



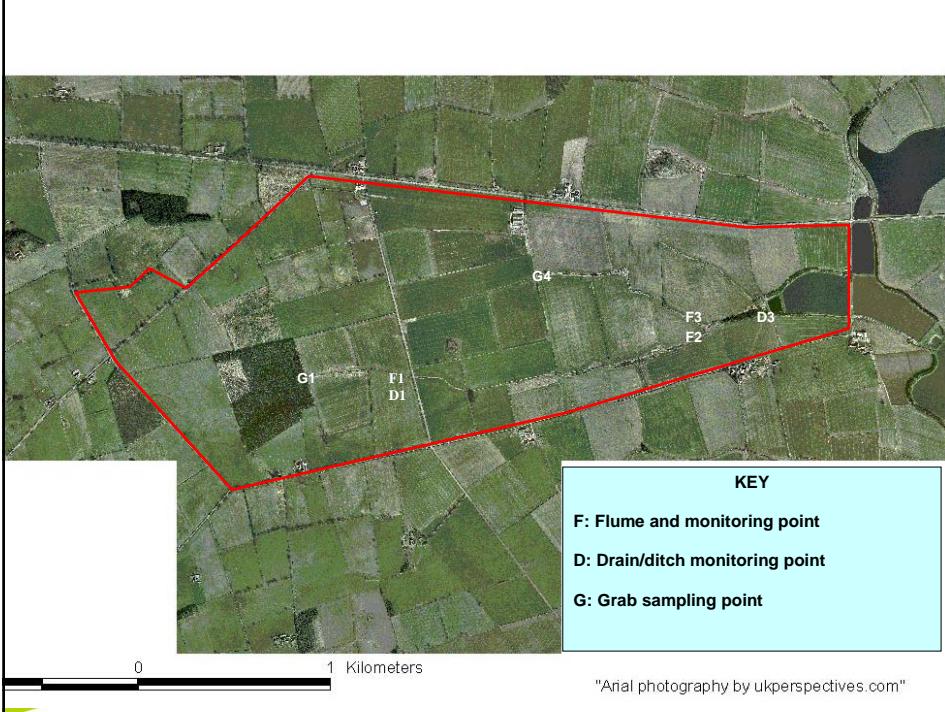
## Integrated pesticide management at the catchment scale

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[www.adas.co.uk](http://www.adas.co.uk)



## Whittle Dene Project Background

- 2001 - Pesticide (IPU) detected in Whittle Burn by Northumbrian Water
- 2002-2004 - Catchment characterisation (Phase 1) contaminants/ aquatic macro-invertebrates
- 2005- 2007 - Implementation of integrated catchment management plan (Phase 2)



## Project Partners

- The Whittle Dene project is managed by ADAS with delivery support from University of Newcastle
- Funded primarily by Defra
- Additional support is provided by: EA, Northumbrian Water, NFU, PSD, CPA & UKWIR

