

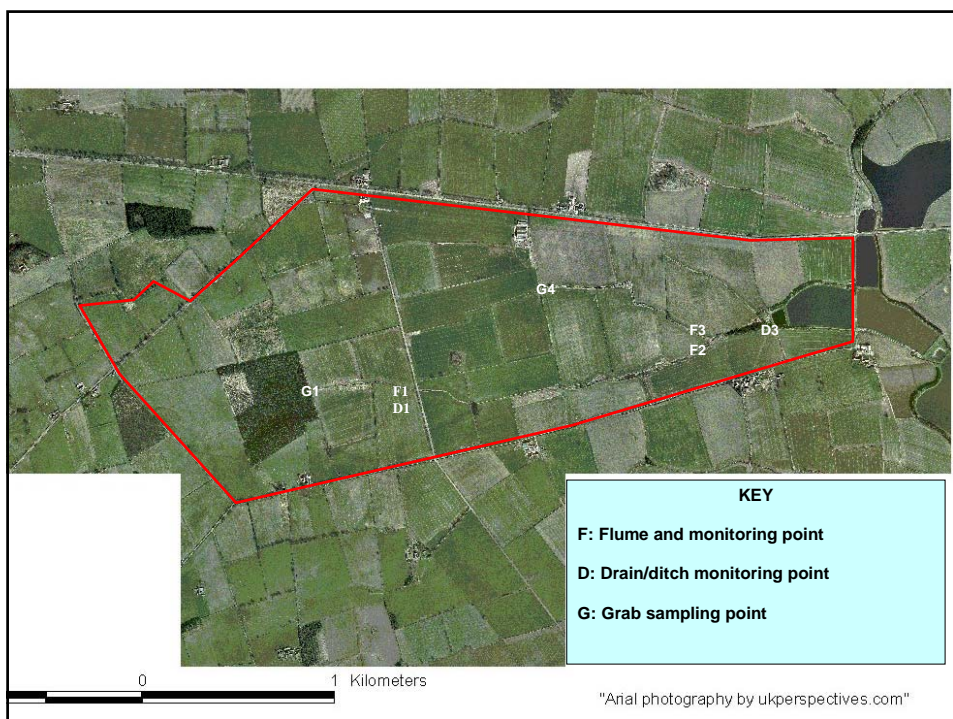


Integrated pesticide management at the catchment scale

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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

