





# Payment by Results (PbR) Framework

Megan Klaar, iCASP, University of Leeds

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VALLEY  
PROJECT

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[www.icasp.org.uk](http://www.icasp.org.uk)@YorkshireiCAS



# Payment by Results (PbR) Framework

- What is it?
- Examples of PbR schemes
- How can PbR be used in the Skell Valley?
- Starter for 10- a proposed framework
- Workshop and activities- stakeholder input

# PbR Framework- Background

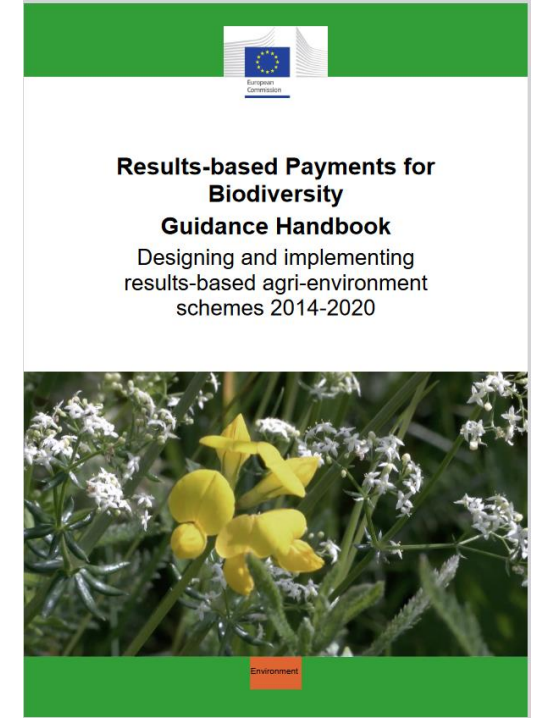
- More common in health and international aid contexts
- Beginning to be applied in the environmental sector
- General definition:

*Payment relating to the achievement of a **defined environmental result**, and the land manager is allowed the flexibility to achieve that result*

# PbR Framework- Background

Steps for designing a PbR scheme:

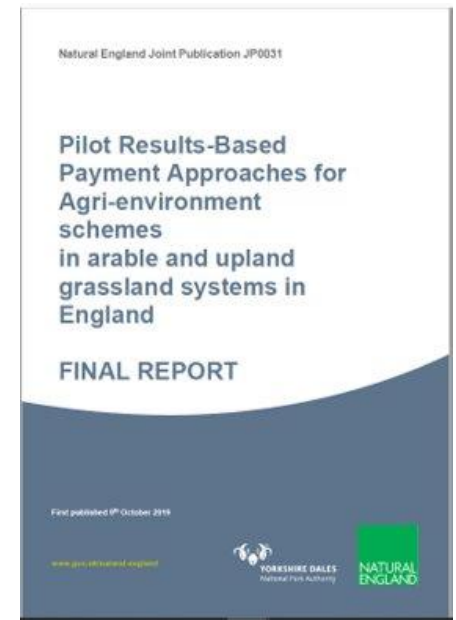
1. Define clear environmental **objectives**
  - A strong relationship between the result to be rewarded and achievement is required
2. Choose/ select result **indicators**
  - Should reflect definition and measure of success in reaching the objective
3. Set indicator **thresholds**
  - Used to determine payment tiers or levels
4. Calculate the **payment**



<https://www.rbpnetwork.eu/media/rbaps-handbook.pdf>

# PbR- A Yorkshire example

- Results-Based Agri-Environmental Pilot Scheme (RBAPS). Natural England (2016) & Defra (2018) funding
- Upland (Wensleydale) and lowland (Norfolk & Suffolk) grassland/ arable systems
- Delivery of four environmental **objectives**:
  - Species rich hay meadows
  - Habitat for breeding waders
  - Provision of winter bird food
  - Provision of pollen and nectar resources for pollinators



<https://publications.naturalengland.org.uk/publication/6331879051755520>

# PbR- A Yorkshire example

- 19 farms, 51 ha meadows, 285 ha wet grassland



Objective	Result indicator
Species rich hay meadow	Species richness score based on presence of positive and negative indicator species.
Habitat for breeding waders	Score based on positive and negative habitat structural characteristics/features.
Provision of winter bird food	Score based on number of specified seed bearing plant species present.
Provision of pollen and nectar resources for pollinators	Score based on number of specified flowering plant species present and in 2 <sup>nd</sup> year after establishment % cover of specified species.

