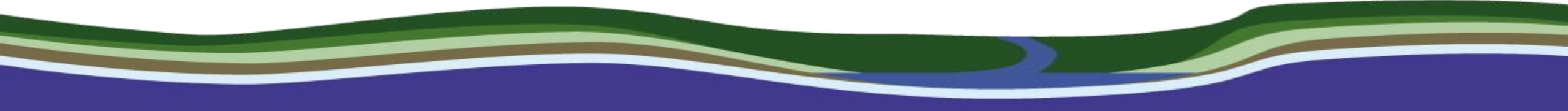




Delamere and Manley Common Diffuse Pollution Project Catchment Characterisation

March 2018

This catchment characterisation provides an overview of the Delamere and Manley Common Project catchments and summarises findings from catchment walkover surveys, desktop survey and farm advisory work delivered in catchment by Reaseheath College advisors during 2015-2017. Associated GIS layers can be requested from the RADA team by contacting hub@reaseheath.ac.uk with permission from the Environment Agency.



Delamere & Manley Pollution Prevention Project 2016-18

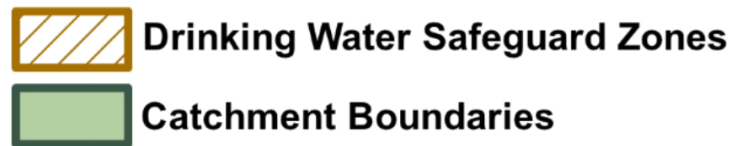
Overview

- The Project aims to reduce nitrates entering groundwater, and to tackle rural diffuse pollution impacts on surface water quality in the brooks arising on the sandstone ridge at Delamere.
- The area includes the groundwater Safeguard Zones (SgZ) at Delamere and Manley, which are designated due to rising nitrates within public water supply boreholes.
- Six surface watercourses have been identified as having poor water quality due to diffuse pollution from agriculture and non-mains drainage in rural unsewered areas.
- The project works with rural landowners with bespoke pollution prevention advice and assistance with mitigations.
- The activity is delivered through a partnership between the Environment Agency, United Utilities and Reaseheath College, funded by the EU Life Integrated Projects 2014 scheme (LIFE14 IPE/UK/027 LIFE-IP RBMP-NWRBD UK).



PROJECT AREA

- Groundwater Safeguard zones (SgZ) - issue with rising nitrates in raw drinking water from boreholes
- Salters, Ashton & Milton Brooks drain to the River Gowy
- Crowton, Cuddington and Darley Brooks drain to the River Weaver

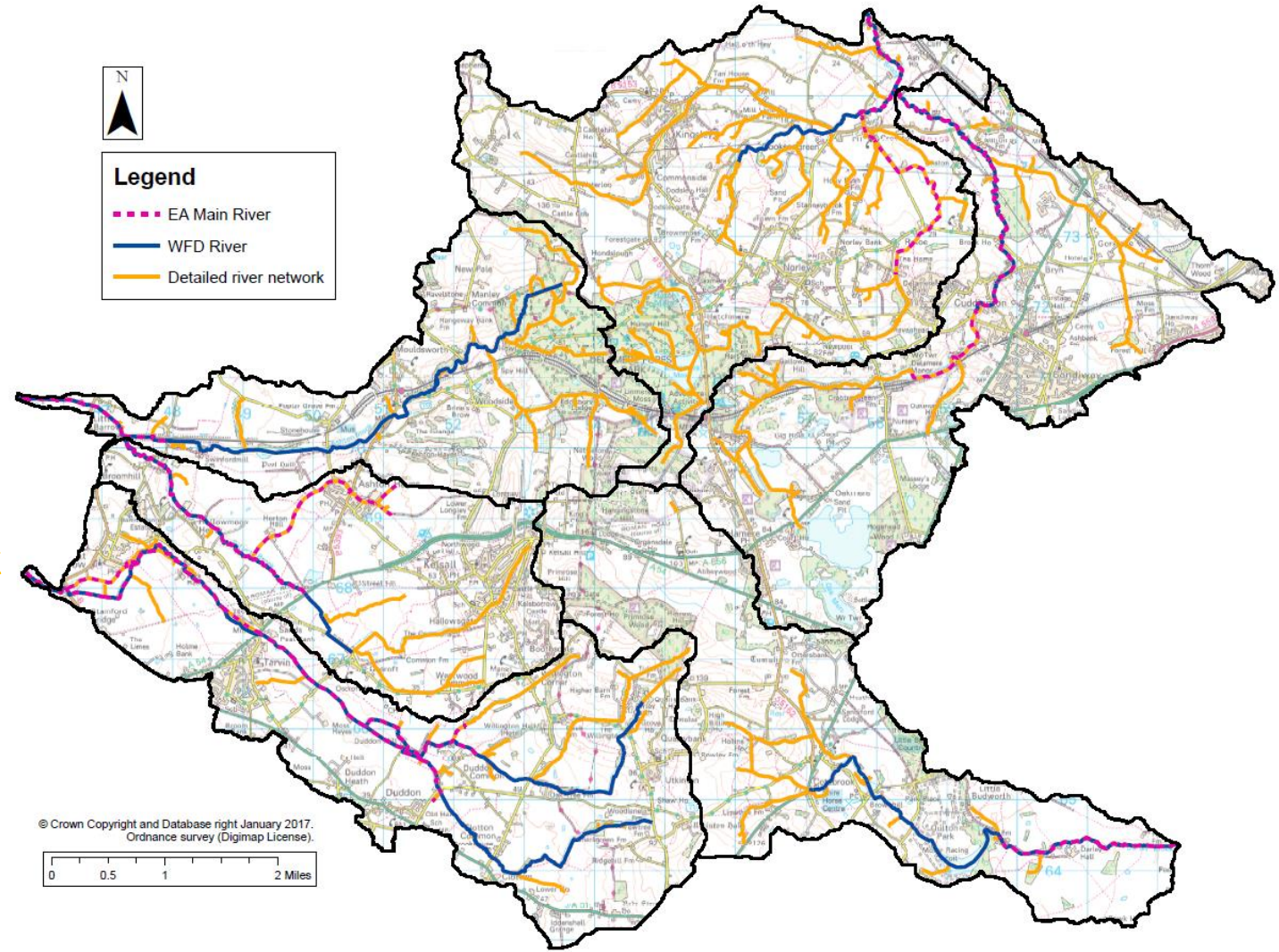


River Networks

The Environment Agency is responsible for carrying out maintenance, improvement or construction work on **EA Main Rivers** to manage flood risk. If landowners want to carry out building or construction work near a main river they may need a Flood Risk Activities permit.

Non-main rivers in the **Detailed River Network** come under the control of Local Authorities – Cheshire West & Chester or Cheshire East.

WFD Rivers have statutory monitoring and reporting requirements under the EU Water Framework Directive.



More information on EA Main River permits is available from www.gov.uk/guidance/flood-risk-activities-environmental-permits

Catchment Waterbody Overview

Brook name	ID	Catchment area (ha)	Main river Length (km)	Hydromorphological status
Salters	GB112068060300	1410	5.5	Not heavily modified or artificial
Ashton	GB112068060320	1650	10.7	Not heavily modified or artificial
Milton	GB112068060290	2210	18.9	Not heavily modified or artificial
Crowton	GB112068060550	2760	4.7	Not heavily modified or artificial
Cuddington	GB112068060480	2450	5.3	Not heavily modified or artificial
Darley	GB112068060450	1990	7.4	Heavily modified

Safeguard Zones	ID	Area (ha)	CLAD Area (ha)	Issue
Delamere	GB41101G202600 Both within Wirral and West Cheshire Permo-triassic Sandstone SgZ ID above	2193	1638	Nitrate as NO ₃ ⁻
Manley Common		504	357	



Custom Waterbody Summary Report

15 June 2017

13:51:49



Ashton Brook

Please be aware that data is based on the best available information as of the date shown above, and may be subject to change

WATERBODY ID	GB112068060320	CYCLE / LATEST VERSION	Cycle 2	4
TYPE	River	DESIGNATION	Not Designated A/HMWB	
LENGTH (km)		EASTING	350098	
AREA (km2)		NORTHING	369976	
Alkalinity		CATCHMENT AREA (Ha)		

Geographical Boundaries	
EA AREA	Greater Manchester Merseyside and Cheshire
RBD	North West
MAN CATCHMENT	Weaver Gowy
OP CATCHMENT	Gowy

Classifications

Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Moderate	Moderate	Good					Moderate	High	High	High	High
2014	Moderate	Moderate	Good		High			Moderate	High	High	High	DNSG
2015	Poor	Poor	Good		High		Poor	Moderate	High	High	High	Sup Good
2016	Poor	Poor	Good		High		Poor	Moderate	High	High	High	DNSG

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'



Custom Waterbody Summary Report

15 June 2017

13:54:13



Environment
Agency

Milton Brook

Please be aware that data is based on the best available information as of the date shown above, and may be subject to change

WATERBODY ID	GB112068060290	CYCLE / LATEST VERSION	Cycle 2	2
TYPE	River	DESIGNATION	Not Designated A/HMWB	
LENGTH (km)		EASTING	352937	
AREA (km2)		NORTHING	365294	
Alkalinity		CATCHMENT AREA (Ha)		

Geographical Boundaries	
EA AREA	Greater Manchester Merseyside and Cheshire
RBD	North West
MAN CATCHMENT	Weaver Gowy
OP CATCHMENT	Gowy

Classifications

Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Good	Good	Good						High	Good	High	High
2014	Poor	Poor	Good		Good		Poor	Poor	High	High	High	Sup Good
2015	Poor	Poor	Good		Good	Moderate	Poor	Poor	High	Good	High	Sup Good
2016	Poor	Poor	Good		Good	Moderate	Poor	Poor	Moderate	Good	High	Sup Good

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'



Custom Waterbody Summary Report

27 June 2017

15:31:19



Environment
Agency

Salters Brook

Please be aware that data is based on the best available information as of the date shown above, and may be subject to change

WATERBODY ID	GB112068060300	CYCLE / LATEST VERSION	Cycle 2	2
TYPE	River	DESIGNATION	Not Designated A/HMWB	
LENGTH (km)		EASTING	348774	
AREA (km2)		NORTHING	368649	
Alkalinity		CATCHMENT AREA (Ha)		

Geographical Boundaries

EA AREA	Greater Manchester Merseyside and Cheshire
RBD	North West
MAN CATCHMENT	Weaver Gowy
OP CATCHMENT	Gowy

Classifications

Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Moderate	Moderate	Good		Moderate							High
2014	Moderate	Moderate	Good		Moderate		Moderate					High
2015	Moderate	Moderate	Good				Moderate	Poor	Moderate	Bad	High	High
2016	Moderate	Moderate	Good				Moderate	Poor	Poor	Bad	High	DNSG

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'



Custom Waterbody Summary Report

15 June 2017

13:49:03



Darley Brook

Please be aware that data is based on the best available information as of the date shown above, and may be subject to change

WATERBODY ID	GB112068060450	CYCLE / LATEST VERSION	Cycle 2	2
TYPE	River	DESIGNATION	Heavily Modified	
LENGTH (km)		EASTING	359513	
AREA (km2)		NORTHING	364284	
Alkalinity		CATCHMENT AREA (Ha)		

