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Floodplain and Callows Grasslands in Ireland: Appendix 3 Supporting Information

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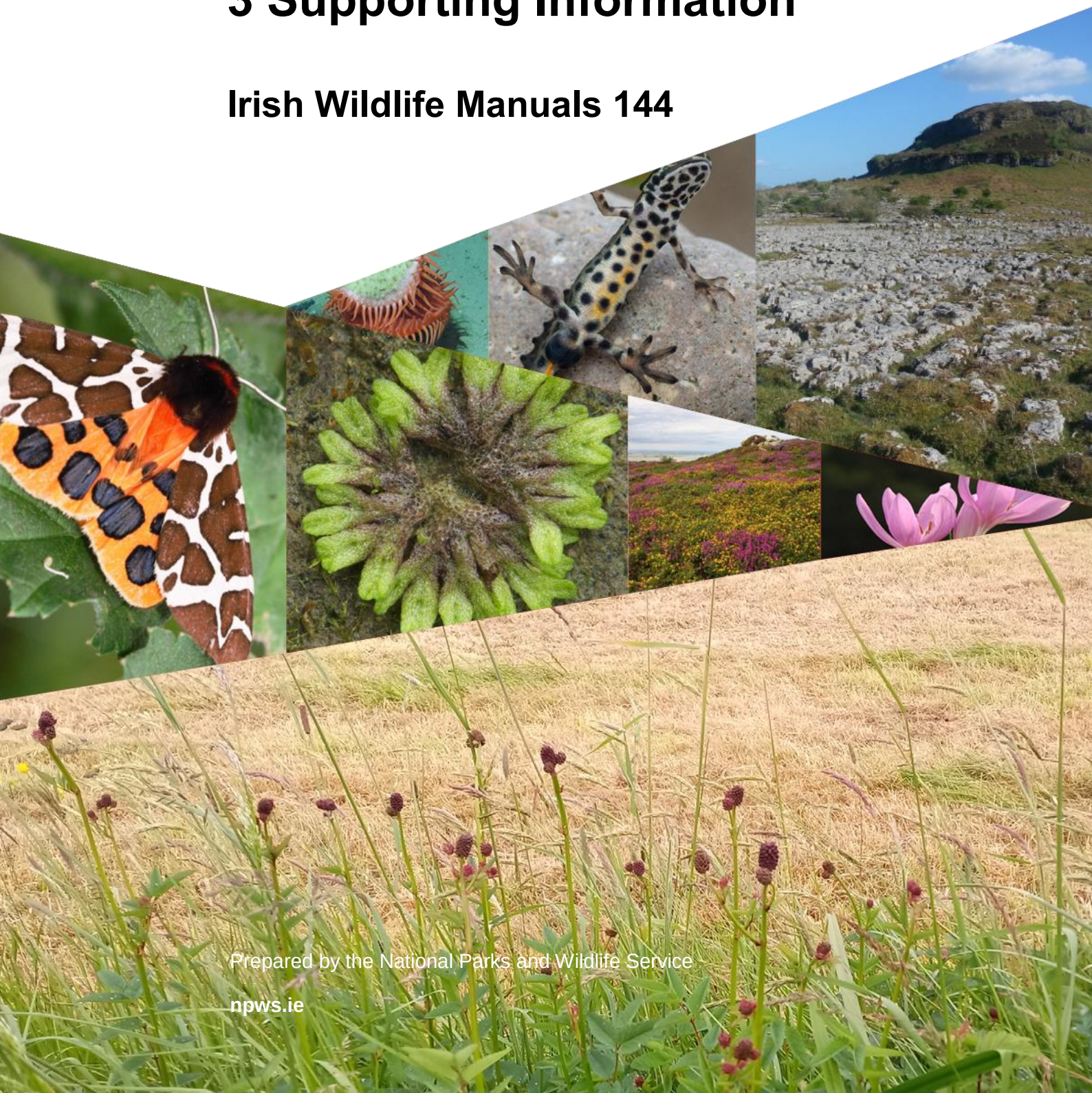

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Front cover, small photographs from top row:

A deep water fly trap anemone *Phelliactis* sp., Yvonne Leahy; **Common Newt** *Lissotriton vulgaris,* Brian Nelson; **Limestone pavement**, Bricklieve Mountains, Co. Sligo, Andy Bleasdale; **Garden Tiger** *Arctia caja,* Brian Nelson; **Violet Crystalwort** *Riccia huebeneriana*, Robert Thompson; **Coastal heath**, Howth Head, Co. Dublin, Maurice Eakin; **Meadow Saffron** *Colchicum autumnale*, Lorcan Scott

Bottom photograph: **Meadow with Great Burnet** *Sanguisorba officinalis,* Jim Martin

Floodplain and Callows Grasslands in Ireland: Appendix 3 Supporting Information

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Appendix 3 Site reports for the 27 field surveyed floodplain sites

The 27 surveyed floodplain grassland sites are ordered within this appendix by site number, with the three NHA sites added at the end. It is recommended that the three shapefiles SCAL20_Field_sites (Field survey polygons), SCAL20_plot_points (2 x 2 m plots), and SCALG20_feature_points (point features such as rare plants or the location of Annex I habitats) are viewed when reading the site reports. The unique identifier, made up of the site number and polygon number (e.g. 4000_1b) is used within the site reports to indicate the location of particular features, together with general location descriptors such as 'north-eastern end of site'.

The EU negative pressures recorded for the target Annex I habitats in the 2021 survey are listed within each site report. When neutral pressures were recorded at a site, these are also listed within the same table but with 'neutral' added in parentheses.

3.1 Leitra Callow, Co. Offaly (Site No. 108):

Location data: Site centroid (ITM) 600700 721500, EPA subcatchment Shannon[Lower]_SC_030

2021 total area surveyed (ha): 75.25

Ranking: =3rd highest scoring site from 2021 field survey. Score of 6/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	3.02	4.01
GS4	62.56	83.14
Secondary habitats	**Area (ha)**	**% of survey area**
ED2,FS1,FS2,GA1,GS1,GS2,HH3,PF1,WN2	9.67	12.85

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	0.01	0.02
6510	0.22	0.30
p6410	2.40	3.19
p6510	1.25	1.66
Secondary habitats	**Area (ha)**	**% of survey area**
6430,91E0	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing with aftergrazing	2.77	3.68
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	19.89	26.44
Extensive pasture - cattle	46.30	61.53
Extensive pasture - horses	2.25	2.99
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	2.84	3.77

2021 EU pressures recorded for the target Annex I habitats:

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	None recorded	-	-
6510	None recorded	-	-

2021EU conservation measures recorded for the three target Annex I habitats:

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.00
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.00

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with only small areas of agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. The semi-natural wet grassland (GS4) habitat within the site includes a very small area of the Annex I habitat *Molinia* meadows (6410) (polygon 108_31) that was recorded at the top of the floodplain and two larger areas of potential 6410 habitat (polygons 108_4, 108_7a). Other areas of potential 6410 habitat were recorded (polygons 108_4, 108_7a), these areas were judged to be p6410 due to the rarity of high quality species such as *Cirsium dissectum*. The majority of the wet grassland surveyed is non-Annex, with areas of rushy pasture with *Agrostis stolonifera, Deschampsia cespitosa, Juncus effusus, Filipendula ulmaria, Ranunculus repens, Galium palustre* and *Ranunculus flammula*. Some of the wet grassland areas within the site are *Phalaris arundinacea* dominated meadow (Figure 1) that are managed by mowing (polygons 108_19, 108_33), the forb species *F. ulmaria* is often common within these swards. Areas of the Annex I habitat Hydrophilous tall-herb (6430) were recorded within one area (polygon 108_19), with species such as *Mentha aquatica, Equisetum fluviatile* and *Lysimachia vulgaris* common within the habitat. Smaller areas of drier grassland were recorded within the site, one small area (northern end of polygon 108_19) that is managed by annual mowing corresponds to the Annex I habitat Lowland hay meadows (6510) and two other areas were mapped as potential 6510 (polygons 108_14, 108_15). Positive indicator species recorded within the potential 6510 habitat that is currently managed by extensive cattle grazing include *Filipendula ulmaria, Plantago lanceolata, Vicia cracca, Leontodon autumnalis, Centaurea nigra*, and the high quality species *Lotus corniculatus.*

Figure 1 *Phalaris arundinacea*-dominated wet meadow that has recently been mown at Leitra Callow (Site 108). Photograph Jim Martin

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

On the day of the survey the area of 6510 habitat (polygon 108_19) recorded by the ISGS (O'Neill *et al.* 2013) was compared with the current area of the Annex I habitat and the current area appeared to be slightly larger (approximately 10% larger). In the absence of any previous data to assess the *Area* parameter for 6410 (polygon 108_31) and 6430 (polygon 108_19) they are also assessed as Favourable.

No plots were recorded within this site to assess the *Structure and functions* of the target Annex I habitats and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. Within the small area of 6510 the two high quality positive indicator species *Leucanthemum vulgare* and *Lotus corniculatus* were occasional within the habitat and for the 6430 habitat the three positive indicator species *Mentha aquatica, Equisetum fluviatile* and *Lysimachia vulgaris* are common within the habitat. The management within the field (polygon 108_19) where both these Annex I habitats were recorded was assessed as appropriate. It should be noted that the mowing within the field did not include the edges near the river where the 6430 habitat was recorded. Based on the data from the walkover survey the *Structure and functions* for both the 6430 and 6510 habitats are assessed as Favourable. No *Structure and functions* data were recorded for the small area of 6410 habitat, but based on the fact that the area was mapped as 6410 and the management in the field was assessed as appropriate it is assumed that the *Structure and functions* are Favourable.

No pressures were recorded within the polygons where the three target Annex I habitats were recorded and the *Future prospects* for all three habitats are assessed as Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for the three target Annex I habitats at Leitra Callow (Site 108). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	Fav	Fav	Positive and negative impacts in balance
6430	Fav	Fav	Fav	Positive and negative impacts in balance
6510	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment for all three target Annex I habitats is Favourable. As stated above, there is evidence that the current area of the 6510 habitat at the site is slightly larger than the area reported by O'Neill *et al.* (2013) and both plots that the ISGS recorded within the polygon that was visited during the current survey passed the *Structure and functions* criteria. In addition, based on previous studies (see discussion below) the Leitra Callows site appears to have changed very little in terms of either management or floodplain grassland habitats since Nairn *et al.* (1988) first surveyed it. For these reasons the long-term trend for the three Annex I grassland habitats was judged to be stable.

Table 2 Overall assessment for the three target Annex I habitats recorded at Leitra Callow (Site 108).

Parameter	6410	6430	6510
Area	Favourable	Favourable	Favourable
Structure and functions	Favourable	Favourable	Favourable
Future prospects	Favourable	Favourable	Favourable
Overall assessment	Favourable	Favourable	Favourable

Site management:

The site at Leitra Callow is impacted by small areas of agricultural improvement, for example the high cover of *Lolium perenne* recorded at the top of one field (polygon 108_13) and two agriculturally improved fields (108_32, 108_20) including one (108_20) that is ploughed and awaiting reseeding. On the day of the survey 23% of the floodplain was considered to be managed too intensively, this figure rises to 25% if the ploughed field is also included (the management level within the field was not assessed on the day of the survey as it is currently a ploughed field awaiting reseeding), no areas were abandoned or undermanaged, and the remaining 75% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site has been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river, negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There are some large maintained drains within the site that were too wide and deep to cross. According to a local farmer in the early 1900s the OPW made a deep cut in the river channel in the vicinity of polygons 108_20 and 108_32 , the spoil and rock from the cut was deposited on the edge of these two fields and has been colonised by woodland and scrub.

Examples of best practice:

The 15.4 ha of *Phalaris arundinacea* dominated wet meadows that are managed by extensive mowing (polygons 108_19, 108_33) have been managed as hay meadows since the site was first surveyed by Nairn *et al.* (1988). Based on the results of the walkover survey these fields are managed by annual mowing in August with the hay removed after cutting. There was no evidence that the meadow is aftergrazed, but the fields are stock proof and therefore aftergrazing probably takes place in the years when the ground remains dry enough to avoid excessive poaching. In addition to the large area of wet meadows these fields also include a small area of 6510 at the northern end of polygon 108_19 and an area of 6430 beside the river.

Previous studies at the site:

There are two floodplain grassland plots from the National Vegetation Database located within the Leitra Callow site, these plots were recorded within the small area of 6510 by the ISGS (O'Neill *et al.* 2013). During the walkover survey the area of 6510 habitat mapped by the ISGS (O'Neill *et al.* 2013) was compared with the current area of the Annex I habitat and the current area appeared to be slightly larger (approximately 10% larger).

The majority of the Leitra Callow site was previously surveyed by Nairn *et al.* (1988) and Heery (1993), with most of the data recorded by these surveys relating to management rather than habitats. The area surveyed in 2021 appears to be managed in a very similar way (i.e. a combination of cattle pasture and hay meadow) to how it was when Nairn *et al.* (1988) undertook their survey. Heery (1993) identified three fields of improved grassland (polygons 108_10, 108_13, 108_14) within the site, but during the current survey all three fields were mapped as GS4, with GA1 only scored as a component of one field (108_13) and *Lolium perenne* noted as locally abundant around a gate in another (108_10). Overall, the Leitra Callow site appears to have changed very little in terms of management or floodplain grassland habitats since Nairn *et al.* (1988) first surveyed the site.

3.2 Drumlosh, Co. Roscommon (Site No. 113):

Location data: Site centroid (ITM) 601400 732100, EPA subcatchment Shannon[Upper]_SC_100

2021 total area surveyed (ha): 45.83

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
ED2	0.12	0.26
FS1	2.51	5.47
GA1	1.21	2.63
GS4	35.73	77.96
Secondary habitats	Area (ha)	% of survey area
BL3,ED2,ED3,FS1,FS2,GA1,GS1,GS2,GS4,HH3,PF3,WN6,WS1	6.27	13.67

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	0.09	0.20
6510	0.14	0.16
7140	0.02	0.05
Secondary habitats	Area (ha)	% of survey area
4010,6430,p6510,91E0	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned - original management unknown	5.07	11.06
Extensive mowing with aftergrazing	10.50	22.91
Extensive pasture - cattle	12.83	28.00
Intensive pasture - cattle	17.23	37.59

2021 EU pressures recorded for the target Annex I habitats:

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	A09: Intensive grazing or overgrazing by livestock (negative)	High	0.31
6510	A06: Abandonment of grassland management (negative)	High	100.00

2021 EU conservation measures recorded for the three target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	15.38
6430	CA05: Adapt mowing, grazing and other equivalent agricultural activities	0.31
6510	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	100.00

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural grassland site, with some areas of agriculturally improved grassland (GA1) recorded within the survey area and six of the fields where semi-natural wet grassland (GS4) habitat was recorded were noted to be agriculturally semi-improved. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife including rare plants such as *Lathyrus palustris*. The majority of the wet grassland surveyed was non-Annex and was relatively species-poor, often dominated by grass species such as *Agrostis stolonifera* and *Holcus lanatus.* The bottom half of one of the largest fields of wet grassland within the site is a *Phalaris arundinacea* dominated meadow that is managed by mowing (polygon 113_38), the rare plant species *Lathyrus palustris* was common along the edges of this field. Areas of the Annex I habitat Hydrophilous tall-herb (6430) were recorded within the survey area (Figure 1) with species such as *Sium latifolium, Mentha aquatica, Equisetum fluviatile, Lythrum salicaria* and *Lysimachia vulgaris* common within the habitat. Small areas of drier grassland were recorded within the site, one small area (centre of polygon 113_2) that currently appears to be abandoned corresponds to the Annex I habitat Lowland hay meadows (6510) and two plots were recorded to assess this area of Annex I habitat. The survey was unable to access the neighbouring field, but viewed from the boundary fence there did appear to be some small areas of potential 6510 habitat within polygon 113_4.

Figure 1 Hydrophilous tall-herb (6430) habitat at Drumlosh (Site 113). Photograph Jim Martin.

Rare floodplain grassland plant species: The species *Lathyrus palustris* was recorded within three of the polygons within the site. Two of the fields were areas of abandoned GS4 and reed swamp (FS1) (polygons 113_2, 113_25). The largest

number of plants, estimated at 100s (i.e. 200-500) of individuals were located around the edges of the large mown field (polygon 113_38).

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6510 habitat within the site (Figure 2) was assessed using two assessment plots. One of the plots was a complete botanical plot that was analysed using ERICA and assigned to the *Festuca rubra - Rhinanthus minor* GL3E IVC community.

Figure 2 Lowland hay meadows (6510) habitat at Drumlosh (Site 113). Photograph Jim Martin.

In the absence of any previous data for the Annex I habitat area, the *Area* parameter for 6510 at the site is assessed to be Favourable. The area was previously surveyed by Nairn *et al.* (1988), but the study focused on recording management data, rather than mapping habitats, from the lower sections of the site nearer to the River Shannon.

The *Structure and functions* are assessed to be Unfavourable-bad as only 50% of the assessment plots passed the forb to graminoid ratio criterion (Table 1). Although the 6510 habitat appears as if it will not be mown this year (the field had not been mown when it was surveyed on the 26th August) mowing has probably taken place within the last few years, as both litter cover and litter depth were low (litter cover of 3% and 5% in the two plots and the minimum litter depth of 1cm recorded in both plots).

Table 1 Results of the 6510 *Structure and functions* criteria assessed at Drumlosh (Site 113).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	100
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	100
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	50
Pass rate for monitoring stops before expert judgement applied	50
Pass rate for monitoring stops after expert judgement applied	50

The pressures on the 6510 habitat and therefore the Future Prospects are considered to be Unfavourable-bad as the negative pressures A06: Abandonment of grassland management (e.g. cessation of grazing or mowing) was recorded for all of the 6510 area (Table 2) due to the fact that the habitat was unlikely to be mown during the current year.

The overall conservation status for the 6510 habitat at the site was assessed to be Unfavourable-bad (Table 3), no trend was assigned as there are no previous data to base a trend on.

Small areas of the Annex I habitat 6430 were also recorded within the site. These areas were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. As for the 6510 habitat, the *Area* parameter for 6430 at the site is assessed to be Favourable in the absence of any previous data for the Annex I habitat. Within the 6430 habitat at the site five positive indicator species; *Sium latifolium, Mentha aquatica, Equisetum fluviatile, Lythrum salicaria* and *Lysimachia vulgaris* were recorded as common within the habitat and on this basis the *Structure and functions* are assessed to be Favourable. The management within one of the fields where the 6430 habitat was recorded was too intensive and although this only represents a small area the *Future prospects* are assessed to by Unfavourable-inadequate (Table 2). Despite the Unfavourable-inadequate assessment it should be noted that 15% of the 6430 habitat was appropriately extensively managed, either as pasture or mowing, and 84% was abandoned with no current management or negative pressure recorded (i.e. the abandonment of grazing and mowing was not considered to be a negative pressure for the 6430 habitat). The overall assessment for the 6430 habitat is Unfavourable-inadequate, no trend was assigned as there are no previous data to base a trend on.

Table 2 *Future prospects* (FP) assessment for the 6430 and 6510 habitats at Drumlosh (Site 113). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6430	Fav	Fav	U-I	Intensive grazing or overgrazing by livestock
6510	Fav	U-B	U-B	Unfavourable S&F (low forb-to-graminoid ratio), abandonment of grassland management

Table 3 Overall assessment for the two target Annex I habitats recorded at Drumlosh (Site 113).

Parameter	6430	6510
Area	Favourable	Favourable
Structure and functions	Favourable	Unfavourable-bad
Future prospects	Unfavourable-inadequate	Unfavourable-bad
Overall assessment	Unfavourable-inadequate	Unfavourable-bad

Site management:

The site at Drumlosh is impacted by agricultural improvements and grazing levels that appeared to be too high within certain areas of the site, with impacts such as poaching noted in places. In contrast some areas of the site are currently abandoned, such as polygon 113_4. On the day of the survey 44% of the floodplain was considered to be managed too intensively, 9% was abandoned or undermanaged, and the remaining 47% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna, the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site would also have been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There is one large maintained double drain in the centre of the site (polygon 113_25) that was constructed to drain water from the cutover bog to the north. There are no significant physical modifications to the floodplain within the surveyed area and there are no levees within the site.

Examples of best practice:

The 7.4 ha of *Phalaris arundinacea* dominated wet meadow that is managed by extensive mowing (polygon 113_38) has been managed as a hay meadow since the site was first surveyed by Nairn *et al.* (1988). Based on the results of the walkover survey this field is managed by annual mowing in August with the hay removed after cutting. There was no evidence that the meadow is aftergrazed, but the field is stock proof and therefore aftergrazing probably takes place in the years when the ground remains dry enough to avoid excessive poaching. In addition to a large area of wet meadow this field also includes a large population of the rare plant *Lathyrus palustris* and an area of the Annex I habitat 6430 beside the River Shannon

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Drumlosh site. Some of the Drumlosh site was previously surveyed by Nairn *et al.* (1988) and Heery (1993), with most of the data recorded

by these surveys relating to management rather than habitats, also these studies focused on recording data from the lower sections of the site nearer to the River Shannon. Nairn *et al.* (1988) recorded cattle, horses, and sheep grazing the site, whereas only cattle were recorded grazing the site in 2021. The area within the site managed as hay meadow appears to have decreased slightly. The large wet meadow (polygon 113_38) recorded in 2021 was also recorded as a hay meadow by Nairn *et al.* (1988), but the adjacent field (polygon 113_15) which was recorded as hay meadow by Nairn *et al.* (1998) is currently a series of intensively grazed cattle paddocks.

