National Plant Monitoring Scheme

Online Training Materials 1: Introduction to the NPMS and Survey Methodology

Plantlife | UK Centre for Ecology & Hydrology | Botanical Society of Britain & Ireland | JNCC | NIEA Northern Ireland Environment Agency | An Agency within the Department of Agriculture, Environment and Rural Affairs

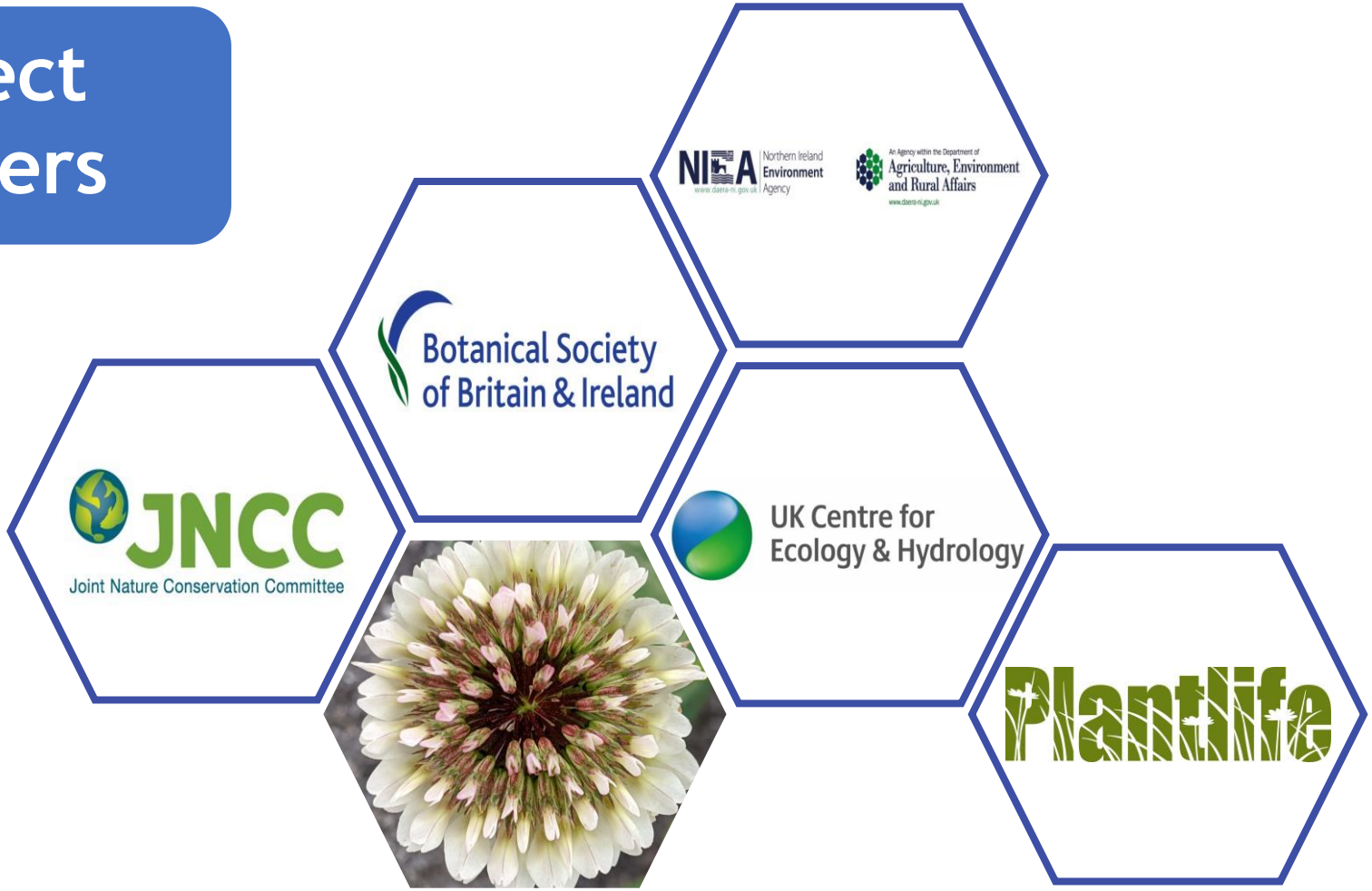
www.NPMS.org.uk

Email: Support@npms.org.uk

Outline

- Background to the NPMS and data uses
- Getting Started with the NPMS
- Survey method
  - Plot selection
  - NPMS habitats
  - Recording plant data
  - Other info to record
- Survey materials
- Volunteer support

Project partners



- Scheme co-developed between the expert partners along with volunteers on the ground
- Inclusive trial phase with contributors and volunteers from a variety of backgrounds and experiences
- Important that the scheme is accessible and inclusive while maintaining robust and standardised methodology and data standards

Background

NPMS provides an indication of changes in plant diversity and abundance, across the UK's habitats, through time.

• Long-standing schemes for monitoring populations of birds, bats and butterflies but previously not for plants.

• Crucial to have a better understanding of plant populations.

• Need for large coverage and systematic approach – otherwise there is potential to mask trends and weaken signals

A brief history

2012 – The four partners came together
2014 – Pilot run in conjunction with Wildflowers Count
2015 – The NPMS was launched
2020 – Celebrating 5 years of NPMS Data

There was no robust national survey and a need to include semi-natural habitat beyond protected sites in monitoring

What can the data tell us in the future?
Habitat inventories and remote sensing applications

Why was the scheme established?

Investigating drivers of change using NPMS data
(Climate change; Habitat management; Invasive species; Air pollution and eutrophication; Coastal management; Agri-environment stewardship; Pest and pathogens; Protected areas; Animal-plant interactions)

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408
NPMS
Species

11
NPMS
Broad
Habitats

5
Partners

5
Plots per
Square

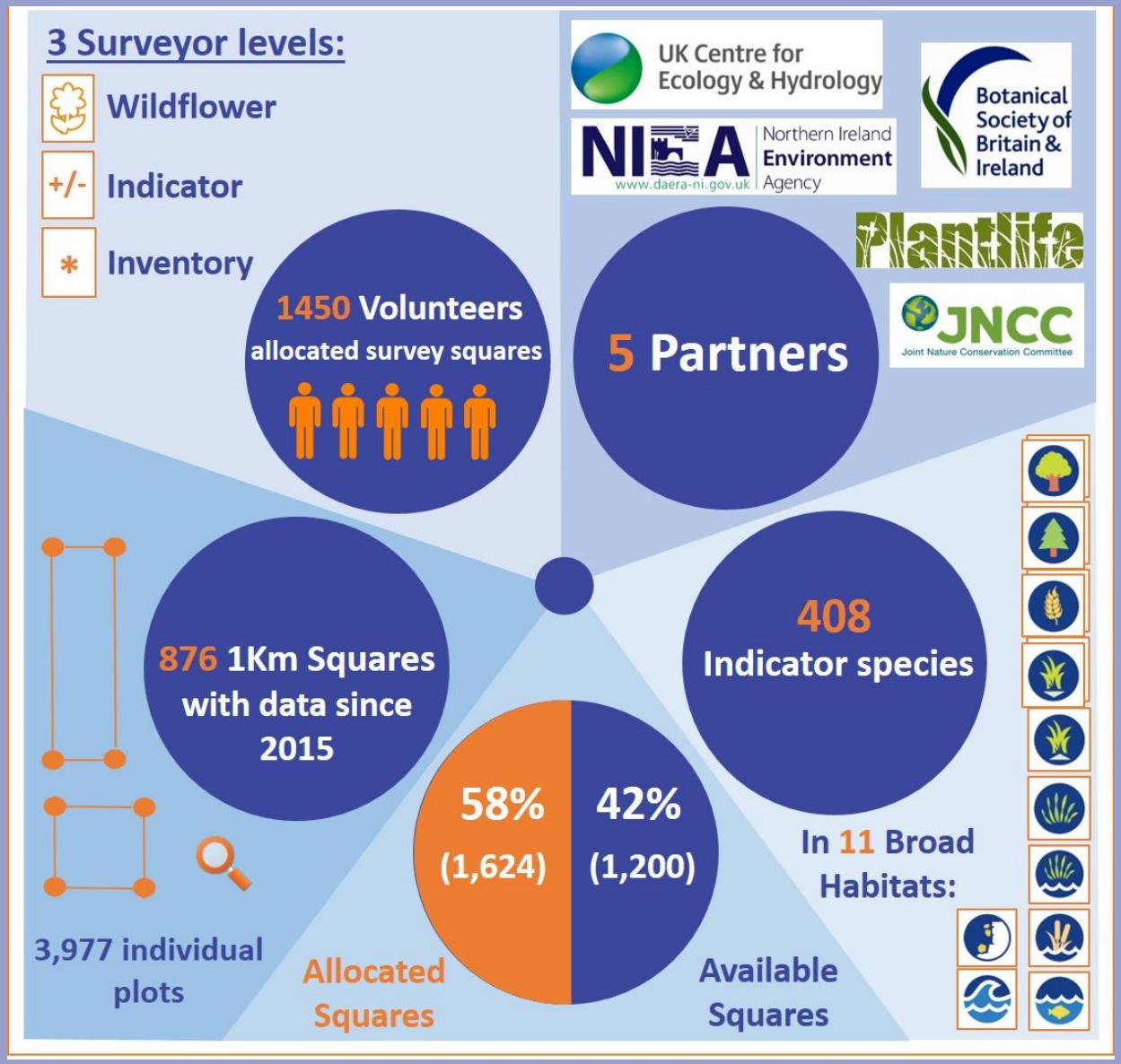
3
Recording
Levels

1500
Volunteers

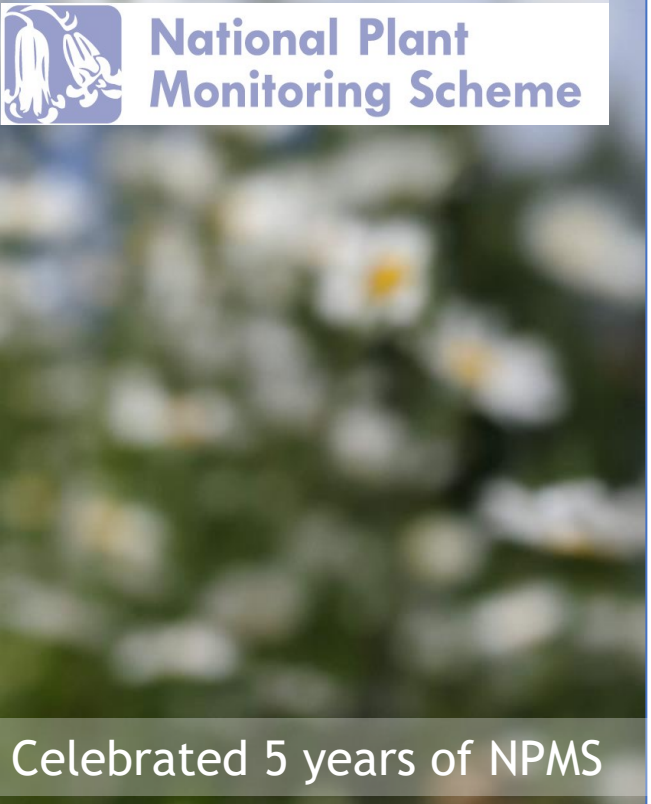
2
Visits Each
Year

28
Fine
Habitats

National Plant Monitoring Scheme



National Plant Monitoring Scheme



Celebrated 5 years of NPMS

Understanding the Health of our Habitats

5 years of the NPMS

1,500 citizen scientists

15,000 surveys across the UK so far

150,000 plant records

From the Cairngorms to the South Downs, from Exmoor to Rannoch Moor, the NPMS is providing robust botanical data from across the UK to monitor change in 30 habitats at small-scales.