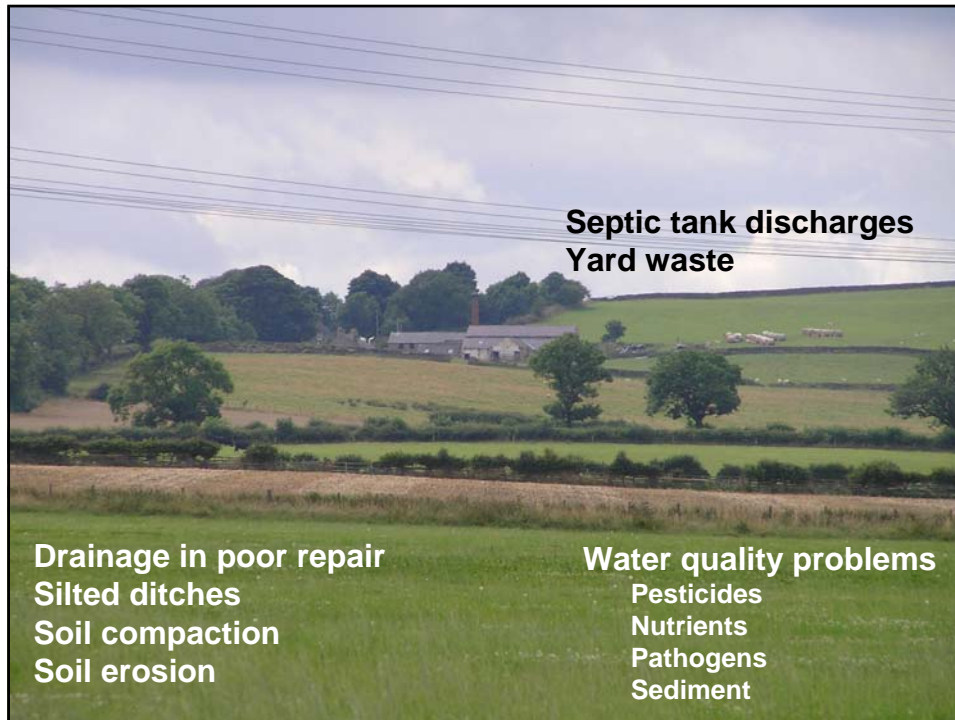


ENVIRONMENT
AGENCY

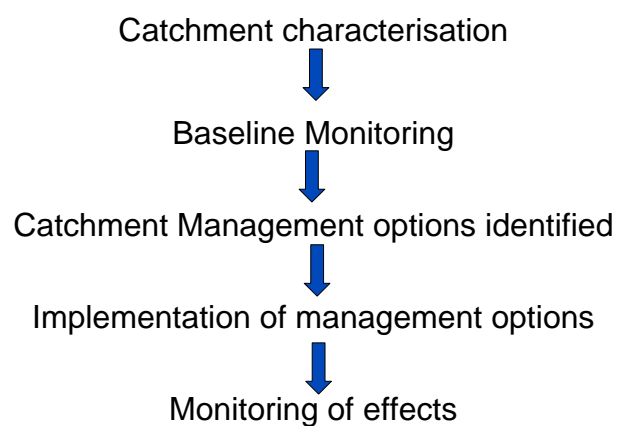


NORTHUMBRIAN
WATER





Whittle Dene Project Activities



Underdrainage: Backfill type used in Northumberland and Whittle Dene

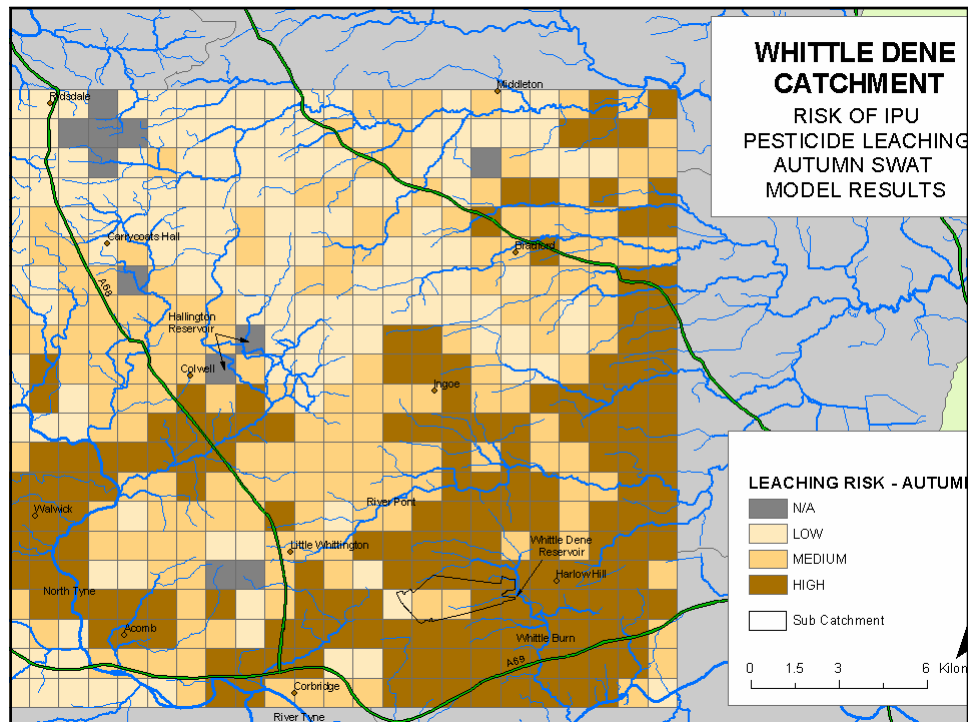
PERMEABLE FILL TYPE	CODES	Northumberland		WD Parishes	
		Number	%	Number	%
No entry on application form	0	0	0	0	0
None used	1	2026	88.6	397	82.0
Washed gravel, crushed stone	2	93	4.1	20	4.1
Reject gravel	3	3	0.1	2	0.4
Clinker	4	0	0.0	0	0
Straw	5	0	0.0	0	0
Slag	6	0	0.0	0	0
Peat or turf	7	163	7.1	64	13.2
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
TOTAL		2287		484	



