

Shropshire Botanical Society Online Flora Web application Specification

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Overview

The Shropshire Botanical Society is seeking to renew it's Online Flora web application. This specification out lines the hoped for functionality together with the technical and development constraints of the work.

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1 Background

3 The Shropshire Botanical Society has been dedicated to promoting the enjoyment, understanding and conservation of the flora of Shropshire since the 18th century. One of the principle activities of the Society is to collect and maintain records of plant sightings within the historical boundaries of the county of Shropshire. Since 2003 the Society has made these records freely available online via a bespoke web application or Online Flora. This original Online Flora was written using PHP and the CodeIgniter Web Framework backed by a MySQL database. The web application is still available at captain-blue.azurewebsites.net but unfortunately the data is now many years out of date.

8 Maintaining and updating the database has proved to be challenging. Additionally the application was conceived prior to the introduction of the iPhone and it not suited to mobile use. Hence the Society seeks to renew the web application, to provide a more modern mobile interface and to use up to date data stored by the National Biodiversity Network Atlas. Currently all the Society's records are submitted to the National Biodiversity Network Atlas and since 2017 the Society's records have been available via a web service at the NBN Web service API. Using the NBN Web service API provides reliable data source and a supported service for maintaining and updating the Society's records.

2 Objective

To replicate the functionality of the original Online Flora in a responsive mobile design using data sourced from the NBN Web service API.

The Online Flora is to be used for searching the Society's records but not for entering new records. Maintaining and updating the data is conducted via a separate manual process. Searches of the database are conducted for three different geographical scenarios.

3 Context

3.1 Users and Usage

Users of the Online Flora are typically members of the Society and as such are often very experienced botanists. In a typical scenario a member of the Society (intending to visit a location) would search for a list of species that have previously been sighted at a location. It is the community or suite of species at a location that is of most interest. For an experienced botanist a species list for a location can provide information about the ecology, geology and history of a location, but will also indicate what other species might be present but have not yet been observed. Ideally the member of the Society would also wish to drill down to see individual records of species sightings, with dates, attributions and further details. This background will give a

botanist some insight about how much weight or credence can be given to individual sightings.

