

Report on the botanical survey of vascular plants, 2020/21, from the banks of the Shochie Burn at the weir, along the banks of the River Tay and River Almond to the A9 bridge at Inveralmond. Survey and Report by Alistair Godfrey.



The Shochie Burn weir

Introduction

The banks of the River Tay and its tributaries have a rich and diverse flora throughout their length. This survey was undertaken initially from 11th May to 5th August in 2020, with some recording on each side of this period to establish accurate identification; such as presence of late flowering and fruit. A small number of records was added in the spring and autumn of 2021.

The early period of recording in 2020 coincided with low levels in the rivers and allowed access to edges of the banks that are usually covered by water at this time. This was particularly good for locating sedges (*Carex* species) that grow in this habitat.

Survey area: grid squares and sites

For recording purposes, a 1km x 1km Ordnance Survey grid square was observed. Mapping and recording recognised habitat differences within squares and together with the OS grid lines define the site boundaries. Some sites have only one broad type of habitat, others have more. The word 'habitat' is used to define the dominant features within a site.

The Shochie banks are enclosed woodland throughout, with steep banks and little water margin. The edge of the woodland is defined at the top of the bank where it meets a track and path that separate the site from woodland of recent origin.

The Hatton section is largely grassland with some individual trees and a riparian habitat at the margin of the riverbank. In addition, there is a small area of long-established woodland on the riverbank on the north side. Its inclusion within the site recognises the location of the OS northing grid line NO29.

Oak woodland becomes a strong feature of the riverbank south of Hatton. These trees are part of the designed landscape of Thomas Graham, Lord Lynedoch, shown on an estate map of 1844. The woodland has *Quercus robur* (Pedunculate Oak) *Q. petraea* (Sessile Oak) and the hybrid between them. Other tree species are also present. The riparian bankside flora also becomes more extensive south of Hatton; one habitat merging into another seamlessly.

Mapping and site references

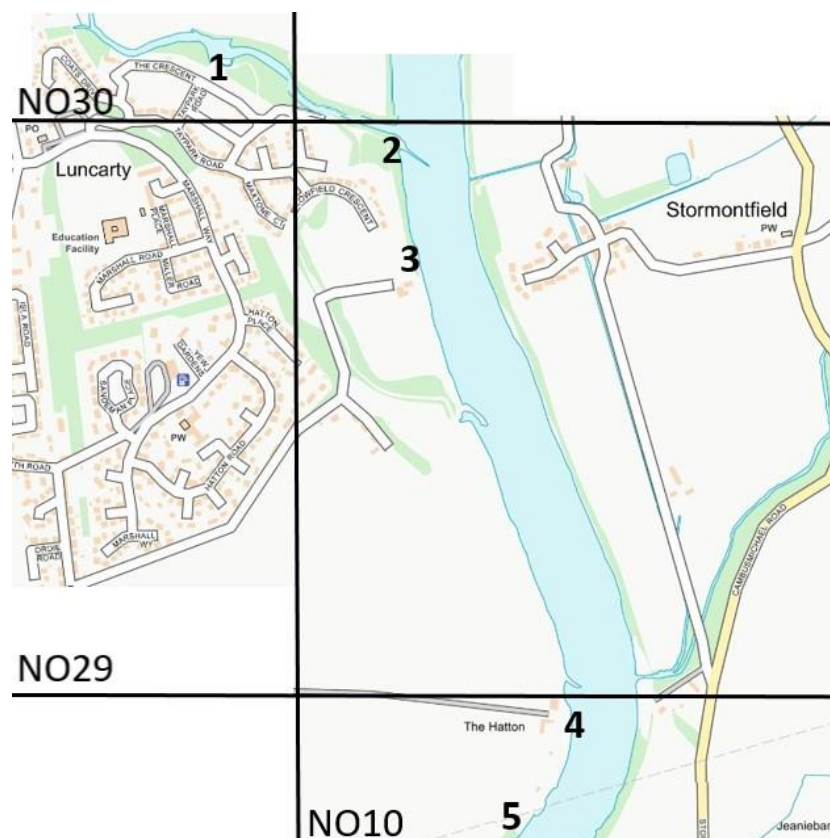
Mapping starts on the Shochie banks within Easting NO09 (left of NO10 on Map 1. following) and above Northing NO30. They come together to define the 1km x 1km square as NO0930. Only part of the site is within this square, the rest falls within two other squares; NO1030 and NO1029.

