Great Ayton Floodplain Meadow Creation

Introduction to the project

Great Ayton Parish Council, in conjunction with its Brighten Up Great Ayton group, have worked on a 2-year project to create a floodplain meadow on riverside land behind the old Friends School in 2022-23. Following the development of a Pollinator Plan for Great Ayton in 2019, the field itself was identified as a potential 'floodplain meadow' a habitat with a nationally rare plant community. The aims of the project were to increase the biodiversity within the village and help to engage and increase the skills and knowledge of local people and visitors with regards to the importance of the floodplain habitat.

A successful application was made to the Margaret K Mawston Environmental Trust, by the Parish Council, in conjunction with the Brighten Up Great Ayton group, to pay for picnic benches, a project webpage and interpretation panels. The application included match funding from the Parish Council in terms of paying for: the expertise of botanist Martin Allen to undertake an audit of the flora of the meadow and leading a number of walks round the meadow; and the cutting of grass by the Council's grounds team. Additional match funding was provided through voluntary time to publicise and support the walks by members of the Brighten Up Great Ayton group. Details of the original plan and budget are in Appendix A.

Year 1 – 2022

Audit of meadow

Martin Allen undertook an audit of the site over several visits. He identified a total of 136 different varieties of plants and trees. This list has since been added to and can be found in Appendix B. He also researched the history of the site with support from Great Ayton History Society (see Appendix C).

"*When I visited in July there were bees on the thistle flowers, hoverflies on the white hogweed, with butterflies flitting in between, and when I walked through the long grass small clouds of a white micro-moth took to the air – this year has been a big pollinator success story for the Floodplain Meadow.*" Martin Allen

Events

Two well received plant ID walks were held in May and June. The first of these also explored the history of the site. These were followed by a seed collecting session in August.

To help extend what is already in the meadow, greater bird's foot trefoil, meadow buttercup, meadow cranesbill, red campion, water avens, and zigzag clover seeds were sown in September. The seeds were either collected from the meadow or sourced locally. The meadow was cut once this year but unfortunately due to poor weather it was cut after the planned session to rake and remove hay, so no hay was removed.

A floodplain meadow project webpage was set up on the Climate Action Stokesley and Villages website as this can be easily updated and a link provided from the Brighten Up Great Ayton section of Visit Great Ayton website.

Year 2 - 2023

Wildflower ID walk
Twenty-seven people joined the walk which was a great turnout considering it was a hot afternoon. The intro and advanced walk were combined into one walk this year based on the experience last year when people with all levels of knowledge turned up to both walks.

Visit by Northern Botany Group
The floodplain meadow was also visited by the North East Yorkshire Botany Group who survey sites and share their findings with the County Recorder. They recorded 87 species during their visit.

Raking the meadow

The Council's grounds team cut half of the meadow in early September, leaving the other half uncut until the autumn to leave seeds for birds such as goldfinches. Representatives of the Brighten up Great Ayton group, Great Ayton Wildlife Association and Climate Action Stokesley and Villages along with Martin Allen raked half the area cut. This was hard work, particularly as there had been heavy rain before the cutting which had flattened the grass leading to an uneven cut.

Next steps

As the picnic benches have had some damage, it is proposed that rather than interpretation panels there should just be a simple sign at the entrance of the floodplain meadow. The sign could include a link to the short section about the floodplain meadow on the Parish Council's website with further detail including the history of the site, which can be easily updated, on the Climate Action Stokesley and Villages website. Discussion will therefore need to take place with the Margaret Mawston Trust with regards to the use of the funding granted for the interpretation panels

A proposed management plan can be found in Appendix D which will provide habitat for the full life cycle of butterflies and moths. To highlight the importance of the site and the action the Parish Council is taking to increase the biodiversity of the area, the meadow could be nominated as a Butterfly Conservation Trust 'wild space'.

Caryn Loftus, Brighten Up Great Ayton, October 2023

Appendix A: Plan and budget

Proposed plan

Year 1 - 2022	**Activity**
Early spring	Audit and plan
Mid spring	Intro walk: plant ID and history of meadow
Late spring/early summer	Advanced walk: Technical ID of plants
Late summer	Seed collection
	Cut and remove hay
	Seed sowing: scarify, turf removal, community sowing
Autumn	Information panel
Autumn	Project webpage
Year 2 - 2023	
Mid spring	Intro walk - plant ID and history of meadow
Late spring/early summer	Advanced walk - Technical ID of plants
Late summer	Seed collection
	Cut and remove hay
	Seed sowing: scarify, turf removal, community sowing
Autumn	Project report

Proposed budget

The table below shows the breakdown of the £5,084 project including match funding.

Activity	**Who**	**Detail**	**Grant required**	**Match funding**
Provision of expertise in preparing the plan, leading walks and seed collection/sowing, writing project report	Martin Allen	5 days @ £350 /day (Great Ayton PC)		£1,750
Interpretation panel (design, manufacture and install)	Sign Art	Two lectern interpretation panels	£1,200	
Content on Bug Trail website	Studio Botez	Adding new links to information about project	£54	
Picnic benches	Thompson Timberworks	Two picnic benches, including installation	£600	
Publicising and supporting walks and seed collection/sowing	Brighten Up Great Ayton	On a voluntary basis = 44 hours @ £20/hour[1]		£880
Cut and remove hay	Council grounds team	30 hours @ £20/hour (Great Ayton PC)		£600
		Total	**£1,854**	**£3,230**

[1] Heritage Lottery rate for match funding by skilled volunteers

Appendix B: Species list

Plants in the Floodplain meadow at Great Ayton

Martin Allen, October 2023

The Floodplain Meadow site has examples of both native and non-native plants, some of which were planted by the various landowners over the years, and some have arrived of their own accord. Three surveys are included in this report, one carried out by Vince Jones and Dorothy Sills in 1986, amalgamated survey results during visits in 2022 by me, and a visit by North East Yorkshire Botany Group (NEYBG) on 17 July 2023 led by Dave Barlow.

We found a cumulative total for the site of 170 different plant species, 136 are native species (though some have been planted on this site or perhaps, like Beech, are not native to the north of England), four are archeophytes (naturalised: introduced by man before 1500 AD), 18 are neophytes (naturalised: introduced by man after c1550 AD) and 12 non-native (planted as decorative/timber tree or shrub/plant).

Locally notable or interesting native species

- **Toothwort;** an unusual plant having no green chlorophyll and so it gets food to grow from being parasitic on woody plants like Hazel or Ash, but here seems to be growing on the roots of the Hybrid Poplar in the south-east corner of the meadow and the Lime tree at the north-east corner of the site. We only see it when it is flowering (the flowers start white and turn pinkish) in early spring but for the rest of the year it lives below ground.


- **Meadow Saxifrage;** a scarce plant in our area, found in a few damp grasslands or banks, and present as a few plants at the base of the Lime tree by the weir and I think there may be more in the mown grassland to the north of the meadow. There are also some present on the foundations of the footbridge to the south of the site suggesting they arrived there during a flooding event when the water was high; there is a population upstream near Little Ayton.


