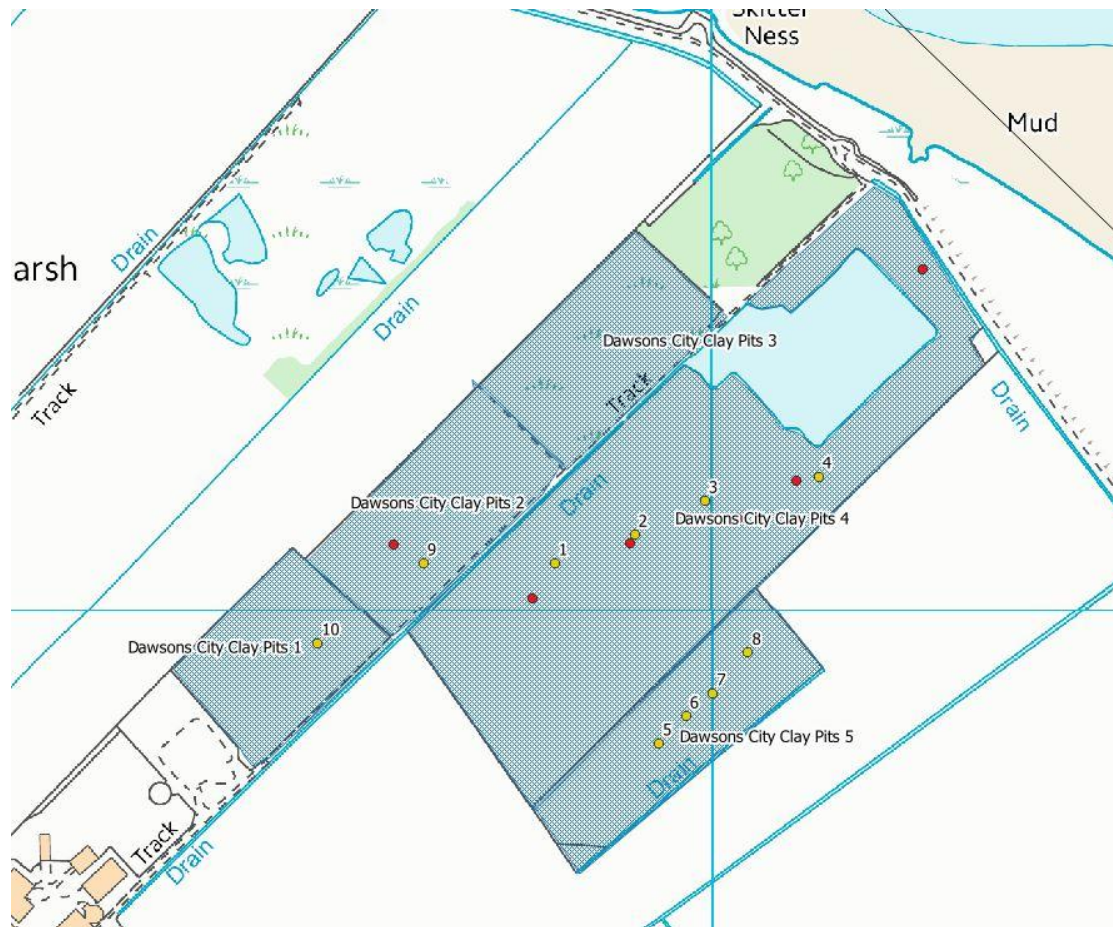


Site Visit Assessment Form – Dawson City Claypits, Lincolnshire.

Update following re-visit in 2022



Yellow dots are quadrat locations visited in 2022.

Red dots are those visited in 2017.

2022 amendments to the form are in red text

| | | | |
|--|---|---|---|
| Site Name Dawson City Claypits | Grid Ref 1=TA 126249 2=TA 128250 3=TA 129251 4=TA129250 5=TA 129249 | County Lincolnshire | |
| River Humber (estuary) | Ownership Lincolnshire Wildlife Trust | Designation Nature Reserve | Size (ha) 1=1.3 2=1.56 3=1.47 4=6.15 5=1.57 |
| Date 13/07/2017 22/06/2022 | Meeting with LWT staff | Managed by Lincolnshire Wildlife Trust | |
| Management and History | | | |

Part of it was a gift (in 1986) to the Trust and another part purchased by the Trust in 1991.

