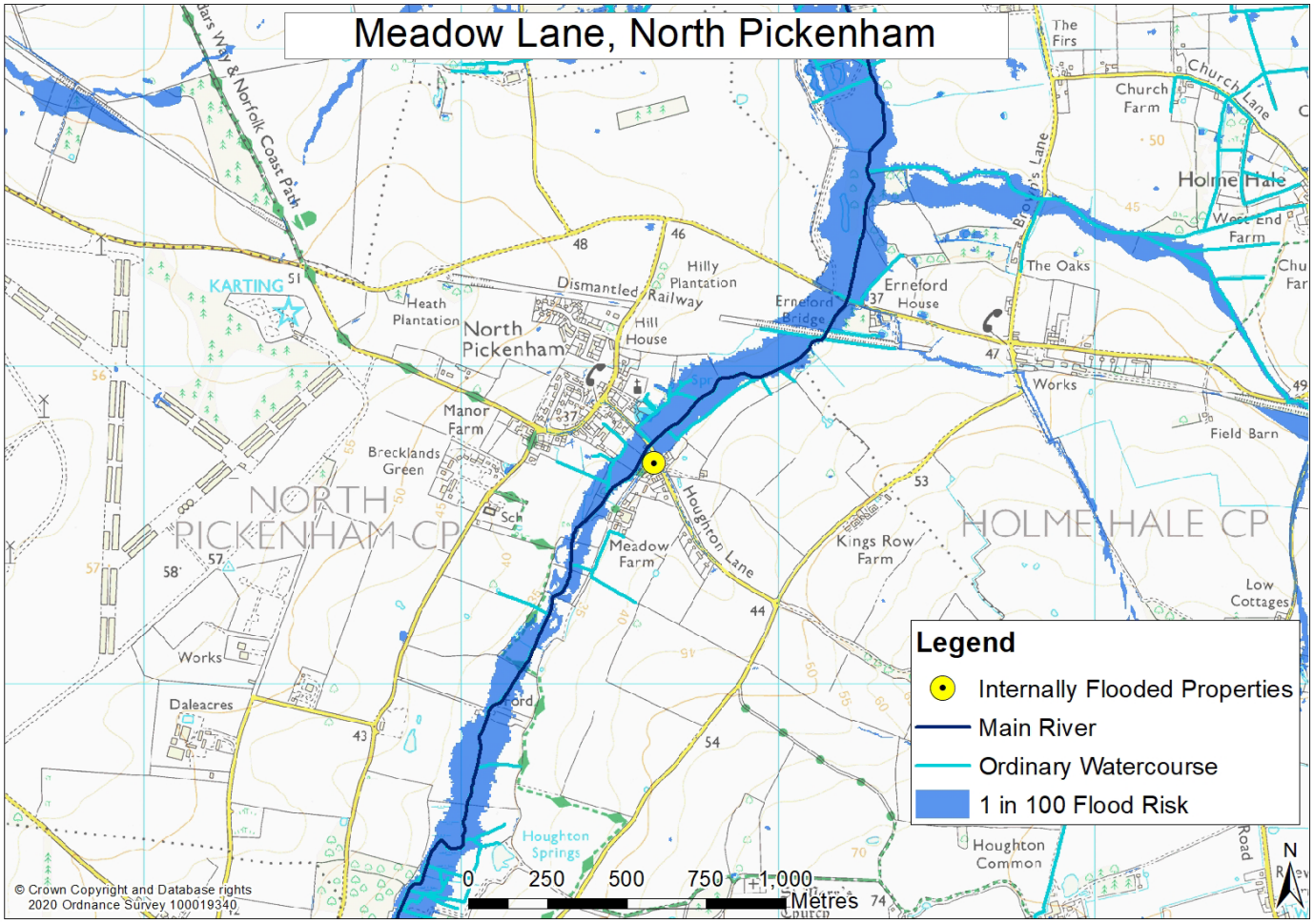
Causes of flooding	Recommendations	Risk Management Authority with Relevant Flood Risk Function
A substantial amount of rain fell on the 23 December onto a catchment with prior high saturation levels. The catchment is 9.6km^2 upstream of Kenninghall generating a flashy response to which local watercourses and drainage infrastructure could not cope.	Any areas of land seeking planning permission should be providing betterment over national planning policy if wishing to discharge to Whittle watercourse.	Breckland District Council: Planning Authority