- **Broad-leaved Helleborine**; a big surprise to find this plant growing happily in the grass near the flood-water inlet. Normally this plant can be found growing in ancient woodland or on the edges of rides in conifer plantations and so it's difficult to explain how it came to be growing so happily here or how it got here, though the seeds are very fine and may have blown in the wind. Given its location it may have first germinated around 2011 when the flood alleviation scheme works occurred and then the leaves grown to the height of the mown grass but any flower spike would have been cut off, making it very hard to spot.


- **Common Bistort**; the leaves look a bit like a Dock plant, but it has spikes of dainty pink flowers in early summer. There are a few large patches (probably clonal i.e. one genetic individual that has spread over the years) growing on the river floodbank. It's more usually found in wet grassland and so sometimes the leaves wilt here in a dry summer when the tree roots make the surrounding soil very dry. This is the native plant not the more robust garden form that is sometimes found growing in the wild.

- **Goldilocks Buttercup**; growing under the large oak tree, this small buttercup relative often has small, crumpled or missing petals and is normally associated with ancient woodland but it also grows in old grassland; it is possible that it has grown on this spot when it was open grassland as well as it does now in leafy shade. It is also unusual in having differently shaped leaves at the base (rounded and lobed) compared to those on the flower stem (long and thin, looking like they are in whorls). There are many different micro-species of Goldilocks Buttercup as it can reproduce asexually (effectively producing clones of itself) and as not all of the micro-species have been described we don't know their distribution.

The main grassland community has only been in existence since 1960 when the site was sown after the lake was drained and used as a playing field. It has been regularly and closely mown since then until 2019 when the mowing was stopped. Since then the proportions of each species in the community has changed. At first the site was mainly Yorkshire-fog (photo below left from 20 June 2019) but now a much broader mix of grasses is apparent from the tall Meadow Foxtail, tufts of Cock's-foot, and more broad-leaved wildflowers like Creeping Buttercup and Hogweed (photo right from 11 June 2023).


Robust plants of Broad-leaved Dock and Hogweed show that the soil is fairly rich in nutrients and scattered examples of the biennial Spear Thistle across the site contrast with denser stands of Creeping Thistle at the southern end of the site, the latter smells strongly of honey when in flower and both are much loved by insects.
Near to the bank by the path is a damper area where Wild Angelica and Meadowsweet can be found flowering late in the year, with typical plants of meadows like the grasses Sweet Vernal-grass, Crested Dog's-tail and wildflowers Red Clover and Meadow Vetchling growing nearby. Near the picnic benches Meadow Crane's-bill can be seen with its blue summer flowers alongside a large patch of Hairy Sedge.

Decorative shrub bank. We know this area has been a shrubbery since around 1890 and so we would expect to find non-native shrubs, though most are likely to date from the late 1950's when the lake was removed and many of the trees/large shrubs on the bank were felled. Whoever planned the planting was aiming for flowers all the year round; in late winter there is the fragrant Farrer Viburnum followed by the evergreen orange-flowered Hedge Barberry along with a double pink Cherry and a magnificent white blossomed Apple tree, here on 28 April 2022.


During May the Red Horse-chestnut flowers, as well as the more familiar white Horse-chestnut, and is closely followed by a range of different Rhododendron varieties including a semi-double flower tell us that the soil is acid enough to support their growth and there is a double flowered lilac in there too. The dense thicket of Snowberry under the Apple tree is I would suggest not welcome – for despite having flowers that are a good source of nectar and later decorative white berries, it spreads…and spreads as you can see when you visit. All leading up to June when you can see the strange green and orange flowers of the Tulip tree, of which there are three planted in the southeast corner. Underneath them in late-April are big drifts of daffodils of the variety called 'Flower Record' and possibly the same bulbs planted by schoolchildren in 1958 as noted in the school magazine at the time.

Growing under the shrubs and trees on the bank are many different types of wildflower most of which can be seen if you duck under the Red Horse-chestnut just as you enter the site from the playing fields where in the spring you can spot Pignut, Wood Anemone, Bugle, and Germander Speedwell amongst others.

At the very south of the site under the conifer woodland there is not much plant growth on the ground in the dense shade but if you look closely then there are a few plants of three-nerved sandwort which have tiny white flowers with three veined leaves, and on the bank facing the meadow some native Primroses survive with large patches of Dog's-Mercury and Ramsons.

Comparing the surveys: There is very little difference between the three different surveys that can't be accounted for through the amount of time available to survey, the time of survey, and the interest of the surveyors when visiting the site.

Some plants can't be seen in the summer as all their leaves and flowers have died down like Lesser Celandine or Wood Anemone. Some grasses are hard to identify unless you visit when they are in flower.

Some wildflowers, like Bramble or Dandelion, are actually composed of many different micro-species which can be identified using specialist floras, a lot of time, and much experience. Most of us just acknowledge that we have seen a Dandelion in the broadest sense writing *Taraxacum* agg. For the scientific name where agg. is short for aggregate i.e. an aggregate of many microspecies. Sometimes we might record that we know it is a type of Willow (or Sallow) tree but we don't know which one and so record 'a sallow' and '*Salix* species'.

Different surveys by different people will note different plants and from that we can build up a more complete picture of what is growing in this area. Will there be new species still to find? Yes, some that all the surveys so far have not recorded (so keep your eyes peeled) and then more wildflowers may colonise from seed in the future either from clinging to (and dropping from) dog fur, light seeds blown in the wind, seeds carried from higher up the river valley and dropped here during a flooding event, or hopefully from the ones we collected from similar local habitats and sowed here.

Having a list of plants for a site also helps when you are learning to identify wildflowers, so if you visit the floodplain meadow site regularly then you can pick a wildflower (just one) to look for each time you visit. Doing them one at a time makes it easier to remember but also makes your visits more enjoyable as you will begin to notice more on your walk the more you learn to identify.

There are two plants not noted recently that were found in 1986, Marsh Valerian and Alternate-leaved Golden-saxifrage. Both are found higher up in the River Leven catchment area and so perhaps changes in conditions on site didn't suit them, or equally we may not have noticed them yet. I suspect that is also the case for the Moschatel noted in 1986 but not since. The record of Cornflower in 1986 may just have been a random casual plant (it happens) but as it is an annual it is unlikely to reappear.

Seeds sown in 2023: the following seeds were collected and sown on site to add diversity to the meadow and also help showcase native wildflowers from the local area that people may not otherwise see.

