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.

Background Contents Background 3 The Shropshire Botanical Society has been dedicated to promoting the enjoyment, understanding and conservation of the Objective flora of Shropshire since the 18th century. One of the principle activities of the Society is to collect and maintain records of plant Context 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 **Search the County** web application is still available at captain-blue.azurewebsites.net but unfortunately the data is now many years out of date. 9 Records for a Single Species in the County Maintaining and updating the database has proved to be challenging. Additionally the application was conceived prior to Search in a Site the introduction of the iPhone and it not suited to mobile use. Site List for the County Hence the Society seeks to renew the web application, to provide a more modern mobile interface and to use up to date data Records for a Single Species at a Site stored by the National Biodiversity Network Atlas. Currently all the Society's records are submitted to the National Biodiversity Search in a Square 19 Network Atlas and since 2017 the Society's records have been Select a Square available via a web service at the NBN Web service API. Using Records for a Single Species at a Site the NBN Web service API provides reliable data source and a supported service for maintaining and updating the Society's Records for a Single Species at a Site records. 7 Technical Constraints 25

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

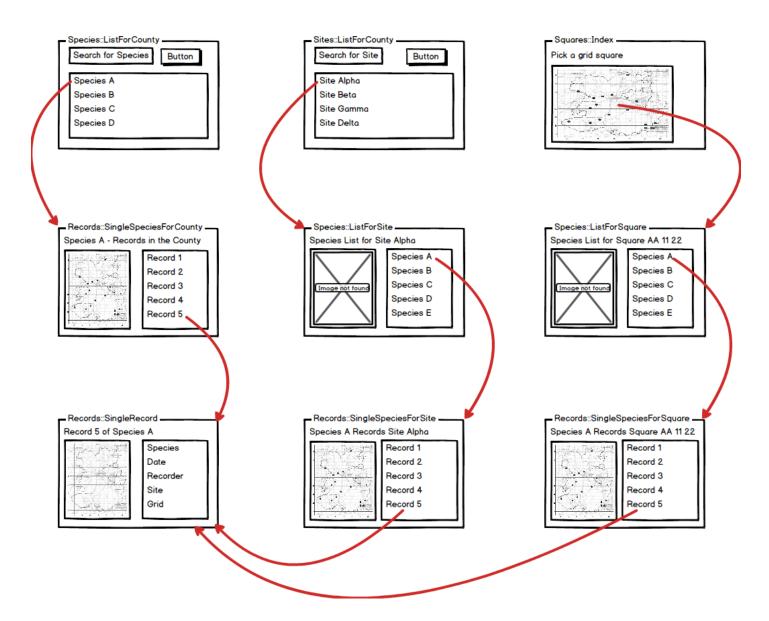
Users of the Online Flora are typically members of the Society and as such are often very experienced botanists. In a typical scenario a member of the Society (intending to visit a location) would search for a list of species that have previously been sighted at a location. It is the community or suite 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.

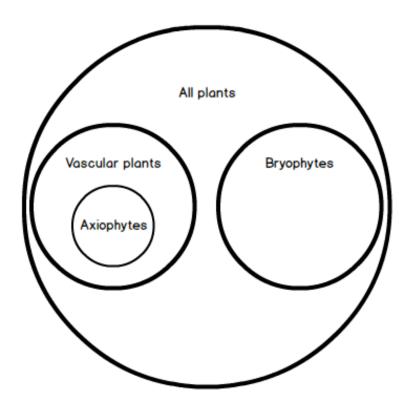
- **Search Shropshire:** searching all the records of based on the name of the plant. Allowing the user to drill down to a single sighting record or showing a map of grid squares with records for a named plant.
- **Search by Site:** searching for a named site, then listing the names of plants for that 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