Geographical Boundaries	
EA AREA	Greater Manchester Merseyside and Cheshire
RBD	North West
MAN CATCHMENT	Weaver Gowy
OP CATCHMENT	Weaver Lower

Classifications

Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Poor	Poor	Good	Mod/less			Poor	Poor	High	High	High	
2014	Poor	Poor	Good	Mod/less	Moderate		Poor	Poor	High	High	High	DNSG
2015	Moderate	Moderate	Good	Mod/less	Moderate	Bad		Poor	High	High	High	
2016	Moderate	Moderate	Good	Mod/less	Moderate	Bad		Poor	High	High	High	

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'



Custom Waterbody Summary Report

15 June 2017

13:59:10



Cuddington Brook (Source to Crowton Brook)

Please be aware that data is based on the best available information as of the date shown above, and may be subject to change

WATERBODY ID	GB112068060480	CYCLE / LATEST VERSION	Cycle 2	2
TYPE	River	DESIGNATION	Not Designated A/HMWB	
LENGTH (km)		EASTING	359686	
AREA (km2)		NORTHING	373731	
Alkalinity		CATCHMENT AREA (Ha)		

Geographical Boundaries

EA AREA	Greater Manchester Merseyside and Cheshire
RBD	North West
MAN CATCHMENT	Weaver Gowy
OP CATCHMENT	Weaver Lower

Classifications

Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Good	Good	Good									Sup Good
2014	Moderate	Moderate	Good		Good		Moderate					DNSG
2015	Poor	Poor	Good		Good		Poor	Poor	Moderate	High	High	Sup Good
2016	Moderate	Moderate	Good		Good		Moderate	Poor	Moderate	High	High	Sup Good

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'



Custom Waterbody Summary Report

15 June 2017

13:56:34



Crowton Brook

Please be aware that data is based on the best available information as of the date shown above, and may be subject to change

WATERBODY ID	GB112068060550	CYCLE / LATEST VERSION	Cycle 2	2
TYPE	River	DESIGNATION	Not Designated A/HMWB	
LENGTH (km)		EASTING	357769	
AREA (km2)		NORTHING	374753	
Alkalinity		CATCHMENT AREA (Ha)		

Geographical Boundaries

EA AREA	Greater Manchester Merseyside and Cheshire
RBD	North West
MAN CATCHMENT	Weaver Gowy
OP CATCHMENT	Weaver Lower

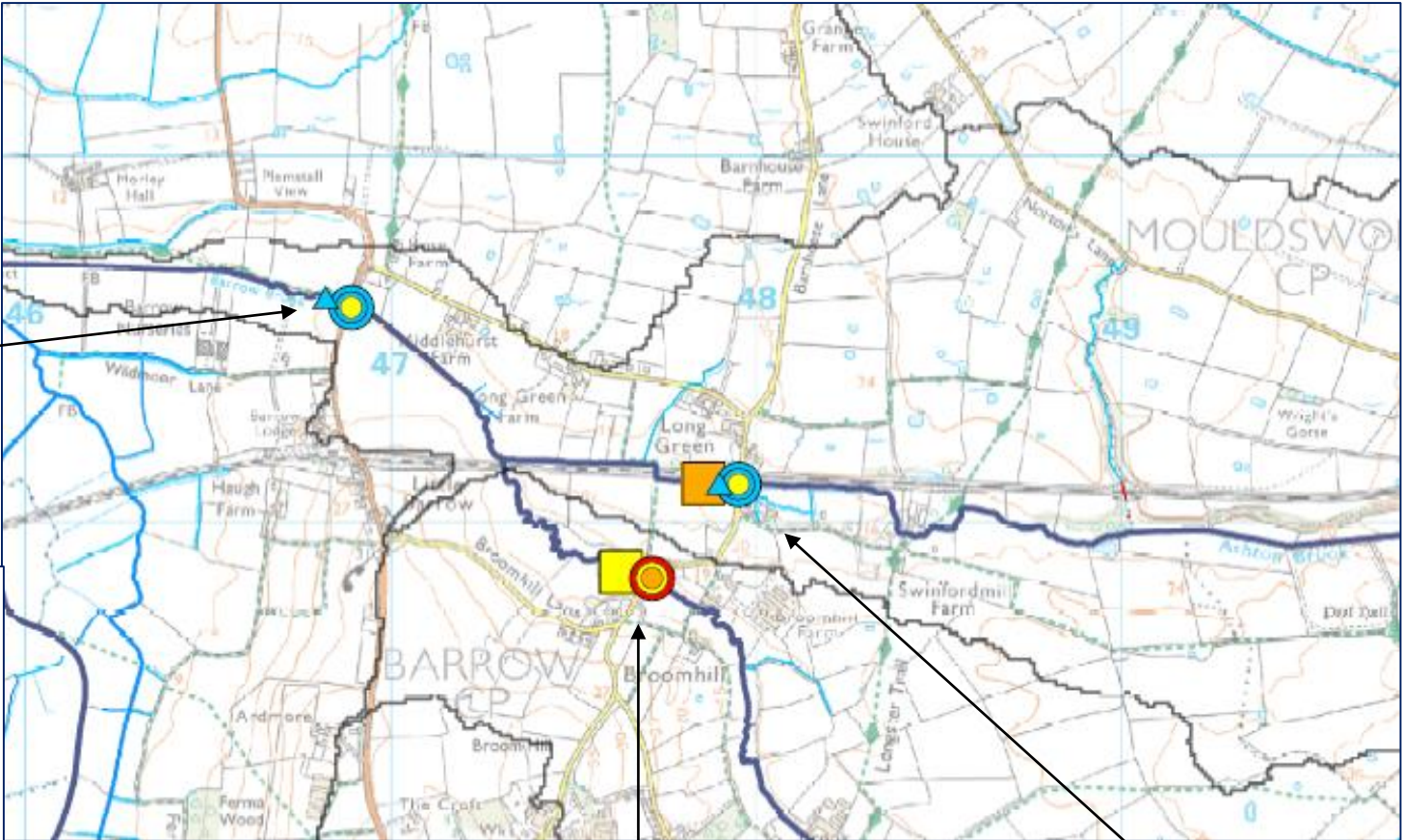
Classifications

Yea	Overall	Ecological	Chemical	MMA	Invertebrates	Fish	Macrophytes and Phytobenthos Combined	Phosphate	Ammonia	Dissolved Oxygen	pH	Hydrological Regime
2013	Moderate	Moderate	Good		Moderate		Good	Poor	Good	High	High	Sup Good
2014	Moderate	Moderate	Good		Moderate		High	Poor	High	High	High	DNSG
2015	Poor	Poor	Good		Moderate	Poor	Good	Poor	Good	High	High	DNSG
2016	Poor	Poor	Good		Moderate	Poor	Good	Poor	Moderate	High	High	DNSG

Note: DNSG = 'Does Not Support Good', DNRA = 'Does Not Require Assessment'

Environment Agency WFD Monitoring points

Combined downstream
sample point on Barrow
Brook



Salters &
Milton Brooks

Ashton Brook

Legend

Sample point data

Inverts	PhysChem (See below)	Phytobenthos	Macrophytes	Lake Sample Data (See below)
▲ High	● High	◆ High	■ High	◆ Good
▲ Good	● Good	◆ Good	■ Good	◆ Moderate
▲ Moderate	● Moderate	◆ Moderate	■ Moderate	◆ Poor
▲ Poor	● Poor	◆ Poor	■ Poor	◆ Bad
▲ Bad	● Bad	◆ Bad	■ Bad	◆ Bad

Phosphate
Ammonia
DO
BOD

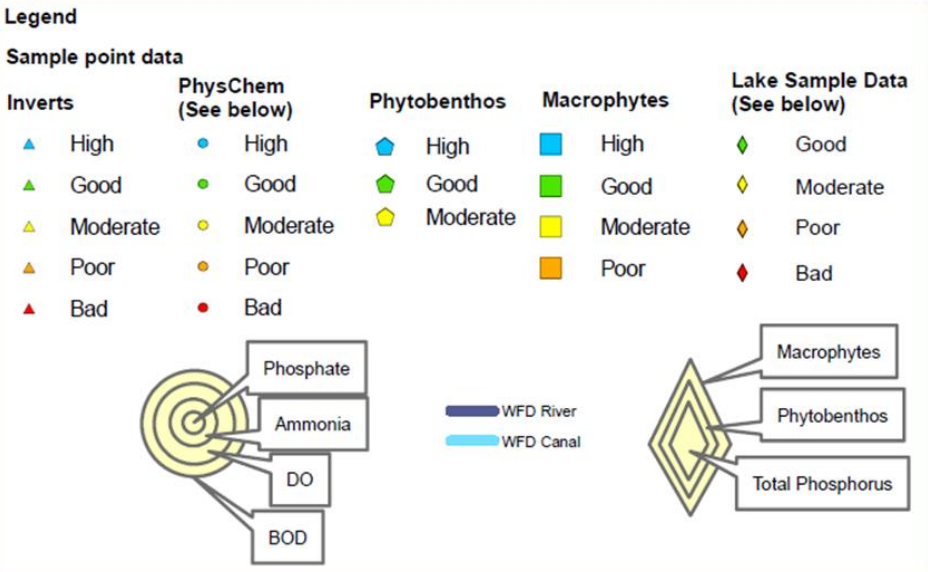
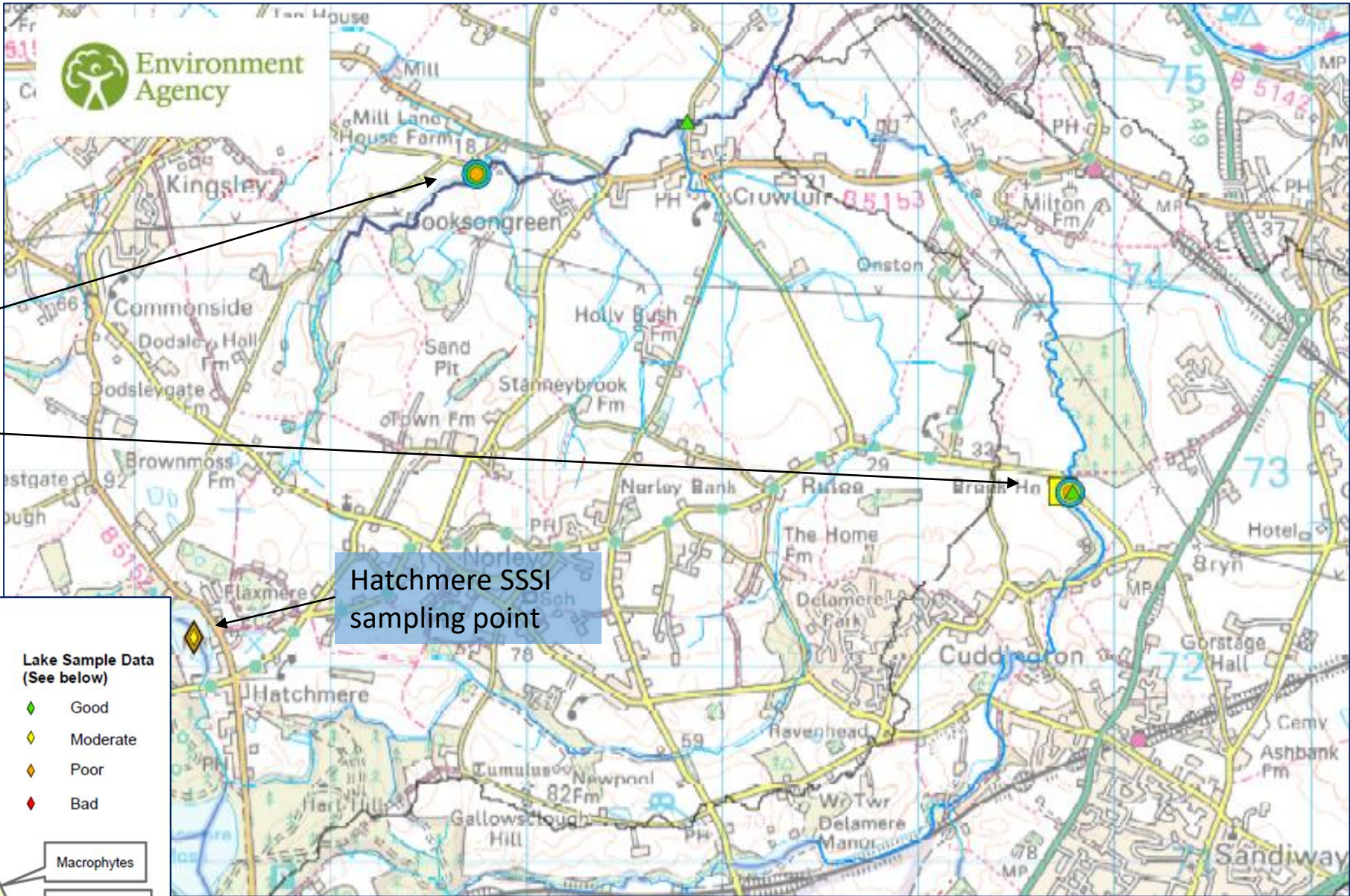
Macrophytes
Phytobenthos
Total Phosphorus