Table 1. Result measures.

# PbR- Breeding waders

‘Score based in positive and negative habitat structural characteristics/ features’

Breeding wader habitat condition assessment

Indicator

Feature	Good habitat characteristics	Score: 5 points each	Moderate habitat characteristics	Score: 2 points each	Poor habitat characteristics	Score: 0 points each
1. Grass sward structure	Limited areas of tussocks and/or other features suitable for chick cover* Over 50% of the sward is short		Tussocks seen frequently across field Between 25% & 50% short		No tussocks or features seen No variation in height, either all short or all long	
3. Rush cover	Between 10 – 30% ‘standing’ rush cover (excluding mown areas) ‘Standing’ rush well scattered across field with no large dense blocks		Between 30% to 50% of the field is covered with ‘standing’ rush Rush scattered across field in large dense blocks but with plenty of gaps in between		Over 50% standing rush cover or less than 10% rush cover Blocks of thick dense rush, few if any gaps	
4. Wet features	Over 50% of the field is damp from April to June Field contains a number of wet pools and/or water filled open ditches with gently sloping edges and are easily accessible by birds (75% of surrounding area short vegetation) Field contains exposed muddy areas that are easily accessible by birds (majority of surrounding vegetation is short) Field contains wet flushes and/or springs where majority of vegetation height is below ankle height		Between 10 and 50% of the field is damp from April to June Field contains steep sided pools and/or water filled open ditches which are dominated by thick stands of tall vegetation or rush Field contains exposed muddy areas that are virtually inaccessible by birds (majority of surrounding vegetation is long and dense) Field contains wet flushes and/or springs where majority of vegetation height is tall and dense.		<10% of the field is damp from April to June Field contains no pools and/or water filled open ditches Field contains no muddy areas Field contains no wet flushes and/or springs	
Total						
<b>Total habitat condition score</b>						

Threshold

<https://publications.naturalengland.org.uk/publication/6331879051755520>



# PbR- Breeding waders

## Threshold/ payment modifiers

### 5. Damaging operations

Severe damage where over 25% of the habitat is damaged will result in an overall score of 0 and no payment will be made that year. Less significant damage may also lead to no payment if scores from other categories are low. See general guidance for further information and below for examples. The list is not exhaustive.

1. Damage to soil and sward from machinery
2. Damage from winter feeding sites that are still clearly seen
3. Damage to soil and sward from poaching
4. High stocking levels during bird nesting season (provide examples)
5. Damage to sward from inappropriate herbicide use
6. Installation of new field drainage system (unless previously agreed with YDNPA/NE)
7. Damage to historic environment features (refer to Historic Features Map)

Damage more severe covering between 10 - 25% of field area	-20
Limited areas covering 5 – 10%	-10
Less than 5%	0
<b>SCORE:</b>	

### Total overall score

Habitat condition score – Damaging operations score	
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## Payment

### Total score matrix

Score / Total points	0 <5 points	1 5 - 9 points	2 10-19 points	3 20 – 29 points	4 30 – 39 points	5 40+ points
£/ha	0	35	69	104	139	174

<https://publications.naturalengland.org.uk/publication/6331879051755520>

# PbR- Winter bird food

Indicator	Threshold per Quadrat
Triticale, wheat, oats or barley	25 seed heads
Red millet	4 seed heads
White millet	4 seed heads
Quinoa	2 seed producing plants
Fodder radish	1 seed producing plant
Dwarf sunflowers	1 seed producing plant
Linseed	5 seed producing plants
Mustard	2 seed producing plant
Gold of pleasure	5 seed producing plants
Spring oilseed rape	1 seed producing plant
Buckwheat	4 seed producing plants

Table 6 Winter bird food plant and seed-head thresholds.