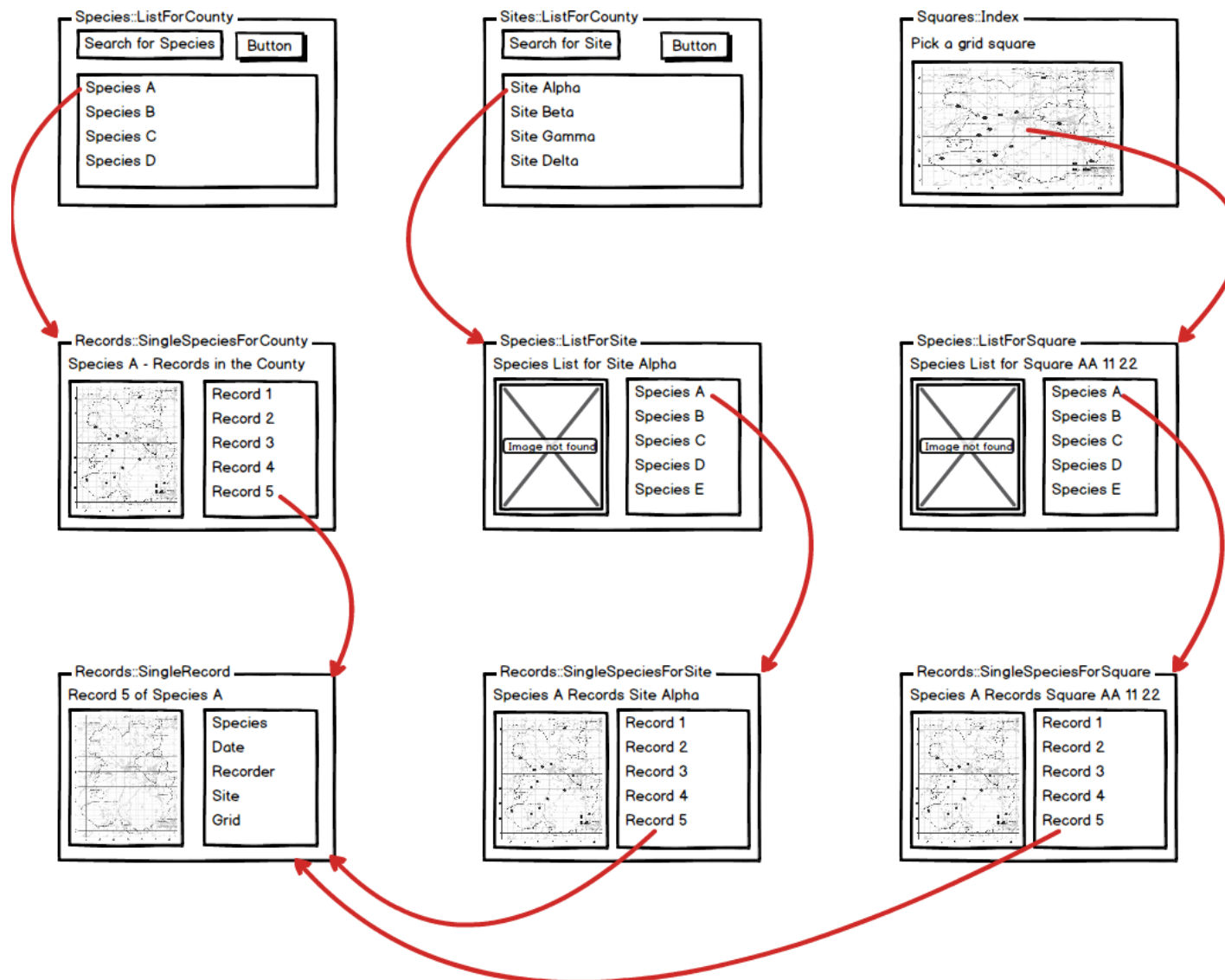
The Online Flora will serve three scenarios for searching for species lists.

Search Shropshire: searching all the records of based on the name of the plant. Allowing the user to drill down to a single sighting record or showing a map of grid squares with records for a named plant.

Search by Site: searching for a named site, then listing the names of plants for that named site. Again allowing the user to drill down to a single sighting record.

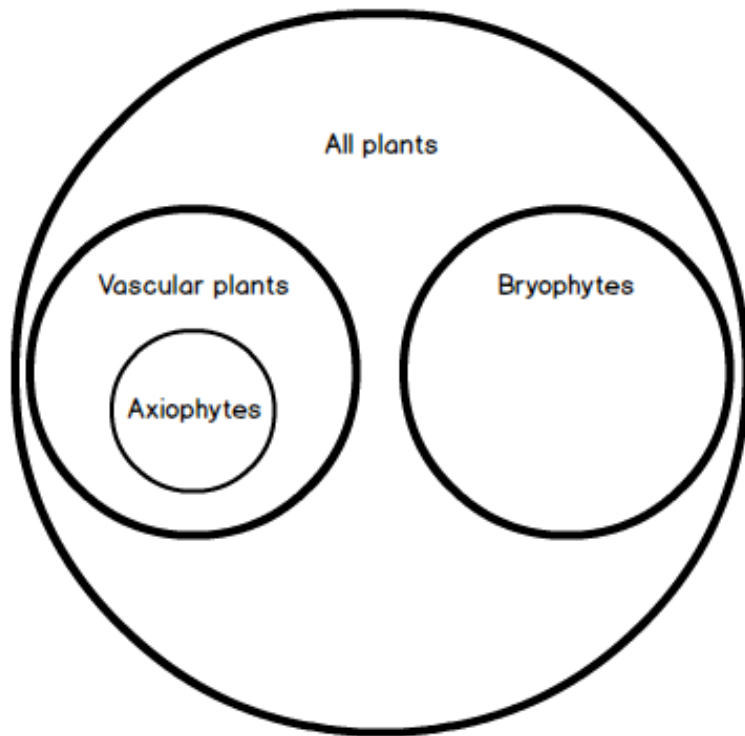
Search by Monad or Grid Square: Selecting a 1 km grid square within the county of Shropshire, then listing the names of plants for that named site. Again allowing the user to drill down to a single sighting record.