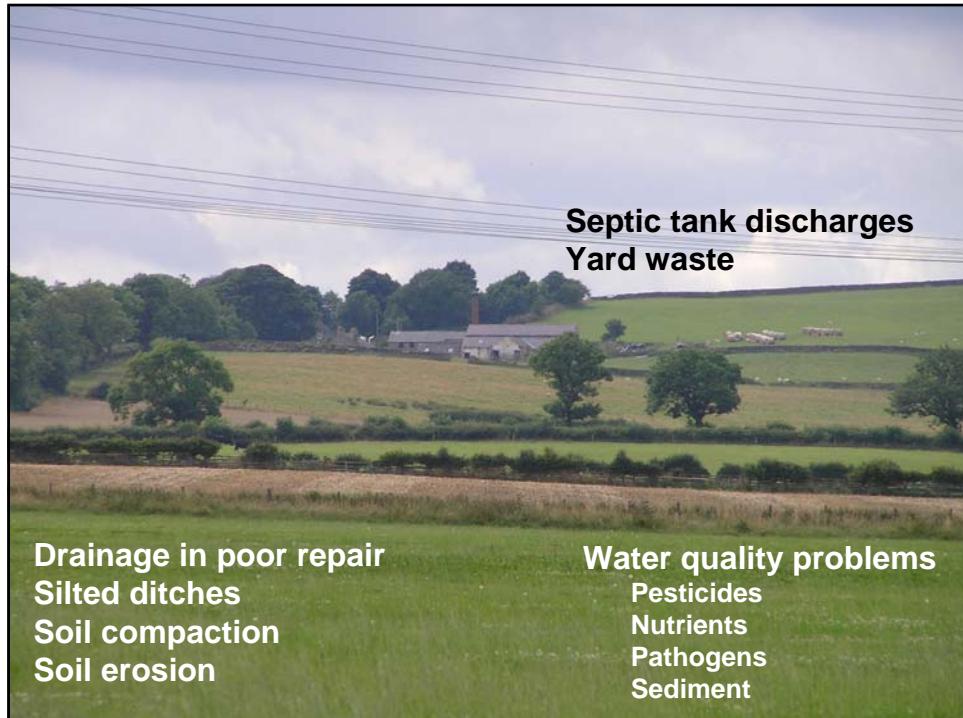


ENVIRONMENT  
AGENCY

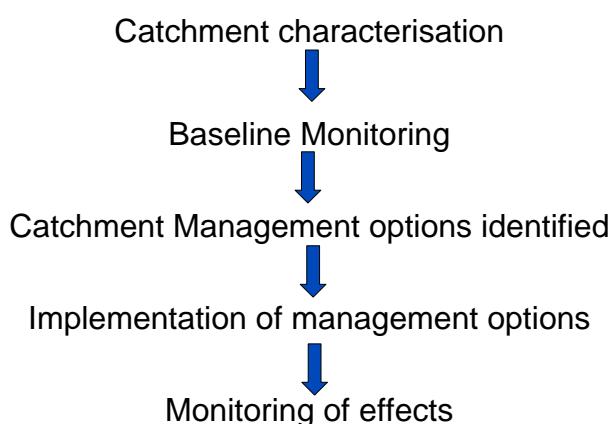


NORTHUMBRIAN  
WATER





## Whittle Dene Project Activities



## Underdrainage: Backfill type used in Northumberland and Whittle Dene

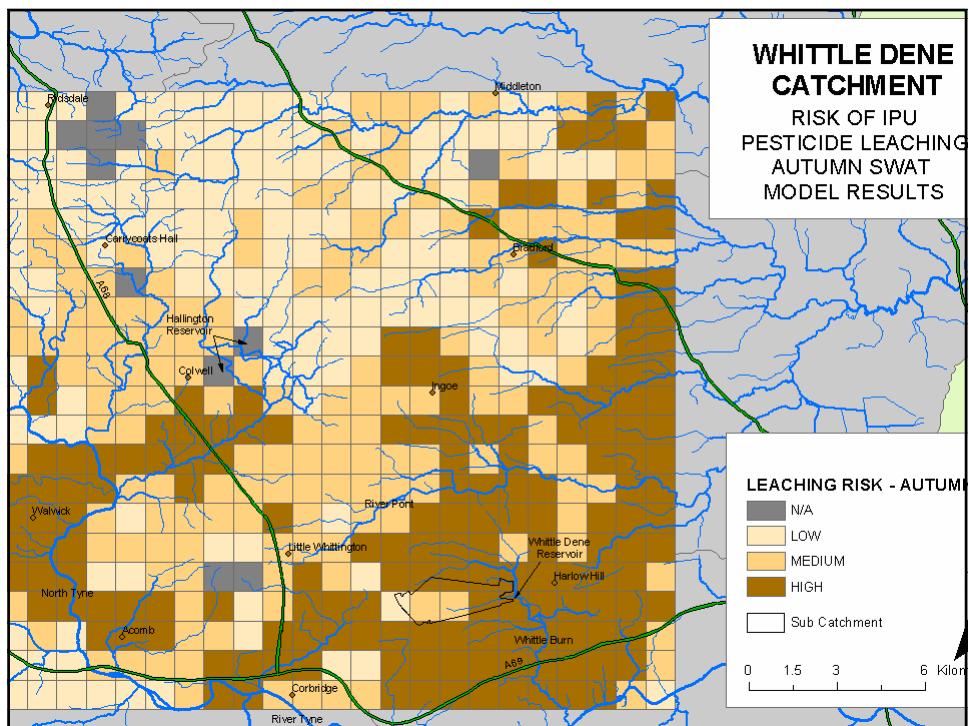
PERMEABLE FILL TYPE	CODES	Northumberland		WD Parishes	
		Number	%	Number	%
No entry on application form	0	0	0	0	0
None used	1	2026	88.6	397	82.0
Washed gravel, crushed stone	2	93	4.1	20	4.1
Reject gravel	3	3	0.1	2	0.4
Clinker	4	0	0.0	0	0
Straw	5	0	0.0	0	0
Slag	6	0	0.0	0	0
Peat or turf	7	163	7.1	64	13.2
Hard synthetics e.g. Lytag, Leca	8	0	0.0	0	0
Soft synthetics e.g. polystyrene	9	0	0.0	0	0
Others	10	2	0.1	1	0.2
<b>TOTAL</b>		<b>2287</b>		<b>484</b>	