‘Score based on number of specified seed bearing plant species present’

Number of Established Sown Species Producing Seed*	Payments rate where 50% or more of plot assessments reach the required plant or seed head threshold
5+	Tier 6 (£842)
4	Tier 5 (£674)
3	Tier 4 (£505)
2	Tier 3 (£337)
1	Tier 2 (£168)
0	Tier 1 (£0)

Table 9: Winter bird food payment tiers.

Tiered payment based on number of species which reached threshold

<https://publications.naturalengland.org.uk/publication/6331879051755520>

# PbR- Skell Valley

Steps for designing a PbR scheme:

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# PbR- Skell Valley *Objectives*

- Reduce flood impacts/ apply NBS solutions
- Reduce sediment flux
- Ecological/ additional benefits
  - Water quality (nutrients)
  - Provision of habitat
  - Soil health

# PbR- Skell Valley *Indicators*

Defining and measuring success. Should be quantifiable, reliable and of reasonable cost to monitor

## Flood benefits

- Decreased flood magnitude, duration, timing downstream
- Upstream flood storage

## Sediment benefits

- Decreased sediment and soil erosion
- Decreased sediment volume downstream

## Ecology/ additional benefits

- Water quality improvement, habitat and species quantification

# PbR- Skell Valley *Indicators*

## Previous iCASP work identified potential indicators



### Leaky woody dams

These are constructed in streams and ditches. They may use tree trunks and branches or may be more engineered structures. They are set either above the water level to allow baseflow to flow freely, or in contact with the bed where all flow will come into contact with it.

#### Outcomes

- Slow the flow of water in the watercourse
- Increase water storage on floodplains and in the channel
- Reduce downstream flow of water
- **Additional benefits:** social benefits, improved water quality, greenhouse gas reduction, and habitat provision

#### Monitoring Information

Outcome to monitor	Measurements, Equipment & Monitoring Frequency	Who could monitor?	Feasibility of use in a Pfo Scheme
<i>Slowing flow</i>	Depth measured using time lapse photography (camera, gauge board and computer). This needs to be checked after flood events.	Anyone trained who can allocate time. Validation by a specialist is required.	There is some evidence that this intervention works, but it may be better in combination with others to make enough difference to warrant a payment scheme. The removal of sediment is important in the proper functioning of the dam and can reduce downstream sedimentation. Leaky woody dams that create a large volume of temporary water storage are more likely to be suitable for these schemes.
<i>Storing water</i>	The capacity above the dam can be measured with a tape measure or using photos, to determine storage. This would be on an ad hoc basis if structural conditions change.	Anyone trained who can allocate time. Validation by a specialist is required.	
<i>Trapping sediment</i>	The volume of sediment stored, and the rate of storage/ deposition can be measured using photographs and a bucket to collect sediment. This would be done after flood events or when the amount of sediment reaches a threshold.	Farmers can monitor this.	

Find out more about this intervention:

- Page 17 - *Natural Flood Management – a practical guide for farmers.*

[Click here](#) to return to the start of the tool.