Causes of flooding	Recommendations	Risk Management Authority with Relevant Flood Risk Function
Within the centre of Kenninghall the floodplain is naturally constrained by a valley bounded by high ground near to the Community Centre and West Church Street. The inability of the river to spread out over a wider floodplain led to the severe depths witnessed in the centre of the village (1.2m deep reading on village shop) and of which are similar to flood levels witnessed in the Great Flood of 1968. The flood water entered the properties through low thresholds at entrances, the air bricks and/or the electricity conduits. A tributary, within East Church Street was also heavily constrained by road crossings but was also backed by the high levels in the Beck. Overall, it appears the Beck was overtopping its bank(s) upstream of Kenninghall as far as Dam Green and conveyance of floodwater within the constrained floodplain inundated Kenninghall rather than localised overtopping within the centre of the village itself. Locals witnessed a torrent of overland flow from the west off East Harling Rd adding to the main problems in the Market Square. Possibly surface water runoff from fields.	Riparian owners to consider increasing size of piped watercourses and/or providing additional surface water storage that may currently act as a constriction. Risk Management Authorities to investigate partnership funding to deliver a capital scheme which aims to increase standard of protection in Kenninghall. Works recommended include: 1) Feasibility Study or hydraulic assessment to understand baseline flood risk and potential alleviation options for Kenninghall. 2) A community led Natural Flood Management Scheme by the community on agricultural land to the South of Kenninghall. One landowner has been identified to date. Pending feasibility study outputs deliver a capital scheme to raise Standard of Protection for properties near the Beck. Norfolk County Council (LLFA) to advise residents of Property Level Resilience measures and funding opportunities. Property owners could also carry out their own measures where funding is not forthcoming, or residents are unwilling to wait. Property Owners should consider the potential to retrofit permeable areas and other methods of small scale sustainable drainage systems.	Norfolk County Council (LLFA and Highways) Homeowners

Causes of flooding	Recommendations	Risk Management Authority with Relevant Flood Risk Function
Blockages were identified at several locations along the watercourse post event, associated with large in channel trees. Two major blockages were evident in the downstream section along Banham Rd.	Norfolk County Council (LLFA) to review maintenance responsibilities for The Beck and its associated drainage infrastructure and implement to a wider action plan. Norfolk County Council (LLFA) Review access arrangements for inspection and maintenance. Emphasis on access to the Inlet and Outlet for the culvert under the Market Square which currently very constrained. Norfolk County Council (Highways) to review the inspection and maintenance schedule of all surface water drainage assets within the adopted Highway. Particularly the Market Square Brick Arch culvert and its upstream face. Monitor and review capacity of highway culverts at Market Square. Suggest adding telemetry to monitor water levels and flow rates on both sides on Norfolk County Council (Highways) culverts. Riparian owners to clear watercourses (open and/or piped) through areas of concern particularly downstream of the Market Square. Ensures sufficient capacity and reduction of blockage potential which is likely to cause reduced conveyance and breaches.	Norfolk County Council (LLFA and Highways)

Causes of flooding	Recommendations	Risk Management Authority with Relevant Flood Risk Function
Although there was no evidence of blockage, the entrance to the market square culvert is likely to be a major constriction to flood flows. The upstream inlet is approximately 2m x 0.6m where freeboard alone for such a major culvert should have bel 0.6m as per Ciria C768.	Norfolk County Council (LLFA and Highways) should determine if works are needed to remove the risk posed by structures that form obstructions to flows and communicate with affected parties and riparian owners. Investigate and/or model culverts and identity if have capacity for flood flows.	Norfolk County Council (LLFA and Highways)
Indirect issue was lack of forecasting, no Flood Warnings are available locally (only flood alerts) even though a monitoring station on the Whittle in Quidenham just downstream.	Suggest upgrading the warning system in Kenninghall using gauges on River Whittle.	Environment Agency

North Pickenham



Flood Incidents Within this Area

Within North Pickenham one 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
01/03/2021	On the 01/03/2021 one property reported internal flooding on Meadow Lane, North Pickenham. This incident was reported by a resident via an online flood report form on the 1/03/2021, (FWF/21/4262)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 North Pickenham

Norfolk County Council (LLFA) has no previous reports of internal flooding in North Pickenham.

Causes of Flooding 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 the following recommendations are made in three areas:

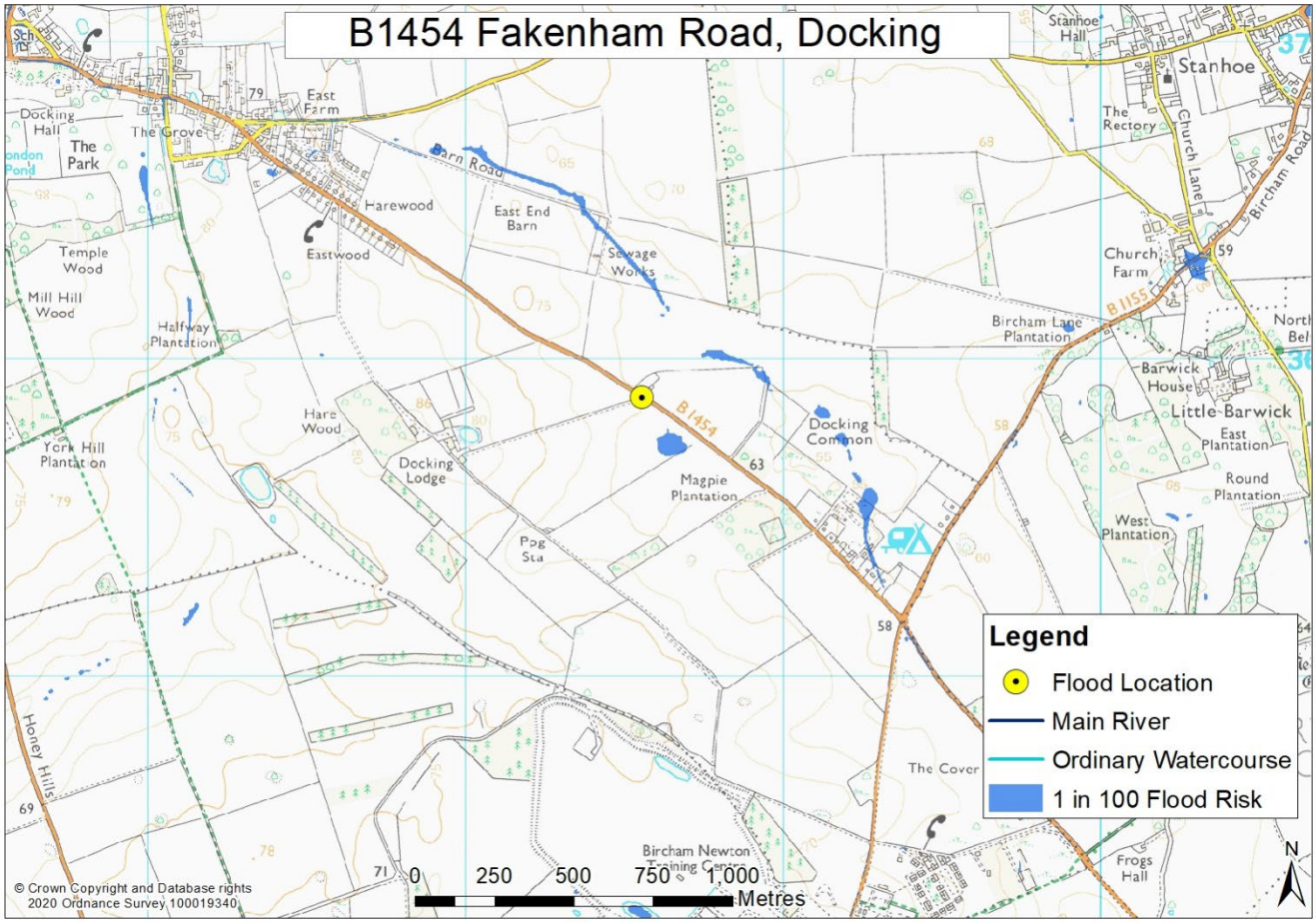
1) Risk Management Authorities should:
   - Communicate with affected residents where their assets have given rise to the flooding of properties.
   - Review the appropriateness of their response to flooding.
   - Determine the integrity and/or capacity of their assets where they have contributed to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

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

3) Norfolk County Council should:
   - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
   - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	**Causes of flooding**	**Recommendation**	**Risk Management Authority/individual with Relevant Flood Risk Roles**
Meadow Lane, North Pickenham, 01/03/2021	Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. High groundwater levels caused water to infiltrate into the foul sewer network and surcharged into the property	Anglian water should survey the foul sewer system to identify points of surface water entry and remove or repair as appropriate. Property owners should check private surface water systems and remove any misconnections to the foul sewer system if identified	Anglian Water Property Owners

Borough Council of King's Lynn and West Norfolk Area
Docking



Flood Incidents Within this Area

Within Docking one incident of flooding that closed a priority one or two gritting route 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 – the Fakenham Road B1454, Docking was flooded causing a road closure. This incident was reported by Norfolk County Council (Highways) via email correspondence on the 19/01/2021, (FWF/21/3945)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Docking

The following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact
23/12/2020	Properties were flooded in Docking during this event. Please see Flood Investigation Report King's Lynn and West Norfolk Winter Flood Report 2020-21 FIR066 on the Flood investigations webpage.