Greater Bird's-foot-trefoil, Common Knapweed, Common Sorrel, Meadow Foxtail, Oxeye Daisy, and Cat's-ear from Great Ayton Cemetery, collected 15 Aug 2022

Greater Bird's-foot-trefoil, Common Knapweed, Zigzag Clover, Lesser Stitchwort, Meadow Vetchling, and Pignut from the road verges near Battersby railway line, collected 15 August 2022

Zigzag Clover, Greater Bird's-foot-trefoil, and Meadow Vetchling from the southern edge of Great Ayton Playing Field, collected end July 2022

Water Avens from Battersby Avenue corner road verge, collected 17 July 2022

Site Plant list

Common Name	Scientific Name	2023	2022	1986
a cotoneaster	*Cotoneaster* sp.		P	
a hybrid Dock	*Rumex x pratensis (R. crispus x R. obtusifolius)*	P		
a Rose	*Rosa* sp.		P	
a sallow	*Salix* sp.		P	
Alder	*Alnus glutinosa*	P	P	
Alternate-leaved Golden Saxifrage	*Chrysosplenium alternifolium*			P
Annual Meadow-grass	*Poa annua*		P	
Apple	*Malus domestica*		P	
Ash	*Fraxinus excelsior*	P	P	
Barren Strawberry	*Potentilla sterilis*	P	P	P
Beech	*Fagus sylvatica*	P	P	
Betony	*Betonica officinalis*	P	P	P
Blackthorn	*Prunus spinosa*	P	P	
Bramble	*Rubus fruticosus* agg.		P	
Broad-leaved Dock	*Rumex obtusifolius*	P	P	
Broad-leaved Helleborine	*Epipactis helleborine*	P	P	
Broad-leaved Willowherb	*Epilobium montanum*			P
Bugle	*Ajuga reptans*		P	
Bush Vetch	*Vicia sepium*	P	P	P
Butterbur	*Petasites hybridus*	P	P	P
Canadian Goldenrod	*Solidago canadensis*		P	
Cleavers	*Galium aparine*	P	P	
Cock's-foot	*Dactylis glomerata*	P	P	
Colt's-foot	*Tussilago farfara*	P	P	P
Common Bent	*Agrostis capillaris*	P		
Common Bird's-foot-trefoil	*Lotus corniculatus*			P
Common Bistort	*Persicaria bistorta*	P	P	P
Common Chickweed	*Stellaria media*			P
Common Couch	*Elymus repens*	P		
Common Dog-violet	*Viola riviniana*		P	P
Common Field Speedwell	*Veronica persica*			P
Common Knapweed	*Centaurea nigra*	P	P	
Common Mouse-ear	*Cerastium fontanum*	P	P	P
Common Nettle	*Urtica dioica*	P	P	P
Common Ragwort	*Jacobea vulgaris (syn. Senecio jacobaea)*	P		
Common Sorrel	*Rumex acetosa*	P	P	
Common Vetch	*Vicia sativa*	P		
Copper Beech	*Fagus sylvatica 'Purpurea'*		P	
Cornflower	*Centaurea cyanus*			P
Cow Parsley	*Anthriscus sylvestris*	P	P	P
Cowslip	*Primula veris*		P	P
Creeping Bent	*Agrostis stolonifera*	P		
Creeping Buttercup	*Ranunculus repens*		P	P

Creeping Soft-grass	*Holcus mollis*	P		
Creeping Thistle	*Cirsium arvense*	P	P	P
Crested Dog's-tail	*Cynosurus cristatus*	P	P	
Crosswort	*Cruciata laevipes*	P	P	
Cuckooflower	*Cardamine pratensis*		P	P
Cultivated Daffodil (9? different cultivars)	*Narcissus agg.*		P	
Daisy	*Bellis perennis*		P	P
Dandelion	*Taraxacum* agg.	P	P	P
Dog-rose	*Rosa canina*	P	P	
Dog's Mercury	*Mercurialis perennis*	P	P	P
Downy Birch	*Betula pubescens*		P	
Dragon's claw Willow	*Salix babylonica var. pekinensis 'Tortuosa'*		P	
Early Dog-violet	*Viola reichenbachiana*	P	P	P
Elder	*Sambucus nigra*	P	P	
Elm-leaved Bramble	*Rubus ulmifolius*	P		
European Larch	*Larix decidua*		P	
False Oat-grass	*Arrhenatherum elatius*	P		
False-brome	*Brachypodium sylvaticum*	P	P	
Farrer viburnum	*Viburnum farreri*		P	
Field Horsetail	*Equisetum arvense*	P	P	
Field Wood-rush	*Luzula campestris*		P	P
Flowering Cherry (cultivar unknown)	*Prunus sp.*		P	
Fringecups	*Tellima grandiflora*		P	
Garlic Mustard	*Alliaria petiolata*		P	
Germander Speedwell	*Veronica chamaedrys*		P	P
Goldilocks Buttercup	*Ranunculus auricomus*		P	P
Great Willowherb	*Epilobium hirsutum*		P	P
Greater Chickweed	*Stellaria neglecta*			P
Greater Plantain	*Plantago major*	P	P	
Greater Stitchwort	*Stellaria holostea*	P	P	P
Ground-elder	*Aegopodium podagraria*	P	P	P
Ground-ivy	*Glechoma hederacea*		P	P
Groundsel	*Senecio vulgaris*			P
Hairy Sedge	*Carex hirta*	P	P	
Hard Rush	*Juncus inflexus*		P	
Hawthorn	*Crataegus monogyna*	P	P	
Hedge Barberry	*Berberis x stenophylla*		P	
Hedge Woundwort	*Stachys sylvatica*		P	
Herb-Robert	*Geranium robertianum*		P	P
Himalayan Balsam	*Impatiens glandulifera*	P	P	P
Hoary Willowherb	*Epilobium parviflorum*	P		
Hogweed	*Heracleum sphondylium*	P	P	P
Holly	*Ilex aquifolium*	P	P	
Hornbeam	*Carpinus betulus*		P	

Horse-chestnut	*Aesculus hippocastanum*		P	
Hybrid Bluebell (H. non-scripta x hispanica)	*Hyacinthoides x massartiana*	P	P	
Hybrid Poplar	*Populus x canadensis 'Robusta'*		P	
Intermediate Lady's-mantle	*Alchemilla xanthochlora*		P	
Ivy	*Hedera helix*		P	
Jointed Rush	*Juncus articulatus*		P	
Knotgrass	*Polygonum aviculare*	P		
Lesser Burdock	*Arctium minus*	P		
Lesser Celandine	*Ficaria verna*		P	P
Lesser Stitchwort	*Stellaria graminea*		P	P
Lilac (double-flowered form)	*Syringa vulgaris*		P	
Lime	*Tilia x europaea*	P	P	
Lords-and-Ladies	*Arum maculatum*		P	P
Male-fern	*Dryopteris filix-mas*		P	
Marsh Marigold	*Caltha palustris*			P
Marsh Thistle	*Cirsium palustre*	P	P	P
Marsh Valerian	*Valeriana dioica*			P
Meadow Buttercup	*Ranunculus acris*	P	P	
Meadow Crane's-bill	*Geranium pratense*	P	P	P
Meadow Foxtail	*Alopecurus pratensis*	P	P	
Meadow Saxifrage	*Saxifraga granulata*		P	
Meadow Vetchling	*Lathyrus pratensis*	P	P	P
Meadowsweet	*Filipendula ulmaria*	P	P	P
Midland Hawthorn	*Crataegus laevigata 'Paul's Scarlet'*		P	
Moschatel	*Adoxa moschatellina*			P
Nipplewort	*Lapsana communis*	P	P	P
Northern Marsh-orchid	*Dactylorhiza purpurella*		P	
Norway Maple	*Acer platanoides*		P	
Opposite-leaved Golden-saxifrage	*Chrysosplenium oppositifolium*		P	
Pedunculate Oak	*Quercus robur*		P	
Pendulous Sedge	*Carex pendula*	P	P	
Perennial Rye-grass	*Lolium perenne*	P	P	
Pignut	*Conopodium majus*		P	P
Pineappleweed	*Matricaria discoidea*	P		
Primrose	*Primula vulgaris*		P	P
Ramsons	*Allium ursinum*		P	P
Raspberry	*Rubus idaeus*	P	P	
Red Campion	*Silene dioica*	P	P	P
Red Clover	*Trifolium pratense*	P	P	
Red Dead-nettle	*Lamium purpureum*			P
Red Fescue	*Festuca rubra*	P	P	
Red Horse-chestnut	*Aesculus carnea*	P	P	
Reed Canary-grass	*Phalaris arundinacea*		P	
Rhododendron (4 or 5 different varieties)	*Rhododendron* sp.	P	P	