Was most likely arable before, but has been pasture for many years - heavily grazed with cattle. In 2000 a hay cut was introduced and since then these grasslands have been cut annually after 15 July and aftermath grazed which has resulted in weed cover reduction.

In Countryside Stewardship/HLS and has been hay cut after 15th July, with aftermath grazing by sheep from Nov-Apr, for at least last 10 years.

Field 1, according to Natural England, this field is too wet to restore. Mainly grassy. Currently cut annually.

Field 2 is grassy.

According to the scheme, fields 2 and 5 are down for the restoration of species-rich, semi-natural grassland, including habitat for wintering waders and wildfowl such as curlew and lapwing.

Fields 1 and 4 are in the scheme for the maintenance of wet grassland for wintering waders such as curlew, lapwing and snipe

Field 3 – restoration of reedbeds for reed bunting

Fields 1, 2, 4 and 5 have a supplement for hay making.

Restoration

Technique used/Dates

Field 4 – donor site at the top of the field, near the reed bed on the clay pit. Any nice-looking area of the field could become a donor.

For last three years, and in 2017 as well, green hay from the donor part of the meadow has been put on top of the recently cut field, and then grazed by sheep. All three fields (2, 4, 5) receive green hay on the same day hay has been cut.

Hydrology

Flooding regime
Water management
Soil-water levels (indicated by auger hole/any other data)

Bottom parts of field 1 and 4 near the clay pit flood occasionally. The rest of the field doesn't flood often.

Historical information

Current site interest

Attached excel spreadsheet for botanical data

Field 1 wasn't surveyed. It is very grassy.

In 2022, one botanical quadrat was recorded in Field 1 to get an estimate of species richness in the meadow. The sward is dominated by 9 species of grasses, 7 forb

species are scattered, but in places have cover up to 20%. The site is kept wet, so 60% cover of Creeping bent is not surprising.

Field 2 was a very grassy field and was not surveyed apart from one quadrat (no. 237). Grass growth is very vigorous growth of the grasses and suggests high soil nutrient levels. Apart from tufted vetch *Vicia cracca* and white clover *Trifolium repens* there were no other forbs recorded on the quadrat. Another 12 species recorded were all grasses, amongst which Yorkshire fog *Holcus lanatus*, meadow barley *Hordeum secalinum* and Timothy *Phleum pratense* were recorded in equal proportions and dominated the community. According to the soil sample, phosphorus available to the plants (Olsen P=8.92) appears to be quite low for the floodplain habitat. The dominating grasses are not exceptionally strong competitors themselves, and the soil nutrient levels are low, so their dominance could be explained by the high amount of bare ground and an absence of forbs which do not seem to have germinated well on the field.

In 2022, 17 species have been recorded on 1 m². Red fescue, Crested dog's-tail, Smooth Brome and Creeping bent are four dominant grasses with similar cover. Nine species of forbs are noted in small abundance, but their presence increased substantially over five years.

Field 3 is part covered with reed bed, with other areas being very grassy. There is a dominance of meadow barley *Hordeum secalinum*, false oat grass *Arrhenatherum elatius* and cock's-foot *Dactylis glomerata*. One of the target grass species – yellow oat grass *Trisetum flavescens*, was also abundant in patches. Common mouse-ear *Cerastium fontanum*, meadow vetchling *Lathyrus pratensis*, meadow buttercup *Ranunculus acris* and goat's-beard *Tragopogon pratense* were among target forbs which have appeared in small amounts, and are well established on the field.

