**Documentation of Nature’s Notebook v2.4**

(2/11/2016 to 2/5/2017)

*Updated 2/17/2017 by Ellen Denny*

The documentation files in this packet are organized as follows:

**Monitoring guidelines** folder includes a few new materials that were released in 2016:

* Mobile app questions added to the “Frequently Asked Questions”
* “Learn How to Observe with a Group” webpage with a series of eight dropdown content items
* “Nature’s Notebook Nugget” articles designed to elucidate some tricky issues in observing

“Learn How to Observe” training videos, the Botany Primer and older Nature’s Notebook Nuggets did not change since Nature’s Notebook v2.3; training materials for group sites (formerly called “shared sites”) did not change since Nature’s Notebook v2.2; and the monitoring guidelines embedded in our webpages did not change appreciably since Nature’s Notebook v2.1. Thus they are not included again in this v2.4 documentation archive (but can be found in the v2.1, v2.2 and v2.3 documentation).

**Species** folder includes a list of all species available for monitoring. The format of the species search page and species profile pages did not change from Nature’s Notebook v2.1 (see v2.1 documentation) and thus example screen captures are not included again in this v2.4 documentation archive. For specifics on phenophases and definitions for each species during this period, check the database output that accompanies download of Nature’s Notebook data.

**Registration forms** did not change from Nature’s Notebook v2.1—with the exception of the initial registration process which was streamlined in Nature’s Notebook v2.2. Thus example screen captures are not included again in this v2.4 documentation archive (but can be found in the v2.1 and v2.2 documentation).

**Datasheets** did not change from Nature’s Notebook v2.1 (see the v2.1 documentation) and thus are not included again in this v2.4 documentation archive.

**Mobile apps** did not change from Nature’s Notebook v2.2 (see the v2.2 documentation) and thus are not included again in this v2.4 documentation archive.

Details of what was new in Spring 2016 were outlined on the Frequently Asked Questions page and are included here:

WHAT'S NEW FOR SPRING 2016?

We have added several new plant and animal species to *Nature’s Notebook*, made some minor changes in wording to several phenophase definitions, and switched several dryland plant species to a new protocol to better represent their phenology on the ground. The details of these changes are listed below. Additionally, we improved or created new protocols for several insect groups—ants, mayflies, beetles, cicadas and grasshoppers. All the other species and phenophases you are accustomed to are still here, unchanged, and waiting to be observed!

* The intensity questions for “Leaves”, “Needles”, “Colored leaves” and “Colored needles” were revised to it make it more clear that observers should be considering the percentage of “potential canopy space” (i.e. the space your tree’s canopy typically fills at the height of the growing season) in their estimates.
* The intensity questions for “Emerging needles” and “Young needles” for pines were revised to specify that estimates should be of the number of needle bundles rather than number of individual needles.
* The “Colored leaves” and “Colored needles” phenophase definitions were revised to make it more clear that color due to drought or other stresses that cause leaves to die (senesce) should be included in addition to typical late-season color.
* Phenophases for “Colored leaves” and “Falling leaves” were added to all drought deciduous tree and shrub species.
* The “Flowers or flower buds” phenophase definition was revised to make it clear that over-wintering, dormant or resting flower buds should not be included, only flower buds that are showing active growth between visits.
* The “Initial growth” phenophase definition for grasses was revised to include re-greening of dried stems or leaves, as occurs in some perennial grasses.
* The “Flower heads” phenophase definition for grasses, sedges and rushes was revised to make it more clear to stop reporting the presence of flower heads once the fruits (grains) begin to develop.
* Thirteen tree and shrub species found in dryland or desert regions were switched to a different protocol to better reflect their phenological characteristics—either to a semi-evergreen protocol (where a species behaves deciduously in some parts of its range and evergreen in others) or to an evergreen protocol where the “Breaking leaf buds” phenophase is not included (for evergreen species that do not have large leaf buds that are easily observed).