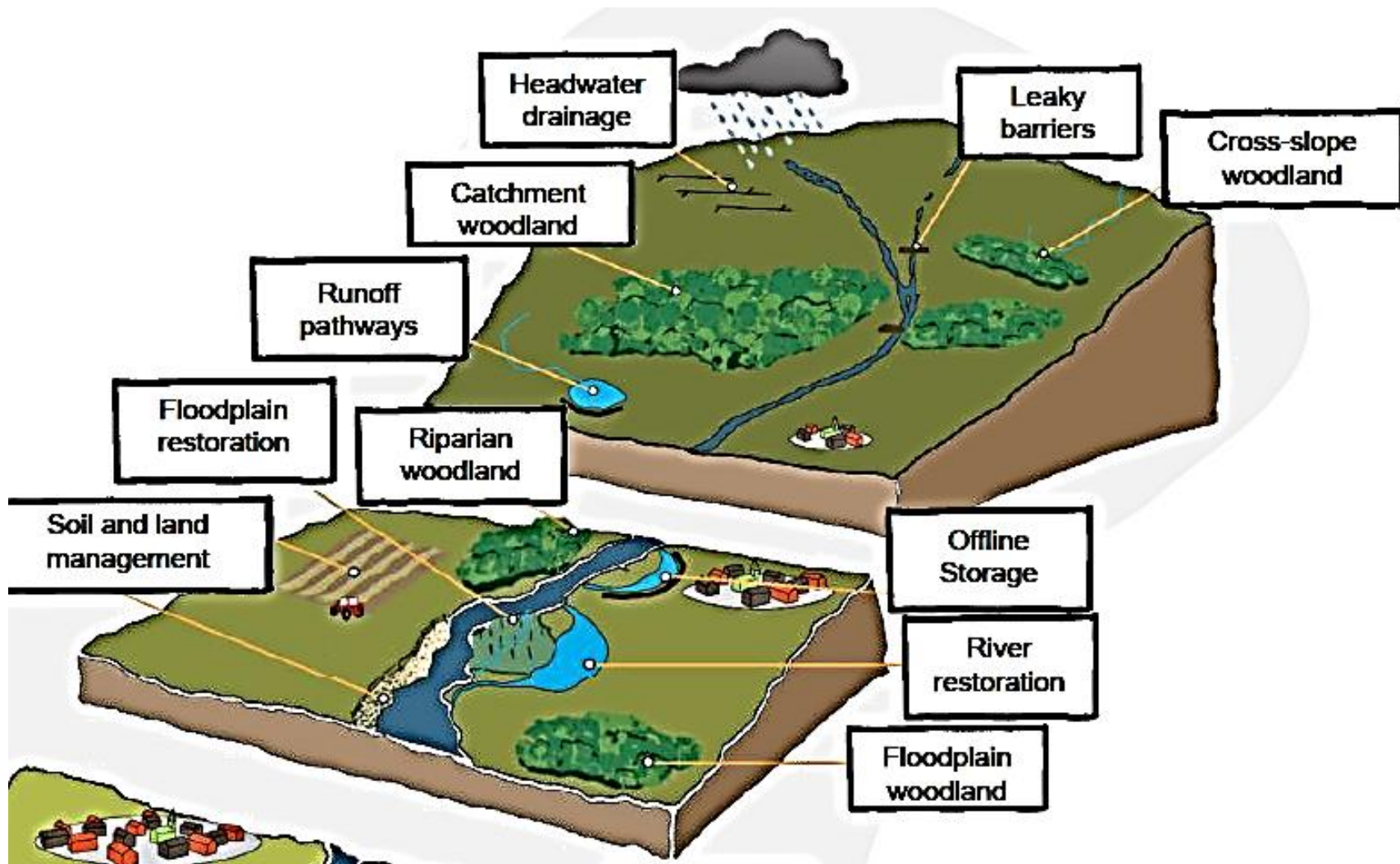