These three scenarios are shown in the diagram below.



3.2 Categories of Plants

Gaining experience identifying plants is a lifetimes work and members of the Society will often focus their attention on one category of plants. So the Society's observation records are separated into **vascular plants** and **bryophytes**, (two categories within the kingdom of all plants). A member of the Society will often wish to limit their searches to the category of plants they are most interested in.



For the vascular plants the concept of indicator species is highlighted by a sub group of vascular plants (referred to as **axiophytes**) These are plants that are archetypical or axiomatic for a particular ecological environment. So a member of the Society interested in vascular plants will often wish to see only the axiophytes to gain a better understanding of the ecological environment at a particular site.

3.3 Data Storage

The National Biodiversity Network Atlas provides a service to maintain and distribute biological records for the United kingdom.

https://records.nbnatlas.org/occurrences/search?q=data_resource_uid%3AAdr782 All the records may be searched on the NBN website.

a regular(ish) process in place for passing updates to the NBN.
every 6 months or so.

updating and maintaining The online flora/data portal will use the NBN (National Biodiversity Network) as a data source and will present a filtered representation of just the SEDN (Shropshire Ecological Data Network) dataset on the NBN (limited to vascular plants and bryophytes). records for the entire country

Based on Solr but with a specialised API

The Society's records exist within the Shropshire Ecological Data Network records. This dataset includes records from other recording groups in Shropshire.

Cache NBN data for a month, if valid json. Data turn over is slow the the NBN API can be laggy.

4 Search the County

4.1 Species List for County

Shropshire Online Flora...

http://flora.shropshirebotany.org.uk/

[Find a Species](#) [Find a Site](#) [Find a Monad](#) [About](#)

Search for a Species in Shropshire

Q search AB [List Species](#)

Enter all or part of a name. Try something like "Hedera"

☒ Scientific Names ☐ Common Names Only

☐ Plants Only ☒ Plants and Bryophytes ☐ Bryophytes Only

☐ Plant Axiophytes Only

Choose name-type

Choose species-group

Search results

Family	Scientific Name	Common Name	Records
Carabidae	Abax parallelepipedus		51
Melandryidae	Abdera biflexuosa		5
Melandryidae	Abdera quadrifasciata		8
Melandryidae	Abia candens		2
Melandryidae	Abia fasciata		4
Melandryidae	Abia sericea		2
Pinaceae	Abies alba	European Silver-fir	3
Pinaceae	Abies grandis	Giant Fir	63
Pinaceae	Abies procera	Noble Fir	4
Pinaceae	Abortiporus biennis	Blushing Rosette	1
Pinaceae	Abraeus granulum		1

< | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 >

[Download this list](#)

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

[Species](#) [Site](#) [Monad](#) [About](#)

Q search AB [List](#)

☒ Scientific Names ☐ Common Names

☐ Plants ☒ Both ☐ Bryophytes

☐ Plant Axiophytes

Name	Records
Abax parallelepipedus	51
Abdera biflexuosa	5
Abdera quadrifasciata	8
Abia candens	2
Abia fasciata	4
Abia sericea	2
Abies alba	3
Abies grandis	63
Abies procera	4
Abortiporus biennis	1

< | 1 | 2 | 3 | 4 | 5 | >

The 'landing' page for the application is the search of the entire dataset for the county. Initially the search output should be empty.