Rhododendron (semi-double flowered)	*Rhododendron × fastuosum 'Flore-pleno'*		P	
Ribwort Plantain	*Plantago lanceolata*		P	
Rosebay Willowherb	*Chamerion angustifolium*	P	P	P
Rough Meadow-grass	*Poa trivialis*	P	P	
Rough Sowthistle	*Sonchus asper*			P
Scots Pine	*Pinus sylvestris*		P	
Selfheal	*Prunella vulgaris*	P	P	P
Sessile Oak	*Quercus petraea*		P	
Silver Birch	*Betula pendula*	P	P	
Silverweed	*Potentilla anserina*		P	
Slender Speedwell	*Veronica filiformis*		P	P
Snowberry	*Symphoricarpos albus*	P	P	
Snowdrop	*Galanthus nivalis*		P	P
Soft-rush	*Juncus effusus*	P	P	
Spear Thistle	*Cirsium vulgare*	P	P	P
Square-stalked St John's-wort	*Hypericum tetrapterum*	P		
Steeple-bush	*Spiraea douglasii*		P	
Sweet Vernal-grass	*Anthoxanthum odoratum*	P	P	
Sycamore	*Acer pseudoplatanus*	P	P	
Tall Fescue	*Schedonorus arundinaceus*		P	
Three-nerved Sandwort	*Moehringia trinervia*		P	
Thyme-leaved Speedwell	*Veronica serpyllifolia*			P
Timothy	*Phleum pratense*	P		
Toothwort	*Lathraea squamaria*		P	P
Tufted Hair-grass	*Deschampsia cespitosa*		P	
Tulip-tree	*Liriodendron tulipifera*	P	P	
Wall Barley	*Hordeum murinum*	P		
Water Figwort	*Scrophularia auriculata*			P
Wavy Bittercress	*Cardamine flexuosa*			P
White Clover	*Trifolium repens*	P	P	
White Dead-nettle	*Lamium album*		P	P
Wild Angelica	*Angelica sylvestris*	P	P	
Wild Cherry	*Prunus avium*	P	P	
Wood Anemone	*Anemone nemorosa*		P	P
Wood Avens	*Geum urbanum*	P	P	
Wood Dock	*Rumex sanguineus*	P	P	
Wood Speedwell	*Veronica montana*		P	
Wych Elm	*Ulmus glabra*		P	
Yorkshire-fog	*Holcus lanatus*	P	P	

Green = native	though may have been planted on this site
yellow = archeophyte	naturalised: introduced by man before 1500 AD
orange = neophyte	naturalised: introduced by man after c1550 AD
blue = non-native	planted as decorative/timber tree or shrub/plant

P = plant noted on site during survey

Appendix C: History of site

A short timeline of the new floodplain meadow site at Great Ayton and its immediate area

Martin Allen, October 2023

Summary

The site has been through many changes of land use; we have records of it being parkland and pleasure shrubbery around the mid Nineteenth Century, to being turned into a lake in the early Twentieth Century, then to a playing field by 1959, making the option of a temporary lake as part of the 2011 flood alleviation scheme and finally the decision to convert the mown grass playing field into a floodplain meadow in 2019.