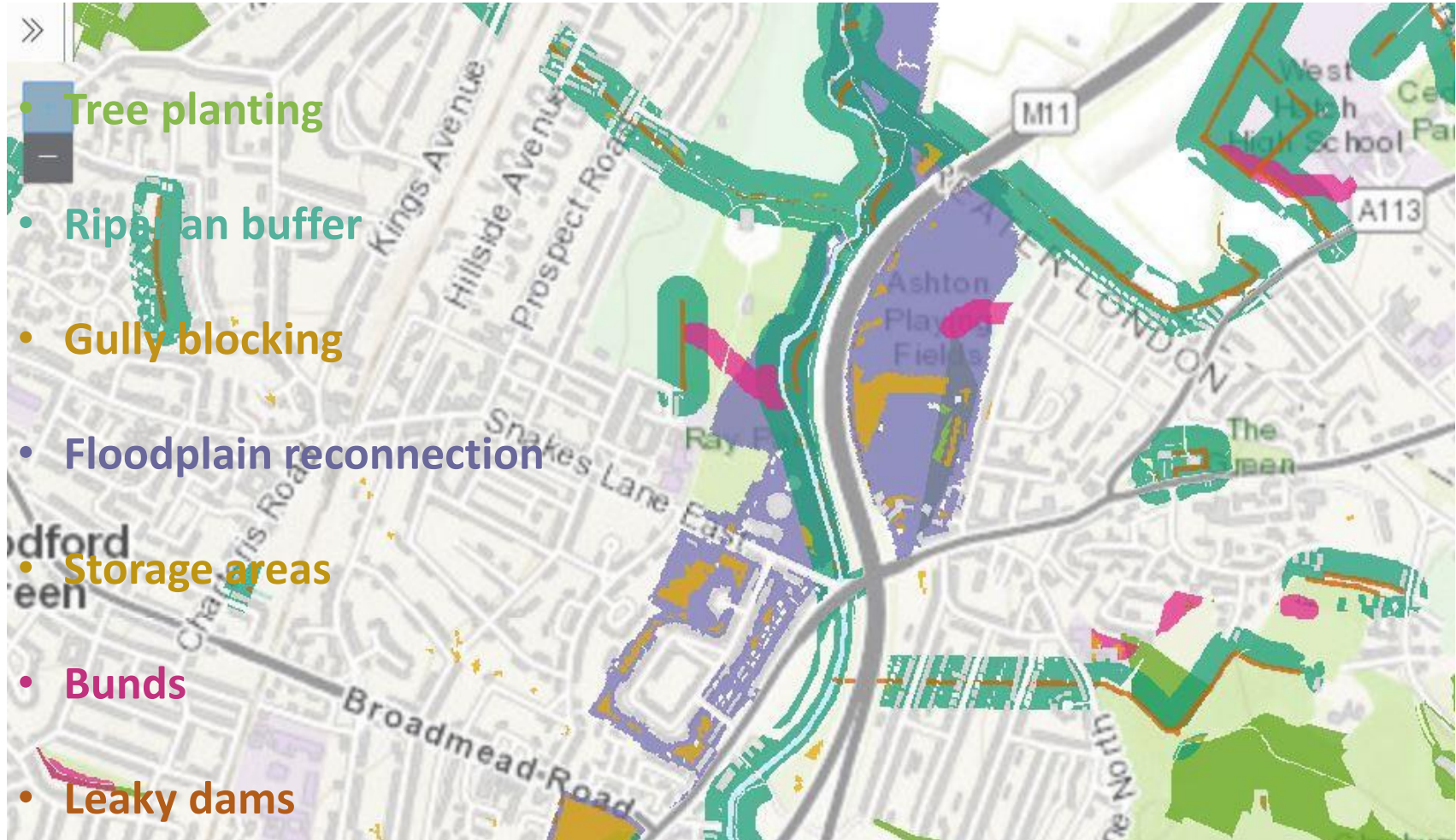