3.3 Cappaleitrim, Co. Roscommon (Site No. 114):

Location data: Site centroid (ITM) 599600 730600, EPA subcatchment Shannon[Lower]_SC_020

2021 total area surveyed (ha): 45.09

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	17.11	37.94
GS4	9.17	20.33
PB1	1.21	2.68
PF1	5.40	11.98
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GS1,GS2,GS4,PF1,WN7,WS1	12.21	27.08

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	0.22	0.48
6430	0.28	0.62
7140	0.19	0.41
p6430	1.62	3.60
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned - original management unknown	15.93	35.32
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	4.06	9.00
Extensive pasture - cattle	11.87	26.33
Extensive pasture - horses	9.10	20.18
Extensive pasture - sheep	4.13	9.17

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	A31: Drainage for use as agricultural land (neutral)	Medium	100
6430	None recorded	-	-

2021 EU conservation measures recorded for the three target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100
6430	None recorded	-

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. There are significant areas of reed swamp (FS1) and rich fen and flush (PF1) within the site, in addition to significant areas of semi-natural wet grassland (GS4). The PF1 habitat within the site includes a small area of the Annex I habitat *Molinia* meadows (6410) within polygon 114_42, the species recorded within the Annex I habitat are discussed below as part of the conservation assessment for the habitat. Much of the wet grassland is rushy pasture with extensive tussocks of *Juncus effusus*, other noted species were *Anthoxanthum odoratum, Holcus lanatus, Urtica dioica, Ranunculus repens, Stachys palustris, Succisa pratensis* and *Valeriana officinalis*. One area of the Annex I habitat Hydrophilous tall-herb (6430) was recorded within the site (polygon 114_45) and an area of potential 6430 (polygon 114_10) with *Sium latifolium, Filipendula ulmaria, Lysimachia vulgaris, Lythrum salicaria, Iris pseudacorus, Equisetum fluviatile,* and the rare plant *Lathyrus palustris*, was also recorded. The area was assessed as potential 6430 as the current management of extensive mowing prevented the development of a tall herb structure.

Figure 1 Extensive horse grazing within a *Glyceria maxima*-dominated sward at Cappaleitrim (Site 114). Photograph Orla Daly.

Rare floodplain grassland plant species: The rare plant species *Lathyrus palustris* was recorded within a field (polygon 114_10) dominated by FS1.

Conservation assessment for the Annex I habitats assessed at the site:

The *Area* parameter for 6410 at the site is assessed as Unfavourable-bad, as the 6410 area has decreased from 5.7 ha mapped by Heery & Keane (1999) to only 0.22 ha recorded within polygon 114_42 during this survey, a reduction of -4.4% per annum over the last 22 years. It appears that the field has become more waterlogged overtime, with fen and swamp habitats currently the most abundant habitat types. In the absence of any previous data for the Annex I habitat the *Area* parameter for 6430 at the site is assessed to be Favourable.

No plots were recorded within this site to assess the *Structure and functions* of the target Annex I habitats and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. Within the small area of 6410 two high quality species were recorded, *Cirsium dissectum* and *Galium uliginosum,* and six positive indicator species comprising *Galium palustre*, *Succisa pratensis*, *Juncus acutiflorus, Ranunculus flammula, Filipendula ulmaria,* and *Mentha aquatica*. For the 6430 habitat four positive indicator species *Filipendula ulmaria, Lysimachia vulgaris, Lythrum salicaria* and *Equisetum fluviatile* were recorded. Based on the results of the walkover survey the *Structure and functions* for both habitats is assessed as Favourable.

Although there were no negative pressures recorded for the 6410 habitat on the day of the survey the area of the habitat at the site has significantly decreased over the last 22 years and therefore the *Future prospects* were assessed to be Unfavourable-bad .There were no negative pressures recorded for the 6430 habitat and the *Future prospects* were assessed as Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for the three target Annex I habitats at Cappaleitrim (Site 114). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	U-B	Fav	U-B	A reduction in area over the last 22 years
6430	Fav	Fav	Fav	Positive and negative impacts in balance

Based on the data from the walkover survey the overall assessment for the 6410 habitat (polygon 114_42) is Unfavourable-bad and for 6430 (polygon 114_45) it is Favourable. The trend for 6410 is declining, there are no available data to make an assessment of the trend for the 6430 habitat.

Table 2 Overall assessment for the two target Annex I habitats recorded at Cappaleitrim (Site 114).

Parameter	6410	6430
Area	Unfavourable-bad	Favourable
Structure and functions	Favourable	Favourable
Future prospects	Unfavourable-bad	Favourable
Overall assessment	Unfavourable-bad	Favourable

Site management:

On the day of the survey all of the floodplain was considered to be appropriately managed.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna, the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site would also have been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There are no significant physical modifications to the floodplain within the surveyed area and there are no levees within the site. There are, however, several large drains within the site that were too wide and deep to cross.

Examples of best practice:

This site has good examples of extensively grazed areas of both GS4 (9.17ha) and PF1 (5.4 ha), with cattle, horses and sheep recorded grazing within the floodplain.

Previous studies at the site:

There are no grassland plots from the National Vegetation Database located within the Cappaleitrim site. The majority of the Cappaleitrim site was previously surveyed by Nairn *et al.* (1988), with most of the data recorded relating to management rather than habitats. The area surveyed in 2021 appears to be managed in a similar way (i.e. a combination of cattle, horse and sheep pasture and hay meadow) to how it was when Nairn *et al.* (1988) undertook their survey. However, the area managed as hay meadow has reduced from 10.4 ha surveyed by Nairn *et al.* (1988) to 4.06 ha currently.

3.4 Portrunny Bay, Co. Roscommon (Site No. 218):

Location data: Site centroid (ITM) 595300 761700, EPA subcatchment Hind_SC_010

2021 total area surveyed (ha): 48.32

Ranking: =17th highest scoring site from 2021 field survey. Score of 3.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	0.09	0.20
FS2	1.57	3.25
GA1	0.29	0.59
GS4	42.99	88.97
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GA1,GS1,GS2,GS4,GM1,PF1,PF3,WS1	3.38	7.00

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	0.89	1.84
7140	0.01	0.03
p6510	0.15	0.30
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned - original management unknown	1.84	3.80
Extensive mowing with aftergrazing	0.72	1.49
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	0.38	0.79
Extensive pasture - cattle	20.54	42.50
Extensive pasture - horses	16.55	34.25
Extensive pasture - cattle and sheep	7.88	16.31
Intensive pasture - cattle	0.41	0.85

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	None recorded	-	-

2021 EU conservation measures recorded for the three target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	2.20

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with small areas of agriculturally improved grassland (GA1) recorded within the survey area, especially the more intensively grazed pastures in the west of the site. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. The GS4 habitat within the east of the site, from polygon 218_43 east to 218_47, includes areas with a non-Annex fen meadow community including *Juncus conglomeratus, Hydrocotyle vulgaris, Galium palustre, Carex nigra* and *Carex leporina* (Figure 1). The community is similar to Annex I habitat *Molinia* meadows (6410) and occurs on peaty soil, but no *Molinia caerulea* was found. Further east is another diverse wet grassland community with *Caltha palustris, Galium palustre, Filipendula ulmaria, Mentha aquatica* and *Myosotis* species. Areas of the Annex I habitat Hydrophilous tall-herb (6430) were also recorded in the east of the site (polygons 218_40, 218_49, 218_54) (Figure 2) with species such as *Iris pseudacorus, Epilobium hirsutum, Equisetum fluviatile, Lythrum salicaria, Valeriana officinalis* and *Filipendula ulmaria* common within the habitat. Small areas of drier grassland were recorded; one small area in the west (polygons 218_5, 2189_9, 218_12) that is managed by extensive horse grazing could potentially, if managed by mowing, develop into the Annex I habitat Lowland hay meadows (6510). One complete botanical plot was recorded within the habitat and the plot was analysed using ERICA but was not assigned to an IVC community as the highest affinity to any one community was only 22%. The p6510 plot included *Rhinanthus minor, Juncus acutiflorus, Filipendula ulmaria, Plantago lanceolata* and *Ranunculus acris.*

Figure 1 Rushy pasture (GS4) habitat at Portrunny Bay (Site 218). Photograph Fionnuala O'Neill

Figure 2 Hydrophilous tall-herb (6430) habitat at Portrunny Bay (Site 218). Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

Small areas of the Annex I habitat 6430 were recorded within the east of the site. These areas were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. The *Area* parameter for 6430 at the site is assessed to be Favourable in the absence of any previous data for the Annex I habitat at the site. Within the 6430 habitat at the site, six positive indicator species - *Iris pseudacorus, Epilobium hirsutum, Equisetum fluviatile, Lythrum salicaria, Valeriana officinalis* and *Filipendula ulmaria* – were recorded, and on this basis the *Structure and functions* are assessed to be Favourable. No negative pressures were recorded for the 6430 habitat and the *Future prospects* were therefore also assessed to be Favourable (Table 1). It should be noted that the majority of the 6430 habitat had no current management or negative pressures recorded within it (i.e. the abandonment of grazing and mowing was not considered to be a negative pressure for the 6430 habitat).

Table 1 *Future prospects* (FP) assessment for the three target Annex I habitats at Portrunny Bay (Site 218). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6430	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment for the 6430 habitat is Favourable, no trend was assigned as there are no previous data to base a trend on.

Table 2 Overall assessment for the one target Annex I habitat recorded at Portrunny Bay (Site 218).

Parameter	6430
Area	Favourable

Structure and functions	Favourable
Future prospects	Favourable
Overall assessment	Favourable

Site management:

On the day of the survey 38% of the Portrunny Bay floodplain was considered to be managed too intensively, no areas were considered to be managed too extensively, and the remaining 62% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

Based on the remote imagery, the section of the Hind River that runs through the Portrunny Bay site has become canalised over the years with some 'unnaturally' straight sections. The river has been dredged in the past, but according to local landowners there has been no systematic dredging of this section of the river in recent times. There are no levees within the site.

Examples of best practice:

This site has good examples of extensively grazed areas of GS4, with cattle and horses recorded grazing within the floodplain. The level of horse grazing in the eastern half of the site from polygons 218_53 to 218_39 appeared to be particularly conducive to producing a species-rich wet grassland sward.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Portrunny Bay site and no previous studies of the site could be found. The floodplain grassland site is located immediately to the north of the ISGS site of the same name that was surveyed in 2007.

3.5 Newtown Cashel, Co. Longford (Site No. 996):

Location data: Site centroid (ITM) 604700 755900, EPA subcatchment Shannon[Upper]_SC_090

2021 total area surveyed (ha): 49.79

Ranking: =13th highest scoring site from 2021 field survey. Score of 4/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	10.22	20.53
GS1	0.22	0.45
GS4	27.40	55.02
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GA1,GS1,GS2,GS4,PF1,WS1	11.95	24.00

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	0.04	0.09
6430	0.08	0.15
Secondary habitats	Area (ha)	% of survey area
6210	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	4.72	9.47
Extensive mowing with aftergrazing	4.13	8.29
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	10.77	21.62
Extensive pasture - cattle	18.07	36.29
Intensive mowing with aftergrazing	1.74	3.50
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	0.75	1.51
Intensive pasture - cattle	7.29	14.64
Intensive pasture - cattle and sheep	2.33	4.68

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	L02: Natural succession resulting in species composition change	Medium	100
6430	None	-	-

2021 EU conservation measures recorded for the three target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA05: Adapt mowing, grazing and other equivalent agricultural activities	100
6430	None	-

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site, but there is a significant proportion of the floodplain grassland that is agriculturally improved grassland (GA1). The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. Semi-natural wet grassland (GS4) areas include swards of *Juncus effusus*, *Agrostis stolonifera* and *Potentilla anserina*, as well as more diverse communities with abundant *Juncus acutiflorus, Mentha aquatica, Galium palustre, Myosotis* spp., *Ranunculus* spp. and *Hydrocotyle vulgaris* (Figure 1). The more inundated areas of GS4 (e.g. polygon 996_19) include a plant community of *Glyceria fluitans* and *Agrostis stolonifera*, while along much of the lake edge the wet grassland grades into a reed and large sedge swamp habitat (FS1). Areas of the Annex I habitat Hydrophilous tall-herb (6430) were recorded within the survey area (polygons 996_5, 996_11) with species such as *Iris pseudacorus, Equisetum fluviatile, Lysimachia vulgaris* and *Filipendula ulmaria* common within the habitat. The rich fen (PF1) habitat within the site includes some small areas of the Annex I habitat *Molinia* meadows (6410) within the most southern polygon (polygon 996_20). This large, extensively-grazed polygon has a diverse mix of habitats and species as it also includes a small area of Annex I Calcareous grassland (6210), patches of *Galium boreale* and *Epipactis palustris*, and a population of the rare plant *Betonica officinalis* (20 plants in three to four clumps).

Figure 1 Semi-natural wet grassland habitat (GS4) with *Galium palustre* and *Juncus acutiflorus* at Newtown Cashel (Site 996). Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species: Although not specifically a plant of floodplain grasslands the rare plant *Betonica officinalis* was recorded within the site (Figure 2).

Figure 2 *Betonica officinalis* near the lake edge at Newtown Cashel (Site 996). Photograph Fionnuala O'Neill.

Conservation assessment for the Annex I habitats assessed at the site:

Small areas of the Annex I habitats 6410 and 6430 were recorded in the site. These areas were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present.

The *Area* parameter for 6410 at the site is assessed to be Favourable in the absence of any previous data for the Annex I habitat at the site. Within the 6410 habitat a number of positive indicator species were recorded including the high quality species *Cirsium dissectum* and *Epipactis palustris*. Other indicator species recorded include *Molinia caerulea, Filipendula ulmaria, Carex nigra* and *Juncus acutiflorus*. On this basis the *Structure and functions* are assessed to be Favourable. Negative pressures on the habitat were caused by scrub encroachment. The *Future prospects* were therefore assessed to be Unfavourable-inadequate (Table 1). Current management is by extensive cattle grazing and this should be maintained.

The *Area* parameter for 6430 at the site is assessed to be Favourable in the absence of any previous data for the Annex I habitat at the site. Within the 6430 habitat at the site six positive indicator species – *Iris pseudacorus, Calystegia sepium, Galium palustre, Equisetum fluviatile, Lysimachia vulgaris* and *Filipendula ulmaria* – were recorded and on this basis the *Structure and functions* are assessed to be Favourable. No negative pressures were recorded for the 6430 habitat and the *Future prospects* were therefore also assessed to be Favourable (Table 1). It should be noted that none of the 6430 habitat had current management or negative pressures recorded within it (i.e. the abandonment of grazing and mowing was not considered to be a negative pressure for the 6430 habitat).

Table 1 *Future prospects* (FP) assessment for the target Annex I habitats recorded at Newtown Cashel (Site 996). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	Fav	U-I	Scrub encroachment is a negative pressure
6430	Fav	Fav	Fav	Positive and negative impacts in balance

The overall conservation status for the 6410 habitat is Unfavourable-inadequate and for the 6430 habitat is Favourable. No trends were assigned as there are no previous data to base trends on.

Table 2 Overall assessment for the target Annex I habitats recorded at Newtown Cashel (Site 996).

Parameter	6410	6430
Area	Favourable	Favourable
Structure and functions	Favourable	Favourable
Future prospects	Unfavourable-inadequate	Favourable
Overall assessment	Unfavourable-inadequate	Favourable

Site management:

On the day of the survey 40% of the floodplain at Newtown Cashel was considered to be managed too intensively, 2% was abandoned or undermanaged, and the remaining 58% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

No additional factors were recorded.

Examples of best practice:

Polygon 996_22 is a good example of a well-managed wet meadow. The field has an even and diverse sward. Tractor tracks (several weeks old) were faintly visible in the sward, along with a small number of cattle droppings, indicating that the field is periodically mown, with the hay removed (no uncollected thatch was evident) and probably aftergrazed. The frequency of mowing is unknown but appears to be low, and aftergrazing is evidently very extensive.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Newtown Cashel site and no previous studies of the site could be found. The floodplain grassland site is located immediately to the west of the ISGS site of the same name that was surveyed in 2009.

3.6 Derryoughter East, Co. Kildare (Site No. 1498):

Location data: Site centroid (ITM) 666300 703000, EPA subcatchment Barrow_SC_060

2021 total area surveyed (ha): 93.86

Ranking: =13th highest scoring site from 2021 field survey. Score of 4/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS2	4.57	4.87
GA1	51.63	55.01
GM1	1.32	1.40
GS2	6.83	7.28
GS4	22.91	24.40
Secondary habitats	Area (ha)	% of survey area
ED2,FS1,FS2,GA1,GM1,GS2,GS4,WS1	6.61	7.04

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	0.44	0.47
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned mowing	7.04	7.50
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	22.14	23.59
Extensive pasture - cattle	6.94	7.40
Extensive pasture - horses	4.59	4.89
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	11.30	12.04
Intensive pasture - cattle	41.85	44.59

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	None recorded	-	-

2021 EU conservation measures recorded for the three target Annex I habitats:

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This floodplain grassland site is located within an agriculturally improved landscape and the majority of the floodplain grassland recorded within the survey area was agriculturally improved (GA1) (Figure 1). The semi-natural grassland within the site included areas of freshwater marsh (GM1) and wet grassland (GS4), with some drier areas of meadow mapped as dry meadows and grassy verges (GS2). The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. A small area of the GS4 habitat corresponded to the Annex I habitat *Molinia* meadows (6410) and this area (polygon 1498_20a) was assessed in detail (see below). *Deschampsia cespitosa* and *Festuca arundinacea* tussocks are frequent within some GS4 areas (polygon 1498_20g) with tall *Filipendula ulmaria* plants also common. There are also GS4 areas, such as polygon 1498_20g, where *Ranunculus repens* is abundant (Figure 2). A notable feature of the site is that *Thalictrum flavum* is very common within some areas of GS4 (polygons 1498_20d, 1498_20f). Five individuals of the highly invasive non-native species *Heracleum mantegazzianum* were recorded beside the river within polygon 1498_27a, and many more individuals were noted across the river on the southern bank.

Figure 1 Improved agricultural floodplain grassland (GA1) at Derryoughter East (Site 1498). The field had just been cut when the site was first visited at the start of June. Photograph Jim Martin.

Figure 2 Semi-natural wet grassland (GS4) habitat with abundant *Ranunculus repens* at Derryoughter East (Site 1498). Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6410 habitat within the site (Figure 3) was assessed using four assessment plots. One of the plots was a complete botanical plot that was analysed using ERICA and assigned to the *Festuca rubra – Lotus corniculatus* GL3F IVC community; this is a drier grassland community that would rarely correspond to the 6410 habitat. It could be argued that the 6410 habitat within this small meadow is transitional to a drier Annex I habitat, such as Lowland hay meadows (6510), and there were indicators for this drier Annex I habitat recorded within the plot, such as *Lathyrus pratensis, Plantago lanceolata* and *Ranunculus acris*.

Figure 3 *Molinia* meadows (6410) habitat at Derryoughter East (Site 1498). Photograph Jim Martin.

The *Area* parameter for 6410 at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site.

Thalictrum flavum was used as a local positive indicator species for the assessment of the *Structure and functions* of 6410 at this site. The *Structure and functions* are assessed to be Unfavourable-bad as none of the assessment plots passed the positive indicator species criterion (Table 1). Although all plots passed the high-quality positive indicator species criterion due to the presence of *Cirsium dissectum*, the total number of positive indicator species was always less than the threshold of seven, ranging from five to six; the total number of positive indicator species across the whole 6410 area was seven. The failure of this criterion is partially due to the low species diversity within the 6410 community, with only 14 plant species recorded within the full botanical plot. It is unclear why the plant species diversity is so low but such a situation could arise if the field was rank and abandoned until recently and annual mowing was only resumed in the last few years.

Table 1 Results of the 6410 *Structure and functions* criteria assessed at Derryoughter East (Site 1498).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	0
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	100
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	100
Pass rate for monitoring stops before expert judgement applied	0
Pass rate for monitoring stops after expert judgement applied	0

No negative impacts were recorded for the 6410 habitat, but the *Future prospects* are judged to be Unfavourable-bad due to the lack of positive indicator species. No trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 2 *Future prospects* (FP) assessment for 6410 at Derryoughter East (Site 1498). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	**FP of Area**	**FP of S&F**	**FP of site**	**Rationale**
6410	Fav	U-B	U-B	Unfavourable S&F (not enough positive species)

The overall assessment is Unfavourable-bad, No trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 3 Overall assessment for the 6410 habitat at Derryoughter East (Site 1498).

