

# The Local Phenology Program Guide

An experiential education tool for site-based  
community engagement.

USA-NPN Education & Engagement Series 2018-001 July 2018

# USA-NPN Education & Engagement Series 2018-001

USA National Phenology Network

## USA National Phenology Network Local Phenology Program Guide

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This guide replaces the USA-NPN Education and Engagement Series 2016-001 *USA National Phenology Network Phenology Walk and Trail Guide: An experiential education tool for site-based community engagement*.

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## INTRODUCTION

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*Phenology* is the study of recurring plant and animal life cycle stages, such as leafing and flowering, the maturation of agricultural plants, the emergence of insects, and the migration of birds. It also involves understanding the relationship of these life cycle stages to weather and, in the long term, climate.

Learning how to make phenology observations is a great way to introduce people, young and old, to outdoor field studies and the basics of data collection. Making repeated observations at a given location on a daily or weekly basis will help students, amateur naturalists, natural area visitors, (and even seasoned scientists and ecologists) notice the subtle changes happening in the natural world. In addition, each observer has the opportunity to participate in scientific research, related to climate science, now being conducted at a global scale. Collecting on the ground observational data helps us to create a detailed record of what is happening here and now, useful for generations to come.

### *The USA National Phenology Network and Nature's Notebook*



The USA National Phenology Network (USA-NPN; [usanpn.org](http://usanpn.org)) is a consortium of individuals and organizations that collect, share, and use phenology data, models, and related information. USA-NPN serves science and society by promoting a broad understanding of plant and animal phenology and its relationship to environmental change. USA-NPN encourages people of all ages and backgrounds to observe and record the activity of organisms to discover and explore the nature and pace of our dynamic world. The Network empowers scientists, resource managers, and the public in areas of decision-making and adapting to variable and changing climates and environments.

The USA-NPN has an online integrated animal and plant-monitoring program called *Nature's Notebook* ([naturesnotebook.org](http://naturesnotebook.org)). This program provides standardized protocols for phenological status monitoring and data management for over 1260 animal and plant species (as of July 2018) nationwide. The program facilitates the collection of observations on phenophases, or the life cycle events of plants and animals, and descriptive information about observation locations and individual plants. It also includes functionality for recording estimates of abundance of animals and intensity of plant phenophases. The data in *Nature's Notebook* make up the National Phenology Database and are intended to be used by resource managers to inform decisions, by educators to teach about phenology and climate change, by scientists to study changes in species phenology and by the public to increase their awareness of both phenology and climate change.

The *Nature's Notebook* phenology observation program has a user-friendly interface for recording phenological observational data. The program was developed to capture phenophase and abundance information by walking observers through a step-by-step detailed process. The USA-NPN would like to ensure that the data collected are accurate and valuable, to ensure scientific confidence about the quality of the overall data set. By enhancing observer education through program design and evaluation, data being collected are accurate and meet Quality Assurance/Quality Control (QA/QC) measures.

The efforts of the USA-NPN are organized and directed by the staff of the National Coordinating Office (NCO), which as of July 2018, is located at the University of Arizona. The NCO curates the National Phenology Database and connects people to phenology by (1) offering tools for understanding phenology, including the *Nature's Notebook* phenology observation program and training resources; (2) providing timely and relevant phenology data and data products; and (3) facilitating Communities of Practice by linking observers, Local Phenology Leaders, researchers, resource managers, educators, and observers.

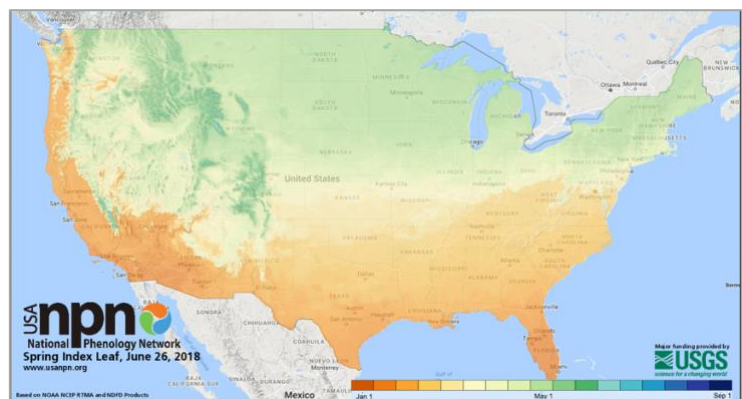
If you are interested in the latest research and journal articles, written by members of the broader USA-NPN, about phenology using the National Phenology Database and other data, visit our Peer-Reviewed Results page linked from the PUBLICATIONS menu on all of the USA-NPN pages ([www.usanpn.org](http://www.usanpn.org)).

If you are interested in sharing summaries of this research with your observers, visit the Highlighted Publications page linked from the MORE WAYS TO CONNECT menu on all of the Nature's Notebook pages. We've summarized some the research for you and described why it is of value. This is a great page to share with your observers.

You also may be interested in some of the USA-NPN Information Sheets which can be downloaded from the PUBLICATIONS page linked on all of the USA-NPN webpages.

### **Observational Data and Data Products**

Real-time raw data for plants (from 2009 to present) and animals (from 2010 to present), including FGDC-compliant metadata and documented methodology, can be downloaded for analysis from the **USA-NPN Phenology Observation Portal** ([usanpn.org/data/observational](http://usanpn.org/data/observational)). The **Visualization Tool** ([usanpn.org/data/visualizations](http://usanpn.org/data/visualizations)) allows exploration of available data and sophisticated graphical visualization of phenological data alongside



**USA-NPN's Spring Index Map**

meteorological data. Additionally, the USA-NPN produces a suite of **Phenology Models and Maps**

([usanpn.org/data/phenology\\_maps](https://usanpn.org/data/phenology_maps)) including contemporary and short-term forecasts of Accumulated Growing Degree Days; historical, contemporary, and short-term forecasts of the Spring Indices (models that predict the “start of spring” at a particular location); and **Pheno Forecasts** which provide 6-day forecasts of invasive pest activity to inform management.

### **Local Phenology Programs, Leaders, and a Community of Practice**



There is a recognized need for collaboration among groups of people monitoring phenology with an interest in building strong datasets. The USA-NPN’s NCO supports regional efforts by sponsoring a **Community of Practice**<sup>1</sup> for leaders (scientists, researchers, land managers, educators) interested in recruiting students, staff, and volunteers to help with data collection. These leaders, also called **Local Phenology Leaders**, manage and maintain well-thought out programs that connect people in science and management. **Anyone** who is managing a group of observers, staff, volunteers, students, or leaders in the collection of data using *Nature’s Notebook* is a Local Phenology Leader. Their programs, called

**Local Phenology Programs**, keep observers engaged and build an accurate and consistent dataset.

Collaboration among researchers, land managers, and educators increases the likelihood that a long-term (two-years or more) monitoring program results in an accurate and consistent dataset. Moreover, collaboration between community organizations to develop meaningful programs **together** increases the **availability of regional datasets** for research. Many backyard *Nature’s Notebook* observers are looking for ways to further engage with other observers. Linking them to local and regional projects creates meaningful participation and opportunities for co-creation of research questions. The NCO has developed a number of educational methodologies to facilitate phenology monitoring by citizen and professional scientists on a large scale and encourage collaboration between organizations interested in monitoring phenology.

### **The Local Phenology Program Guide**

This resource guide describes how to develop a program plan for **monitoring phenology with groups of people**. It walks you through the steps to creating a **long-term (defined as collecting observational data over at least a two-year period)** phenology monitoring program using staff, volunteers, or students as observers. This guide is relevant to anyone with a programmatic need for using *Nature’s Notebook* and its phenology data for research, management, or education. It provides details on the installation of a **Phenology Walk** or **Phenology Trail** and describes steps and

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<sup>1</sup> According to Wegner-Trayner a Community of Practice is defined as, “Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.” <http://wenger-trayner.com/introduction-to-communities-of-practice/>

materials necessary for creating a successful long-term Local Phenology Program that is documented, shared, and evaluated for two years or more.

The NCO's research has shown that data collection with a group of people will not be successful unless the process is managed by a Leader. For example:

- If you are a **formal educator at a K-12 school or higher education** institution you are the Leader teaching your students about the scientific process and the value of collecting careful, accurate observations for a crowd-sourced science program. Plan to build your program into your curriculum in a way that meets as many of your learning outcomes as possible for more than one semester. Plan to manage the data collection process and promote accurate data submissions for more than one semester. Then you'll have your own dataset that students can use for comparison.
- If you are a **land manager or researcher** in need of a dataset you are the Leader responsible for designing the monitoring program and plan. If you cannot recruit and manage volunteers on your own, plan to find a volunteer or other staff person to help you with that process and plan to communicate observational results regularly with observers.
- If you are someone who **manages staff or volunteers** at more than one location or for more than one organization where *Nature's Notebook* will help with management or outreach, you are the Leader who can encourage others to implement *Nature's Notebook* at their sites. Your plan will include methodologies for engaging other leaders who work with observers, rather than engaging observers directly, building a valued regional dataset.

In all of these cases it is critical to think through why you would like to use *Nature's Notebook*, how to use it, and how to teach others to use it. By keeping your observers, partnering Leaders, or staff engaged you will ensure the regular collection of data.

This guide was designed to help you articulate your needs, develop outcomes, and document your process to ensure your program is sustainable long after you leave your post. If you are interested in starting your own Local Phenology Program, read through this guide and be sure to take a look at all of our additional online resources. Visit the **FOR GROUPS** menu linked from **all** *Nature's Notebook* web pages. You will find a detailed description of Local Phenology Programs ([usanpn.org/nn/groups/local-phenology-programs](https://usanpn.org/nn/groups/local-phenology-programs)) as well as resources to help you develop a solid step-by-step program plan designed to help you evaluate your progress. Plan to join the **Local Phenology Leader Community of Practice** ([usanpn.org/nn/groups/LPLCommunity](https://usanpn.org/nn/groups/LPLCommunity)) to connect further with other Local Phenology Leaders. Attend monthly calls designed to be sharing and networking sessions focused on many topics of interest related to using *Nature's Notebook* for monitoring with a group of people.

Share what you are doing with the staff at the NCO. Let us know what you need and how we can help. Contact [education@usanpn.org](mailto:education@usanpn.org) if you have questions. If you have created an excellent set of resources or photo guides, upload them to our website so we can share them with others ([usanpn.org/nn/share-resources](https://usanpn.org/nn/share-resources)). Participate in our annual Group evaluation process to communicate your impact with us!



## LOCAL PHENOLOGY PROGRAMS

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A **Local Phenology Program (LPP)** is a program sponsored by an organization(s) with an interest in using *Nature's Notebook* phenological observations for science, management, or education. It is actively managed for two years or more. In this context, a “program” is a **series of activities** with a well-thought out plan, designed to achieve a set of short, medium, and long-term outcomes. These outcomes should be evaluated on a regular basis. LPPs are powerful tools for collecting long-term observational data for research and management

and/or for educating and engaging students or visitors in science and natural history. LPPs can be developed for one organization or link many in a community. A solid, sustainable *Nature's Notebook* Local Phenology Program will take **many** years to implement and should be designed to have 3-5 years' worth of observational data. Local Phenology Programs will take a few years to get started, recruit volunteers, and create realistic programming for staff, volunteers, or students.

If you are considering adding *Nature's Notebook* to your existing programming, **don't plan on doing it only once for a few weeks**. If that is all you have time for, there are lots of great citizen science programs that do not involve establishing a plan with site-based protocols and long-term observer management. Visit SciStarter for ideas on exciting short-term citizen science experiences ([scistarter.com](http://scistarter.com)).

On the other hand, if you are ready to commit to long-term phenology (two+ years) monitoring using *Nature's Notebook*, then join us as a Local Phenology Leader. Leaders, facilitators, or owners of the LPPs are called **Local Phenology Leaders (LPLs)**. LPPs are set up as **Groups in Nature's Notebook** that are publicly visible and allow multiple observers to contribute observations for the same locations. A “Group” includes one or more *Nature's Notebook* sites for the sponsoring organization. LPLs are administrators of the Groups in *Nature's Notebook*. They also manage, in person and online, their Group participants whomever they are.

Local Phenology Programs use **Phenology Walks** to engage people in *Nature's Notebook* phenology monitoring. A Phenology Walk is a series of plants (two species, or more, with multiple individuals of each) marked in succession along a walkway or path, and/or a checklist of animals observed at the site. The observational data on these plants and animals are directly entered into a **Nature's Notebook site**. The Phenology Walk may follow an existing pathway or hiking trail and could begin with a list of common plants or animals found in the area. There should be a pre-determined and guiding **science question** regarding the phenology of these species established by the sponsoring organization. The science question may be complex or may simply be to establish a long-term phenological record of species that occur at the site. The Phenology Walk engages observers in a

meaningful way, provides a venue for collecting phenology data, and **meets the goals of both the USA-NPN's NCO and the sponsoring organization(s).**

Local Phenology Leaders may wish to create a **Nature's Notebook Group online**. *Nature's Notebook* Groups online allow Leaders to invite multiple observers to contribute data along their Phenology Walk. These Groups have the ability to aggregate more than one *Nature's Notebook* site, if necessary. Groups are also designed to be administrated by someone who is able to access the data for the Group, manage the users for the Group, and who can designate others to assist with the process. *Nature's Notebook* Groups are useful because they eliminate the need for Leaders to create shared accounts in *Nature's Notebook*. Everyone can contribute using their own user name and, when a Leader leaves the administrative role can be assigned to someone else. Observers who leave can either remove themselves from the Group or be removed by the administrator. Details on how to manage a *Nature's Notebook* Group online can be found on page 32 of this guide.