Causes of Flooding 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 the following recommendations are made in three areas:

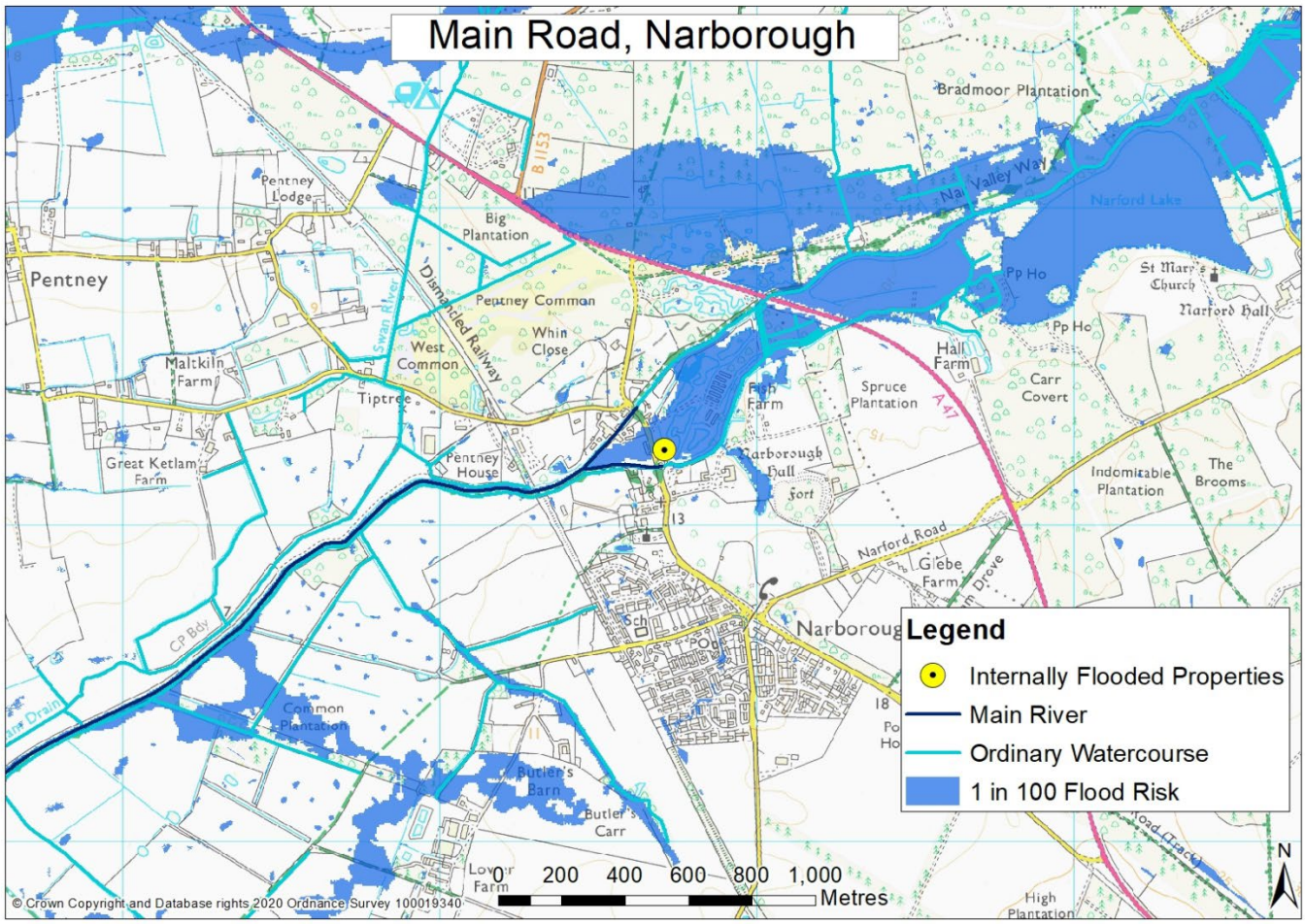
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