Field 4 is the largest field, very topographically diverse, ranging from clay pits to the large open areas. Reedbeds occupy the former clay pits (the area was not surveyed). The north-west corner of the pits has very species-rich vegetation, which could be an ideal donor of green hay for the rest of the fields. Such target species as common knapweed *Centaurea nigra*, common agrimony *Agrimonia eupatorium*, ladies bedstraw *Galium verum*, bird's-foot trefoil *Lotus corniculatus* and selfheal *Prunella vulgaris* were recorded there. The north-east corner, which floods occasionally, is very grassy and species poor. The main donor area lies south of the pits, but any nice-looking area could be cut for donor green hay. The dominance of meadow barley *Hordeum secalinum* and false oat grass *Arrhenatherum elatius* in some areas can be explained by their tendency to grow later in the season, after yellow rattle has completed its own growth cycle. Therefore regular late cutting can increase the dominance of these species. *Rhinanthus minor* (yellow rattle) was still dominant in the community on 14th July, reaching a cover of 30%. Fifteen species of grasses were recorded on 5 botanical quadrats, but no grasses were obviously dominant. Legumes like tufted vetch *Vicia cracca*, white clover *Trifolium repens*, red clover *Trifolium pratense* and meadow vetchling *Lathyrus pratense* were well established in the plant

community all across the field. Ribwort plantain *Plantago lanceolata* had up to 20% cover in some areas.

Overall, the vegetation on the field was not even. Dispersal of propagules from the species-rich north-west corner of the field is desirable even though the average species richness was 18.4/m². Vegetation appeared closest to the MG4 Typical NVC community. The soil profile at quadrat 233 showed a significant fluctuation of groundwater in the field, with the water table standing at about 50-60 cm depth for prolonged periods. The soil therefore looks very suitable to accommodate the MG4 plant community.

In 2022 botanical survey was carried out on five 1 x 1 m quadrats scattered across the field 4 (Map). The vegetation appeared more species rich (on average 20.2 sp/m²) compared to 18 sp/m² in 2017.

The plant community has developed a higher similarity to MG4 grassland (Table 1) since 2017. Rotation in application of green hay to different parts of the field on different years has resulted in much more even vegetation across the site.

Ellenberg indicator scores suggest the soil moisture has remained quite stable in the field, however the soil nutrient level has slightly decreased over last five years (Table 1). Even though grasses are still dominant in the sward, forbs are spread more or less evenly in the field. Red clover and yellow rattle have the highest abundance, up to 30% in places.

Functional diversity in the plant community is reaching desired ratios between competitive, stress-tolerant and ruderal species, similar to the best examples of MG4 meadows.

Field 5 was very grassy, with dominance of creeping bent grass *Agrostis stolonifera*, *Alopecurus pratensis*, couch grass *Elytrigia repens*, meadow barley *Hordeum secalinum* and occasional yellow oat grass *Trisetum flavescens* despite yellow rattle being plentiful on the field. Some target meadow forbs like common sorrel *Rumex acetosa*, meadow buttercup *Ranunculus acris*, meadow vetchling *Lathyrus pratense* and red clover *Trifolium pratense*, are present in the field. Other species like ribwort plantain *Plantago lanceolata* and bird's-foot trefoil *Lotus corniculatus* are still very uncommon.


In 2022, a botanical survey was carried out on five 1 x 1 m quadrats. This has allowed an estimate of the species richness and plant community (Table 1).

The field is wetter and more fertile, according to Ellenberg indicator scores, than Field 4 (Table 1). In these conditions, grass dominance is higher although the species composition is very similar. Forbs preferring drier soils, like bird's-foot-trefoil, bulbous buttercup and yellow rattle were not recorded in the field in 2022. The functional diversity of the plant community is not well balanced (Table 3).

Neither Fields 4 nor Field 5 qualify on the Priority Habitat Inventory for Lowland Meadows which is surprising given their diversity and progress on the restoration assessments (Tables 4 and 5). Insufficient data were collected to assess Fields 1, 2 and 3.

| | |
|--------------------------|--|
| Phosphorus levels | A soil sample was taken at Quadrat 237 on Field-2 pH=6.53, Olsen P=8.92 mg/kg PO ₄ ^{-P} |
|--------------------------|--|

Soil profiles

| | |
|--|---|
|  | <p>Soil profile at quadrat 233</p> <p><i>A horizon</i> 0 – 10 cm – fine peat with silt</p> <p><i>B horizon</i> 10 – 20 cm – loam with iron 20 – 50 cm – clay loam with a lot of iron and slight gley 50 – 60 cm – transition layer 60 – 70 cm – fine blue gley clay 70 – 120 cm – brown silty clay with a lot of iron, gley and large inclusions of organic matter.</p> <p>Soil type for all fields is 814c (Soil Series) described as: NEWCHURCH 2 - seasonally wet deep clay. Marine alluvium. Deep stoneless mainly calcareous clayey soils. Groundwater controlled by ditches and pumps. Flat land. Risk of flooding in places. Permanent grassland with winter cereals in Somerset and Avon; cereals, sugar beet, potatoes and field vegetables in the Eastern Region.</p> |
|--|---|

Site manager aspirations/objectives

Continue to develop species rich meadows for HLS objectives.