WFD River
WFD Canal

WFD Monitoring points

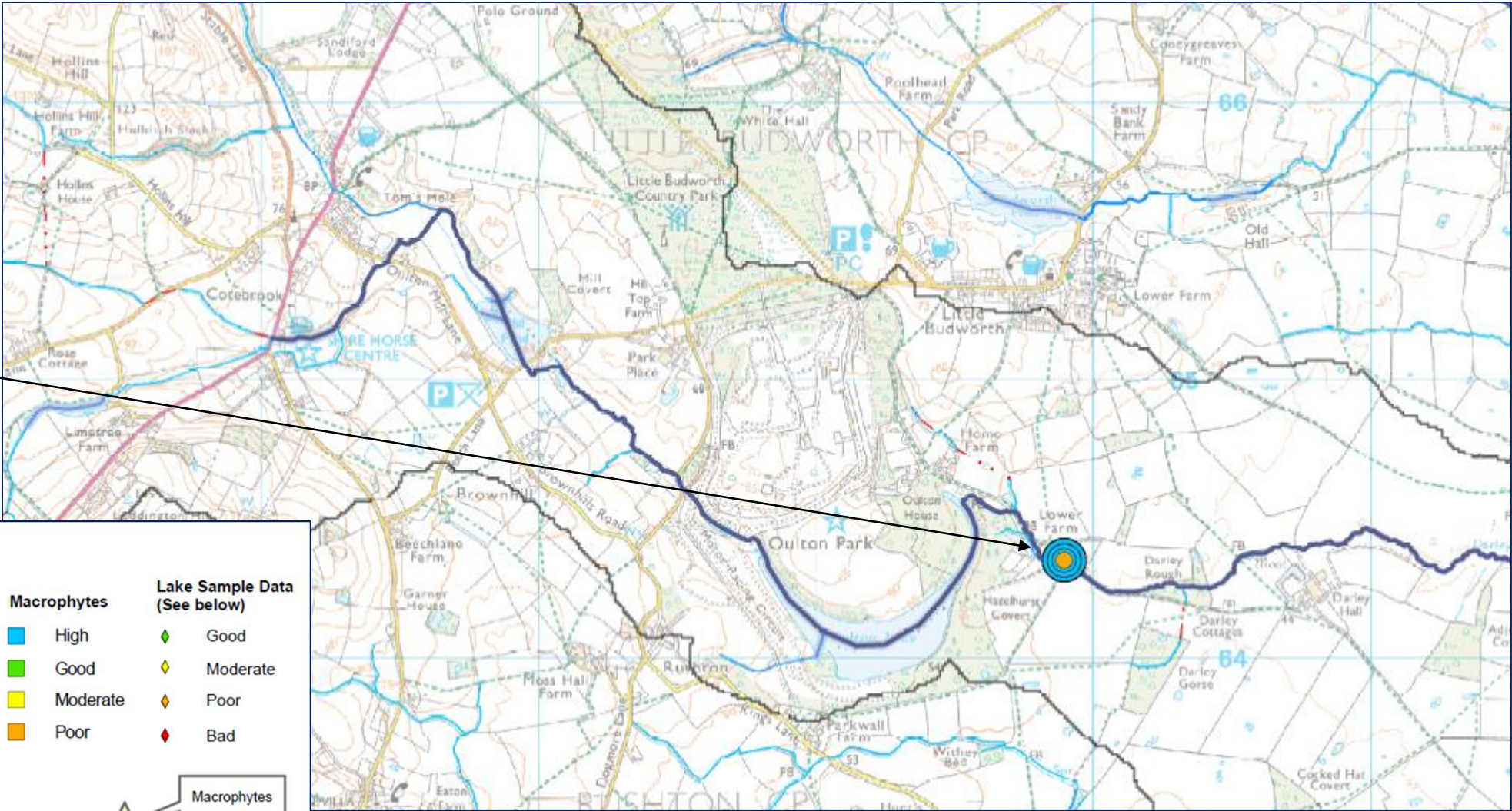
Crowton brook

Cuddington brook



WFD Monitoring points

Darley Brook



Legend

Sample point data

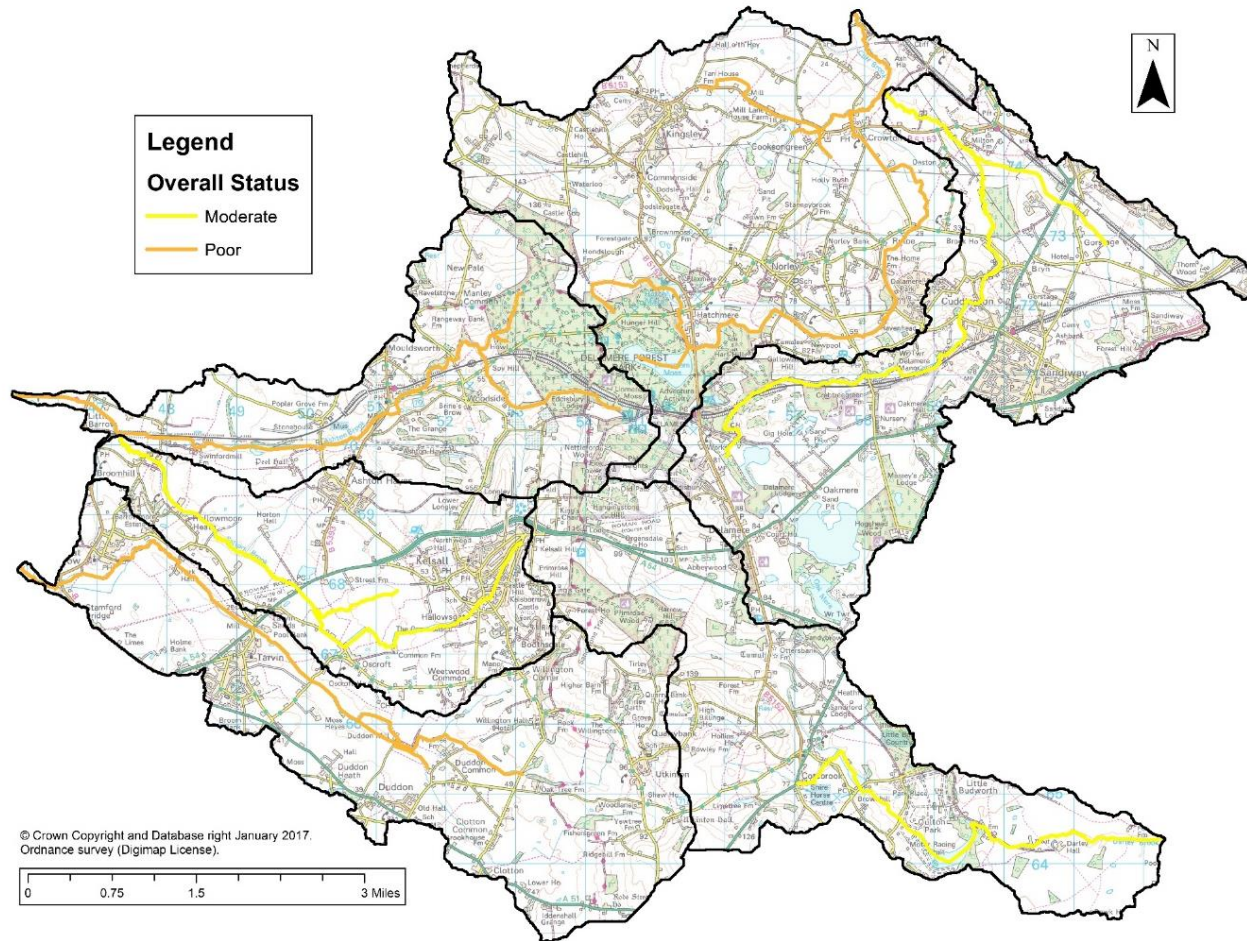
Inverts	PhysChem (See below)	Phytobenthos	Macrophytes	Lake Sample Data (See below)
▲ High	● High	◆ High	■ High	◆ Good
▲ Good	● Good	◆ Good	■ Good	◆ Moderate
▲ Moderate	● Moderate	◆ Moderate	■ Moderate	◆ Poor
▲ Poor	● Poor	◆ Poor	■ Poor	◆ Bad
▲ Bad	● Bad	◆ Bad	■ Bad	◆ Bad