- ☐ On landing the selected list is empty.
- ☐ By default the **Scientific** name selected first. favour identifying plant species via the scientific name.
- ☐ If **Common** set a cookie to retain the user's choice of naming type.
- ☐ Also set a cookie for the user's choice of plant group
- ☐ The characters entered in the search box are used to search for names beginning with those letters, not within the names.
- ☐ Clicking on **list** or pressing return on the desktop list will fill the list.
- ☐ If **Common** is selected, only the species with common names will be searched and shown.
- ☐ If **Axiophytes** a limited static list of scientific names will be searched and shown.
- ☐ Changing the radio button will reset the search and blank the list.

e.g. ¹

¹https://records-ws.nbnatlas.org/explore/group/Plants?fq=data`resource`uid:dr782+AND+taxon`name:B*

4.2 Records for a Single Species in the County

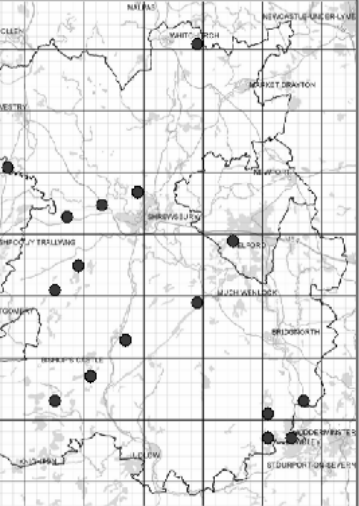
Shropshire Online Flora...

<http://flora.shropshirebotany.org.uk/>

[About](#)

[Find a Species](#) [Find a Site](#) [Find a Monad](#)

« Abax parallelepipedus in Shropshire



Date	Site	Square	Recorder	Detail
2010	Birchen Park	SJ3522	John Bingham	View record
2010	Breakneck Bar	SJ3522	Caroline Uff	View record
2010	Brokenstones	SJ3522	Bob Lawrence	View record
2010	Clee Hill	SJ3522	G.Wenman	View record
2010	Ercall Quarry	SJ3522	Caroline Uff	View record
2010	Breakneck Bar	SJ3522	Caroline Uff	View record
2010	Brokenstones	SJ3522	Bob Lawrence	View record
2010	Clee Hill	SJ3522	G.Wenman	View record
2010	Ercall Quarry	SJ3522	Caroline Uff	View record

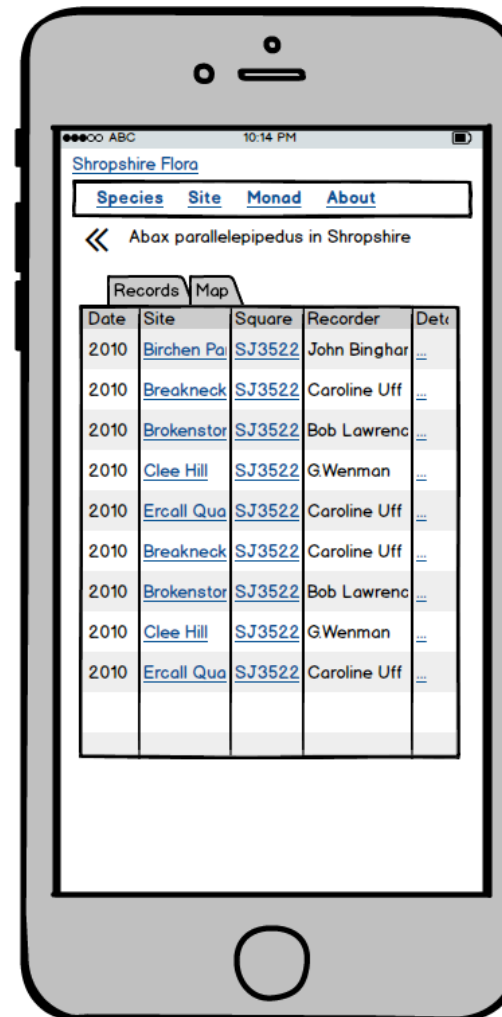
[Download this list](#)

↖
↗

WMS layer from NBN

CSV download from NBN

Shropshire Botanical Society Data supported by National Biodiversity Network



Clicking on a species name will show details for the

☐ Collapse the map? Retain state in cookie

☐ Page the records?

