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The development of a draft peatlands and
heathland scorecard using the Results-
Based Agri-environmental Pilot Scheme
(RBAPS) scorecard approach

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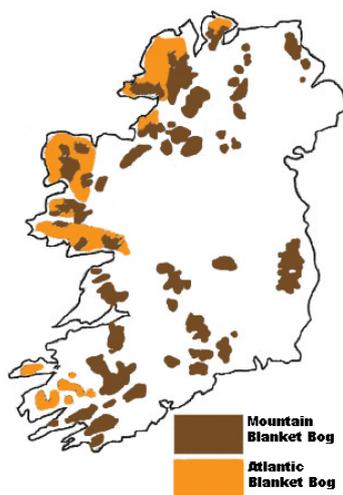
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Introduction

Results-based agri-environment schemes (RBAPS) have been piloted and implemented on a small-scale across Europe. They are typically carefully targeted at specific habitats or species in High Nature Value (HNV) farmland landscapes. The RBAPS Ireland and Spain project focused on grassland and vineyards (in accordance with the DG Environment call). The HNV Ireland project took the RBAPS scorecard and examined the possibility of applying it to a different habitat type. As a starting point the “health” assessment proposed by McGurn and Moran 2013 have been adopted to produce an RBAPS style score card for peatland and heathland habitats.

Peatland habitats

We selected peatland habitats as they are prevalent on HNV farmland areas across Ireland. Around 20% of Ireland has peat soils. Peatlands in this instance only refers to blanket bog and heath habitats. Raised bog is not included as this habitat is not grazed nor is it maintained through grazing. See Figure 1 for the broad distribution of blanket bog in Ireland and the main land use categories of peatlands.



Distribution of the main land use categories of peatlands.

Natural Peatlands	269,270ha ¹
Cutover Peatlands(Affected by Domestic Turf Cutting)	612,380ha ²
Afforested Peatland	300,000ha ³
Farmed Peatland (grassland)	295,000ha ⁴
Industrial cutaway peatlands	70,000ha ⁵
Rehabilitated cutaway	18000 ⁶

Figure 1. Broad distribution of blanket bogs in Ireland (source: ipcc.ie) and the distribution of the main landuse categories of peatlands (NPWS, 2015).

Having a scorecard that could be used to assess the quality of peatland habitats would be a very valuable resource for results-based agri-environmental schemes that include farmed peatland areas. The application of the RBAPS scorecard system to a peatland habitat is a sensible progression given that peatlands are also very common habitats on Irish farmland. Peatland rehabilitation, restoration and enhancement can contribute to climate change mitigation and adaptation (NPWS, 2015) and

improved water quality (Moran and Sullivan, 2017) as well as biodiversity. Protection of carbon stores and increases in carbon sequestration, reduction in erosion and tourism are also potential benefits of peatland restoration (Pilkington, 2015).

Peatland structure

The nature of a peatland is controlled by hydrological processes. Its existence and quality depends upon retaining water. A peatlands characteristics depend upon the origin, volume, chemical quality and variability of water supply (Labadz et al., 2010). High levels of rainfall are common in areas with blanket bog in Ireland. The bog acts as a sponge and can effectively absorb large amounts of water of the top layer of the bog is healthy (i.e. has healthy *Sphagnum* moss communities) (Conaghan et al., 2000). Peatlands can be damaged by a number of activities such as afforestation, peat extraction, overgrazing, agricultural reclamation, burning and windfarm development (Conaghan et al., 2000).

Peatland vegetation

Peatlands (in this instance) are comprised of blanket bog and wet heath and dry heath. These habitats contain a restricted number of species which are adapted to the wet acidic conditions. A number of key species indicate a quality bog with good underlying hydrology. These include the presence of heathers (e.g. *Erica tetralix*, *Erica cinerea*, *Calluna vulgaris*), *Sphagnum spp.* and other key species listed in Table 1.

Plant species	Plant species
<i>Agrostis tenuis</i>	<i>Myrica gale</i>
<i>Anthoxanthum odoratum</i>	<i>Nardus stricta</i>
<i>Arctostaphylos uva-ursi</i>	<i>Narthecium ossifragum</i>
<i>Calluna vulgaris</i>	<i>Pedicularis sylvatica</i>
<i>Carex binervis</i>	<i>Pinguicula lusitanica</i>
<i>Daboecia cantabrica</i>	<i>Polygala serpyllifolia</i>
<i>Danthonia decumbens</i>	<i>Rhynchospora alba</i>
<i>Drosera spp.</i>	<i>Salix repens</i>
<i>Eleocharis multicaulis</i>	<i>Schoenus nigricans</i>
<i>Empetrum nigrum</i>	<i>Sphagnum spp</i>
<i>Erica spp.</i>	<i>Succisa pratensis</i>
<i>Eriophorum angustifolium</i>	<i>Trichophorum germanicum</i>
<i>Eriophorum vaginatum</i>	<i>Tricophorum caespitosum</i>
<i>Festuca vivipara</i>	<i>Ulex gallii</i>
<i>Molinia caerulea</i>	<i>Vaccinium spp.</i>

Table 1. Plants listed as indicator species of wet heath, blanket bog and dry heath habitats. Very few species were exclusive to one habitat.