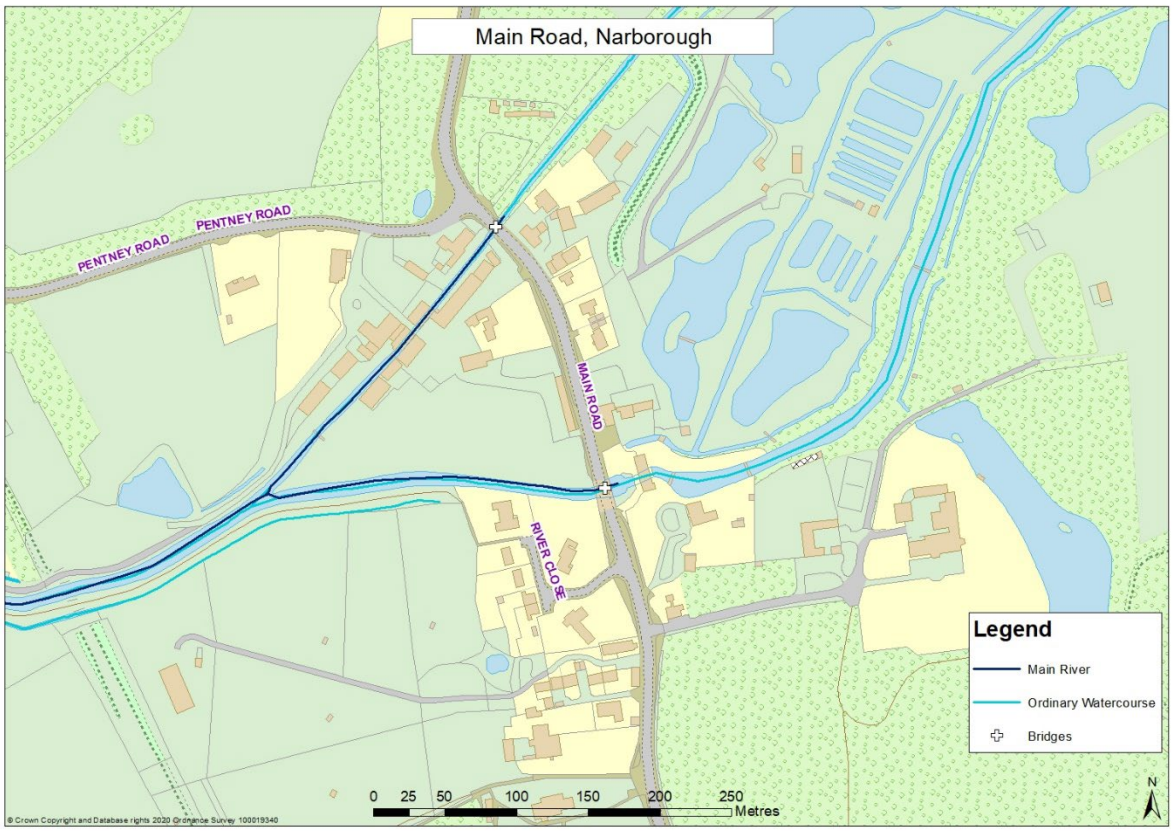
2) Property owners of affected properties should seek their own legal advice.

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Fakenham Road B1454, Docking, 19/01/2021	A substantial amount of rain fell on 23 and 24 December onto a catchment with prior high saturation levels. Due to the saturation of soils localised ground conditions caused runoff to be directed quickly from where it fell as rain to the areas of flooding. Surface runoff made its way into the surface water network. These flows could not be accommodated as the system was already overloaded. Surface runoff also made its way onto tracks and roads and flowed along the road network.	Norfolk County Council (Highways) will consider opportunities to route flood water on the highway away from affected areas to alternative points of discharge, or other solutions as practicable.	Norfolk County Council (Highways)

Narborough





Narborough Detailed Map.

Flood Incidents Within this Area

Within this catchment one 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
25/12/2020	On the 25/12/2020 one property reported internal flooding on Main Road, Narborough. This incident was reported by a resident via an online flood report form on 01 June 2021, (FWF/21/4713)	The Fire and Rescue Service carried out measures to minimise the impact of flooding during the incident. A resident carried out measures to minimise the impact of flooding during the incident. Norfolk County Council (LLFA) visited affected residents to offer advice and to gather information after the incident. Norfolk County Council (Highways) undertook works to raise the level of the kerb on the road 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 (LLFA) 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 Narborough

Norfolk County Council (LLFA) has no previous reports of internal flooding in Narborough

Causes of Flooding 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 the following recommendations are made in three areas:

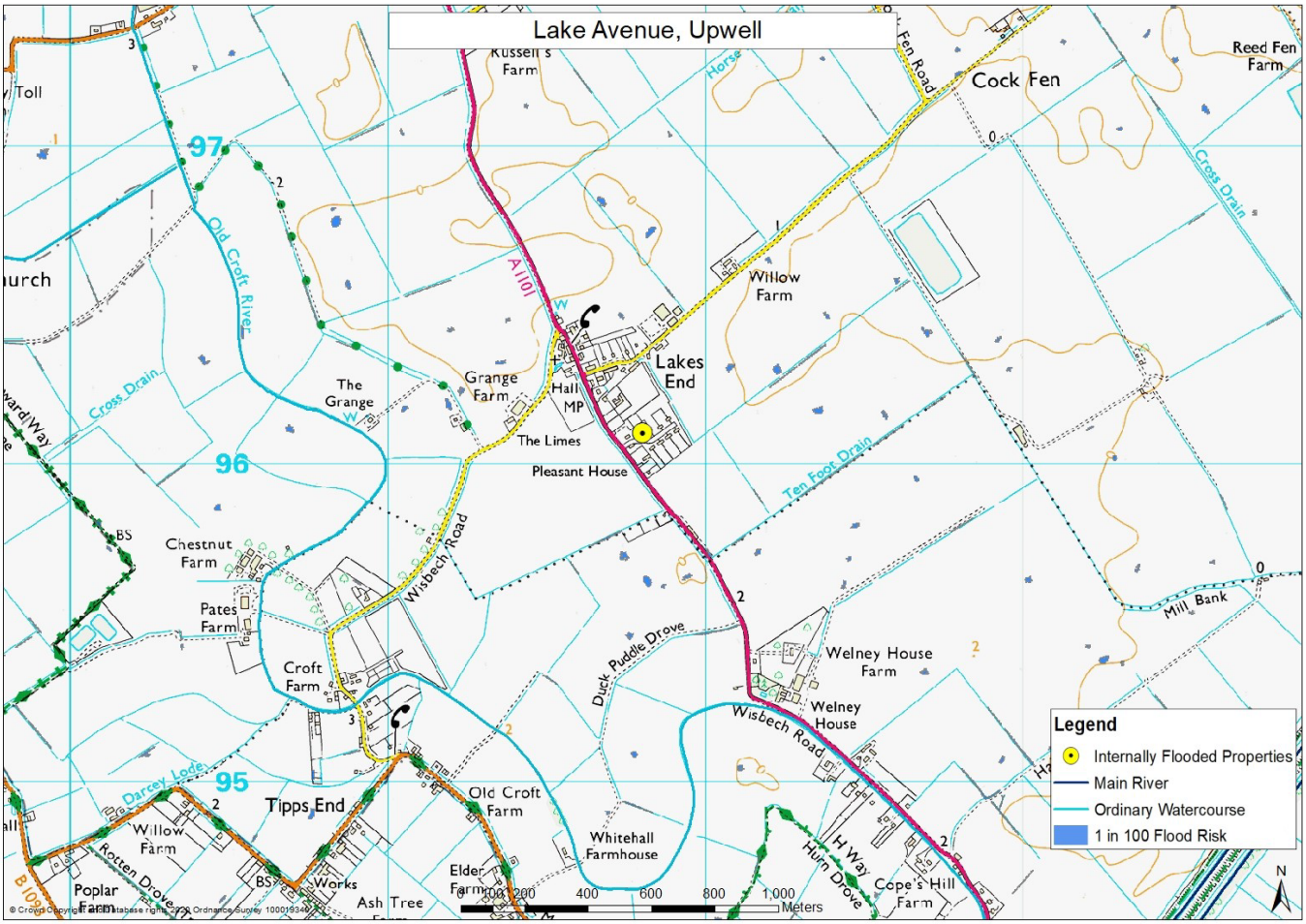
1) Risk Management Authorities should:
    - Communicate with affected residents where their assets have given rise to the flooding of properties.
    - Review the appropriateness of their response to flooding.
    - Determine the integrity and/or capacity of their assets where they have contributed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

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Main Road, Narborough, 25/12/2020	Significant rainfall was concentrated on the highway. Vehicles using the highway passed through the flood water causing it to wash towards the affected property.	Norfolk County Council (Highways) will consider options that would prevent water from pooling on the highway.	Norfolk County Council (Highways)
Main Road, Narborough, 25/12/2020	The surface water drainage, watercourses and river networks were obstructed by high water levels downstream. This reduced the efficiency of the upstream drainage system contributing to flooding at the affected properties.	The Internal Drainage Board and the Environment Agency should continue to review their maintenance programme using a risk based approach. Riparian owners are encouraged to maintain watercourses applying for a Flood Risk Activity Permit where necessary.”	Internal Drainage Board Environment Agency Riparian Owners

Upwell


Lake Avenue, Upwell
Russell's Farm
Horse
Fen Road
Cock Fen
Reed Fen Farm
Cross Drain
Willow Farm
A1101
Lakes End
Grange Farm
Hall MP
The Limes
Pleasant House
The Grange
Old Croft River
Ward Way
Cross Drain
97
96
95
Ten Foot Drain
Mill Bank
Chestnut Farm
Pates Farm
Wisbech Road
Croft Farm
Duck Puddle Drove
Welney House Farm
Welney House
Wisbech Road
Darcey Lode
Tipps End
Old Croft Farm
Whitehall Farmhouse
Willow Farm
Rotten Drove
Poplar Farm
Works
Ash Tree
Elder Farm
H Way
Hurn Drove
Cope's Hill Farm
B1098
Legend
Internally Flooded Properties
Main River
Ordinary Watercourse
1 in 100 Flood Risk
0 200 400 600 800 1,000 Meters
N

Flood Incidents Within this Area

Within Upwell one 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 one property reported internal flooding on Lake Avenue, Upwell. This incident was reported by a resident via email correspondence on the 9/08/2021, (FWF/21/5578)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 Upwell.

Norfolk County Council (LLFA) has no previous reports of internal flooding on Lakes End, Upwell.

Causes of Flooding 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 the following recommendations are made in three areas:

1) 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.