☐ Site link goes to what?


4.3 A Single Record

Shropshire Online Flora...

http://flora.shropshirebotany.org.uk/

[Find a Species](#) [Find a Site](#) [Find a Monad](#) [About](#)

« Abax parallelepipedus record detail



Record ID	306776
Taxon Name	Acaena novae-zelandia
Site Name	Marrington Dingle
Full Grid Ref	SO2796
Tetrad	SO29T
Recorders	Dr F.H. Perring
Full Date	23 JUL 1989
Year	1989
Phylum	Tracheophyta
Scientific Name	Echinochloa colona
Common Name	Shama Millet


[Download this record](#)

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

[Species](#) [Site](#) [Monad](#) [About](#)

« Abax parallelepipedus record detail



Record ID	306776
Taxon Name	Acaena novae-zelandia
Site Name	Marrington Dingle
Full Grid Ref	SO2796
Tetrad	SO29T
Recorders	Dr F.H. Perring
Full Date	23 JUL 1989
Year	1989

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The illustration shows a mobile application interface for "Shropshire Flora". The top status bar displays signal strength, "ABC", time "10:14 PM", and battery level. The app's header includes the title "Shropshire Flora" and four underlined navigation tabs: "Species", "Site", "Monad", and "About". A search bar below the header contains the placeholder text "search Church". To the right of the search bar is a button labeled "List".

Site	Records
Church	56
Church Bank	4
Church Hill	34
Church Plantation	5
Church Quarry	13

At the bottom of the screen, a pagination control shows "< | 1 | >", indicating the current page is 1.

- List is empty, actually is this necessary?

e.g. [https://records-ws.nbnatlas.org/occurrences/search?
fq=location_id:\[Church%20T0%20*\]&fq=data_resource_uid:
dr782&facets=location_id&facet=on&pageSize=0](https://records-ws.nbnatlas.org/occurrences/search?fq=location_id:[Church%20T0%20*]&fq=data_resource_uid:dr782&facets=location_id&facet=on&pageSize=0)

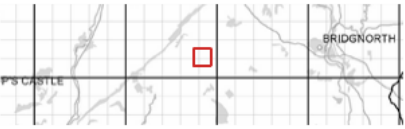
5.2 Species List for a Site

Shropshire Online Flora...

<http://flora.shropshirebotany.org.uk/>

[Find a Species](#) [Find a Site](#) [Find a Monad](#) [About](#)

« Species at Church Hill



☒ Scientific Names ☐ Common Names Only
☐ Plants Only ☒ Plants and Bryophytes ☐ Bryophytes Only
☐ Plant Axiophytes Only

Family	Scientific Name	Common Name	Records
Carabidae	Abax parallelepipedus		51
Melandryidae	Abdera biflexuosa		5
Melandryidae	Abdera quadrifasciata		8
Melandryidae	Abia candens		2
Melandryidae	Abia fasciata		4
Melandryidae	Abia sericea		2
Pinaceae	Abies alba	European Silver-fir	3
Pinaceae	Abies grandis	Giant Fir	63
Pinaceae	Abies procera	Noble Fir	4
Pinaceae	Abortiporus biennis	Blushing Rosette	1

[«](#) | [1](#) | [2](#) | [3](#) | [4](#) | [5](#) | [»](#)

[Download this list](#)

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

[Species](#) [Site](#) [Monad](#) [About](#)

« Species at Church Hill

☒ Scientific Names ☐ Common Names
☐ Plants ☒ Both ☐ Bryophytes
☐ Plant Axiophytes