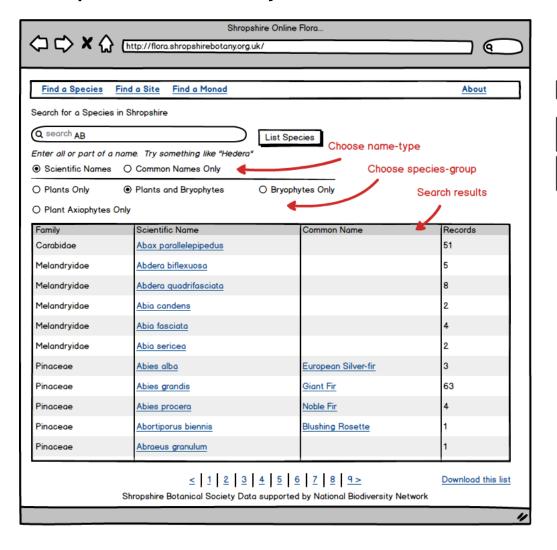
The National Biodiversity Network Atlas (NBN) provides a service to maintain and distribute biological records for the United kingdom. The Shropshire Botanical Society contributes records to the NBN via the Shropshire Ecological Data Network (SEDN). So all the botanical records for Shropshire are contained within the SEDN dataset on the NBN service (dataset 782). There is a regular(ish) process in place for passing updates to the NBN so new records are added every 6 months or so.

The NBN provides a specialized API to query these data which is based on Apache Solr. A primer for how to use the API is provided by the NBN.

To improve performance queries should be cached on the server for about 30 days.

4 Search the County

4.1 Species List for County



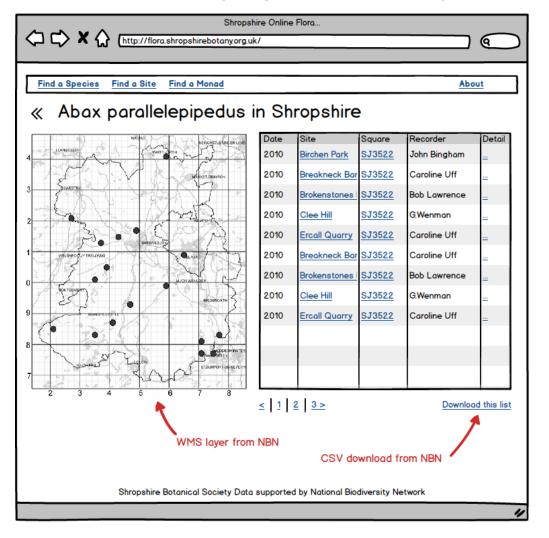


'Landing' Initially the search output should be empty.	The search results should be listed alphabetically by scientific name or common name, whichever is selected.
By default the Scientific name selected first, since botanists tend to favour identifying plant species via the scientific name.	If Common is selected, only the species with common names will be searched and shown. Any species without common names should not be included in the search results.
If Common is selected set a cookie to retain the user's choice of naming type.	If Axiophytes is selected a limited static list of scientific names will be searched and shown. The list of axiophytes
Also set a cookie for the user's choice of plant group (bryophytes or vascular plants).	is provided as a list of scientific species names. This list was last updated in 2014.
Species Search	Changing any radio button will renew the search using the changed set of parameters, without pressing return or clicking on the button.
The search is of the entire dataset for the county.	☐ If the search result list is long pages links should be
☐ The characters entered in the search box are used to	provided.
search for names beginning with those letters, not within the names. ¹	☐ The download link, downloads a zipped CSV of the search results directly from the NBN. ²
Clicking on List Species or pressing return on the desktop list executes the search. If the search box is empty species beginning with 'A' are searched for.	Clicking on the scientific or common species name, takes you to a list of records for that species in the county.
Any characters entered in the search box are retained after the button is clicked.	