## Rainfall (mm) Jan 2003 to Nov 2005

	long term average	2003	% of average	2004	% of average	2005	% of average
Jan	61	25	41	94	155	47.8	78
Feb	49	22	46	33	67	53.2	109
Mar	41	22	53	31	75	53.2	130
Apr	44	20	46	76	173	80.4	183
May	51	52	101	23	45	29.2	57
Jun	48	88	183	82	172	67.6	141
Jul	60	11	19	73	122	51.4	86
Aug	78	15	19	153	196	31	40
Sep	59	40	68	22	38	53.4	91
Oct	54	49	91	103	190	95.6	177
Nov	70	25	35	27	38	70	100
Dec	55	37	68	37	68		
<b>TOTAL</b>	<b>670</b>	<b>406</b>	<b>61</b>	<b>754</b>	<b>113</b>	<b>632.8</b>	<b>94</b>



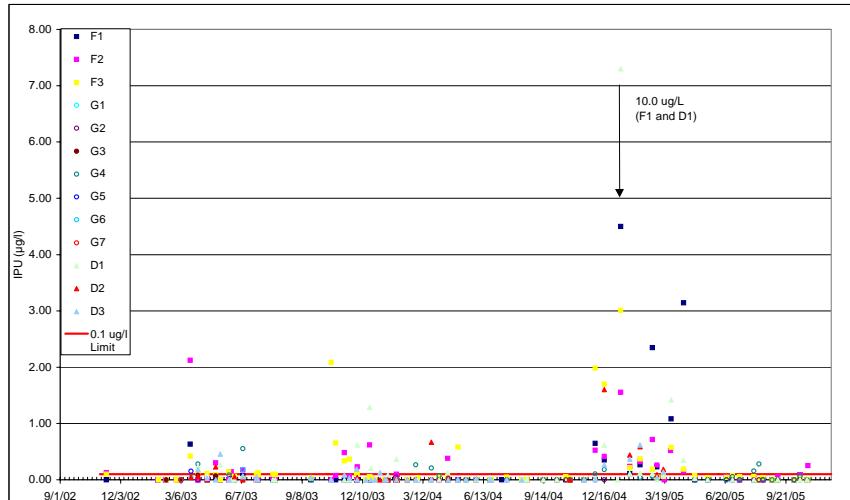


## Pesticides and Water Quality

- IPU regularly detected  $>0.1 \mu\text{g L}^{-1}$
- Peak concentrations up to  $10.0 \mu\text{g L}^{-1}$
- Propyzamide and Cypermethrin also detected above  $0.1 \mu\text{g L}^{-1}$  in drain water
- Attributed to drained, clay soils under arable production, not irresponsible use/point sources