The RBAPS scorecard

The RBAPS scorecard is made up of two sections. Section A covers indicators of ecological integrity with a high score of 60 points and Section B covers current habitat suitability with a high score of 45 points. This gives a total high score of 105 points with a higher weighting going towards Section A. The overall ratio of Section A to Section B was 4:3. See Figure 2.

RBAPS Irish Species-rich Grassland (Version 1 - 25 July 2016)

Landowner: _____ Date of scoring: _____ Surveyor: _____
 Townland: _____ Field Number: _____

A. Ecological Integrity SCORE A & B: _____

A.1 What is the number of positive indicators in the field or management unit? Circle all positive indicators present in Box 1.
Note all positive indicators present on you walk through the field/management unit and around the boundaries. Include positive indicators present on earth banks and other field features, if these are grazed.

No. of positive indicators	4 or 5	6 or 7	8 or 9	10 or 11	12 or 13	14 or 15	16 or more
Score	-2	-4	-5	-10	-15	-20	25

A.2 What is the cover of positive indicators (listed below) through the field or management unit?
Cover is the proportion of the field or management unit taken up by all positive indicators present.

Low: <10%	Med-low: 11-25%	Med-high: 26-50%	High: >50%	
Score	0	5	15	25

A.3 What is the cover (total) of negative indicator species &/or agricultural 'weeds' throughout the field or management unit.
Weeds around current feeding sites should be scored under B.4; all other weeds under this indicator.

Circle: Docks Perennial rye grass Ragwort Nettles Thistles (Creeping & Spear)

High: >50%	Med-high: 26-50%	Med-low: 11-25%	Low: 5-30%	Negligible (<5%)	
Score	-30	-20	-10	0	10

B. Current Habitat Suitability

B.1 What is the vegetation structure in grasslands? Look for how much of the grassland shows variation in height and microtopography (hummocks, earth banks, etc).
Note: If grassland is primarily grazed use B.1a; if grassland is cut for hay or silage, use B.1b.

B.1a (grazed grasslands)

Poor structure Most of field (>75%) has either tall or short sward; intermediate sward absent or confined to small patches. Few flowering plants.	Moderate structure 20-50% of site has tall and/or short sward with occasional to frequent intermediate sward patches and flowering plants.	Good structure >50% of field with sward having variety of tall and/or shorter sward with intermediate sward throughout.	
Score	-10	10	20

B.1b (grasslands cut for silage/hay)

Unlimited structure None to very little aftermath grazing and very limited variation in microtopography; grassland looks uniform in appearance.	Good structure Aftermath grazing, and variation in height of sward and some areas of bare ground; or rotational cutting which may be evident through dark or patches of sward; grassland does not look uniform in appearance.	
Score	10	20

B.2 What is the litter level? - plant litter is dead plant material.

High: >75%	Med-high: 50-75%	Med-low: 25-50%	Low: <20%	
Score	-15	-5	5	15

B.3 What is the cover of encroaching scrub? Encroaching scrub can be brambles, sweetgum, scrub and young trees.
Identify main species: _____

High: >50%	Med-high: 26-50%	Med-low: 11-25%	Low: <10%	
Score	-30	-20	-10	5

Please turn over

B.4 What is the cover of bracken?

High: >50%	Med-high: 26-50%	Med-low: 11-25%	Low: <10%	
Score	-30	-20	-10	0

B.5 Are there any damaging activities to vegetation, soil or water?
If yes, list all activities in comment box overleaf.

High	Med-high	Med-low	Very low/None
Score	-40	-20	0

B.6 Is there damage due to supplementary feeding?
Identify type (silage, concentrates etc): _____

High	Medium	Very low/None	
Score	-40	-20	0

BOX 1: Circle or tick the positive indicators which occur more than once within the grassland.
 Each individual indicator, whether a single species or group of species, counts as one indicator for Questions A.1 & A.2.
 Refer to Positive and Negative Plant Identification Booklet to assist with correct identification.

