Nature’s Calendar- 300 years of ‘citizen science’

Kate Lewthwaite
Talk outline

- An introduction to the Woodland Trust
- A brief history of recording the seasons
- Bringing the story up to date – what is recorded now?
- What do the records show?
  - What is their significance?
- Future challenges
A UK rich in woods and trees, enjoyed and valued by everyone

Enabling the creation of more native woods and places rich in trees

Protecting native woods, trees and their wildlife for the future

Inspiring everyone to enjoy and value woods and trees
Phenology

The study of the timing of natural events, such as first leafing, first flowering, fruit ripening, first migrant birds seen, etc. particularly in relation to climate.
The first phenologist?
Various sources of phenological data
Alan Chester’s garden shed in Warwickshire
What is recorded?
flowers
birds
insects
trees
fungi
frogs
Welcome to Nature’s Calendar

Here you can record and view seasonal events that show the impact of climate change on our wildlife.

If you’d like to know when bluebells are blooming, song thrushes are singing or the trees are about to treat you to an explosion of colour, Nature’s Calendar is for you.

Find out more about what we’re up to.

Species last recorded:
Lawn - first cut - 23/04/2013

Free calendars

www.naturescalendar.org.uk
Grantham

Click on the category tabs below for more species and events. Add a date by clicking the white boxes in the table. You can change a record by clicking the box again and following the instructions in the popup calendar.

To see when events usually happen in this location, open your season planner.

<table>
<thead>
<tr>
<th>List of species</th>
<th>Seasonal events</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>first rise</td>
</tr>
<tr>
<td><strong>My settings</strong></td>
<td></td>
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<tr>
<td>ash</td>
<td></td>
</tr>
<tr>
<td>beech</td>
<td></td>
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<tr>
<td>field maple</td>
<td></td>
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<tr>
<td>horse chestnut</td>
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<tr>
<td>oak (pedunculate)</td>
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<td>oak (sessile)</td>
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<tr>
<td>rowan</td>
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<td>silver birch</td>
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<tr>
<td>sycamore</td>
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View as: Recording table | Season planner
Grantham

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<table>
<thead>
<tr>
<th>List of species</th>
<th>Autumn</th>
<th>Trees</th>
<th>Shrubs</th>
<th>Flowers</th>
<th>Grasses</th>
<th>Birds</th>
<th>Insects</th>
<th>Amphibians</th>
<th>Fungi</th>
</tr>
</thead>
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**Is this what you saw?**

- **rowan first ripe fruit**

Click the date when this event occurred.

**Season planner**
frog spawn - first recorded 2013

- Get species information
- Get event information

MAP ZOOM

Click the magnifying glass to zoom in, then click on either map to navigate

Recordings: 48

06/01/13 03/02/13 14/05/13
It is apparent that timing varies from year-to-year

Daffodils, Feb 1st
What do the records show?

Oak budburst 1950-2013

- May 10
- Apr 30
- Apr 20
- Apr 10
- Mar 31
- Mar 21

Year

- 1950
- 1960
- 1970
- 1980
- 1990
- 2000
- 2010
Central England Temperature

Spring 1950-2013

with 10 year running mean

Source: Met Office Hadley Centre
Snowdrop flowering Northumberland (blue), Norfolk (black)
176 years of hawthorn flowering dates

![Hawthorn flowers](image.png)

Scatter plot showing the relationship between March-April mean temperature and day number.
Frogspawn, Walsall

First observation date vs. Mean January-March CET

- X-axis: Mean January-March CET
- Y-axis: First observation date

The graph shows a scatter plot with red dots indicating the relationship between first observation dates and mean January-March CET temperatures.
Changes in Spring – compared to 30 years ago

- insects 3 weeks earlier
- plants 10 days-2 weeks
- birds a week earlier
Changes in Autumn

- Active/growing season is extending
- Early events like fruiting are happening earlier
- Late events like leaf fall are happening later as temperatures stay high
The value of autumn records

- 12 years of Nature’s Calendar records
- Especially valuable for autumn
- 12 trees fruiting much earlier, up to a month earlier for rowan
- Scale and speed of change is surprising
- Supports research in scientific journal Nature of value of ‘real data’
Where are the records used?

- One of 18 biodiversity indicators in UK government’s climate impacts programme
- Featured in IPCC reports
- Woodland Trust use it for lobbying politicians
- 50+ scientific articles, many with CEH our partner


European phenological response to climate change matches the warming pattern

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Abstract

Global climate change impacts can be tracked in many physical and biological responses; in particular, terrestrial ecosystems provide a consistent picture of observed changes. One of the preferred indicators is phenology, the science of natural recurring events, as its recorded dates provide a high-temporal resolution of ongoing change. Thus, numerous analyses have demonstrated an earlier onset of spring events for cool and higher latitudes and a lengthening of the growing season. However, published single-site or single-species studies are particularly open to suspicion of being biased towards predominantly reporting climate-change-induced impacts. No comprehensive study or meta-analysis has so far examined the possible lack of evidence for changes or shifts at sites where no long-term change is observed. We used an enormous systematic phenological network data set of more than 12,000 observational series of 542 plant and 195 animal species in 23 European countries (1970-2008). Our results showed that 79% of all flowering, fruiting and budding records advanced (OR significantly) and only 3% were significantly delayed, whereas the signal of leaf colouring/hapax is ambiguous. We conclude that previously published results of phenological changes were not biased by reporting or publication predilections: the average advance of spring-summer was 2.5 days annually in Europe. Our analysis of 285 more national time series unambiguously demonstrates that species’ phenology is responsive to temperature of the preceding
Europe-wide changes

European phenological response to climate change matches the warming pattern

ANNETTE MENZEL, TIM H. SPARKS et al

“We used an enormous systematic phenological network data set of more than 125,000 observational series of 542 plant and 19 animal species in 21 European countries (1971–2000). Our results showed that 78% of all leafing, flowering and fruiting records advanced (30% significantly) and only 3% were significantly delayed, whereas the signal of leaf colouring/fall is ambiguous.”
“The average advance of spring/summer was 2.5 days per decade in Europe”
Measuring success

- Half a million website visits in 2012 to Nature’s Calendar
- 470 mentions in UK media during 2012, total audience reach of 97 million.
- 90,000 email subscribers
Challenges

1.5 staff to deliver project

Recorder numbers dropping significantly year on year:

2,500 active participants so far this year, 400 ‘expert recorders’

Can you or your contacts help?
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