2020 is a milestone year for the NPMS as we celebrate our first five years of data collection. NPMS volunteers produce a dataset that is not only informative about the changing plant communities of differing habitats, but which can also dramatically increase the value of other datasets.

All environmental monitoring is a long-term endeavour: the saying that the best time to start monitoring is 100 years ago but that the second-best time is now, holds for plants as for any other part of our environment.

Built on partnership and government-funded research, the NPMS uses long-term botanical surveys to investigate the health, plant abundance and diversity of our habitats, and allows us to investigate the growing pressures on our environment – from eutrophication, climate change and extreme weather, to how land management can affect biodiversity.

An astonishing 30% of all our volunteers are new to plant recording.

60% of the entire native flora of Britain and Ireland recorded

meadows heathland streams

INDICATOR

- DEFRA/JNCC 2020 published UK Biodiversity Indicators
- A series of measurements to illustrate how our wildlife is doing
- First ever contribution of NPMS data to a national indicator
- Four of the broad habitats
- Plants now included because of NPMS citizen science

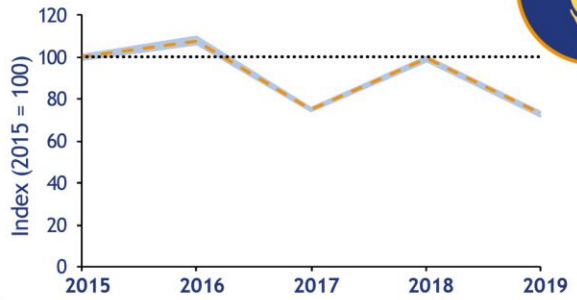
UK Biodiversity Indicator

C7. Plants of the wider countryside

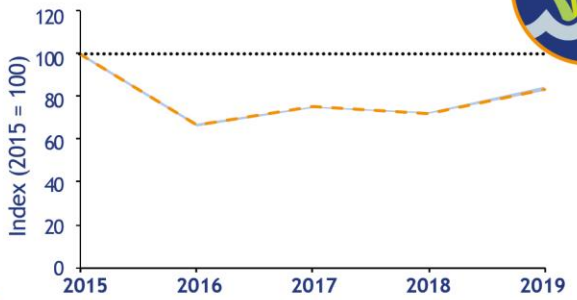
National Plant Monitoring Scheme

This indicator measures change in the abundance (% cover) of plant species that are used to assess a healthy habitat in the UK.

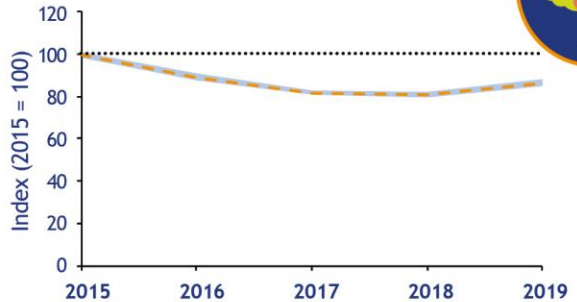
Arable field margins



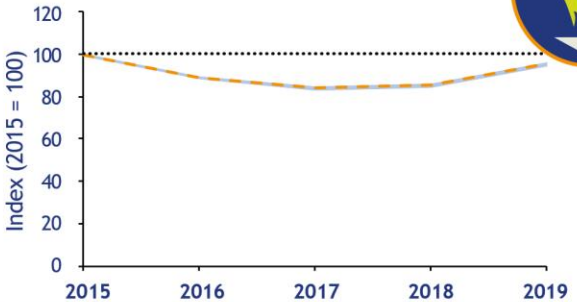
Bog and wet heath



Broadleaved woodland & hedges



Lowland grassland



What is the indicator for?

The UK is fortunate to have lots of information about its biodiversity, which is collected across a whole range of species and habitats, including plant data from NPMS citizen scientists. This information provides an essential source of evidence for reporting biodiversity change and the impact of policies and actions to conserve biodiversity.

This indicator is still an experimental statistic in the official indicator set

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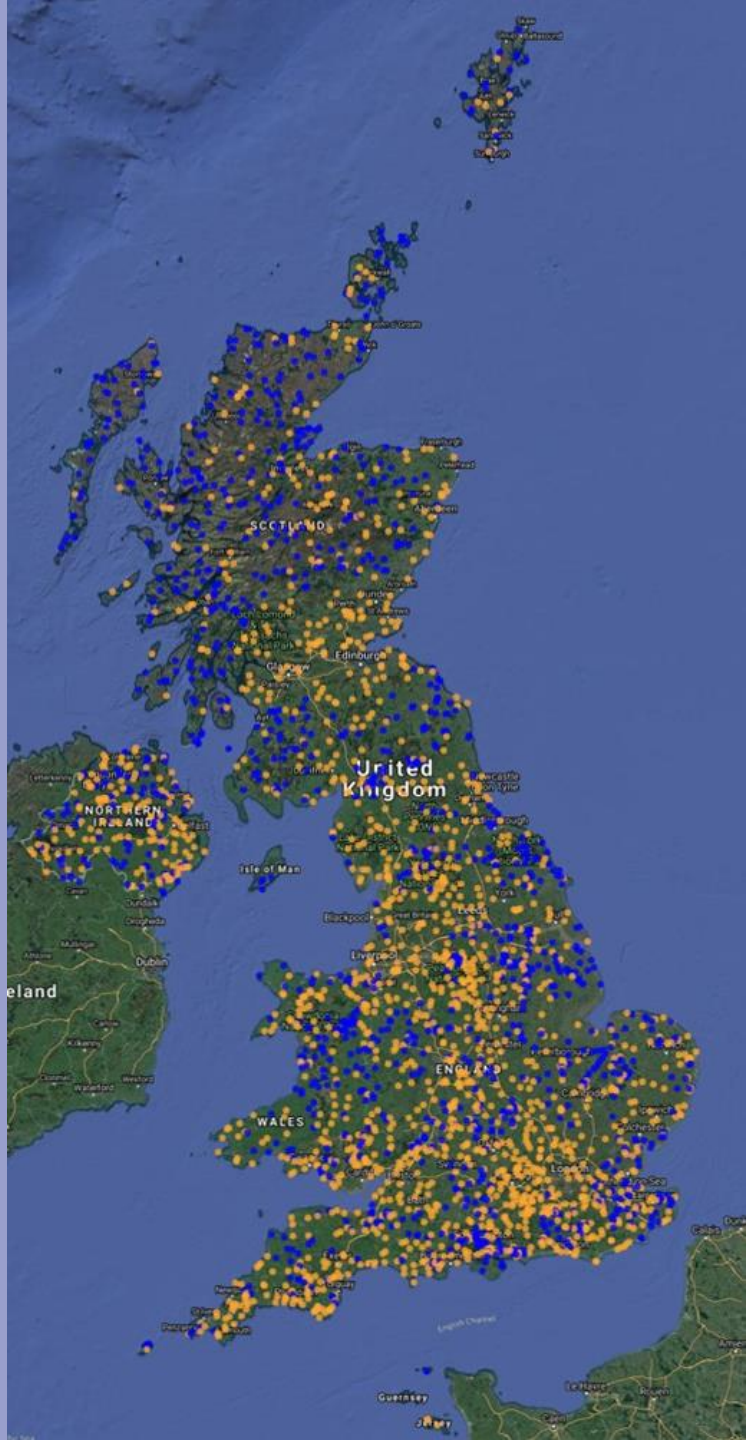
Coverage:
Orange = Allocated
Blue = Unallocated

How are we doing so far?

- 1580 NPMS Volunteers allocated a square
- To date ~914 squares with data returned
- >1674 surveys
- 2000 NPMS squares required



National Plant Monitoring Scheme

Aims

Measures of Change; species/habitats

Positive and Negative indicators

Simple, repeatable and achievable

The Basics

- Randomly allocated 1km square
- 5 Plots per square
- Different NPMS habitats
- Record NPMS species abundance
- Survey square twice per year

National Plant Monitoring Scheme

Getting Started

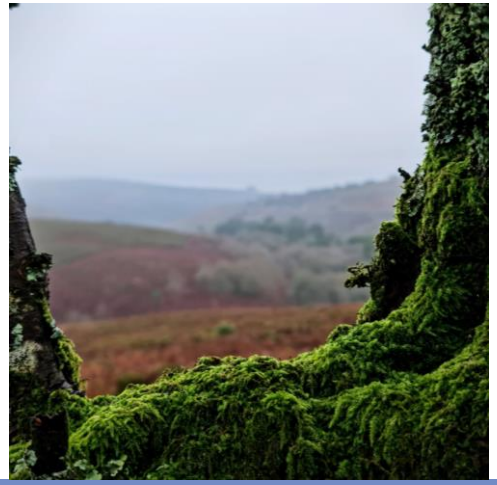
- Register online
- Request 1km Square
- Receive Pack

