

California Phenology Project (CPP) Briefing: Goals for National Park participation

Collaborators:
National Park Service
UC Santa Barbara
National Phenology Network



Presenter: Introduce yourself and your basic role in the project.

Thanks for coming, and thanks in advance for your patience -- if necessary! -- in case we have any technical glitches.

Today we'll be reviewing the elements of a recently funded research and education program that we hope will attract the interest and sustained participation of NP resource managers, interpreters, and park visitors.

We've designed the California Phenology Project to provide training and to generate products that will be of interest to resource managers, to interpreters, and to seasonal workers.

We also aim to reach out and to engage partners such as outdoor educators; native plant society and audubon society members; research institutes; schools whose teachers and students come regularly to your parks; and volunteers interested in participating in a long-term citizen science program.

California Phenology Project (CPP)

PRESENTATION OUTLINE

- **Background**
- **Project Scope & Collaborators**
- **Project Goals**
 - **Part 1:** *Steps towards implementation*
 - **Part 2:** *Human capacity-building*
 - **Part 3:** *Project sustainability*
- **Progress to date**
- **Next steps.....*your* participation!**

This presentation is divided into five parts.

The Project Scope and Collaborators include two partners outside of the Parks -- UCSB and the NPN, as well as a key staff member from each of the six pilot park regions that I'll describe in a few minutes.

I'll describe the project goals in three parts:

First I'll describe our early steps towards designing and implementing the CPP, which began in September of 2010

Then, I'll describe the components of the project that have to do with building the human capacity necessary to contribute to our scientific and educational goals.

Third, I'll talk about ways we intend to prepare the CPP to become a long-term and sustainable project beyond the next two and half years of funding.

I'll then describe our progress to date, and then Angie will take over and discuss the upcoming steps that need your participation to reach their maximum potential.

California Phenology Project (CPP)

BACKGROUND

WHAT IS PHENOLOGY ?

- The study of the timing of biological events such as flowering, leaf-out, insect emergence, and animal migration

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I'll start with some definitions and perspective to give us some common ground.

Phenology can be succinctly defined as the study of seasonal biological events such as the date of first flowering or the duration of flowering, or the date of leaf-out, insect emergence in the spring, and animal migration. Phenology is a particularly appropriate theme for national park-based research on climate change because the dynamic seasonal status of plants and animals is closely linked to ecological and climatic variables, and it provides an integrative signal of environmental conditions.

It's also easy to measure and consequently allows students and citizens of all ages to participate in data collection with a minimum of training while raising their awareness of and connection to nature and the natural resources needed to sustain our flora and fauna.

The CPP was funded in 2010 after a nationwide competition by the NPS Climate Change Response Program to fund park-based projects related to climate change. The CPP is one of only 12 projects funded nationally through the Climate Change Response program.

The development of the proposal was spearheaded by Angie Evenden, who worked energetically to bring together a team of us who shared this vision and who bring a variety of complementary experiences and skills together in a way that I think will help us maintain the momentum we need to move the project forward rapidly.

In spite of the limited period of funding that we have in hand, we envision of the Cal Pheno Project as being the nucleus of what will become a much broader and long-term program driven by the Park Service, by educators in and outside of the parks, and by citizen scientists.

California Phenology Project (CPP)

BACKGROUND

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- The study of the timing of biological events such as flowering, leaf-out, insect emergence, and animal migration

WHY PHENOLOGY ?

- The onset and duration of phenological events in plants and animals is closely linked to ecological and climatic variables
- Long-term monitoring can detect plant and animal responses to climate change
- Offers the possibility of forecasting the effects of climate change on plant and animal distributions
- Easy to measure & can engage citizens in data collection

10/29/2011

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HOW & WHEN?

- NPS Pacific West Region Received \$495K in FY10 from NPS Climate Change Response Program for 2.5 year collaborative project

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- Next steps.....*your* participation!

Moving on to the Project Scope & Collaborators...

California Phenology Project (CPP)

PROJECT SCOPE

- Develop and test a suite of scientific and education/outreach protocols for monitoring phenology and assessing the response to climate in CA NPS units, in UC Natural Reserves, and in nearby public schools and other landholdings
- Initial focus is on plants
- Effort builds on existing programs of project cooperators
- Engages park natural resource & interpretation staff in development and execution of project
- Attracts naturalists and volunteers to participate in a nationwide scientific effort
- Creation of an easy-to-use 'toolkit' for parks, UC reserves, and schools to monitor plant phenology & to conduct related climate change education activities

Our primary goals are listed here:

Bullet 1: First, throughout the duration of the project, we'll be developing and testing a suite of scientific protocols as well as educational and outreach materials and approaches for monitoring phenology and for assessing the response to climate in CA NPS units. Another overarching goal is to make it easy for park service staff to implement these protocols and to give visitors the ability to take part in these activities on their own.