The name of each site includes two 8-figure grid references, which mark the start and finish of the site. For example: "Shochie Burn banks & woods: NO0988 3012 to NO1018 2995."

The last 8-figure grid reference of one site appears as the first of the next. For example: "River Tay banks & woods: from Shochie, NO1018 2995 to NO1022 2974" and "River Tay banks & woods: Tayview, NO1022 2974 to NO1045 2900."

Grid reference NO1022 2974 reflects a change in vegetation, where the close woodland cover on the top of the bank ends. On the 'Tayview' site, the banks are much more open with scattered trees as opposed to continuous woodland cover, apart from woodland at the mouth of the lade. The lade is shown on Map 1 where it enters the Tay below a curving stone revetment. A footbridge crosses the lade banks and only vegetation south of the footbridge is included in the 'Tayview' site.

Numbers on the following maps identify the start and finish locations of each site. The survey area comprises eight sites, which are identified in Table 1.

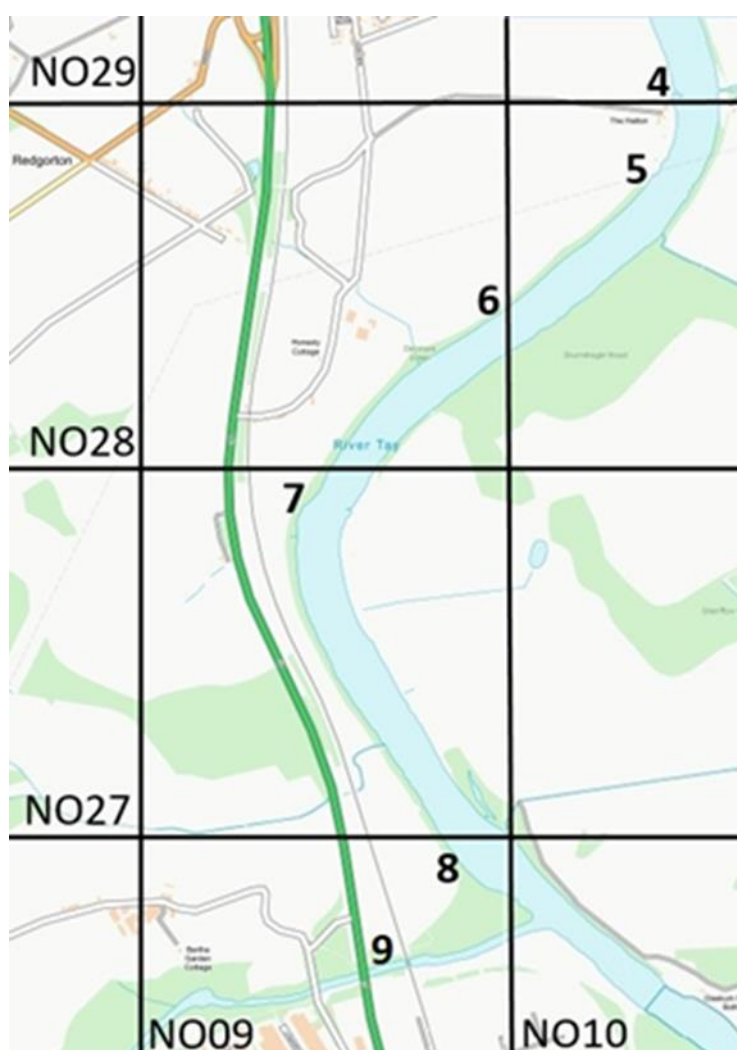


Map 1. Numbered start and finish of site locations within grid lines

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Sites start and finish	Mapping refs.
Shochie Burn banks & woods: NO0988 3012 to NO1018 2995	1-2
River Tay banks & woods: from Shochie, NO1018 2995 to NO1022 2974	2-3
River Tay banks & woods: Tayview, NO1022 2974 to NO1045 2900	3-4
River Tay banks & woods: Hatton, NO1045 2900 to NO1041 2879	4-5
River Tay banks & woods: from Hatton, NO1041 2879 to NO0999 2843	5-6
River Tay banks & woods: Denmark Green, NO0999 2843 to NO0950 2800	6-7
River Tay banks & woods: Broxy, NO0950 2800 to NO0981 2700	7-8
River Tay banks & woods: Inveralmond, NO0981 2700 to NO0962 2662	8-9

Table 1. Locations of sites covered during the survey



Map 2. Numbered start and finish of site locations within grid lines

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Plant records

Botanical names change as a result of discoveries in taxonomy. The names used in this survey follow the Fourth Edition of the *New Flora of the British Isles* published in 2019 by C. & M. floristics. Its author, Professor C. A. Stace, acknowledges recent changes in taxonomy

arising from genetic research. Changes between the Third Edition of 2010 and Fourth Edition are marked with an asterisk against taxa in the spreadsheets of records.