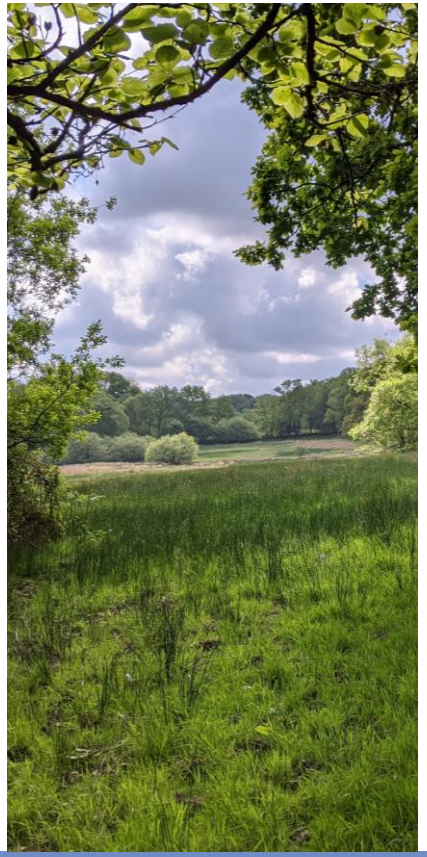
All material also available online

Getting to know your survey square and plots

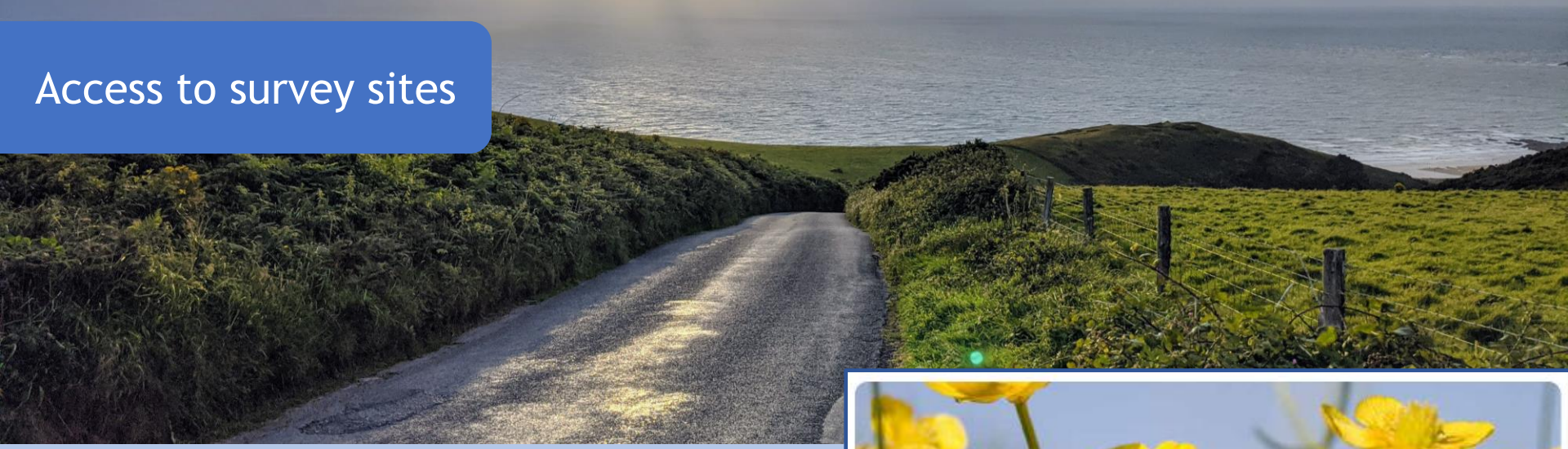
- Habitat Map in your survey pack
- Ordinance survey map
- View your square on your NPMS account/ Google maps
- Review habitats

- Reccy/visit your site/plan ahead
- Consider landmarks
- Consider land access and safety
- FAQs on our resources web page





Access to survey sites



- Volunteer responsibility
- Permission required on private land
- Tips in our FAQs
  - Local Council
  - National Park, National Trust etc
  - Local businesses
  - Post office/Library
  - Google maps
- NPMS Permission letter
- Thank You letter
- Land owner record
- Keep the Landowner informed

Access

- NPMS Access permission postcard - Northern Ireland
- Landowner thank you letter
- Landowner access permission letter.pdf

Let the landowner know planned visit dates in advance

- Three 5x5 m plots (10x10m if in woodland)
- Two 1x25 m linear plots
- Where possible use pre-selected plot locations

•Only carry out surveys in NPMS habitats

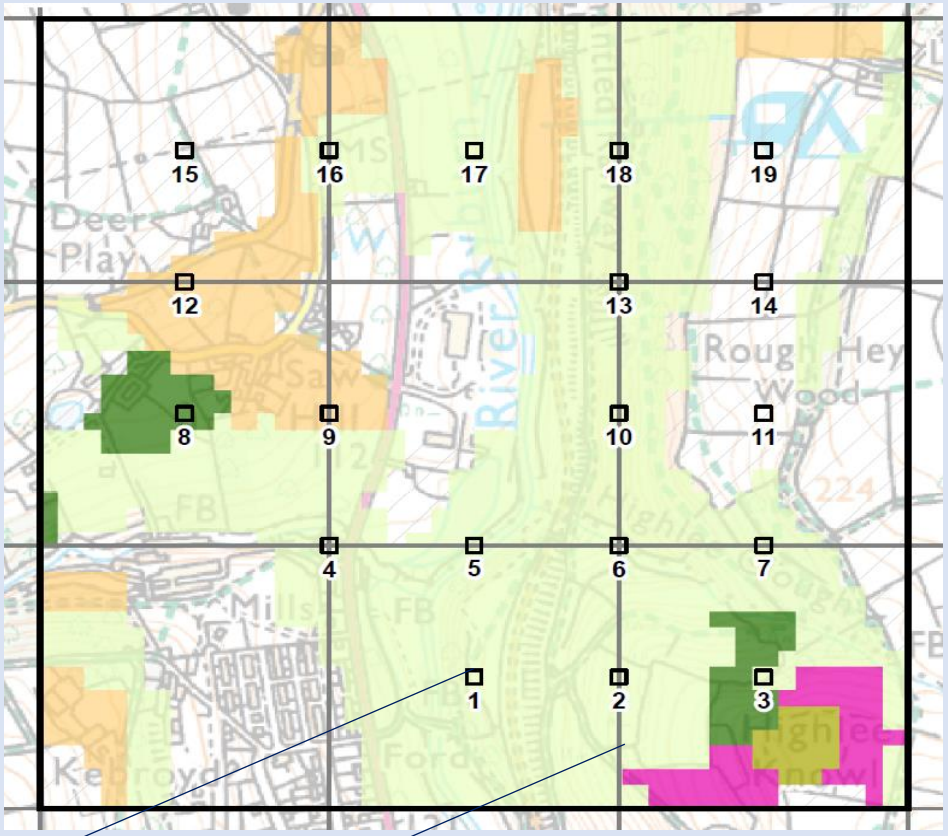
- Ideally locate each plot in a different habitat

- If there is an accessible pond or flush, please include this

The Groundwork

- Square reconnaissance
- Plot Set up

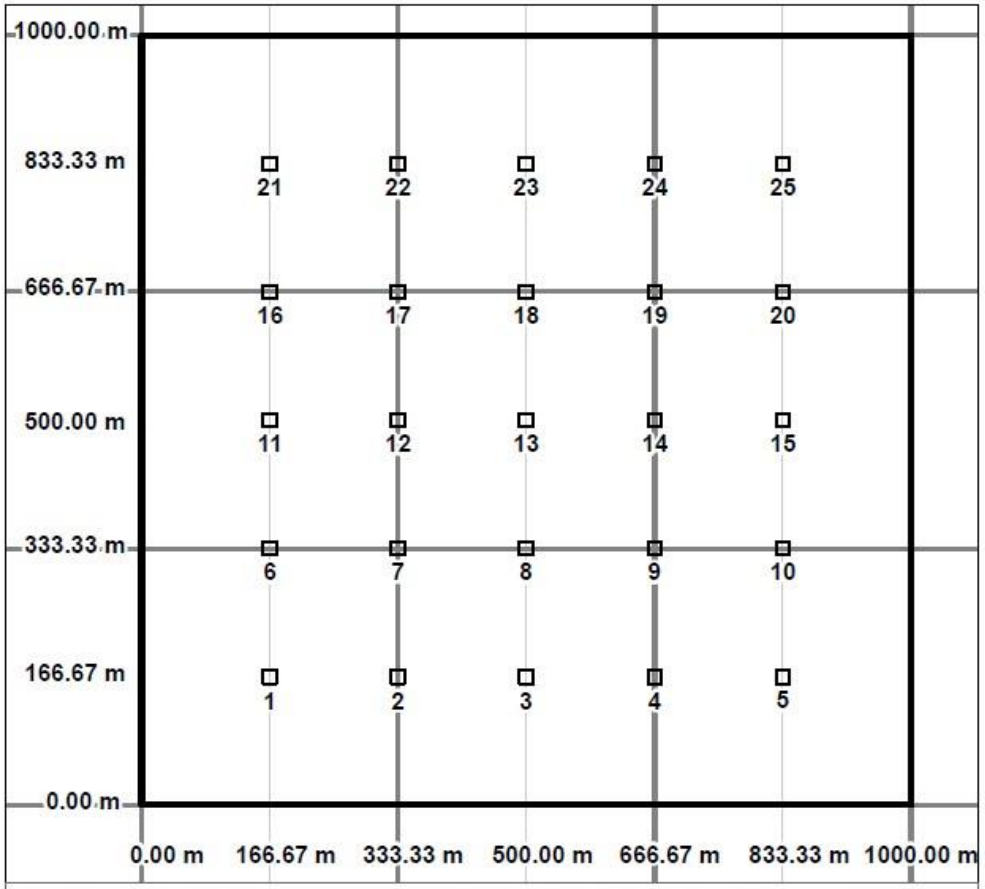
Recommended locations for square plots



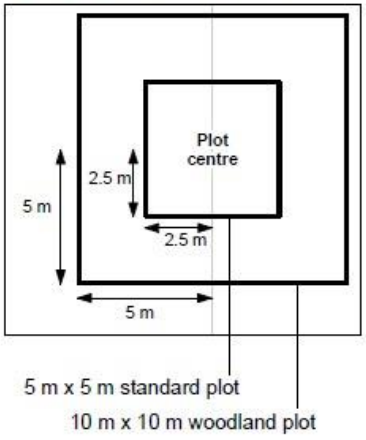
Linear plots: where linear feature intersects a grid-line/boundary line

Using this method you can work out your grid references for the pre-numbered plots before you set out

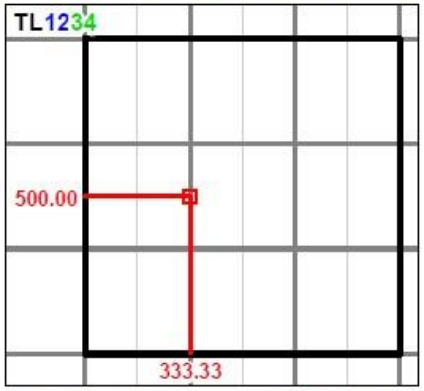
Then use GPS (phone or device) to get to each plot location