Create your *Nature's Notebook* Group by visiting the **Start a Phenology Program** page ([usanpn.org/nn/groups/group-site](https://usanpn.org/nn/groups/group-site)) and clicking on the link for **Review our requirements and request a new Group**. You will be taken through a series of requirements to establish a Group in *Nature's Notebook* and at the end submit a form with your Group's information.

Local Phenology Programs are valuable to those using the National Phenology Database, which is curated by the NCO. The National Phenology Database consists of all of the on-the-ground observational data entered by all users of the *Nature's Notebook* program. Rich datasets (of at two years or more) contributed by observers and Local Phenology Leaders provide a great deal of information about phenological patterns or, in the longer term, trends in phenology onset or duration.

Land managers and researchers are interested in these rich phenological datasets to answer research questions or make decisions. Many of these people are unable to collect the amount of observations they need on their own. Thus, LPLs help to recruit, train, and manage groups of observers, volunteers, or students willing and able to contribute to building the dataset. This on the ground component of the *Nature's Notebook* phenology monitoring program becomes critical to site-based sustainability. **It is also a fantastic way for the research and management community to collaborate with the education and outreach community toward a common goal or outcome.**

Community groups and organizations may wish to link their LPPs together to create a **Phenology Trail**. A Phenology Trail is a virtual trail – a series of LPPs in a town, community, or region. Trails provide opportunities for observers to have a similar experience in more than one location, while collecting observations for research. Trails also allow comparisons of plant and animal phenology between locations and shed light on environmental changes at the regional level. They are excellent ways to increase Community Engagement. Phenology Trails can be big or small. Conceptually, they can cover an entire town, state, or span multiple states.



Phenology Trails are meant to be creative and meet the needs of **your** community, however you define it (school, city, county, town, club, etc.). They also help the NCO achieve its goal of collecting accurate long-term phenological data in a given location to build the National Phenology Database for scientific research. If you create a Phenology Trail, be sure to register it with *Nature's Notebook*. Contact our Education Coordinator ([education@usanpn.org](mailto:education@usanpn.org)) to let us know you've established one. The NCO can add your Trail to our list

([usanpn.org/nn/groups/phenology-trail-examples](https://usanpn.org/nn/groups/phenology-trail-examples)). Others can learn from your example!

Our research has shown that Local Phenology Programs and Trails work best when there is a staff person or volunteer, a **Local Phenology Leader** or a **Phenology Trail Coordinator**, available to maintain the Walk or Trail, engage participants in continuous phenology monitoring, answer questions, and connect participants to the managers or researchers interested in the observational data. Essentially, the most successful programs have someone whose role it is to maintain the relationships with observers or other Local Phenology Leaders through time. This individual also provides local training to observers or Local Phenology Leaders.

**The Local Phenology Leader Certification Course.** Local Phenology Leaders or Phenology Trail Coordinators may wish to obtain further training from the USA-NPN's NCO to help establish a program plan, gain ideas for training and engaging students or volunteers, and report annual results to celebrate successes. The **Local Phenology Leader and Trail Coordinator Certification Course** ([usanpn.org/nn/LPLCertification](https://usanpn.org/nn/LPLCertification)) is available to anyone interested in learning more about engaging potential observers or other Local Phenology Leaders in science and phenology research. The 60-hour course is offered twice yearly and is designed to help leaders create and maintain a sustainable long-term *Nature's Notebook* Local Phenology Program for science, management, or education. Certified Local Phenology Leaders are recognized by the USA-NPN as having the knowledge, skills, and abilities to train others in using *Nature's Notebook*. They also annually report their program outcomes to the USA-NPN and serve as models for other programs just beginning. View a list of all Certified Local Phenology Leaders here: [usanpn.org/nn/groups/certified-LPLs](https://usanpn.org/nn/groups/certified-LPLs).

The NCO also offers a **Local Phenology Program Summer Short-course** (eight-hours in length) designed to help potential Local Phenology Leaders jump start their monitoring program design. The Summer Short-course does not result in certification.

It is likely that your school, organization, or community already has an area or path that is ideal for a Phenology Walk or Trail, with plants and animals waiting to be observed. Depending on your location and resources, you may consider adding interpretive signs and markers, or using curricula

to engage students and visitors. If you are still not sure where to begin we suggest starting small with a few species of plants within a walk-able distance of your building or school.

On page 26 of this guide you will find more specific guidance for **Designing a Phenology Walk or Trail** for your organization. We provide suggestions on:

- how to create the physical observational space
- how to create and manage your Group in *Nature's Notebook*
- guidance on marking plants and creating interpretive signs
- how to print datasheets
- how to share your walk with others

### **Summary—Local Phenology Program Definitions**

The USA-NPN's NCO uses the following definitions when referencing Local Phenology Programs, and their elements, from small to large scale:

- **Long-term *Nature's Notebook* Phenology Monitoring Program** – a program whose Leader has committed to managing data collection, observers, and data for **two years or more**. In this context, a “program” is a **series of activities** with a well-thought out plan, designed to collectively achieve a set of short, medium, and long-term outcomes.
- ***Nature's Notebook* Site** – a designation in the *Nature's Notebook* **online** application referring to a bounded and select area, less than 15 acres, and includes at least one tagged individual plant or animal species. Review the USA-NPN's **How to Observe Handbook** ([usanpn.org/pubs/reports#Education](https://usanpn.org/pubs/reports#Education)) for more information on physical site parameters.
- **Phenology Walk** – a path or hiking trail at one *Nature's Notebook* organizational location, with any number of individual plants or animals tagged for observation. Numbers of monitored species range from two to ten and consist of at least three individuals per plant species. Phenology Walks correspond to *Nature's Notebook* sites in the online application. These Walks are designed to be used by Local Phenology Programs.
- ***Nature's Notebook* Group** - Groups in the *Nature's Notebook* **online** application are open to anyone to join. All plants and animals associated with the *Nature's Notebook* Group are visible to all members. Groups can consist of one site or many. They help organizations of any size or formality share monitoring responsibility at a shared physical location. *Nature's Notebook* Groups have the administration capability (usually reserved for the Local Phenology Leader and another designee) to manage users, sites, plants and animals, view all observations. Groups allow users to contribute data using their own personal user name and account in *Nature's Notebook* rather than having to manage a shared account for many people.
- ***Nature's Notebook* Local Phenology Program (LPP)** –A *Nature's Notebook* Local Phenology Program establishes a long-term phenology monitoring program at a given location, in service to a science, management, or educational outcome(s). It exists to meet other programmatic goals for the sponsoring organization such as establishing a phenological record on sentinel species, engaging the community in a citizen science

program, educating citizens about climate change or other key interpretive themes or topics. LPPs are lead or facilitated by on-site Local Phenology Leaders.

- **Local Phenology Leader (LPL)** - a person in charge of designing and/or facilitating a Local Phenology Program using a *Nature's Notebook* Group for a participating organization(s). This person can be a paid staff member responsible for science, management, or education, OR may even be a volunteer. Successful Local Phenology Programs have a point person responsible for maintaining the program through time and have developed a sustainability plan for keeping the program going when inevitable staff or volunteer turnover occurs. If the program was designed correctly, more than one individual or department within the organization is invested in creating a phenological record for the site and will not treat the program as a one-time activity.
- **Certified Local Phenology Leader** – A Local Phenology Leader who has successfully completed the 60-hour USA-NPN's NCO-sponsored online Local Phenology Leader Certification Course. Review the list of Certified Local Phenology Leaders online here: [usanpn.org/nn/groups/certified-LPLs](https://usanpn.org/nn/groups/certified-LPLs).
- **Phenology Trail** – a **series of Local Phenology Programs** virtually linked together in a geographic region.
- **Phenology Trail Coordinator (PTC)** – a person whose role is to organize and maintain a Phenology Trail. This person provides training and resources for all organizational members of the Trail, **recruits and retains volunteers across multiple LPPs**, hosts events and outings, and serves as a liaison between the Phenology Trail and the USA National Phenology Network's National Coordinating Office. A Phenology Trail Coordinator may also be a Certified Local Phenology Leader, although Certification is not required.

## CHECKLIST FOR CREATING A LOCAL PHENOLOGY PROGRAM

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You've committed to trying to establish a Local Phenology Program. Congratulations! Before you begin, review this checklist.

Here is a two-page checklist of steps you should complete to most efficiently and successfully develop and deliver your long-term Local Phenology Program:

- STEP 1:** Commit to sponsoring a Local Phenology Program for at least two years.
  - Recruit colleagues or volunteers who can help you.
  - Make sure using *Nature's Notebook* meets several needs for your work or your organization.
  
- STEP 2:** Draft a Needs Assessment ([usanpn.org/nn/groups/needs-assessment](https://usanpn.org/nn/groups/needs-assessment)).
  - Decide upon the big outcome, goal, or impact you'd like to achieve by using *Nature's Notebook*. How is *Nature's Notebook* going to help you? What do you need to get there? Who is your audience? Are you recruiting staff or researchers to help? Training leaders from other sites? Volunteers? Students?
  
- STEP 3:** Learn how to use the *Nature's Notebook* online observation system. ([usanpn.org/nn/guidelines](https://usanpn.org/nn/guidelines)).
  - Create an account in *Nature's Notebook* and learn how to use it.
  - Learn how to create and use a *Nature's Notebook* Group.
  
- STEP 4:** Familiarize yourself with the *Nature's Notebook* monitoring protocols. ([usanpn.org/pubs/reports-USA-NPN Technical Series](https://usanpn.org/pubs/reports-USA-NPN_Technical_Series)).
  - Review the *USA-NPN Phenology Protocols* (DOI 10.1007/s00484-014-0789-5) and *Plant and Animal Phenophase Definitions*. These reports are the most important of the USA-NPN's Technical Series needed for managing others.
  
- STEP 5:** Learn how to use the USA-NPN Visualization Tool. ([usanpn.org/data/visualizations](https://usanpn.org/data/visualizations)).
  - Watch the tutorials on the sidebar of the Visualization Tool page and on our YouTube Channel ([youtube.com/user/USANPN1/playlists](https://youtube.com/user/USANPN1/playlists))
  - Explore the Visualization Tool to learn how to create visualizations of data collected by your observers or leaders along your Walk or Trail.
  
- STEP 6:** Develop a documented plan for implementing *Nature's Notebook*, recruiting observers, managing observers or other leaders, and summarizing the data on a regular basis. Plan to review it annually ([usanpn.org/nn/program-planning-guide](https://usanpn.org/nn/program-planning-guide)).
  - Think about how using *Nature's Notebook* can help you achieve outcomes or goals you have for yourself and the work that you do. Commit to evaluating your process every year along the way.
  
- STEP 7:** Recruit, train, and maintain observers, students, volunteers, or leaders ([usanpn.org/nn/groups/resources](https://usanpn.org/nn/groups/resources)).
  - Decide upon the resources you need to do so. **Know where to find them.** Many of these resources exist on the *Nature's Notebook* website – including those appropriate for marketing to a research-based audience and those not on the

ground collecting observational data. **Bookmark the Local Phenology Programs page on the *Nature's Notebook* website.** All of the resources you need for success are accessible on that page or via the **FOR GROUPS** dropdown menu.



- **STEP 8:** Use and share your data.
  - Use the Visualization Tool to view and summarize your Group's data.
  - Or, view your Group's data in Excel format by visiting the Manage Users link on your Observation Deck and clicking the link to Download Group Data
  - Visit the Local Phenology Program Dashboard to obtain a snapshot of the number of phenology records per species, the number of site visits your observers are making, and the number of active observers you have per month ([usanpn.org/nn/groups/dashboard](https://usanpn.org/nn/groups/dashboard)).
  
- **STEP 9:** Annually report your results, successes, and impact to the NCO.
  - Consider using the above tools to create an annual report.
  - Plan to answer an annual active *Nature's Notebook* Group Survey at the end of the calendar year. The NCO wants to know how it is going in the field and is interested in learning from you what resources will make managing phenology data and observers easier.
  - Use your program plan and action plan to track your milestones.
  - Adjust your plan, as needed, based upon actual work you are doing and changes in resources or needs

# PLANNING YOUR LOCAL PHENOLOGY PROGRAM

## STEP 1: Make a two-year commitment



The USA-NPN's National Coordinating Office asks Local Phenology Leaders to plan to commit to at least two years-worth of *Nature's Notebook* data collection. The intent of building our National Phenology Database is to have records of phenological abundance and change in **fixed locations** through time such that data end users can use that information to view annual trends in phenology. As a Local Phenology Leader planning to collect data for at least two years also provides you with a dataset you can use for management or education.

**Be aware that it will likely take you a year or two to get to the point where you are regularly able to contribute data** yourself or with volunteers, students, observers, or other leaders. That means it may take you three or four years to have two years-worth of data. If you follow the steps to establishing

a program, you'll be able to decide if this is the right program for your needs.

Also, if you set out on this path and find that you cannot make it work, that is alright too. Consider personally contributing observations at your location until there comes a time when you are able to recruit others or get buy in from your organization and partners to move forward. The most important thing is to have enough data available at your geographic site to tell the story of the species' natural history for the growing season.

## STEP 2: Draft a Needs Assessment

Once you have committed to moving forward with *Nature's Notebook*, begin to conceptualize how you'll establish a Local Phenology Program that meets your organization's or community's needs.

Consider first why you might wish to create a *Nature's Notebook* Local Phenology Program. Does it fill a need that you or your organization has? Will it help you connect with local land managers or researchers? Do you need a phenology dataset but don't have the capacity to collect all of the needed observations on your own? Are you interested and willing to work with more than one organization in your community?

What species will you monitor and are they already available in the *Nature's Notebook* database? Check the species list on the *Nature's Notebook* website ([usanpn.org/nn/species\\_search](https://usanpn.org/nn/species_search)). If you need ideas check out the USA-NPN's Campaigns ([usanpn.org/nn/campaigns](https://usanpn.org/nn/campaigns)).