Parameter	Conservation status
Area	Favourable
Structure and functions	Unfavourable-bad
Future prospects	Unfavourable-bad
Overall assessment	Unfavourable-bad

Site management:

The site at Derryoughter East is significantly impacted by agricultural improvement and on the day of the survey 60% of the floodplain was considered to be managed too intensively, 14% was abandoned or undermanaged, and only 26% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

Based on the remote imagery and the results of the walkover survey, the section of the Tully Stream that runs along the southern border of the site has become canalised over the years with some 'unnaturally' straight sections, particularly at the western end of the site. At the western end of the site the river appears to have been dredged in the past and there are maintained levees along the southern border of the site.

Examples of best practice:

No examples of best practice management were recorded on the site.

Previous studies at the site:

There are four floodplain grassland plots from the National Vegetation Database located within the Derryoughter East site, all four having been recorded in the western section of the site during the ISGS (O'Neill *et al.* 2013) When this section of the site was surveyed by the ISGS in 2010, 2.3 ha of the Annex I habitat Hydrophilous tall-herb (6430) was recorded within polygon 1498_30. During the current survey GS4 was the main habitat recorded within this polygon and the field was managed by extensive mowing. It is probable that the management of this area has changed since 2010, with either extensive grazing or a period of abandonment in the past having allowed the tall herb community recorded during the ISGS to develop.

3.7 Cloonmacduff, Co. Sligo (Site No. 1541):

Location data: Site centroid (ITM) 570100 826900, EPA subcatchment Owenmore[Sligo]_SC_030

2021 total area surveyed (ha): 43.47

Ranking: 12th highest scoring site from 2021 field survey. Score of 4.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	3.46	7.95
GS1	0.23	0.54
GS4	34.11	78.46
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GA1,GS1,GS2,GS4,PF1,WS1	5.67	13.05

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	0.69	1.58
p6410	1.10	2.52
p6510	0.23	0.54
Secondary habitats	Area (ha)	% of survey area
6410,6430	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	9.07	20.86
Abandoned - original management unknown	0.42	0.98
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	8.38	19.28
Extensive pasture - cattle	14.32	32.94
Extensive pasture - sheep	4.51	10.37
Intensive pasture - cattle	3.28	7.54
Intensive pasture - sheep	3.49	8.03

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	A06: Abandonment of grassland management (negative)	High	52.9
6410	A10: Undergrazing by livestock (negative)	High	18.5
6410	A31: Drainage for use as agricultural land (neutral)	Medium	28.6

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	28.6
6410	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	52.9
6410	CA05: Adapt mowing, grazing and other equivalent agricultural activities	18.5

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with the only significant areas of agriculturally improved grassland (GA1) recorded within the centre of the survey area (polygons 1541_17, 1541_24, 1541_30). The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. The GS4 habitat within the site includes significant areas of the Annex I habitat *Molinia* meadows (6410) that were assessed in detail (see below). There was also one field (polygon 1541_33) of potential 6410 habitat recorded, the area was judged to be p6410 due to the lack of a high quality species such as *Cirsium dissectum*; it should be noted that a thorough search of the field was not possible due to the excitable cattle that were grazing the field at the time. The semi-natural wet grassland (GS4) surveyed included more inundated communities on the lower ground nearer to the River Unshin with common species including *Glyceria fluitans, Juncus effusus, Agrostis stolonifera, Caltha palustris, Filipendula ulmaria, Iris pseudacorus, Ranunculus repens, Senecio aquaticus* and *Cardamine pratensis*. In areas that were abandoned, or had lower levels of grazing, a tussocky *Festuca arundinacea* wet grassland habitat was observed. Reed and large sedge swamp (FS1) was dominant within an abandoned area in the north of the site (polygon 1541_43). The Annex I habitat Hydrophilous tall-herb (6430) was recorded within one field (polygon 1541_35) (Figure 1) with the indicator species *Equisetum fluviatile, Filipendula ulmaria, Lythrum salicaria* and *Phalaris arundinacea* noted. Small areas of drier grassland were recorded within the site, one small area (polygon 1541_35) that is currently abandoned corresponds to potential Annex I habitat Lowland hay meadows (p6510) (Figure 2).

Figure 1 A mosaic of wet grassland (GS4) and tall herb (FS2) habitats at Cloonmacduff (Site 1541). Some of these areas correspond to the Annex I habitats *Molinia* meadows (6410) and Hydrophilous tall-herb (6430). Photograph Orla Daly.

Figure 2 Potential Lowland hay meadows (p6510) habitat at Cloonmacduff (Site 1541). Photograph Orla Daly.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The areas of the target Annex I habitats on this site were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. The *Area* parameter for 6410 at the site, which is located within polygons 1541_12, 1541_13, 1541_15, 1541_26 and 1541_35, is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. The *Area* parameter for 6430 (polygon 1541_35) is also assessed as Favourable in the absence of any previous data for the Annex I habitat at the site.

Figure 3 Undergrazed *Molinia* meadows (6410) habitat at Cloonmacduff (Site 1541). Photograph Jim Martin.

Within the 6410 habitat at the site the eleven positive indicator species were recorded, the three high quality species, *Cirsium dissectum, Crepis paludosa* and *Juncus conglomeratus*, and eight positive indicator species, *Carex panicea, Molinia caerulea, Filipendula ulmaria, Equisetum palustre, Galium palustre, Succisa pratensis, Carex flacca* and *Mentha aquatic*. Although the positive indicator criteria for the habitat passes the threshold of seven species, large areas of the 6410 habitat in the north of the site is rank with a high cover of litter and on this basis the *Structure and functions* for 6410 habitat is assessed to be Unfavourable-bad.

The four positive indicator species *Equisetum fluviatile, Filipendula ulmaria, Lythrum salicaria* and *Phalaris arundinacea* were recorded within the 6430 habitat and on this basis the *Structure and functions* are assessed to be Favourable for this habitat.

The negative pressures of both abandonment and undergrazing are impacting 81.5% of the area of the 6410 habitat. These negative pressures in combination with the Unfavourable-bad *Structure and functions* result in Unfavourable-bad *Future prospects* for the 6410 habitat (Table 1). No negative pressures were recorded for the 6430 habitat and the *Future prospects* were therefore also assessed to be Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for the target Annex I habitats at Cloonmacduff (Site 1541). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	U-B	U-B	Unfavourable S&F (high litter cover), negative pressures of abandonment and undergrazing
6430	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment for the 6410 habitat is Unfavourable-bad and for 6430 it is Favourable. No trend was assigned for either of the target Annex I habitats due to the absence of any previous data for the habitats at the site.

Table 2 Overall assessment for the target Annex I habitats at Cloonmacduff (Site 1541).

Parameter	6410	6430
Area	Favourable	Favourable
Structure and functions	Unfavourable-bad	Favourable
Future prospects	Unfavourable-bad	Favourable
Overall assessment	Unfavourable-bad	Favourable

Site management:

On the day of the survey 16% of the floodplain was considered to be managed too intensively, 32% was abandoned or undermanaged, and the remaining 52% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

There is a network of well-maintained drains within the centre and south of the site, but in the north of the site (e.g. polygon 1541_43) this network of drains have been abandoned.

Examples of best practice:

No examples of best practice management were recorded on the site.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Cloonmacduff site. The site is adjacent to the ISGS site with the same name which was most recently monitored in 2017 (Martin *et al.* 2018).

3.8 Sraheen, Co. Mayo (Site No. 1730):

Location data: Site centroid (ITM) 526600 808300, EPA subcatchment Moy_SC_100

2021 total area surveyed (ha): 64.53

Ranking: =13th highest scoring site from 2021 field survey. Score of 4/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	9.90	15.34
GA2	1.40	2.17
GS1	5.37	8.32
GS2	20.09	31.14
GS4	11.44	17.72
WS1	2.05	2.05
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GA1,GS1,GS2,GS4,HD1,WN2,WN6,WS1	14.29	22.15

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6510	0.79	1.23
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned mowing	1.75	2.71
Abandoned - original management unknown	2.36	3.66
Extensive mowing with aftergrazing	2.90	4.49
Extensive mowing with no aftergrazing	20.95	32.47
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	2.97	4.60
Extensive pasture - cattle	12.81	19.86
Intensive mowing with aftergrazing	0.90	1.40
Intensive mowing with no aftergrazing	10.29	15.94
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	3.94	6.11
Intensive pasture - cattle	4.26	6.60

2021 EU pressures recorded for the target Annex I habitats:

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6510	A06: Abandonment of grassland management (negative)	Medium	12.0
6510	A13: Reseeding of grasslands and other semi-natural habitats	High	36.9
6510	A19: Application of natural fertilisers on agricultural land	High	49.6

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	1.5
6510	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	12
6510	CA05: Adapt mowing, grazing and other equivalent agricultural activities	36.9
6510	CA09: Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production	49.6

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with significant areas of agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife including the rare plant *Sanguisorba officinalis*. Dry meadows and grassy verges (GS2) managed by mowing is the most common habitat within this site and a botanical plot was recorded within this habitat. The GS2 habitat at the site is characterised by a high cover of *Alopecurus pratensis, Holcus lanatus, Carex disticha* and *Persicaria amphibia*; other notable species are *Glyceria fluitans, Festuca rubra* and *Lolium perenne*. The broadleaf herb cover in the plot was relatively low at 25%. This plot was analysed using ERICA but was not assigned to a community as the highest affinity to an IVC community was only 28% (plots are only assigned when there is at least a 50% affinity). The Annex I habitat Lowland hay meadows (6510) was located within five areas of the site (polygons 1730_18, 1730_26, 1730_44, 1730_47, and 1730_48a). The high-quality indicator species *Sanguisorba officinalis, Rhinanthus minor* and *Lotus corniculatus* were recorded within the 6510 habitat, together with four positive indicator species: *Alopecurus pratensis, Filipendula ulmaria, Plantago lanceolata* and *Ranunculus acris*. Semi-natural wet grassland (GS4) is common at this site, characterised by rush species such as *Juncus acutiflorus* and *Juncus effusus* and sedges such as *Carex leporina.*

Figure 1 Dry meadows and grassy verges (GS2) managed by mowing at Sraheen (Site 1730). Photograph Jim Martin.

Figure 2 *Sanguisorba officinalis* within the verge of a meadow at Sraheen (Site 1730). Photograph Jim Martin.

Rare floodplain grassland plant species: The rare plant species *Sanguisorba officinalis* (Figure 2) was noted within six fields throughout the site. Approximately 150 individuals were located and the species was always found in the verges of mown fields or areas that had been recently abandoned.

Conservation assessment for the Annex I habitats assessed at the site:

The areas of 6510 habitat within this site were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. The *Area* parameter for 6510 at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site.

Within the 6510 habitat at the site the three high-quality indicator species *Sanguisorba officinalis, Rhinanthus minor* and *Lotus corniculatus* were recorded, together with four positive indicator species: *Alopecurus pratensis, Filipendula ulmaria, Plantago lanceolata* and *Ranunculus acris*. Although the 6510 habitat passed the threshold of seven positive indicator species, within one field (1730_44) the 6510 habitat was rank and failed the litter criterion with a litter depth of 10cm. In the absence of additional data on which to base the assessment, the *Structure and functions* are assessed to be Unfavourable-Inadequate as the area of 6510 that fails the litter criterion represents 1-25% of the total habitat area.

The negative pressures of abandonment, reseeding and the application of natural fertilisers (slurry) are impacting 98.5% of the area of the 6510 habitat. These pressures together with Unfavourable *Structure and functions* result in an Unfavourable-bad *Future prospects* for the 6510 habitat (Table 1).

Table 1 *Future prospects* (FP) assessment for the 6510 habitat at Sraheen (Site 1730). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6510	Fav	U-I	U-B	Unfavourable S&F (high litter cover), abandonment, reseeding and the application of natural fertilisers

The overall assessment for the 6510 habitat is Unfavourable-bad, no trend was assigned due to the absence of any previous data for the habitat at the site.

Table 2 Overall assessment for the 6510 habitat at Sraheen (Site 1730).

Parameter	Conservation status
Area	Favourable
Structure and functions	Unfavourable-inadequate
Future prospects	Unfavourable-bad
Overall assessment	Unfavourable-bad

Site management:

On the day of the survey 36% of the floodplain was considered to be managed too intensively, 8% was abandoned or undermanaged, and the remaining 54% of the survey area was considered to be appropriately managed. The management of a small area of the floodplain site was not assessed as it is within a private garden.

Other factors impacting the site:

The River Moy and many of its larger tributaries were dredged during the 1960s as part of a major arterial drainage scheme that continues to impact the ecology and hydrology of the River Moy and its floodplain (McGarrigle *et al.*, 1998; O'Connor 2004). The impact of the scheme on the River Moy can still be observed, with much of the river having modified raised banks, where the dredged material was deposited, and a trapezoidal-shaped river channel. As reported by McGarrigle *et al.* (1998), the channel of the River Moy was deepened rather than widened and the number of natural meanders removed during the works were insignificant.

Examples of best practice:

The verges along the edges of many of the meadows appear to be cut less frequently and receive less fertiliser (i.e. slurry) than the rest of the field and therefore provide a refuge for broadleaf herb species such as the rare floodplain species *Sanguisorba officinalis*. Ideally, the management of these verges would be regularised through a local results-based agri-environment scheme that would encourage wider verges that receive no slurry and are only cut once a year when the second cut of the meadow is taken.

Previous studies at the site:

There are two floodplain grassland plots from the National Vegetation Database located within the Sraheen site. Both plots were recorded by the ISGS (O'Neill *et al.* 2013) and the southern half of the current Sraheen site overlaps with most of the original ISGS site. The data recorded by the ISGS in 2011 indicate that there were small areas (0.16 ha) of the Annex I habitat Hydrophilous tall-herb (6430) within polygon 1730_8a. Although the current survey did record the corresponding Fossitt habitat Tall herb swamp (FS2) no examples of the 6430 habitat were located. Agricultural improvement may have taken place within this region of the site between 2011 and 2021; the ISGS recorded a semi-natural GS2 plot with no *Lolium perenne* present within polygon 1730_22 in 2011, but in 2021 the field was recorded as 100% GA1 with a recent slurry application and a high cover of *Lolium perenne* noted.

3.9 Foxford, Co. Mayo (Site No. 1732):

Location data: Site centroid (ITM) 527100 805600, EPA subcatchment Moy_SC_090

2021 total area surveyed (ha): 45.46

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
BL3	0.69	1.51
GA1	5.91	13.01
GA2	3.97	8.73
GS1	1.48	3.25
GS2	26.79	58.94
GS4	1.12	2.46
Secondary habitats	Area (ha)	% of survey area
BL3,FS1,FS2,GA1,GS1,GS2,GS4,WN6	5.50	12.11

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	<0.01	0.00
6510	0.26	0.57
p6510	2.55	5.61
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing with aftergrazing	15.95	35.09
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	4.20	9.24
Extensive pasture - cattle	1.74	3.84
Intensive mowing with aftergrazing	5.93	13.04
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	11.52	25.34
Intensive pasture - cattle	0.71	1.57

2021 EU pressures recorded for the target Annex I habitats:

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	None recorded	-	-
6510	A19: Application of natural fertilisers on agricultural land	High	100

2021 EU conservation measures recorded for the target Annex I habitats:

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100
6510	CA09: Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with areas of agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife, including the rare plant *Sanguisorba officinalis*. Dry meadows and grassy verges (GS2) managed by mowing are the most common habitat within this site and small areas of this habitat correspond to the Annex I habitat Lowland hay meadows (6510). The 6510 habitat was recorded within five fields (1732_5, 1732_7, 1732_31, 1732_40, 1732_44) and two plots were recorded to assess the *Structure and functions* of the habitat (discussed below). One field of potential 6510 habitat, with positive indicator species recorded and managed by mowing, was recorded within polygon 1732_36. This field was judged to be p6510 due to the lack of a high quality species such as *Leucanthemum vulgare.* The non-Annex GS2 meadows within this site are often dominated by *Holcus lanatus*, with *Alopecurus pratensis* and *Ranunculus acris* also frequent. Where areas of wet grassland (GS4) become frequently inundated *Agrostis stolonifera* and/or *Alopecurus geniculatus* can often dominate. One small area of the Annex I habitat Hydrophilous tall-herb (6430) was recorded in the north of the site (polygon 1732_6) with *Filipendula ulmaria* and *Epilobium hirsutum* common within the habitat. The highly invasive alien species American mink was observed in the south of the site (polygon 1732_1) preying on chicks in nearby Sand martin burrows.

Figure 1 Lowland hay meadows (6510) at Foxford (Site 1732). Photograph Jim Martin

Rare floodplain grassland plant species: A small number of individuals (<10 plants) of the rare plant species *Sanguisorba officinalis* were recorded within a meadow at the centre of the site (polygon 1732_44).

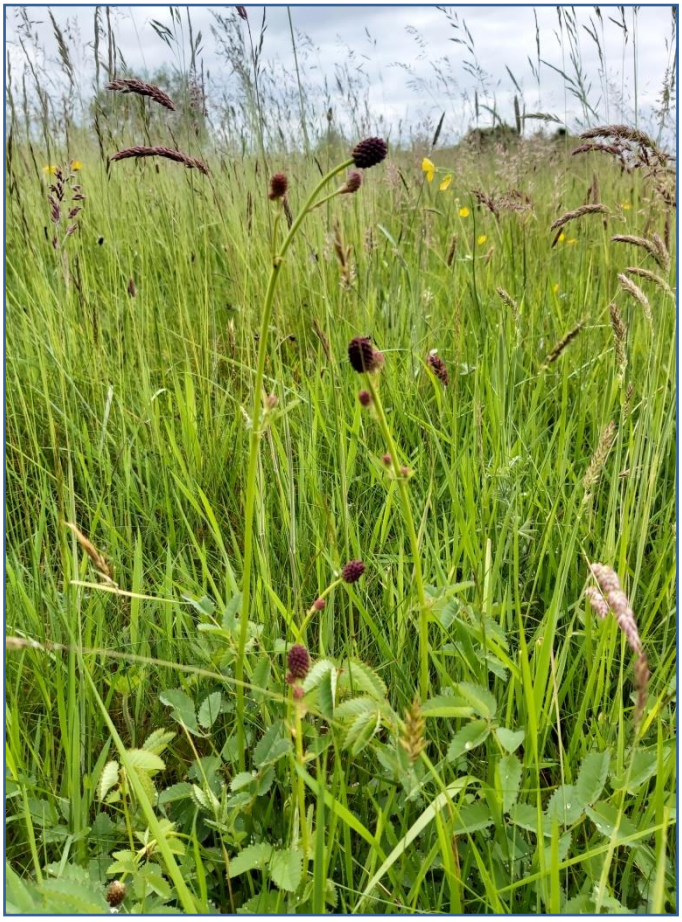

Figure 2 *Sanguisorba officinalis* in Lowland hay meadows (6510) habitat at Foxford (Site 1732). Photograph by Fionnuala O'Neill.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6510 habitat within the site (Figure 1) was assessed using two assessment plots. One of the plots was a complete botanical plot that was analysed using ERICA and assigned to the *Festuca rubra – Plantago lanceolata* GL3C IVC community.

The *Area* parameter for the 6510 habitat at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. No assessment was undertaken for the 6430 habitat at the site as it covered an area of less than 100 m².

Table 1 Results of the 6510 *Structure and functions* criteria assessed at Foxford (Site 1732).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	100
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	100
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	100
Pass rate for monitoring stops before expert judgement applied	100
Pass rate for monitoring stops after expert judgement applied	100

The *Structure and functions* parameter for the 6510 habitat was assessed as Favourable as both stops passed all of the assessment criteria.

The negative pressure of the application of natural fertilisers (e.g. slurry) was recorded for all of the 6510 habitat, resulting in an assessment of Unfavourable-bad for the *Future prospects* parameter.

Table 2 *Future prospects* (FP) assessment for 6510 at Foxford (Site 1732). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6510	Fav	Fav	U-B	The application of natural fertilisers

The overall assessment is Unfavourable-bad. No trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 3 Overall assessment for the 6510 habitat at Foxford (Site 1732).

Parameter	Conservation status
Area	Favourable
Structure and functions	Favourable
Future prospects	Unfavourable-bad
Overall assessment	Unfavourable-bad

Site management:

On the day of the survey 62% of the floodplain was considered to be managed too intensively, none of the site was abandoned or undermanaged, and 26% of the survey area was considered to be appropriately managed. The remaining 12% of the floodplain site was either GAA pitches or a waste water treatment plant and was not assessed.

Other factors impacting the site:

The River Moy and many of its larger tributaries were dredged during the 1960s as part of a major arterial drainage scheme that continues to impact the ecology and hydrology of the River Moy and its floodplain (McGarrigle *et al.*, 1998; O'Connor 2004). The impact of the scheme on the River Moy can still be observed, with much of the river having modified raised banks, where the dredged material was deposited, and a trapezoidal-shaped river channel. As reported by McGarrigle *et al.* (1998), the channel of the River Moy was deepened rather than widened and the number of natural meanders removed during the works were insignificant.

Examples of best practice:

Although areas of 6510 meadow were recorded within the site, due to the spreading of slurry within the meadows they are not a good example of best practice.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Foxford site. The floodplain grassland site is located immediately adjacent to the ISGS site of the same name that was surveyed in 2011.