Finding plot corners



Looking up a plot grid reference



Grid reference (1 m precision) of red plot is:

TL12333 34500

- Use fixed landmarks
- Temporary markers (leave nothing)
- Record GPS
- Plot sketch
- Written description
- Annual photograph from same point/angle

Plot Set Up

- Important to find same location in subsequent years

- Tape Measure
- String
- Yarn
- Clipboard
- Flags/markers X4

Use canes or flags to mark corners

Use a clipboard to get a right angle on the corners

Measure out your plot sides

Tape Measure

Pre-measured string

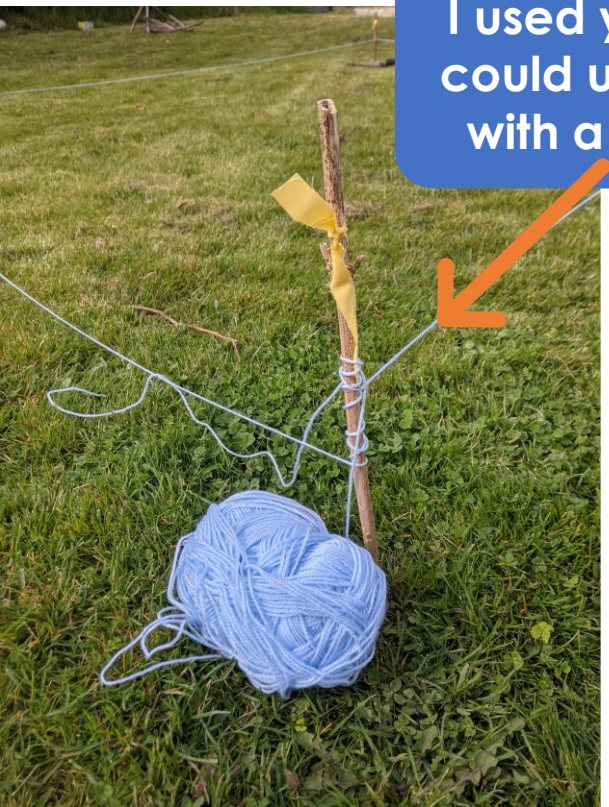
Pacing

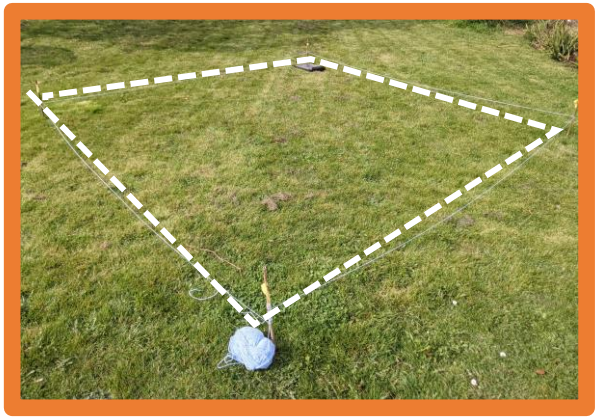
From the South West corner take a photo, draw a sketch and note grid reference

Pace out

Or measure

I used yarn and paced out, but you could use pre-measured yarn/string with a marker at each 5m interval





Use a clipboard to get the 90 degree angle on the corners

Specific instructions on linear plots

Hedgerows:

1 m out from hedgerow centre, or the outer 1 m section of the hedgerow (including ground flora)

Diagram 1: Laying out a plot in an arable margin

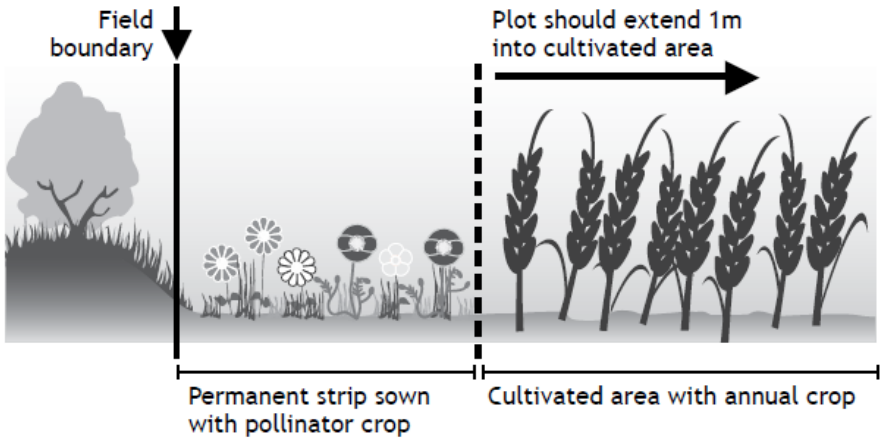
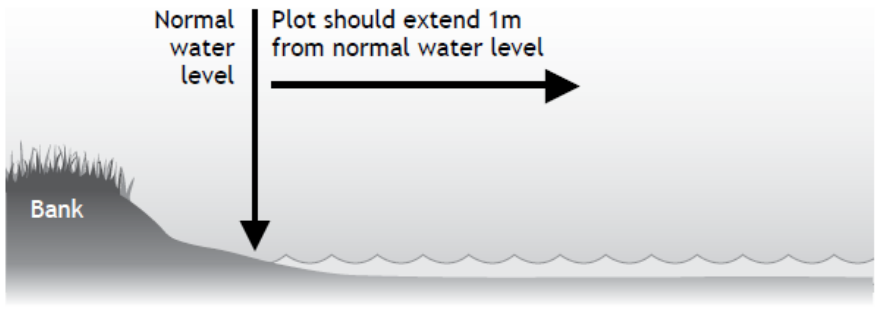
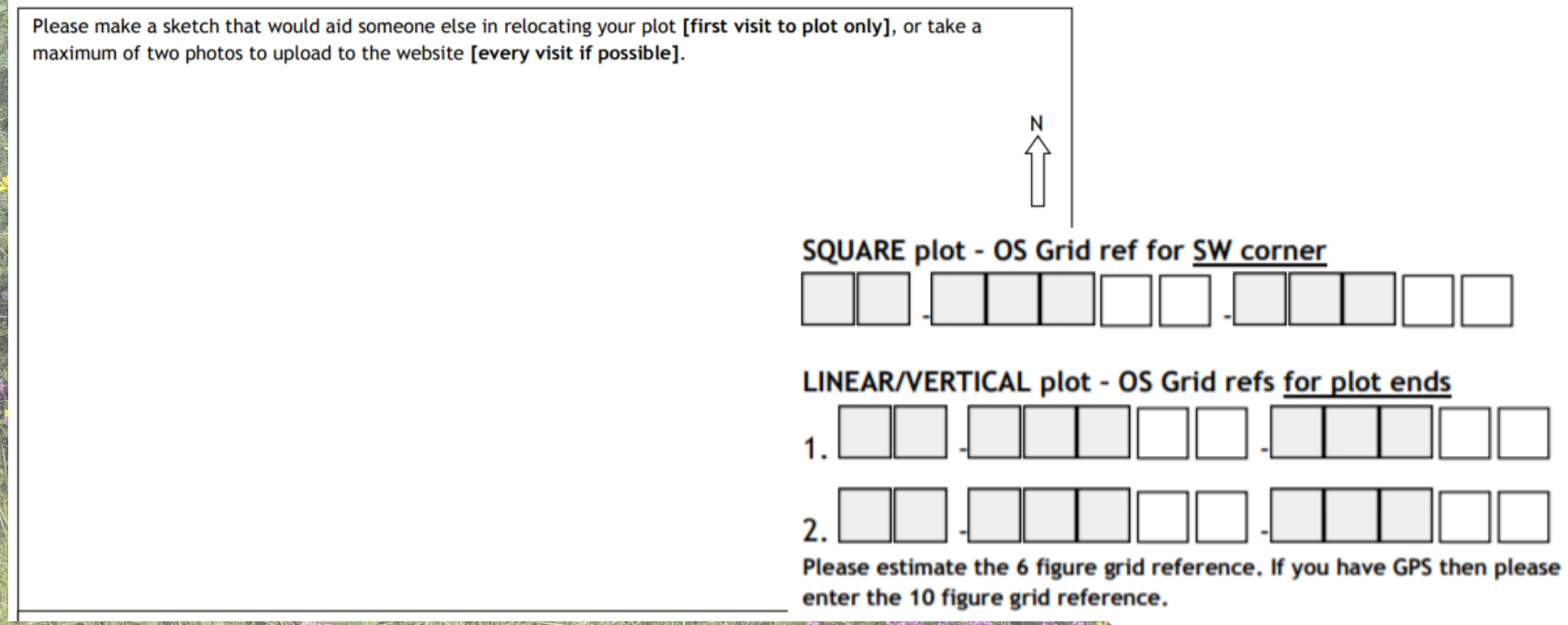


Diagram 2: Laying out a plot along standing waters, rivers, streams, ponds and canals



Getting Started

- Contact landowner(s) to get permissions
- Reconnaissance visit to identify NPMS habitats and establish your plots
- Record your plot locations carefully and enter online so you can relocate them
- Agree survey dates with landowner as required



Please make a sketch that would aid someone else in relocating your plot **[first visit to plot only]**, or take a maximum of two photos to upload to the website **[every visit if possible]**.

N

SQUARE plot - OS Grid ref for SW corner

LINEAR/VERTICAL plot - OS Grid refs for plot ends

1.

2.

Please estimate the 6 figure grid reference. If you have GPS then please enter the 10 figure grid reference.