Bullet 2: animals will be added as additional resources are secured.

Bullet 3 – The CPP builds on existing programs developed by the National Phenology Network and UCSB, details of which will be described in upcoming slides

Bullet 4 - The success of the project will depend on the engagement of park natural resource and interpretation staff, but we will be providing in-person training, educational materials, and follow-up activities that will make this as easy as possible.

Bullet 5 - Part of the job of making participation in the project attractive to and easy for park staff is to attract and to engage citizen scientists to help with the data collection.

Bullet 6 - Accordingly, we will be preparing a toolkit of materials to enable all California national parks to implement phenological monitoring as soon as they wish to. The toolkit will include protocols for monitoring selected species and for choosing the number and distribution of monitored plants, as well as protocols for engaging citizen scientists and tools for using phenology to educate the public about climate change. The toolkit will also enable parks other than the six pilot parks to initiate phenological monitoring on their own.

California Phenology Project (CPP)

PROJECT SCOPE

- Will develop tools for monitoring plant phenology in *19 CA NPS units and with partners at interested UC NRS sites*
- Initial work focused in *six pilots* in three biogeographic regions

Desert

- Joshua Tree NP

Coastal

- Redwood N&SPs
- Golden Gate NRA & Muir Woods NHS
- Santa Monica Mountains NRA

Montane

- Lassen Volcanic NP
- Sequoia & Kings Canyon NPs



To give you a bit more detail about the scope of the project...

Bullet 1 – Of the 30 or so NPS units in California, 19 are included in this project because they contain botanical resources where it would make sense to monitor phenology

Bullet 2 - Our initial work will be focused in six pilot parks or units in three biogeographic areas:

Desert regions

Coastal regions

Montane regions

A staff member at each park helped to design the project and is facilitating our interaction with interpretive and management staff at each park.

We have sufficient funding to do a fair amount of in-person training at these parks in 2011 and 2012, and we'll invite staff from nearby parks to join us at

these training visits during this spring and next.

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Moving on to the Project Collaborators...

California Phenology Project (CPP) COLLABORATORS

USA – National Phenology Network



The screenshot shows the homepage of the USA National Phenology Network. At the top, there is a navigation bar with links for HOME, FAQs, CONTACT US, and NATURE'S NOTEBOOK. Below this is a search bar and a 'Log In' button. The main content area features a large image of a monarch butterfly on the left, with a 'Join Us!' call to action. To the right, there is a section titled 'USA National Phenology Network' with a brief description of the network's mission. Below this, there is a 'What is phenology?' section with a definition and a 'Learn more about us' link. Further down, there are sections for 'USA-NPN News', 'Phenology Feed', and 'Join the Conversation', each with a list of links to various resources. At the bottom, there is a 'Sponsors' section featuring the USGS logo.

www.usanpn.org

The California Phenology Project is greatly strengthened by our partnership with the National Phenology Network, which is a nationwide consortium of scientists, educators and citizens dedicated to developing and implementing phenological monitoring programs for research, education, and management.

It's National Coordinating Office is in Tucson, AZ, and comprises a small but talented and focused director (Jake Weltzin) and staff who have created the on-line database to which our project's data will be contributed and from which we can all download and use it.

The website contains full instructions for phenological monitoring of the more than 250 species that are targeted for large-scale monitoring in the U.S.

We'll be augmenting the NPN's instructional resources so that they accommodate the species that we select for monitoring in the California National Parks, but there are plenty of educational resources available on their website, which I'd urge you to explore if you haven't already.

Check out: <http://www.usanpn.org> and explore the "Participate", "Resources",

and “Education” tabs.

California Phenology Project (CPP) COLLABORATORS

UCSB Phenology Stewardship Program

The Phenology Handbook

*A guide to phenological monitoring for students,
teachers, families, and nature enthusiasts*

Program Accomplishments:

- phenology handbook
- teacher training
- undergraduate training
- phenology trails
- phenology gardens in local schools
- after-school phenology program at a Boys & Girls' Club



Brian P Haggerty and Susan J Mazer
University of California, Santa Barbara

© 2008 Brian P Haggerty and Susan J Mazer

The other major partner is the University of California, at Santa Barbara (UCSB), where Professor Susan Mazer is a Co-PI on this project.