3.10 Pollagh (Mayo), Co. Mayo (Site No. 1736):

Location data: Site centroid (ITM) 525400 801900, EPA subcatchment Moy_SC_080

2021 total area surveyed (ha): 51.54

Ranking: =21st highest scoring site from 2021 field survey. Score of 3/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	25.59	49.64
GS1	4.60	8.93
GS2	6.70	12.99
GS4	8.46	16.41
Secondary habitats	Area (ha)	% of survey area
ED2,ED3,FS1,FS2,GA1,GS1,GS2,GS4,PF1,PF3,WN5,WS1	6.20	12.02

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6510	0.09	0.17
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing with aftergrazing	11.08	21.50
Extensive pasture - cattle	10.17	19.72
Intensive mowing with aftergrazing	21.92	42.52
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	5.67	11.01
Intensive pasture - cattle	2.70	5.24

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6510	A19: Application of natural fertilisers on agricultural land (negative)	High	35.8

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	64.2
6510	CA09: Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production	35.8

Description of the grassland, swamp and fen meadow habitats surveyed:

Agriculturally improved grassland (GA1) was the most common floodplain grassland type recorded within the survey area, with an intensive mowing regime the most common management recorded. Of the semi-natural grassland habitats surveyed drier grassland habitats (GS1 and GS2) were more common than wet grassland (GS4). All areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. Dry meadows and grassy verges (GS2) managed by mowing is the most common of the drier grassland habitats within this site and a botanical plot was recorded within this habitat (Figure 1). The GS2 habitat at the site is characterised by a high cover of *Alopecurus pratensis, Holcus lanatus, and Lolium perenne,* the broadleaf herb cover in the plot was low at 7% with *Trifolium repens* and *Ranunculus acris* accounting for almost all of this. This plot was analysed using ERICA and had a high affinity (89%) with the *Holcus lanatus - Lolium perenne* (GL2C) IVC community, indicating that the GS2 habitat is agriculturally improved. Small areas of the Annex I habitat Lowland hay meadows (6510) were located within three fields (polygons 1736_20, 1736_26, 1736_32) with the high-quality indicator species *Rhinanthus minor*, *Leucanthemum vulgare*, and *Lotus corniculatus* recorded within the 6510 habitat, together with the positive indicator species *Alopecurus pratensis, Filipendula ulmaria, Plantago lanceolata*, *Ranunculus acris,* and *Trifolium pratense.* The GS4 habitat within the site is characterised by a high cover of *Juncus effusus* and *Agrostis stolonifera*, with *Alopecurus geniculatus* frequent in more waterlogged areas.

Figure 1 Dry meadows and grassy verges (GS2) habitat at Pollagh (Mayo) (Site 1736). The GS2 habitat corresponds to the IVC community *Holcus lanatus - Lolium perenne* (GL2C). Photograph Jim Martin.

Figure 2 Area of meadow with some of the positive indicator species for the Annex I habitat Lowland hay meadows (6510) at Pollagh (Mayo) (Site 1736). Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The areas of 6510 habitat within this site were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. The *Area* parameter for 6510 at the site is assessed to be Favourable, with no areas of Annex I habitat recorded when similar areas were surveyed during the ISGS (O'Neill *et al.* 2013). As the areas of 6510 habitat recorded during the current survey are small (0.09 ha) it is difficult to assess if they have developed during the intervening 10 years, or if they were just missed during the baseline survey.

Within the 6510 habitat at the site the three high-quality indicator species *Rhinanthus minor, Leucanthemum vulgare* and *Lotus corniculatus* were recorded, together with five positive indicator species: *Alopecurus pratensis, Filipendula ulmaria, Plantago lanceolata, Ranunculus acris* and *Trifolium pratense*. Although the 6510 habitat passed the threshold of seven positive indicator species the habitat failed the negative species criterion, with both *Lolium perenne* and *Trifolium repens* common and often with an individual cover >10%. In the absence of additional data on which to base the assessment, the *Structure and functions* are assessed to be Unfavourable-bad as the area of 6510 that fails the negative species criterion represents >25% of the total habitat area.

The negative pressure of the application of natural fertilisers (slurry) is impacting 35.8% of the area of the 6510 habitat. This pressure together with Unfavourable *Structure and functions* results in an Unfavourable-bad *Future prospects* for the 6510 habitat (Table 1).

Table 1 *Future prospects* (FP) assessment for the 6510 habitat at Pollagh (Mayo) (Site 1736). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6510	Fav	U-B	U-B	Unfavourable S&F (high cover of negative indicator species) and the application of natural fertilisers

The overall assessment for the 6510 habitat is Unfavourable-bad, no trend was assigned due to the absence of any previous data for the 6510 habitat at the site.

Table 2 Overall assessment for the 6510 habitat at Pollagh (Mayo) (Site 1736).

Parameter	Conservation status
Area	Favourable
Structure and functions	Unfavourable-bad
Future prospects	Unfavourable-bad
Overall assessment	Unfavourable-bad

Site management:

On the day of the survey 68.5% of the floodplain was considered to be managed too intensively, 2.8% was abandoned or undermanaged, and the remaining 28.7% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

The River Moy and many of its larger tributaries were dredged during the 1960s as part of a major arterial drainage scheme that continues to impact the ecology and hydrology of the River Moy and its floodplain (McGarrigle et al, 1998; O'Connor 2004). The impact of the scheme on the River Moy can still be observed with much of the river having modified raised banks, where the dredged material was deposited, and a trapezoidal shaped river channel. As reported by McGarrigle *et al.* (1998) the channel of the River Moy was deepened rather than widened and the number of natural meanders removed during the works were insignificant.

Examples of best practice:

Much of this site is too intensively managed for there to be examples of best practice for the management of semi-natural grassland habitats.

Previous studies at the site:

There are three floodplain grassland plots from the National Vegetation Database located within the Pollagh (Mayo) site, and all three were recorded in 2011 as part of the ISGS (O'Neill *et al.* (2013). One of the ISGS plots corresponds to the IVC community *Festuca rubra - Rhinanthus minor* (GL3E), one within an area of wet grassland corresponds to the IVC community *Juncus effusus - Rumex Acetosa* (GL2D), and the third plot was intermediate between different IVC communities with the highest affinity to the GL3E community. The grassland habitats within the Pollagh (Mayo) site appear to have changed little over the last ten years. Interestingly, it appears as if some fields, such as polygon 1736_16, are sometimes managed by cattle grazing (as was the case in 2021) and at other times managed by mowing (as was the case in 2011). Most of the differences between the ISGS habitat map and the current survey appear to be due to interpretation, for example polygon 1736_34 is mapped as GS4 during the current survey and semi-improved GS4 by the ISGS, and polygons 1736_18, and 1736_25 are mapped as mown GS4 during the current survey and GS2 during the ISGS. Large areas of the 2021 site are improved agricultural grassland and were not surveyed in 2011 as the ISGS focused on areas of semi-natural grassland.

3.11 Barnadarrig (Shanahoe marsh), Co. Laois (Site No. 2606):

Location data: Site centroid (ITM) 640100 688700, EPA subcatchment Nore_SC_040

2021 total area surveyed (ha): 53.08

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS2	5.67	10.69
GM1	3.38	6.37
GS4	20.80	39.18
PF1	11.62	21.90
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GS1,GS2,GS4,PF1,PF3,WS1	11.60	21.86

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	2.91	5.48
6510	3.06	5.77
Secondary habitats	Area (ha)	% of survey area
7140	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	13.94	26.26
Extensive mowing with aftergrazing	27.70	52.18
Extensive pasture - cattle	11.44	21.56

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	A06: Abandonment of grassland management (negative)	Medium	100.0
6510	F07: Sports, tourism and leisure activities (neutral)	Low	63.3

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	100.0
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife, including rare plants and wetland birds. The semi-natural wet grassland (GS4) habitat is the most common within the site, with common broadleaf herb species within the habitat including *Caltha palustris, Ranunculus repens* and *Galium palustre*. The GS4 habitat forms mosaics with rich fen and flush habitat (PF1) (Figure 1), the PF1 habitat at the site is defined by a higher cover of sedges, such as *Carex nigra*, and a reduction in the cover of grasses and broadleaf herb species. There are also three areas of transition mire (PF3), dominated by the sedge species *Carex rostrata* and *Carex vesicaria,* within the site. In the northeast of the site there are extensive areas of tall-herb swamp (FS2) and freshwater marsh (GM1), some of which corresponds to the Annex I habitat Hydrophilous tall-herb (6430) (Figure 2), with species such as *Iris pseudacorus, Epilobium hirsutum, Lythrum salicaria*, *Filipendula ulmaria*, and *Valerian officinale* common within the habitat. Small areas of drier grassland were recorded within the site and two areas (southern end of polygon 2606_15 and southern end of 2606_37) managed by annual mowing correspond to the Annex I habitat Lowland hay meadows (6510). The high quality species *Orchis morio* and *Lotus corniculatus* were recorded within the 6510 habitat, along with the positive indicator species *Centaurea nigra*, *Hypochaeris radicata*, *Plantago lanceolata* and *Trifolium pratense* (Figure 3). The *Orchis morio* population covered approximately 40 x 25 m and 352 flowering spikes were counted on the day of the site visit.

Figure 1 Mosaic of rich fen and flush (PF1) and semi-natural wet grassland (GS4) managed by mowing with aftergrazing at Barnadarrig (Shanahoe marsh) (Site 2606). Photograph Fionnuala O'Neill.

Figure 2 Hydrophilous tall-herb (6430) habitat at Barnadarrig (Shanahoe marsh) (Site 2606). Photograph Jim Martin.

Figure 3 Annex I Lowland hay meadows (6510) habitat with *Orchis morio* at Barnadarrig (Shanahoe marsh) (Site 2606). Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species: No rare floodplain species were recorded at this site but a population of the rare plant species *Orchis morio* (352 flowering spike were recorded on the day of the survey) was recorded within an area of the Annex I habitat 6510.

Conservation assessment for the Annex I habitats assessed at the site:

The areas of 6430 and 6510 habitat within this site were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded

on habitat condition or species present. In the absence of any previous data to assess the *Area* parameter for 6430 (polygons 2606_27a, 2606_27b, 2606_28) and 6510 (polygons 2606_15 and 2606_37) they are both assessed as Favourable.

With the five positive indicator species *Iris pseudacorus, Epilobium hirsutum, Lythrum salicaria*, *Filipendula ulmaria*, and *Valerian officinale* common within the 6430 habitat the *Structure and functions* parameter for this habitat is assessed as Favourable. Within the 6510 habitat at the site the two high-quality indicator species *Orchis morio* and *Lotus corniculatus* were recorded, together with five positive indicator species that included *Centaurea nigra*, *Hypochaeris radicata*, *Plantago lanceolata* and *Trifolium pratense.* Based on the data collected during the walkover survey the 6510 habitat is judged to have passed all *Structure and functions* criteria and the parameter is assessed as Favourable.

The negative pressure A06: abandonment of grassland management, was noted within all three polygons where the 6430 habitat was recorded and therefore the *Future prospects* are assessed as Unfavourable-bad. Abandonment of management is often not a negative impact for the 6430 habitat, particularly in areas on the edge of rivers and lakes that are frequently inundated. However, the 6430 habitat at this site is slightly higher up and floodplain and appears to be vulnerable to the negative consequences of abandonment such as succession to woodland. No pressures were recorded within the two polygons where the 6510 habitat was recorded and the *Future prospects* are therefore assessed as Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for the two target Annex I habitats at Barnadarrig (Shanahoe marsh) (Site 2606). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6430	Fav	Fav	U-B	Abandonment of management
6510	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessments for the two target Annex I habitats are shown in Table 2, no trends were assigned as there are no previous data to base trends on.

Table 2 Overall assessment for the two target Annex I habitats recorded at Barnadarrig (Shanahoe marsh) (Site 2606).

Parameter	6430	6510
Area	Favourable	Favourable
Structure and functions	Favourable	Favourable
Future prospects	Unfavourable-bad	Favourable
Overall assessment	Unfavourable-bad	Favourable

Site management:

On the day of the survey 19% of the floodplain was considered to be managed too intensively, 26% was abandoned or undermanaged, and the remaining 55% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

This site is regularly monitored by local bird watchers, especially when it is flooded during the winter months (D. Finnamore, Pers. Comm).

Examples of best practice:

The south of the Barnadarrig (Shanahoe marsh) site (polygons 2606_15 and 2606_37) are a good example of best practice for the management of seasonally flooded grassland through a combination of annual mowing and aftergrazing. The

landowner of these areas farms sensitively, with no evidence of fertiliser application. Cattle are removed from the site before the ground becomes too waterlogged and suceptible to poaching and only allowed back on the site for a short period in the spring before the site is shut off to grazing animals and the meadows are allowed to develop (D. Finnamore, Pers. Comm).

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Barnadarrig (Shanahoe marsh) site. The floodplain grassland site is located immediately adjacent to ISGS site 2606 that was surveyed in 2012.

3.12 Redwood, Co. Tipperary (Site No. 4000):

Location data: Site centroid (ITM) 590000 709600, EPA subcatchment Shannon[Lower]_SC_060

2021 total area surveyed (ha): 71.29

Ranking: 2nd highest scoring site from 2021 field survey. Score of 7/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GS4	50.23	70.45
PF1	9.23	12.95
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GS1,GS2,GS4,PF1,PF3,WN2	11.83	16.60

2021 Annex I habitats; including any potential (p) target habitats:

Area (ha)	Area (ha)	% of survey area
6410	5.83	8.18
6510	0.25	0.35
7140	0.04	0.06
Secondary habitats	Area (ha)	% of survey area
6210,6430,7140	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	0.23	0.32
Abandoned - original management unknown	3.32	4.66
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	8.40	11.79
Extensive pasture - cattle	59.33	83.23

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	A06: Abandonment of grassland management (negative)	High	22.8
6410	A10: Undergrazing by livestock (negative)	High	<1

2021 EU conservation measures recorded for the three target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	77.1
6410	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	22.8
6410	CA05: Adapt mowing, grazing and other equivalent agricultural activities	<1
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. The GS4 habitat within the site includes significant areas of the Annex I habitat *Molinia* meadows (6410) that were assessed in detail (see below). The *Molinia* meadows within the site are located within the higher areas of the floodplain (polygons 4000_1b, 4000_3, 4000_4, 4000_5). The majority of the wet grassland surveyed is non-Annex, often with extensive tussocks of *Juncus effusus* and *Juncus inflexus* or *Festuca arundinacea*. PF1 habitat was the most common habitat recorded within two (polygons 4000_1a, 40007b) of the 14 fields surveyed and the non-Annex fen meadow habitat was characterised by abundant *Carex nigra*. FS1 habitat was recorded within six of the 14 fields and it included either a tall-reed (e.g. *Phragmites australis*)-dominated community or a swampy grassland community (Figure 1) with *Glyceria maxima*, *Agrostis stolonifera*, *Caltha palustris* and *Carex* species. Areas of the Annex I habitat Hydrophilous tall-herb (6430) were recorded within the survey area (Figure 2) with species such as *Iris pseudacorus, Mentha aquatica, Equisetum fluviatile* and *Filipendula ulmaria* common within the habitat. Small areas of drier grassland were recorded within the site; one small area (northern end of polygon 4000_1a) that is managed by annual mowing corresponds to the Annex I habitat Lowland hay meadows (6510) and another small area (north eastern edge of polygon 4000_4) corresponds to Annex I Calcareous grassland (6210).

Figure 1 Swamp grassland habitat at Redwood (Site 4000). Photograph Fionnuala O'Neill

Figure 2 Hydrophilous tall-herb (6430) habitat at Redwood (Site 4000). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6410 habitat within the site (Figure 3) was assessed using six assessment plots. Two of the plots were complete botanical plots that were analysed using ERICA and assigned to the *Molinia caerulea - Potentilla erecta - Agrostis stolonifera* GL1D IVC community (6410 habitat in the north of the site) and *Carex nigra - Ranunculus flammula* FE3A IVC community (6410 habitat in the south of the site).

Figure 3 *Molinia* meadows (6410) habitat at Redwood (site 4000). Photograph Jim Martin.

The *Area* parameter for the 6410 habitat at the site is assessed to be Unfavourable-inadequate based on expert judgement. The current area appears to have significantly decreased compared to the 17.18 ha of potential 6410 habitat mapped

based on Heery (1993), who recorded a plant community very similar to 6410 in two additional fields (polygons 4000_7d and 4000_7e). However, as it is unclear what area of potential 6410 mapped based on Heery (1993) corresponded to the 6410 habitat expert judgement has been applied and it has been assumed that there has been some loss in habitat, but ≤1% decline in area per year. Smaller areas of the target Annex I habitats 6430 and 6510 were also recorded within the site; these Annex I habitats were not assessed using plots and instead an indicative assessment of their conservation status was made based on additional notes that were recorded on habitat condition or species present. The *Area* parameter for both 6430 and 6510 at the site is assessed to be Favourable in the absence of any previous data for these Annex I habitats.

The *Structure and functions* for 6410 at the Redwood site are assessed to be Unfavourable-bad, as only 33% of the assessment plots passed the litter criterion (Table 1).

Table 1 Results of the 6410 *Structure and functions* criteria assessed at Redwood (Site 4000).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	100
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	33
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	50
Pass rate for monitoring stops before expert judgement applied	16.5
Pass rate for monitoring stops after expert judgement applied	33

Within the 6430 habitat at the site, four positive indicator species - *Iris pseudacorus, Mentha aquatica, Equisetum fluviatile* and *Filipendula ulmaria* – were recorded as common within the habitat, and on this basis the *Structure and functions* are assessed to be Favourable. No *Structure and functions* data were recorded for the small area of 6510 habitat, but based on the fact that the area was recorded as 6510 and the management in the field was assessed as appropriate (see below) it is assumed that the *Structure and functions* are Favourable.

The negative pressures A06: Abandonment of grassland management (e.g. cessation of grazing or mowing) and A10: Undergrazing by livestock were recorded for <25% of the 6410 area. These pressures together with the failed *Structure and functions* criteria result in an assessment of Unfavourable-bad for the *Future prospects* for the 6410 habitat (Table 2). No negative pressures were recorded for the smaller areas of 6410 and 6510 and the *Future prospects* for both are Favourable.

Table 2 *Future prospects* (FP) assessment for the three target Annex I habitats at Redwood (Site 4000). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	U-I	U-B	U-B	Unfavourable S&F (high litter cover), negative pressures of abandonment and undergrazing
6430	Fav	Fav	Fav	Positive and negative impacts in balance
6510	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment for the 6410 habitat at the site is Unfavourable-bad and due to the fact that the area the habitat occupies appears to have decreased compared to Heery (1993) the long-term trend for the 6410 habitat was judged to be decreasing. The overall assessment for the 6430 and 6510 habitats at the site is Favourable and no trend was assigned due to the absence of any previous data for these Annex I habitats at the site.

Table 3 Overall assessment for the three target Annex I habitats recorded at Redwood (Site 4000).

Parameter	6410	6430	6510
Area	Unfavourable-inadequate	Favourable	Favourable
Structure and functions	Unfavourable-bad	Favourable	Favourable
Future prospects	Unfavourable-bad	Favourable	Favourable
Overall assessment	Unfavourable-bad	Favourable	Favourable

Site management:

Small areas of the site at Redwood are impacted by undergrazing and abandonment, but there are also areas where grazing levels are too high, with impacts such as poaching noted. On the day of the survey 12% of the floodplain was considered to be managed too intensively, 13% was abandoned or undermanaged, and the remaining 75% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna, the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site would also have been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river, negatively impacting aquatic plants and animals in particular. However, since 2020, Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There is one large maintained drain in the centre of the site that is approximately 6 m wide. There are no significant physical modifications to the floodplain within the surveyed area and there are no levees within the site.

Examples of best practice:

The 8.4 ha of non-Annex fen meadow in the south of the site (polygon 4000_1a) is managed by annual mowing in August with the hay removed after cutting. There was no evidence that the meadow is aftergrazed, which is appropriate for this area as the soil is waterlogged and grazing after mowing would probably result in excessive poaching within some areas of the wet meadow.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Redwood site. The Redwood site was previously surveyed by Nairn *et al.* (1988) and Heery (1993). Heery (1993) identified a sedge-rich wet grassland community, which is judged to have often corresponded closely to the 6410 habitat, within each of the four fields where the Annex I habitat was mapped in 2021. Heery (1993) also recorded the sedge-rich wet grassland community in two fields where the 6410 habitat was not recorded in 2021 (polygons 4000_7d and 40007e). This potential loss of the 6410 habitat could be due to overgrazing, which was recorded within this area of the site. Nairn *et al.* (1988) recorded cattle, horses and sheep and no evidence of mowing within the Redwood site. In 2021 mowing was recorded within the south of the site (polygon 4000_1a) and cattle were the only stock observed to be grazing the site. Therefore it appears as if the diversity of stock type has decreased since the study of Nairn *et al.* (1988) and that mowing has been introduced for the management of part of the site.