Mapping Natural Flood  
Management opportunity from soil  
data:  
comparing technical and farmer knowledge  
Samantha Broadmeadow

# NFM opportunity mapping



# EA Thames RFCC - NFM opportunity and priority



Gavin Haughton  
EA NFM officer, June 2020

# FC - Land Information Search

Forestry Commission Map Browser

Make a...

Map Layers

- CS Biodiversity - Priority Species - Red Squirrel - Management ...
- Water - Water Quality ...
- High Spatial Priority
- Lower Spatial Priority
- CS Water - Water Quality - Acidification ...
- Water - Flood Risk ...
- High Spatial Priority
- Lower Spatial Priority
- Cross-cutting - Keeping Rivers Cool ...
- NfC Social ...
- NfC Ammonia Reduction for SSSI ...
- CS Cross-cutting - Project Areas - Demonstration Test Catchment / Making Space for Water Demonstration Catchment ...

Place, Grid Ref, Postcode.

491091 191278 Metres SU 910 912

2mi

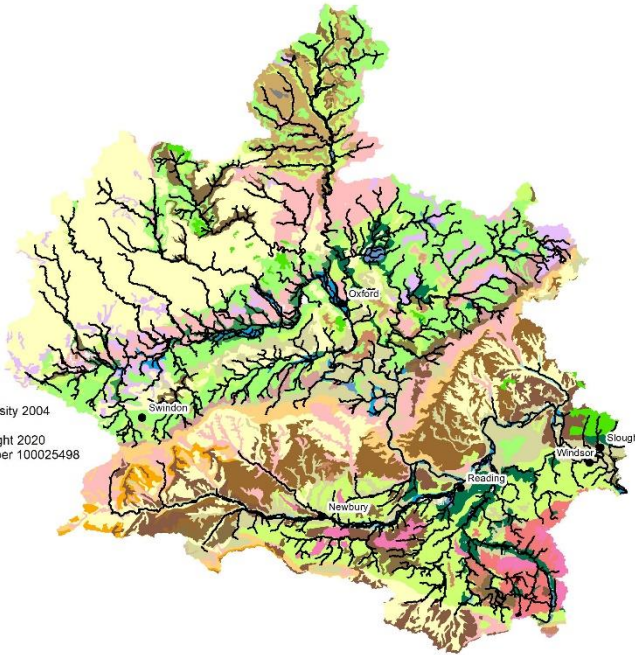
12:10  
17/05/2021

# LANDWISE mapping objectives:

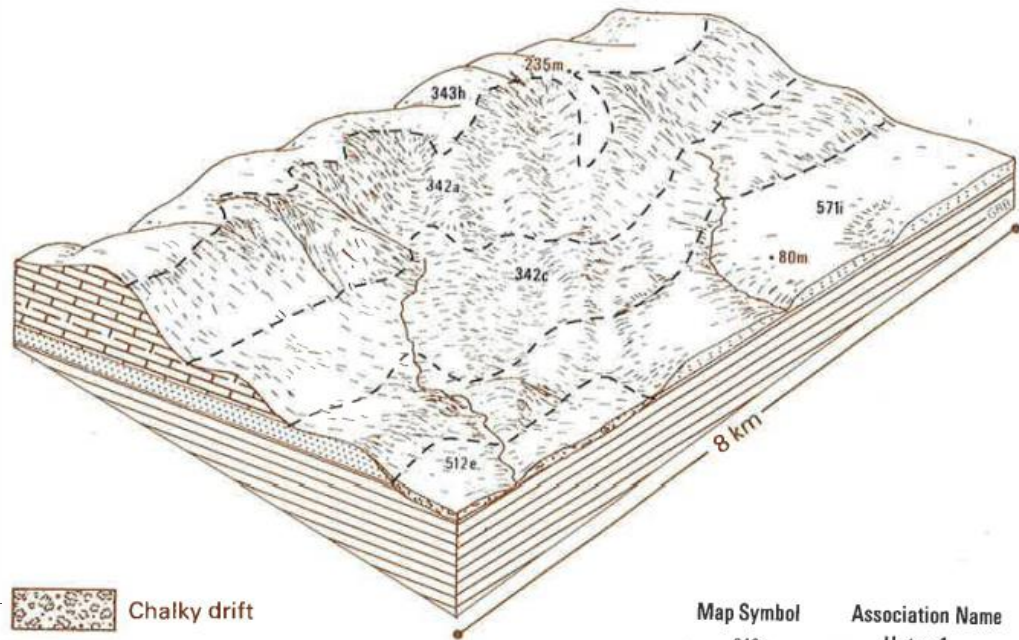
- Compare the extent and distribution of *priority/target* areas for NFM in existing national opportunity mapping
- Compare existing maps with NEW approach using the NSRI soil survey database and pedo-transfer functions to represent structural changes in the topsoil arising from agricultural use
- *Compare predicted soil properties derived from the NSRI national soil map and soil survey database with the results of LANDWISE soil survey*
- Map catchment community NFM preferences based to landscape character rather than soil type