Phosphate
Ammonia
DO
BOD

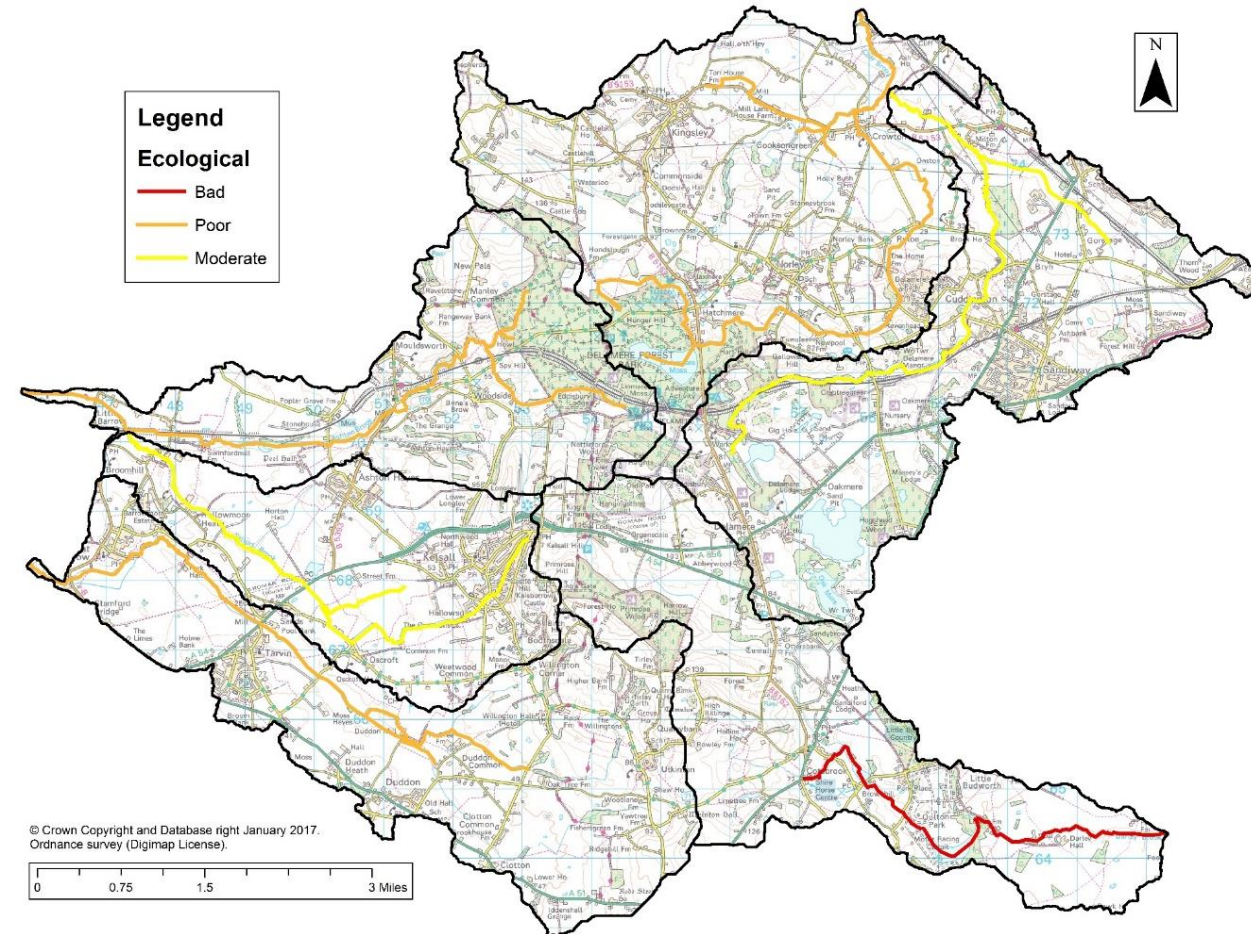
Macrophytes
Phytobenthos
Total Phosphorus