3.13 Ballymacoolaghan, Co. Offaly (Site No. 4001):

Location data: Site centroid (ITM) 598100 715800, EPA subcatchment Shannon[Lower]_SC_040

2021 total area surveyed (ha): 20.37

Ranking: =21st highest scoring site from 2021 field survey. Score of 3/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GS4	18.19	89.28
PF1	0.22	1.07
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GS1,GS2,GS4,PF1,WS1	1.97	9.65

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	<0.01	0.01
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	3.64	17.87
Extensive pasture - cattle	16.73	82.13

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	None	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife, including wetland birds. The semi-natural wet grassland (GS4) habitat that covers the majority of the site

includes the grass species *Agrostis stolonifera* together with occasional *Juncus effusus*, and *Carex nigra*, *Ranunculus repens* is a common forb. PF1 habitat was the most common habitat recorded within one field (polygon 4001_9) and the habitat was characterised by *Carex nigra* with *Carex vesicaria, Eleocharis palustris, Caltha palustris, Equisetum fluviatile, Ranunculus flammula*, and *Veronica scutellata*. FS1 habitat was recorded within two of the fields (polygons 4001_8, 4001_27) and the habitat includes areas where *Phalaris arundinacea* and *Carex vesicaria* are abundant. One small area of the Annex I habitat Hydrophilous tall-herb (6430) was recorded within the survey area (polygon 4001_48), the indicator species for the Annex I habitat at this sites were not recorded. No photographs are presented for this site due to the poor quality of the images, a consequence of the heavy rain on the day of the survey.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

No assessment was undertaken for the 6430 habitat at the site as it covered an area of less than 100 m². Heery (1993) identified an old hay meadow community, within the northern section of polygon 4001_48, which is judged to have corresponded closely to the Lowland hay meadows (6510) habitat. This area is currently mapped as GS4 cattle pasture and represents a potential loss of an Annex I habitat from the site.

Site management:

On the day of the survey 54% of the floodplain was considered to be managed too intensively, none of the area was abandoned or undermanaged, and the remaining 46% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna, the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site would also have been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There is one large maintained drain in the centre of the site that is approximately 3 m wide, there are no significant physical modifications to the floodplain within the surveyed area and there are no levees within the site.

Examples of best practice:

The landowner is working with the local BirdWatch office to try to enhance the habitats on his land for wetland bird species. One example of best practice is providing accessible entrance/exit points to large drains by grading the sides at certain points along the drain.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Ballymacoolaghan site. The Ballymacoolaghan site was previously surveyed by Nairn *et al.* (1988) and Heery (1993). Heery (1993) identified an old hay meadow community, which is judged to have corresponded closely to the 6510 habitat, within an area that is now mapped as GS4 cattle pasture. This potential loss of the 6510 habitat could be due to a change in the management in this field from hay meadow to cattle pasture. Nairn *et al.* (1988) recorded cattle pasture and hay meadow as the two management types within the site. In 2021 mowing was recorded within one field (polygon 4001_8), whereas Nairn *et al*. (1988) recorded two fields (polygon 4001_48 and the eastern half of 4001_47) as hay meadow. Therefore it appears as if the area of the site managed by extensive mowing has decreased over time and the area managed as cattle pasture has increased.

3.14 Inishee and Esker Islands, Co. Galway (Site No. 4003):

Location data: Site centroid (ITM) 598400 716200, EPA subcatchment Shannon[Lower]_SC_040

2021 total area surveyed (ha): 35.39

Ranking: 3rd highest scoring site from 2021 field survey. Score of 6/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GS4	22.05	62.29
Secondary habitats	Area (ha)	% of survey area
ED2,FS1,FS2,GS1	13.35	37.71

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	1.07	3.02
6430	0.25	0.70
Secondary habitats	Area (ha)	% of survey area
6430	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive pasture - cattle	35.39	100.00

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	None recorded	-	-
6430	None recorded	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.00
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.00

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area, although as shown in Figure 1 there are areas of species-poor semi-natural wet grassland (GS4) that have been poached by cattle

and ruderal species such as docks (Rumex *spp*.) are frequent. The GS4 habitat within the site includes one area (southern part of polygon 4003_1) of the Annex I habitat *Molinia* meadows (6410) that was assessed in detail (see below). The more common non-Annex GS4 grassland is often a similar community, but with an absence of the high quality indicator species *Cirsium dissectum* and a higher cover of species such as *Juncus* sp., *Agrostis stolonifera*, and *Ranunculus repens*. Areas of the Annex I habitat Hydrophilous tall-herb (6430) were recorded within the site with species such as *Iris pseudacorus, Mentha aquatica, Equisetum fluviatile* and *Lysimachia vulgaris* common within the habitat. Small areas of drier calcareous and neutral grassland GS1) were also recorded within the site with characteristic species including *Juncus inflexus, Plantago lanceolata, Centaurea nigra,* and *Trifolium pratense*.

Figure 1 Area of semi-natural wet grassland (GS4) that has been poached by cattle and ruderal species such as docks (Rumex *spp*.) are frequent. From Inishee and Esker Islands (Site 4003). Photograph Jim Martin.

Figure 2 *Molina* meadow (6410) habitat at Inishee and Esker Islands (Site 4003). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6410 habitat within the site (Figure 2) was assessed using four assessment plots. One of the plots was a complete botanical plot that was analysed using ERICA, but the plot was not assigned to an IVC community as the highest percentage affinity was less than 50%.

The *Area* parameter for 6410 at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. In the absence of any previous data, the *Area* parameter for the 6430 habitat at the site is also assessed to be Favourable.

The *Structure and functions* for the 6410 habitat was assessed to be Unfavourable-bad as 50% of the plots failed the forb-to-graminoid ratio, after expert judgement had been applied to pass two of the plots with a ratio of 31%. One of the two failing plots also failed the positive indicator species criterion.

Table 1 Results of the 6410 *Structure and functions* criteria assessed at Inishee and Esker Islands (Site 4003).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	75
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	100
Bare soil cover	100

Grazing & disturbance	100
Forb-to-graminoid ratio	0
Pass rate for monitoring stops before expert judgement applied	0
Pass rate for monitoring stops after expert judgement applied	50

The *Structure and functions* of the 6430 habitat was assessed as Favourable, as four positive indicator species were recorded within the habitat.

No negative pressures were recorded for the 6410 habitat, but the *Future prospects* are judged to be Unfavourable-bad due to the low forb-to-graminoid ratio and the lack of positive indicator species (Table 2). No negative pressures were recorded for the 6430 habitat and the *Future prospects* are judged to be Favourable.

Table 2 *Future prospects* (FP) assessment for the 6410 and 6430 habitats recorded at Inishee and Esker Islands (Site 4003). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	U-B	U-B	Unfavourable S&F (low forb-to-graminoid ratio, not enough positive species)
6430	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment for the 6410 habitat is Unfavourable-bad, no trend was assigned due to the absence of any previous data for the Annex I habitat at the site. The overall assessment for the 6430 habitat is Favourable, no trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 3 Overall assessment for the 6410 and 6430 habitats recorded at at Inishee and Esker Islands (Site 4003).

Parameter	6410	6430
Area	Favourable	Favourable
Structure and functions	Unfavourable-bad	Favourable
Future prospects	Unfavourable-bad	Favourable
Overall assessment	Unfavourable-bad	Favourable

Site management:

On the day of the survey 100% of the survey area was considered to be appropriately managed. Although the impacts of poaching were noted in areas, the grazing intensity was never considered to be too high. It should also be noted that for important wading bird species sites such as this, areas of poaching can provide feeding sites.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna, the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site would also have been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition

silt traps were often used to reduce the impacts of suspended solids entering the river. There are no significant physical modifications to the floodplain within the surveyed area and there are no levees within the site.

Examples of best practice:

This site is an example of best practice, with extensive cattle grazing used to manage an area of semi-natural wet grassland for the benefit of both an Annex I habitat and important bird species, such as lapwing.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Inishee and Esker Islands. The Inishee and Esker Islands was previously surveyed by Heery (1993), the islands were not surveyed by Nairn *et al.* (1988). Heery (1993) identified a lowland wet grassland habitat for the whole site that was noted as a typical callows wet grassland with a very high breeding wader population. In 2021 a number of breeding waders, such as lapwing, were observed using the site.

3.15 Ballintemple, Co. Mayo (Site No. 4012):

Location data: Site centroid (ITM) 532800 801000, EPA subcatchment Moy_SC_050

2021 total area surveyed (ha): 11.37

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	4.00	35.15
GS1	0.35	3.12
GS2	3.94	34.65
GS4	1.95	17.15
Secondary habitats	Area (ha)	% of survey area
ED2,FS2,GS2,GS4,WS1	1.13	9.92

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6410	0.04	0.39
6430	<0.01	0.00
6510	0.40	3.51
Secondary habitats	Area (ha)	% of survey area
p6210	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing with aftergrazing	3.94	34.65
Extensive pasture - cattle	2.07	18.18
Extensive pasture - horses	0.84	7.40
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	4.52	39.77

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	F07: Sports, tourism and leisure activities (neutral)	Low	100.0
6430	None	-	-
6510	A19: Application of natural fertilisers on agricultural land (negative)	High	100.0

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.0
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.0
6510	CA09: Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production	100.0

Description of the grassland, swamp and fen meadow habitats surveyed:

Agriculturally improved grassland (GA1) was the most common floodplain grassland type recorded within the survey area, with an intensive mowing regime the most common management recorded. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. Of the semi-natural grassland habitats surveyed drier grassland habitats (GS1 and GS2) were more common than wet grassland (GS4). Dry meadows and grassy verges (GS2) managed by mowing is the most common of the drier grassland habitats within this site and a small areas within one of these fields (polygon 4012_1a) corresponded to the Annex I habitat Lowland hay meadows (6510). Two plots were recorded to assess the 6510 habitat (see below) in this species-rich sward, with *Festuca rubra* and *Holcus lanatus* the most common grass species and *Trifolium pratense* and *Ranunculus bulbosus* the most common broadleaved herbs (Figure 1). The GS4 habitat, which is mainly in the south of the site (polygons 4012_14, 4012_16, 4012_18), is characterised by a high cover of *Juncus effusus*. One small area of GS4 in polygon 4012_11 corresponded to the Annex I habitat *Molinia* meadows (6410) with *Cirsium dissectum* and positive indicators species, including *Molinia caerulea, Mentha aquatica, Carex panicea*, and *Succisa pratensis*, recorded. A small area of the Annex I habitat Hydrophilous tall-herb was recorded along the river bank with the four positive indicator species *Epilobium hirsutum, Iris pseudacorus, Filipendula ulmaria,* and *Stachys palustris* noted (Figure 2).

Figure 1 Lowland hay meadows (6510) at Ballintemple (Site 4012). Photograph Fionnuala O'Neill.

Figure 2 Hydrophilous tall-herb (6430) habitat at Ballintemple (Site 4012). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6510 habitat within the site (Figure 1) was assessed using two assessment plots. One of the plots was a complete botanical plot that was analysed using ERICA and assigned to the *Festuca rubra - Rhinanthus* GL3E IVC community with an affinity of 62%.

The *Area* parameter for 6510 at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. The *Area* parameter for both 6410 and 6430 are also assessed to be Favourable, in the absence of any previous data.

The *Structure and functions* for the 6510 habitat was assessed to be Unfavourable-bad as neither of the two assessment plots passed the positive indicator species criterion (Table 1).

Table 1 Results of the 6510 *Structure and functions* criteria assessed at Ballintemple (Site 4012).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	0
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	100
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	100
Pass rate for monitoring stops before expert judgement applied	0
Pass rate for monitoring stops after expert judgement applied	0

The *Structure and functions* parameter for the 6410 and 6430 habitats were not assessed using plots and instead an indicative assessment was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. The *Structure and functions* parameter for 6410 was assessed as Favourable with the high quality species *Cirsium dissectum* and six positive indicator species recorded. The *Structure and functions* parameter for 6430 was also assessed as Favourable, with four positive indicator species recorded.

No negative impacts were recorded for the 6410 and 6430 habitats and for both habitats the *Future prospects* are judged to be Favourable. The negative impact of A19: Application of natural fertilisers on agricultural land (slurry) was recorded for the 6510 habitat and because of this and the lack of positive indicator species the *Future prospects* for the 6510 habitat was assessed as Unfavourable-bad.

Table 2 *Future prospects* (FP) assessment for the three target Annex I habitats at Ballintemple (Site 4012). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	Fav	Fav	Positive and negative impacts in balance
6430	Fav	Fav	Fav	Positive and negative impacts in balance
6510	Fav	U-B	U-B	Unfavourable S&F (low number of positive species), application of natural fertilisers (slurry)

The overall assessments for the three target Annex I habitats is shown in Table 3, no trend was assigned due to the absence of any previous assessment data for the Annex I habitats at the site.

Table 3 Overall assessment for the three target Annex I habitats at Ballintemple (Site 4012).

Parameter	6410	6430	6510
Area	Favourable	Favourable	Favourable
Structure and functions	Favourable	Favourable	Unfavourable-bad
Future prospects	Favourable	Favourable	Unfavourable-bad
Overall assessment	Favourable	Favourable	Unfavourable-bad

Site management:

On the day of the survey 40% of the floodplain was considered to be managed too intensively, no areas were abandoned or undermanaged, and the remaining 60% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

The River Moy and many of its larger tributaries were dredged during the 1960s as part of a major arterial drainage scheme that continues to impact the ecology and hydrology of the River Moy and its floodplain (McGarrigle *et al.*, 1998; O'Connor, 2004). The impact of the scheme on the River Moy can still be observed with much of the river having modified raised banks, where the dredged material was deposited, and a trapezoidal shaped river channel. As reported by McGarrigle et al (1998) the channel of the River Moy was deepened rather than widened and the number of natural meanders removed during the works were insignificant.

Examples of best practice:

No examples of best practice management were recorded for this site. Although the Annex I habitats 6410 and 6430 are in a Favourable condition at this site, this is due to these small areas having avoided agricultural improvement due their close proximity to the river's edge and difficult access for machinery, rather than best practice management.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Ballintemple site. Much of this site was previously surveyed for the OPW (OPW, 2020) as part of a survey that took place in 2015. There are some differences between the grassland habitats recorded during the OPW survey and those recorded during the current survey, with the four semi-natural meadows (polygons 4012_1a, 40121b, 4012_4, 4012_5) that included some areas of the Annex I habitat 6510 recorded as improved agricultural grassland (GA1) during the OPW survey. It is likely that these four meadows had been mown before they were surveyed in August 2015 for the OPW survey, making it difficult to accurately assess the habitats that were present.

3.16 Kilgarvan, Co. Westmeath (Site No. 4013):

Location data: Site centroid (ITM) 605800 734900, EPA subcatchment Shannon[Lower]_SC_010

2021 total area surveyed (ha): 65.02

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS2	8.24	12.67
GS4	42.03	64.65
PF1	2.99	4.61
Secondary habitats	Area (ha)	% of survey area
FS1,GS4,PF1	11.75	18.08

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	3.35	5.15
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	17.26	26.55
Extensive pasture - cattle	25.71	39.54
Extensive alternating pasture and mowing	22.05	33.91

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	None recorded	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area. The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife, including rare plants. The GS4 habitat within the site was typically sedge-rich in character containing *Carex nigra* and *Carex disticha,* with common grasses including *Agrostis stolonifera, Phalaris arundinacea*, *Festuca arundinacea* and *Deschampsia cespitosa,* together with species such as *Potentilla anserina, Ranunculus repens, Filipendula ulmaria, Mentha aquatica, Eleocharis palustris, Ranunculus flammula, Galium palustre* and *Senecio aquaticus* (Figure 1). Rich fen and flush (PF1) habitat was the most common habitat recorded within two fields (polygons 4013_2, 4013_7), the non-Annex fen meadow habitat is characterised by abundant *Carex nigra* and *Carex disticha* with other species comprising *Eleocharis palustris, Filipendula ulmaria, Mentha aquatica, Ranunculus flammula, Galium palustre, Senecio aquaticus, Caltha palustris* and *Stellaria palustris*. Tall herb swamp (FS2) was the dominant habitat within two fields (polygons 4013_3, 4013_6). *Phalaris arundinacea* and *Filipendula ulmaria* were the dominant plants here (Figure 2), with other species indicative of the Annex I habitat Hydrophilous tall-herb (6430) recorded including *Galium palustre, Thalictrum flavum, Lysimachia vulgaris, Equisetum fluviatile* and *Lathyrus palustris*.

Figure 1 Expanse of mown semi-natural wet grassland (GS4) at Kilgarvan (Site 4013). Photograph Orla Daly.

Rare floodplain grassland plant species: Thousands of individuals of the rare plant species *Lathyrus palustris* were recorded within the tall herb swamp (FS2) vegetation within the site (polygons 4013_6 and 4013_3).

Conservation assessment for the Annex I habitats assessed at the site:

The Annex I habitat 6430 were recorded within this site. These areas were not assessed using plots and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. The *Area* parameter for 6430 at the site is assessed to be Favourable in the absence of any previous data for the Annex I habitat. Within the 6430 habitat at the site five positive indicator species comprising *Filipendula ulmaria, Galium palustre, Lysimachia vulgaris, Mentha aquatica* and *Equisetum fluviatile* were recorded. Two additional local positive indicator species for 6430, *Thalictrum flavum* and *Lathyrus palustris,* were included for this site. Although there is a good diversity of positive indicator species the *Structure and functions* are assessed to be Unfavourable-bad due to the high cover (above the 33% threshold) of the negative indicator species *P. arundinacea* throughout much of the 6430 habitat.

Figure 2 Mown tall-herb swamp (FS2) at Kilgarvan (Site 4013) dominated by *Phalaris arundinacea* and *Filipendula ulmaria*. Photograph Orla Daly.

No negative pressures were recorded for the 6430 habitat within the site, with all areas managed by an appropriate level of extensive mowing. However, due to the high cover of the negative indicator species *P. arundinacea* the *Future prospects* are assessed as Unfavourable-bad.

Table 2 *Future prospects* (FP) assessment for 6430 at Kilgarvan (Site 4013). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6430	Fav	U-B	U-B	Unfavourable S&F (high cover of negative indicator species)

The overall assessment for 6430 is Unfavourable-bad, no trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 3 Overall assessment for the 6430 habitat at Kilgarvan (Site 4013).

Parameter	Conservation status
Area	Favourable
Structure and functions	Unfavourable-bad
Future prospects	Unfavourable-bad
Overall assessment	Unfavourable-bad

Site management:

On the day of the survey all of the survey area was considered to be appropriately managed.

Other factors impacting the site:

As with all callows sites beside the River Shannon between Athlone and Portumna, the site has been impacted by the hydroelectric scheme at Ardnacrusha and the artificial raising and lowering of water levels by the ESB. These impacts, both on natural systems and the livelihoods of farmers, appear to be most significant when they cause flooding outside the expected winter flooding period. This site would also have been impacted by the industrial peat cutting of the bogs within the Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly

increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There are maintained drains present at the eastern end of the site. There are no significant physical modifications to the floodplain within the surveyed area and there are no levees within the site.

Examples of best practice:

Large areas of the floodplain within this site are managed extensively by annual mowing and/ or alternating pasture and mowing. Where mowing takes place the hay is removed after cutting.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Kilgarvan site. The Kilgarvan site was previously surveyed by Nairn *et al.* (1988) and Heery (1993). Heery (1993) identified a lowland wet grassland habitat across the whole of the Kilgarvan site and Nairn *et al.* (1988) recorded cattle pasture throughout the site. Since these data were recorded the diversity of habitats and management types within the site has increased. Wet grassland is still the main habitat within the site, but within four fields FS2 or PF1 were judged to be the main habitat types. Extensive mowing or alternating pasture and mowing now account for 60% of the management at the site, with extensive cattle grazing recorded for the remaining 40%.

3.17 Ballyconnell (Meath), Co. Meath (Site No. 4014):

Location data: Site centroid (ITM) 674400 752900, EPA subcatchment Boyne_SC_050

2021 total area surveyed (ha): 37.23

Ranking: =26th lowest scoring site from 2021 field survey. Score of 1.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
BC1	14.70	39.48
GA1	18.23	48.98
GS1	3.94	10.58
Secondary habitats	Area (ha)	% of survey area
ED2,ED3,FS1,FS2,GA1,WS1	0.35	0.95

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6210	<0.01	0.00
p6510	1.37	3.69
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive pasture - horses	2.11	5.67
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	1.68	4.50
Intensive pasture - cattle	16.61	44.62
Intensive pasture - horses	2.13	5.72
Arable crop	14.7	39.48

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
None	-	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
None	-	-

Description of the grassland, swamp and fen meadow habitats surveyed:

This is an agriculturally improved floodplain site with arable (BC1) and improved agricultural grasslands (GA1) the main habitat types recorded within the survey area. The Ballyconnell site is also one of the few floodplain grassland sites surveyed during the project where no semi-natural wet grassland (GS4) was recorded. The only semi-natural grassland habitat recorded within the site was dry calcareous and neutral grassland (GS1), which was recorded within four fields (polygons 4014_2, 4014_4, 4014_6, 4014_7) in the west of the site. Here, *Agrostis* spp., *Lolium perenne*, *Achillea millefolium* and *Ranunculus* spp. were characteristic, and agricultural weedy species such as *Rumex obtusifolius* and *Cirsium arvense* were frequent in the sward. Potential Annex I Lowland hay meadows (p6510) was recorded within one of the more species-rich of these fields (polygon 4014_4), with the high-quality indicators *Rhinanthus minor* and *Leucanthemum vulgare* plus nine positive indicator species – *Centaurea nigra, Crepis capillaris, Daucus carota, Plantago lanceolata, Trifolium pratense, Filipendula ulmaria, Ranunculus acris, Lathyrus pratensis* and *Heracleum sphondylium* – recorded. The management within this area is currently extensive horse pasture, but potentially this area could be managed by alternating grazing and mowing (see discussion below). If mowing was implemented, the area could be reclassified as the 6510 habitat rather than potential Annex I. A very small area of Annex I Calcareous grassland (6210) was recorded in polygon 4014_6, with the high-quality indicators *Briza media*, *Linum catharticum* and *Dactylorhiza fuchsii* recorded, as well as other positive indicators such as *Carex flacca*, *Pilosella officinarum* and *Lotus corniculatus*.