# Mapped soil associations reflect the landscape

MAP UNIT	
341	582
342	631
343	634
411	643
511	711
512	712
541	714
544	812
554	813
571	814
572	832
573	841
581	952
	1024



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 Crown copyright and database right 2020  
 Ordnance Survey Licence number 100025498



-  Chalky drift
-  Middle Chalk  
Lower Chalk
-  Upper Greensand
-  Gault Clay

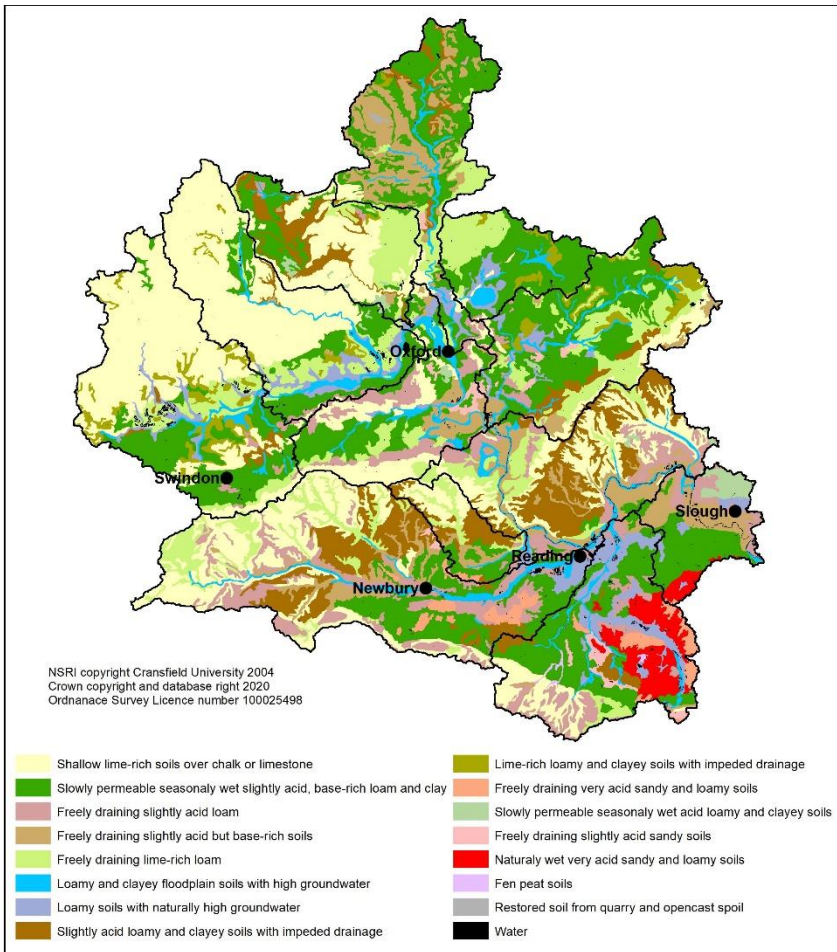
Map Symbol	Association Name
342a	Upton 1
342c	Wantage 1
343h	Andover 1
512r	Block
571i	Harwell