#### Desired Outcome: Additional Benefits

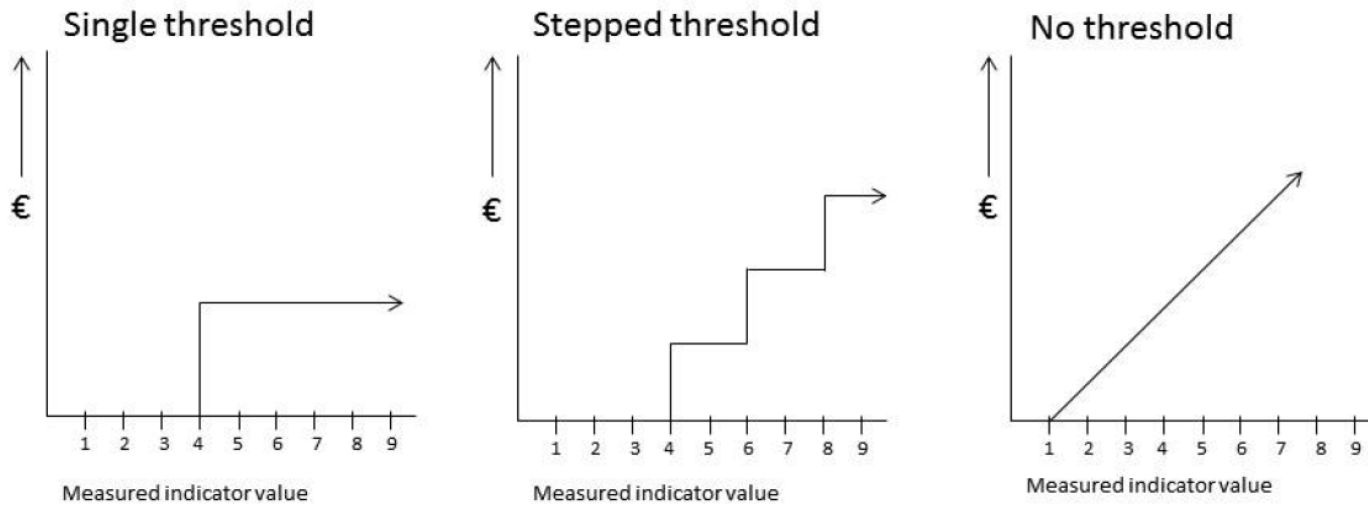
NFM interventions can have several additional benefits, as are briefly outlined in the table below. Please note that this is not a complete coverage of such benefits and, in some cases, there may be confounding factors. Information in this table was taken from the Environment Agency (Burgess-Gamble *et al.*, 2018); for more detailed benefits of the interventions please see the [Evidence Directory document](#).

	Social Benefits (Health benefits, aesthetic values, cultural qualities etc.)	Improved water quality	Greenhouse gas reduction	Habitat provision
<i>Blocking drainage grips</i>	The return to a more 'natural' state can improve the recreational and aesthetic values of the area.	This can increase trapping of sediment and reduce the pollution being mobilised to watercourses.	This may reduce the amount of carbon being lost to watercourses, making the area a more effective carbon sink.	This can create habitats for vegetation such as Sphagnum mosses, as well as a range of other species.
<i>Bunds, swales, and scrapes</i>	The improvements to habitat may attract visitors.	These capture sediment and pollutants, reducing the amount reaching watercourses.	There is little evidence for this benefit.	These features and associated detention areas may provide habitats.
<i>Creating and managing buffer strips</i>	Can improve accessibility for visitors. Their 'natural' look also gives them aesthetic value.	Buffer strips can reduce phosphorous, nitrogen, organic matter, and suspended sediment.	Vegetation may reduce atmospheric greenhouse gases and produce oxygen.	These may be important for invertebrate habitats, plant diversity, and habitat connectivity.
<i>Cross drains in farm tracks</i>	There is little evidence for this benefit.	These help to protect against erosion and sediment loss to watercourses.	There is little evidence for this benefit.	There is little evidence for this benefit.
<i>Increasing soil permeability/water holding capacity</i>	There is little evidence for this benefit.	Increased infiltration means fewer pollutants reach watercourses in runoff.	Increased soil health may improve its ability to reduce greenhouse gases.	Healthier soil may provide a habitat for some new species.
<i>Leaky woody dams</i>	Habitat provision can be an opportunity for education and tourism. More available fish for angling may increase recreational activity and its economic benefits.	These can help filter sediment and pollutants out of the river. They have been seen to reduce phosphorous and nitrogen levels.	These dams may sequester carbon in the long term.	They cause a greater range of flow velocities and create pools. These habitats can support a variety of species.