Name	Records
Abax parallelepipedus	51
Abdera biflexuosa	5
Abdera quadrifasciata	8
Abia candens	2
Abia fasciata	4
Abia sericea	2
Abies alba	3
Abies grandis	63
Abies procera	4
Abortiporus biennis	1

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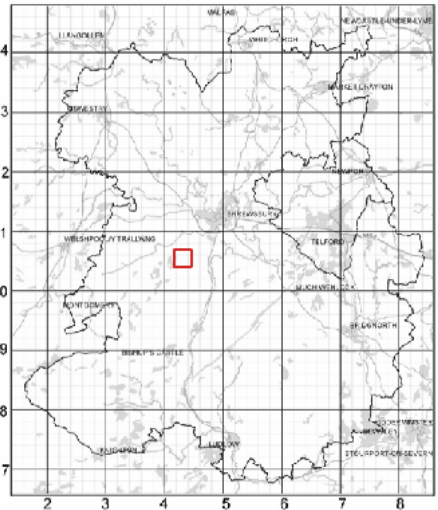
5.3 Records for a Single Species at a Site

Shropshire Online Flora...

http://flora.shropshirebotany.org.uk/

[Find a Species](#) [Find a Site](#) [Find a Monad](#) [About](#)

« Abax parallelepipedus in Church Hill



Date	Site	Square	Recorder	Detail
2011	Church Hill	SJ3522	John Bingham	...
2010	Church Hill	SJ3522	Caroline Uff	...
2010	Church Hill	SJ3522	Bob Lawrence	...
2010	Church Hill	SJ3422	G.Wenman	...
2009	Church Hill	SJ3523	Caroline Uff	...
2009	Church Hill	SJ3522	Caroline Uff	...
2007	Church Hill	SJ3523	Bob Lawrence	...
2001	Church Hill	SJ3422	G.Wenman	...
1998	Church Hill	SJ3522	Caroline Uff	...

[Download this list](#)

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Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

[Species](#) [Site](#) [Monad](#) [About](#)