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		
TOTAL	670	406	61	754	113	632.8	94

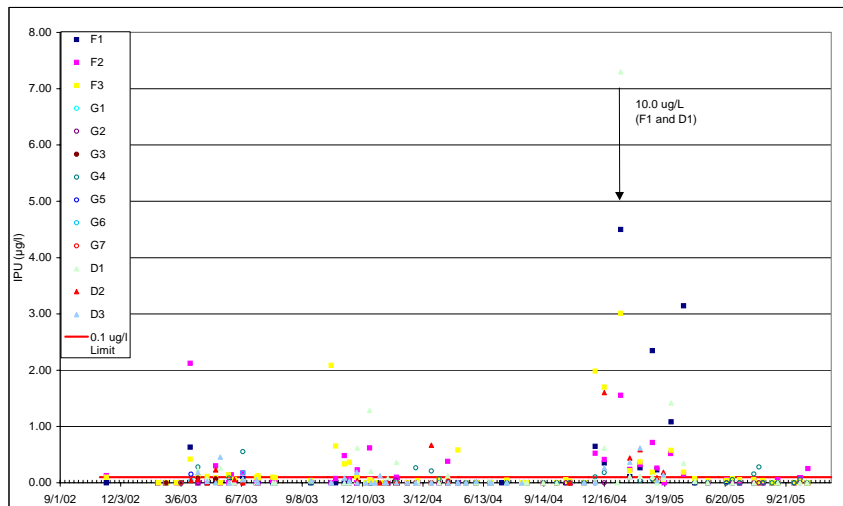




Pesticides and Water Quality