**NOTE:** if the species you desire are not yet available there may be an opportunity to request them. Contact [education@usanpn.org](mailto:education@usanpn.org) for more information.



Before you dive in with your *Nature's Notebook* Local Phenology Program, complete a needs assessment to articulate and document why establishing one would benefit you and others in your community. Think about who your audience is, what resources you have and what outcomes you'd like to achieve. What needs would sponsorship of a *Nature's Notebook* program fill? What are the solutions to those needs? Who are your stakeholders and how would everyone benefit from the program?

**ACTIVITY:** Complete a **Needs Assessment Worksheet** (Appendix 1) found online at [usanpn.org/nn/needs-assessment-worksheet](https://usanpn.org/nn/needs-assessment-worksheet) and identify partners to assist you, obtain buy-in from your organization, and begin to articulate your vision for the program in the next five years. This activity allows you to submit online your Needs Assessment to the NCO for review.

Again, a solid, sustainable *Nature's Notebook* Local Phenology Program will take **many** years to implement and should be designed to have at minimum two years' worth of observational data. Expect that it will take you a few years to get started, recruit volunteers, or create realistic programming for your observers. Again, **Don't plan on doing *Nature's Notebook* once for a few weeks.** There are lots of great citizen science programs out there that do not involve site-based protocols and long-term management. Visit SciStarter for ideas on exciting short-term citizen science experiences ([scistarter.com](https://scistarter.com)).

If you begin with the intention of collecting data for the long term and find that you are not able to maintain a program for more than one season, your data are still very valuable to the USA-NPN. We'd rather you do your best to start with the intent of having regularly collected data for two years, however, we also understand that due to shifting priorities, loss of funding, loss of volunteers, etc., it is not always possible to continue. **Do not let that possibility deter you from starting in the first place.**

### ***STEP 3: Learn how to use the Nature's Notebook online observation system***

Familiarize yourself with the *Nature's Notebook* online observation system. For specific instructions on setting up a *Nature's Notebook* site online and in the field, and for details about how to collect phenology observations and enter them into the database, visit our **OBSERVE** menu located on **all** of the *Nature's Notebook* webpages. You may also wish to review our many online resources to help you get started:

- **Create** your observation account ([usanpn.org/nn/become-observer](https://usanpn.org/nn/become-observer))
- **Learn** How to Observe ([usanpn.org/nn/guidelines](https://usanpn.org/nn/guidelines))
- **Take** our online How-to *Nature's Notebook* Course linked from the right sidebar of the Learn How to Observe Page ([usanpn.org/nn/guidelines](https://usanpn.org/nn/guidelines))
- **Read** more about our observation protocols and phenophase definitions ([usanpn.org/pubs/reports-USA-NPN\\_Technical\\_Series](https://usanpn.org/pubs/reports-USA-NPN_Technical_Series))
- **Review** our Botany and Phenophase Primers ([usanpn.org/pubs/reports#Education](https://usanpn.org/pubs/reports#Education))
- **Read** our *Nature's Notebook* Nuggets ([usanpn.org/nn/observe/questionsanswered](https://usanpn.org/nn/observe/questionsanswered))
- **View** our Frequently Asked Questions ([usanpn.org/nn/faq](https://usanpn.org/nn/faq))
- **Take** our Basic Botany and Intensity Quizzes ([usanpn.org/nn/BotanyIntensityQuizzes](https://usanpn.org/nn/BotanyIntensityQuizzes))

- **Watch** our tutorial videos on the *Nature's Notebook* How-to Playlist on the USA-NPN YouTube Channel ([youtube.com/user/USANPN1/playlists](https://youtube.com/user/USANPN1/playlists))
- **Review** our Mobile Application Tip Sheets ([usanpn.org/nn/mobile-app-tip-sheets](https://usanpn.org/nn/mobile-app-tip-sheets)) and be ready to share the information with others who will help you collect data in the field.

#### **STEP 4: Familiarize yourself with the Nature's Notebook Monitoring Protocols**



What is a "protocol?" In the context of phenology monitoring and according to Merriam-Webster, it is "a detailed plan of a scientific or medical experiment, treatment, or procedure."

Thus, to facilitate coordinated cross-site, cross-species, and geographically extensive phenological monitoring across the nation, the USA National Phenology Network has developed in situ (in place) monitoring protocols *standardized across taxonomic groups* and ecosystem types for terrestrial, freshwater, and marine plant and animal

taxa. These standardized protocols are designed to quantify the onset, duration, and intensity of phenological stages of plants and animals to understand how life cycles track environmental variation. Having standardized protocols ensures participants are using the same framework when collecting data in the field. The NCO requires that all educational and training materials created by partners communicate the protocol as designed by our data team. It ensures the data are of sound quality and usable by managers and researchers. To read more about our Quality Assurance/Quality Control Procedures, view our **Observational Data Documentation** which can be downloaded from the USA-NPN's [Data Quality Page \(usanpn.org/data/quality\)](https://usanpn.org/data/quality).

Before you begin designing your monitoring program and training others, review the USA-NPN publication entitled, *Standardized phenology monitoring methods to track plant and animal activity for science and resource management applications* and the companion guide entitled, *Plant and Animal Phenophase Definitions*. These materials, found on the USA-NPN's **OUR REPORTS** page ([usanpn.org/pubs/reports#USA-NPN Technical Series](https://usanpn.org/pubs/reports#USA-NPN_Technical_Series)) under the Technical Series section, will provide you with a framework for understanding how to best collect observations in the field.

You will notice that *Nature's Notebook* allows you to report on the status **and** intensity of the phenophases. Observers are instructed to make weekly observations (or more frequent during the active growing season) and indicate a **YES, NO, or ?** for each (status). Negative data (NO reports) demonstrate the full natural history of the plant and allows data end users to know that someone observed the individual or species through time and to better pinpoint the onset and end of phenophases. This also accurately captures phenophases that may start and stop more than once during the year at varying times. Intensity is reported for some of the phases telling the data end user how much or how many. This information is useful for describing the amount of a resource (e.g. nectar source) available or the peak of a phenophase.

The NCO has developed training materials for:

1. The phenophase protocols (definitions). See the **Phenophase Primer** on the **OUR REPORTS** page linked from **all** USA-NPN pages, under the Education & Engagement Series ([usanpn.org/pubs/reports#Education](https://usanpn.org/pubs/reports#Education)). The Phenophase Primer includes details about reporting on the status and intensity of plant phenophases.

2. Basic botany. See the **Botany Primer** on the **OUR REPORTS** page linked from all USA-NPN pages, under the Education & Engagement Series ([usanpn.org/pubs/reports#Education](https://usanpn.org/pubs/reports#Education)).

You will also find more details about how to answer the phenophase definition questions in the following resources which can be shared with anyone you are training:

1. **Nature's Notebook Nuggets** ([usanpn.org/nn/observe/questionsanswered](https://usanpn.org/nn/observe/questionsanswered)) which are questions submitted by observers that have been researched and answered by the USA-NPN's NCO staff. The Nuggets are linked from the **Learn How to Observe** page found on the **OBSERVE** menu of all *Nature's Notebook* pages.
2. **Basic Botany and Intensity Quizzes** ([usanpn.org/nn/Curriculum/Intensity-Quiz](https://usanpn.org/nn/Curriculum/Intensity-Quiz)) designed to test observer's knowledge about recording intensity. The quizzes can be accessed via the *Natures' Notebook* Activities Table linked from the **EDUCATE** menu on all *Nature's Notebook* pages.
3. **The Frequently Asked Questions page for Nature's Notebook** ([usanpn.org/nn/faq](https://usanpn.org/nn/faq)) linked on the bottom of all *Nature's Notebook* pages.

**The Nature's Notebook Species List.** Each year our data management team reviews the master list of species and keeps them up to date. We may not have every species you are interested in observing on the list simply because we seek to build a deep dataset with long-term observational data on a relatively limited number. Our species were chosen carefully by select research and Local Phenology Leaders willing to recruit people to observe or to be used for management and research. However, the NCO takes requests for species once a year through the end of August and, if the requestor can justify the need for the addition, then we will consider adding the species the following year. If you have questions, email [education@usanpn.org](mailto:education@usanpn.org).

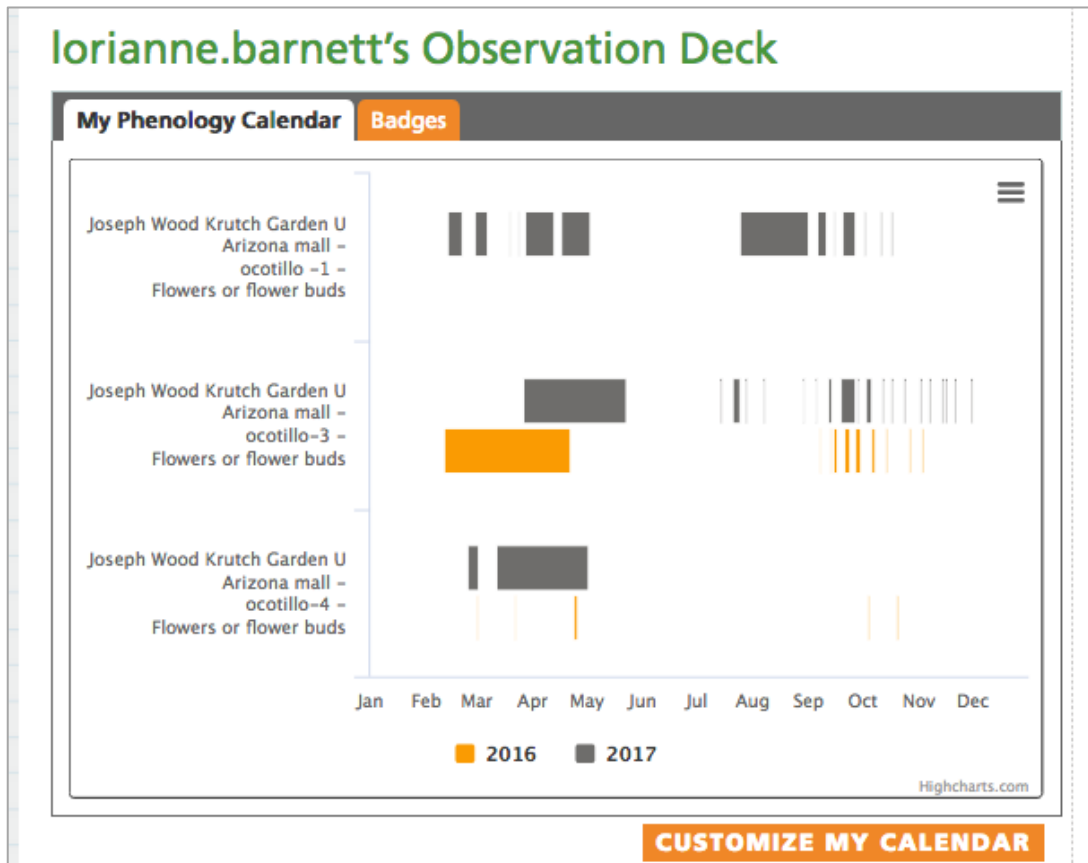
The species on the list are organized using the current accepted scientific name (genus and species) at the time of the species addition. You will also find a reference to a common name. For plants, those common names have been obtained via the USDA's PLANTS Database ([plants.usda.gov](https://plants.usda.gov)), which is why your chosen species may include a common name for which you are not familiar. The NCO recommends utilizing the genus and species as a priority to eliminate confusion. You can search the available species on The Plants and Animals page ([usanpn.org/npnapps/species](https://usanpn.org/npnapps/species)) linked from the **OBSERVE** menu on all *Nature's Notebook* pages.

The USA-NPN does not track cultivars in the National Phenology Database. If you wish to add a species cultivar, add it at the genus and species level and in the comments for the plant you may add the cultivar name. That information from the comments fields is accessible via download using the Phenology Observation Portal ([usanpn.org/data/observational](https://usanpn.org/data/observational)).

Photos of phenophases are the most requested training material that the NCO receives. The NCO is working to find photographs of all phenophases for all species of plants in the database. If you are able to take photographs of each of the phases and wish to share them with the NCO and others, it would be appreciated. Visit the **Phenophase Photo Guidelines** page ([usanpn.org/nn/phenophoto\\_guidelines](https://usanpn.org/nn/phenophoto_guidelines)) for details on how to contribute. If you wish to create phenophase photo guides for your observers, the NCO would appreciate receiving a copy of those as well. Follow the instructions on the **Species Phenophase Photo Guides** page ([usanpn.org/nn/species-template](https://usanpn.org/nn/species-template)) and use the pre-populated templates with instructions. The NCO will add the most accurate ones to the species profile pages for each species as we receive them.

**STEP 5: Review how to use the Observation Deck Calendars and the USA-NPN’s Visualization Tool**

The Observation Deck in *Nature’s Notebook* includes a customizable calendar for observers to view data they’ve submitted, or data submitted from a Group. The calendar allows for a visual comparison of three variables for a maximum of two years. The calendar displays when YESs were reported on the select phenophases each month.



*The Observation Deck Phenology Calendar*

The calendar is customizable by clicking on the button on the lower right labeled “Customize My Calendar.” Observers can choose between their personal sites or Groups to which they belong, select species, and phenophases, and choose the years to compare. The screen cap on the next page provides a picture of the options available for customization.

Home » Observation Deck » Phenology Calendars

## Phenology Calendar

Create a customized phenology calendar based on your data. Select "My Sites" or a group from the dropdown, then select a site, individual or species, and phenophase and click "Add to Calendar". You can add up to three phenophases to your calendar at one time. If no data appears on the calendar for a series you selected, then there is no data for that individual/phenophase for the selected date range.