« Abax parallelepipedus in Church Hill

Records | Map

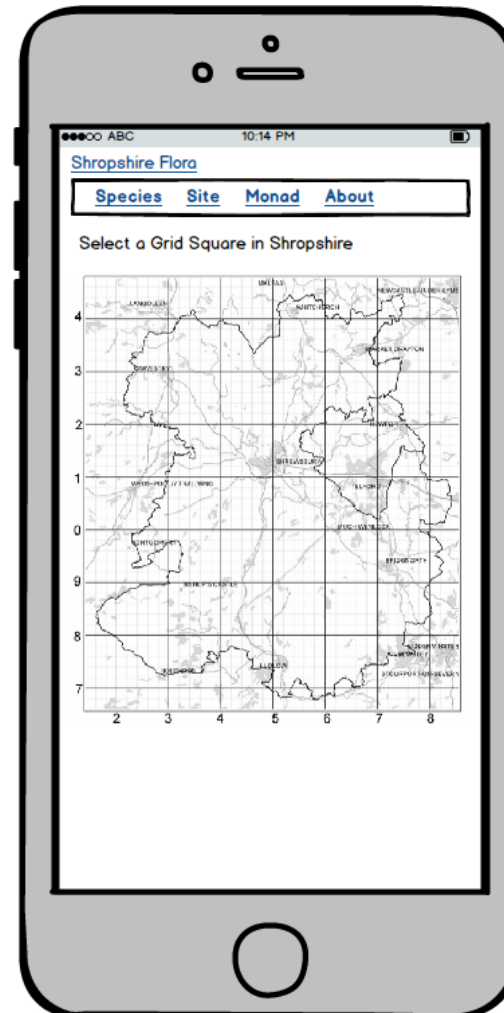
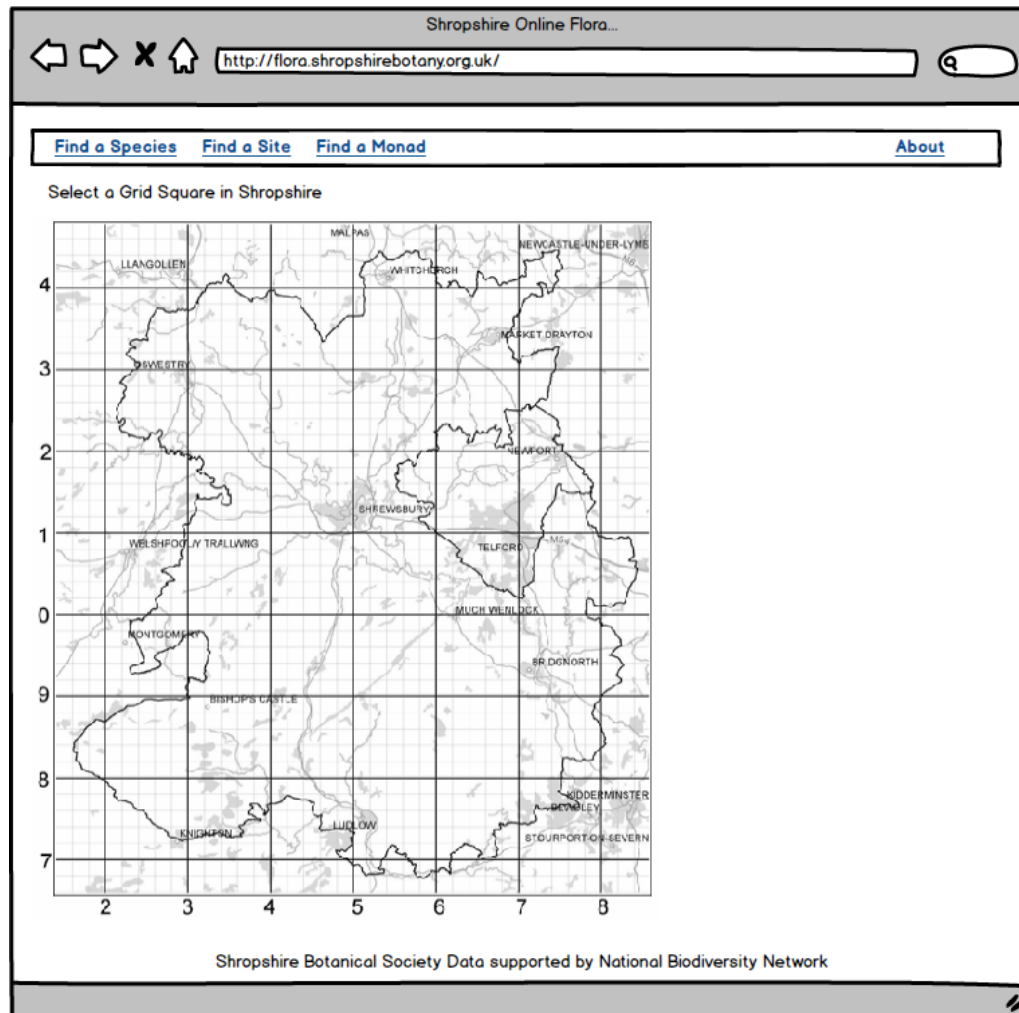
Date	Square	Recorder	Detail
2011	SJ3522	John Bingham	...
2010	SJ3522	Caroline Uff	...
2010	SJ3522	Bob Lawrence	...
2010	SJ3422	G.Wenman	...
2009	SJ3523	Caroline Uff	...
2009	SJ3522	Caroline Uff	...
2007	SJ3523	Bob Lawrence	...
2001	SJ3422	G.Wenman	...
1998	SJ3522	Caroline Uff	...