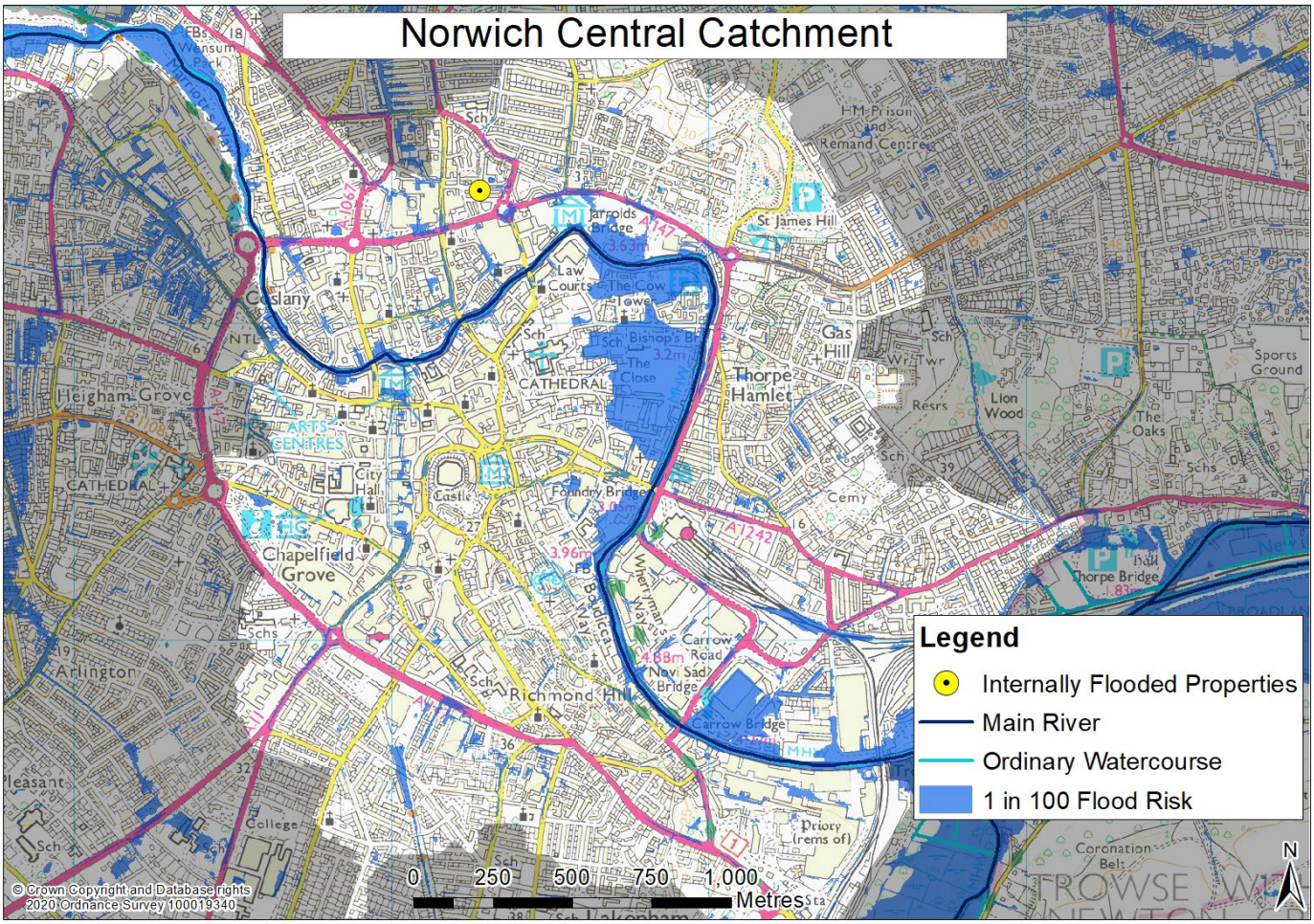
2) Property owners of affected properties should seek their own legal advice.

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/individual with Relevant Flood Risk Roles
Lake Avenue, Upwell, 24/12/2020	Significant rainfall was directed into the surface water and foul system causing it to surcharge elsewhere. This surcharging contributed to the flooding at the affected property. Surface runoff flowed off adjacent fields and into the affected properties that were situated lower than these features.	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 The relevant organisation and/or riparian owners to undertake a regular regime of maintenance to ensure watercourses are free from obstruction (i.e. tree leaves or roots and other foreign objects) at all times. Middle Level Commissioners IDB and landowners to consider the provision of an additional drainage ditch to direct water away from the property	Property owner Riparian owners/ Land Owners Middle Level Commissioners Internal Drainage Board Norfolk County Council (LLFA)

Norwich City Council Area

Norwich



Description of the Catchment

The catchment is urban in nature located within the city centre of Norwich. There are a significant number of residential properties within the catchment as well as numerous commercial ones. There are several areas of green space with the catchment however the surface is predominantly metalled, including areas of car parking. The catchment is bisected by the River Wensum to the north which in turn is separated via a flood wall.