**Select Site:** U of A Campus Arboretum

**Select Individual or Species:** candy barrelcactus-1  
Coues' cassia-1  
ocotillo - 1  
Santa Rita pricklypear-3  
catclaw acacia-3  
catclaw acacia-2  
catclaw acacia-1  
soaptree yucca-2  
soaptree yucca-1  
velvet mesquite-1

**Select Phenophase:** flowers or flower buds  
open flowers  
fruits  
ripe fruits  
recent fruit or seed drop

ADD TO CALENDAR REMOVE FROM CALENDAR

Joseph Wood Krutch Garden U Arizona mall - candy barrelcactus-1 - ripe fruits

Select Year 1: 2017  
Select Year 2: 2018

**CREATE MY PHENOLOGY CALENDAR**

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Nature's Notebook is a project of the USA National Phenology Network.

*Observation Deck Phenology Calendar Customization Tool*

The Visualization Tool ([usanpn.org/data/visualizations](http://usanpn.org/data/visualizations)) allows anyone to view the data submitted by your Group and others. The Tool allows you to:

*The USA-NPN's Visualization Tool*

- See which species and locations are data-rich

- Find patterns like the relationship between spring temperature and the timing of flowering
- Answer questions such as "Did my poppies flower earlier or later this year compared to last year?"
- See how the Accumulated Growing Degree Days for this year match up to a long-term average
- Compare the predicted onset of spring for this year to other years, and map observations from *Nature's Notebook* against these predictions

View the tutorials on the right-side bar of the Visualization Tool page to learn how to view your data. Those tutorials are also located on our USA-NPN YouTube Channel ([youtube.com/user/USANPN1/playlists](https://youtube.com/user/USANPN1/playlists)). Plan to utilize the Visualization Tool at least twice a year in order to keep your students, observers, volunteers, or leaders engaged. You may wish to add the phenology calendars or activity curves to an annual report.

If you would like to analyze data, you may instead use our Phenology Observation Portal ([usanpn.org/data/observational](https://usanpn.org/data/observational)). The Portal allows you to set filters and download data into a .csv or .xls file.

### ***STEP 6: Develop a documented plan for implementing Nature's Notebook***

**Develop a *Nature's Notebook* Goal Statement.** Once you've articulated the relevance for your program via the needs assessment process, you'll want to develop a relevance statement that will ultimately become your *Nature's Notebook* Goal Statement.

There are many suggested methods for developing a program plan for evaluation. There are equally as many ways to articulate each of the elements of the process. Often the terms are used interchangeably. In the end it doesn't matter which methodology you choose – the point is to think about

**WHAT** you would like to achieve with your Local Phenology Program,

**HOW** you will get there, and document your

**MEASURES** for success.



Documenting all of this information creates accountability. It also is a fantastic way to share what you are doing with stakeholders, including potential funders. Funders will ask to see most of this information in one form or another.

For the purpose of working with *Nature's Notebook* Local Phenology Programs, the NCO suggests the following guidelines for developing a program plan.

Outlining broad goals for *Nature's Notebook* program implementation help you to visualize the long-term outcomes (five to seven years), the GOAL, you'd like to achieve. Beginning with this end in mind helps you to set targets for the intervening years. It also adds structure and relevance to your program.

Regardless of whether your purpose is for science, management, or education, you should plan for at least five years of engagement with the program.

Goal statements should be written clearly using following formula:

- To (**An action verb**)
- What (**quantifiable and measurable statement**)
- By (**within a given amount of time**)
- So that (**what your desired outcomes will do for you**)

**For example: To create, by October 2022, a sustainable phenology monitoring program using *Nature's Notebook* that provides weekly engagement opportunities designed to teach visitors about the annual phenology of four native species.**

Writing measurable and actionable goal statements can be critical to the success of your program.

In addition to a goal statement, develop a **relevant science question** to provide your program with structure. Regardless of whether your goals are for science, management, or education, a relevant science question will help your Local Phenology Leaders, observers, volunteers, or students better understand why you seek to collect phenology data in this location. Science questions also provide a framework for sharing the data with observers who care about the species you are monitoring. Sharing updates on the data observers collect is critical to keeping them engaged. Make sure your science question can be addressed by the species available in the *Nature's Notebook* database.



A localized science question better engages participants at your Walk site or along your Phenology Trail and gives them something to observe, examine change, and hypothesize about in the shorter term. *Nature's Notebook* is an optimal tool for bridging the gap between the science and education/outreach communities. If you are an outreach or education leader, you may want to partner with scientists within your organization or in your community to create scientific questions to answer. If you are a management professional or scientist, consider partnering with local volunteer organizations or outreach professionals to help you recruit volunteers to collect observations in service to your question. The data collected for

collaborative programs may be of even greater value if local managers, planners, researchers or scientists benefit from them.

Lastly, you'll establish your **short-, medium-, and long-term program outcomes**. Outcomes are designed to achieve **impact** (a change in condition, directly related to your goal). First, think about some of the longer-term outcomes you'd like to achieve related to your goal, and then work backwards to fill in some outcomes that will be measures of success along the way.

Outcome statements should follow a formula. Include:

- **What or who** is going to be affected
- The change you desire (**action verb**)
- Your **expected results**
- By **when**

Examples of long, medium and short-term **outcomes** of your phenology monitoring program may include:

- **Researchers analyze** collected observational data to **answer science or management questions by 2022** (Long-term *outcome* or *impact*)
- **Volunteers collect weekly observations** to **document regional seasonal changes by 2019** (medium-term *outcome*)
- **Local Phenology Leaders recruit 20 volunteers** to **monitor phenology weekly by the end of 2018** (short-term *outcome*)

It is helpful to write outcome statements as though they are currently happening (note the tense in the sentences above). You may then wish to use that language in your annual review of your program or in reporting to your stakeholders.

Once you've documented your short-, medium, and long-term outcomes, you can fill in some of the activities you'll need to begin planning to achieve your identified short-term outcome(s). Think about the people who will participate in these activities, the resources you already have and those you need.



Doing this planning before you begin helps you document what you'd like to achieve, visualize why and where you are headed, and keep you committed to moving forward. This type of documentation can also be critically important to securing funding, as most grant proposals require you to have this information articulated for the application.

**ACTIVITY:** Complete the *Nature's Notebook Program Planning Activity* (Appendix 2) found online at [usanpn.org/nn/goal-setting](https://usanpn.org/nn/goal-setting). Have your program plan documented and organized to more easily share with others.

Need help articulating your short-medium and long-term outcomes and objectives on the Program Planning Activity? Check out the *Nature's Notebook Program Mapping Worksheet* (Appendix 3) ([usanpn.org/nn/nn-program-map](https://usanpn.org/nn/nn-program-map)) which provides a visual or linear guide to writing your outcomes and objectives.

**NOTE:** We've create a *Nature's Notebook Building Program Outcomes Guidance Document* as a companion to this process that further explains how to write measurable outcome and objective statements, and how to write clear, concise activities that you can report on. Access this document and all of the Planning Resources on this page ([usanpn.org/nn/program-planning-guide](https://usanpn.org/nn/program-planning-guide)).

**Moving from Ideas to Action.** After articulating your vision for your Local Phenology Program, the next step is to document more specifically how you will move your objectives to action. This exercise takes account of your short-term outcomes and their objectives and develops an actionable plan for execution.

If you are developing a Phenology Trail and engaging other Leaders, we suggest hosting regularly scheduled meetings - quarterly or monthly - with selected site leads who are willing and able to record their work for you on this Action Plan. That way you can manage the needs and outcomes of everyone involved.

This template should be **completed for one year at a time**. Begin with the short-term outcomes you articulated on the *Nature's Notebook Program Planning Activity*. Reference the objectives you articulated in the *Nature's Notebook Program Mapping Activity*. Identify the step-by-step actions, resources, barriers, and timeline for each objective.

**ACTIVITY:** Complete the *Nature's Notebook Action Planning Template* (Appendix 4) found online at: [usanpn.org/nn/nn-action-plan](https://usanpn.org/nn/nn-action-plan). This activity is designed to help you document the specific activities you and your team will undertake, related to your stated objectives and short-term outcomes. It is meant to further create accountability and help you assign tasks to yourself and others. If you regularly revisit this Action Plan at the end of the year you can document what you achieved and if it met the stated objectives and outcomes. This template is also offered in linear and tabular format – use whichever is most comfortable for you. On that link you will also find a sustainability plan for documenting the overall details of your program.

The last step in the process is to document all of your resources and ideas in a **Sustainability Plan** for your Program. This document will provide necessary information to colleagues and volunteers about all aspects of your Local Phenology Program in the event that you or the Program lead is no

longer able to serve in the lead role. It includes details about the *Nature's Notebook* Group name, Group partners, existing funding, and copies of your outcomes, action, and evaluation plan. They can be handed off to someone else, so your Program may continue.

**ACTIVITY:** View and complete the *Nature's Notebook Sustainability Plan* (Appendix 5) online at [usanpn.org/nn/nn-sustainability-plan](https://usanpn.org/nn/nn-sustainability-plan).

### **STEP 7: Recruit and train observers, students, volunteers, or Local Phenology Leaders**



Now that you've articulated what you would like to achieve and how you can move into the action phase of your plan, determine who will be doing the observing.

If you are working with students, develop and deliver your lessons and activities designed to engage them in monitoring with *Nature's Notebook*.

If you are a land manager and have gotten buy-in from a volunteer coordinator or visitor services staff person, meet with them to decide on a schedule for training and engagement.

If you are a Phenology Trail Coordinator decide how to recruit other Leaders in your region and provide them with information about your plan. You'll also be serving in a training and engaging role. Think about the ways, which you may have documented in

your action plan, to keep leaders engaged and how to help them help their volunteers.

Remember that the NCO has many resources available to help you get started with training observers including those found on the **Host an Event** page ([usanpn.org/nn/groups/event](https://usanpn.org/nn/groups/event)) and the *Nature's Notebook* Activities page ([usanpn.org/nn/educate/activities](https://usanpn.org/nn/educate/activities)). Both are accessible via the main *Nature's Notebook* website under the **FOR GROUPS** and **EDUCATE** dropdown menus.

Whenever you host a training the NCO would like to know how many volunteers or students you've reached. This contributes to the Quality Assurance of our dataset. You should report those numbers via the Phenospokesperson webform ([usanpn.org/nn/pheno-spokesperson](https://usanpn.org/nn/pheno-spokesperson)) linked from the **Host an Event** page. You may also wish to share your teaching and training resources with us. Find a second webform on sidebar of the Host an Event page ([usanpn.org/nn/share-resources](https://usanpn.org/nn/share-resources)).

### **STEP 8: Use and share your data**

Plan to periodically check in on your data using the Observation Deck Phenology Calendar or Visualization Tool. Create a calendar or an activity curve to compare the overlap in the phenological activity of two species' peak phenophases or compare your observations to other Groups in your region. In order to really see details for comparison for your Group you'll need to have at least a few months of data entered by at least one person.

Check in on your Group's observational statistics by exploring the Local Phenology Program Dashboard ([usanpn.org/nn/groups/dashboard](https://usanpn.org/nn/groups/dashboard)). This tool was designed to help you review your Group-based data. You can obtain a quick snapshot of the number of phenology records per Group

site and species, number of site visits, and active observers per month. This dashboard can be helpful to you as you are trying to retain observers, volunteers, or Leaders.



You may save each of the graphics generated by clicking on the icon at the bottom on the Tableau toolbar. The second icon from the left – a square with an arrow pointing down as pictured to the left. This will bring up a menu of options for saving each image on the dashboard.

Expanded details about how to use these dashboards can be found in our Phenology Report Guide. This guide is also linked from the OUR REPORTS page on all USA-NPN webpages under the Education and Engagement Series ([usanpn.org/pubs/reports#Education](https://usanpn.org/pubs/reports#Education)).

### **STEP 9: Annually report your results, successes, and impact to the NCO.**

You may also choose to report the data from the Visualization Tool and Local Phenology Program Dashboards to your stakeholders via an annual report. Take a look at our **Phenology Report Guide** ([usanpn.org/pubs/reports-Education](https://usanpn.org/pubs/reports-Education)) for some examples and guidance on how to write one. Don't forget to report on your stated goal, your outcomes, and achievements for the year in the report.

If you create a report, please also share it with the NCO and the rest of your stakeholders. We are one of your stakeholders! You can send it to us at the end of the year when we send out the annual survey.

**Nature's Notebook Impact Statements.** The NCO has developed a process for reporting your valuable and exciting impacts to us on an annual basis. We have our own program evaluation process, complete with a logic model and action plan. We seek to learn as much as we can from LPLs in the field who have successfully achieved one or more of their annual goals. We love to highlight the work LPLs are doing in newsletters, annual reports, and we often share this information with our many stakeholders who use *Nature's Notebook* and the tools available via the USA National Phenology Network.

Every year in November (open until mid-January) we circulate an **Nature's Notebook Active or Inactive Group Survey**. Active groups are those who have submitted at least some data for the year. Inactive Groups are those that did not submit data for the calendar year. We want to hear from everyone.

If you've taken the time to document what you are doing and how you did it via the program planning process, it should be easy for you to share that with us.

Additionally, we have created an online form for sharing this information which will be circulated with the survey. If you have not made an annual report but can still share information with us, we'd appreciate it.

Tell us:

- The Relevance of your *Nature's Notebook* Program (from the ***Nature's Notebook Program Planning Activity Worksheet***)
- The Response to the relevance of your program. What did you do this year to move toward solving the issue or reaching your broad goal? This information can be obtained from your short-term outcomes documented on the ***Nature's Notebook Program Mapping Activity Worksheet***.
- The Result of your effort for the year. What were you actually able to achieve (completed results from your ***Nature's Notebook Action Planning Worksheet***)

Here is the link to the online form ([usanpn.org/nn/groups/impact](https://usanpn.org/nn/groups/impact)) and worksheet that you can use to create your annual impact statement and report on the success of your Local Phenology Program.