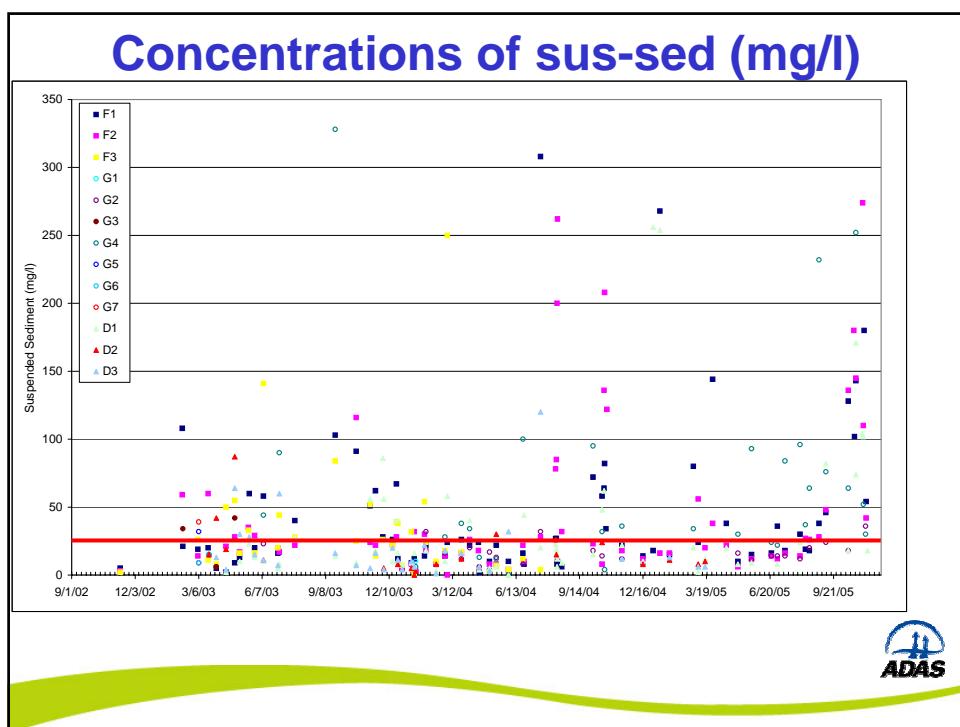
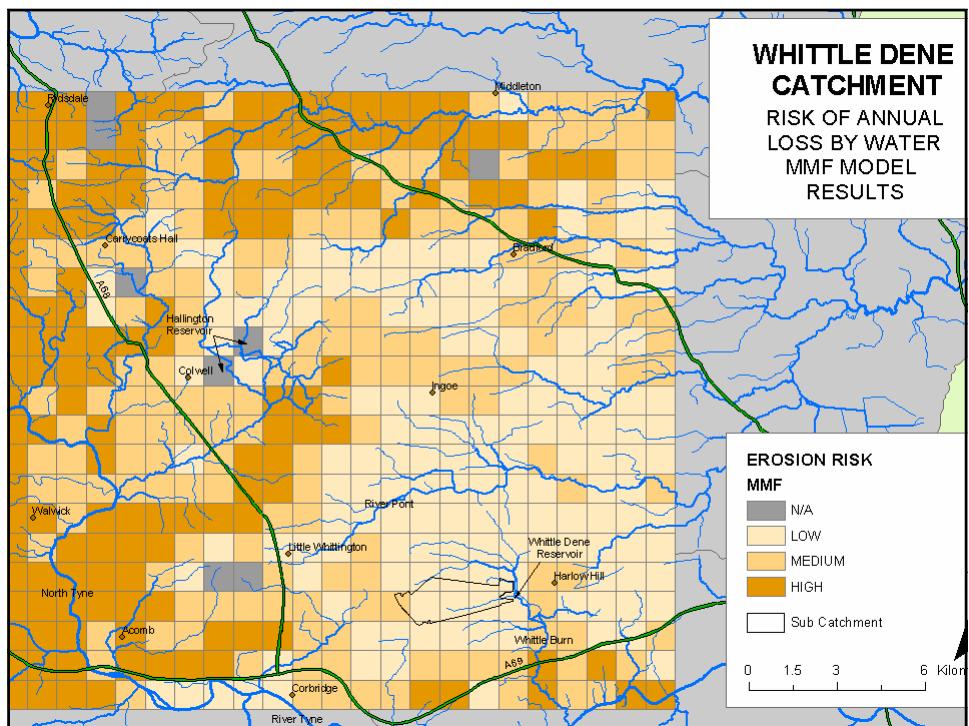
## Concentrations of IPU ( $\mu\text{g L}^{-1}$ )



## Sediment and Water Quality

- Burns (streams) and drains have allegedly silted up quickly in recent years
- Summer storms identified as key to sediment mobilisation
- Livestock tracks are a key sediment source
- Links to phosphorus and pesticide transfer
- Small forestry operation within catchment







## Nutrients and Water Quality

- Concentrations of nitrate ( $\text{NO}_3\text{-N}$ ) exceed  $11.3 \text{ mg NO}_3\text{-N L}^{-1}$  ( $50 \text{ mg NO}_3 \text{ L}^{-1}$ )
- Phosphorus (MRP) exceeds  $100 \mu\text{g L}^{-1}$
- Large N inputs to soil
- Algal blooms observed - likely to be caused by excess P
- Potential septic tank inputs via drainage



**WHITTLE DENE RESERVOIR COMPLEX**

**BLUE GREEN ALGAE**

Recent monitoring of the water in the above Reservoir has established the presence of Blue Green Algae which has the potential to form a toxic surface scum.