— WFD River
— WFD Canal

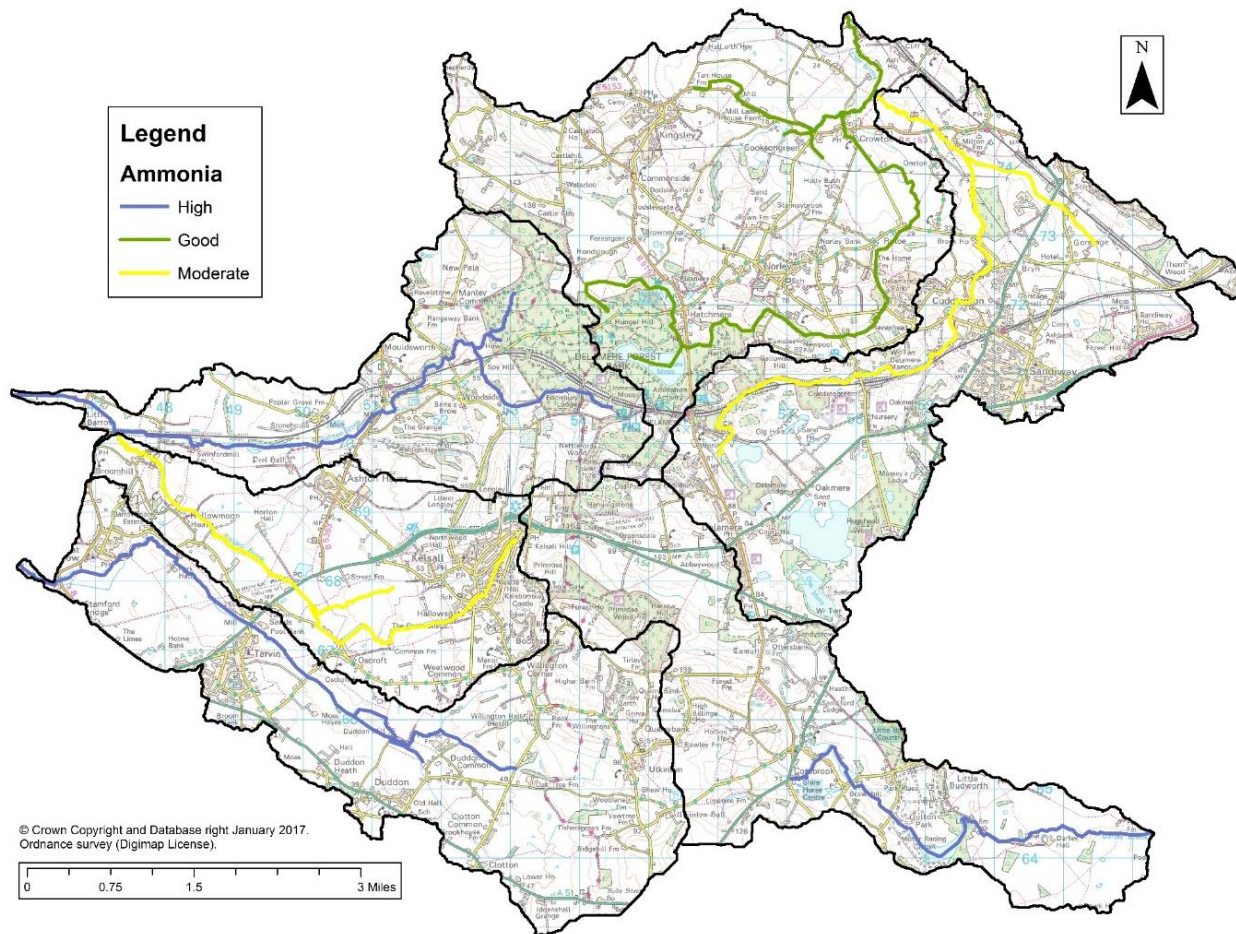
Overall WFD Status



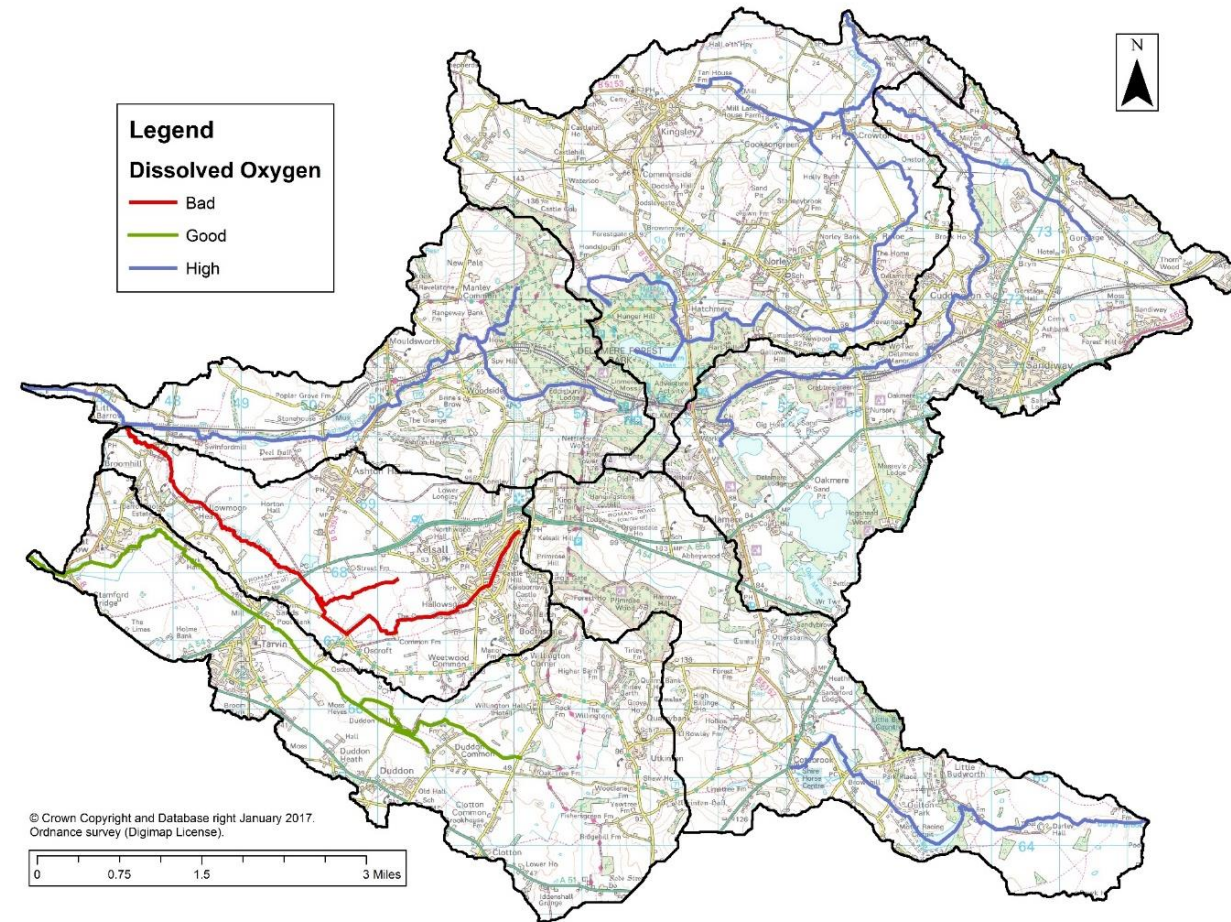
Ecological Status



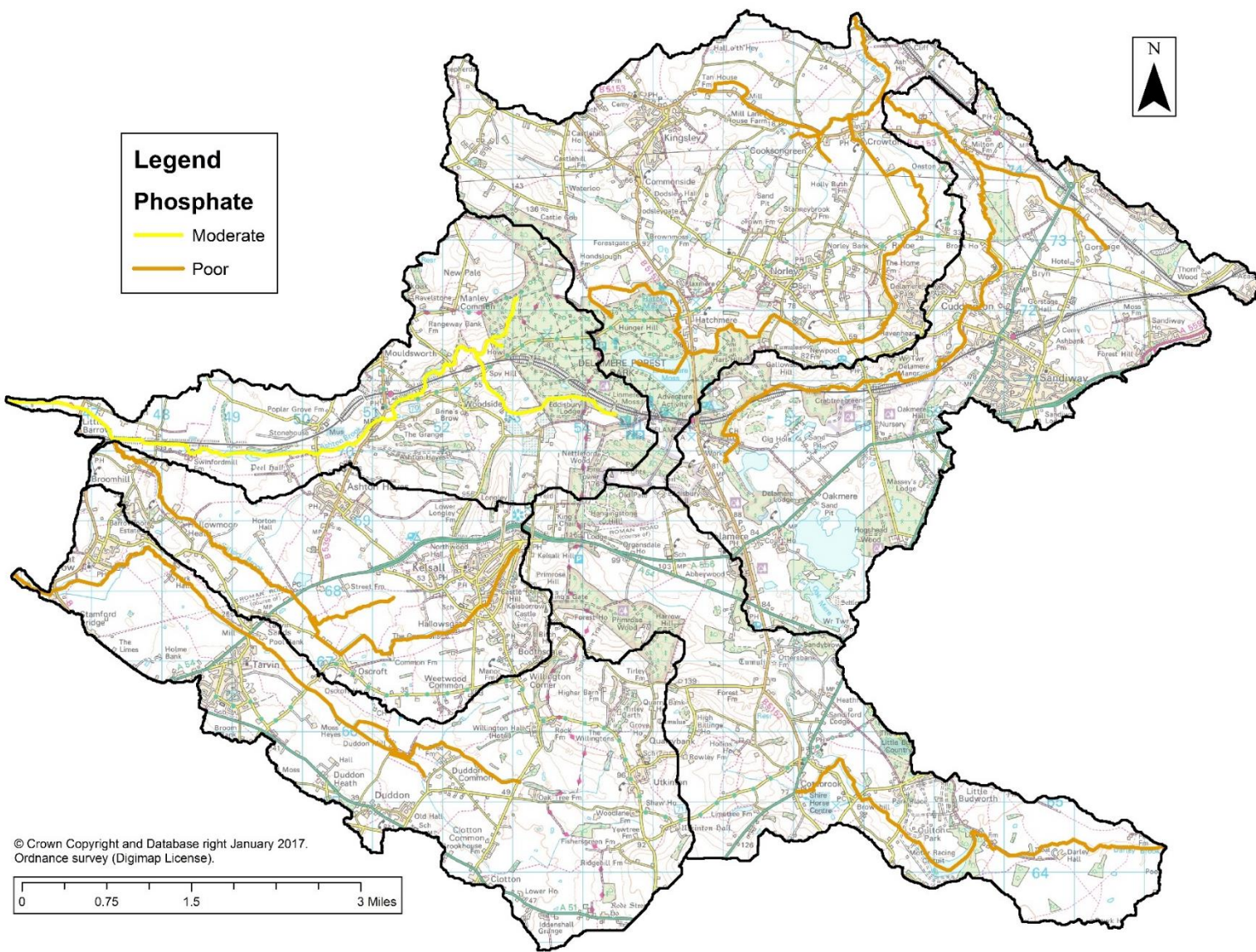
Ammonia Status



Dissolved Oxygen Status



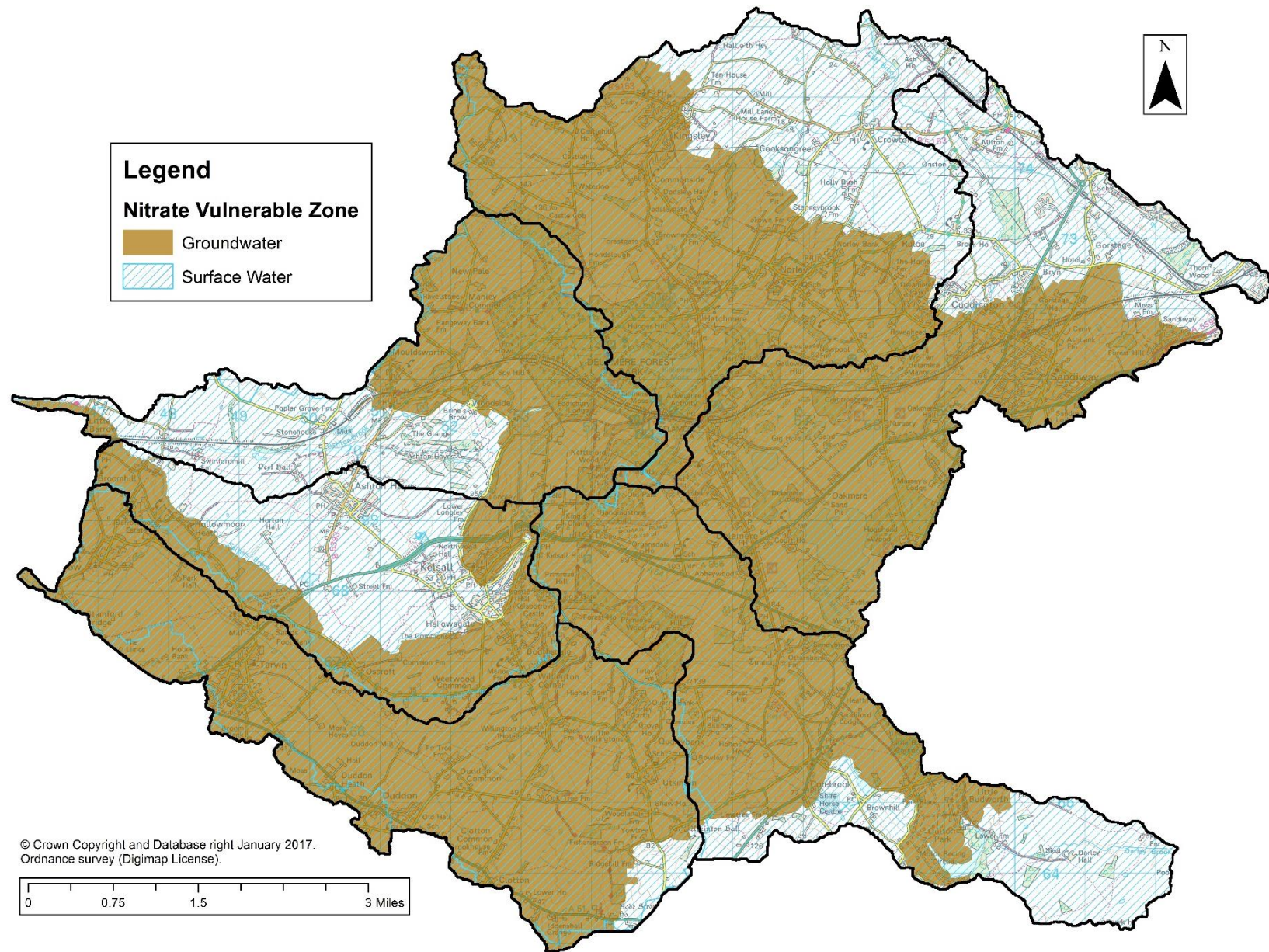
Phosphate WFD Status



Nitrate Vulnerable Zones

A review of NVZ status for 2017 in the Groundwater Catchment finds high agricultural load scoring.

The surface water catchment remains a designated NVZ due to some monitoring results indicating that some tributaries are still affected or could be affected by nitrate pollution.

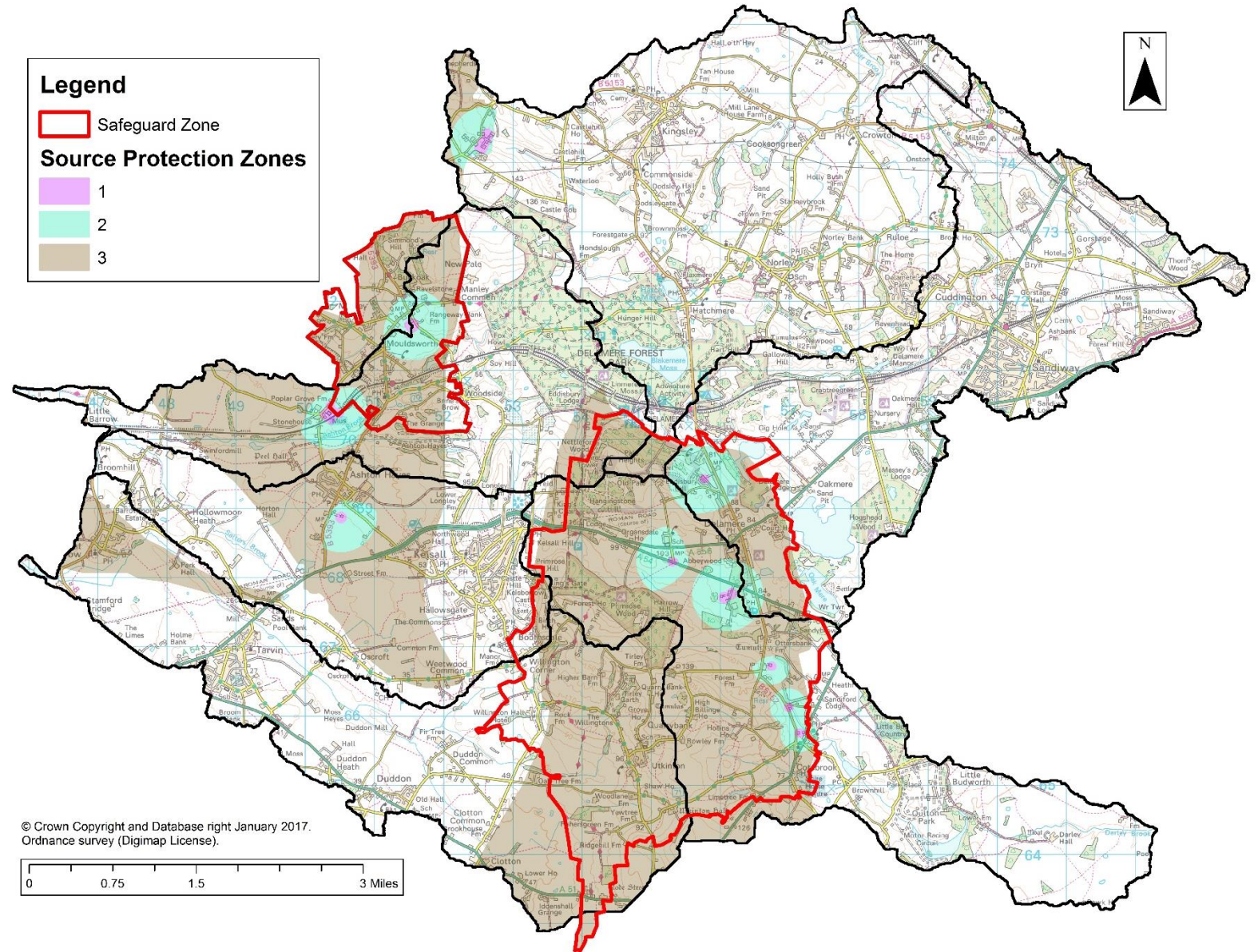


Groundwater Source Protection Zones

Zone 1 - Defined as the 50 day travel time from any point below the water table to the source. This zone has a minimum radius of 50 metres

Zone 2 - Defined by a 400 day travel time from a point below the water table

Zone 3 - Total catchment - Defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source

