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.

Contents

1 Background

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 The web application is still available at captain-blue.azurewebsites.net but unfortunately the data is now many years out of date.

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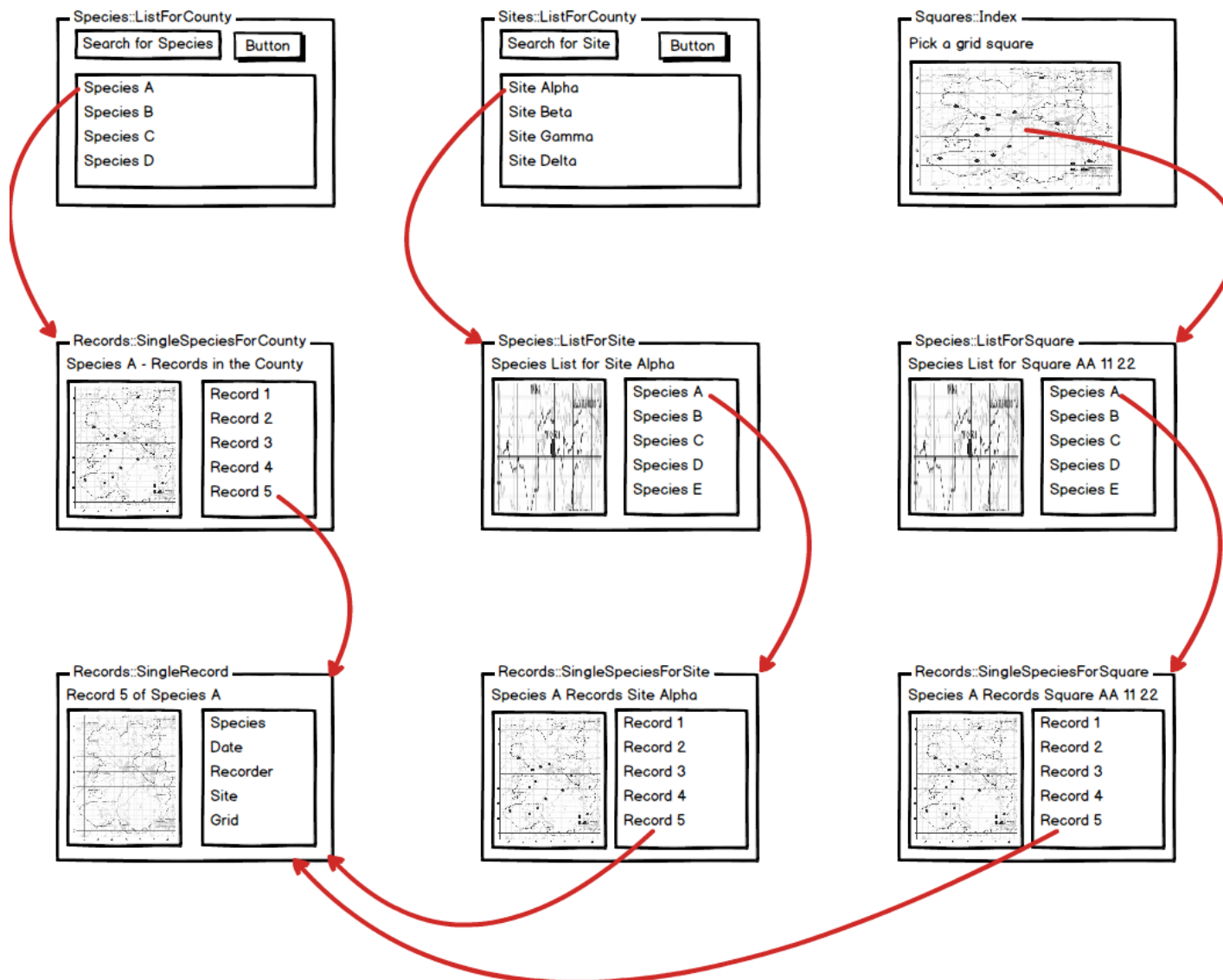
The Online Flora will serve three scenarios for searching for species lists.

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.