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

²https://records-ws.nbnatlas.org/occurrences/index/download?q=data`resource`uid:dr782&fq=taxon`name:A*&reasonTypeId=11&fileType=csv

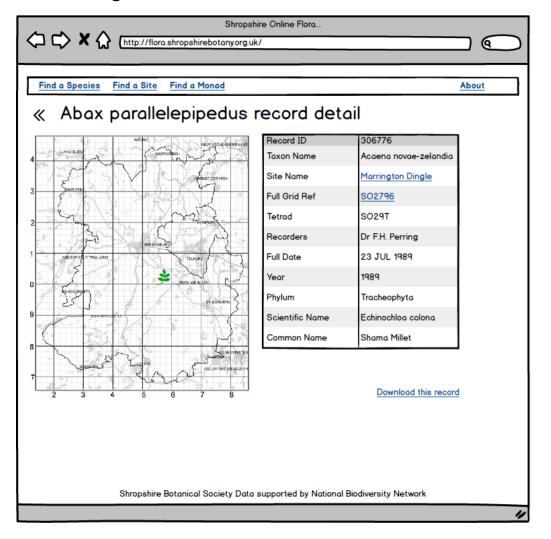
4.2 Records for a Single Species in the County





Records List
Title is the scientific name or common name depending on which was clicked on in the previous page.
☐ The '<<' goes back to the search for a species name using the same search parameters.
☐ The records are sorted by date, with most recent first.
☐ If the records list is long pages links should be provided.
☐ The download link, downloads a zipped CSV of the search results directly from the NBN.
Site link goes to a list of records for the same species at the selected site.
Square link goes to a list of records for the same species at the selected square.
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Zoomable slippy map.
The map overlay comes from the NBN Web Mapping Service showing a distribution map of the species.
For mobile devices, the map is initially hidden on a tab behind the records.

4.3 A Single Record

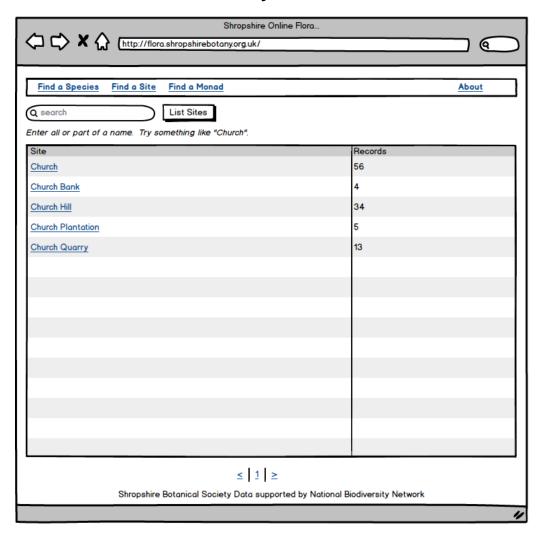


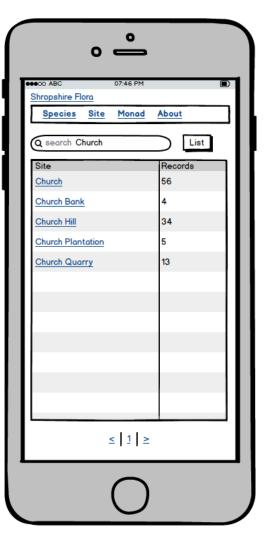


Reco	ord Detail
	Title is the scientific name or common name depending on the previous page.
	The '<<' goes back to the records list for that species in the county.
	Site link goes to a list of records for the same species at the selected site.
	Square link goes to a list of records for the same species at the selected square.
	The download link, downloads a zipped CSV of the search results directly from the NBN.
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	Zoomable slippy map.
	The location of the record is marked with plant or leaf icon.
	For mobile devices the map is more compact.