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6 Search in a Square

6.1 Select a Square



- Zoom in and select.
- Graticule

6.2 Species List for a Square

Shropshire Online Flora...

http://flora.shropshirebotany.org.uk/

[Find a Species](#) [Find a Site](#) [Find a Monad](#) [About](#)

« Grid Square TF2054

☒ Scientific Names ☐ Common Names Only

☐ Plants Only ☒ Plants and Bryophytes ☐ Bryophytes Only

☐ Plant Axiophytes Only

Family	Scientific Name	Common Name	Records
Carabidae	Abax parallelepipedus		51
Melandryidae	Abdera biflexuosa		5
Melandryidae	Abdera quadrifasciata		8
Melandryidae	Abia candens		2
Melandryidae	Abia fasciata		4
Melandryidae	Abia sericea		2
Pinaceae	Abies alba	European Silver-fir	3
Pinaceae	Abies grandis	Giant Fir	63
Pinaceae	Abies procera	Noble Fir	4
Pinaceae	Abortiporus biennis	Blushing Rosette	1

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[Download this list](#)

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

[Species](#) [Site](#) [Monad](#) [About](#)

« Grid Square TF2054

☒ Scientific Names ☐ Common Names

☐ Plants ☒ Both ☐ Bryophytes

☐ Plant Axiophytes

Name	Records
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Abdera biflexuosa	5
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Abies grandis	63
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Abortiporus biennis	1

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6.3 Records for a Single Species at a Site

Shropshire Online Flora...

http://flora.shropshirebotany.org.uk/

[Find a Species](#) [Find a Site](#) [Find a Monad](#) [About](#)

« Abax parallelepipedus in TF2055



Date	Site	Recorder
2012	Birchen Park	John Bingham
2012	Birchen Park	Caroline Uff
2012	Birchen Park	Bob Lawrence
2011	Birchen Park	GWenman
2011	Church Hill	Caroline Uff
2010	Birchen Park	Bob Lawrence
2010	Birchen Park	GWenman
2010	Church Hill	Caroline Uff
2008	Birchen Park	Bob Lawrence
2008	Birchen Park	GWenman
2008	Birchen Park	Caroline Uff

[Download this list](#)

≤ | 1 | 2 | 3 | 4 | 5 | ≥

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

[Species](#) [Site](#) [Monad](#) [About](#)

« Abax parallelepipedus in TF2044

[Records](#) [Map](#)

Date	Site	Recorder
2012	Birchen Park	John Bingham
2012	Birchen Park	Caroline Uff
2012	Birchen Park	Bob Lawrence
2011	Birchen Park	GWenman
2011	Church Hill	Caroline Uff
2010	Birchen Park	Bob Lawrence
2010	Birchen Park	GWenman
2010	Church Hill	Caroline Uff
2008	Birchen Park	Bob Lawrence
2008	Birchen Park	GWenman

≤ | 1 | 2 | 3 | 4 | 5 | ≥

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7 Technical Constraints

The Botanical Society has limited means and wishes to ensure that the results of any programming effort can be maintained and supported into the future, either via an open source project or via the efforts of members of the Society. To facilitate these possibilities the technical environment for the projects is intended to provide a low barrier to contributions.

PHP 7.3 for deployment to Google App Engine for free hosting.

CodeIgniter 4.0.4 has been used successfully in the past and provides convenient caching should it be required.

Twitter Bootstrap 4.5.2 for responsive layout.

Leaflet 1.6.0 should be used to provide mapping services.

<https://github.com/DuncanRowland/NBNMapOverlayExamples>

Commits to Github since the Society will retain the intellectual property rights over any code produced. So all branching should be on the repository at Github The Society will

Style Sheet taken from www.shropshirebotany.org.uk. The Online Flora is to be consistent with this website, so should reuse the same classes and styles.

No NBN API Calls from the Client because we might want to use caching.

No database should be used other than the NBN Web service API. Any static data (such as the list of axiophytes) should be hard coded into the application.