Species::ListForCounty

Search for Species | Button

Species A
Species B
Species C
Species D

Sites::ListForCounty

Search for Site | Button

Site Alpha
Site Beta
Site Gamma
Site Delta

Squares::Index

Pick a grid square

Records::SingleSpeciesForCounty

Species A - Records in the County

Record 1
Record 2
Record 3
Record 4
Record 5

Species::ListForSite

Species List for Site Alpha

Species A
Species B
Species C
Species D
Species E

Species::ListForSquare

Species List for Square AA 11 22

Species A
Species B
Species C
Species D
Species E

Records::SingleRecord

Record 5 of Species A

Species
Date
Recorder
Site
Grid

Records::SingleSpeciesForSite

Species A Records Site Alpha

Record 1
Record 2
Record 3
Record 4
Record 5

Records::SingleSpeciesForSquare

Species A Records Square AA 11 22

Record 1
Record 2
Record 3
Record 4
Record 5

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.

All plants

Vascular plants

Bryophytes
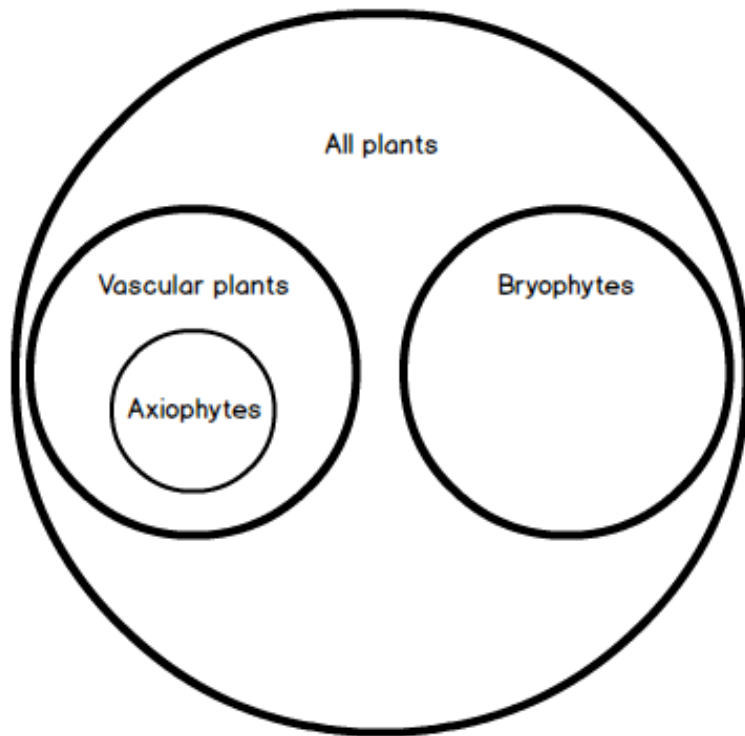
Axiophytes

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

Free service

updating and maintaining

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

The 'landing' page for the application is the search of the entire dataset for the county.

- [ ] By default the **Scientific** name selected first. favour identifying plant species via the scientific name

- [ ] On landing the selected list is empty.

- [ ] The characters entered in the search box are used to search for names begining 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]

_____

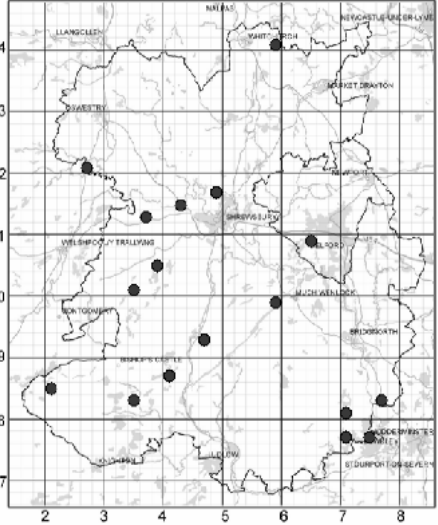[1]https://records-ws.nbnatlas.org/explore/group/Plants?fq=data˙resource˙uid:dr782+AND+taxon˙name:B*

4.2 Records for a Single Species in the County

Shropshire Online Flora...

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

Find a Species   Find a Site   Find a Monad   About
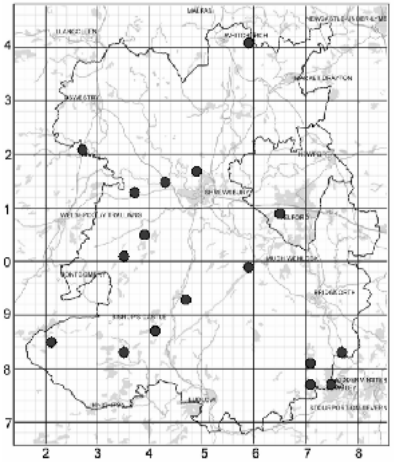
« Abax parallelepipedus in Shropshire

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

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

Species   Site   Monad   About

« Abax parallelepipedus in Shropshire

Date	Site	Recorder	
2010	Birchen Park	John Bingham	...
2010	Breakneck Bank	Caroline Uff	...
2010	Brokenstones Plan	Bob Lawrence	...