Although such toxins are not always harmful to the health of humans and animals, it is a sensible precaution to avoid all contact with the scum and the water close by it.

Farmers and pet owners should therefore ensure that their animals do not have access to the affected water.

There is no evidence that this scum is harmful to aquatic life but any sign of fish mortality should be reported to the Northumbrian Water Control Room at Howdon as soon as possible, Telephone Number: 0191 2968333.

R. Warneford  
Tyneside & Northumberland Water Production Manager



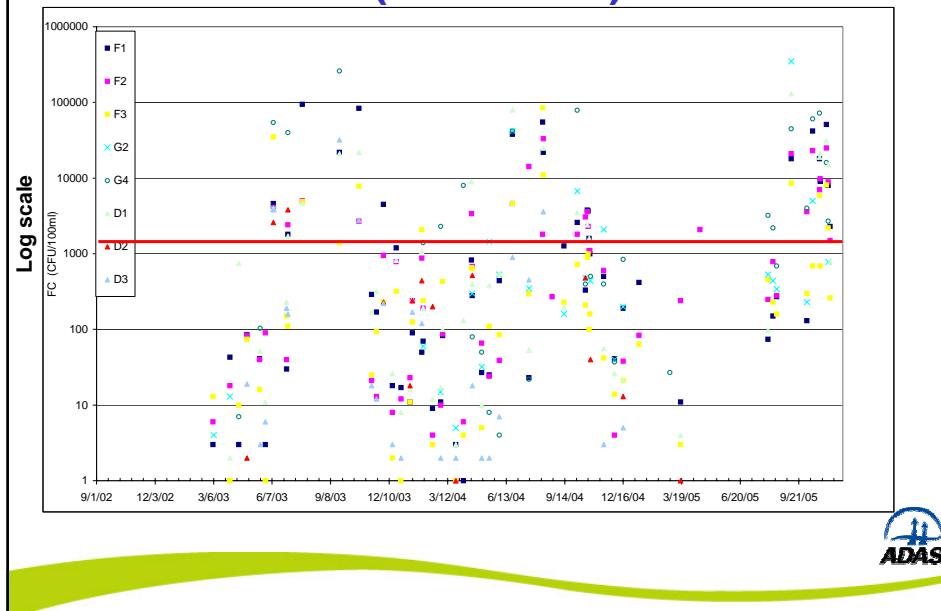
## Pathogens and Water Quality

**Faecal Indicator Organisms:**

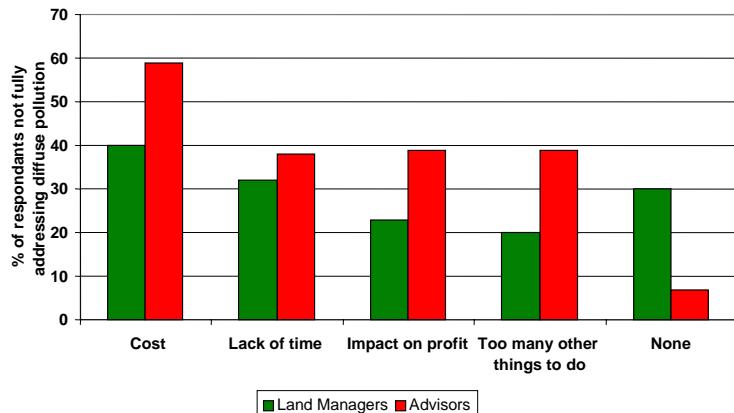
- Summer concentrations > winter
- Range of <10 cfu/100ml to 100,000 cfu/100ml
- High Risk Areas identified:
  - unfenced watercourses in livestock fields
  - seasonally wet depressions in fields
  - grassland over old field drains