The Local Phenology Leaders who take time to map out their program have the most successful long-term programs. Five years of data tell us that those programs with a solid foundation and purpose for monitoring, as well as a Leader who keeps track of the process, are those which render the best and most useable data for our National Phenology Database.

We know it is a lot to ask, but we think it is an important step in creating a sustainable program and contributing to the record we curate documenting the changes in phenology across the US. Thank you so much for deciding to participate! We really value your input and expertise and look forward to hearing from you at the end of each year.

## DESIGNING A PHENOLOGY WALK OR TRAIL

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### *Choose your species and individual plants and animals*



Start out by conducting a short plant and animal survey along the path for your proposed Phenology Walk. It would be helpful to bring a list of available local *Nature's Notebook* species with you to reference as you walk along. Visit [usanpn.org/nn/species\\_search](https://usanpn.org/nn/species_search), select your state, and generate the list. Available species will have unique webpages, called species profile pages, including information about the species and the corresponding datasheet. There are currently (as of July 2018) 1260 total species available to choose from including plants, animals, insects, reptiles & amphibians, fish, and birds. If you wish to track a species for research that is not in *Nature's Notebook*, contact our Education Coordinator ([education@usanpn.org](mailto:education@usanpn.org)) to discuss the possibility of adding the species to the list. If you need help deciding on a species to monitor, visit our **Join a**

**Campaign** page [usanpn.org/nn/campaigns](https://usanpn.org/nn/campaigns) linked from the **OBSERVE** menu of every *Nature's Notebook* page to find a campaign for your region.

If you are partnering with a local organization, have a science question, or are contributing data for management purposes be sure to consult with everyone on your team to ensure that the design of your Walk is valid for the observational data being sought. You may need to make special arrangements for doing transect walks for counting animal or bird species or take into consideration native vs. invasive species on the list.

Regardless, as you walk along take notes on plants and animals of interest that are accessible and can easily be seen and monitored by participants from the path. Many locations do not encourage traveling off-path so be cautious when designing your Walk to adhere to local guidelines. Be sure to design your Walk at a site that allows visitors to freely enter the property. Be aware of trespassing guidelines and stick to local rules and regulations by obtaining proper permissions ahead of time.

The NCO suggests using some native species with which folks may already be familiar and occur regularly in your region. Select a few frequently occurring individual plants, mark them at more than one location, and capture the variety of phenophase timing between individuals and their spatial distribution. If multiple sites/walks are added to your trail, there is a good chance these plants will appear at more than one location.

The NCO also suggests selecting between three to ten plant species to monitor at the site. Each should include two to three individuals of each species to account for any microclimates in the area. For example, if you choose common milkweed, eastern white pine, and yellow star-thistle for your

three species, you could have three milkweed plants, three white pine trees, and three yellow star-thistle plants on your walk. You will compare the observations from one plant with another to understand if any local environmental variables are affecting the phenology of each plant. More information on how many plants to choose can be found in our **Frequently Asked Questions**, here: [usanpn.org/nn/faq#how\\_many](https://usanpn.org/nn/faq#how_many)

You may discover that there are not individuals of any particular species on the *Nature's Notebook* list along your proposed Phenology Walk. If you have difficulty designing your Walk you may want to consider planting new plants either from seed or by transplanting individuals from a local nursery. Before choosing new plants be sure to get advice from someone with knowledge of native plants species for your area, and again, be cognizant of local guidelines. Certain natural areas prohibit the planting of species due to management regulations.

Start with plants and animals whose phenophases you are already familiar. **Keeping it simple from the beginning** is the best way to start. You'll be training others to observe so select things that are familiar with phases that are easy to identify. Save the monitoring of the abundance data for a time when everyone feels comfortable making those observations. Refer to all of our training materials including the **Botany and Phenophase Primers** ([usanpn.org/pubs/reports#Education](https://usanpn.org/pubs/reports#Education)); the *Nature's Notebook* **Frequently Asked Questions** linked from the bottom of each *Nature's Notebook* webpage ([usanpn.org/nn/faq](https://usanpn.org/nn/faq)); and the **Nature's Notebook Nuggets** ([usanpn.org/nn/observe/questionsanswered](https://usanpn.org/nn/observe/questionsanswered)) that describe in more detail some of the common questions about phenophases the NCO receives. Plan to make Phenophase Photo Guides to help train folks on what the phases of your exact individual look like in its habitat. Visit the Phenophase Photo Guide ([usanpn.org/nn/species-template](https://usanpn.org/nn/species-template)) page for more information.

If you are using your Walk for public engagement, be sure to choose engaging species – those that will catch the attention of amateur observers. The more interactive and interesting the species, the more likely an observer will notice it and the more likely they will be interested in participating in this mode of scientific discovery.

Keep a log or notebook of the plant species chosen and their specific location. As an added benefit, you can take pictures and collect GPS waypoints of each individual plant to make your program more interactive. If you are working with youth, consider using the **Geocaching and Phenology Activity for Nature's Notebook** ([usanpn.org/nn/geocache](https://usanpn.org/nn/geocache)). Plotting the points using a mapping



program, such as Google Maps ©, will provide a big picture snapshot of your space as well as be useful to participants collecting data for you in the field.

You will also want to physically mark the plants along your Walk so that others can easily find them and record data on the correct individual. Use inexpensive plant tags that can be written on with pencil or pen and affix them to the plant. Consider including a label with the *Nature's Notebook* logo and on the other side the name of the plant

corresponding to the nickname entered for that individual in the *Nature's Notebook* system. When attaching the tag to the tree, spiral the wire around a pencil so that as the tree or plant grows, the wire will expand with it. Depending upon how you use your Walk or Trail, you may decide to label the species differently. Some groups have enough funding to purchase more permanent plant markers and signs. You'll find a few examples on page 38 of this guide.

Ideally to begin, your Phenology Walk should be no more than a mile long to allow a diversity of observers to participate. Of course, if potential observers are hiking enthusiasts or experienced in outdoor exploration, your Walk may be significantly longer, or may be a combination of *Nature's Notebook* sites. For schools and organizations introducing phenology for the first time, it is important to create an experience that will be both accessible to new observers and create useful and interesting phenology data to explore and contribute. The exact parameters are up to you, the Local Phenology Leader, to decide. Ultimately you will want to create an activity that meets the needs of your organization as well as those of the USA-NPN.

### **Create your account in Nature's Notebook online**

Before you begin, create an account in *Nature's Notebook*. To create your personal account, visit the **OBSERVE** menu from the main *Nature's Notebook* website and select the **Become an Observer** page. Read the information and click on the link for Become an Observer Now. You'll be guided through the steps for creating an account.

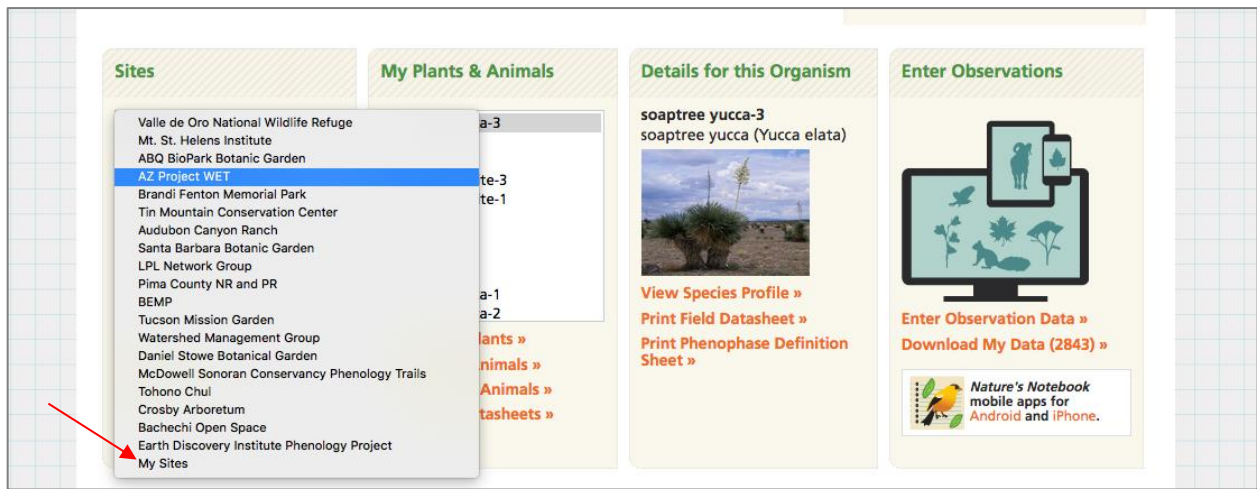
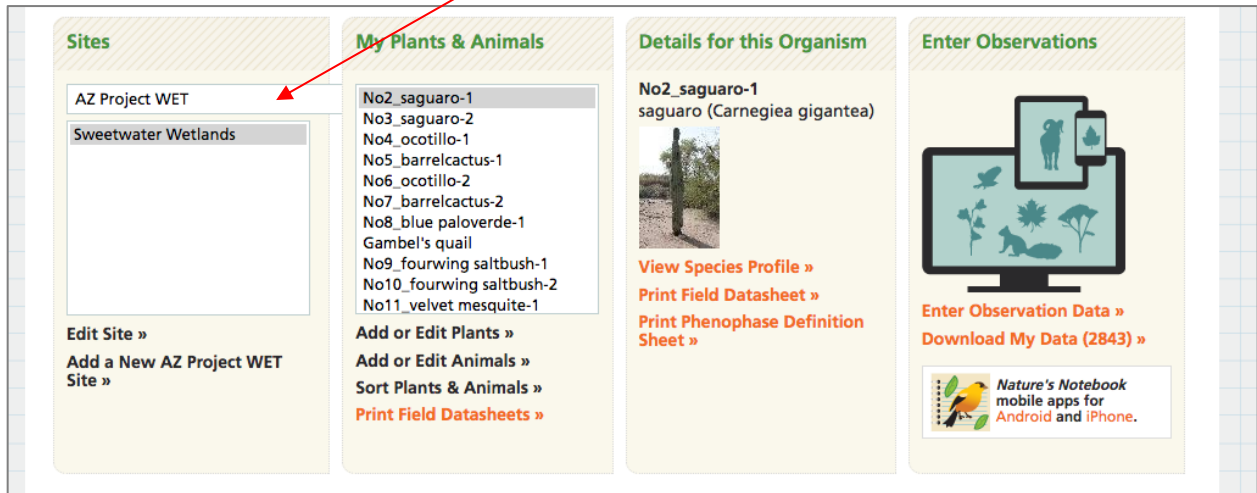
**NOTE:** The NCO recommends that you create an account using **your** email address, and **not a shared email address**. *Nature's Notebook* has the capability to create a shared Group for multiple people to contribute data, thus sharing an email account and a *Nature's Notebook* account is not necessary and is not practical. When someone who has a shared email address moves on from the organization and does not notify the NCO, it is difficult to transfer administrative rights to another person if that person is not yet hired. By creating an account for you personally, even if you leave your post with the organization you can transfer ownership of your managed Group to another person very easily via the Manage Users functionality before you depart. You may also continue to observe elsewhere with another Group or in your backyard or other location you frequent.

Groups that have already been created are found listed under the Partner Group section of the **Join Nature's Notebook** page. If you wish to join an existing Group (other than your own) when you create your account, you are welcome to check the box next to the Group's name. Your preference will be saved, and it will be visible on the Observation Deck under the Sites box dropdown menu.

You will be prompted to create a personal site during the account creation process. You may choose to create a personal site now or create the site which you will use for your Group. If you choose the latter, you will be able to move the site to your Group in *Nature's Notebook* **after it is established**. You'll find specific details on how to do create your Group the next section (page 33) of this guide entitled **Create a Group in Nature's Notebook**.

Follow the instructions on the screen to add the site location details. Save your work at the bottom of the page. You can go back at any time and edit these details, including the name of your site, by clicking on the link for **Edit Site >>** at the bottom of the Observation Deck.

You'll be able to toggle between MY SITES and any Groups that you belong to. This is what users who wish to join your Group later will see, so you'll advise them to check the box next to your Group name once it has been created. If you have affiliated yourself with a Group when you create your account, by default the Groups will be visible first in the Observation Deck. Click on the dropdown link to switch between Groups you belong to and My Sites (your personal sites). See the screen shots below for more details.



We also have an editable handout you can use with your observers that describes how to join *Nature's Notebook* ([usanpn.org/nn/online-group-setup](http://usanpn.org/nn/online-group-setup)) and affiliate themselves with your Group. The handout is found on the *Nature's Notebook* Activities table linked from the **EDUCATE** menu on **all** *Nature's Notebook* pages.

If you did not enter your personal details when you created your account, you can go back and edit them at any time. If you are a Local Phenology Leader you should complete your personal details such as your name and your location (city and state). From your Observation Deck:

1. Click on the link tab for **Edit Account Details**
2. Click on the **Edit** tab
3. Click on the box entitled **Participant Information**
  - a. Provide as much information as you like. Your personal information is not shared with data end users or others via *Nature's Notebook*.



Home » Observation Deck

## Lorianne.barnett's Observation Deck

**My Phenology Calendar** Badges

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

2016 2017

Highcharts.com

**CUSTOMIZE MY CALENDAR**

**Observations**

Enter your observations below or via smartphone. You can edit the sites, plants or animals you've selected anytime.

**Observe**

Why Observe?