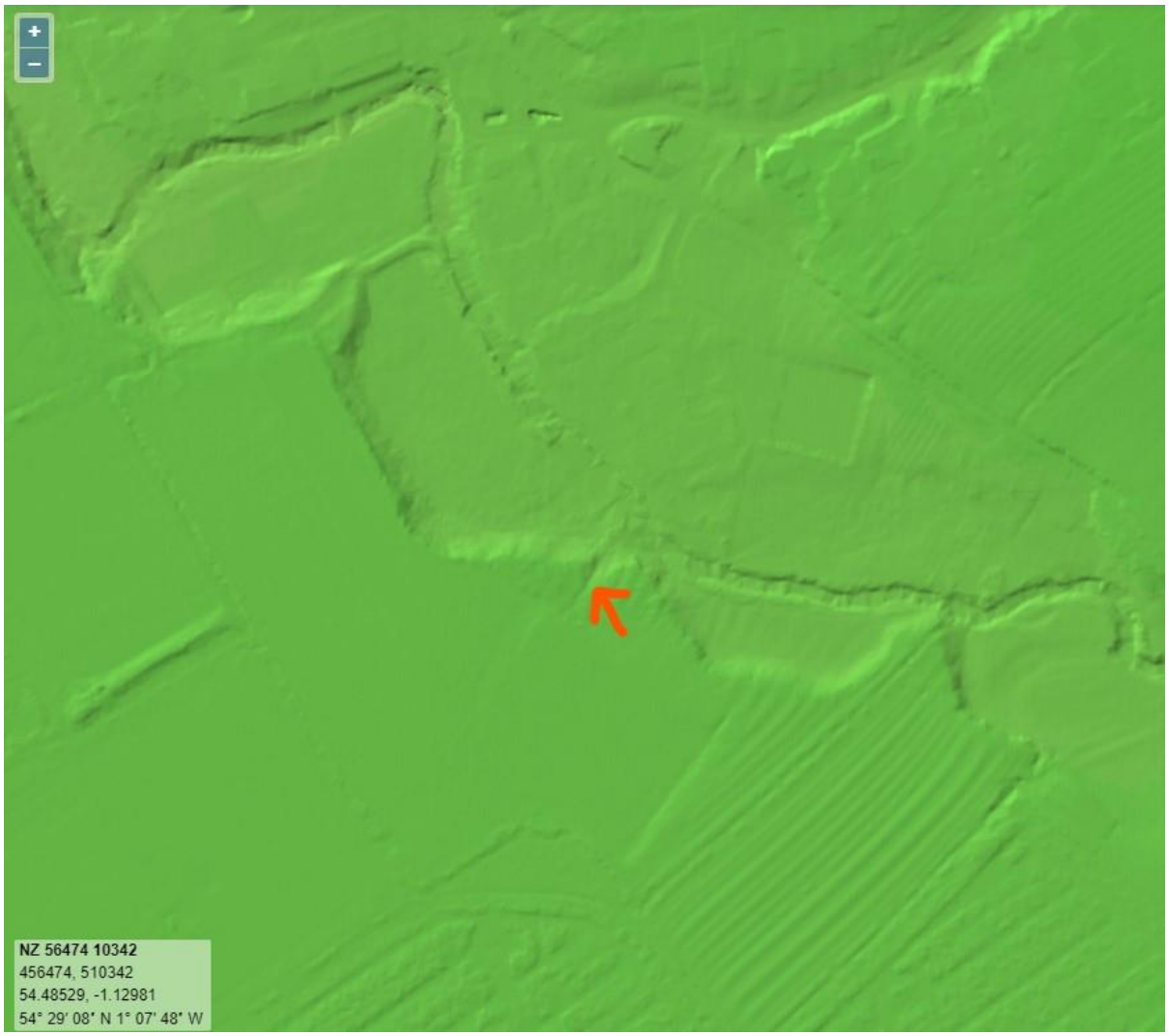
Geology

The River Leven runs through an area almost entirely of till (boulder clay) i.e. clay with pebbles/boulders and lenses of gravel which was deposited from the Devensian glacial period. Alongside the Leven there is a narrow belt of post glacial clay, sand and gravel. The solid geology underlying this part of the Ayton area is of Jurassic age. The rocks are Redcar Mudstone, cropping-out only in a small area in the river close to the weir next to the floodplain meadow (information via David Taylor, Great Ayton History Society – thank you).

The soil within the meadow (noted from mole hills) looks to be a loam, fairly light and sandy in places near the riverside, but heavier and wetter to the south of the site.

Medieval Period

A probable medieval hollow-way to the southeast leading to the existing footbridge area shows clearly on the LIDAR image below (red arrow points to it) but is currently not as noticeable on the ground given the presence of dense shrubs growing on or adjacent to it. It is possible that this place was historically a ford across the river. The hollow-way is also on or immediately adjacent to the boundary line created in 1782 between Great Ayton and Little Ayton Parishes.



The wide ridge and furrow visible on the grassland area to the south-east of the hollow-way is typical of early medieval ploughing and the plough has clearly continued from the land to the south down the slope towards the River. Of interest on the slope area are two patches of Great Burnet and one of Common Bistort, both long-lived plants of damp meadows. On the lower area, adjacent to the river, patches of Wood Anemone grow amongst the grass and on patches on the slope; we typically see this as a woodland wildflower, but it also flourishes in damp undisturbed pasture.

The presence of the wide ridge and furrow and the three plant species mentioned suggest that this land area may not have been ploughed for hundreds of years (possibly since approx 1350 AD when black death reduced the population by a third to a half with consequent reduction in area ploughed). It is possible that although this field has not been ploughed that it has been sprayed with weedkiller at some point in the more recent past (1970s/80s), killing off much of the broad-leaved wildflowers that were present and leaving only those that have leaves that die down in the summer like Wood Anemone and any wildflowers on steep slopes, alongside the grasses.

Enclosure of the Great Ayton occurred in 1658 and this would be when the main hedgerows were planted around the boundary of owners' allotted land. There are no Enclosure hedges adjacent to the floodplain meadow site but the straight hedge to the south-west of the playing fields (and its adjacent ditch) could well be such a hedge.

"The motive for enclosure was the desire by freeholders to profit from the booming trade in dairy products, by raising cattle on enclosed pasture rather than pursuing arable farming."
http://greatayton.wdfiles.com/local--files/agriculture/Enclosure-of-the-Open-Fields-in-1658.pdf

1788; A possible time for the weir on the River Leven (adjacent to the floodplain meadow site) to have been built as a flax spinning mill to create thread for Linen was started on the river corner and would have needed water to power the mechanised spinning machines. At the same time as building the weir, the flood bank adjacent to the river (shown in the engraving of 1841) would have been built to enable a suitable depth of water to be held behind the weir enabling the mill to be powered for a set length of time until the water ran out when the sluice gates were closed for the water level to build up again. In the 1840s the Mill was bought by the Friends school and converted for corn grinding, threshing and sawing.

1840 Flood. There have been many floods that caused damage along the River Leven but a particularly notable one for which there is evidence was on 22nd July 1840 when an extraordinarily intense summer storm during the previous night caused the failure of two dams in Kildale sending a two-metre high wave of water through the village, undermining some of the buildings and flooding buildings in Stokesley. This flood

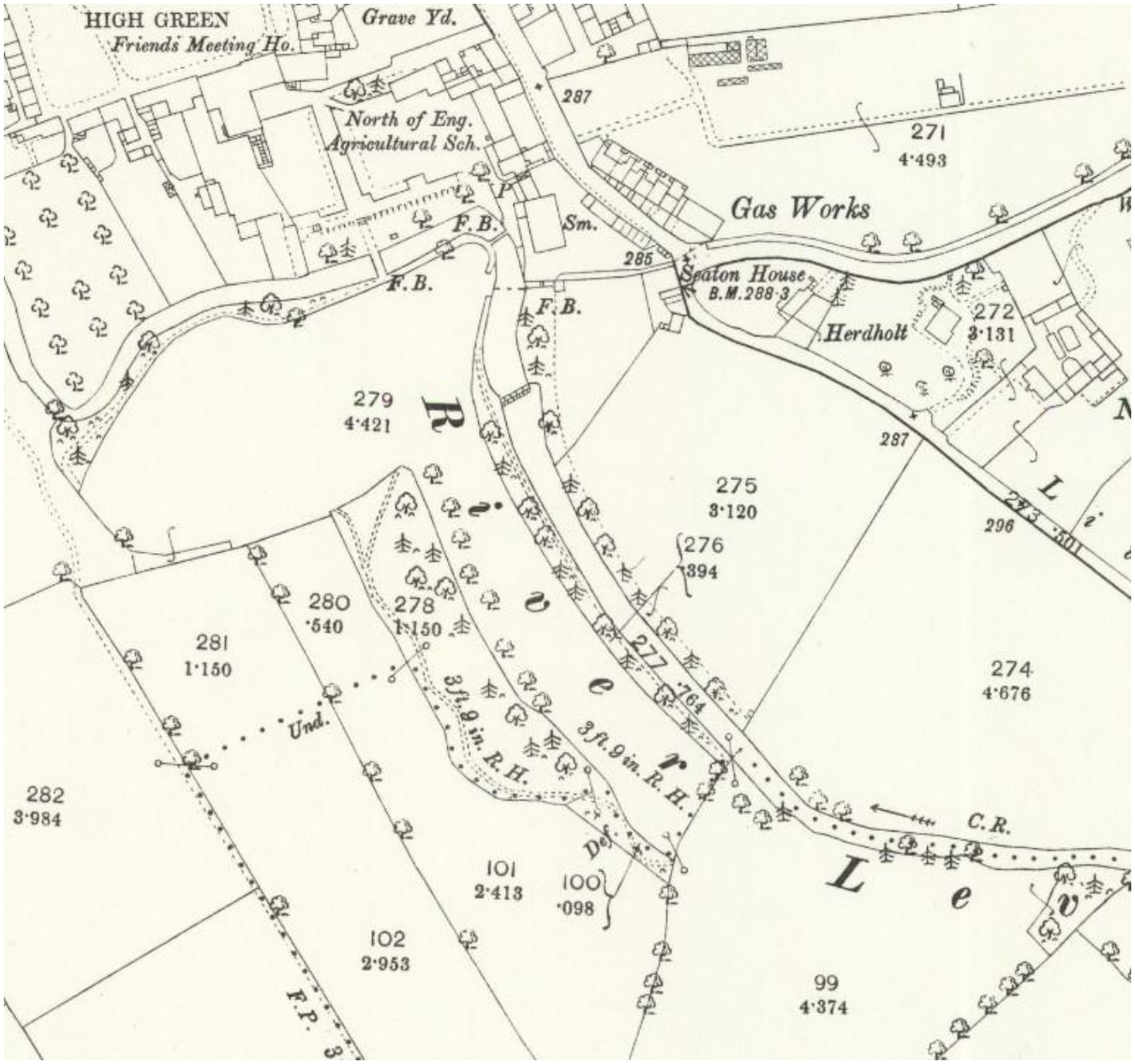
swept away the dam in Waterfall Park, which was rebuilt in its present form by the local benefactor Thomas Richardson. Although not mentioned in newspaper reports river flooding often deposits layers of mud and debris on top of land within the floodplain effecting the plants growing there by adding nutrients or smothering smaller ones.