- 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

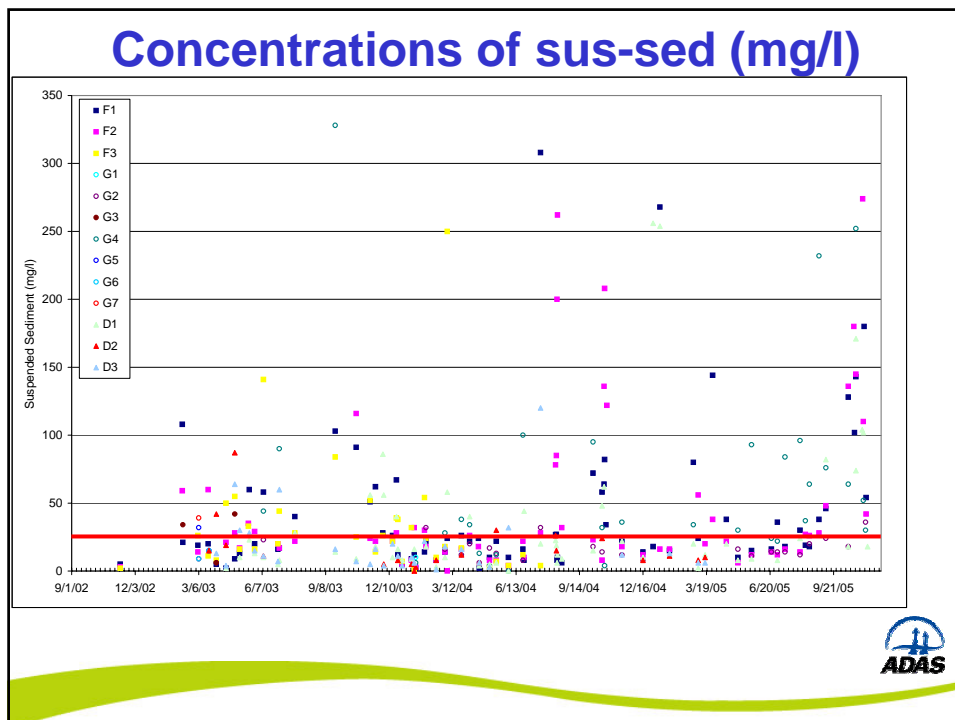
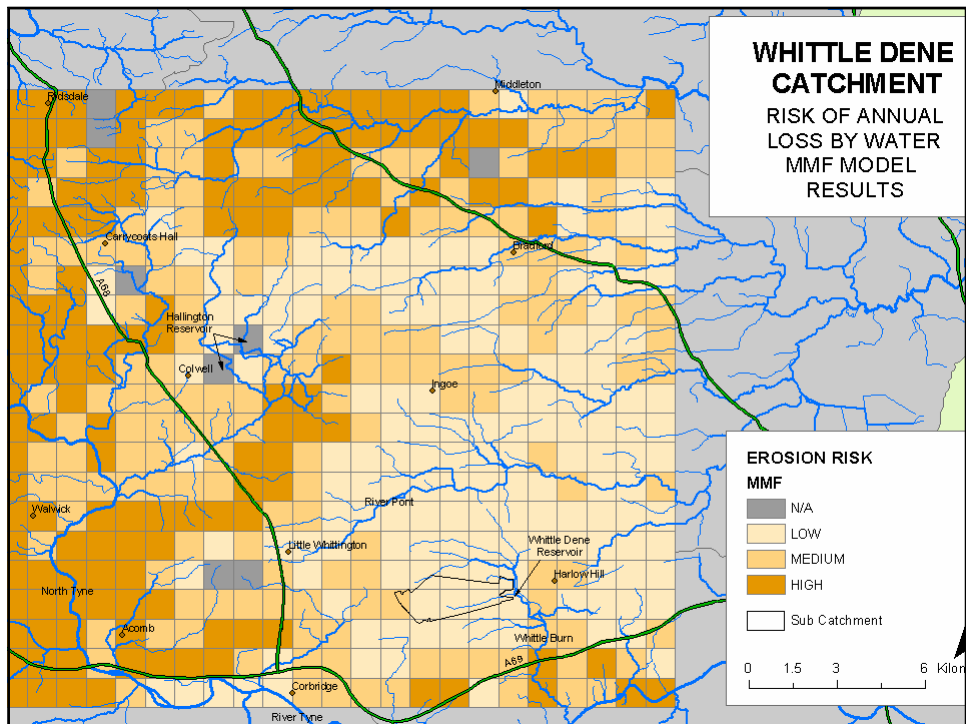
Concentrations of IPU ($\mu\text{g L}^{-1}$)



