

## Signs of the Seasons: A Maine Phenology Project

### Phenophase Definitions

#### Eastern White Pine, *Pinus strobus*

##### Directions:

As you report on phenophase status (Y, N, or?) on the datasheets, refer to the definitions on this sheet to find out what you should look for, for each phenophase in each species. To report the intensity of the phenophase, choose the best answer to the question below the phenophase, if one is included.

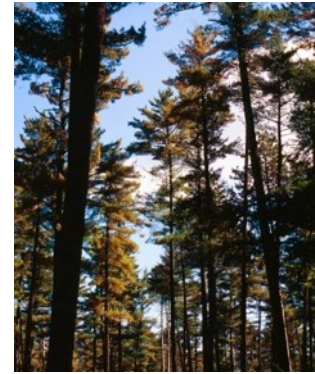


Figure 1: Eastern white pine. Image source: Linda Haugen, USDA Forest Service, Bugwood.org.

### Needles

#### Emerging needles

One or more emerging needles or needle bundles (fascicles) are visible on the plant. A needle or needle bundle is considered “emerging” once the green tip is visible along the newly developing stem (candle), but before the needles have begun to unfold and spread away at an angle from the others in the bundle. See the picture captioned, “Emerging needles with emerging female flower cone” under the Seed Cones section to view a picture of emerging needles.

*How many needles or needle bundles are emerging?*

**Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000**



Figure 2: Expanding buds, often called “candles”. Image source: Josh Fecteau, joshfecteau.com.

#### Young needles

One or more young, unfolded needles are visible on the plant. A needle is considered “young” and “unfolded” once it begins to spread away at an angle from the other needles in the bundle (and is no longer press flat against them), but before it has reached full size or turned the darker green color or tougher texture of mature needles on the plant.

*How many young needles are present?*

**Less than 3; 3 to 10; 11 to 100;  
 101 to 1,000; 1,001 to 10,000;  
 More than 10,000**



Figure 3: Young needles. Image source: Keith Kantoni, Maine Forest Service, Bugwood.org.

## Pollen Cones

### Pollen Cones

One or more fresh, male pollen cones (strobili) are visible on the plant. Cones have overlapping scales that are initially tightly closed, then spread apart to open the cone and release the pollen. Include cones that are unopened or open, but do not include wilted or dried cones that have already released all of their pollen.

*How many fresh pollen cones are present?*

**Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000**



Figure 4: Male pollen cones. Image source: Josh Fecteau, joshfecteau.com.

### Open pollen cones

One or more open, fresh, male pollen cones (strobili) are visible on the plant. Cones are considered “open” when the scales have spread apart to release pollen. Do not include wilted or dried cones that have already released all of their pollen.

*What percentage of all fresh pollen cones (unopened plus open) on the plant are open?*

**Less than 5%; 5-24%; 25-49%; 50-74%; 75-94%; 95% or more**



Figure 5: Male pollen cones releasing pollen. Image source: Josh Fecteau, joshfecteau.com.

### Pollen release

One or more male cones (strobili) on the plant release visible pollen grains when gently shaken or blown into your palm or onto a dark surface.

*How much pollen is released?*

**Little** - Only a few grains are released

**Some** - Many grains are released

**Lots** - A layer of pollen covers your palm, or a cloud of pollen can be seen in the air when the wind blows.

## Seed Cones

### Unripe seed cones

One or more unripe, female seed cones are visible on the plant. For *Pinus strobus*, an unripe seed cone is green, gray-brown, or brown with scales closed together.

*How many seed cones are unripe?*

**Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000**

### Ripe seed cones

One or more ripe, female seed cones are visible on the plant. For *Pinus strobus*, a seed cone is considered ripe when it has turned brown and the scales have begun to spread apart to expose the seeds inside. Do not include empty cones that have already dropped all of their seeds.

*How many seed cones are ripe?*

**Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000**

### Recent cone or seed drop

One or more seed cones or seeds have dropped or been removed from the plant since your last visit. Do not include empty seed cones that had long ago dropped all of their seeds but remained on the plant.

*How many seed cones have dropped seeds or have completely dropped or been removed from the plant since your last visit?*

**Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000**



Figure 6: Emerging needles with emerging female flower cone. Image source: Josh Fecteau, joshfecteau.com



Figure 7: One year old female seed cones (unripe). Image source: Josh Fecteau, joshfecteau.com.



Figure 8: Ripe seed cone (seeds present or recently dropped).  
Image source: Keith Kanoti, Maine Forest Service, Bugwood.org.