There is an engraving of the site **dated 1841** when the nearby Society of Friends (or Quakers) school was founded, showing a line of trees (planted on mounds, a technique used then on damp ground) with cows grazing under the trees and looking at the back of the Ayton School (taken from http://greatayton.wdfiles.com/local--files/schools/Friends-School-Great-Ayton-Last-50-years.pdf). There also appears to be a couple on a path on top of the flood bank adjacent to the River Leven with an iron park/estate fence to keep the cows away from the river. The site slopes down towards the River Leven rather than being the flat site we know today. Although the date is before the first edition Ordnance Survey map, no conifers are shown on that map so perhaps they were felled and the tall conifers shown in the second edition Ordnance Survey map (which was surveyed in 1892) were planted afterwards. The image of the Friends' school is an earlier building to that shown in the 1853 Map, the extension being added in 1846.

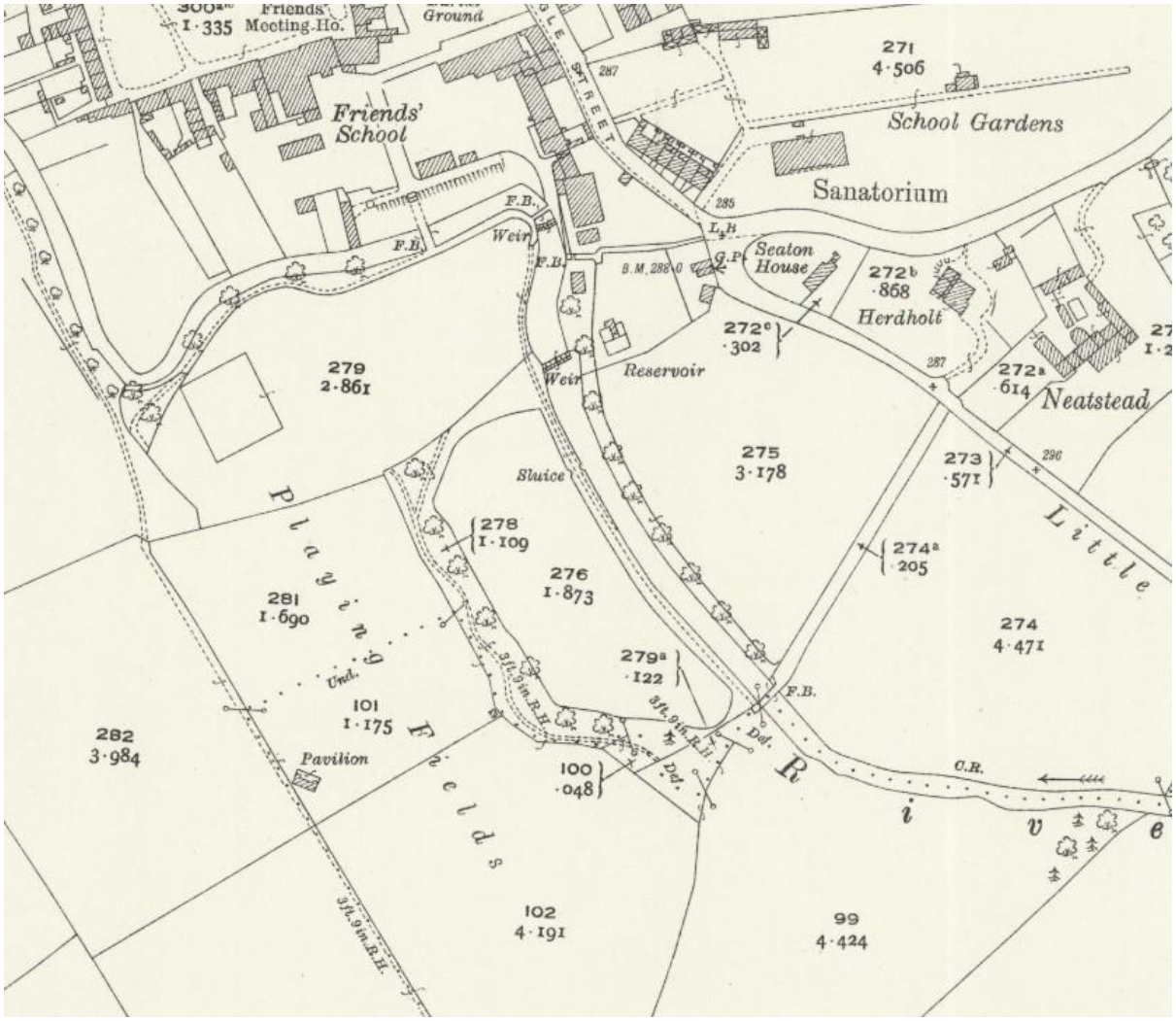
SOUTH VIEW OF AYTON SCHOOL IN 1841.

Surveyed: 1853, Published: 1856. The first edition Ordnance Survey map is the first detailed map we have of the area. It shows the flood bank with deciduous trees on it adjacent to the River Leven and the Dam in the same place as we see today. Half the site is marked as parkland which is shown as part of the Friends' School on the north of the river attached via a bridge (which is still in the same place today) and a formal garden. The southwest side of the site is shown as enclosed, with scattered trees and shrubs, and with a circular walkway within it suggesting that it is a decorative shrubbery for the owners of the park to walk around. Such shrubberies were popular at the time and so it may have been established by the school so that students could tend it as part of their training for later employment as gardeners for large estates.

Surveyed: 1892, Published: 1894: The 25" Ordnance Survey Map shows a similar picture with the exception that coniferous trees are also shown to be present on site. The shrubbery area is still fenced off, the lower track is now missing with only the upper track shown and it extends now to the very south of the site. It might be worth looking to see if there any remains of that track or footpath left today. The trees shown in the 1841 engraving planted on slightly raised mounds are still present growing down the centre of the site. The fields are numbered (our site is all of 278 and 100 (which is in Little Ayton Parish) and part of 279) and the size of the field in acres given below the number.