1,188 records were made of 314 different kinds of vascular plants. 'Vascular plants' have recognised vessels within stems and leaves for transporting water and nutrients. Vascular plants include ferns like Bracken (*Pteridium aquilinum*) and fern allies like Horsetail; the genus *Equisetum*. Recognisable flowering plants are included in the vascular plant group, including; trees, grasses, sedges and rushes to name a few.

Some vascular plants are aquatic, immersed mostly in water during their lives. An example is *Myriophyllum alterniflorum* (Alternate Water-milfoil). Strictly speaking, aquatics were not planned to be included in the survey, but sightings of this plant at the edges of the River Tay adjacent to the Broxy and Inveralmond sites were so unexpected that their presence made sense to record them. These plants, with their filamentous leaves, would have gone unnoticed had water levels been higher. This species is more frequent in Highland Perthshire and usually confined to slower moving rivers or stiller waters in Lowland Perthshire.

A larger filamentous vascular plant group has colonised the River Tay and is now familiar on many stretches, such as the 'Tayview' section. These are called 'Crowfoot' or 'Water-crowfoot', members of the genus *Ranunculus*. They are aquatic buttercups whose flowers have white petals with yellow centres. These plants are difficult to identify, requiring specialist experience for identification and are not included in this survey.

Terminology

The botanical terms 'taxon' (singular) and 'taxa' (plural) are references to plants that belong to a recognised group. These terms and the word 'taxonomy' are derived from the Greek *taxis* meaning 'arrangement'. All known living things have been categorised into taxa. They include hybrids, where two or more parents have contributed their genes to offspring.

Some plants are more closely related than others. They can be recognised at the broader genus level, but not always at species level where similarities are closer. '*Arctium* sp.', a Burdock, is an example. A finer examination of a specimen may resolve the difficulty and allow a full taxonomic name to be applied.

Another grouping is an 'aggregate' or 'agg.' for short, used for *Rubus fruticosus* (Brambles) *Hieracium* (Hawkweeds) and *Taraxacum* (Dandelions). Species in these aggregates, are often apomictic; plants reproducing asexually, seed produced without fertilisation. Offspring are clones of the seed parent: speciation arises over long periods from mutation of their genes. These aggregates require specialist knowledge for identification and are often referred to as 'critical groups'.

Sometimes changes in taxonomy arising from research may be radical. The garden 'Michaelmas-daisy', formerly in the genus *Aster*, is now in the genus *Symphyotrichum*. Hybridisation within this genus has confused identification; similarities may be deceptive, where two similar looking plants are not the same taxon.

Recording results

The number of taxa recorded during the survey was 314 from a total of 1,188 records. Table 2 provides the number of records of taxa for each site. Site areas are variable in size, therefore similarities and differences in the number of records between them are not comparable. The number of taxa recorded between sites also varies: up to eight sites sometimes sharing the same taxon; sometimes only one taxon associated with a site. Two examples are: *Viola odorata* (Sweet Violet) recorded only on the Shochie banks and *V. riviniana* (Common Dog-violet) recorded on seven sites.

1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	Total
101	96	183	141	155	170	163	179	1188

Table 2. The number of records of taxa for each site from a survey checklist of 309 taxa

The sites are identified as numbers, used in Table 1 above and the appendix that follows.

The survey recorded 13 taxa new to grid squares within the survey area. Most were small populations and included: *Geranium sanguineum* (Bloody Crane's-bill) *Eupatorium cannabinum* (Hemp-agrimony) *Lythrum salicaria* (Purple-loosetrife) and *Lysimachia nummularia* (Creeping-Jenny).

Crocsmia x crocosmiiflora (Monbertia) was another new taxon to the squares; its presence, a plant of hybrid cultivation with invasive habits, is most definitely unwanted. *Allium carinatum* (Keeled Garlic) is spreading, it is attractive in flower, and crucially, is unlike its invasive relative *A. paradoxum* (Few-flowered Garlic) that clothes the Shochie banks.