# Soil - farmer survey data

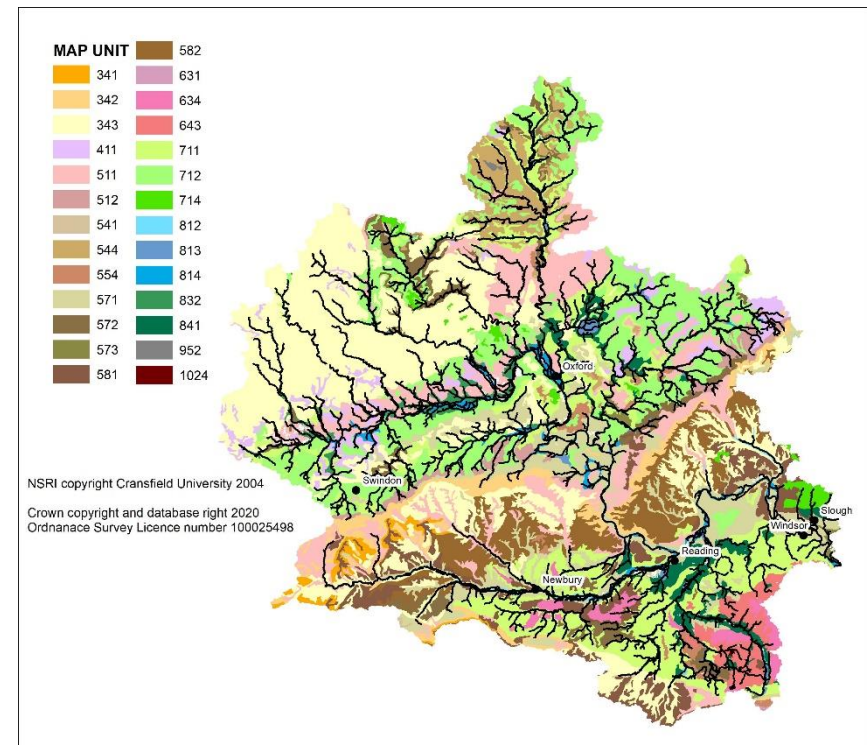
**Farmers asked in online/phone survey about how they manage the soil(s) on their own farm and what steps are required to keep it healthy and resilient**