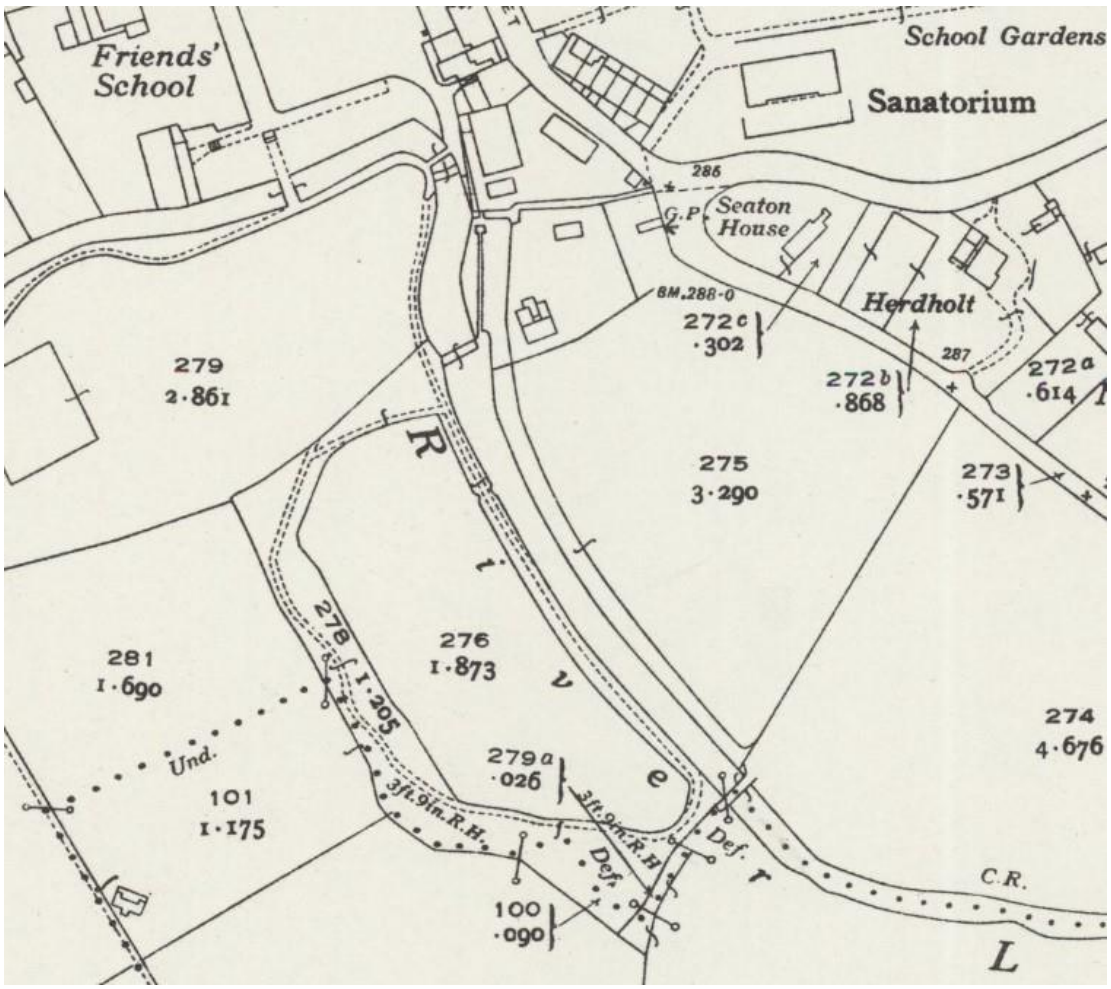
Revised: 1927, Published: 1928: This 25" Ordnance survey map shows a major change in the site showing a dam has been built at the north of the site to create a new lake fed by water from the River Leven via a sluice gate (marked) and that the large house is now labelled the Friends' School. There are no trees on the floodbank adjacent to the River Leven, the existing ones perhaps removed during the creation of the lake. The path to the south of the site is still present as are the deciduous trees, but the conifers are no longer shown as present except at the south end where the boundary of the site is shown as different to that in the previous map. A footbridge is shown crossing the River Leven at the boundary line between Great and Little Ayton Parishes for the first time.



This is the first map which shows the lake; I have been unable to find a date for when the lake was created.

1930 Flood: Another notable flood occurred on 23rd July 1930 in which Squire Bridge in Great Ayton was washed away. Photographs in the Northeastern Daily Gazette show flooding in Stokesley at the time.

Revised: 1938, Published: 1946: No trees are shown on this edition of the 25" Ordnance Survey Map though they would be present in real life. The track or footpath has been re-routed such that it does a circuit around the lake and to accommodate this the southern boundary of the site has been moved nearer to the Great and Little Ayton Parish Boundary once more.



This photograph, probably dated to the **late 1940s** shows the lake clearly in the foreground filling the area that is now meadow. The path on top of the floodbank adjacent to the River Leven shows clearly in a pale colour. Many of the trees adjacent to the playing field must have been felled when the lake was removed as they no longer show in a later 1962 aerial photograph.

A photograph on the Ayton Scholars website shows the boat on the lake being rowed by one person with a young boy as passenger and is dated **approx. 1949** http://new.aytonoldscholars.org/wp-content/uploads/2017/06/boat_on_lake_1949ish.jpg

"in **1951**, 'the appearance of a boat upon the lake excited a great deal of curiosity, and when the news spread round that the boat had been given to the Boat Club, interest in rowing and sailing increased amazingly'. [536]" from http://greatayton.wdfiles.com/local--files/schools/Friends-School-Great-Ayton-History-150411.pdf

"The main attraction of **1953** was the drainage of the lake by the groundsmen, which took several years work.[200]
Barbara Gibson wrote that:

'many eels and fishes were found around the pipe which leads to the beck. Some of the eels were taken to Mr. Rodwell in the Lab. Old tree stumps have appeared and already grass and other weeds have begun to grow. The Lake is to be filled and used for games. Most of us, I think, will miss the lake, although it is to be used for our benefit'. [201]

Almost four years later, in **spring 1957**, 'Mr. Reader announced, to the amusement of all, that potatoes were going to be grown in the lake, and eventually it was to be turned into a playing field'. [202]

The following year, **1958**, saw the lake looking 'something like a cross between the muddy end of 3rd game football pitch and a battle field'. [203] Unfortunately (though perhaps to the delight of the pupils), 'the bulldozer did succumb to the lake, and a twin "dozer" had to be delivered in order to pull it out again'. [204]

In the **spring of 1959**, the lake was 'a ploughed field, on a level with Botton Field, part of which is also ploughed'. [205] Finally, in the autumn of that year, 'the lake area was now thoroughly drained and available for football', whilst 'the banks surrounding the field were planted with daffodil bulbs'. [206]"

"In **1958** came the felling of more old trees, but during the following year, Bridget Dunn remarked that, 'the School appears to be getting more and more horticultural', as along with the ploughing of the old lake, 'we have put in some baby trees at intervals all over the grounds, to replace those that have been felled'. [212] "