At UCSB, we've established a multi-faceted phenology stewardship program, the active components of which depend on funding, on the number of volunteers who are working in the Mazer lab, and on whether or not she's teaching a course or a lab into which we can integrate phenological monitoring and assignments.

These activities have targeted a wide range of participants, ranging from pre-service teachers at UCSB's Graduate School of Education, to undergraduates enrolled in upper division Botany courses, to freshman enrolled in Climate Change seminars, to local schoolchildren at two public schools and a two Boys & Girls Clubs.....(listed here)

Dr. Mazer and a PhD student, Brian Haggerty, have also written a guide to phenological monitoring which is available on the NPN website.

California Phenology Project (CPP)

COLLABORATORS

UCSB Phenology Stewardship Program Projects

Coal Oil Point Natural Reserve

Phenology trails with ~120 labeled plants representing 20 species



Santa Barbara Botanic Garden



At UCSB, our local phenology network has three components: phenological research, environmental education, and community outreach.

One method that has been very successful at UCSB, and which could be incorporated into CPP monitoring, is the creation of phenology trails with labeled plants along its length.

Here you see an aerial view of the 3 km of phenology monitoring trails that we created at the University of California reserve adjacent to our campus, where undergraduates regularly monitor over 120 individual plants representing 20 species. We've also mapped at the Santa Barbara Botanic Garden numerous plants representing 12 species targeted by the National Phenology Network.

Through workshops, site visits, and collaborative efforts, we've expanded our network across southern California, where we've offered numerous workshops to train national park service staff, environmental education teachers, public school teachers, California Native Plant Society members, and amateur naturalists in phenological monitoring and its link to climate change.

Our partners include a variety of government science agencies (US-NPS, USFWS, USGS), non-government organizations and institutions (e.g., San Diego MNH, Channel Islands-NMS, Theodore Payne Foundation), academic institutions (UCSB, California State University of the Channel Islands), K-12 students (in SB & Ventura Counties), and others.

These activities have taught us about approaches that work well and those that don't work so well, and we can customize these activities for park-based programs.

California Phenology Project (CPP)

OTHER PARTNERS

We hope to attract many partners:



Other possible partners:

- CA Native Plant Society
- Audubon
- Botanic Gardens
- NPS Research Institutes
- NPS Research Learning Centers
- Public schools that visit parks and UC reserves

The CPP as a whole is also very interested in developing partnerships that make use of our national parks and of other natural areas such as the 36 field stations of the University of California Natural Reserve System.

Other possible partners include the CNPS, the Theodore Payne Wildflower foundation, research and educational institutes associated with each park, and botanic gardens.

The CPP: Project goals (Part 1)

Steps towards implementation:

- identify **scientific/management questions** to motivate CPP monitoring
- compile floras to **assist in the selection of plant species**, communities, and habitats for monitoring
- **choose species** (for all 19 units)
- **create plant species profiles & phenophase definitions** of target species
- determine **spatial sampling schemes** and configuration at each park or UCNR
- integrate phenological monitoring with **I & M vital signs** where possible
- **identify historical data sets** that are relevant to NP and adjoining lands
- identify **outreach and education approaches** to be tested
- initiate phenological monitoring and outreach **in six pilot units**

Our first steps towards implementing the CPP are summarized here.

I'll talk about the scientific questions that we've identified in a moment.

We've done a good deal of floristic analysis of the combined floras of the California National Parks and the UC reserves to determine the most common and characteristic species within and among our parks.

In addition, we're organizing several upcoming webinars to choose species based on the criteria that we settled on at the November 2010 Science Advisor Meeting and that we continue to refine.

Upcoming tasks to complete before and while we initiate phenological monitoring in our six pilot parks include:

1. create species profiles, of which I'll show an example in a moment; determining the spatial sampling and intensity of our monitoring for each species at each park;
2. work with Inventory & Monitoring programs at each park to coordinate our phenological monitoring with I & M activities for overlapping habitats and species;
3. identify legacy data sets that provide historical information about at least some of the species we choose for upcoming monitoring;
4. develop educational activities to be tested.