Figure 1 Dry calcareous and neutral grassland (GS1) at Ballyconnell (Meath) (Site 4014) with potential to be converted to Annex I Lowland hay meadows (6510) if managed by combination of mowing and aftergrazing. Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site: No examples of the three target Annex I habitats were recorded within the site.

Site management:

On the day of the survey 55% of the floodplain was considered to be managed too intensively, 6% of the survey area was considered to be appropriately managed, and the management for the 39% of the site that was mapped as arable crop was not recorded.

Other factors impacting the site:

The eastern half of the site is given over to wheat cultivation.

Examples of best practice:

Species-rich grassland occurs in part of the area that is currently managed as extensive horse pasture (polygon 4014_4). While mowing is suggested as a way to encourage the development of Annex I Lowland hay meadows, the current level of grazing is still suitable for maintaining a good diversity of species in this relatively dry part of the site.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Ballyconnell site. This site was previously surveyed for the OPW (OPW, 2020) as part of a survey that took place between 2013 and 2019 (no specific survey date was provided for the Ballyconnell area). The grassland habitats recorded during the OPW survey were very similar to those recorded during the current study, except that two fields of drier grassland in the west of the site (polygons 4014_2, 4014_4) were mapped by the OPW study as dry meadows and grassy verges and the very western field was mapped as the 6510 habitat. These areas are currently managed by horse grazing and further data will need to be collected to ascertain if the management of the fields has permanently switched to pasture, or if the areas are managed by alternating grazing and mowing.

3.18 Kilnagross, Co. Meath (Site No. 4015):

Location data: Site centroid (ITM) 676100 757100, EPA subcatchment Boyne_SC_070

2021 total area surveyed (ha): 15.22

Ranking: =25th lowest scoring site from 2021 field survey. Score of 2/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
BC1	6.77	44.45
GA1	1.37	8.99
GS1	2.70	17.71
GS2	1.84	12.08
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GA1,GS2,GS4,WS1	2.55	16.77

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
None recorded	0	0
Secondary habitats	Area (ha)	% of survey area
None recorded	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	0.48	3.16
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	1.85	12.15
Extensive pasture - cattle	1.80	11.81
Extensive pasture - stock unknown	2.40	15.74
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	1.52	9.99

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
None	-	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted

None	-	-

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a floodplain site where arable crops, particularly maize, are the most common habitat type within the survey area. There were no Annex I habitats recorded within the survey area and only very small areas of semi-natural wet grassland (GS4) were recorded. Semi-natural dry calcareous and neutral grassland (GS1) was the main habitat type within two fields (polygons 4015_3, 4015_8). The GS1 habitat (Figure 1) is a relatively damp community with *Holcus lanatus* common, alongside *Cynosurus cristatus* and *Lolium perenne*, common broadleaf herbs include *Plantago lanceolata*. The embankment beside the river in polygon 4015_8 is species-rich with *Achillea millefolium*, *Galium verum* and *Leucanthemum vulgare* common in places. The dry meadows and grassy verges (GS2) habitat within the site is common within three fields, two small meadows that appeared to be cut annually (polygons 4015_10, 4015_11) and the abandoned embankment within polygon 4015_1a (Figure 2). The GS2 habitat is made up of similar species to the GS1 habitat, but with a higher incidence of tall-sward species such as *Arrhenatherum elatius* and *Dactylis glomerata*. All the semi-natural grassland habitats surveyed have been agricultural improved to some degree, with species that are indicative of agricultural improvement, such as *L. perenne, Cirsium arvense* and *Rumex obtusifolius* common within areas of the grasslands.

Figure 1 Semi-natural dry calcareous and neutral grassland (GS1) at Kilnagross (Site 4015). Photograph Jim Martin.

Figure 2 Semi-natural dry meadow and grassy verges (GS2) at Kilnagross (Site 4015). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site: None of the three target Annex I habitats were recorded within this site

Site management:

On the day of the survey 32% of the floodplain was considered to be managed too intensively, 3% was judged to be undermanaged, 18% of the survey area was considered to be appropriately managed, and the remaining 47% was not assessed as the areas were dominated by arable crops.

Other factors impacting the site:

The Athboy River, that runs along the eastern edge of the site and the section of the River Boyne, that runs along the southern border, have both been dredged and straightened, resulting in a highly modified river channel that is deep and narrow. Levees have also been built along the length of the Athboy River.

Examples of best practice: No examples of best practice were recorded within the site.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Kilnagross site. All of this site was previously surveyed for the OPW (OPW, 2020) as part of a survey that took place between 2013 and 2019 (no specific survey date was provided for the Kilnagross area). The OPW survey recorded most of the site as agriculturally improved grassland (GA1), with the current survey recording semi-natural grassland habitats in areas where the OPW recorded GA1. The differences between the two surveys is probably due to interpretation and the threshold covers for species such as *Lolium perenne* and *Trifolium repens,* that were used to distinguish agriculturally improved grassland from semi-improved examples of semi-natural grassland habitats. The OPW recorded the Annex I habitat Lowland hay meadows (6510) within polygons 4015_9 and 4015_6. Unfortunately, this survey was not granted access to survey these areas, but viewed from the road, polygon 4015_9 appeared to be GA1 and 4015_6 was an arable field.

3.19 O'Daly's bridge, Co. Cavan (Site No. 4016):

Location data: Site centroid (ITM) 665300 780400, EPA subcatchment Blackwater[Kells]_SC_030

2021 total area surveyed (ha): 0.89

Ranking: =26th lowest scoring site from 2021 field survey. Score of 1.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GS2	0.89	100.00
Secondary habitats	Area (ha)	% of survey area
None	0.00	0.00

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
p6510	0.09	10.00
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	0.89	100.00

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
None	-	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
None	-	-

Description of the grassland, swamp and fen meadow habitats surveyed:

This was a small floodplain grassland site selected around an area of Lowland hay meadows (6510) mapped by the OPW (2020). This site was the only one of the 27 sites selected for a field survey that was not mapped within the OPW's three datasets that map high (10%), medium (1%) and low (0.1%) probability of present day river flood extents (public_ex_f_c_001_ITM.shp). Instead, the European Environmental Agency Water and Wetness (WAW) product (EEA, 2018) in combination with a brief walkover survey were used to provide evidence for flooding within the selected areas. The WAW product only provided evidence for seasonal flooding within the 6510 field (polygon 4016_10) and apart

from a few wet hollows the walkover survey provided no evidence for seasonal flooding within the other five selected polygons. These five polygons were all dominated by improved agricultural grassland (GA1) and it was decided to remove them from the floodplain grassland dataset.

The resulting site is made up of one field of dry meadow and grassy verge habitat (GS2). The field had been recently mown when it was first visited in July, so a second visit was made in September. This second visit recorded *Leucanthemum vulgare*, a high quality positive indicator species for the 6510 habitat, as occasional within the field, and four positive indicator species, *Plantago lanceolata, Vicia cracca, Heracleum sphondylium, Lathyrus pratensis*. With one high quality plant species and less than five positive indicators the field was assessed as an area of potential 6510 habitat. In addition, the negative indicator species *Lolium perenne* was recorded as frequent within the sward.

Figure 1 Potential Lowland hay meadows (p6510) at O'Daly's bridge (Site 4016). Photograph Orla Daly.

Conservation assessment for the Annex I habitats assessed at the site: As only an area of potential Annex I habitat was recorded at the site no conservation assessment was undertaken

Site management:

On the day of the survey all of the survey area was considered to be appropriately managed.

Other factors impacting the site:

This site represents a small area of potential Annex I habitat within an agriculturally improved landscape. The fact that the OPW have undertaken surveys along the banks of the river as part of a flood relief scheme (OPW, 2020) implies that future flood alleviation (e.g. dredging and building up the river banks) may be planned for this section of the River Blackwater.

Examples of best practice:

This site cannot be considered as an example of best practice as there is some evidence of re-seeding with agricultural species (e.g. *Lolium perenne*) within the meadow.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the O'Daly's bridge site This site was previously surveyed for the OPW (OPW, 2020) as part of a survey that took place between 2013 and 2019 (no specific survey date was provided for the O'Daly's bridge area). The OPW survey mapped the one field within this site as the Annex I habitat 6510, although it should be noted that only three positive indicator species were listed for the site during the survey. Two of the positive indicator species, *Centaurea nigra* and *Hypochaeris radicata*, listed by OPW

(2020) were not recorded during the current 2021 survey, indicating that the meadow may have been more diverse in the past and has been agriculturally improved over the last few years.

3.20 Roosky, Co. Roscommon (Site No. 4017):

Location data: Site centroid (ITM) 604700 787800, EPA subcatchment Shannon[Upper]_SC_040

2021 total area surveyed (ha): 54.55

Ranking: =17th highest scoring site from 2021 field survey. Score of 3.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	2.00	3.66
GS4	45.34	83.13
WN6	1.21	2.22
WS1	0.47	0.47
Secondary habitats	Area (ha)	% of survey area
BL3,ED2,ED3,ER2,FS1,FS2,GA1,GS1,GS2,GS4 PF1,PF3,WN2,WN6,WS1	5.52	10.13

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	0.07	0.12
7140	0.01	0.02
91E0	1.60	2.92
Secondary habitats	Area (ha)	% of survey area
6430,p6510,7140	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	0.81	1.48
Abandoned - original management unknown	5.81	10.65
Extensive mowing with aftergrazing	1.02	1.86
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	12.40	22.73
Extensive pasture - cattle	32.56	59.68
Intensive mowing with aftergrazing	0.20	0.36
Intensive pasture - cattle	1.36	2.49

2021EU negative pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	A31: Drainage for use as agricultural land (neutral)	Low	84.0

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.0

Description of the grassland, swamp and fen meadow habitats surveyed:

The majority of the semi-natural grassland habitat within the survey area is wet grassland (GS4). The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife including wetland birds. Significant areas of the GS4 habitat are mown maintaining an open species-rich sward (Figure 1) that includes *Juncus effusus, Agrostis stolonifera, Caltha palustris, Plantago lanceolata, Leontodon autumnalis, Ranunculus acris, Ranunculus flammula, Ranunculus repens, Cardamine pratensis, Galium palustre, Filipendula ulmaria, Potentilla palustris, and Lotus pedunculatus*. Snipe were commonly observed within the wet grassland within the north of the site. A relatively extensive area of the wet grassland in the south-east of the site has been abandoned and willow scrub is developing. Other areas of wet grassland in the south of the site have a relatively rank sward that is dominated by *Juncus effusus*. Areas of the Annex I habitat Hydrophilous tall-herb (6430) were recorded within four fields (polygons 4017_23, 4017_30, 4017_43, 4017_52) with species such as *Iris pseudacorus, Mentha aquatica, Equisetum fluviatile, Lythrum salicaria,* and *Cicuta virosa* listed for the habitat (Figure 2). Only small areas of drier grassland were recorded within the site. One of these areas, within polygon 4017_30, corresponded to potential Lowland hay meadows (p6510), the area was extensively mown and there were six positive indicator species, *P. lanceolata, L. autumnalis, R. acris, F. ulmaria, Vicia cracca*, and *Prunella vulgaris,* but no high quality species, such as *Rhinanthus minor*.

Figure 1 Semi-natural wet grassland (GS4) meadows at Roosky (Site 4017). Photograph Orla Daly.

Figure 2 Hydrophilous tall-herb (6430) habitat at Roosky (Site 4017). Photograph Orla Daly.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The *Area* parameter for 6430 habitat at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. No plots were recorded within this site to assess the *Structure and functions* of the 6430 habitat and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. Within the 6430 habitat five positive indicator species *Iris pseudacorus, Mentha aquatica, Equisetum fluviatile, Lythrum salicaria,* and *Cicuta virosa* were noted, passing the threshold for this criterion of three positive species. Based on these limited results the *Structure and functions* are assessed as Favourable.

No negative impacts were recorded for the 6430 habitat and the *Future prospects* are assessed as Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for 6430 at Roosky (Site 4017). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6430	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment is Favourable, no trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 2 Overall assessment for the 6430 habitat at Roosky (Site 4017).

Parameter	Conservation status
Area	Favourable
Structure and functions	Favourable
Future prospects	Favourable
Overall assessment	Favourable

Site management:

On the day of the survey 10% of the floodplain was considered to be managed too intensively, 12% was abandoned or undermanaged, 77% of the survey area was considered to be appropriately managed, and the remaining 1% was accounted for areas where the management regime was not assessed such as wet woodlands.

Other factors impacting the site:

This site would also have been impacted by the industrial peat cutting of the bogs within the Upper Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There are no significant levees within the site.

Examples of best practice:

The 12.4 ha of extensively mown GS4 habitat within the site is an example of best practice. All of these wet meadows are located to the east of the road that runs through the middle of the site. It was unclear if there was any aftergrazing within the meadows. The ditches between some of the meadows contained the Annex I habitat 6430.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Roosky site. There are no previous studies for this site.

3.21 Kildalkey, Co. Meath (Site No. 4018):

Location data: Site centroid (ITM) 674300 759300, EPA subcatchment Boyne_SC_070

2021 total area surveyed (ha): 32.31

Ranking: =24th lowest scoring site from 2021 field survey. Score of 2/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
GA1	11.25	34.81
GS1	10.01	30.99
GS2	1.49	4.62
GS4	3.14	9.71
Secondary habitats	Area (ha)	% of survey area
ED2,ED3,FS1,FS2,GA1,GS1,GS2,GS4,WS1	6.42	19.87

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Extensive mowing with aftergrazing	1.49	4.62
Extensive pasture - cattle	20.96	64.86
Intensive mowing with no aftergrazing	0.89	2.77
Intensive pasture - cattle	8.97	27.75

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
None	-	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
None	-	-

Description of the grassland, swamp and fen meadow habitats surveyed:

Agriculturally improved grassland (GA1) is the most common grassland habitat within the floodplain and this is one of the few sites where none of the target Annex I habitats were recorded. Areas of grassland that were more extensively grazed, such as the area of semi-natural wet grassland shown in Figure 1 (polygon 4018_2) often had a high cover of *Juncus effusus, Holcus lanatus*, and *Rumex acetosa*, with species that are indicative of more agriculturally improved areas such as *Cirsium arvense, Lolium perenne* and *Trifolium repens* common. Drier semi-natural grasslands were more common within the Kildalkey site than wet grassland. Areas of dry calcareous and neutral pasture (GS1), such as polygon 4018_10, had a high cover of grasses such as *Cynosurus cristatus*, but species that are indicative of agricultural improvement, such as *L. perenne* and *T. repens* were still common.

Figure 1 Semi-natural wet grassland (GS4) at Kildalkey (Site 4018). Photograph Jim Martin.

Figure 2 A recently mown semi-natural dry meadow (GS2) at Kildalkey (Site 4018). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site: None of the three target Annex I habitats were recorded within this site

Site management:

On the day of the survey 57% of the floodplain was considered to be managed too intensively, none of the areas were abandoned or undermanaged, and the remaining 43% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

The Athboy River, that runs along the eastern edge of the site has been dredged and straightened, resulting in a highly modified river channel that is deep and narrow. Levees have been built along the length of the river bank.

Examples of best practice: No examples of best practice were recorded within the site.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Kildalkey site. The majority of this site was previously surveyed for the OPW (OPW, 2020) as part of a survey that took place between 2013 and 2019 (no specific survey date was provided for the Kildalkey area). The OPW survey recorded the whole of the site as agriculturally improved grassland (GA1), whereas the current survey also recorded semi-natural grassland habitats. The difference between the two surveys is probably due to interpretation and the threshold covers for species such as *Lolium perenne* and *Trifolium repens*, that were used to distinguish agriculturally improved grassland from semi-improved examples of semi-natural grassland habitats.

3.22 Bunratty, Co. Clare (Site No. 4019):

Location data: Site centroid (ITM) 545800 661900, EPA subcatchment Owenogarney_SC_020

2021 total area surveyed (ha): 88.90

Ranking: =13th highest scoring site from 2021 field survey. Score of 4/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	3.39	3.82
FS2	0.44	0.50
GA1	49.25	55.40
GS1	0.97	1.09
GS2	1.16	1.30
GS4	19.56	22.00
Secondary habitats	Area (ha)	% of survey area
CM2,ED2,ED3,FS1,FS2,GA1,GS1,GS2,GS4,WS1	14.14	15.90

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	0.11	0.12
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned - original management unknown	2.51	2.82
Extensive pasture - cattle	32.90	37.00
Extensive pasture - cattle and sheep	2.36	2.66
Intensive mowing with aftergrazing	14.90	16.76
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	7.91	8.90
Intensive pasture - cattle	28.32	31.86

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	A06: Abandonment of grassland management (neutral)	Medium	97.5

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:
The majority of the grassland within this floodplain site is agriculturally improved grassland (GA1), which is managed as cattle pasture and/or by mowing (Figure 1). Examples of recent agricultural improvement, such as re-seeding and clearing ditches, were noted during the survey, fields that had signs of recent agricultural improvement included polygons 4019_5 and 4019_31a. Areas of semi-natural wet grassland (GS4) are common within the site with *Juncus effusus* often noted as being dominant in these wetter areas. In the north of the site two areas (polygons 4019_9c, 4019_31a) of the Annex I habitat Hydrophilous tall-herb (6430) were recorded. *Epilobium* species, *Stachys palustris*, *Mentha aquatica, Filipendula ulmaria,* and *Calystegia sepium,* were noted within the 6430 habitat. In the south of the site, outside the levees, there are areas of GS4, upper salt marsh (CM2), and brackish swamp (FS1). A small population of the rare plant species *Hordeum secalinum* (Figure 3) was found within this area (polygon 4019_39). The grassland on the large embankments that form the levees around this site is either extensively grazed dry calcareous and neutral grassland (GS1), or dry meadows and grassy verge (GS2) habitat, where stock have little or no access.

Figure 1 A recently mown improved agricultural grassland (GA1) at Bunratty (Site 4019). Photograph Jim Martin

Figure 2 Hydrophilous tall-herb (6430) habitat at Bunratty (Site 4019). Photograph Jim Martin.

Rare floodplain grassland plant species: A small population of approximately 100 flowering spikes of the rare plant species *Hordeum secalinum* was recorded within a 100 m² area in the south of the site (polygon 4019_39). The *H. secalinum* was recorded within a mosaic of wet grassland and upper saltmarsh that is managed by extensive cattle grazing. This area would be frequently inundated, as it is outside of the extensive system of levees that surrounds the agricultural grassland at the Bunratty site.

Figure 3 Three *Hordeum secalinum* flowering spikes, the species was found within a mosaic of wet grassland and upper saltmarsh at Bunratty (Site 4019). Photograph Jim Martin.

Conservation assessment for the Annex I habitats assessed at the site:

The *Area* parameter for 6430 habitat at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. No plots were recorded within this site to assess the *Structure and functions* of the 6430 habitat and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. Within the 6430 habitat six positive indicator species *Epilobium hirsutum, Epilobium parviflorum, Stachys palustris*, *Mentha aquatica, Filipendula ulmaria,* and *Calystegia sepium,* were noted, passing the threshold for this criterion of three positive species. Based on these limited results the *Structure and functions* are assessed as Favourable.

No negative impacts were recorded for the 6430 habitat and the *Future prospects* are assessed as Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for 6430 at Bunratty (Site 4019). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6430	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment is Favourable, no trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 2 Overall assessment for the 6430 habitat at Bunratty (Site 4019).

Parameter	Conservation status
Area	Favourable
Structure and functions	Favourable
Future prospects	Favourable
Overall assessment	Favourable

Site management:

On the day of the survey 65% of the floodplain was considered to be managed too intensively, 8% was abandoned or undermanaged, and the remaining 27% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

The OPW maintain an extensive system of levees at this site.

Examples of best practice:

No examples of best practice recorded.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Bunratty site. The western side of this site was previously surveyed for the OPW (OPW, 2020) as part of a survey that took place in June 2018. Where the OPW survey overlaps with the current survey there are some differences in the grassland habitats that were mapped by the different surveys. For example, the current survey mapped polygons 4019_22, 4019_37, 4019_9a, and 4019_9b as mostly wet semi-natural grassland (GS4), whereas the OPW mapped all these areas as improved agricultural grassland (GA1). The difference between the two surveys is probably due to interpretation and the threshold covers for species such as *Lolium perenne* and *Trifolium repens* that were used to distinguish agriculturally improved grassland from semi-improved examples of semi-natural grassland habitats.