5 Search in a Site

5.1 Site List for the County

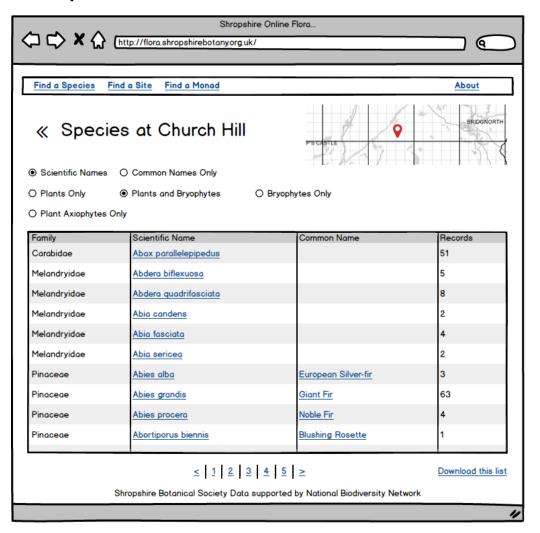


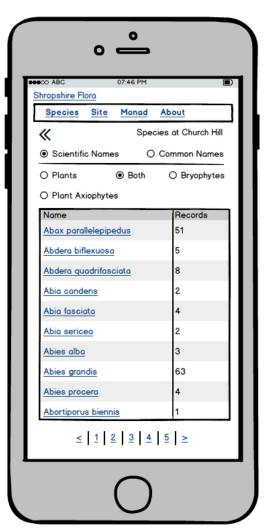


Sites Search
Initially the search output should be empty.
Sites List
☐ The characters entered in the search box are used to search for names beginning with those letters, not within the names. ³
Clicking on List Sites or pressing return on the desktop list executes the search. If the search box is empty species beginning with 'A' are searched for.
☐ The sites should be ordered alphabetically by the site name (i.e. the 'location_id' field from the NBN records).
Any characters entered in the search box are retained after the button is clicked.
Clicking on the site name take you to a species list for that site.

³https://records-ws.nbnatlas.org/occurrences/search?fq=location`id:[Church"%20TO"%20*]&fq=data`resource`uid:dr782&facets=location`id&facet=on&pageSize=0

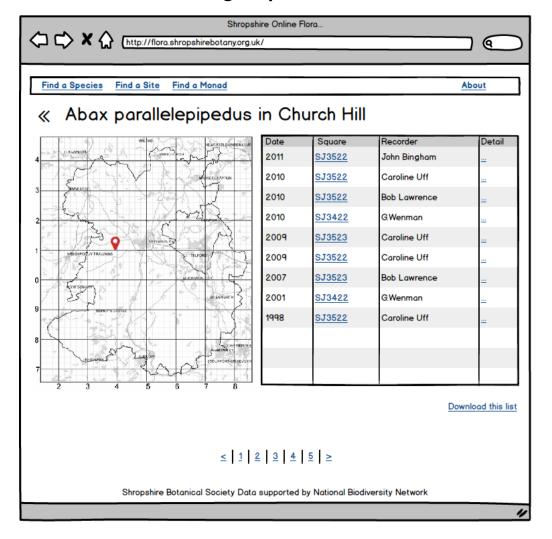
5.2 Species List for a Site





	Title is the name of the site clicked on in the previous page.
	The '<<' goes back to the previous search of site names.
	Changing any radio button will renew the search using the changed set of parameters.
,	Radio button settings should be retained in a cookie. These values are the same as the ones used in the Species List for County.

5.3 Records for a Single Species at a Site

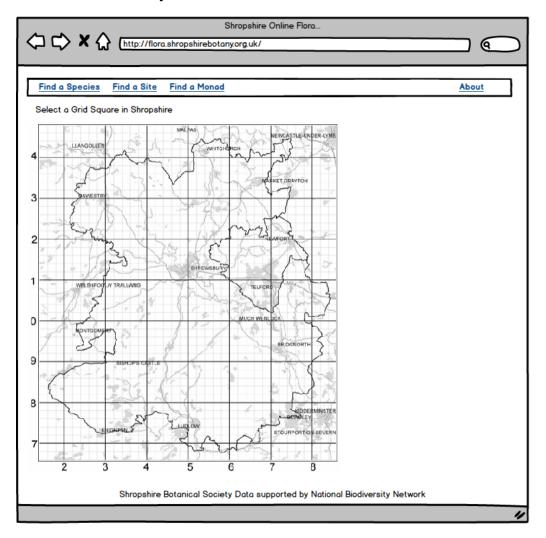


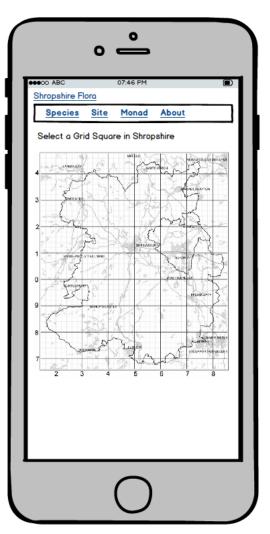


Records List
☐ Show records for that species at the selected site.
Square link goes to a list of records for the same species at the selected square.
Мар
Showing location of the site with a pin, since we don't have shape files for the sites.