## Concentrations of faecal coliforms (cfu/100ml)



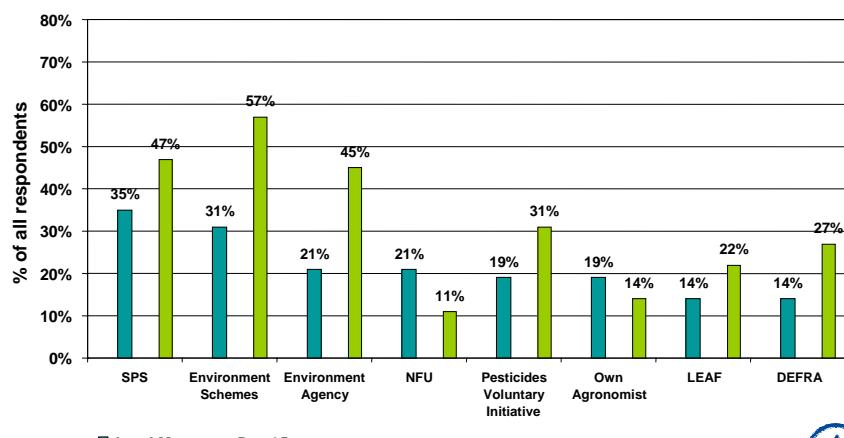
## Percentage of land managers and advisors/influencers indicating barrier to changing farm practice



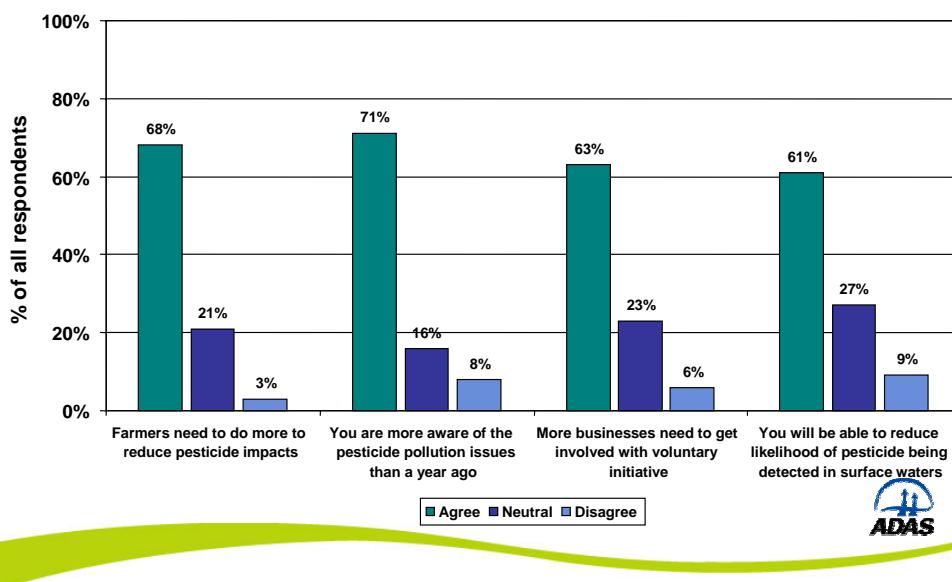
Base = 217 land managers + 148 advisors



## Organisations / initiatives influencing change in farm practice



## Land managers' attitudes - pesticide pollution



## Project Activities

- 1-2-1 Farmer Advice through local experienced consultant (Cross Compliance c.£200/ha)
- Agri-environment initiatives encouraged e.g. Entry Level Scheme (ELS) (£30/ha)
  - Reduced inputs
  - Buffer strips
  - Grassland conversion
- Additional measures funded by project for specific problems
- Demonstration catchment



## Additional Management Options

- Biobed for pesticide washdown area
- Pond to intercept drainage water and sediment - farm diversification
- Livestock stream fencing - mains fed water troughs
- Free soil, nutrient & crop protection management plans
- Drainage remediation and ditch clearance





## Summary

- Original IPU issue revealed other pollutants of concern to drinking water
- Inappropriate landuse driven by CAP
- Measures must be integrated to avoid conflicts
- Farmers must be supportive of change
- Need for **integrated** catchment management
- Avoidance of disproportionate risk management