Management recommendations

Field 2 requires harrowing after the hay cut and before the application of green hay. This would increase the chances of forb seeds germinating successfully.

Fields 3 and 5 would benefit from a double hay cut which will suppress the dominance of the grasses and give a better opportunity for target forbs to establish in the fields. The north-west corner of Field 4 is the best donor site for green hay, however it is not very large, so green hay from there could be applied to the small area of one or another field in alternating years. The absence of such species as common knapweed

Centaurea nigra, common agrimony *Agrimonia eupatoria*, selfheal *Prunella vulgaris* and oxeye daisy *Leucanthemum vulgare* in the restoration fields could be caused by their later seed production. Suggest taking a later hay cut followed by green hay spreading in years when green hay is to be spread, to help establishment of those species in the restoration fields (e.g. end July). However, it is not recommended to routinely cut later in the season, and in those fields where grass is dominant, earlier cuts would be desirable (end June). Therefore green hay applications could be staggered to be carried out (say) once every three years, resulting in a later hay cut and application every three years and earlier cuts in between times.

Given the current high diversity of the field, a botanical re-survey in 2023 is recommended, focussing on PHI indicator species, stopping at between 10 and 20 points in each field in order to pick up as many of the indicator species across the field as possible. If the fields do qualify it is recommended to submit the data to Natural England if future Stewardship schemes are desirable.

Table 1. Summary of botanical data.

| Dawson City Claypits | | | |
|--|---------------|--------------|--------------|
| | Field 4 2017 | Field 4 2022 | Field 5 2022 |
| Ellenberg F (moisture tolerance) | 5.3 | 5.3 | 5.48 |
| Ellenberg N (fertility) | 5.3 | 5.04 | 5.32 |
| Ellenberg R (Reaction) | 6.42 | 6.24 | 6.42 |
| Species/quadrat (mean and range /1 m x 1 m) | 18.4 (15-22) | 20 (18-22) | 17 (16-19) |
| NVC (top 2 MAVIS subcommunities) | MG4b MG4v2 | MG4b MG4a | MG6 MG4c |

Table 2. Five categories of meadow restoration progress, measured by indicator scales based on species richness, NVC similarity score and ratios of Grime's plant functional types. Adapted from Rothero, Tatarenko & Gowing, 2020.

| Field 4 | Score of success/progress | | | | |
|--|---------------------------|---------|--------|-------|-----------|
| | 1 Failure | 2 | 3 | 4 | 5 Success |
| Average scores from five botanical quadrats per field. Calculated in MAVIS | | | | | |
| Species richness (number of species per 1 m ²) | <8 | 8 to 12 | 13-15 | 16-20 | >20 |
| NVC similarity score | <50% | 50-55% | 55-60% | >60% | >60% |
| C:S ratio | 1.65 | 1.39 | 1.23 | 1.1 | 1.09 |
| S:R ratio | 0.67 | 0.79 | 0.81 | 0.89 | 0.93 |

Table 3. Five categories of meadow restoration progress, measured by indicator scales based on species richness, NVC similarity score and ratios of Grime's plant functional types. Adapted from Rothero, Tatarenko & Gowing, 2020.

| Field 5 | Score of success/progress | | | | |
|--|----------------------------------|---------|--------|-------|-----------|
| Measure | 1 Failure | 2 | 3 | 4 | 5 Success |
| Average scores from five botanical quadrats per field. Calculated in MAVIS | | | | | |
| Species richness (number of species per 1 m ²) | <8 | 8 to 12 | 13-15 | 16-20 | >20 |
| NVC similarity score | <50% | 50-55% | 55-60% | >60% | >60% |
| C:S ratio | 1.65 | 1.39 | 1.23 | 1.1 | 1.09 |
| S:R ratio | 0.67 | 0.79 | 0.81 | 0.89 | 0.93 |