6 Search in a Square

6.1 Select a Square

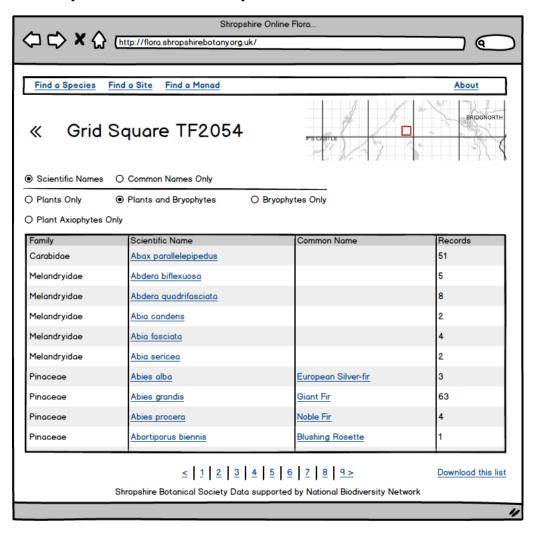


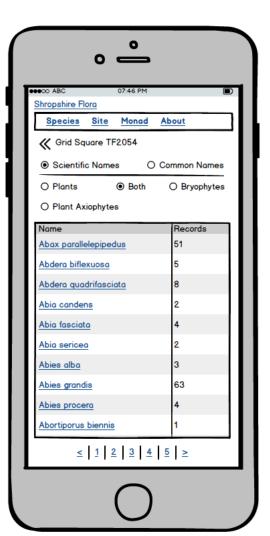


6.2 Rec	ords for	[·] a Single	Species	at a	Site
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Zoom in and select a 1 km grid square.
 A 1 km graticule to appear when the squares are big enough (for selection with a finger).
 Retain map zoom and centre position between visits.

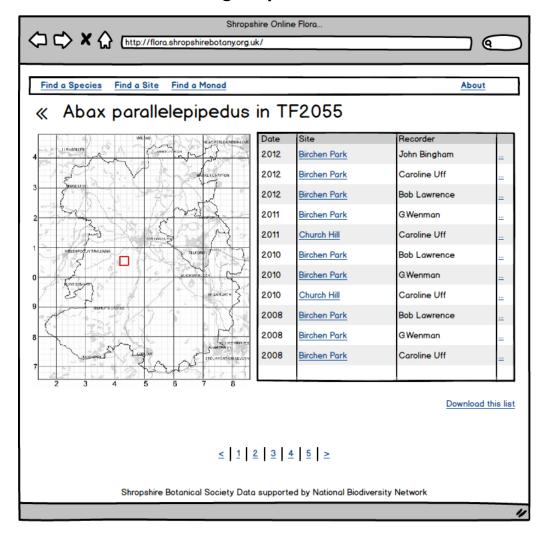
6.3 Species List for a Square





Title is the name of the square selected on in the previous page.
The '<<' goes back to the map for selecting grid squares.
Changing any radio button will renew the search using the changed set of parameters.
Radio button settings should be retained in a cookie. These values are the same as the ones used in the Species List for County.

6.4 Records for a Single Species at a Site





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Title is the name of the square and the species selected on in the previous page.
The '<<' goes back to the species list for a grid square.

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☐ Compact and zoomed in with the grid square marked.

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.

Codelgniter 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,

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

No database should be used other than the NBN Web service API, to keep down maintenance costs. Any static data (such as the list of axiophytes) should be hard coded into the application. there are examples at 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 at https://github.com/joejcollins/captain-magenta.git.

CI/CD the develop branch deploys to https://captain-magenta.azurewebsites.net/ on Azure and the master branch deploys to http://flora.shropshirebotany.org.uk/ on GCP. These URLs will be used to review progress.