The CPP: Project goals (Part 2)

Steps towards human capacity-building:

- train NPS scientists and interpreters in the use of **USA-NPN monitoring protocols (Spring 2011 workshops at each pilot park)**
- **Invite NRS staff or volunteers to participate in these workshops.**
- **train NPS staff, seasonal workers, and NPS and NRS volunteers** to upload records into USA-NPN website, and to download them!
- develop and **test educational and outreach materials** to engage citizens, teachers and students to record and use phenological data
- **create partnerships** with groups and institutions
- Train the trainers

Our major steps towards achieving this include the following goals:

- To train NPS scientists and interpreters in the use of **USA-NPN monitoring protocols**

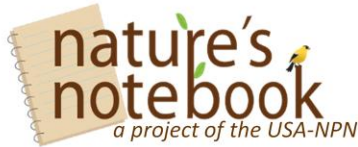
Our regular visits to our six pilot parks to initiate this training will begin in April 2010.

- To **train NPS staff, seasonal workers, and volunteers** to upload records into USA-NPN website, and to download them for use and interpretation
- To develop and **test educational and outreach approaches and materials** to engage citizens, teachers and students to record and use phenological data
- To **create partnerships** with groups and institutions that will enhance Park-focused monitoring efforts -- these partnerships will be park-specific and depend on relationships that park staff have already developed with

local volunteers, visitors, researchers, and educators.

The CPP: Project goals (Part 2)

Train NPS and NRS staff and volunteers in USA-NPN protocols



- Go to www.usanpn.org
 - 253+ plant species
 - 158+ animal species
 - Status monitoring
 - Core protocols
- Species on demand
- Abundance reporting
- User profiles



Metadata: method used, effort reporting, condition of site & organism

Happily, our training efforts will be greatly facilitated by the large amount of information available on the National Phenology Network's Site, where each of the four steps necessary for monitoring by individuals, on their own, are described clearly and in detail.

The NPN's phenological monitoring program and online interface is called Nature's Notebook, and currently allows users to enter phenological data for over 400 plant and animal species, with more to come.

The protocols that we'll be using in the California Phenology Project will be the same as the NPN's. This is not a coincidence -- we think that these protocols are great...simple to use and easy to interpret.

We also will have the ability to add species to the NPN's current list....

The CPP: Project goals (Part 2)

Train NPS staff, seasonals & volunteers in USA-NPN protocols

- Photos and descriptions of phenophases
- Include species in NPN interface

Which phenophases should I observe?



Artemisia tridentata

big sagebrush



Did you know?:

Artemisia tridentata is one of the most widespread shrubs in North America. It is an important browse for wildlife, and food for birds, sometimes making up 100% of a species' diet during winter. It also is valuable for its cover and thermal properties for many birds. The bark is used by Native Americans for ropes and baskets, as a smudge herb (burnt as incense), leaves powdered for rashes, and other medicinal uses. Sagebrush is Nevada's state flower.

Howard F. Schwartz, Colorado State University, Bugwood.org.

What does this species look like?

Big sagebrush is an evergreen, perennial shrub usually growing to 4 feet tall but ranging between 1.3 to 15 feet tall. Numerous flowers occur along many stalks on the upper part of the plant. The cream-colored to yellow flowers are small and not very showy and each flower contains both male and female parts. Flowering begins when the plants mature at 2 to 3 years of age and the flowers are wind or self-pollinated.

Big sagebrush is a somewhat drought tolerant plant. It grows on a variety of soil types on arid plains, valleys, foothills, and mountains.

Leaves

Do you see...?

Emerging leaves

In at least 3 locations on the plant, an emerging leaf is visible. A leaf is considered "emerging" once the green tip is visible at the end of the leaf bud, but before it has fully unfolded to expose the petiole (leaf stalk) or leaf base. For *Artemisia tridentata*, primary new leaves develop along the main stem. More...

Young unfolded leaves

In at least 3 locations on the plant, a young unfolded leaf is visible. A leaf is considered "young" and "unfolded" once the petiole (leaf stalk) or leaf base is visible, but before the leaf has reached full size or turned the darker green color of mature leaves on the plant. The leaf may need to be bent backwards to see whether the petiole or leaf base is visible.

Flowers

Do you see...?

Open flowers

In at least 3 locations on the plant, an open fresh flower is visible. Flowers are considered "open" when the reproductive parts are visible between unfolded or open flower parts. Do not include spent (wilted) flowers that remain on the plant.