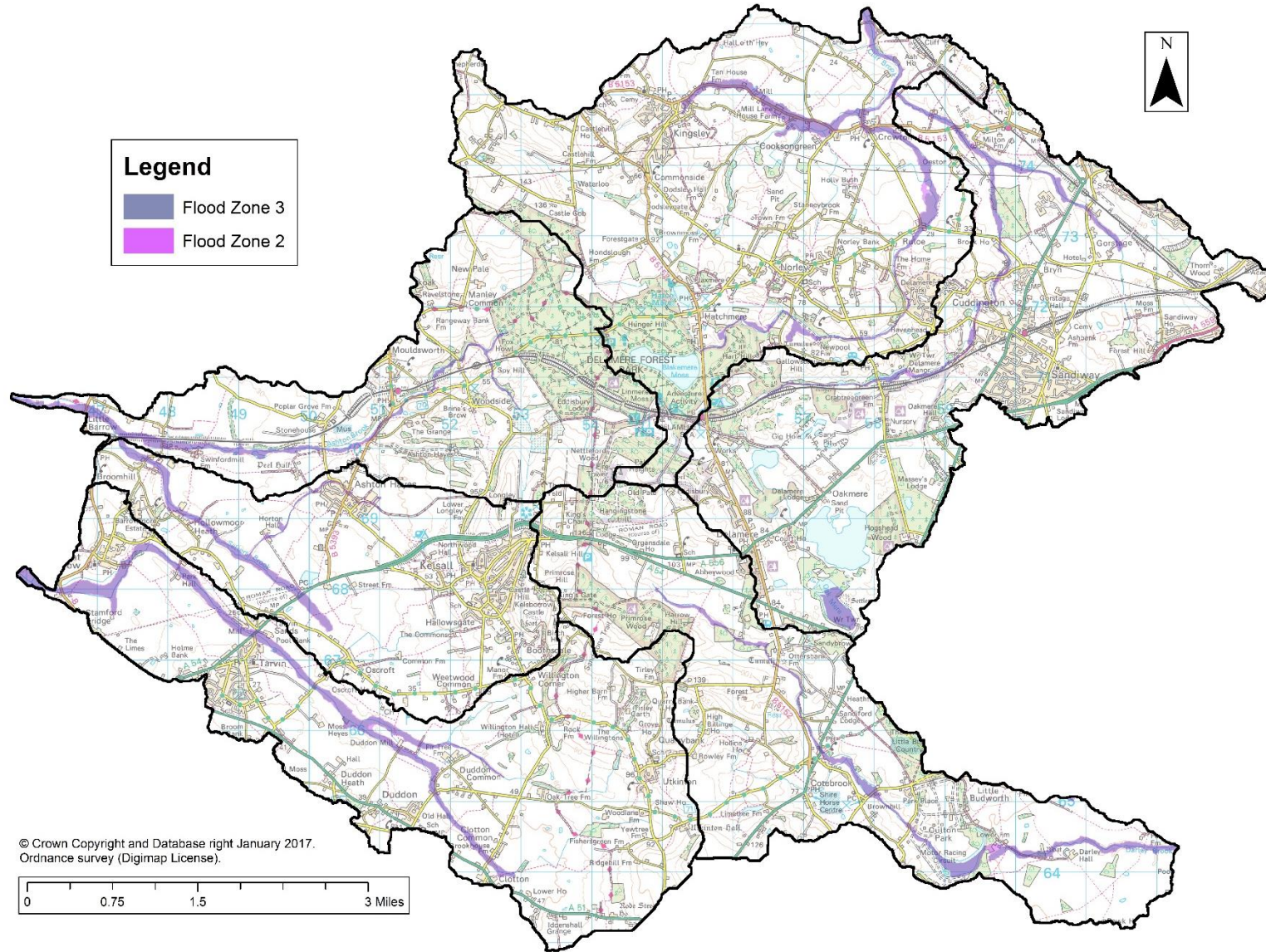


Environment Agency Flood Risk for Planning

The extent of the natural floodplain if there were no flood defenses or certain other manmade structures and channel improvements.

Flood Zone 3 (Higher risk) - area that could be affected by flooding from a river by a flood that has a 1 per cent (1 in 100) or greater chance of happening each year.

Flood Zone 2 (Lower risk) shows the additional extent of an extreme flood from rivers with up to a 0.1 per cent (1 in 1000) chance of occurring each year.

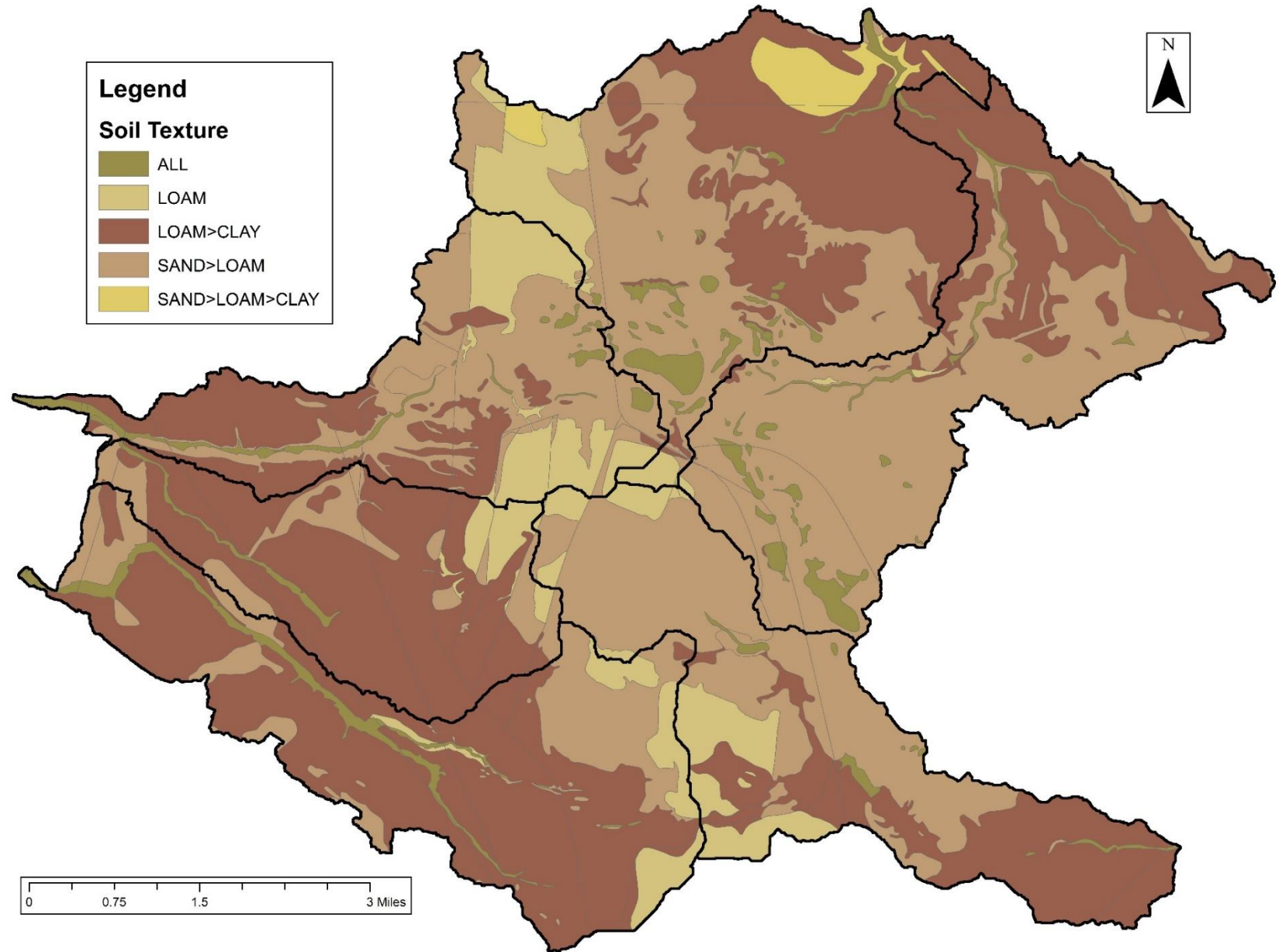


Soil Texture

Largely clay loams on plains on lower reaches of Salters and Milton Brooks.

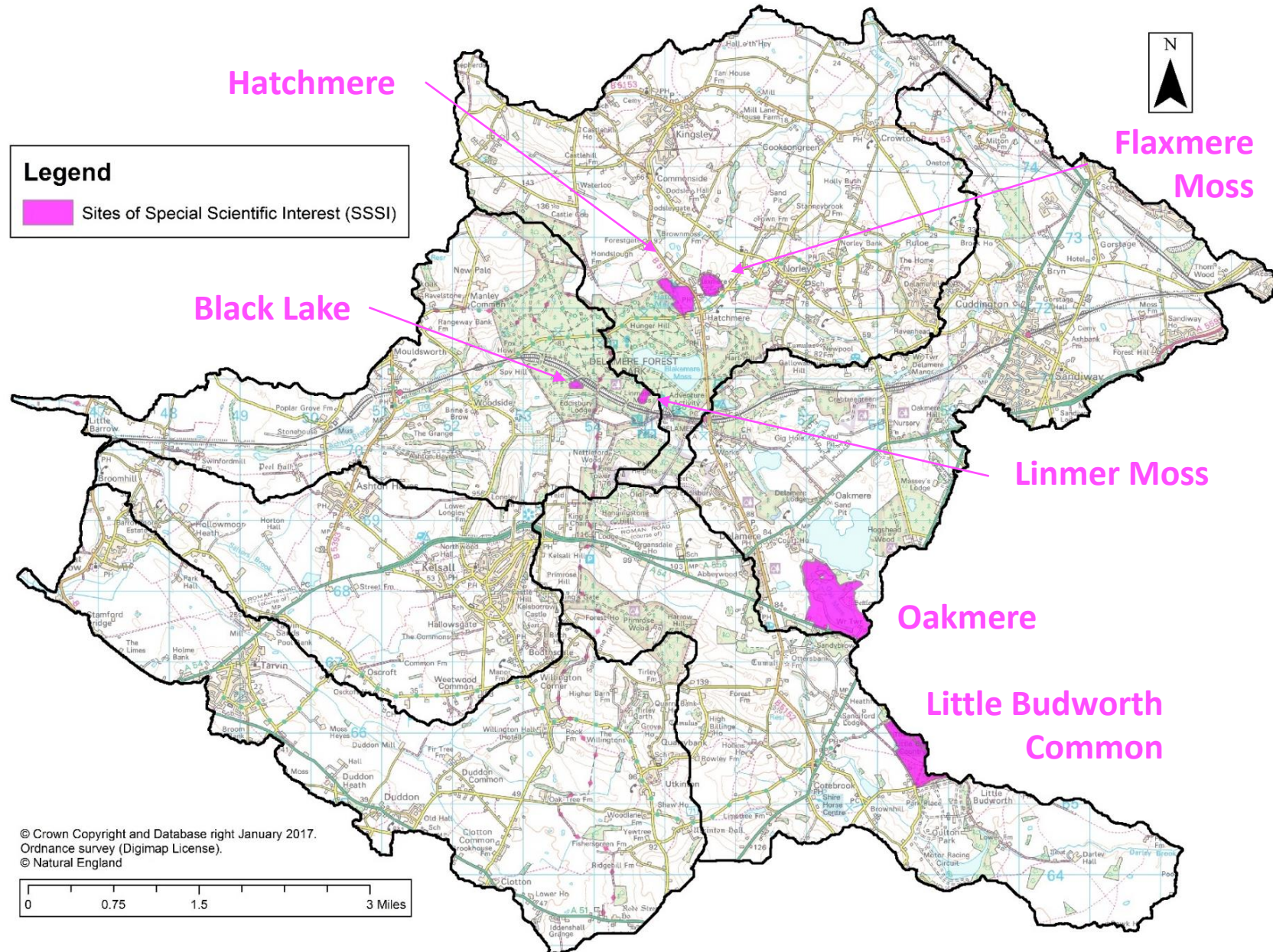
Upper brooks arising from sandy loams loamy sands on the Delamere Sandstone hills.