Become an Observer

**My Observation Deck**

Learn How To Observe

The Plants and Animals

Leaderboards

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**MY ACCOUNT**

You are currently logged in as **lorianne.barnett**

**MY ACCOUNT DETAILS**

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**REMINDERS TO OBSERVE**

You are currently signed up for weekly reminders to observe emails.

**UNSUBSCRIBE**

### Setting up your sites, plants and animals

After selecting and tagging the species outside that you'd like to include on your Walk, you'll need to add them to your site in *Nature's Notebook*. For detailed instructions on how to create your site and add plants and animals to it, review our **Learn How to Observe Guide** or the information on our website linked from the **OBSERVE** menu on **all** *Nature's Notebook* pages ([usanpn.org/nn/guidelines](http://usanpn.org/nn/guidelines)).

**Sites**

- U of A Campus Arboretum
- Joseph Wood Krutch Garden U
- UA Old Main Loop
- Palmer's agave at Saguaro Hall

**Edit Site »**

**Add a New U of A Campus Arboretum Site »**

**Manage Users »**

**My Plants & Animals**

- candy barrelcactus-1
- Coues' cassia-1
- ocotillo -1
- Santa Rita pricklypear-3
- catclaw acacia-3
- catclaw acacia-2
- catclaw acacia-1
- soaptree yucca-2
- soaptree yucca-1
- velvet mesquite-1
- Santa Rita pricklypear-4

**Add or Edit Plants »**

**Add or Edit Animals »**

**Sort Plants & Animals »**

**Print Field Datasheets »**

**Details for this Organism**

candy barrelcactus-1  
candy barrelcactus (Ferocactus wislizeni)

**View Species Profile »**

**Print Field Datasheet »**

**Print Phenophase Definition Sheet »**

**Enter Observations**

**Enter Observation Data »**

**Download My Data (2843) »**

**Nature's Notebook mobile apps for Android and iPhone.**

## Create your Group in Nature's Notebook

You can create a Group for a Phenology Walk or Trail so others can contribute observations to it. Be sure that you have permission from the landowner to mark plants for observation, make the Group public, and invite outside visitors to the location.

Once your Group is set up, observers will be able to easily locate your it from the list of **Partner Groups** when they join *Nature's Notebook*. Information about how to create a Group online in *Nature's Notebook* can be found on the **Start a Phenology Program** page ([usanpn.org/nn/groups/group-site](https://usanpn.org/nn/groups/group-site)) linked from the **FOR GROUPS** menu on **all** *Nature's Notebook* webpages. You can name yourself and as many other people as you like as administrators. All administrators, including yourself must have already created a *Nature's Notebook* user account before requesting your Group. The **NCO recommends naming at least one other person** as an administrator when you create your Group so that in case one of you leaves there is someone who is still responsible for it in the organization. Once your Group is created you'll have administrative rights to add site(s), add and edit plants and animals, manage your users, and download your Group's data directly from the Observation Deck. Details about administrative rights are found on the next page.

If you created the site you'd like to use on your personal sites list when you created your account, once your Group is set up you can move it from there to your Group. From your Observation Deck:

1. Click on the site you'd like to move to the Group in your list of Sites
2. Click on the link for **Edit Site >>**
3. Scroll to the bottom of the page past the map and the optional information.
4. Find a dropdown box at the bottom of the page that allows you to select the Group to which you'd like to move your site.
5. Click on the link to **MOVE SITE TO SELECTED GROUP**

Optional Additional Information  
Please answer as many of the following questions as you can. Hover over the ⓘ symbol for further explanation of the choices. If you do not know how to best answer a question for your site, please leave it blank.

Overall Plants Animals

Site Image  
ADD IMAGE

The degree of development surrounding the site can best be described as: ⓘ  
Wildlands or semi-wildlands

This site is best described as: ⓘ  
Shrubland, shrub thicket or shrubby field (with few tall trees)

How close is the nearest paved or maintained dirt road to the site? ⓘ  
1.0 miles

How close is the nearest permanent body of water to the site? ⓘ  
5.0 feet

What is the area of the site? ⓘ  
acres

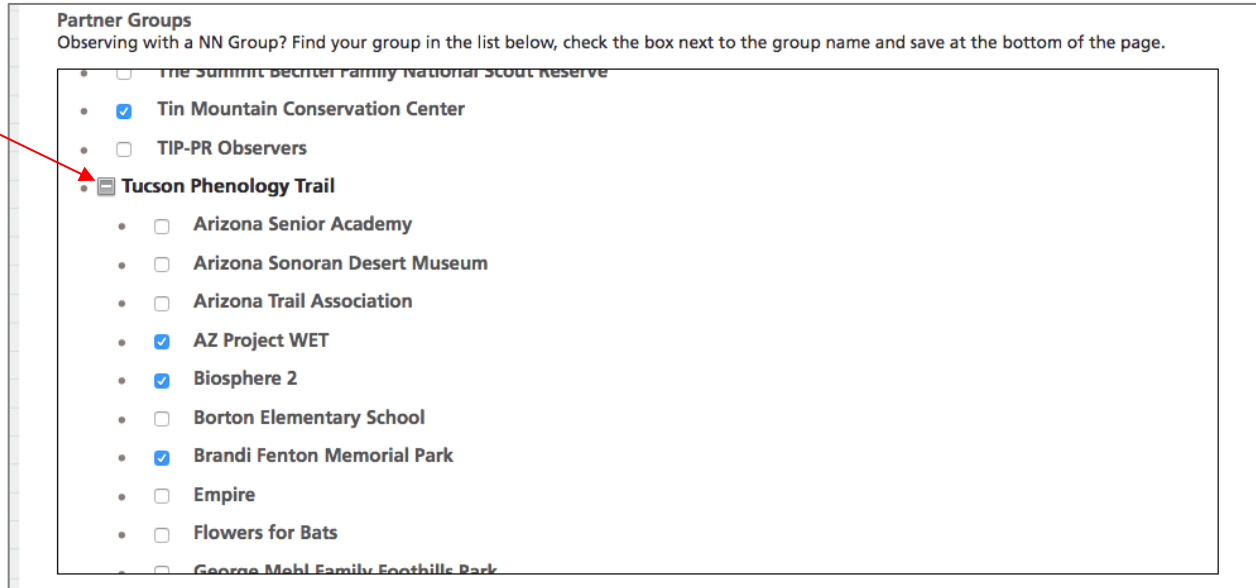
Comments:

SAVE CHANGES

LPL Network Group

MOVE SITE TO SELECTED GROUP

Groups also function very well for Phenology Trails. The sites that are created need not be for one organization. You can tie many organization's Groups together in one higher-level Group and manage the users and data at the Phenology Trail level from *Nature's Notebook*. See the example for the Tucson Phenology Trail below.



### Administrative rights in Nature's Notebook Groups

Administrative rights allow you to add as many sites as you need to your Group; **Manage the Users** for your Group; **Add and Edit Plants**; **Add or Edit Animals**; and **Sort Plants and Animals**. Anyone with administrative rights to your Group can do the same. The links below the My Plants & Animals section of your Observation Deck are highlighted in orange if you have administrative rights. For those who do not have administrative rights those links are unclickable and are black.



### Manage your Group's users

Once your Group is established you are able to view who the users are at any given time. The list of users you see corresponds to those who have joined your Group during the Become an Observer Process. Administrative rights give you the opportunity to Manage Users by selecting each user and:

1. Download observations per user (helpful if you are an educator managing a group of students for a class).
2. Remove users from the Group if people are no longer participating. They are always welcome to rejoin again in the future.
3. Make other users administrators – who will then have all of the rights described here and above.
4. Assign one or more members as Data Entry Technician – helpful if someone is entering paper datasheets for your Group of observers or reviewing data from all observers for data quality.

Administrators can also download:

1. A Group Roster which creates a downloadable file containing:
  - a. Email addresses and unique Person IDs assigned by the database for each person
  - b. Their user name in *Nature's Notebook*
  - c. Their name if they filled in their Participant Details via the Edit User Details page
  - d. The date they registered for *Nature's Notebook*, and
  - e. Any badges they have earned through participation
2. Your Group's data in an excel file. It delivers all of the data contributed by all users in your group to date.
3. Filtered data for your Group – this takes you directly to the Phenology Observation Portal ([usanpn.org/data/observational](https://usanpn.org/data/observational)) and automatically fills in your Partner Group name for you.

Home » Observation Deck » Edit Users

## Manage Users

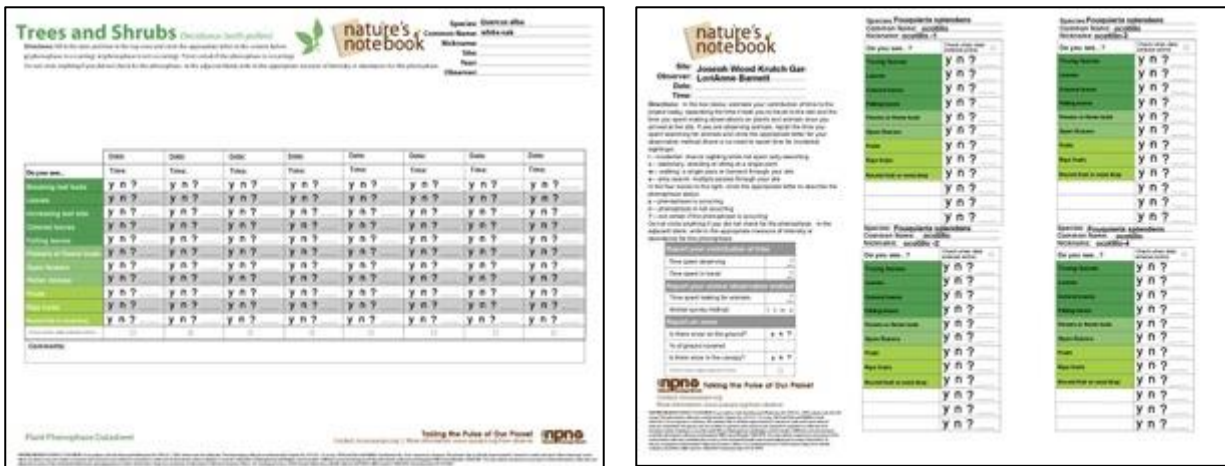
Groups I Administer	Users in this group	User Details	Downloads
<ul style="list-style-type: none"> <li>Biosphere 2</li> <li>Buffelgrass Monitoring Networ</li> <li><b>U of A Campus Arboretum</b></li> <li>Tucson Botanical Garden</li> <li>Mt. St. Helens Institute</li> <li>Brandi Fenton Memorial Park</li> <li>LPL Network Group</li> <li>Pima County NR and PR</li> <li>Tucson Mission Garden</li> <li>Earth Discovery Institute Pheno</li> </ul>	<ul style="list-style-type: none"> <li>rutis@giub.unibe.ch</li> <li>sharmonics2@cox.net</li> <li>cwinston@thepartnership.us</li> <li>kfranklin@desertmuseum.org</li> <li>noellee@email.arizona.edu</li> <li>rmick@email.arizona.edu</li> <li>tchilcote@email.arizona.edu</li> <li>mlgradall@email.arizona.edu</li> <li>taylordayton@email.arizona.ed</li> <li>thuckleberry@email.arizona.ed</li> </ul>	<ul style="list-style-type: none"> <li>Observer ID: 29042</li> <li>User Name: Crane Ranch</li> <li>Date Registered: Wed Feb 24 12:47:10 MST 2016</li> <li>Address:</li> <li><a href="#">Download Observations (0)</a></li> <li><a href="#">Remove User from Group</a></li> <li><input type="checkbox"/> Group Admin</li> <li><input type="checkbox"/> Data Entry Technician</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Group Roster</a></li> <li><a href="#">Group Data</a></li> <li><a href="#">Download Filtered Data</a> ⓘ</li> </ul>

FAQs | Terms of Use

Nature's Notebook is a project of the USA National Phenology Network.

## Print Datasheets and Collect Data

You can print *Nature's Notebook* datasheets for individual species with multiple observation date slots OR single day data collection with one observation date for each species. The latter is most useful for visitors collecting information along your Walk as a one-time event (image below, right). Those making repeated observations on multiple days should print out individual species datasheets with multiple dates of observation.



Sample species datasheet (left) and day-by-day datasheet (right)

Your Phenology Walk may be designed to be self-guided, but a teacher or docent can lead observers through the Walk for the first time. In cases where groups of people all observe the same individual plants or animal species at a site on a one-time visit, we recommend that one person (e.g. the docent or group leader) make one entry in *Nature's Notebook* for the entire group of visitors on that day. In other words, if your organization has a ranger, environmental educator, or volunteer docent who leads tours, that person should collect the datasheets from each participant at the end of the session, review them for accuracy, and make ONE entry for the whole group using their own *Nature's Notebook* login information.

The NCO also recommends observers use our mobile application for Android and Apple devices. View our Mobile Application Tip Sheets ([usanpn.org/nn/mobile-app-tip-sheets](https://usanpn.org/nn/mobile-app-tip-sheets)) for more details. Mobile applications eliminate the extra step needed for entering the data from paper datasheets into the database. The mobile applications also work outside of Wi-Fi or cell range, storing the observations locally on the phone until it is returned to a service area. The user should open the application when back in range and make sure the data are uploaded. Users can check their Observation Deck to be sure that the observations were in fact uploaded.

**If you decide that you must create an more simplified version of *Nature's Notebook* datasheets reflective of the type of visitors you anticipate, then please be sure to follow our guidelines for using Simple Datasheets.** We have created a simplified, verified protocol for using *Nature's Notebook* with these audiences. You can find the guidance materials on the **Simple Phenophase Definition and Datasheet** page ([usanpn.org/nn/simple-pheno-data](https://usanpn.org/nn/simple-pheno-data)). **If you create your own definitions because you think it is easier for you and your observers to understand then you are no longer participating in *Nature's Notebook*.** Our Education Coordinator and Data

Manager have vetted these simple definitions and they have been successfully tested with people as young as 2<sup>nd</sup> grade. Creating supplemental materials for your observers is acceptable as long as you also include the exact phenophase definition/protocol with the information you provide.