Full flowering

For the whole plant, at least half (50%) of the flowers are open and still fresh.

Fruits

Do you see...?

Ripe fruits

In at least 3 locations on the plant, a ripe fruit is visible. For *Artemisia tridentata*, a fruit is considered ripe when it has turned dark brown in color.

So, for example, all species that we select for monitoring in California will be represented by a species profile (as seen here for *Artemisia tridentata*) that provides a general description of the species and of the phenological phases, or phenophases, that should be monitored for that species.

Not all species have the same phenophases monitored. For example, only deciduous species would be monitored for the timing of leaf color change or leaf loss.

Consequently, each new species' profile will be customized to include the appropriate phenophases for its functional group.

The CPP: Project goals (Part 2)

Test educational and outreach approaches and materials

- Develop activities for park rangers and UC NRS docents to lead with supervised visitors
- Develop opportunities for self-guided monitoring: e.g., design signs, phenology trails, data sheets
- Create on-line materials for teachers whose classes visit a park
- Create on-line materials for teachers who cannot visit parks



We aim to provide educational and outreach materials that are appropriate for a range of participants.

For example...we will:

- Develop activities for park rangers to provide to supervised visitors
- Develop opportunities for monitoring by independent visitors: e.g., design signs, phenology trails, data sheets
- Create on-line materials for teachers whose classes visit a park
- Create on-line materials for teachers who cannot visit parks

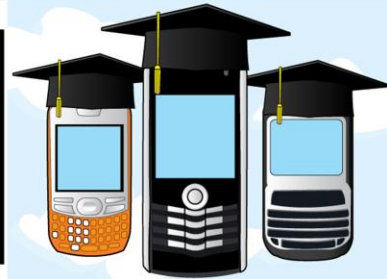
The CPP: Project goals (Part 2)

Educational and Outreach

- Explore use of new technologies for phenological monitoring
 - smart phones
 - phenocams
 - picture posts



Ceci n'est pas un smartphone



We're also mindful of the appeal of technological tools for recording phenological activity, including smart phones, web cameras, and picture posts, where hikers can take their own photographs of landscapes in different seasons and post them on the web.

Our current project doesn't have funding for us to develop these tools, but we are keeping in touch with other programs, such as the North East Temperate Network and the UCLA biological sensor program, with the hope of introducing such tools in the future.

The CPP: Project goals (Part 3)

Sustainability:

- Train the trainers
- Extend monitoring to all California National Parks and UC Reserves
- Distribute educational materials and tools on-line
- Create Standard Operating Procedures
- Create decision tools for:
 - selecting species
 - plant sampling (phenology trails, phenology stations)
 - monitoring frequency
- More webinars!



We are taking a number of approaches to reinforce and to motivate the continuation of this project over the long term

For example, since the value of this project for climate change requires a long time view and long-term participation, we are taking a train the trainers approach...

By extending monitoring to all of the California National Parks and the UC Reserves, we can ensure an institutional memory such that any local lapses can be repaired with help from nearby parks or reserves.

We'll be documenting our procedures in documents that include Standard Operating Procedures and decision tools for selecting species, sampling plants, and determining the frequency of monitoring.

We'll offer more webinars as necessary, and this powerpoint (and its script) will be available on the website for others to use!!

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- **Progress to date**
- **Next steps.....*your* participation!**

To give you a short description and summary of our progress to date:

California Phenology Project (CPP)

PROGRESS

Convened science advisory meeting on November 2, 2010:

- Identified ecological questions to enable forecasts of biological responses to climate change
- Agreed on criteria for selecting species for monitoring at each site
- Identified measures of success



Conducted national recruitment for full-time post-doc:

- Hired Dr. Elizabeth Matthews (at UCSB; from U North Carolina)

Hired two part-time PhD students:

- Brian Haggerty (UCSB, Ecol & Evol) and Margot Higgins (UCB, ESPM)

Hired one part-time PhD student at the NPN:

- Kathy Gerst (University of Arizona, NPN)

Describe these steps...

The next few slides describe these ecological questions and criteria.

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Describe these steps...

As mentioned earlier, we convened a science advisory meeting in November, 2010 where, among other achievements described in a report on the CPP website (<http://www.usanpn.org/cpp>), we:

1. identified ecological questions that would facilitate forecasts of biological responses to climate change, and
2. Agreed on criteria for selecting species for monitoring at each park

We also hired several key people, listed here....