Large area of loamy sand on lower Crowton brook in proximity to weaver.





Sites of Special Scientific Interest

6 SSSIs of which Linmer Moss, Oakmere, Flaxmere and Hatchmere are RAMSAR designated (European level designation)



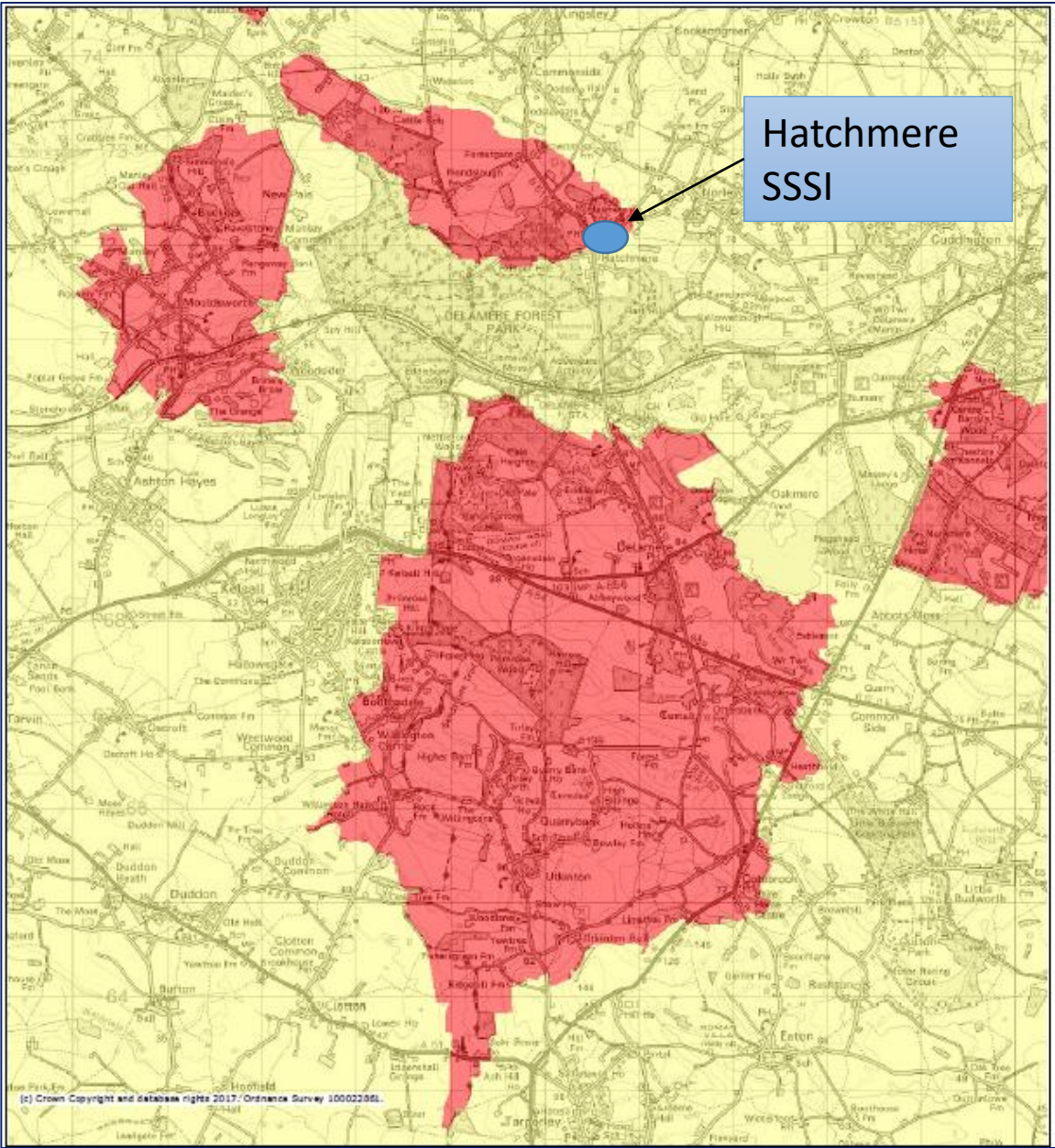
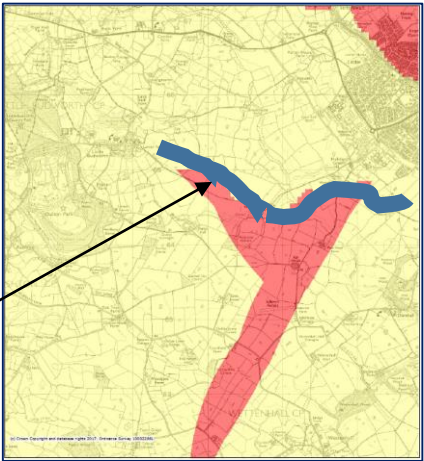
Countryside Stewardship scheme

Water Quality high priority areas

-  High Priority Water Quality Area
-  Moderate Priority Water Quality Area

High priority areas largely overlie the Delamere and Manley SgZs, surface water catchment of Hatchmere SSSI and groundwater area within Darley Brook catchment.

Darley Brook





Land Use, Risk Factors and Pressures in the Delamere and Manley Common catchment

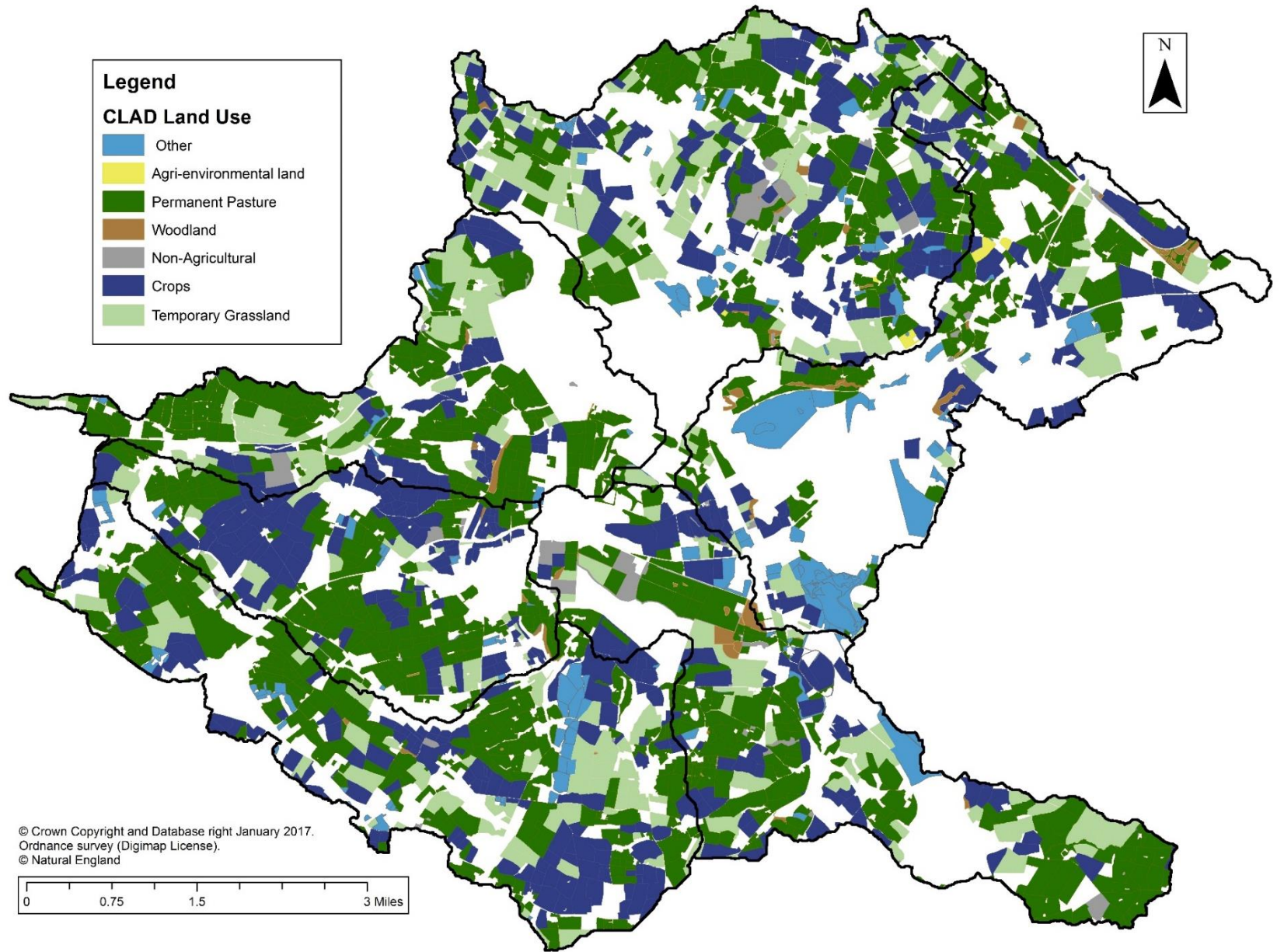


Land Use

Ground checked with catchment walkover information.

White areas are mainly woodland (Forestry Commission) but also golf courses or open water.

Some areas of unregistered land, also currently in white, will be surveyed during July-Sept 2017.