For example, if you are working with 4<sup>th</sup> grade school groups, each visiting one time, you may wish to create re-useable datasheets with these phenophases. These simple sheets could also include photos to help the students understand what they are looking for and be laminated for re-use. A Data Entry Technician can be designated to enter all of the data for the day if datasheets are collected, although in this case it is strongly recommended that the Leader or teacher who is knowledgeable about the exact phenophases occurring is responsible for making the entry to ensure the data are valid. Pairing the simple datasheets with a phenophase photo guide ([usanpn.org/nn/species-template](http://usanpn.org/nn/species-template)) is also recommended.



*Sample simple, re-useable datasheets produced by the Biosphere 2*

Alternatively, if a leader or a teacher is working with a group of 4<sup>th</sup> graders who are using the simple datasheets as described above, the Leader who knows the protocol can be entering the data via the mobile app for the students as they participate outside.

**Utilize your program plan to regularly collect data**

The NCO recommends that there are weekly observations coming in from each site in *Nature's Notebook*. Develop a plan for engaging volunteers, staff, and leaders so they can share the workload of documenting the phenology of your chosen species for at least two years.

If conducting observations as a classroom, try to encourage or schedule observations on a frequent and consistent basis. As explained above, the consistent collection of observations will yield a data set that can be used for investigation and analysis. If you are working with volunteers, consider creating a monitoring schedule so that no one person has to be responsible for collecting data each week. If you have enough trained volunteers sharing the observation process, volunteers may only need to collect observations individually once a month, yet you can schedule someone to make observations one or more times a week

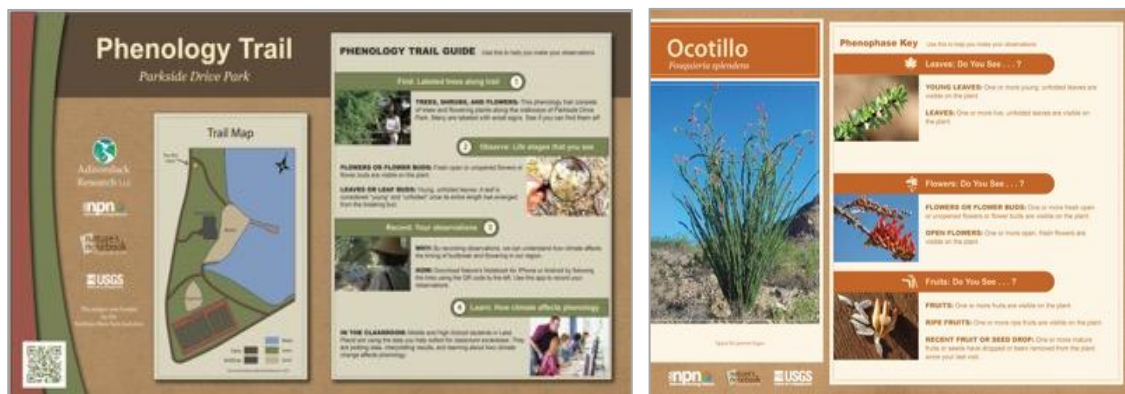
Scheduling events with participating observers and Leaders, at least monthly, is important to cultivate interest and community around the program. Employ the use of docents who are

interested in leading group walks to collect data. Partner with other groups who have an interest in the natural world, such as Master Naturalists, to gain momentum.

### Create interpretive signs and markers

If your Phenology Walk or Trail is going to become a permanent part of your interpretive or education program, you may want to consider installing permanent signs. Create signs that include descriptions of the phenophases, as well as some photos, so that they are easily identifiable, and the individuals are easily located. The phenophase definitions can be printed on the signs so participants simply need a datasheet or the phone app when they are on the Walk. Visit the Phenology Walks and Trails webpage, [usanpn.org/nn/groups/phenology-trail](https://usanpn.org/nn/groups/phenology-trail), for example PDFs and templates of such signs; see photos below. All of the information on the sign for each species, can be found on the species profile pages accessible via the Species Search ([usanpn.org/nn/species\\_search](https://usanpn.org/nn/species_search)) page. **Remember that you must print the phenophase definitions exactly as they appear in the *Nature's Notebook* protocol to ensure the program meets Quality Assurance standards.**

If possible, include pictures of the primary phenophases that occur. It would be even better to include pictures of your *actual* plant or animal on the sign, so people get a better sense of what the plant looks like in each phase in your location. If you choose to include animals on your list, you might want to include photos of each of their phenophases as well.



Example intro sign and species signs along a Phenology Walk

Some other content you may wish to use on your signs:

- ✓ **Common name and/or scientific name:** The suggested field guides listed on our FAQ page ([usanpn.org/nn/faq#how\\_id](https://usanpn.org/nn/faq#how_id)) can help you locate this information for your plants and animals.
- ✓ **Did you know?:** Use this section to deliver a fun fact or information about the many uses of this species.
- ✓ **Why observe this species?:** There are many reasons for observing particular species. The species you chose may be important ecologically or economically, or may impact human health, like allergenic species.

- ✓ **Image of species with attribution:** Most plant images can be found through [USDA PLANTS \(www.plants.usda.gov\)](http://www.plants.usda.gov). A Google Image “Advanced Search” restricted to images labeled for re-use is a good supplement to PLANTS. Always give credit through attribution and note the photographer and source for the image and be sure you have permission to use the photos.
- ✓ **Which phenophases should I observe?:** Find your species using the [Species Search \(www.usanpn.org/nn/species\\_search\)](http://www.usanpn.org/nn/species_search) page, and then use the “Which phenophases should I observe?” section of each species profile.
- ✓ **Where is this species found?:** Each species profile has the states in which the species is found. For more detailed information, visit NatureServe ([www.natureserve.org](http://www.natureserve.org)).
- ✓ **QR codes:** Consider adding QR codes to your signs to direct people to *Nature’s Notebook*, USA-NPN and your website. Find more information on [Wikipedia \(https://en.wikipedia.org/wiki/QR\\_code\)](https://en.wikipedia.org/wiki/QR_code).

### **Test your Phenology Walk**

Before bringing students or the general public to your Phenology Walk, test it out with some friends or co-workers. These beta testers will help you determine if the Phenology Walk is ready for observers. After collecting observations hold a discussion with the test observers. Ask them questions like the ones below:

- ✓ Are the plants on the phenology walk easy to find?
- ✓ Is the datasheet easy to understand?
- ✓ Was enough information provided on the datasheet for the Phenology Walk to be self-guided?
- ✓ What did you like about the Phenology Walk?
- ✓ Were there any challenges that you encountered while collecting your observations?



Observations may be tricky if your plants are dormant and not showing any phenophase activity. It is important to communicate to observers the importance of **phenological data at all times of the year**, and at every stage of the life cycle, for these plants. Data throughout the year will provide a robust and complete dataset for investigation and analysis to understand the phenological trends of each species. The USA-NPN strongly encourages groups to collect data as often as possible, even if phenophases are not occurring. Activities designed around collecting this “negative data” may serve to encourage people to keep collecting data. Knowing when a phenophases is not occurring is as important as knowing when it is, in

order for researchers to know when the phenophases began. It’s also relevant for species conservation – knowing that flowers are not blooming anymore is key information for species conservation.



Conduct several tests of your Phenology Walk with different groups of observers. If certain plants pose problems for many observers, you may need to select a different species for the walk or make more information available about what observers should search for. Similarly, if a plant has difficulty thriving along your Phenology Walk, you may want to replace it on the list of observed plants so that observers have a reliable plant to make observations on during their walk. Testing your Walk a few times will provide you with important background information that you might share with participants before they begin.

***Share your Phenology Walk or Trail and stay connected with the USA-NPN***

Share your experiences with the USA-NPN Education Coordinator so other groups can benefit from your progress. Don't forget to respond to our annual survey and share any successes or questions with the Local Phenology Leader Community of Practice.

Publicizing your Phenology Walk is the best way to engage people with your site and encourage



regular phenology data collection. The NCO has experienced success advertising locally via participating sites and through setting up a Facebook Group tied specifically to events and hikes along our trail. The network of sites that make up the Tucson Phenology Trail ([usanpn.org/nn/groups/tucson-phenology-trail](https://usanpn.org/nn/groups/tucson-phenology-trail)) each have volunteer Local Phenology Leaders whomaintain the program with each organization. When the Trail meets the needs of both the USA-NPN and the organizations creating the sites, it is much more likely to be sustainable.

The Tucson Phenology Trail was, for the most part, implemented without the benefit of funding. It is possible to create and maintain such a program by engaging end users in a common goal as long as you have at least one person available to organize it with a vision and the ability to create the program. The key to a successful Phenology Walk or Trail will be consistent engagement and communication with the participants involved. Partner with Master Naturalists who have an interest in taking leadership over citizen science programs. Scheduling community days and capitalizing upon local events happening at each site increases the reach of the group. Long-term engagement with volunteers and coordinators can be direct and meaningful.

## **Phenology Walk or Trail: In review**

Start simple. Keep it simple.

1. **Choose your species and individual plants and animals.** Mark a handful of accessible plants for observation. Use commonly occurring plants and animals found in the list of 1260+ species in the National Phenology Database. Plan to observe only those phenophases that are easiest when you begin.
2. **Create your personal *Nature's Notebook* account.** Use the *How to Observe Handbook* as a guide.
3. **Create your Group in *Nature's Notebook*.** Follow instructions on the Start a Phenology Program page.
4. **Learn about administrative rights in *Nature's Notebook*.** Administrators can add and remove people and sites from the *Nature's Notebook* Group.
5. **Manage your Group's users.** Review your users and the data they are collecting.
6. **Print datasheets and collect data.** Don't change the protocols! Use the datasheets and definitions provided by the USA-NPN.
7. **Utilize your program plan and regularly collect data.** Keep checking back on your plan and measuring your success.
8. **Create interpretive signs and markers.** Have some extra funding? Consider installing permanent signs for observers to use in the field.
9. **Test your Phenology Walk.** Test your walk with groups of observers and be open to their feedback on physical location, accessibility, and plant selection.
10. **Share your Phenology Walk or Trail.** Communicate regularly with the NCO and share your Walk or Trail with others in your community. Don't forget to complete the NCO's annual Group evaluation!

# QUICK REFERENCE GUIDE FOR LOCAL PHENOLOGY PROGRAMS

## Local Phenology Program page

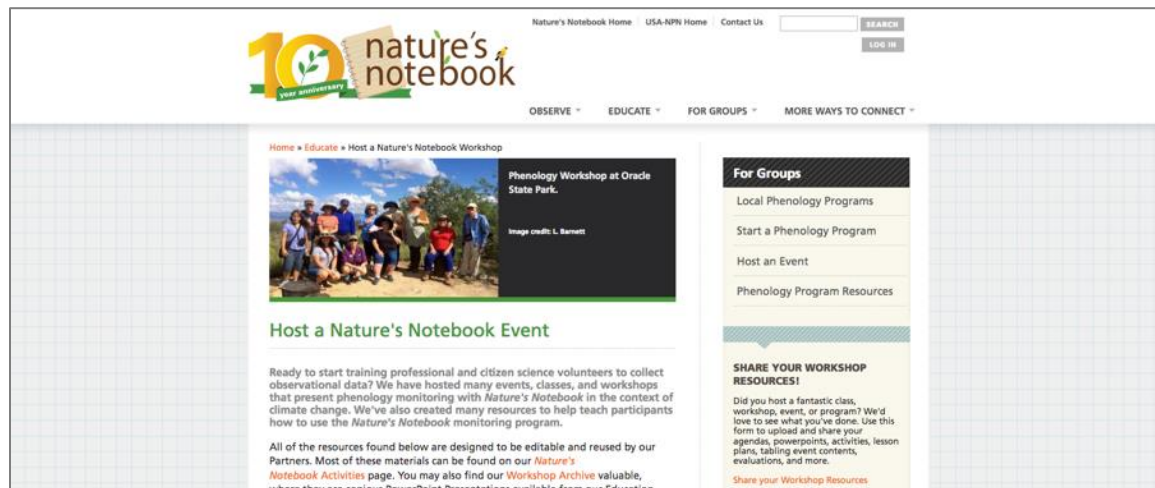
Accessible via all *Nature's Notebook* pages under the **FOR GROUPS** menu. Note the menu contains links to the **Host an Event** page and the **Phenology Program Resources** page.

[usanpn.org/nn/groups/local-phenology-programs](http://usanpn.org/nn/groups/local-phenology-programs)



## Host an Event page

Accessible via all *Nature's Notebook* pages under the **FOR GROUPS** menu. Includes sample PowerPoints for training and activities used for tabling events. [usanpn.org/nn/groups/event](http://usanpn.org/nn/groups/event)



## Learn How to Observe page

Accessible from the **OBSERVE** menu. Includes sidebar links to the *Nature's Notebook* Nuggets, Botany and Phenophase Primers, the Learn How to Observe Course, and the Basic Botany and Intensity Quizzes.