3.23 Lough Corrib, Co. Galway (Site No. 4020):

Location data: Site centroid (ITM) 527700 729400, EPA subcatchment Corrib_SC_010

2021 total area surveyed (ha): 104.43

Ranking: =17th highest scoring site from 2021 field survey. Score of 3.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	0.70	0.67
FS2	1.84	1.76
GS2	0.48	0.46
GS4	3.04	2.91
HH3	49.90	47.79
PF1	8.27	7.92
WS1	1.80	1.80
Secondary habitats	Area (ha)	% of survey area
ED3,FS1,FS2,GM1,GS1,GS2,GS4 HH3,PB3,PF1,PF3,WN6,WS1	38.39	36.76

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
4010	51.86	49.66
6410	0.82	0.79
6430	1.89	1.81
91E0	0.07	0.07
p6410	0.94	0.90
p6510	0.26	0.25
Secondary habitats	Area (ha)	% of survey area
4010,6410,6430,7140 7210,7230,91E0	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned - original management unknown	101.86	97.54
Extensive pasture - horses	2.57	2.46

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	A06: Abandonment of grassland management (negative)	High	13.2
6410	L02: Natural succession resulting in species composition change (negative)	High	86.8
6430	L02: Natural succession resulting in species composition change (negative)	Medium	99.8

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	100.0
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	0.2
6430	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	99.8

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse semi-natural site with no agriculturally improved grassland (GA1) recorded within the survey area. This site is highly unusual amongst the floodplains surveyed due to the fact that 98% of the site has been abandoned with no evidence of any management, such as grazing or mowing, recorded. Due to the lack of management semi-natural grassland habitats account for less than 5% of the total area of the site and wet heath is the main habitat accounting for 50% of the survey area. The rich fen and flush (PF1) within the site includes small areas of the Annex I habitat *Molinia* meadows (6410) that were assessed in detail (see below). The 6410 (Figure 1) within the site is located within four areas (polygons 4020_5, 4020_6a, 4020_8a, 4020_8d) with the main area of 6410habitat where the four assessment plots were recorded, in the east of polygon 4020_8a. One area of potential 6410 habitat was also identified (polygon 4020_8c), this area has been abandoned and due to the rankness of sward and high litter cover the area was judged to be p6410. The Annex I habitat Hydrophilous tall-herb (6430) (Figure 2) was recorded throughout the site, either associated with large drains or the shoreline of Lough Corrib. Common species within the 6430 habitat included *Eupatorium cannabinum, Filipendula ulmaria*, *Epilobium hirsutum, Lysimachia vulgaris, Lythrum salicaria, Stachys palustris* and *Equisetum fluviatile*. A small area of drier semi-natural grassland corresponded to potential Lowland hay meadows (p6510), the high quality indicator species *Rhinanthus minor* and *Leucanthemum vulgare* were recorded within the field but the area was currently managed by horse grazing rather than mowing.

Figure 1 *Molinia* meadows (6410) at Lough Corrib (Site 4020). Photograph Jim Martin

Figure 2 Hydrophilous tall-herb (6430) habitat at Lough Corrib (Site 4020). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6410 habitat within the site (Figure 1) was assessed using four assessment plots. One of the plots was a complete botanical plot that was analysed using ERICA and assigned to the *Molinia caerulea - Succisa pratensis* GL1C IVC community with a 57% affinity.

Baseline area data for both the 6410 and 6430 habitats are available in the NCA dataset. The NCA data, that were recorded in 2014 as part of the Galway City Transport Project (Galway City Council, 2014) record 1.21 ha of 6410 and 3.47 ha of 6430 within the survey area. The areas of 0.82 ha for 6410 and 1.89 ha for 6430 recorded during the current survey are lower, but as both habitats were often recorded as secondary habitats (i.e. the actual area the habitat covered was not always recorded), these areas are considered to be an underestimate. Therefore the decision was made that the area for both habitats is unchanged from the baseline NCA data and the *Area* parameter for both 6410 and 6430 is assessed as Favourable.

Two of the 6410 plots failed the *Structure and functions* assessment due to a high litter cover of >25%, one of these plots also failed due to a shrub and heath cover of 10% and a forb-to-graminoid ratio of only 33%. All the failed *Structure and functions* criteria are a consequence of the abandonment of management at the site.

Table 1 Results of the 6410 *Structure and functions* criteria assessed at Lough Corrib (Site 4020).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	100
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	75
Sward height	100
Litter cover	50
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	75
Pass rate for monitoring stops before expert judgement applied	50
Pass rate for monitoring stops after expert judgement applied	50

No plots were recorded to assess the *Structure and functions* of the 6430 habitat and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. Within the 6430 habitat seven positive indicator species *Eupatorium cannabinum, Filipendula ulmaria, Epilobium hirsutum, Lysimachia vulgaris, Lythrum salicaria, Stachys palustris* and *Equisetum fluviatile,* were noted, passing the threshold for this criterion of three positive species. Based on these limited results the *Structure and functions* for the 6430 habitat are assessed as Favourable.

The negative impacts of A06: Abandonment of grassland management and L02: Natural succession resulting in species composition change, were recorded for the whole of the 6410 habitat and L02: Natural succession resulting in species composition change was recorded as a negative impact for 99.8% of the 6430 habitat. These negative impacts results in a *Future prospects* assessment of Unfavourable-bad for both Annex I habitats (Table 2).

Table 2 *Future prospects* (FP) assessment for 6410 and 6430 habitats at Lough Corrib (Site 4020). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	U-B	U-B	Unfavourable S&F (high litter cover, scrub encroachment, low broadleaf herb cover), abandonment ,and natural succession
6430	Fav	Fav	U-B	Natural succession resulting in species composition change

The overall assessment for both Annex I habitats is Unfavourable-bad (Table 3), no trend was assigned due to the lack of baseline data for the Annex I habitats at the site. However, it would be expected that the trend for both the 6410 and 6430 habitats is negative, due to the abandonment of management across almost the whole site and the natural succession of heath and scrub habitats.

Table 3 Overall assessment for the 6410 and 6430 habitats at Lough Corrib (Site 4020).

Parameter	6410	6430
Area	Favourable	Favourable
Structure and functions	Unfavourable-bad	Favourable
Future prospects	Unfavourable-bad	Unfavourable-bad
Overall assessment	Unfavourable-bad	Unfavourable-bad

Site management:

On the day of the survey 98% of the survey area was abandoned or undermanaged, and the remaining 2% was considered to be appropriately managed.

Other factors impacting the site:

This site appears to be part of a natural floodplain with few anthropogenic impacts.

Examples of best practice:

No examples were recorded.

Previous studies at the site:

There are nine floodplain grassland plots from the National Vegetation Database (NVD) located within the Lough Corrib site. Four of these plots were recorded in 2014 as part of the Galway City Transport Project (Galway County Council, 2017) and five plots were recorded during the 1980s as part of the Ph.D thesis 'A Phytosociological and Palaeoecological Study of the Wetlands of the Lower Corrib Basin' (Mooney, 1991). As discussed above there have been some changes in the recorded areas of the 6410 and 6430 Annex I habitats since the Galway City Transport Project data were recorded, but these changes are thought to be due to differences in methodology, rather than actual change. The southern shoreline of the Lough Corrib site has also been surveyed for the OPW (OPW, 2020) as part of a survey that took place in August 2014. The OPW survey recorded all the shoreline areas as tall-herb swamp habitat (FS2) which is in broad agreement with the current survey. Overall, there is no evidence for significant change in the floodplain habitats recorded within this site, however future studies should try to revisit NVD plot locations to allow more direct comparisons between datasets to be made.

3.24 Derrygoss, Co. Cavan (Site No. 4021):

Location data: Site centroid (ITM) 639700 810800, EPA subcatchment Erne_SC_030

2021 total area surveyed (ha): 31.58

Ranking: =17th highest scoring site from 2021 field survey. Score of 3.5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	1.16	3.68
GA1	8.00	25.34
GA2	0.17	0.54
GS1	0.43	1.37
GS2	3.01	9.52
GS4	12.76	40.42
WN6	0.24	0.75
Secondary habitats	Area (ha)	% of survey area
FS1,FS2,GA1,GM1,GS1,GS2,GS4, WD1,WN2,WS1	5.80	18.38

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	< 0.01	0.01
91E0	0.24	0.75
p6510	< 0.01	0.00
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	1.12	3.54
Abandoned - original management unknown	2.36	7.47
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	5.39	17.08
Extensive pasture - cattle	10.19	32.29
Extensive pasture - stock unknown	0.18	0.57
Intensive mowing with aftergrazing	8.66	27.43
Intensive mowing with no aftergrazing	0.19	0.60
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	3.36	10.66

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6430	None	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100

Description of the grassland, swamp and fen meadow habitats surveyed:

This is a diverse floodplain grassland site, with semi-natural grassland habitats that support a diversity of wildlife and represent a valuable conservation resource. The semi-natural wet grassland (GS4) habitat within the site covers a large area, but it is often semi-improved with a poor broadleaf herb diversity. Common species within the GS4 habitat include *Agrostis stolonifera, Alopecurus pratensis, Deschampsia cespitosa, Glyceria fluitans, Holcus lanatus, Phalaris arundinacea, Juncus effusus, Filipendula ulmaria,* and *Ranunculus repens. J. effusus* is abundant within areas of the GS4 habitat forming a rushy sward. Within one field (polygon 4021_33), there is an area of freshwater marsh (GM1) and the invasive aquatic species *Elodea nuttallii* was common in the river next to the marsh (Figure 1). One small area of the Annex I habitat Hydrophilous tall-herb (6430) was recorded within the survey area, with species such as *Angelica sylvestris, Equisetum fluviatile, Epilobium hirsutum and Valeriana officinalis* noted within the habitat. There are areas of drier grassland within the site, one very small area (southern end of polygon 4021_24), that is managed by annual mowing, corresponds to the potential Annex I habitat Lowland hay meadows (p6510), with *Leucanthemum vulgare* and five other positive species for the habitat, such as *Plantago lanceolata*, recorded in a 5 x 5 m area (Figure 2).

Figure 1 Freshwater marsh (GM1) habitat at Derrygoss (Site 4021). Photograph Jim Martin.

Figure 2 A small area of potential Annex I Lowland hay meadows (p6510) at Derrygoss (Site 4021). Photograph Jim Martin

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site: No assessment was undertaken for the 6430 habitat at the site as it covered an area of less than 100 m².

Site management:

On the day of the survey 58% of the floodplain was considered to be managed too intensively, 9% was abandoned or undermanaged, 32% of the survey area was considered to be appropriately managed, and 1% of the site was not assessed as it was wet woodland.

Other factors impacting the site:

Much of this floodplain site is located on relatively steep slopes down to the River Erne, with the very east section of the site on the banks of the Annalee River, a tributary of the River Erne. Due to the steep slopes, the floodplain is quite narrow in places. This area appears to be popular with anglers, with some stiles erected to assist access. On the day of the survey anglers were fishing from a boat in the very south of the site.

Examples of best practice:

A wire fence has been installed along the river bank, approximately 4 m from the river edge, throughout the southwest section of the site. The fence provides a buffer protecting the river edge from disturbance by stock. The fence is probably maintained by local anglers.

Previous studies at the site:

There are no floodplain grassland plots from the National Vegetation Database located within the Derrygoss site and no evidence of any previous habitat surveys within the vicinity of the site were found.

3.25 Suck River Callows NHA, Co. Galway and Roscommon (Site No. 222):

Location data: Site centroid (ITM) 584600 737500, EPA subcatchment Suck_SC_040 to 100

2021 total area surveyed (ha): 778.33

Ranking: 1st, highest scoring site from 2021 field survey. Score of 10/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	39.46	5.07
FS2	2.78	0.36
GA1	13.97	1.79
GM1	6.92	0.89
GS1	18.55	2.38
GS2	1.18	0.15
GS4	501.95	64.49
PB4	2.47	0.32
PF1	28.25	3.63
WN1	0.71	0.09
WN2	1.45	0.19
WN6	7.99	1.03
WS1	3.40	3.40
Secondary habitats	Area (ha)	% of survey area
BL2,ED2,ED3,FL8,FS1,FS2,GA1,GM1,GS1,GS2,GS4, PB4,PF1,PF3,WD5,WN2,WN6,WN7,WS1	149.26	19.18

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6210	0.07	0.01
6410	7.56	0.97
6430	1.54	0.20
6510	1.91	0.25
7140	0.03	0.00
91E0	5.59	0.72
p6410	2.75	0.35
p6430	6.86	0.88
p6510	12.96	1.67
Secondary habitats	Area (ha)	% of survey area
6210,6430,p6510,7140,91E0	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	14.57	1.87
Abandoned - original management unknown	17.42	2.24
Extensive mowing with aftergrazing	40.85	5.25
Extensive mowing with no aftergrazing	2.30	0.30
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	51.80	6.65
Extensive pasture - cattle	428.79	55.09
Extensive pasture - horses	19.48	2.50
Extensive pasture - sheep	72.80	9.35
Extensive pasture - cattle and horses	16.46	2.11
Extensive pasture - cattle and sheep	37.64	4.84
Extensive pasture - cattle, horses and sheep	6.34	0.81
Extensive pasture - stock unknown	0.42	0.05
Extensive alternating pasture and mowing	2.78	2.78
Intensive mowing with aftergrazing	10.57	1.36
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	1.27	0.16
Intensive pasture - cattle	29.85	3.84
Intensive pasture - sheep	7.34	0.94
Intensive pasture - cattle and sheep	5.97	0.77

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	A06: Abandonment of grassland management (negative)	High	2.7
6410	L02: Natural succession resulting in species composition change (scored as both neutral and negative within the site)	Medium	40.0
6430	A06: Abandonment of grassland management (neutral)	Low	18.7
6430	A10: Undergrazing by livestock (neutral)	Low	27.7
6510	A13: Reseeding of grasslands (negative)	High	7.0

2021 EU conservation measures recorded for the target Annex I habitats (CA03 was applied for areas where only a neutral pressure was recorded)

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	66.5
6410	CA04: Reinstate appropriate agricultural practices to address abandonment, including mowing, grazing, burning or equivalent measures	2.7
6410	CA05: Adapt mowing, grazing and other equivalent agricultural activities	30.8
6430	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	81.3
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	93.0
6510	CA05: Adapt mowing, grazing and other equivalent agricultural activities	7.0

Description of the grassland, swamp and fen meadow habitats surveyed:

The floodplain grasslands within the Suck River Callows NHA cover a large area from Castlecoote in the north to Shannonbridge in the south. As it was not possible to survey all areas of semi-natural floodplain grassland within the NHA during this project, remote imagery was utilised to make an assessment of where to focus survey efforts to maximise the area of target habitats that could be surveyed. The decision was made to focus the survey in two areas: on the northern part of the NHA around Athleague and the southern areas around Ballinasloe. It was also decided to focus the survey on areas where no previous baseline semi-natural grasslands data had been collected (i.e. ISGS sites were generally avoided).

The majority of the grassland surveyed within the Suck River Callows floodplain was semi-natural wet grassland (GS4). The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife, including wetland birds. Within GS4 areas, a wetter grassland community with abundant *Glyceria fluitans* was often found on the lowest, most inundated ground and then moving up the slope an *Agrostis stolonifera* and *Alopecurus pratensis* plant community became more common. Extensive areas of rushy pasture with *Juncus effusus* and *Deschampsia cespitosa* were also recorded, and in areas of wet grasslands that were more agriculturally improved, a high cover of *Holcus lanatus* was sometimes noted. Areas of the floodplain where smaller sedge species, such as *Carex nigra, Carex echinata* and *Carex viridula,* were dominant were recorded as rich fen and flush (PF1) and some of these areas corresponded to *Molinia* meadows (6410). Fen meadow habitat was common within the Suck Callows but it can be difficult to accurately classify these areas into either GS4 or PF1, as the range of fen meadow communities overlaps with examples of both habitat types. This is illustrated by the full botanical plot that was recorded within an area of herb-rich non-Annex fen meadow recorded in the north of the site (Figure 1): despite a 50% cover of *Carex nigra*, ERICA classified the community as *Agrostis stolonifera – Ranunculus repens* IVC code GL2a due to the high cover of *Agrostis stolonifera* (40%) and *Ranunculus repens* (35%).

The Annex I habitat 6410 was recorded within 11 fields (000222_493, 000222_554, 000222_560a, 000222_561, 000222_1050, 000222_1123, 000222_1133, 000222_1164, 000222_1418, 000222_1432b, 000222_1435b) that were spread across the survey area (Figure 2). Areas of potential 6410 habitat were also recorded (e.g. polygons 000222_1428a, 000222_1435a), these areas were judged to be p6410 due to the lack of high quality species such as *Cirsium dissectum*.

Two of the areas (000222_1123 and 000222_1432b) were assessed with plots (discussed below). Hydrophilous tall-herb (6430) was recorded within five fields; four from the northern section of the site (000222_464, 000222_480, 000222_529b, 000222_669) and one from the southern section (polygon 000222_1428b). The indicator species *Iris pseudacorus, Mentha aquatica, Filipendula ulmaria* and *Epilobium* spp. were recorded within the habitat. Areas of potential 6430 were also

recorded, these areas were judged to be 'potential' areas due to the difficulty in assessing the *Structure and functions* as the areas had been recently mown.

Smaller areas of drier semi-natural grassland were recorded within the site, the majority of which was dry calcareous and neutral grassland managed as pasture. Some of these drier grasslands were managed by mowing, and the Annex I habitat Lowland hay meadows (6510) was recorded within three fields, one in the northern section of the site (polygon 000222_817) and two in the southern area (polygons 000222_1432a, 000222_1232). The small area of 6510 habitat in the north of the site included the rare plant species *Bromus racemosus*. Both of the 6510 fields in the south of the site had been recently mown when they were surveyed in the middle of August. The high-quality species *Lotus corniculatus* and positive indicator species including *Filipendula ulmaria* and *Centaurea nigra* were recorded. Further areas were recorded in the south of the site that have the potential to develop into 6510 if a small change in management from topped cattle pasture to mowing were to be implemented (polygons 000222_842, 000222_895; Figure 3). Two small areas of Annex I Calcareous grassland (6210) were also recorded within the site.

Figure 1 Non-Annex I Fen meadow habitat within the Suck River Callows NHA (Site 000222). Photograph Jim Martin

Figure 2 *Molinia* meadows (6410) habitat within the Suck River Callows NHA (Site 000222). Photograph Jim Martin.

Figure 3 Potential Lowland hay meadows (6510) habitat within the Suck River Callows NHA (Site 000222). Photograph Fionnuala O'Neill.

Rare floodplain grassland plant species:

The rare species *Lathyrus palustris* was recorded at the very southern end of the Suck River Callows NHA, within the northern half of polygon 000222_1432b. The species was abundant within the field, with the population size estimated at between 500 and 1000 individuals. This polygon was managed by extensive mowing and the Annex I habitat 6410 was also recorded within the field.

The rare species *Bromus racemosus* was recorded in the northern section of the Suck River Callows NHA (polygon 000222_817), along a section of slightly higher ground. The species was abundant along this bank with the population size estimated at between 500 and 1000 individuals. The field was managed by extensive mowing and the Annex I habitat 6510 was recorded along the higher ground where *B. racemosus* was found.

Conservation assessment for the Annex I habitats assessed at the site:

The *Structure and functions* of the 6410 habitat within the site (Figure 1) was assessed using six assessment plots, four recorded within polygon 000222_1123 and two recorded within polygon 000222_1432b. Two of the plots were complete botanical plots that were analysed using ERICA and both were assigned to the *Agrostis stolonifera – Filipendula ulmaria* GL1B IVC community, which is strongly associated with the 6410 habitat

In the absence of any previous baseline data for the Annex I habitat at the site, the *Area* parameter for 6410 is assessed to be Favourable. The *Area* parameter for both 6430 and 6510 is also assessed to be Favourable in the absence of any previous data for the Annex I habitats at the site

Table 1 Results of the 6410 *Structure and functions* criteria assessed for the Suck River Callows NHA (Site 00222).

Assessment Criteria	% monitoring stops that passed each criterion
Positive indicator species (HQ)	100
Positive indicator species (HQ + Non-HQ)	100
Non-native species	100
Individual negative indicator species	100
Total cover negative indicator species	100
Encroachment	100
Sward height	100
Litter cover	100
Bare soil cover	100
Grazing & disturbance	100
Forb-to-graminoid ratio	67
Pass rate for monitoring stops before expert judgement applied	67
Pass rate for monitoring stops after expert judgement applied	100

The *Structure and functions* of the 6410 habitat at the site is assessed to be Favourable based on the six plots recorded within the site. Two of the plots narrowly failed the forb-to-graminoid ratio, but these were passed based on expert judgement as the percentage covers were 37% and 38%; as discussed by O'Neill *et al.* (2013) and Martin *et al.* (2018), a forb-to-graminoid ratio ≥30% can be assessed as a pass for the 6410 habitat, especially when all other monitoring criteria have passed.