Represented on only one site, *Hedera algeriensis* (Algerian Ivy) is established on *Alnus glutinosa* (Alder) at the Tay's edge behind Hatton Cottage. The Algerian Ivy was determined for me by Paul Green, who I noticed had recorded it in Ireland. Paul is a vice-county recorder for Wexford for the Botanical Society of Britain and Ireland.

This is a very attractive species and provided a new County record for Perthshire.



Plant recording formats

Records have been sorted for each site on Excel spreadsheets. Every taxon recorded is listed alphabetically in a column on the left-hand side. Every entry displays the taxonomic name and vernacular name side by side. The 'vernacular' name is the accepted English version. Taxa are sorted in taxonomic order on one set of spreadsheets and the other set is sorted in vernacular order. The header row on each spreadsheet presents the eight sites. The number of taxa or the taxon recorded in each site is presented as a number. Two examples follow. The total number of taxa for each site is given at the bottom of the column. The last column is a cumulative count from the sites for each taxon. The total number of records for all taxa is shown at the bottom of the final column.

Two versions of the spreadsheets are available; one suitable for printing, the other for use on a computer as a continuous scroll.

Taxon	Vernacular	Shochie	from Shochie	Tayview	Hatton	from Hatton	Denmark	Broxy	In'almond	Records
<i>Acer platanoides</i>	Norway Maple	0	0	0	1	0	1	1	0	3
<i>Acer pseudoplatanus</i>	Sycamore	1	1	1	0	1	1	1	1	7
<i>Achillea millefolium</i>	Yarrow	0	1	1	1	1	1	1	1	7

Vernacular	Taxon	Shochie	from Shochie	Tayview	Hatton	from Hatton	Denmark	Broxy	In'almond	Records
Alder	<i>Alnus glutinosa</i>	1	0	1	1	1	1	1	1	7
Algerian Ivy	<i>Hedera algeriensis</i>	0	0	0	1	0	0	0	0	1
Alternate Water-milfoil	<i>Myriophyllum alterniflorum</i>	0	0	0	0	0	0	1	1	2

Figure 1. Extracts from spreadsheets showing alphabetical arrangement in taxonomic order and vernacular order.

Appendix 1 Site boundaries

Site name	Site boundary
Shochie Burn banks & woods: NO0988 3012 to NO1018 2995 (Map ref. 1-2).	Woodland edge at top of the bank adjacent to track and path and edge of lade to west.
River Tay banks & woods: from Shochie, N1018 2995 to NO1022 2974 (Map ref. 2-3).	From bank where the Shochie Burn and River Tay meet; from the riparian habitat to the top edge of the bank with trees.
River Tay banks & woods: Tayview, NO1022 2974 to NO1045 2900 (Map ref. 3-4).	Riparian and grassland bank to top edge; top edge fenced from Tayview House to bridge over lade; from east edge of path to northing NO29 at Hatton Cottage.
River Tay banks & woods: Hatton, NO1045 2900 to NO1041 2879 (Map ref. 4-5).	Continuing edge of Tay below; edges of gardens, walls and road to gate are not in the site; fence from Hatton House and farm fence; ending at start of wooded bank.
River Tay banks & woods: from Hatton, NO1041 2879 to NO0999 2843 (Map ref. 5-6).	Starting at wooded bank from young oak after pylon; farm fence to west; riparian habitat to east; ending at easting NO10.
River Tay banks & woods: Denmark Green, NO0999 2843 to NO0950 2800 (Map ref. 6-7).	From easting NO10 to northing NO28 just beyond Horse Chestnut at edge of track; farm fence to west; riparian habitat to east.
River Tay banks & woods: Broxy, NO0950 2800 to NO0981 2700 (Map ref. 7-8).	Farm fence to burn from Bertha Loch; farm fence south of burn at top of wooded bank to northing NO27 where minor paths divide; riparian habitat to east.
River Tay banks & woods: Inveralmond, NO0981 2700 to NO0962 2662 (Map ref. 8-9).	Continuing fence line at top of wooded bank above River Tay and River Almond; riparian edge of River Tay and edge of River Almond; ending at east edge of underpass of A9 bridge.

Alistair Godfrey, 9th October, 2021