[usanpn.org/nn/guidelines](http://usanpn.org/nn/guidelines)

The screenshot shows the 'Learn How to Observe' page. At the top, there is a navigation bar with 'nature's notebook' logo, '10 year anniversary' badge, and links for 'Nature's Notebook Home', 'USA-NPN Home', and 'Contact Us'. Below the navigation bar are tabs for 'OBSERVE', 'EDUCATE', 'FOR GROUPS', and 'MORE WAYS TO CONNECT'. The main content area features a large image of purple crocuses with a text box that says: 'Once you pick a site and species, and register them online, you're ready to observe. Download and print your datasheets and head outside! Image credit: California Phenology Project'. Below this is the heading 'Learn How to Observe' and a sub-heading 'Follow the steps below to learn how to observe in your back yard. To view these instructions in Spanish: Versión en español (con una Introducción a la Red Fenológica)'. A section titled '1. JOIN NATURE'S NOTEBOOK' explains that the first step is to create an account with a username and password, and provides a link to the 'How to Observe Handbook'. On the right side, there is a sidebar with the heading 'Observe' and links for 'Why Observe?', 'Become an Observer', 'My Observation Deck', 'Learn How to Observe', 'The Plants and Animals', and 'Join a Campaign'. At the bottom of the sidebar, there is a section titled 'Are two plants better than one?' with a small image and text explaining that observing more than one individual of each plant species allows for capturing individual variation in phenological events.

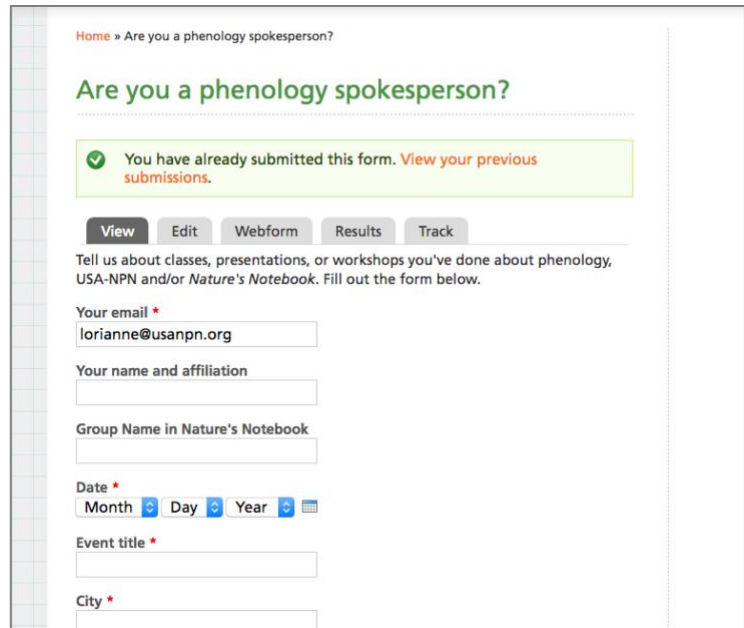
## The Search Plants and Animals to Observe page

Accessible via the **OBSERVE** menu. You will also find a link to our campaign species if you are unsure what species to select for observation.

The screenshot shows the 'Search Plants and Animals to Observe' page. At the top, there is a navigation bar with 'nature's notebook' logo, '10 year anniversary' badge, and links for 'Nature's Notebook Home', 'USA-NPN Home', and 'Contact Us'. Below the navigation bar are tabs for 'OBSERVE', 'EDUCATE', 'FOR GROUPS', and 'MORE WAYS TO CONNECT'. The main content area features the heading 'Search Plants and Animals to Observe' and a paragraph stating: 'There are over 1,260 species on the USA-NPN's Nature's Notebook species list available to you to observe. Use the search tool below to find species to observe or download all the species information as an Excel file.' Below this is a section titled 'Not sure what to observe? Check out our Nature's Notebook campaigns - we are especially interested in observations of those plants and animals!'. The search tool includes a 'Name Contains' input field, a 'State or Province' dropdown menu with options for Alabama, Alaska, Alberta, American Samoa, and Arizona, and radio buttons for 'All', 'Plants', and 'Animals'. There is also an 'Advanced' search option. Below the search tool are two buttons: 'SEARCH' and 'CLEAR FILTERS'. At the bottom, there are three images of species: 'ohi'a lehua (Metrosideros polymorpha)', 'absinthium (Artemisia absinthium)', and 'Acadian flycatcher (Empidonax virensens)'. The 'ohi'a lehua' image shows a cluster of red flowers. The 'absinthium' image shows a field of green plants. The 'Acadian flycatcher' image shows a small bird perched on a branch.

## Report your PhenoSpokesperson numbers

Accessible via the **Host an Event** page sidebar. [usanpn.org/nn/pheno-spokesperson](https://usanpn.org/nn/pheno-spokesperson). You must be logged in to enter your information.



Home » Are you a phenology spokesperson?

### Are you a phenology spokesperson?

✔ You have already submitted this form. [View your previous submissions.](#)

View Edit Webform Results Track

Tell us about classes, presentations, or workshops you've done about phenology, USA-NPN and/or *Nature's Notebook*. Fill out the form below.

Your email \*

Your name and affiliation

Group Name in Nature's Notebook

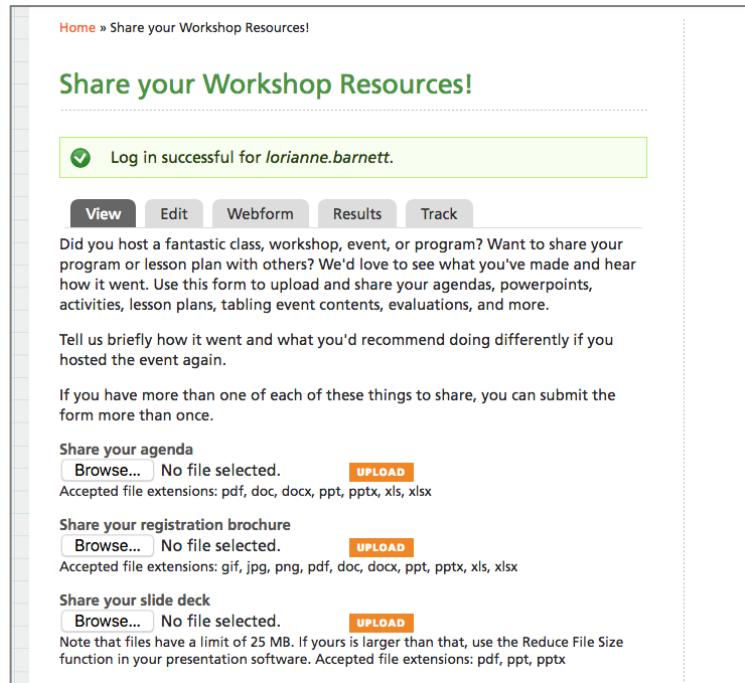
Date \*  
Month  Day  Year

Event title \*

City \*

## Share your Workshop Resources page

Accessible via the **Host an Event** page. [usanpn.org/nn/share-resources](https://usanpn.org/nn/share-resources). You must be logged in to share your resources.



Home » Share your Workshop Resources!

### Share your Workshop Resources!

✔ Log in successful for [lorianne.barnett](#).

View Edit Webform Results Track

Did you host a fantastic class, workshop, event, or program? Want to share your program or lesson plan with others? We'd love to see what you've made and hear how it went. Use this form to upload and share your agendas, powerpoints, activities, lesson plans, tabling event contents, evaluations, and more.

Tell us briefly how it went and what you'd recommend doing differently if you hosted the event again.

If you have more than one of each of these things to share, you can submit the form more than once.

Share your agenda  
 No file selected.   
Accepted file extensions: pdf, doc, docx, ppt, pptx, xls, xlsx

Share your registration brochure  
 No file selected.   
Accepted file extensions: gif, jpg, png, pdf, doc, docx, ppt, pptx, xls, xlsx

Share your slide deck  
 No file selected.   
Note that files have a limit of 25 MB. If yours is larger than that, use the Reduce File Size function in your presentation software. Accepted file extensions: pdf, ppt, pptx

## Nature's Notebook Nuggets

Contains questions submitted by observers that have been researched and answered by the USA-NPN's staff to help observers better understand species and phenophases for *Nature's Notebook*.  
[usanpn.org/nn/observe/questionsanswered](http://usanpn.org/nn/observe/questionsanswered)

The screenshot shows the homepage of the Nature's Notebook website. The header includes the logo for the 10th anniversary of Nature's Notebook, navigation links for 'Nature's Notebook Home', 'USA-NPN Home', and 'Contact Us', and a 'LOG IN' button. Below the header are menu items: 'OBSERVE', 'EDUCATE', 'FOR GROUPS', and 'MORE WAYS TO CONNECT'. The main content area features a 'Home' breadcrumb and the title 'Nature's Notebook Nuggets'. A paragraph explains that the page contains questions submitted by observers that have been researched and answered by the USA-NPN's staff. Below this is a search bar with a search term input field and an 'APPLY' button. A featured article titled 'CATCH SPRING IN THE ACT!' includes an image of a plant bud and text about resting buds transitioning out of dormancy. Another article titled 'A YEAR OF PHENOPHASES FOR A CONIFER' is also visible. On the right side, there is a sidebar with the heading 'Observe' and a list of links: 'Why Observe?', 'Become an Observer', 'My Observation Deck', 'Learn How to Observe', 'The Plants and Animals', and 'Join a Campaign'. Below the sidebar, there is a section titled 'Terms used here can be found in the Nature's Notebook Glossary.' and 'Other resources:' with links to 'Learn How to Observe page', 'Botany Primer: a guide to understanding botany for Nature's Notebook', and 'Past Webinars (such as "Basic Botany and Tricky Phenophases" or "Gaining Knowledge in the Field")'.

## Frequently Asked Questions page

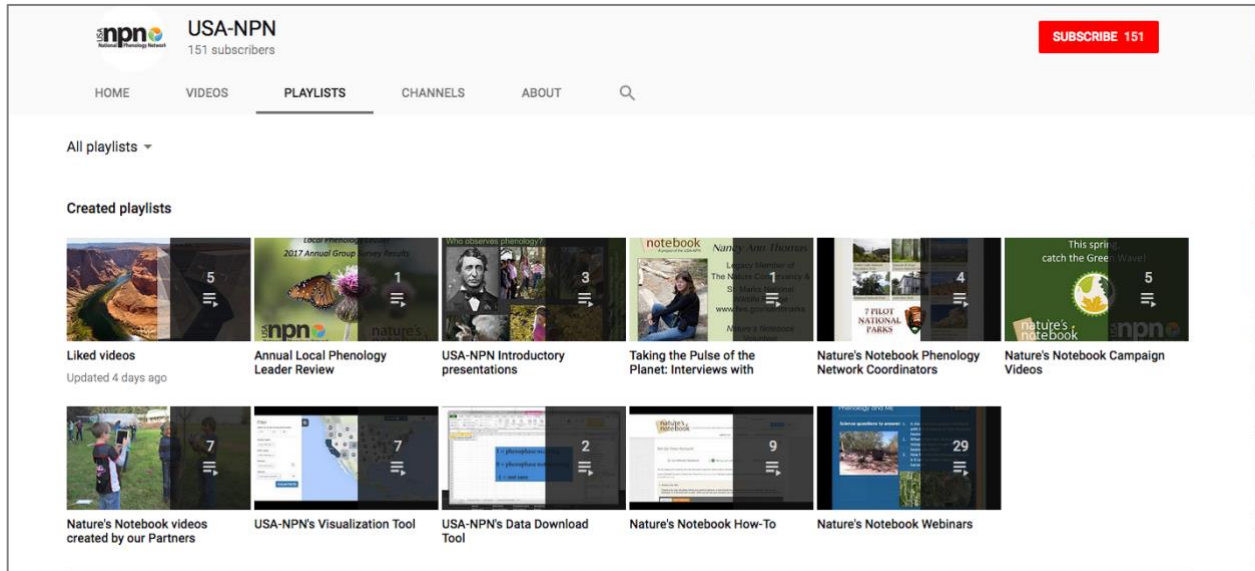
[usanpn.org/nn/faq](http://usanpn.org/nn/faq)

The screenshot shows the 'Frequently Asked Questions' page on the Nature's Notebook website. The header is identical to the previous screenshot. The main content area features a 'Home' breadcrumb and the title 'Frequently Asked Questions'. Below the title is a section titled 'NEW IN NATURE'S NOTEBOOK' with a link to 'What's new for Spring 2018?'. There are three main sections of questions: 'SITE SELECTION', 'SPECIES SELECTION', and 'INDIVIDUAL PLANT SELECTION', each with several bullet points of questions. On the right side, there is a sidebar with a featured article titled 'A year of phenophases for a conifer' with an image of a conifer tree. Below the article is a link to 'See all Nature's Notebook Nuggets' and a link to 'Go to your Observation Deck'. At the bottom of the sidebar, there is a link to 'Read archived versions of USA-NPN's e-mail newsletters'.

## USA-NPN YouTube Channel

The USA-NPN YouTube Channel includes playlists with tutorial videos for all aspects of the *Nature's Notebook* program. It also has links to videos made by Local Phenology Leaders, videos for our Campaigns, and a list of favorite videos created by partners in the field.

[youtube.com/user/USANPN1/playlists](https://youtube.com/user/USANPN1/playlists)



## APPENDICES

### ***Appendix 1: Nature's Notebook Needs Assessment Worksheet***

[usanpn.org/nn/needs-assessment-worksheet](https://usanpn.org/nn/needs-assessment-worksheet)

### ***Appendix 2: Nature's Notebook Program Planning Activity***

[usanpn.org/nn/goal-setting](https://usanpn.org/nn/goal-setting)

### ***Appendix 3: Nature's Notebook Program Mapping Worksheet***

[usanpn.org/nn/nn-program-map](https://usanpn.org/nn/nn-program-map)

### ***Appendix 4: Nature's Notebook Program Action Planning Template***

[usanpn.org/nn/nn-action-plan](https://usanpn.org/nn/nn-action-plan)

### ***Appendix 5: Nature's Notebook Program Sustainability Plan Worksheet***

[usanpn.org/nn/nn-sustainability-plan](https://usanpn.org/nn/nn-sustainability-plan)