Our full-time postdoc based at UCSB is **Dr. Liz Matthews**; **Brian Haggerty** is a PhD student in evolutionary ecology at UCSB who is conducting his dissertation research on phenological variation in the native California wildflower, *Clarkia unguiculata*, and who is developing a range of phenology-themed curricula for fifth-graders and other citizen scientists; **Margot Higgins** is a PhD student in Education at UC Berkeley who is assisting with the development and assessment of environmental educational tools; and **Kathy Gerst** is a recent PhD at the University of Arizona who will be working on the species profiles and phenophase descriptions.

The next few slides describe these ecological questions and criteria.

Scientific questions to be addressed by CPP

- **How do iconic, widespread, and ecologically important species of the California flora respond to variation in climate?**
- **Which plant species in California are most sensitive to climate (and, by extension, to climate change)?**
- **Are relationships between inter-dependent plant and animal mutualists at risk due to climate change?**
- **How do particular communities or vegetation types differ in their phenological response to climate change?**

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These are a few examples of the kind of scientific questions that we will be poised to address with our phenological monitoring.

Our priority is to establish a program that will provide data to monitor directly the biological responses to long-term climate change. Over the short-term, however, by observing the relationship between phenology and climatic conditions across current ecological gradients, we'll be able to anticipate the kinds of phenological change that we'll observe as climate changes over time.

Scientific questions to be addressed by CPP

- How do plant reproductive schedules respond to invasions of competitors or diseases?
- How do species respond to abiotic disturbance?
- What are the earliest indicators of spring?
- How are end-of-season phenological events and patterns affected by long-term climate change?
- Across all species and habitat types, are certain functional groups (e.g., winter annuals, perennial herbs, evergreen shrubs) more sensitive to climate and to climate change than others?

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Those questions are part of a much longer list of questions, which are described in detail in the Summary report of the Science Advisory meeting located on the NPN CPP website:

<http://www.usanpn.org/cpp>

Flexible criteria for the selection of species by regional groups of NPS staff and botanists

Guiding Principles: Limit the number of species to be monitored at each location to 4 species, with each species representing one or more of the following categories:

- **dominant species** that represent regional vegetation types;
- **widely distributed species** (within or across bioregions or parks)
- **indicator species** for habitats of particular interest
- **species of local ecological or management concern:**
- **available and accessible** to park staff and visitors

Practical point: 100 individual plants can be monitored and data recorded on data sheets in < 90 minutes, excluding travel time. Monitoring should occur twice per week.

The second major accomplishment of the science advisory meeting was to identify a set of flexible criteria to meet as we select 3-4 species for long-term monitoring at each California park.

These criteria include a high priority on selecting one or more of the following to monitor at each location:

dominant species that represent the most characteristic local or regional vegetation type;

widely distributed species (within or across coastal, montane, and arid regions and National Parks)

indicator species for habitats, or *transitions between habitats*, of particular interest

species of local ecological or management concern: e.g., keystone species, highly charismatic taxa, or species involved in highly inter-dependent plant-animal interactions

available and accessible to park staff and visitors

Added Value! criteria for the selection of species

- ***ease of identification***
- ***distribution across a gradient*** such as: elevation, aspect, soil moisture, invasive species abundance, disturbance (e.g., across a wildfire boundary); coastal fog;
- ***proximity to other monitoring efforts***: e.g., co-location with NPS Inventory & Monitoring plots
- ***species for which there exist historical data*** to which current phenological behavior can be compared
- ***benchmark species***: e.g., species that are first-responders to spring warming; species that are last-to-flower; species that provide dramatic spring flowering or fall foliage displays

Other criteria that would provide ADDED VALUE are listed here.

Any of these might be more or less important, depending on the park and on the species' availability.

Planting the Seed for Citizen Science At Your Reserve



So...now that we've given you an idea of the vision that we've been developing for the last year or so, now we'd like to switch gears and put all of us to work to consider how best we can design and implement a customized monitoring and educational program at your park that will not be a burden to your staff.