<https://icasp.org.uk/projects-2-2/payment-for-outcomes/>

# PbR- Skell Valley *Thresholds*

Payment bands/ tiers linked to achievement of indicators (objectives)



Number of sown flowering species present	Percentage cover of flowering sown species*					
	0-49	50-59	60-69	70-79	80-89	90-100 Yr1
5+	Tier 1 (£0)	Tier 6 (£423)	Tier 7 (£494)	Tier 8 (£564)	Tier 9 (£635)	Tier 10 (£705)
4	Tier 1 (£0)	Tier 5 (£353)	Tier 6 (£423)	Tier 7 (£494)	Tier 8 (£564)	Tier 9 (£635)
3	Tier 1 (£0)	Tier 4 (£282)	Tier 5 (£353)	Tier 6 (£423)	Tier 7 (£494)	Tier 8 (£564)
2	Tier 1 (£0)	Tier 3 (£212)	Tier 4 (£282)	Tier 5 (£353)	Tier 6 (£423)	Tier 7 (£494)
1	Tier 1 (£0)	Tier 2 (£141)	Tier 3 (£212)	Tier 4 (£282)	Tier 5 (£353)	Tier 6 (£423)
0	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)	Tier 1 (£0)

Table 10: Pollen and nectar payment tiers.

Figure: Keenleyside et al., 2014 <https://www.rbpnetwork.eu/media/rbaps-handbook.pdf>

<https://publications.naturalengland.org.uk/publication/6331879051755520>

# PbR- Skell Valley *Thresholds*

- PbR NFM monitoring workshop, March 2019
- Land & water interventions & monitoring of outcomes
- Main points:
  - Time lag to outcomes (particularly land based interventions)
  - Payment for actions vs outcomes
  - Consolidation of management efforts for payment via 'total volume of water or sediment stored'?





# PbR- Skell Valley *Payments*

Typically, higher payment levels than comparable management-based schemes

- **Opportunity costs** (*maintaining current management which is already delivering benefits*)
- **Income foregone** (*reduced income or productivity due to interventions cf. decreased stocking density*)
- **Additional costs** (*due to interventions*)

Farmers Weekly

<https://www.fwi.co.uk/news/environment/results-based-pilot-scheme-helps-farmers-deliver-green-goals>

Comparison of RBAPS and conventional payment scheme to farmers					
Objective	RBAPS payment range (£/ha)	Average RBAPS payment year 1 (£/ha)	Average RBAPS payment year 2 (£/ha)	Countryside Stewardship equivalent	Countryside Stewardship equivalent (£/ha)
Species-rich hay meadow	Five tiers £112-£371	183	210	G6 Management of species-rich grassland GS15 haymaking supplement	182 85
Habitat for breeding waders	Five tiers £35-£174	146	147	UP2 Management of rough grazing for birds GS16 Rush control supplement WN2 (capital) creation of scrapes and gutters	88 73
Provision of winter bird food	Six tiers £0-£842	766	789	AB9 Winter bird food	640
Provision of pollen and nectar resources for pollinators	10 tiers (six in year 1) £0-£705	702	629	AB1 Nectar flower mix	511

# PbR- Skell Valley *Payments*

Multiple objectives

- Sediment
- Flood impact
- Biodiversity
- Land owner engagement

Multiple and unknown indicators,  
thresholds and measures of success



# PbR- Skell Valley *Payments*

- Proposed formulaic approach due to multiple objectives
- Parameters:

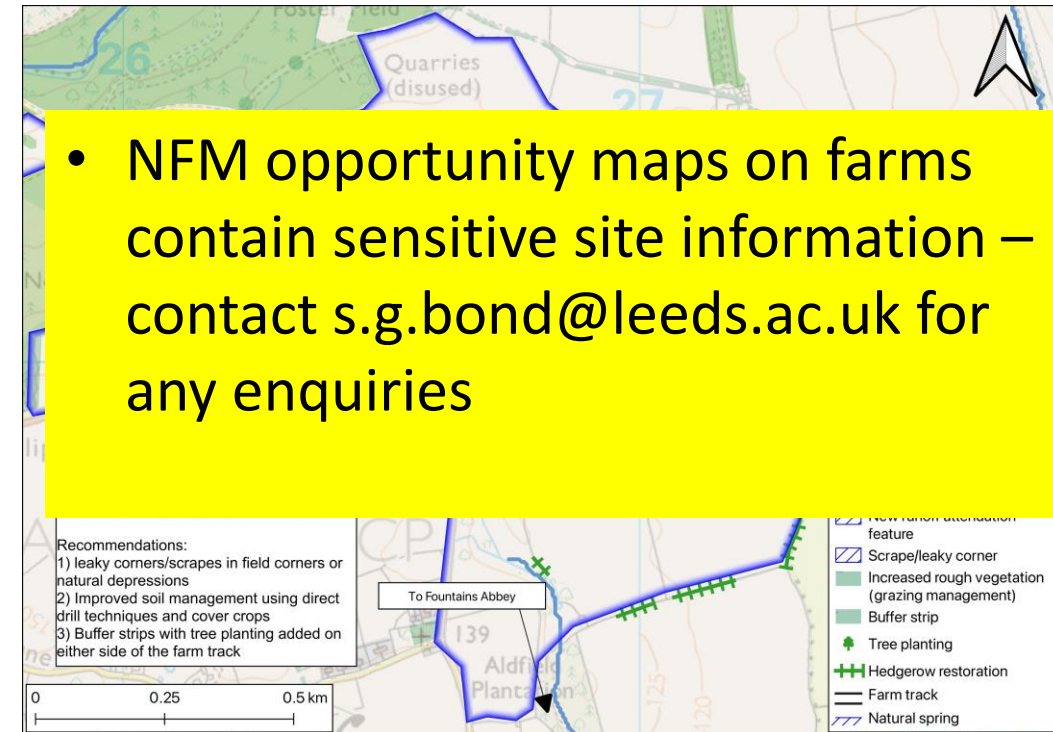
Initial costs (I)	Sediment benefits (Sed)
Maintenance costs (M)	Flood benefits (FI)
Other? e.g. ongoing success or monetary loss	Ecological benefits (Ecol)
- Parameters valued/ weighted to support PbR
- $\text{Payment} = \text{Sed} + \text{FI} + \text{Ecol} + \text{I} + \text{M}$

# PbR- Skell Valley *Payments*

	sediment	flood	ecology
Runoff Attenuation	3	5	2
Buffer strip	2	4	3
Hedgerow	3	3	4
Scrape	4	4	2
<b>TOTAL</b>	<b>12</b>	<b>16</b>	<b>11</b>

Banding score = Sed + Fl + Ecol + I + M  
 = 12 + 16 + 11 + ...  
 = 39

## Overland flow risk



## Payment bands/ tiers

< 10	11- 30	31- 50	> 51
NIL	£	££	£££

# PbR- Skell Valley *Payments*

- Proposed formulaic approach due to multiple objectives

- Parameters:

Initial costs (I)

Sediment benefits (Sed)

Maintenance costs (M)

Flood benefits (FI)

Other? Eg ongoing success  
or monetary loss

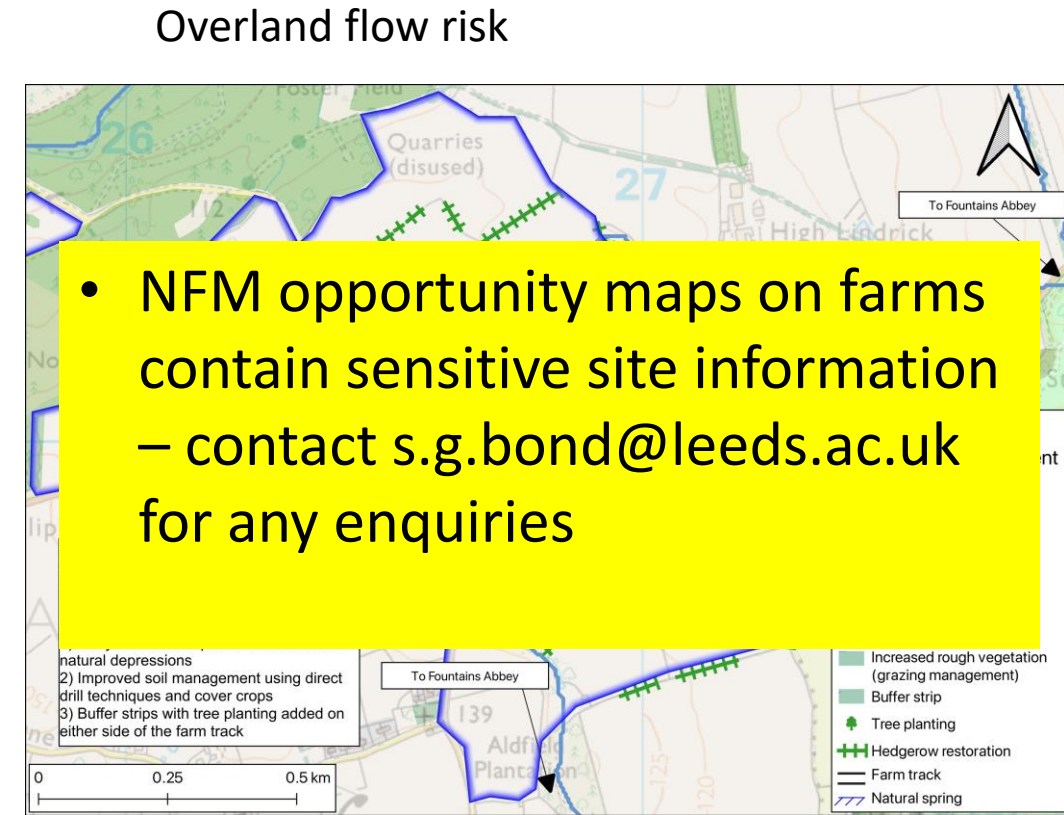
Ecological benefits (Ecol)