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

Desktop browser view

Shropshire Online Flora...

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

Find a Species   Find a Site   Find a Monad   About

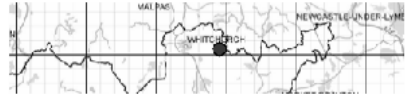« **Abax parallelepipedus record detail**

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

Shropshire Botanical Society Data supported by National Biodiversity Network

Mobile view

●●●○○ ABC   06:50 PM

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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5 Search in a Site

5.1 Site List for the County

- List is empty, actually is this necessary?

e.g. `https://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

Browser view — 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   ○ Axiophytes Only
- ○ Only Plants   ○ Only Bryophytes   ◉ Both Plants and Bryophytes

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 | >

Shropshire Botanical Society Data supported by National Biodiversity Network

Shropshire Flora

Species   Site   Monad   About

« Species at Church Hill

- ◉ Scientific   ○ Common   ○ Axiophytes
- ○ Plants   ○ Bryophytes   ◉ Both

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

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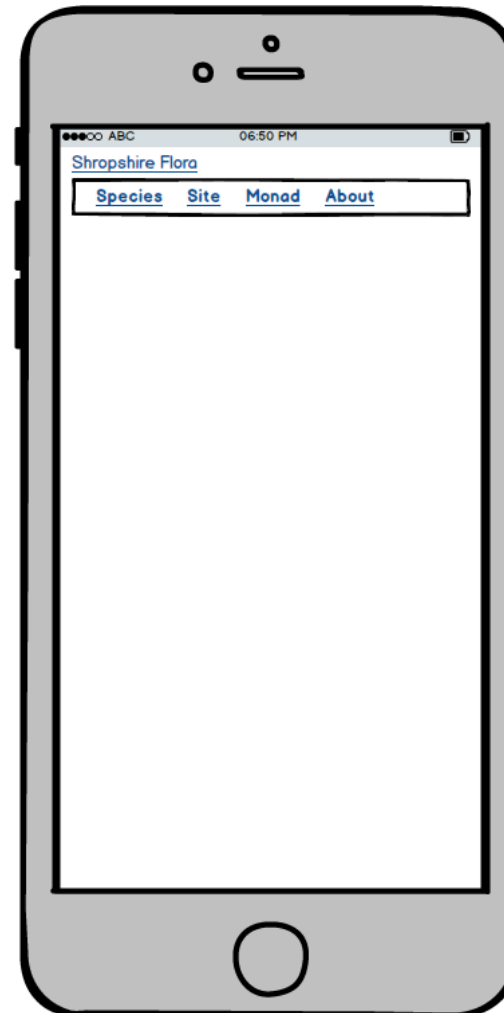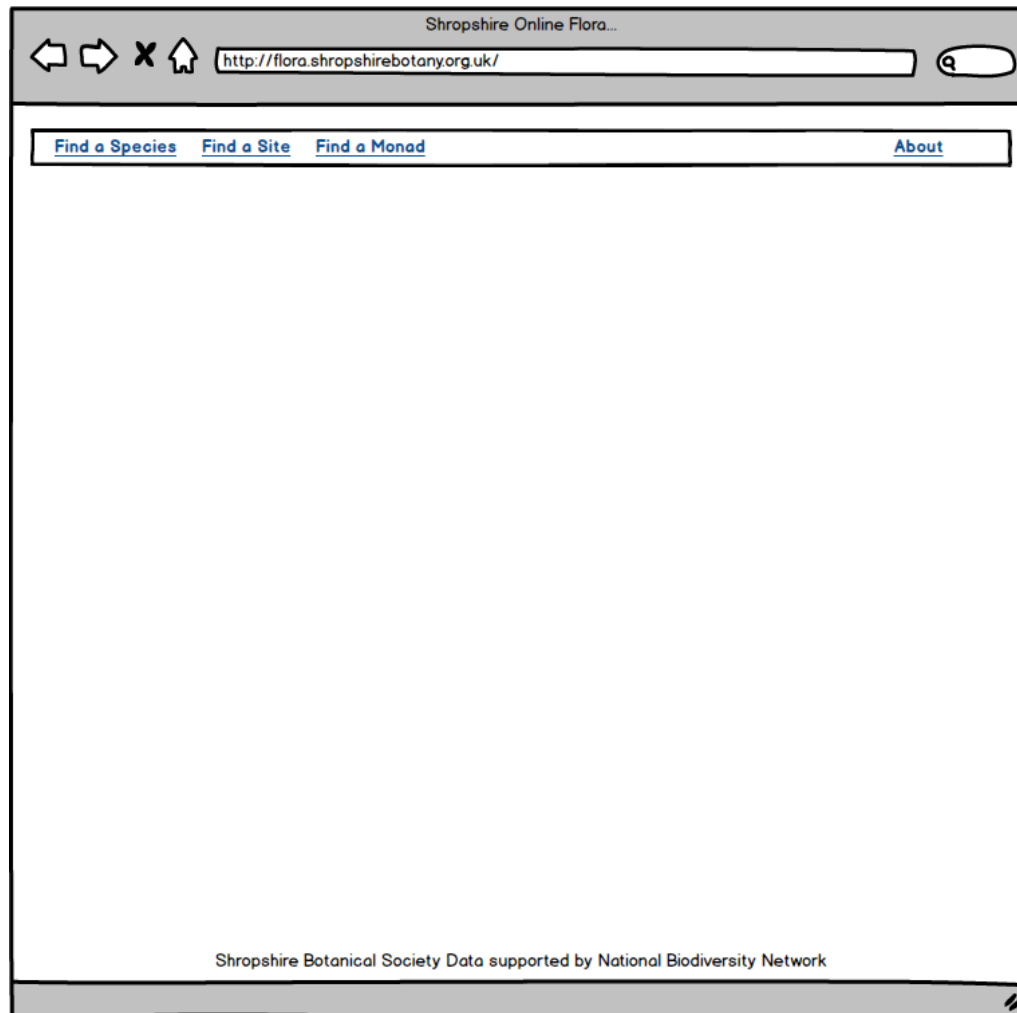
6   Search in a Square