California Phenology Project (CPP)

PRESENTATION OUTLINE

- Background
- Project Scope & Collaborators
- **Project Goals**
 - Part 1: *Steps towards implementation*
 - Part 2: *Human capacity-building*
 - Part 3: *Project sustainability*
- Progress to date
- **Next steps.....*your* participation!**

California Phenology Project (CPP)

NEXT STEPS – PROJECT PARTICIPANTS

☐ CORE NPS TEAM

- ☐ Semi-arid – Josh Hoines (JOTR)
- ☐ Coastal – Stassia Samuels (REDW), Sue Fritzke (GGNRA), Christy Brigham (SAMO)
- ☐ Montane – Sylvia Haultain (SEKI) and Janet Coles (LAVO)
- ☐ Research Learning Center – Ben Becker (PCSLC)
- ☐ CA-CESU – Angie Evenden
- ☐ I&M – Penny Latham

☐ COOPERATORS

- ☐ UCSB – Susan Mazer (PI), Liz Matthews (post-doc), Brian Haggerty (Ph.D student)
- ☐ USA-NPN – Kathryn Thomas, Kathy Gerst, Jake Weltzin
- ☐ UCB – Margot Higgins (Ph.D Student)

☐ 19 PARK NATURAL RESOURCE & INTERPRETATION POINTS OF CONTACT

☐ SCIENCE EXPERTS

☐ OTHER PARTNERS - TBD

We've mentioned before that this project is greatly benefiting from the leadership and participation of park staff at each of the national parks -- this is our "Core NPS Team" -- and they're listed here.

We've described the experiences contributed by the CPP's other partners. Cooperators Mazer, Matthews, and Haggerty will be the primary people conducting the visits and training workshops at each of the parks, and developing the educational materials to be used at the parks

We're depending on our points of contact at each of the 19 parks to educate us on the best way to customize our programs for their use.

We also have informed a wide range of other scientists and vegetation experts (i.e., the participants at the Science Advisory Meeting in November 2010) about the CPP, and these are important consultants for species selection and for the integration of phenological data with climatic data.

California Phenology Project (CPP)

NEXT STEPS & TIMELINE

- Conduct briefing webinars to inform staff across 19 California NPS units
- Conduct Biogeographic Region webinars to
 - Select Species for all 19 parks
 - Semi-arid (Ongoing)
 - Coastal (February & March)
 - Montane (March)
 - Conduct 5-day workshops in pilot parks to train NPS, NRS, and partners
 - Establish trails for self-guided pheno monitoring at the six pilot parks
 - Create georeferenced maps and photographic field guides for monitored plants
 - **If you'd like to participate in these webinars to select Coastal & Montane species, please contact me ASAP (mazer@lifesci.ucsb.edu)**
- Implement pilot monitoring in spring and summer 2011
- More pilot park visits and tool kit development in 2012
- Final products early 2013

Our most pressing goal is to choose the species that we'll start monitoring in March or April, 2010.

First, we'll convene our points of contact in each of the biogeographic regions (natural resource staff and botanical experts) to choose species, and then we'll work with our points of contact for interpretation to begin to develop customized educational tools for each park. Other steps include:

1. A teleconference/webinar meeting on January 25th for the DESERT PARKS to begin the species-selection process
2. In the upcoming months, we will be selecting species and developing a tool kit that will serve ALL 19 PARKS (although the initial work will be focused on the 6 pilot parks)
3. We will consider offering training workshops in additional areas (beyond the six pilot parks) if we can leverage resources to do that...
4. COASTAL AND MONTANE GROUPS are about to schedule their species selection meetings
5. The participants in species selection will generally include botanical professionals and researchers, but we'll broaden the communication to include the interpretation folks in the process soon after.

Note: we will aim to select slightly more than the 3-4 species per park unit at the start....we have some wiggle room if necessary to modify the species list depending on the accessibility and availability of highly desirable taxa.

California Phenology Project (CPP)

DISCUSSION

- How do we successfully connect with, attract, and engage NRS staff and NRS volunteers in this project?
- What are reasonable expectations given a 2.5 year timeframe?
- What are your ideas for outreach/education activities, approaches, partners, etc.

QUESTIONS OR COMMENTS ?

California Phenology Project (CPP)

Susan Mazer, UC Santa Barbara
mazer@lifesci.ucsb.edu

Kathryn Thomas, USGS and USA-NPN/NCO
kathryn_a_thomas@usgs.gov

Angie Evenden, NPS CA-CESU
angela_evenden@nps.gov

Websites for more information:

<http://www.usanpn.org/nps>

<http://www.usanpn.org/cpp> (← See this webpage to download report of science workshop & other CPP products)

Please contact any of the Co-Pis listed here to learn more about their roles and responsibilities in the project