Code	Positive Indicator	Code	Positive Indicator
1	Birds-foot-trefoil (Common & Greater) & Kidney Vetch	17	On-eye Daisy - also known as Dog Daisy (<u>not common data</u>)
2	Cowslip & Primrose	18	Orchids - all species
3	Eyebrights - all species	19	Ragged Robin
4	Forget-me-nots - all species	20	Scabious - Devil's-bit & Field
5	Heathers - all species, where total cover in grassland is <25%	21	Sedges - all species
6	Knapweeds - Common & Greater	22	Selfheal & Bugle
7	Lady's Bedstraw	23	Small Rushes - Woodrushes, Spike Rushes, Heath, Sharp-flowered & Jointed Rush
8	Lady's Mantle	24	Small Umbels - Yarrow, Sneezewort, Pignut & Wild Carrot
9	Lady's Smock - also known as Cuckooflower	25	Sorrel - Common & Sheep
10	Large Umbels - Angelica, Valerian & Common Hageweed	26	Stitchworts (Field & Marsh); Small Bedstraws (all species); Fairy Flax
11	Looseworts - Common & Marsh	27	Thistles - Marsh & Carline
12	Marsh Cinquefoil & Water Avens	28	Tormentil - Common & English; & Yellow Pimpernel
13	Marsh Pennywort	29	Witches - all species including Bush, Turfed, Meadow
14	Meadowsweet	30	Yellow Composites - Cat's Ear, Hawkweed's, Hawkbit's & Goat's-beard (<u>not dandelion</u>)
15	Meadow Thistle	31	Yellow-rattle - also known as Hay Rattle
16	Mints - all species	32	Wild Thyme

Comments or any recommended actions:

Any issues to be brought to farmers attention for immediate action or to rectify in short/medium term:

Figure 2. The RBAPS scorecard

Section A focused on cover and presence of positive indicator plant species, with 4 or less indicator species scoring low and 13 or more indicator species scoring high. Cover of negative indicator species (representing high nutrient inputs) was also considered.

Section B focused on habitat structure, plant litter cover, scrub encroachment and bracken presence. Where conditions were favourable the field received positive scores. It also examined evidence of damaging activities to the vegetation, soil, water or supplementary feeding. Where these were favourable they received a zero score.

The HNV Ireland Peatland Scorecard

Heathland and Peatland Scorecard development

There is a single scorecard for heathland and peatlands. This is based on the lack of distinct indicator species and similar ecological integrity conditions that exist. The need for a separate dry heath card can be assessed following testing of the card. The scorecard is split into two sections: A and B.

Section A: Ecological quality (species richness and composition)

Section A covers an assessment of the species present and their cover. It examines both positive and negative indicators. The number of species considered for section A.1 might appear quite low but this is for two reasons. One, the species-richness of these sites is lower in general and two, once you consider genera as indicators instead of species the overall indicator list is quite low and warrants these lower values. The A.3 species list is based on what you see when peatland habitats have been mismanaged or fertilised.

Section B: Threats and future prospects

Following some consideration of the key features of peatland integrity, this section is split into assessments of soil, hydrology, grazing, plant litter and damage due to supplementary feeding. Burning and bare soil/erosion are damaging activities and so there is no positive score. There is a high positive score for hydrology as it is an important feature of these sites and there are positive indicators of this such as sphagnum cover. There are also positive scores for optimal grazing levels and litter (note-we should consider whether or not this is double scoring). The negative scores for around the supplementary feeder are low enough as these peatland sites are often large upland complexes and the impact of supplementary feeding, while necessary to note, will be lower than the same supplementary feeder in a small grassland field.

The ratio of section A to B is 1:1. This is probably reasonable as the carbon storage potential and hydrology of these sites is as important (if not more) as the species richness though this will need to be tested. There is potential for the weighting being even more in favour of section B. Much of the structure related assessments are based on A Manual for the production of grazing impact assessments in upland and peatland habitats (Duchas, 1999) and in consultation with the Dartmoor Farming Futures group who developed a peatland plant crib in association with Natural England (Silcock et al., 2013).

Indicator species list

The indicator list is derived from a combination of A Manual for the production of grazing impact assessments in upland and peatland habitats (Duchas, 1999), Guidelines for a national survey and

conservation assessment of upland vegetation and habitats in Ireland. Version 2.0 (Perrin et al., 2014) and A Guide to the Habitats of Ireland (Fossitt, 2000).

The final list was reduced based on the Dartmoor scorecard which is really simple and works well and something similar should work for Ireland. Grasses and other potentially difficult to ID species were excluded. Those that remain should be present on reasonably intact peatlands (this should be confirmed through testing). It has been recommended that the card be tested on a peatland habitat that is poor quality to verify the plant list (C. Maher *pers comm.*). A complementary plant crib (photos of each plant listed) should also be compiled for the Irish situation.

This report should be read in conjunction with the June 2017 version of the peatlands scorecard

Application of the RBAPS scorecard approach in other areas

In short, it does indeed seem feasible to apply the RBAPS scorecard principles to other habitats. It is probably also feasible to adapt this type of scorecard to other potential agri-environment scheme goals such as water quality or other eco-system services. It is however, important to ensure that the farmer doesn't end up with ten scorecards if he/she has a diverse farm however. So, while the scorecard approach could be applied elsewhere, how well they work if more than one scorecard is required should be considered and monitored.

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