Flood Risk Within the Catchment

The flood risk from local sources (ordinary watercourses and surface runoff) and strategic sources (fluvial above three 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 (3.33% AEP) event and the 1 in 100 (1% AEP) 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 (3.33% AEP) event:	0	4	3
[b] Number of properties subject to surface water flood risk at 1 in 100 (1% AEP) event:	0	13	6
[c] Number of properties subject to flood risk from rivers and the sea at 1 in 30 (3.33% AEP) event:	0	0	0
[d] Number of properties subject to flood risk from rivers and the sea at 1 in 100 (1% AEP) event:	0	0	0
[e] Number of properties only subject to both flood risk from surface water and rivers and the sea (combined risk) at 1 in 30 (3.33% AEP) event:	0	0	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 (1% AEP) event:	0	0	0

Flood Incidents Within this Catchment

Within this catchment one 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
26/12/2020	On the 26/12/2020 one property reported internal flooding on Cowgate, Norwich. This incident was reported by a resident via an online flood report form on the 20 January 2021, (FWF/21/3781)	Norfolk County Council (LLFA) assessed validity and impact of the flood report 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 (LLFA) 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 following table lists flooding incidents within the catchment that have been recorded.

Date of incident	Impact	Rainfall intensity
27/05/2014	13 properties flooded internally	Heavy rain
23/06/2014	One property flooded internally	Heavy rain
13/07/2014	One property flooded internally	Heavy rain
20/07/2014	17 properties flooded internally	Heavy rain
05/01/2015	Four properties flooded internally	Heavy rain
29/03/2015	One property flooded internally	Unknown
26/08/2015	Three properties flooded internally	Unknown
06/07/2017	One property flooded internally	Heavy rain
25/07/2017	One property flooded internally	Heavy rain
07/12/2018	One property flooded internally	Unknown
08/12/2018	One property flooded internally	Unknown
16/12/2018	One property flooded internally	Unknown
07/04/2019	One property flooded internally	Unknown
11/06/2019	One property flooded internally	Steady Rain

Causes of Flooding 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 the following recommendations are made in three areas:

1) 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.

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

3) Norfolk County Council should:
    - Incorporate all relevant information of actual flooding into the review of the Norfolk Preliminary Flood Risk Assessment.
    - Review and monitor the delivery of recommendations within this and other relevant flood investigation reports.

Location and date of flooding	Causes of flooding	Recommendation	Risk Management Authority/ individual with Relevant Flood Risk Roles
Cowgate, Norwich, 26/12/2020	The flood Water entered via below ground structures (i.e. basements and cellars) was reported to a depth of approximately 50mm.	Property owners should protect their buildings through flood protection 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 Norfolk County Council (LLFA)

Disclaimer

Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, it cannot be guaranteed 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.

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, where:

a) Basements and below ground level floors are included.
b) Garages are included if in the fabric of the building. Garages adjacent or separate from the main building are not included.
c) 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, where:

a) '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.
b) 'Groundwater' means all water which is below the surface of the ground and in direct contact with the ground or subsoil.
c) '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 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 Risk Management Authorities have a duty to cooperate with other Risk Management Authorities.

1. Norfolk County Council (LLFA)

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

2. District, City and Borough Councils

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

3. Internal Drainage Boards

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

4. Highway Authorities (Norfolk County Council or National Highways)

a) Powers to undertake works to manage water on the highway and to move water off the highway.

b) Enforcement powers to unauthorised alterations, obstructions and interferences with highway drainage.
c) Have responsibilities for culverts vested in the highway. Currently Norfolk County Council 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

a) Undertake cost beneficial capital schemes to alleviate or eliminate flooding where the flood event is associated with a failure of their assets.
b) Duty to provide, improve, maintain and operate systems of public sewers and works for the purpose of effectually draining an area.
c) Are responsible for flooding from their foul, combined and surface water sewers, and from burst water mains.
d) 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.
e) 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.
f) Duties as a Category 2 Responder for Emergency Planning.

6. Riparian Owners (any landowner who has a watercourse running within or adjacent to their land has duties under common law)

a) Duty of care towards neighbours upstream and downstream, avoiding any action likely to cause flooding.
b) Entitled to protect their properties from flooding.
c) May be required to maintain the condition of their watercourse to ensure that the proper flow of water is unimpeded.
d) Further information regarding the responsibility of riparian owners can be found here:

7. Environment Agency

a) Powers to regulate Activities on Main Rivers.
b) Permissive powers to undertake maintenance, however responsibility rests with riparian owners, any maintenance done under Environment Agency permissive powers is done on a risk based approach within the funding available.
c) Power to undertake works to manage flood risk from main rivers.
d) Required to have a strategic overview of all forms of flooding.
e) Enforcement powers for reservoirs greater than 25,000m^3 and a duty to maintain a register of these reservoirs.
f) Duties as a Category 1 Responder for Emergency Planning (including issuing flood warnings).