- Multipliers used to encourage most effective interventions

$$\text{Band} = 2 * \text{Sed} + 4 * \text{FI} + 1.25 * \text{Ecol} + I + M$$

# PbR- Skell Valley Payments *Banding and multipliers*

	sediment	flood	ecology
Runoff Attenuation	3	5	2
Buffer strip	2	4	3
Hedgerow	3	3	4
Scrape	4	4	2
<b>TOTAL</b>	<b>12</b>	<b>16</b>	<b>11</b>



$$\begin{aligned}
 \text{Buffer} &= 2 * \text{Sed} + 4 * \text{Fl} + 1.25 * \text{Ecol} + I + M \\
 &= 4 + 16 + 3.75 \\
 &= 23.75
 \end{aligned}$$

< 10	11- 15	16- 20	> 21
£	££	£££	££££

# PbR- Skell Valley Payments *Banding and multipliers*

	sediment	flood	ecology
Runoff Attenuation	3	5	2
Buffer strip	2	4	3
Hedgerow	3	3	4
Scrape	4	4	2
<b>TOTAL</b>	<b>12</b>	<b>16</b>	<b>11</b>



- NFM opportunity maps on farms contain sensitive site information – contact [s.g.bond@leeds.ac.uk](mailto:s.g.bond@leeds.ac.uk) for any enquiries



$$\begin{aligned}
 \text{Buffer} &= 4 * \text{Sed} + 2 * \text{Fl} + 1.25 * \text{Ecol} + I + M \\
 &= 8 + 8 + 3.75 \\
 &= 19.75
 \end{aligned}$$

< 10	11- 15	16- 20	> 21
£	££	£££	££££

# PbR- Skell Valley *Payments*

- Multipliers could be applied at intervention AND farm AND/OR catchment level

	sediment	flood	ecology
Runoff Attenuation	3	5	2
Buffer strip	2	4	3
Hedgerow	3	3	4
Scrape	4	4	2
<b>TOTAL</b>	<b>12</b>	<b>16</b>	<b>11</b>

$$\begin{aligned} \text{Mallard Grange} &= 2 * \text{Sed} + 4 * \text{Fl} + 1.25 * \text{Ecol} + I + M \\ &= 24 + 64 \dots \\ &= 88 \end{aligned}$$

$$\begin{aligned} \text{Home Farm} &= 4 * \text{Sed} + 2 * \text{Fl} + 1.25 * \text{Ecol} + I + M \\ &= 48 + 32 \dots \\ &= 80 \end{aligned}$$



# Skell Valley PbR

- Multiple objectives and unclear thresholds
- Spatial (scale) and temporal complexities
- Potential to use a formulaic approach to payments
- Multipliers could be used at various management scales to encourage and reward most effective interventions and locations
- More work to be done on number of bands and payment tiers
- Opinions please!