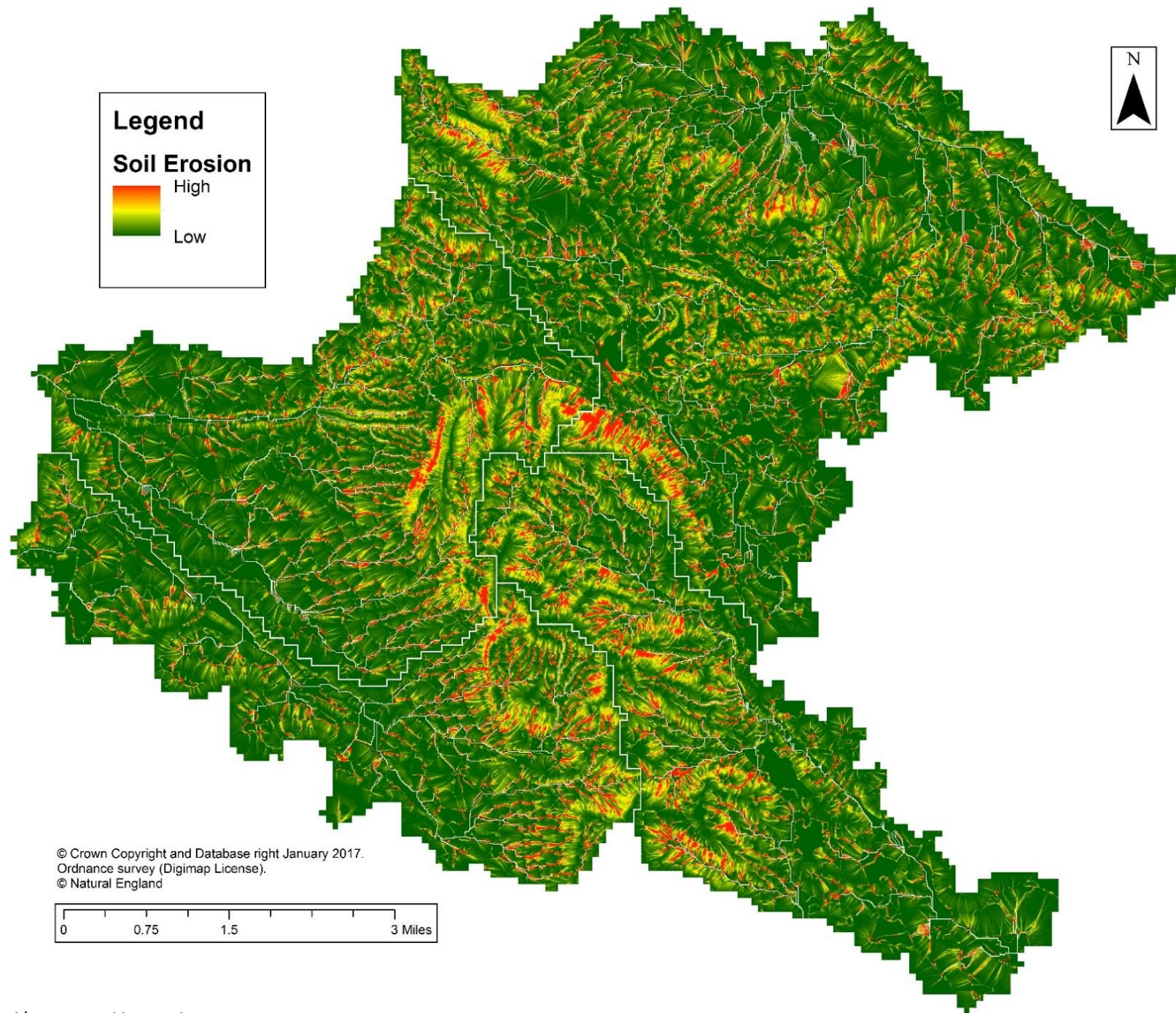


SCIMAP

Soil erosion risk

Higher soil erosion risk on the steeper slopes and ravines in the Delamere SgZ catchment.

Localised **RED** and **YELLOW** areas show higher erosion risk on steeper slopes in NW Crowton Catchment and area around Cuddington.



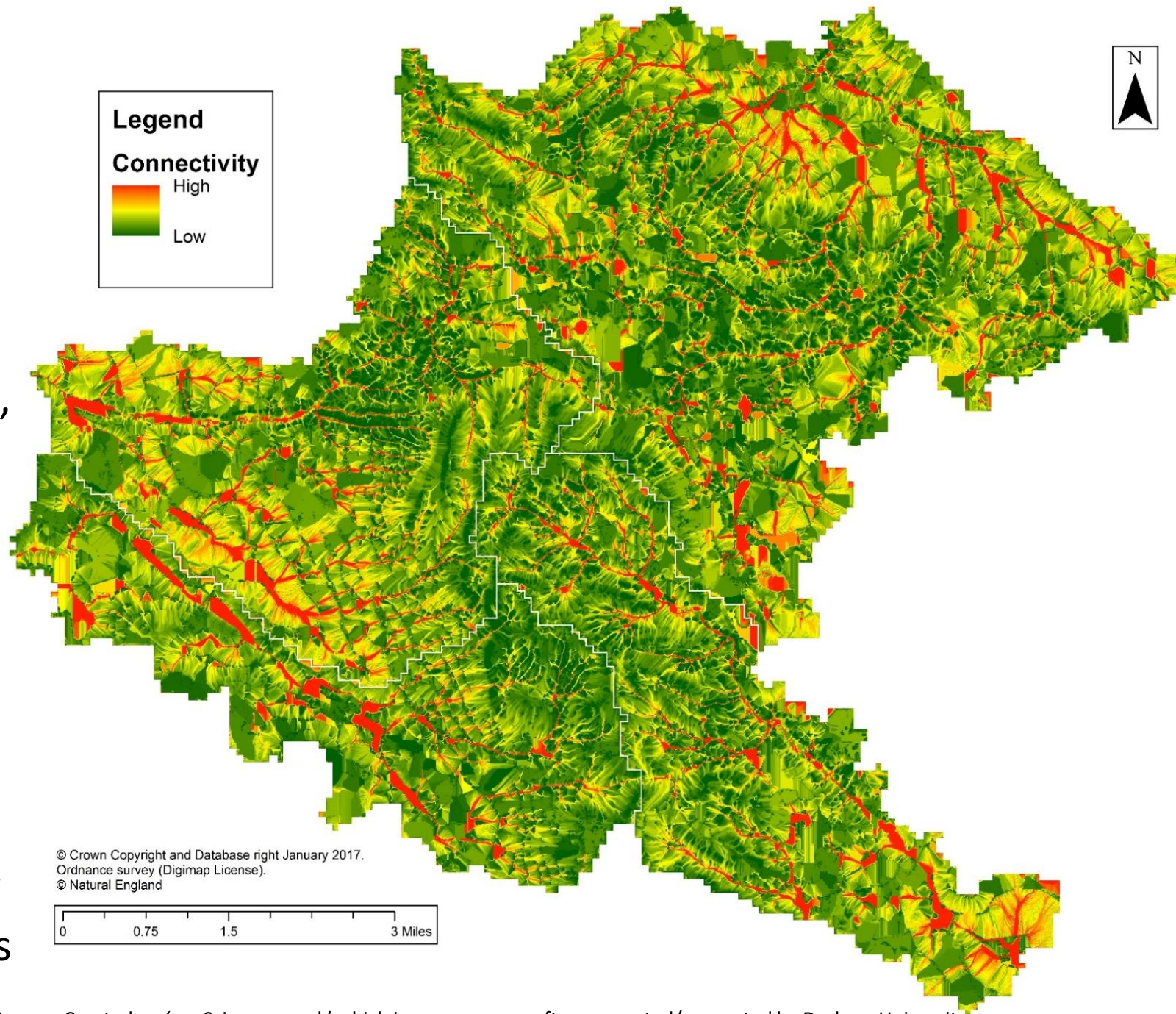
SCIMAP

Connectivity of land to watercourse

The connectivity describes the ease of travel of water (and pollutants) through the landscape, expressed as a measure of the probability of continuous flow to the river channel.

The **RED** areas show areas of high connectivity between land and watercourses, particularly prevalent along the floodplain areas.

YELLOW areas are largely areas of more slowly permeable clay loams and flat topography.

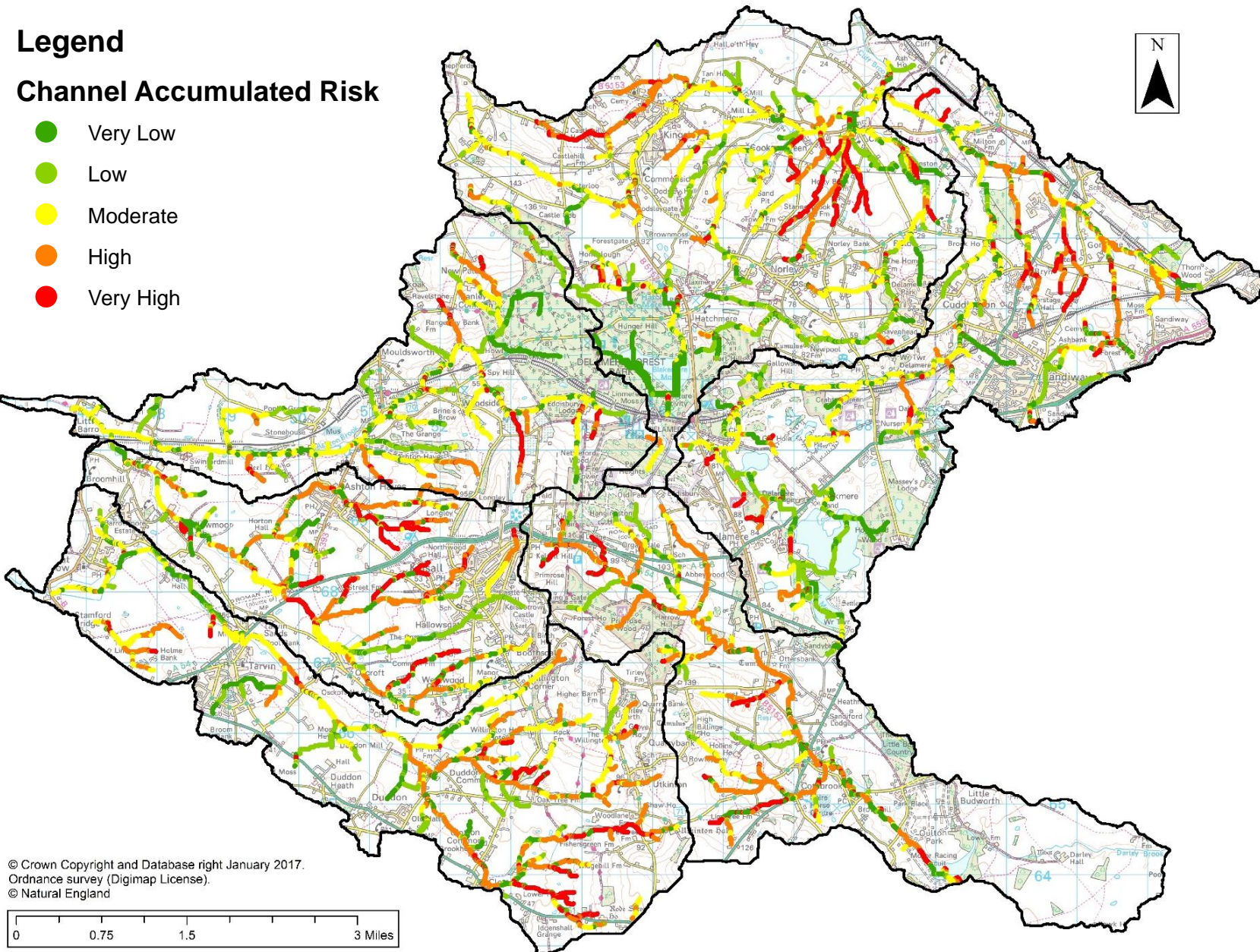


SCIMAP

Accumulated channel risk

This describes this accumulated risk of water and pollutant sources in the watercourse channels across the catchment, based on average annual rainfall, topography, soil erodibility and land cover.

Higher channel risk tends to be in the upper tributaries of the catchment.



Delamere and Manley Common Diffuse Pollution Project

*For further information on project outcomes contact Reaseheath Farm Environmental
Services on 01270 613 195 or email hub@reaseheath.ac.uk*