Choose a survey level

Inventory
All Vascular Plant Species

Indicator
A list of species per habitat

Wildflower
Reduced list of species per habitat

NPMS Habitats

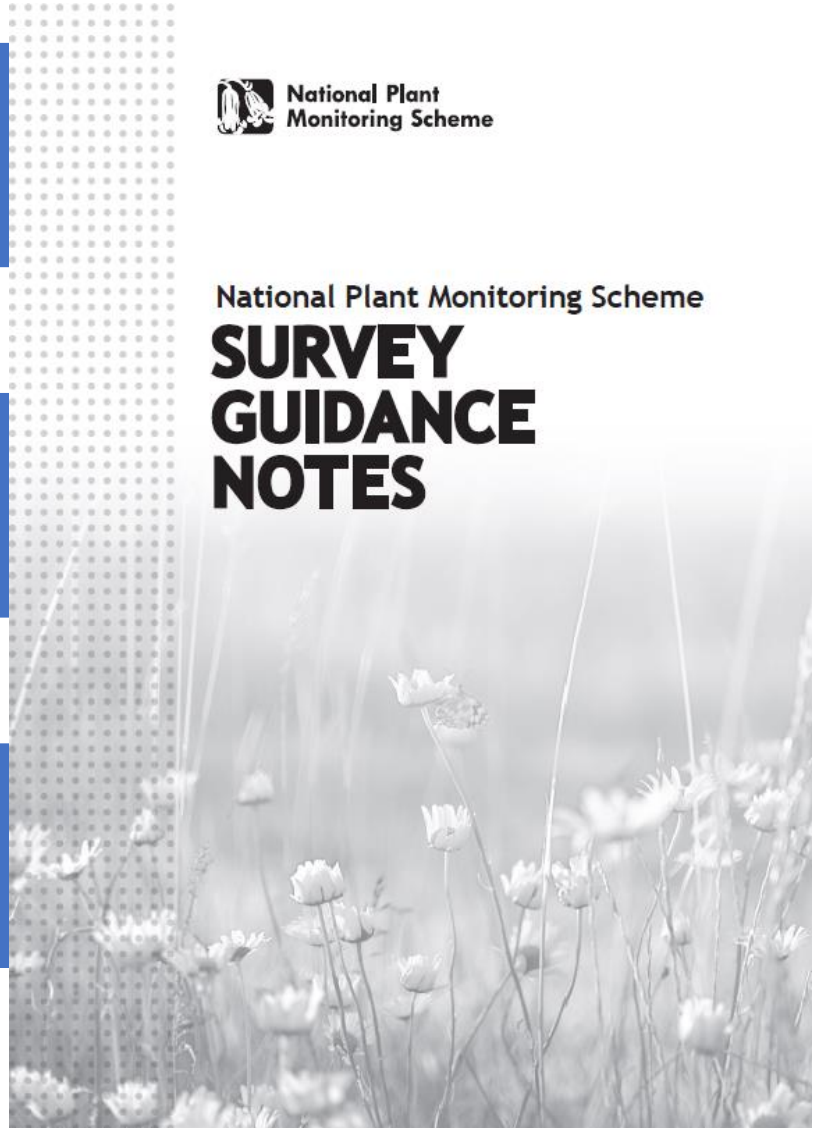
Broad category	Fine-scale habitat(s) included	Wildflower	Indicator
Arable field margins	Arable field margins	15	30
Bog & wet heath	Blanket bog; raised bog; wet heath	31	53
Broadleaved woodland	Dry deciduous woodland; hedgerows of native species; wet woodland	49	75
Coast	Coastal saltmarsh; coastal sand-dunes; coastal vegetated shingle; machair; maritime cliff-tops and slopes	65	110
Freshwater	Nutrient-poor lakes and ponds; nutrient-rich lakes and ponds; rivers and streams	29	56
Heathland	Dry heathland; dry montane heathland	28	48
Lowland grassland	Dry acid grassland; dry calcareous grassland; neutral damp grassland; neutral pastures and meadows	62	98
Marsh & fen	Acid fens, flushes, mires and springs; base-rich fens, flushes, mires and springs	33	51
Upland grassland	Montane acid grassland; montane calcareous grassland	31	53
Native pinewood & juniper scrub	Conifer woods and juniper scrub	21	29
Rock outcrops, cliffs & screes	Inland rocks and scree; montane rocks and scree	34	52

NPMS habitats

Appendix 1, page 27

Full list of Broad-scale and fine-scale NPMS habitats

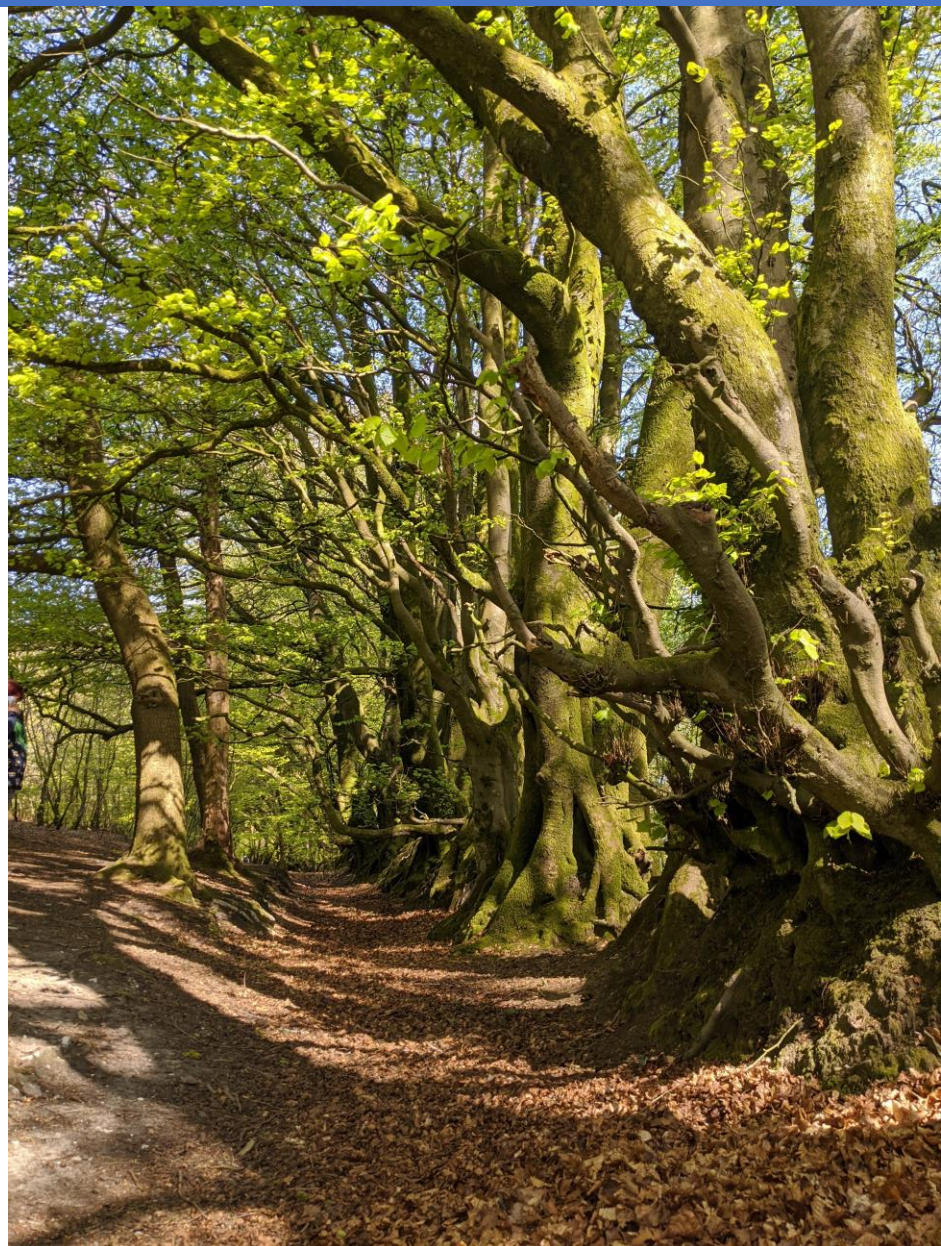
Habitat descriptions and images



NPMS habitat types: Appendix 1 in Survey guidance notes

1. Broadleaved woodland comprising:

- **Dry deciduous woodland**
- **Hedgerows of native species**
- **Wet woodland**



NPMS habitats

2. Native pinewood and juniper scrub comprising:

- **Conifer woods and Juniper scrub**

3. Arable field margins

NPMS habitats

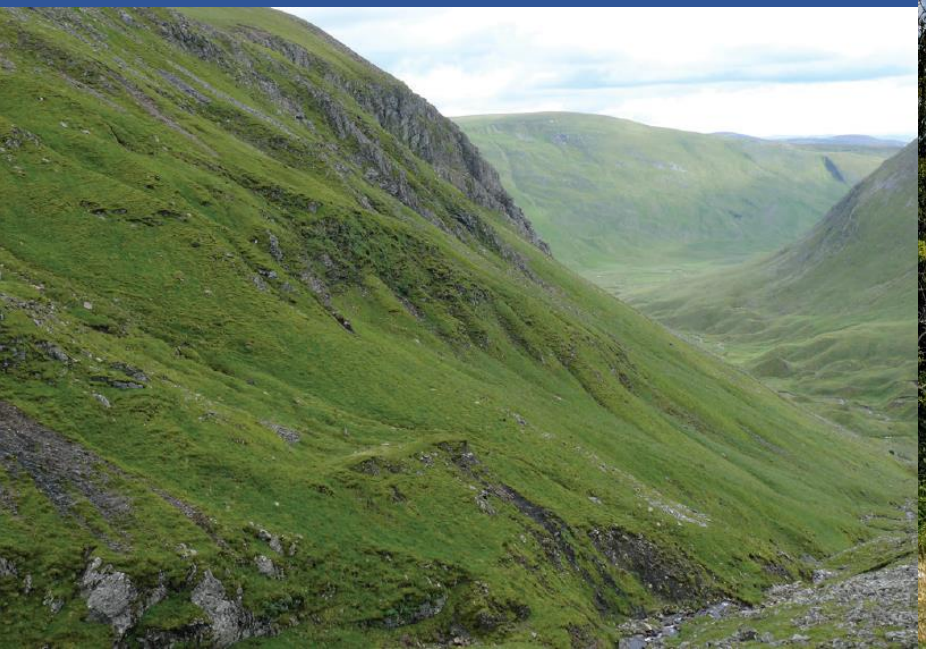
4. **Lowland Grassland** comprising:

- Dry Acid Grassland
- Dry Calcareous Grassland
- Neutral Damp Grassland
- Neutral Pastures and Meadows