The *Structure and functions* of the 6430 habitat were assessed as Favourable based on the four positive indicator species *Iris pseudacorus, Mentha aquatica, Filipendula ulmaria* and *Epilobium* spp. (i.e. *Epilobium parviflorum* and *Epilobium hirsutum*) recorded within the habitat. It is proposed that *Rorippa amphibia* should be a local positive indicator species for the 6430 habitat within the Suck River Callows where it was noted as a characteristic component of the community. Based on the limited data recorded within the 6510 habitat, the *Structure and functions* are also assessed as Favourable.

Due to the negative pressures of abandonment and natural succession that covered 31% of the 6410 habitat at the site, the *Future prospects* are judged to be Unfavourable-bad. No negative pressures were recorded within the 6430 habitat, with abandonment assessed as having no impact or a neutral impact on the habitat, and the *Future prospects* of the habitat are Favourable. The negative pressure of re-seeding was recorded for 7% of the 6510 habitat, therefore its *Future prospects* are assessed as Unfavourable-inadequate.

Table 2 *Future prospects* (FP) assessment for the three target Annex I habitats within the Suck River Callows NHA (Site 222). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	Fav	Fav	U-B	>25% of the area impacted by abandonment or natural succession
6430	Fav	Fav	Fav	Positive and negative impacts in balance
6510	Fav	Fav	U-I	>0-25% of the area impacted by re-seeding

The overall assessments for the three target Annex I habitat are shown in Table 3. No trends were assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 3 Overall assessment for the three target Annex I habitats within the Suck River Callows NHA (Site 222).

Parameter	6410	6430	6510
Area	Favourable	Favourable	Favourable
Structure and functions	Favourable	Favourable	Favourable
Future prospects	Unfavourable-bad	Favourable	Unfavourable-inadequate
Overall assessment	Unfavourable-bad	Favourable	Unfavourable-inadequate

Site management:

During the 2021 survey 16% of the floodplain was considered to be managed too intensively, 3% was abandoned or undermanaged, and 80% of the survey area was considered to be appropriately managed. The management within five areas, such as areas of woodland or private garden, that account for 1% of the survey area were not assessed.

Other factors impacting the site:

Within the areas of the River Suck that were surveyed, there was little evidence that the river channel had been dredged and no levees were recorded. This site would have been impacted by the industrial peat cutting of the bogs within the River Suck catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river, negatively impacting aquatic plants and animals in particular. However, since 2020, Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. Areas within the northern section of the Suck River Callows can be accessed via the Suck Valley Way, a marked walking trail between Castlecoote and Ballygar.

Examples of best practice:

In the southern half of the site the large (6.9 ha) field of semi-natural wet grassland within polygon 000222_1123 is a good example of extensive cattle pasture, with the Annex I habitat 6410 recorded within 10% of the field. In addition to the Annex I habitat, local landowners reported Whooper swan using the field during the winter when it flooded.

Previous studies at the site:

There are seven floodplain grassland plots from the National Vegetation Database located within the Suck River Callows NHA, which were all recorded during the ISGS (O'Neill *et al.*, 2013). The ISGS surveyed two areas of semi-natural grassland within the northern part of the Suck River Callows NHA: Site 245 in Co. Roscommon and Site 2332 in Co. Galway. These sites did not include any surveyed areas of Annex I habitat and covered 105.1 ha in total. They were not surveyed during the current survey, which focused on areas where no previous baseline semi-natural grasslands data had been collected.

3.26 River Little Brosna Callows NHA, Co. Offaly and Tipperary (Site No. 564):

Location data: Site centroid (ITM) 599300 710200, EPA subcatchment Shannon[Lower]_SC_060

2021 total area surveyed (ha): 374.92

Ranking: 3rd highest scoring site from 2021 field survey. Score of 6/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
ED2	0.17	0.05
FS1	77.19	20.59
GA1	23.77	6.34
GM1	15.21	4.06
GS1	2.77	0.74
GS2	5.70	1.52
GS3	0.22	0.06
GS4	164.68	43.93
HH3	2.92	0.78
PB4	5.23	1.40
PF1	16.23	4.33
WL2	0.02	0.00
WN2	0.11	0.03
WN6	1.71	0.46
WN7	0.74	0.20
WS1	0.57	0.57
Secondary habitats	Area (ha)	% of survey area
ED2,FS1,FS2,GA1,GM1,GS1,GS2,GS3,GS4 HD1,HH3,PF1,PF3,WN6,WN7,WS1	57.66	15.38

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
4010	0.28	0.07
6410	3.58	0.96
6510	5.58	1.49
7140	0.09	0.02
91E0	0.29	0.08
p6410	2.59	0.69
p6510	8.71	2.32
Secondary habitats	Area (ha)	% of survey area
p6410,p6510	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	13.27	3.54
Abandoned - original management unknown	76.76	20.47
Extensive mowing with aftergrazing	9.11	2.43
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	15.00	4.00
Extensive pasture - cattle	138.05	36.82
Extensive pasture - sheep	27.82	7.42
Extensive pasture - cattle and horses	30.28	8.08
Extensive pasture - cattle and sheep	5.74	1.53
Extensive alternating pasture and mowing	13.17	13.17
Intensive mowing with aftergrazing	0.26	0.07
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	3.67	0.98
Intensive pasture - cattle	37.63	10.04
Intensive pasture - sheep	0.24	0.06

2021 EU pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6410	A31: Drainage for use as agricultural land (neutral)	Medium	53.4
6410	L02: Natural succession resulting in species composition change (negative)	Low	46.6
6510	A19: Application of natural fertilisers on agricultural land	High	98.3

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6410	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	53.4
6410	CA05: Adapt mowing, grazing and other equivalent agricultural activities	46.6
6510	CA09: Manage the use of natural fertilisers and chemicals in agricultural (plant and animal) production	100.0

Description of the grassland, swamp and fen meadow habitats surveyed:

The floodplain grasslands within the River Little Brosna Callows NHA cover a large area and it was not possible to survey all areas of semi-natural floodplain grassland within the NHA during this project. The focus of the survey within the NHA was on the southern side of the river (Co. Tipperary), which unlike the northern side of the river (Co. Offaly) had not been surveyed during the ISGS.

Semi-natural wet grassland (GS4) was the most common habitat within the areas surveyed within the River Little Brosna Callows NHA. The areas of semi-natural grassland within this site represent a valuable conservation resource

that supports a diversity of wildlife, including rare invertebrates. Within the GS4 areas, some fields are ranker and dominated by *Juncus effusus*, or in some cases *Deschampsia cespitosa*, whereas other fields have a more grassy sward with *Agrostis stolonifera, Alopecurus pratensis* and *Holcus lanatus* more common, together with higher broadleaf herb diversity. Areas of the floodplain where smaller sedge species, such as *Carex nigra*, are dominant were recorded as rich fen and flush (PF1). Other species recorded within the fen habitat include *Caltha palustris, Galium palustre* and *Eleocharis palustris*. Freshwater marsh (GM1) was extensive within the surveyed area with *Persicaria amphibia, Rorippa* species, including *Rorippa amphibia, R. palustris* and *R. nasturtium-aquaticum, Mentha aquatica, Myosotis* species, *Equisetum fluviatile,* and *Agrostis stolonifera* (Figure 1).

The Annex I habitat *Molinia* meadows (6410) was recorded within four fields (polygons 000564_4, 000564_7c, 000564_11, 000564_27) within the west of the site. Plant species recorded within the 6410 habitat included *Cirsium dissectum, Galium uliginosum, Carex pulicaris, Carex nigra, Carex panicea, Molinia caerulea, Filipendula ulmaria, Mentha aquatica, Ranunculus flammula* and *Succisa pratensis*. Areas of potential 6410 habitat were also recorded (e.g. polygons 000564_106, 000564_146), these areas were judged to be p6410 either due to a lack of high quality species such as *Cirsium dissectum*, or a lack of positive indicator species. The Annex I habitat Annex I habitat Lowland hay meadows (6510) was recorded within two adjacent fields (000564_269, 000564_277) in the east of the site. Plant species recorded within the 6510 habitat included *Leucanthemum vulgare, Lotus corniculatus, Alopecurus pratensis, Centaurea nigra, Crepis capillaris, Hypochaeris radicata, Plantago lanceolata, Filipendula ulmaria, Lathyrus pratensis, Ranunculus acris* and *Trifolium pratense.* Extensive areas of potential 6510 habitat were also recorded within the NHA such as the abandoned meadows within polygon 000564_16 (Figure 2). Areas of potential 6510 habitat were judged to be p6510, rather than actual 6510, either due to a lack of high quality species such as *L. vulgare and L. corniculatus,* or due to abandonment.

Polygon 000564_244f, which occurs between cutover bog to the west and the river to the east, is extremely wet in the centre and several snipe were flushed from this area during the survey.

Figure 1 Freshwater marsh (GM1) habitat at the River Little Brosna Callows NHA (Site 564). Photograph Fionnuala O'Neill.

Figure 2 Potential Lowland hay meadows (p6510) habitat recorded in an abandoned field within the River Little Brosna Callows NHA (Site 564). Photograph Jim Martin.

Rare floodplain grassland plant species: No rare plant species were recorded at this site, but a larval web for the rare butterfly Marsh fritillary was recorded within an area of *Succisa pratensis* in the west of polygon 000564_7b.

Conservation assessment for the Annex I habitats assessed at the site:

Based on the baseline data for the target Annex I habitats collected by Heery (1993) and the ISGS (O'Neill *et al.*, 2013) (discussed in detail below), the *Area* parameter for 6410 is assessed to be Unfavourable-inadequate as a known area of approximately 2.9 ha of the 6410 habitat has been lost from polygon 564_26, representing a rate of loss for the total area of the 6410 habitat within the NHA of <1% per annum. It should be noted that the total current area of 6410 habitat for the River Little Brosna Callows NHA is 11.0 ha, which includes the 3.6 ha recorded during the current survey and the additional 7.4 ha recorded during the ISGS which is assumed to still be present. As discussed below, the loss in area for the 6410 habitat at the site could be greater than just this one field and could include a further six fields in the north of the site. The *Area* parameter for 6510 is assessed to be Favourable in the absence of any previous data for the Annex I habitats at the site. There are some indications that the area of 6510 habitat at the site has increased over time as the two adjacent fields (000564_269, 000564_277) where the 6510 habitat was recorded during the current survey were recorded as lowland wet grassland by Heery (1993).

No plots were recorded within the River Little Brosna Callows NHA during the current survey to assess the *Structure and functions* of the target Annex I habitats. Instead, an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present. Three high quality indicator species, *Cirsium dissectum*, *Galium uliginosum*, and *Carex pulicaris*, and seven additional positive indicator species were noted within the four polygons where the 6410 habitat was recorded. Two high quality species, *Leucanthemum vulgare* and *Lotus corniculatus*, and nine additional positive indicator species were noted within the two polygons where the 6510 habitat was recorded. Although *Lolium perenne* was noted within one of the 6510 fields, the negative species criterion was passed as the species was not flagged as having a cover above the 10% threshold. Both the 6510 meadows were judged to have been mown at the end of July. Based on these limited data the *Structure and functions* parameter is assessed as Favourable for both the 6410 and 6510 habitats at the site.

The negative pressure L02: natural succession resulting in species composition change, is negatively impacting 47% of the area surveyed and scrub was recorded as present within all 6410 areas. For the 6510 habitat A19: the application of natural fertilisers (slurry spreading) on agricultural land, is negatively impacting all of the habitat. These pressures, together with the loss in area for the 6410 habitats, result in an assessment of Unfavourable-bad for the *Future prospects* for both the 6410 and 6510 habitats (Table 1).

Table 1 *Future prospects* (FP) assessment for the two target Annex I habitats recorded at River Little Brosna Callows NHA (Site 564). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6410	U-I	Fav	U-B	>25% of the area surveyed during the current survey is impacted by natural succession resulting in species composition change, area loss
6510	Fav	Fav	U-B	100% of the area is impacted by the application of natural fertilisers (slurry spreading) on agricultural land

The overall assessment for both the target Annex I habitats recorded during the survey is Unfavourable-bad (Table 2). A negative trend was assigned to the 6410 habitat due to the loss in area recorded since Heery (1993) surveyed the area. In the absence of any previous data for the 6510 habitat at the site no trend was assigned.

Table 2 Overall assessment for the two target Annex I habitats recorded at River Little Brosna Callows NHA (Site 564).

Parameter	6410	6510
Area	Unfavourable-inadequate	Favourable
Structure and functions	Favourable	Favourable
Future prospects	Unfavourable-bad	Unfavourable-bad
Overall assessment	Unfavourable-bad	Unfavourable-bad

Site management:

On the day of the survey 16% of the floodplain was considered to be managed too intensively, 13% was abandoned or undermanaged, and 69% of the survey area was considered to be appropriately managed. The final 1% of the area assessed was covered by habitats where the management regime was not assessed, such as wet woodland.

Other factors impacting the site:

This site would have been impacted in the past by the industrial peat cutting of the bogs within the River Brosna catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river, negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river.

Examples of best practice:

The large polygon 000564_244, which was subdivided into smaller sections during the survey, is a complex of, at times, very wet swamp, marsh and wet grassland that could be difficult to manage, but the level and type of grazing appears to be suitable for the habitat. The southern half is extensively grazed by cattle and donkeys, while most of the northern half, where the wettest areas of habitat occur, appears to be largely unmanaged. However this area appears to be excellent habitat for birds, with lapwing, snipe and geese observed during the survey.

Previous studies at the site:

There are seven floodplain grassland plots from the National Vegetation Database located within the River Little Brosna Callows NHA, and three additional ISGS plots that were recorded within non-target floodplain grassland habitats such as Reed and large sedge swamp (FS1). All of the historical plot data were recorded north of the river and did not overlap with the data recorded during the current survey. The River Little Brosna Callows NHA was previously surveyed by Nairn *et al.* (1988) and Heery (1993). Heery (1993) identified a sedge-rich wet grassland community, which is judged to have corresponded closely to the 6410 habitat, in eight fields within the NHA. Two of these fields were visited during

the current survey and the 6410 habitat was identified in one of these (polygon 000564_7c) but not in the other (polygon 000564_26). The other six 6410 fields recorded by Heery (1993) overlap with the area surveyed by the ISGS and were therefore not revisited during the current survey. Where there is overlap between the two surveys the 6410 habitat was not recorded by the ISGS survey indicating that additional areas of 6410 habitat have been lost since Heery (1993) surveyed the area. Heery (1993) observed during his survey that many of the fields with sedge-rich wet grassland, including areas with *Cirsium dissectum* and *Carex pulicaris*, had been agriculturally improved and it seems likely that agricultural improvement has continued to impact negatively on the 6410 habitat, contributing to further losses. Heery (1993) did not record any areas of meadow that corresponded to the Annex I habitat 6510. The two adjacent fields (000564_269, 000564_277), where the 6510 habitat was recorded during the current survey, were recorded as lowland wet grassland by Heery (1993), but unfortunately neither Heery nor Nairn *et al.* (1988) recorded the management within these fields.

3.27 Rinn River NHA, Co. Leitrim and Longford (Site No. 691):

Location data: Site centroid (ITM) 609300 786900, EPA subcatchment Shannon[Upper]_SC_050

2021 total area surveyed (ha): 131.32

Ranking: =5th highest scoring site from 2021 field survey. Score of 5/10

2021 Fossitt habitats:

Primary habitats	Area (ha)	% of survey area
FS1	6.87	5.23
GS2	7.16	5.45
GS4	94.14	71.69
Secondary habitats	Area (ha)	% of survey area
ED3,FS1,FS2,GA1,GM1,GS1,GS2,GS4,HD1,PF1,PF3,WN6,WS1	23.15	17.63

2021 Annex I habitats; including any potential (p) target habitats:

Primary habitats	Area (ha)	% of survey area
6430	<0.01	0.00
6510	0.10	0.07
p6510	0.24	0.18
7140	<0.01	0.00
Secondary habitats	Area (ha)	% of survey area
None	Not recorded	Not recorded

2021 management regime:

Management regime	Area (ha)	% of survey area
Abandoned pasture	5.64	4.29
Abandoned - original management unknown	30.48	23.21
Extensive mowing with aftergrazing	10.16	7.73
Extensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	0.79	0.60
Extensive pasture - cattle	73.18	55.73
Extensive pasture - horses	0.57	0.43
Intensive mowing with no aftergrazing	1.20	0.91
Intensive mowing - aftergrazing unknown (i.e. it is unknown if aftergrazing is occurring)	9.32	7.09

2021EU negative pressures recorded for the target Annex I habitats

Primary habitat	Pressures	Intensity	% of Annex I habitat impacted
6510	None recorded	-	-

2021 EU conservation measures recorded for the target Annex I habitats

Primary habitat	Conservation measures	% of Annex I habitat impacted
6510	CA03: Maintain existing extensive agricultural practices and agricultural landscape features	100.0

Description of the grassland, swamp and fen meadow habitats surveyed:

The majority of the semi-natural grassland habitat within the survey area is wet grassland (GS4). The areas of semi-natural grassland within this site represent a valuable conservation resource that supports a diversity of wildlife. *Glyceria fluitans* and *Agrostis stolonifera* are common components of the more inundated GS4 habitats nearer to the river. *Juncus effusus* is abundant to dominant within many of the more rank GS4 swards (Figure 1). In the north of the site there are fields (polygons 000691_179, 000691_199) with a more species-rich GS4 community (Figure 2) that includes *Anthoxanthum odoratum, Festuca pratensis, Filipendula ulmaria, Lychnis flos-cuculi, Plantago lanceolata* and *Ranunculus* species. A small area of the Annex I habitat Hydrophilous tall-herb (6430) was recorded within polygon 000691_115, with *Filipendula ulmaria, Lythrum salicaria, Calystegia sepium* and *Geum rivale* common within the habitat. Small areas of drier grassland were recorded within the site. One small area (western end of polygon 000691_104) that was managed by annual mowing corresponded to the Annex I habitat Lowland hay meadows (6510). The meadow had recently been mown, but *Leucanthemum vulgare* and six other positive indicators for the habitat were found within the hay that was drying in the field. An area of potential 6510 was also recorded (polygon 000691_82), this area was judged to be p6510 due to a lack of positive indicator species. This area was judged to be intensively managed which could account for the lack of positive indicator species.

Figure 1 Semi-natural wet grassland (GS4) within the Rinn River NHA (Site 691). Photograph Jim Martin.

Figure 2 Species-rich semi-natural wet grassland (GS4) within the Rinn River NHA (Site 691). Photograph Orla Daly.

Rare floodplain grassland plant species: No rare plant species were recorded at this site during the survey.

Conservation assessment for the Annex I habitats assessed at the site:

As the area of 6430 habitat recorded within the Rinn River NHA was very small (<100 m²), no conservation assessment was undertaken for the habitat. No plots were recorded within this site to assess the *Structure and functions* of the 6510 habitat and instead an indicative assessment of the conservation status was made based on the results of the walkover survey and additional notes that were recorded on habitat condition or species present.

The *Area* parameter for 6510 at the site is assessed to be Favourable, in the absence of any previous data for the Annex I habitat at the site. The *Structure and functions* assessment is assessed as Favourable based on limited data, with the 6510 habitat passing the positive indicator species criterion with one high quality species and six positive indicator species recorded within the field. No negative impacts were recorded for the 6510 habitat and therefore the *Future prospects* are also judged to be Favourable (Table 1).

Table 1 *Future prospects* (FP) assessment for 6510 at Rinn River NHA (Site 691). Fav=Favourable, U-I=Unfavourable-Inadequate; U-B=Unfavourable-Bad.

Habitat	FP of Area	FP of S&F	FP of site	Rationale
6510	Fav	Fav	Fav	Positive and negative impacts in balance

The overall assessment is Favourable (Table 2), no trend was assigned due to the absence of any previous data for the Annex I habitat at the site.

Table 2 Overall assessment for the 6510 habitat at Rinn River NHA (Site 691).

Parameter	Conservation status
Area	Favourable
Structure and functions	Favourable
Future prospects	Favourable
Overall assessment	Favourable

Site management:

On the day of the survey 8% of the floodplain was considered to be managed too intensively, 31% was abandoned or undermanaged, and the remaining 61% of the survey area was considered to be appropriately managed.

Other factors impacting the site:

This site would have been impacted in the past by the industrial peat cutting of the bogs within the Upper Shannon catchment and the subsequent increases in suspended solids that enter the river. Significantly increased levels of suspended solids will increase the turbidity and silt levels within the river negatively impacting aquatic plants and animals in particular. However, since 2020 Bord na Móna have ceased peat cutting and in addition silt traps were often used to reduce the impacts of suspended solids entering the river. There are no significant levees within the site.

Examples of best practice:

No examples of best practice were recorded at this site.

Previous studies at the site:

There are three floodplain grassland plots from the National Vegetation Database located within the Rinn River NHA and they were recorded in 2009 as part of the survey of the ISGS site Cloonmorris (Site 880). All three plots were recorded within semi-natural wet grassland (GS4).

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