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



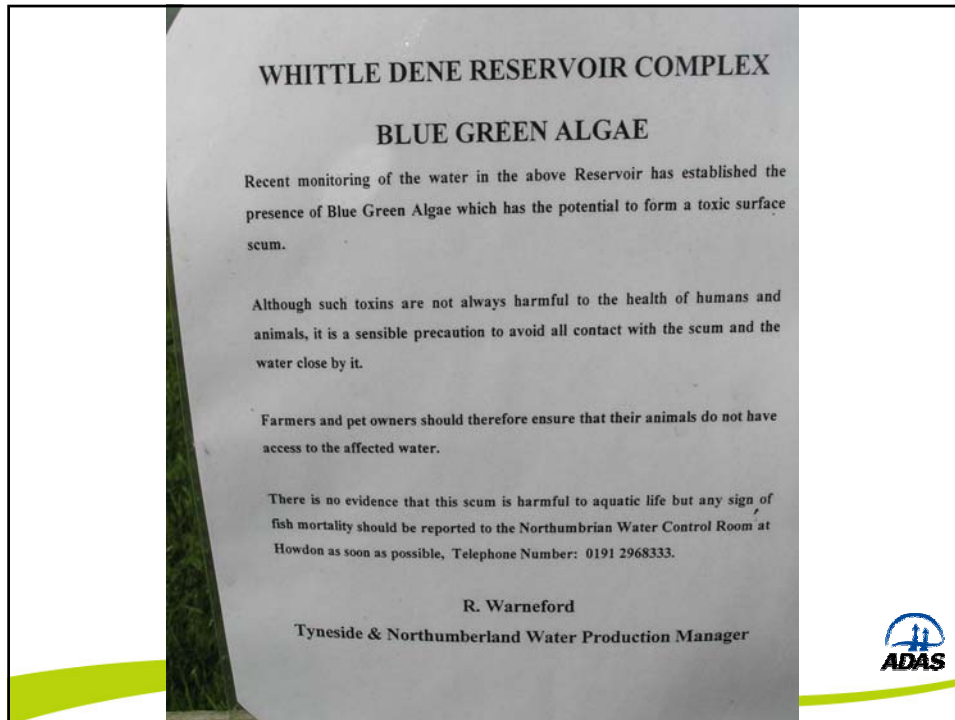




Nutrients and Water Quality

- 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





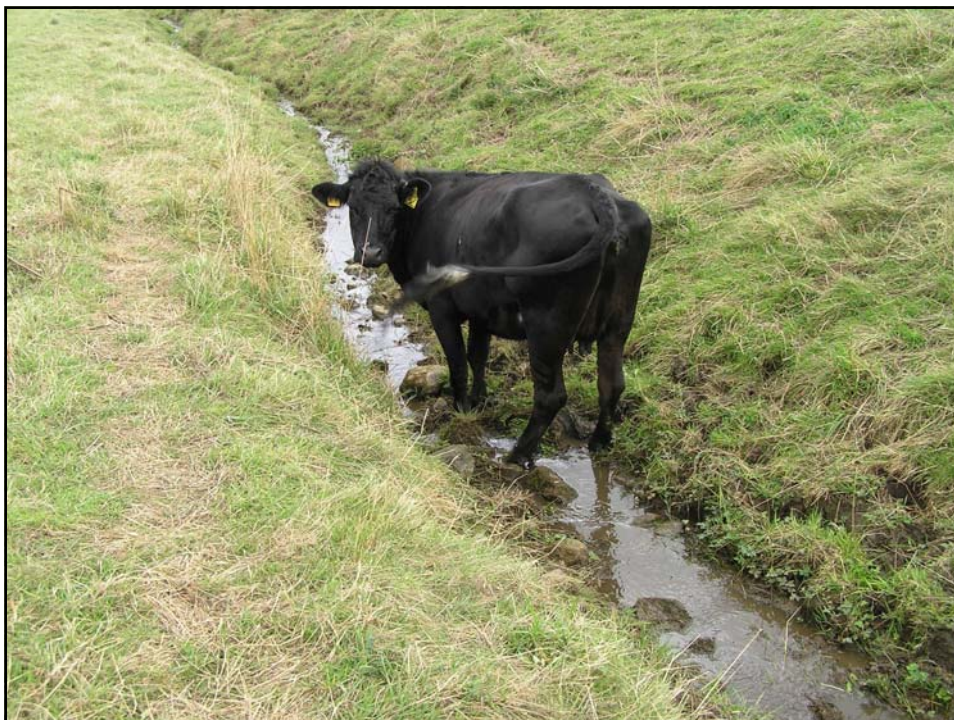
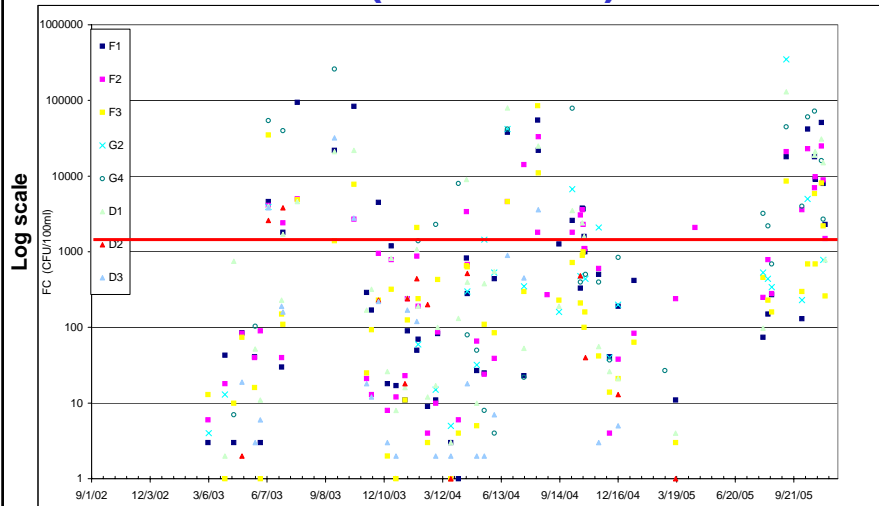
Pathogens and Water Quality

Faecal Indicator Organisms:

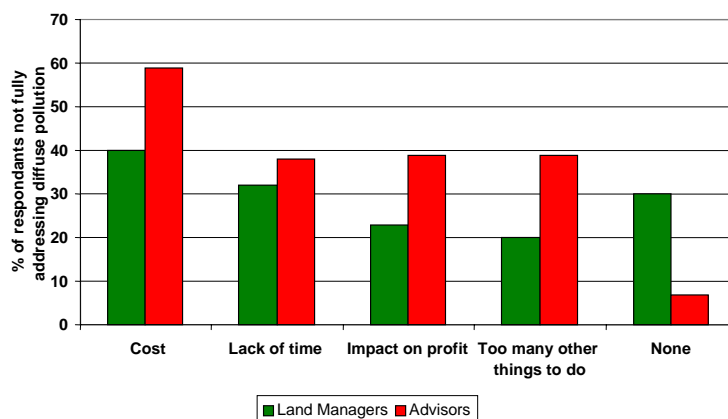
- Summer concentrations > winter
- Range of <10 cfu/100ml to 100,000 cfu/100ml
- High Risk Areas identified:
 - unfenced watercourses in livestock fields
 - seasonally wet depressions in fields
 - grassland over old field drains



Concentrations of faecal coliforms (cfu/100ml)



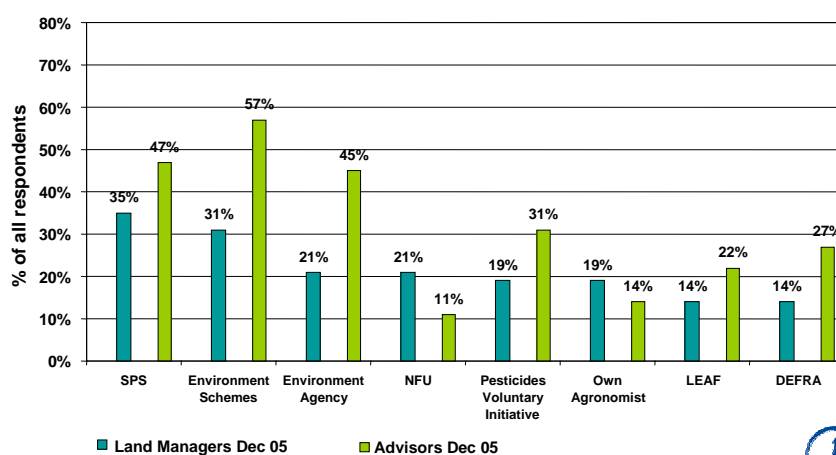
Percentage of land managers and advisors/influencers indicating barrier to changing farm practice



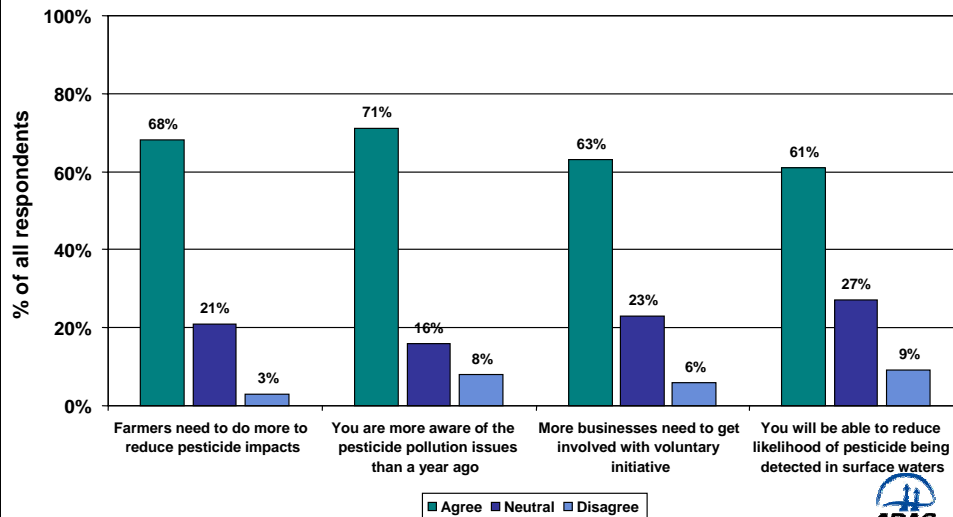
Base = 217 land managers + 148 advisors



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