NPMS habitats

5. Upland grassland comprising:

- **Montane acid grassland**
- **Montane calcareous grassland**



NPMS habitats

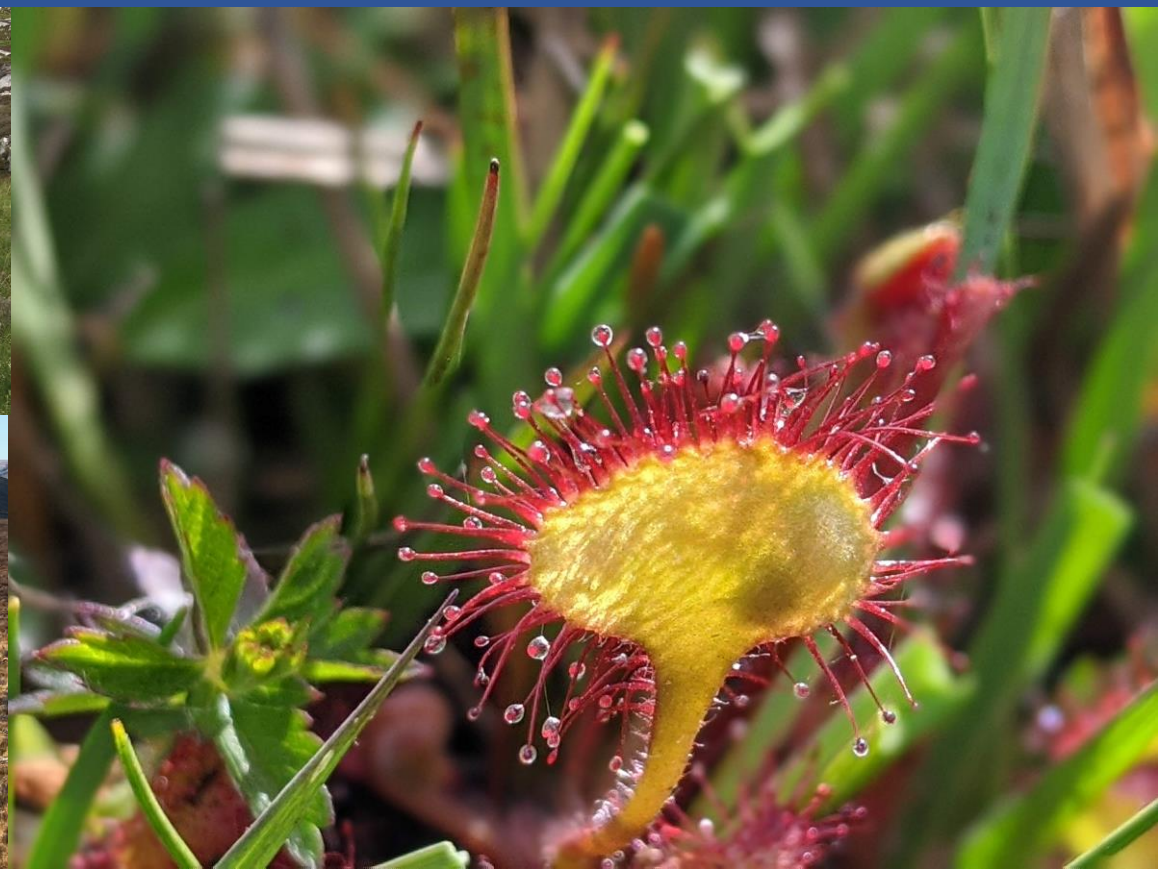
6. Heathland comprising:

- **Dry heathland**
- **Dry montane heathland**

NPMS habitats

7. Bog and wet heath comprising:

- **Blanket Bog**
- **Raised Bog**
- **Wet Heath**



NPMS habitats

8. Marsh and Fen comprising:

- **Acidic fens, flushes, mires and springs**
- **Base-rich fens, flushes, mires and springs**

NPMS habitats

9. Fresh water comprising:

- **Nutrient-poor lakes and ponds**
- **Nutrient-rich lakes and ponds**
- **Rivers and streams**

NPMS habitats

10. Rock outcrops, cliffs and screes comprising:

- **Inland rocks and scree**
- **Montane rocks and scree**

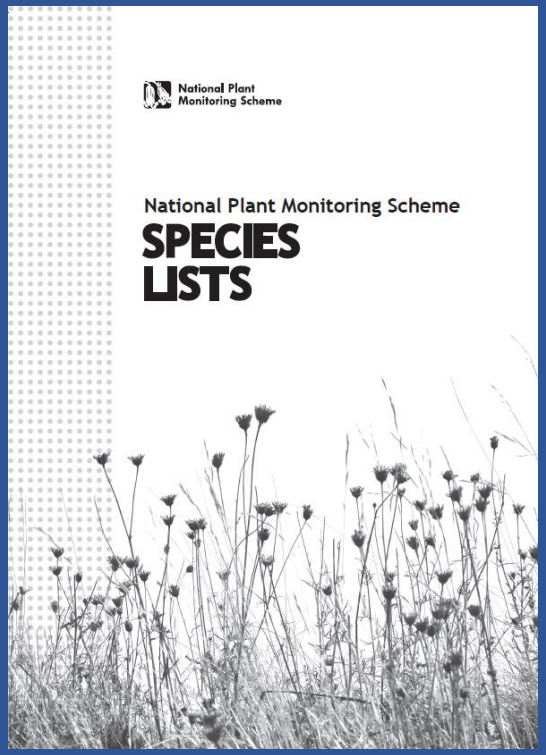
NPMS habitats

11. **Coast** comprising:

- Coastal Saltmarsh
- Coastal Sand Dunes
- Coastal Vegetated Shingle
- Machair
- Maritime Cliff Tops and Slopes

NPMS habitats

Using the NPMS Species lists



Heathland comprising Dry heathland (DH) and Dry montane heathland (DMH)

Name	Common name	WF	Page No.	Fine habitats
Agrostis capillaris	Common Bent		130	DMH
Anemone nemorosa	Wood Anemone	❦	3	DMH
Antennaria dioica	Mountain Everlasting	❦	66	DMH
Anthoxanthum odoratum	Sweet Vernal-grass		131	DMH
Arctostaphylos uva-ursi	Bearberry		6	DMH
Betonica officinalis (Stachys officinalis)	Betony	❦	84	All
Betula pubescens / pendula	Downy Birch / Silver Birch	❦	148	DH
Calluna vulgaris	Heather	❦	84	All
Carex bigelowii	Bigelow's Sedge, Stiff Sedge		140	DMH
Cerastium fontanum	Common Mouse-ear	❦	8	DH
Cirsium arvense	Creeping Thistle	❦	87	All
Cuscuta epithymum	Dodder	❦	69	DH
Dactylorhiza maculata	Heath Spotted-orchid		70	DH
Deschampsia flexuosa	Wavy Hair-grass		134	All
Digitalis purpurea	Foxglove	❦	90	DH
Diphasiastrum alpinum	Alpine Clubmoss		124	DMH
Empetrum nigrum	Crowberry	❦	90	All
Erica cinerea	Bell Heather	❦	91	All
Galium saxatile	Heath Bedstraw	❦	16	All
Genista anglica	Petty Whin		37	All
Huperzia selago	Fir Clubmoss		124	DMH
Hypochoeris radicata	Cat's-ear		41	All
Jasione montana	Sheep's-bit		93	DH
Juniperus communis	Common Juniper	❦	151	DMH
Linum catharticum	Fairy Flax	❦	18	DH
Lotus corniculatus	Common Bird's-foot-trefoil	❦	44	DH
Luzula sylvatica	Great Wood-rush		154	DMH
Lycopodium clavatum	Stag's-horn Clubmoss		124	DMH
Melampyrum pratense	Common Cow-wheat		47	DMH
Nardus stricta	Mat-grass		136	All
Pedicularis sylvatica	Lousewort		75	DH
Plantago coronopus	Buck's-horn Plantain	❦	112	DH
Platanthera bifolia	Lesser Butterfly-orchid		24	DH
Polygala serpyllifolia / vulgaris	Heath Milkwort / Common Milkwort	❦	97	DH
Primula vulgaris	Primrose	❦	50	DMH
Pteridium aquilinum	Bracken	❦	129	DH

Wildflower list

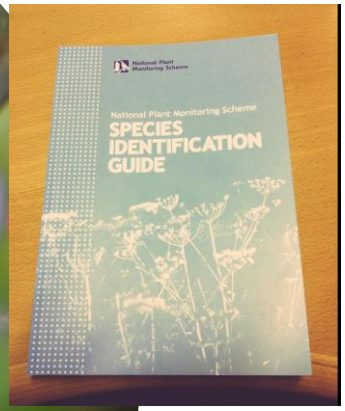
Indicator list

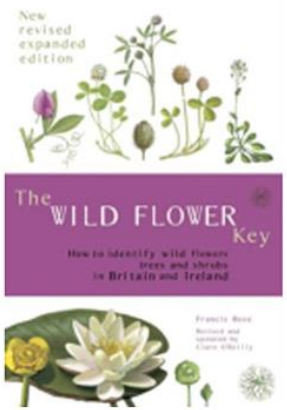
Dry heathland

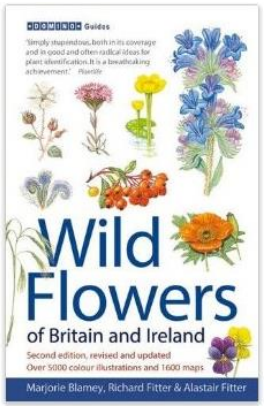
Name	Common name	WF	Indicator	Page No.
Betonica officinalis (Stachys officinalis)	Betony	❦	+	84
Betula pubescens / pendula	Downy Birch / Silver Birch	❦	-	148
Calluna vulgaris	Heather	❦	+	84
Cerastium fontanum	Common Mouse-ear	❦	+	8
Cirsium arvense	Creeping Thistle	❦	-	87
Cuscuta epithymum	Dodder	❦	+	69
Dactylorhiza maculata	Heath Spotted-orchid		+	70
Deschampsia flexuosa	Wavy Hair-grass		+	134
Digitalis purpurea	Foxglove	❦	+	90
Empetrum nigrum	Crowberry	❦	+	90
Erica cinerea	Bell Heather	❦	+	91
Galium saxatile	Heath Bedstraw	❦	+	16
Genista anglica	Petty Whin		+	37
Hypochoeris radicata	Cat's-ear		+	41
Jasione montana	Sheep's-bit		+	93
Linum catharticum	Fairy Flax	❦	+	18
Lotus corniculatus	Common Bird's-foot-trefoil	❦	+	44
Nardus stricta	Mat-grass		+	136
Pedicularis sylvatica	Lousewort		+	75
Plantago coronopus	Buck's-horn Plantain	❦	+	112
Platanthera bifolia	Lesser Butterfly-orchid		+	24
Polygala serpyllifolia / vulgaris	Heath Milkwort / Common Milkwort	❦	+	97
Pteridium aquilinum	Bracken	❦	-	129
Rubus fruticosus agg.	Bramble	❦	-	25
Sedum anglicum	English Stonecrop		+	29
Serratula tinctoria	Saw-wort		+	100
Thymus polytrichus / pulegioides	Wild Thyme / Large Thyme	❦	+	79
Ulex gallii / minor	Western Gorse / Dwarf Gorse	❦	+	61
Urtica dioica	Common Nettle	❦	-	117
Vaccinium myrtillus	Bilberry / Blaeberry	❦	+	81

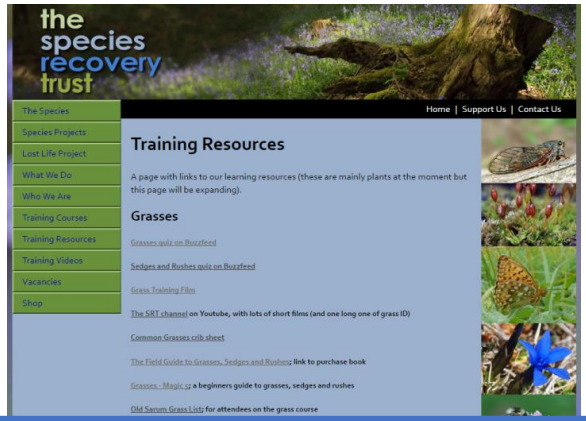
Page No. in ID guide

ID Support









Books and Web Resources

National Plant Monitoring Scheme

FSC

THE wildlife TRUSTS

Training Options

Filling out your recording forms - Page1

Key to fill clearly every visit

Can change between visits

Vegetation height categories

National Plant Monitoring Scheme

Name(s):

1km square grid ref ☐☐-☐☐☐☐

Date of 1st survey: ☐☐ - ☐☐ - ☐☐

Date of 2nd survey: ☐☐ - ☐☐ - ☐☐

At which level are you surveying?