# National soil mapping

## NSRI - Soilscales

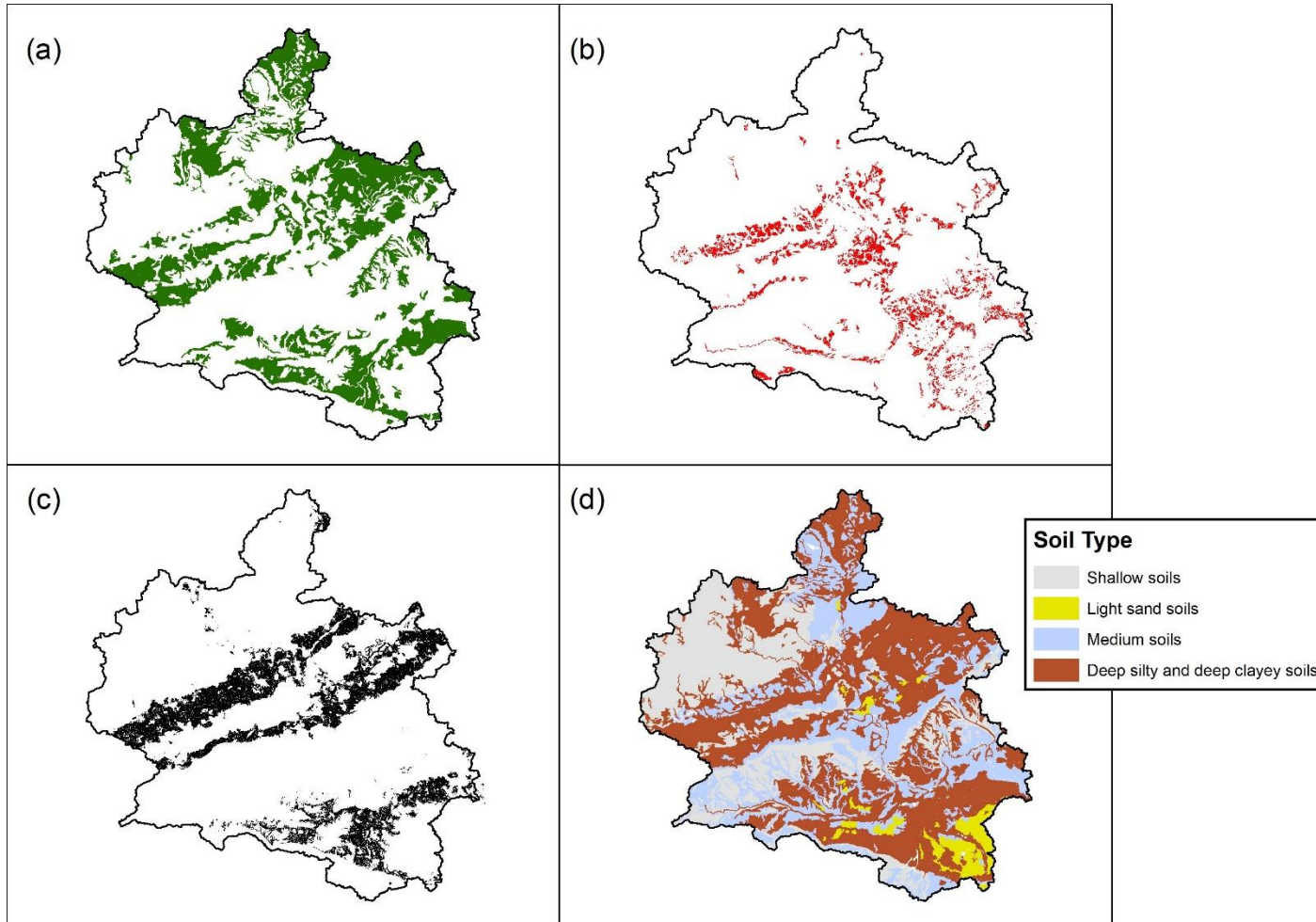


## NSRI - NatMap





# Opportunity mapping



## Relative ranking for land use change to deliver NFM objectives

Soil classification (RB209)	1. CS woodland creation - NFM	2. WWNP – woodland creation	3. PTF - soil water storage	Farmer survey
Shallow soils	2	1	1	-
Light sand soils	1	1	<b>4</b>	-
Medium soils	2	2	<b>3</b>	1 (n=1)
Deep clayey/silty soils - carbonate	2	2	1	2 (n=8)
Deep clayey/silty soils - mudstone	<b>3</b>	<b>3</b>	2	
Peat soil	1	1	2	-

## Cultivation practice and management problems per soil type

	Shallow soils (n=28)	Light sand soils (n=2)	Medium soils (n=8)	Deep clayey/silty soils (n=16)
Mean (max) length crop rotation length (years)	5.4 (6)	3 (3)	4.4 (5)	5.7 (no rotation)
Cover crops are a valuable element in my crop rotation (%)	39.3	0	62.5	43.8
Livestock present	66.7	50	37.5	80
Restrict operations to dry conditions	7.1			18.8
SOM improves access to fields more quickly after wet weather	67.9	100	75	50
Area of the farm have become unproductive/unusable in last 10 years	14.3	0	37.5	37.5
Flooding/Waterlogging reported as a cause of reduced yield	0	0	12.5	37.5
Considered significant change to farming methods	64.3	100	75	56.25

### Crop use within standardized 6 year rotation by soil type

	Shallow soils (n=28)	Light sand soils (n=2)	Medium soils (n=8)	Deep clay /silty soils (n=16)
Winter (wheat, barley, oats, rye, oil seed rape & beans)	39%	100%	50.6%	23.5%
Spring (wheat, barley, oats & beans)	22.8%	-	13.0%	12.3%
Grass ley	25.4%	-	-	<b>39.7%</b>
Maize	0.8%	-	13.2%	10.1%
No season (barley, beans, oats, oil seed rape, wheat)	6.2%	-	16.4%	8.2%
Other (game cover, peas, linseed, poppies, sugar beet, break and forage crops)	6.5%	-	6.9%	6.2%

- LANDWISE objective was not to create new opportunity maps but to explore how accurate and useful the national maps are perceived to be by the farmers, catchment partnerships and government agencies
- Permanent pasture/rotational arable land use spilt should be incorporated with soil type in the national opportunity maps
- Soil types with water management issues are identified as the priority/target areas for LUC in the national opportunity maps – perhaps there will be scope in new ELMS scheme to increase incentives for NFM measures in these areas