

## 1Supporting Statement Part B

### USA National Phenology Network – The *Nature’s Notebook* Plant and Animal Observing Program

OMB Control Number: 1028-NEW

#### B. Collections of Information Employing Statistical Methods

The agency should be prepared to justify its decision not to use statistical methods in any case where such methods might reduce burden or improve accuracy of results. When the question “Does this ICR contain surveys, censuses, or employ statistical methods?” is checked “Yes,” the following documentation should be included in Supporting Statement B to the extent that it applies to the methods proposed:

1. Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection method to be used. Data on the number of entities (e.g., establishments, State and local government units, households, or persons) in the universe covered by the collection and in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.

Statistical methods are not used in the selection of respondents. Qualified participants (i.e., individuals with the ability and inclination to observe and record species’ phenologies) are found via targeted media outlets, collaborations with on-the-ground partners (e.g., Cooperative Extension, Great Sunflower Project, National Park Service), public talks and word-of-mouth. Table 1 summarizes participation in the program to date.

**Table 1.** *Nature’s Notebook* participation summary, 2008-2011 (excerpt from Kellerman et al in prep “USA-NPN Data and Participant Summary 2011).

	2008	2009	2010	2011	Cumulative
Number of registrations received	90	2153	795	1069	4107
Observers reporting	40	556	437	530	1,196 <sup>a</sup>
Percent of registered observers reporting <sup>b</sup>	11%	25%	31%	29%	29%
Number of days observed per observer (mean)	7.6	9.2	9.7	11.7	NA
Registered sites <sup>c</sup>	-	-	-	1,192	5,526

Total observations	2,556	17,757	28,793	48,131	97,237
Total records <sup>d</sup>	12,615	135,352	201,935	380,941	730,843

<sup>a</sup> Cumulative total is less than the sum of 2008-2011 due to some observers reporting in multiple years

<sup>b</sup> The percent of registered observers that reported data in the year that they registered

<sup>c</sup> Prior to 2011 the date a site was registered was not recorded in the NPN database

<sup>d</sup> Note that an 'observation' is a suite of phenophase status records taken for an individual plant during a single observation event. A single observation may contain up to 11 phenophase status records depending on the species.

## 2. Describe the procedures for the collection of information including:

- \* **Statistical methodology for stratification and sample selection,**
- \* **Estimation procedure,**
- \* **Degree of accuracy needed for the purpose described in the justification,**
- \* **Unusual problems requiring specialized sampling procedures, and**
- \* **Any use of periodic (less frequent than annual) data collection cycles to reduce burden.**

Statistical methods are not used during the selection of respondents, sample location, or sample species. Participants opt in, and chose and/or adjust their intensity of participation at their will (e.g., number of sites, number and type of species at a site, type of phenological observations, and frequency of observation). However, the project website provides suggestions, guidelines and criteria for observation protocols, and substantial quality assurance/quality controls tools are implemented automatically. Training materials are provided on the project website, participants self-report their training, background and interest. Finally, there are intentional barriers to participation embedded in the socio-cultural language of the web-site which helps ensure participation by committed individuals.

The conceptual framework for participation is described in Supporting Statement A. Once an observer has registered and described their background, completed optional training, selected, marked and described a site, selected plant individuals or animal species to observe, and either printed datasheets or downloaded a mobile application, they are encouraged to make observations at least weekly. During each sampling bout, the observer records the status of plant phenophases (e.g., leafing, flowering) as either "Yes" = occurring; "No" = not

occurring, “?” = uncertain, or blank if not checked. Similarly, for animals, during each sampling bout the observer uses one of four predefined observation methods, records whether the animal species was observed or heard, and then records the status of animal phenophases (Y, N, ?, or blank). For the majority of these plant or animal phenophases, the observer can also enter the estimated canopy development or abundance (as proportions or counts). Data are recorded onto datasheets for later entry into the web application, or can be recorded directly into the mobile device. Guidelines and best-practices for observation and data entry are extensive, are supplemented by FAQs, and are provided on the project website.

Additional details on sampling methodology are Thomas, K.A., E.G. Denny, A.J. Miller-Rushing, T.M. Crimmins, and J.F. Weltzin. 2010. *The National Phenology Monitoring System v0.1. USA-NPN Technical Series 2010-001*. In addition, a more detailed methodology paper is in preparation for the peer-reviewed literature (Denny et al., in prep., *The USA National Phenology Network protocols: Standardized phenology monitoring methodology for plants and animals*), and US National Park Service compliant SOPs (standard operating protocols) and full Protocols (following standards in Oakley et al. 2003 used by NPS Inventory & Monitoring Program) are currently under development.

Phenological status and abundance data are used to understand patterns of organismal activity (including ‘negative’ data), development and abundance by individual/species at a given site on a given date; in turn, these raw data may be summarized by researchers according to custom criteria. Summarized data can be used to understand spatiotemporal patterns of organismal response along environmental gradients. At this time, there are few numerical and statistical tools available through the website; rather, data winnowing, assessment of quality, analysis and summarization are conducted by the data end-user.

- 3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections based on sampling, a special justification must be provided for any collection that will not yield "reliable" data that can be generalized to the universe studied.**

Respondents voluntarily decide to participate and report; response rates have increased (based on a variety of metrics, including number of field visits, number of observations, number of species observed), though the reporting system has been operational only since 2008. Several engagement tactics support continued participation, and reduce non-response including newsletters with appreciation, motivation and results delivered to participants, and optional bi-weekly reminders to observe. The “status” monitoring approach enables us to determine the frequency of field visits, as well as estimate the potential and realized error around particular events (e.g., first leaf); we are working to determine probability of detection, and to estimate sampling size required to estimate a particular event at a given level of error. We document all existing QA/QC tools and approaches utilized and provide this information on the project website.

- 4. Describe any tests of procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.**

Not applicable; we do not test our observers, though we have conducted informal usability studies to improve efficiency and reduce burden.

- 5. Provide the names and telephone numbers of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.**

Statistical consultants

Dr. Katharine Gerst, USA-NPN Research Associate; 520-792-0571

Dr. Abraham Miller-Rushing, Science Coordinator, Acadia National Park; 207-288-1338

John Gross, National Park Service Inventory & Monitoring Program; 970-267-2111

Collection and analysis agency:

Dr. Theresa Crimmins, University of Arizona; 520-622-0363

Jherime Kellerman (PhD candidate), University of Arizona; 520-792-0571

Dr. John Sauer; USGS Patuxent Wildlife Research Center; 301-497-5662