6.1   Select a Square

- Zoom in and select.

- Graticule

6.2 Species List for a Square

Browser view — Shropshire Online Flora...

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

Find a Species   Find a Site   Find a Monad   About

« Grid Square TF20

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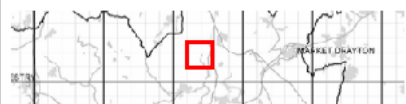
≤ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 >

Shropshire Botanical Society Data supported by National Biodiversity Network

Mobile view — Shropshire Flora
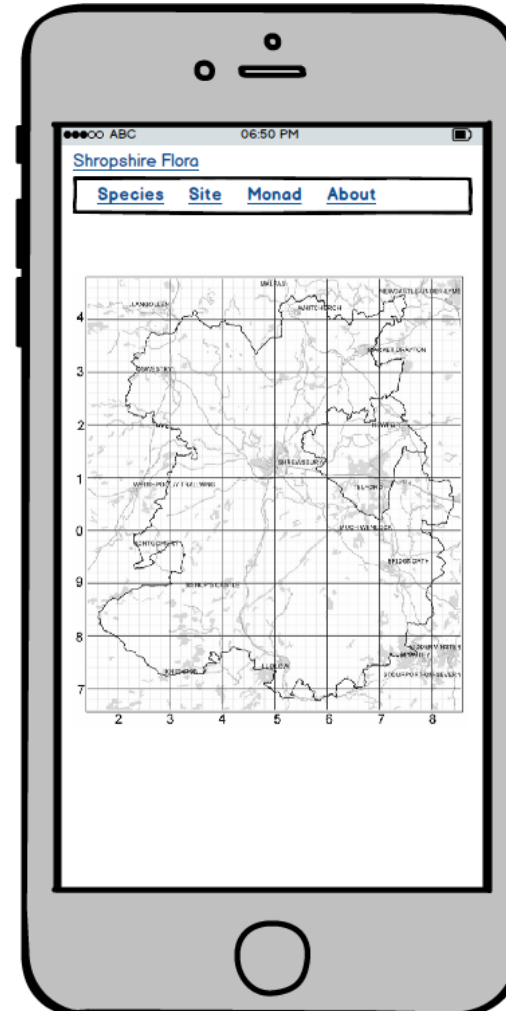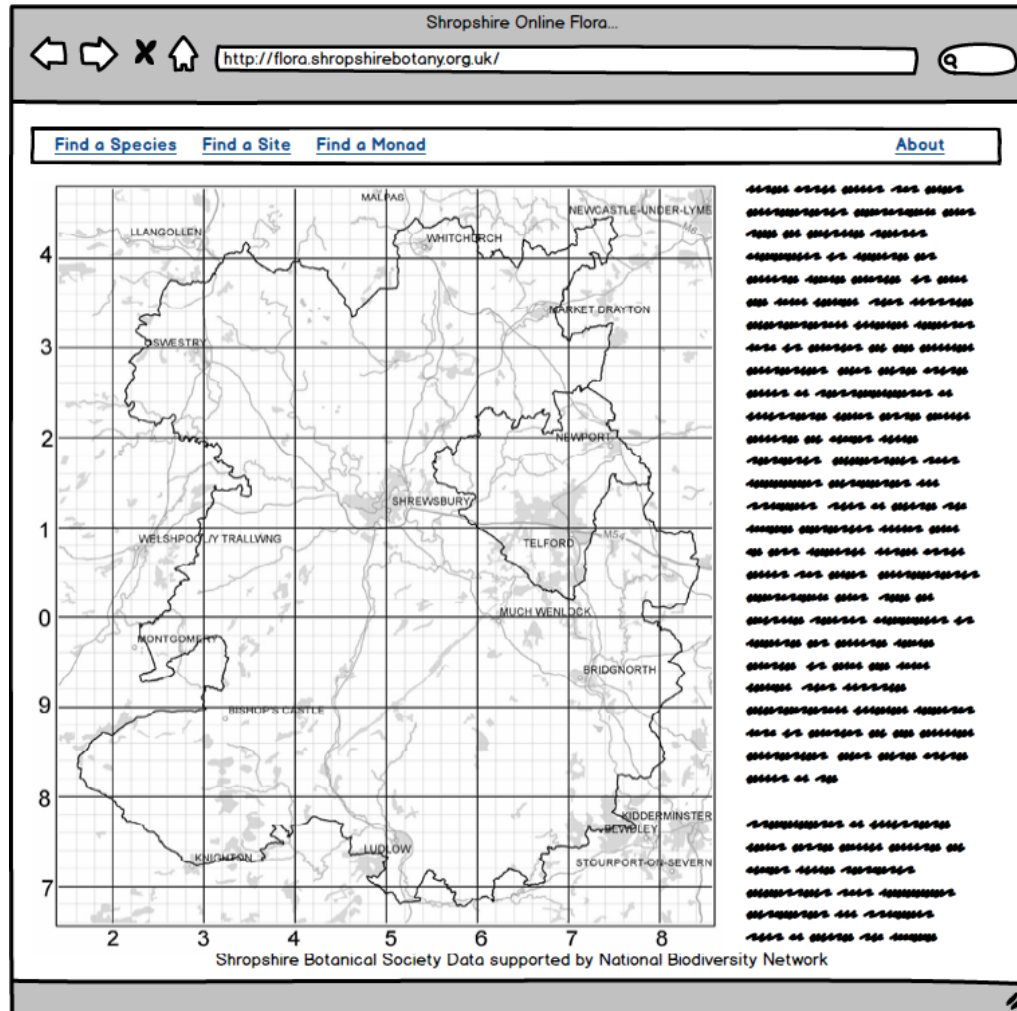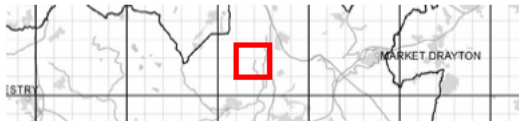
Species   Site   Monad   About

« Grid Square TF20

search   List

⦿ Scientific   ○ Common   ○ Axiophytes
○ Plants   ○ Bryophytes   ⦿ Both

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

≤ | 1 | 2 | 3 | 4 | 5 | >

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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

Shropshire Botanical Society Data supported by National Biodiversity Network

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Shropshire Flora

Species   Site   Monad   About

« Abax parallelipedus in TF20

Date	Site	Recorder	
2012	Birchen Park	John Bingham	...
2012	Birchen Park	Caroline Uff	...
2012	Birchen Park	Bob Lawrence	...
2011	Birchen Park	G.Wenman	...
2011	Birchen Park	Caroline Uff	...
2010	Birchen Park	Bob Lawrence	...
2010	Birchen Park	G.Wenman	...
2010	Birchen Park	Caroline Uff	...
2008	Birchen Park	Bob Lawrence	...
2008	Birchen Park	G.Wenman	...

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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 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.