The above quotes from http://greatayton.wdfiles.com/local--files/schools/Friends-School-Great-Ayton-History-150411.pdf

side note – which demonstrates a lot of wild roses flowering and hipping in the nearby hedgerows.
"**Rosehips**
An interesting initiative was taken up by many schools during the war and post-war years: the collection of rosehips. In Autumn edition of the 'Beckside' in **1944**, a contributor wrote that:

'In answer to an appeal to schools to collect Rose Hips in the Autumn, Miss Harwood took on the organisation, and the School collected 262lbs., for which we were paid at the rate of 2d. per lb. At the end of the season hip-gatherers were able to hand over £2 5s 2d. to Friends' Relief Service'. [753]

The following year:

'we were again asked to help in the collection of rose hips, and a total of 587 lbs was realised (more than double last year's yield)'. [754]

Even more were collected in **1946**, reaching the grand total of 640lbs.[755]"
http://greatayton.wdfiles.com/local--files/schools/Friends-School-Great-Ayton-History-150411.pdf

4th October 1962 An Aerial Photo of the site https://historicengland.org.uk/images-books/archive/collections/aerial-photos/record/RAF_58_5508_F22_0075 shows only small trees on the floodbank next to the river, scattered small trees on the bank opposite and the bank to the north that retained the water in the lake no longer present. This provides evidence that most of the trees present on site were planted around the 1960's or afterwards – which would mean those poplars at the south of the site by the river have grown very big, very quickly! The conifers at the south of the site appear to be present in this photograph. The site in the 1960's has far fewer trees round the edges than now.
Two opposite goal posts suggest a football pitch in the centre of the site and the flat rectangles of concrete present now at the south end of the site appear to show in the photograph too.
The large Oak tree to the northwest of the site shows clearly and the large Crab Apple can be seen in the centre of the westside of the site. Difficult to be sure whether the three trees in a row in the bottom west side are the current Tulip trees or not.

2011 Building of the Flood Alleviation scheme by the Environment Agency. A bund was placed at the north end of the site and another sluice gate at the south of the site such that water could flow into the site when the River Leven levels were at a certain height and fill the floodplain meadow area thus lessening the chance of flooding through the town when the river is in spate. The grass was still mown regularly and available to be used as a football pitch but proved to be too wet to be practical.

2019 site proposed to be managed as a hay meadow to increase diversity of native species present in the area, however as the machinery to cut and remove the grass at the end of the summer is not currently available it is likely that the area be left to grow long in the summer and cut at the end of the summer, with the cuttings left where they are cut.

Notes

More information on history in Great Ayton https://www.visitgreatayton.com/community/history-society and http://greatayton.wikidot.com/development
Notes on flooding mainly in the North York Moors from here https://www.jbatrust.org/wp-content/uploads/2020/09/Yorkshire-Rye-and-N-York-Moors.pdf and on Mills in Great Ayton from here https://greatayton.wdfiles.com/local--files/mills/Great-Ayton-Mills.PDF

Appendix D: Management plan

Site management plan - Great Ayton Floodplain Meadow
Martin Allen, Oct 2023

Background
The purpose of a traditional Floodplain Meadow was to provide an annual hay crop which was harvested in late-June or early July and following that harvest the regrowth of vegetation was available for livestock grazing over the winter or until the site got too wet.

Great Ayton's floodplain meadow has a primary purpose to store water when the River Leven is very high and there is danger of flooding downstream and then to release that stored water gradually after the flood peak is over.

Management as a traditional floodplain meadow is not possible at Great Ayton due to the difficulty of getting hay-making machinery on site and the equal problem of the site not being suitable for livestock grazing due to its small size and the frequency of dog walkers on site. This being the case we need to be pragmatic about how the site can be managed to be best for wildlife and also be practical to undertake.

Management
An ideal to aim for would be to cut the grass at the end of August/early September, rake up and then remove the cuttings taking them to the south of the site where they can be placed in a pile to rot at the base of the slope. Removing the cuttings removes nutrients from the soil so the grasses grow less vigorously and the wildflowers are then better able to compete and grow.

Seed collected from populations of local plants can then be scattered on the raked area to add more diversity of wildflowers for wildlife and a more species-rich plant community in the meadow.

A minimum level of management would be to ensure that the grassland was cut once a year and the cuttings left in place to rot down. The northern half can be cut at the end of August/beginning of September and the southern half left over the winter to retain the thistle seedheads for seed eating birds and insect hibernation and then to be cut in March.

In 2023 a team of volunteers managed to rake up the cuttings from a quarter of the main meadow area and move them to the south end of the site during an afternoon and it was felt that it would be difficult to get a team to undertake this every year and for the whole site.

One possible route to reducing the height and volume of grass growth is to sow the semi-parasitic annual **Yellow-rattle** which has been used with some good effect in promoting a more biodiverse meadow plant community. There is some more helpful information on the Plantlife website https://meadows.plantlife.org.uk/making-meadows/yellow-rattle/ but note that it can be difficult to establish on rich soils and it is likely that would include the Great Ayton floodplain meadow soil.

Generally, an access path around edge of meadow area can be regularly mown and also around the picnic benches to make it pleasant to sit there. Ensure that the steps are accessible and the adjacent vegetation does not flop over the pathways.

Management of non-native plants

Remove **Himalayan Balsam** either as seedlings, during the year as young plants, or as larger plants when they begin to flower – they can be tall at this stage 1.5 to 1.8 m high. This needs to be carried out regularly and before the plants set seed if the aim is to prevent it from growing on site. It is classed as a Schedule 9 plant meaning it is an offence to plant or cause to grow this species in the wild. As it is frequently found along, and spreads via, watercourses it can be difficult to control. The River Tees Trust are currently trialling the use of a rust fungus which damages the plant and acts as a form of bio-control. More detailed information here https://www.nonnativespecies.org/non-native-species/information-portal/view/1810

The **Snowberry** bush can be cut back to reduce its spread, regular cutting will weaken the plant but carefully applied weedkiller will be required to kill it off. It does have advantages as its dense growth habitat provides shelter for some birds and mammals. More detailed information here https://www.nonnativespecies.org/non-native-species/information-portal/view/3440

The **Hybrid Poplar** trees have grown very large very quickly which can be seen by comparing their size on the aerial photos of the 1950s in the site timeline document and so may be coming to the end of the healthy stage of their lifespan. It's possible that they may start to become too large for the site and be blown down in windy weather or have some of the larger branches snap and fall. That being the case it would be advisable to get professional advice of a tree surgeon on how to proceed in the future with their management. The site has plenty of large trees and so it would be not affect the wildlife adversely if the timber were to be harvested.

Ash Dieback. This fungal disease is already killing some of the Ash saplings on site and has affected some of the standard trees in the hedgerow at the edge of the playing field boundary. As the tree branches are individually killed off they can start to rot and therefore be liable to breaking and falling in windy weather. Where they are close to or above pathways that becomes a safety hazard and so a regular inspection is recommended. There is no cure, but it is thought that perhaps 10% of Ash trees will be genetically immune to the effects of the fungus and so survive to reproduce in future.