Wildflower ☐

Indicator ☐

Inventory ☐

Plot number: ☐

SQUARE plot - OS Grid ref for SW corner

☐☐ - ☐☐☐☐☐ - ☐☐☐☐☐

LINEAR/VERTICAL plot - OS Grid refs for plot ends

1. ☐☐ - ☐☐☐☐☐ - ☐☐☐☐☐

2. ☐☐ - ☐☐☐☐☐ - ☐☐☐☐☐

Please estimate the 6 figure grid reference. If you have GPS then please enter the 10 figure grid reference.

Habitat type and description (see guidance notes pages 27-39 for categories to use):

Broad habitat: Fine habitat:

Please also fill in the following information where possible (see guidance notes pages 20-23).

If your plot is on a slope, in which direction does it face (optional)? Please circle one or more:

N NE E SE S SW W NW

How steep is the plot (optional)? Flat (0-5°) ☐ Moderate (6-30°) ☐ Steep (>30°) ☐

Management type/description (optional):

Grazing (1 box for each visit): Low ☐☐ Moderate ☐☐ High ☐☐ (see guidance notes page 23)

Which animals graze the plot, if known? Visit 1: Visit 2:

How wooded is your plot?

Dense tree and/or shrub cover ☐ Scattered trees and/or shrubs ☐ Hedgerow ☐ No trees or shrubs ☐

Vegetation height (both visits), enter in the box how much of the vegetation falls into each category (excluding the canopy layer if in woodland) using the following scores: 0 = 0%; 1 = 1-33%; 2 = 34-66%; 3 = 67-100%

<10cm ☐☐ 11-30cm ☐☐ 31-100cm ☐☐ 101-300cm ☐☐ >300cm ☐☐

Please use this space for any additional comments: e.g. weather conditions; are plants/trees looking healthy?

Filling out your recording forms - Page 2

Plot Sketches and photos – every visit

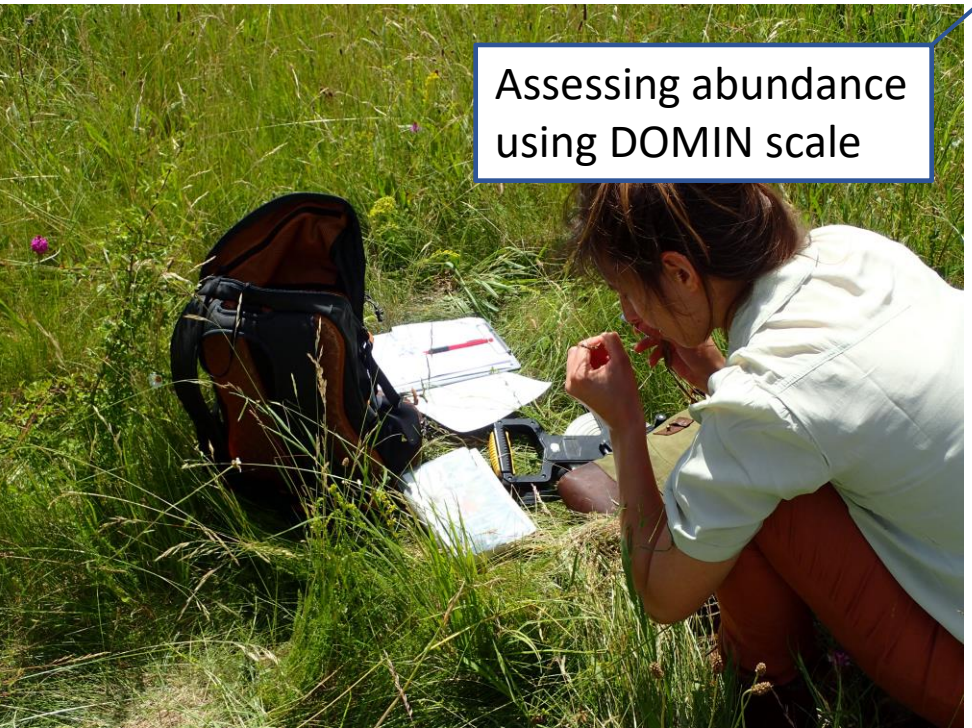
Please make a sketch that would aid someone else in relocating your plot [first visit to plot only], or take a maximum of two photos to upload to the website [every visit if possible].

N

For your plot, allocate an abundance score for each species using the 'Domin' scale below (also see inside the back cover of the guidance notes). Record species in all layers i.e. including overlapping shrubs and trees. Please also include scores for the extra items (Bare soil etc.) listed at the end of the table if possible.

Domin	1	2	3	4	5	6	7	8	9	10
% cover	<1% (1-2 indivs)	< 1% (several indivs)	1-4%	5-10%	11-25%	26-33%	34-50%	51-75%	76-90%	91-100%

Species name	Domin visit 1	Domin visit 2	Species name	Domin visit 1	Domin visit 2
			Bare soil		
			Bare rock/gravel		
			Litter		
			Mosses & lichens		



Assessing abundance using DOMIN scale

Assessing abundance using DOMIN scale

Score:	1	2	3	4	5	6	7	8	9	10
% Cover:	<1	<1	1-4	5-10	11-25	26-33	34-50	51-75	76-90	91-100

- <1% and only 1-2 individuals = score of 1
- <1% but several individuals = score of 2
- If species are scattered try to imagine them clustered in a corner – how many 50x50cm squares they would occupy, **including their leaves**

50x50cm square = 1% of a 5x5m square plot

Square plot - 5x5m

Score:	1	2	3	4	5	6	7	8	9	10
% Cover:	<1	<1	1-4	5-10	11-25	26-33	34-50	51-75	76-90	91-100

Rough Hawkbit
35%
7

Oxeye Daisy
10%
4

Fairy Flax
4%
3

Salad Burnet
50%
7

Additional survey information

- Slope aspect and steepness
- Management description
- Grazing
- How wooded the plot is
- Vegetation height (excluding woodland canopy)
- DOMIN scale for bare soil, rock/gravel, litter, mosses and lichens

What is the vegetation Height?

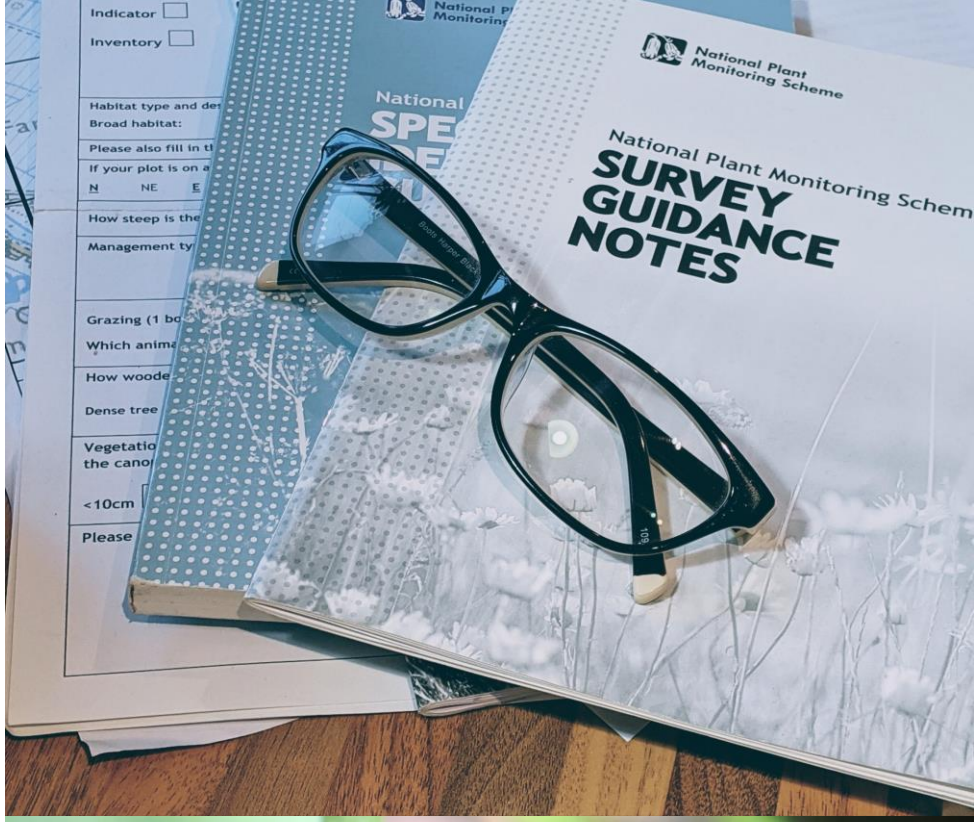
What proportion of the vegetation is:

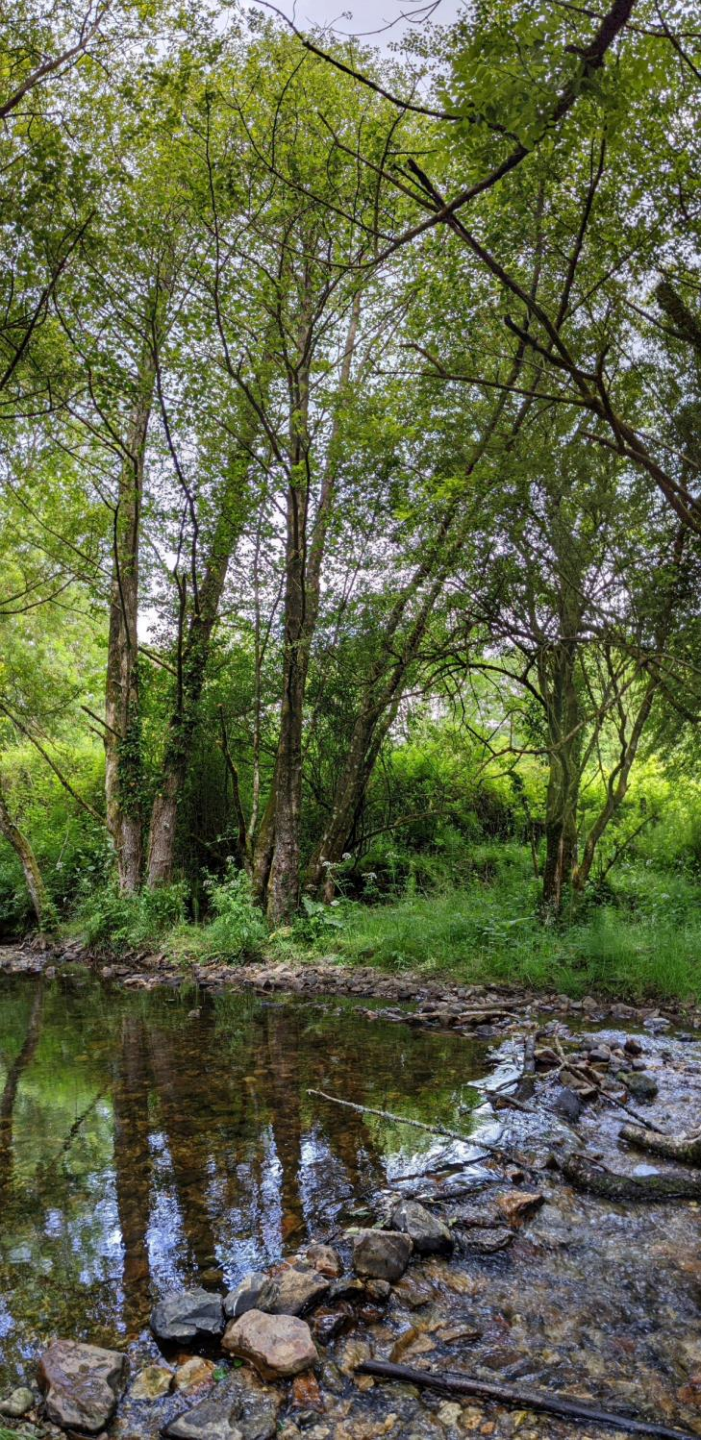
<10 cm
11-30 cm
31-100 cm
101-300 cm
>300 cm

Use a scale of 1-3:
1 = less than one third of area
2 = one to two thirds of area
3 = more than two thirds of area)

Equipment list: In the Field

- Survey form, guidance notes, species lists
- Map
- Clipboard and pencils
- Tape measure and string
- Plot corner markers (sticks, stones, walking poles!)
- ID guides
- Hand lens
- Compass
- GPS device
- Camera
- Phone
- Consider health and safety





- Consider your safety (access and landscape)
- Let someone know where you are going and when you are expected back
- Be prepared for weather changes
- Consider a small first aid kit, phone, food and drink
- Reccy/visit your site

Safety

A quick reminder: When carrying out plant monitoring, NPMS volunteers do so at their own risk.

Submitting your data

Enter data online at www.npms.org.uk

Useful YouTube video tutorials here: https://www.youtube.com/channel/UCxJpSzbAZMkC5eO9B2c4HOg

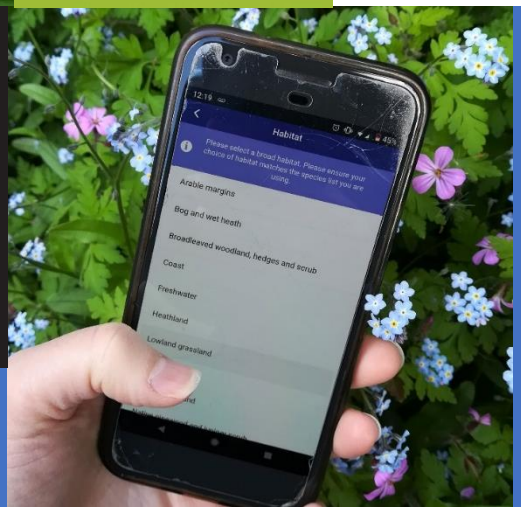
Further Data guidance available on NPMS Resources web page and through specific data entry training.

Data entry forms still accept historical data (data recorded in a previous season)

Contact: support@npms.org.uk for help

Submitting your data

The App



Registration and plot creation still needs to be carried out on desk top

Allows in field data entry

Contact: support@npms.org.uk for help

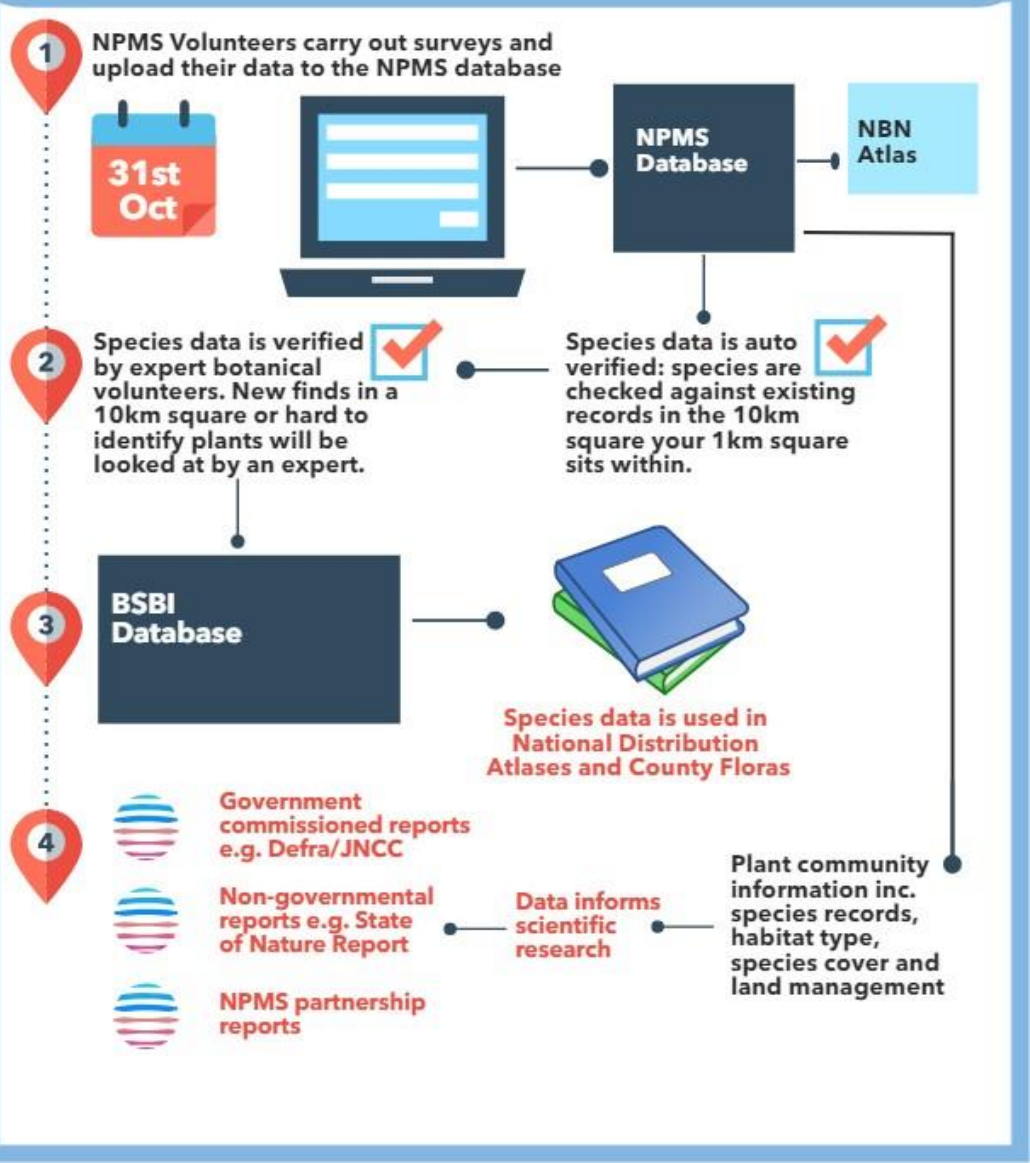
The Website

Your data really helps...

- Detect national trends
- Detect annual trends – species, groups of species
- Non-natives, climate sensitive etc.
- Direct impacts of physical events e.g. severe weather, introduction of pests
- Changes in land management
- Links with other species groups e.g. pollinators

National Plant Monitoring Scheme

I've uploaded my data. What happens next?



Ways to Find Support

- Survey packs – materials provided

Website

- Resources
- FAQs
- Online Training
- Data guidance videos
- YouTube channel

Support on Social Media

Survey guidance and forms

- NPMS Online data entry and website guidance
- NPMS Field survey guidance notes
- NPMS Survey form
- NPMS Species lists
- NPMS Species ID guide
- NPMS Flow diagram overview

Additional resources

- FAQs
- NPMS Overview presentation
- NPMS Plot grid reference crib
- NPMS Useful books and websites
- NPMS Code of Support

Access

- NPMS Access permission postcard - Northern Ireland
- Landowner thank you letter
- Landowner access permission letter.pdf

Volunteer opportunities

- NPMS Volunteer role - Trainer
- NPMS Volunteer Role - Mentor

NPMS Mentors

- NPMS Mentors contact directory

Habitats and species

- NPMS Habitat links to 'Britain's Habitats' book
- NPMS Fern crib
- NPMS Fern glossary
- NPMS Species ID Crib

Training

Face to face training
Online training webinars
Online one to one data surgeries
Online virtual meet ups
Face to face volunteer meet ups

Visit the website to see latest training and events

Events available and free to registered NPMS volunteers

NPMS Mentors

- NPMS Mentors contact directory (2019 update)

Regional Mentors

https://www.npms.org.uk/content/npms-mentors

- Sarah Shuttleworth
  Volunteer Manager
- Email:
  support@npms.org.uk

- Phone: **07711 922098**

National Plant Monitoring Scheme

For more information
or to sign up to become an
NPMS volunteer go to
www.npms.org.uk
Follow us on

SCAN ME