



Flowers or Flower Buds
(*P. tremuloides*)

Photo © Lorna Morris



Emerging Needles
(*P. ponderosa*)

Photo © Lorna Morris



Open Flowers (male)
(*P. tremuloides*)

Photo © Lorna Morris



Unripe Seed Cones
(*P. ponderosa*)

Photo © Lorna Morris



Fruits (female)
(*P. tremuloides*)

Photo © Paul Alaback



Recent Fruit or Seed Drop
(*B. gracilis*)

Photo © Peggy Hanson

There is also a mobile app available on NPN's website.

FOR MORE INFORMATION, GO TO:

<http://www.botanicgardens.org/research-conservation/phenology>
OR <https://www.usanpn.org/>

For a map of this and the other Phenology Walks, scan this code:



Look for this logo on plant signs

<i>Populus tremuloides</i> (quaking aspen)			
Phase	No. 1	No. 2	No. 3
Breaking leaf buds	Y N ?	Y N ?	Y N ?
Leaves	Y N ?	Y N ?	Y N ?
Increasing leaf size	Y N ?	Y N ?	Y N ?
Colored leaves	Y N ?	Y N ?	Y N ?
Falling leaves	Y N ?	Y N ?	Y N ?
Flowers or flower buds	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?
Pollen release (non-conifers)	Y N ?	Y N ?	Y N ?
Fruits	Y N ?	Y N ?	Y N ?
Ripe fruits	Y N ?	Y N ?	Y N ?
Recent fruit or seed drop	Y N ?	Y N ?	Y N ?

<i>Yucca glauca</i> (soapweed yucca)			
Phase	No. 1	No. 2	No. 3
Flowers or flower buds	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?
Fruits	Y N ?	Y N ?	Y N ?
Ripe fruits	Y N ?	Y N ?	Y N ?
Recent fruit or seed drop	Y N ?	Y N ?	Y N ?

<i>Achillea millefolium</i> (common yarrow)			
Phase	No. 1	No. 2	No. 3
Initial Growth	Y N ?	Y N ?	Y N ?
Leaves	Y N ?	Y N ?	Y N ?
Flowers or flower buds	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?
Fruits	Y N ?	Y N ?	Y N ?
Ripe fruits	Y N ?	Y N ?	Y N ?
Recent fruit or seed drop	Y N ?	Y N ?	Y N ?

<i>Syringa vulgaris</i> (common lilac)				
Phase	No. 1	No. 2	No. 3	No. 4
Breaking leaf buds	Y N ?	Y N ?	Y N ?	Y N ?
All leaf buds broken	Y N ?	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?	Y N ?
Full flowering	Y N ?	Y N ?	Y N ?	Y N ?
End of flowering	Y N ?	Y N ?	Y N ?	Y N ?

DENVER BOTANIC
GARDENS

York Street Phenology Walk
Part of Denver Botanic Gardens Phenology Trail

Distance: ~ 1.3 miles; Time: ~ 90 minutes

Match plant # to plant sign #.

Fill ALL boxes in that column.

(Phenophases described on other side.)

For each phase, circle: Y, N or ? (uncertain)

REMEMBER: Knowing when a plant is NOT in a phenophase is as important as knowing when it IS.

NOTE: Phenophases are not necessarily in order of occurrence

Date: _____

Time: _____ AM PM

Snow on ground?: YES NO

% of ground covered?: _____%

Snow in treetops?: YES NO

<i>Bouteloua gracilis</i> (blue grama)			
Phase	No. 1	No. 2	No. 3
Initial Growth	Y N ?	Y N ?	Y N ?
Leaves	Y N ?	Y N ?	Y N ?
Flower heads	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?
Pollen release (non-conifers)	Y N ?	Y N ?	Y N ?
Fruits	Y N ?	Y N ?	Y N ?
Ripe fruits	Y N ?	Y N ?	Y N ?
Recent fruit or seed drop	Y N ?	Y N ?	Y N ?

<i>Aquilegia caerulea</i> (Colorado blue columbine)			
Phase	No. 1	No. 2	No. 3
Initial Growth	Y N ?	Y N ?	Y N ?
Leaves	Y N ?	Y N ?	Y N ?
Flowers or flower buds	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?
Fruits	Y N ?	Y N ?	Y N ?
Ripe fruits	Y N ?	Y N ?	Y N ?
Recent fruit or seed drop	Y N ?	Y N ?	Y N ?

<i>Pinus ponderosa</i> (ponderosa pine)			
Phase	No. 1	No. 2	No. 3
Emerging needles	Y N ?	Y N ?	Y N ?
Young needles	Y N ?	Y N ?	Y N ?
Pollen cones	Y N ?	Y N ?	Y N ?
Open pollen cones	Y N ?	Y N ?	Y N ?
Pollen release (cones)	Y N ?	Y N ?	Y N ?
Unripe seed cones	Y N ?	Y N ?	Y N ?
Ripe seed cones	Y N ?	Y N ?	Y N ?
Recent cone or seed drop	Y N ?	Y N ?	Y N ?

<i>Amorpha canescens</i> (leadplant)			
Phase	No. 1	No. 2	No. 3
Breaking leaf buds	Y N ?	Y N ?	Y N ?
Leaves	Y N ?	Y N ?	Y N ?
Increasing leaf size	Y N ?	Y N ?	Y N ?
Colored leaves	Y N ?	Y N ?	Y N ?
Falling leaves	Y N ?	Y N ?	Y N ?
Flowers or flower buds	Y N ?	Y N ?	Y N ?
Open flowers	Y N ?	Y N ?	Y N ?
Fruits	Y N ?	Y N ?	Y N ?
Ripe fruits	Y N ?	Y N ?	Y N ?
Recent fruit or seed drop	Y N ?	Y N ?	Y N ?

<i>Chamerion angustifolium</i> (syn: <i>Potentilla floribunda</i>) (fireweed)	
Phase	No. 1
Initial Growth	Y N ?
Leaves	Y N ?
Flowers or flower buds	Y N ?
Open flowers	Y N ?
Fruits	Y N ?
Ripe fruits	Y N ?
Recent fruit or seed drop	Y N ?

Code	Phenophase	Description — Note: Phenophases are <u>not</u> necessarily in order of occurrence —
LEAF PHASES	Initial growth	New growth visible after no growth (winter or drought); either buds with green tips, or new shoots breaking through the soil. Growth is considered "initial" <u>until</u> the first leaf has fully unfolded.
	Breaking leaf buds	One or more breaking leaf buds are visible. A leaf bud is considered "breaking" once a green leaf tip is visible at the end of the bud, but <u>before</u> the first leaf from the bud has unfolded to expose the leaf stalk (petiole) or leaf base.
	All leaf buds broken (lilac only)	For the whole plant, the widest part of a new leaf has emerged from virtually all (95-100%) of the actively growing leaf buds.
	Leaves	One or more live, fully unfolded leaves are visible. For seedlings, consider only true leaves and do not count the one or two small, round or elongated leaves (cotyledons) that are found on the stem almost immediately after the seedling germinates. Do not include fully dried or dead leaves.
	Increasing leaf size	A majority of leaves on the plant have not yet reached their full size and are still growing larger. Do not include new leaves that continue to emerge at the ends of elongating stems throughout the growing season.
	Colored leaves	One or more leaves (including any that have recently fallen from the plant) have turned to their late season colors. Do not include fully dried or dead leaves that remain.
	Falling leaves	One or more leaves are falling or have recently fallen from the plant.
	Emerging needles (conifers only)	One or more emerging needles or needle bundles (fascicles) are visible. 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 others in the bundle.
	Young needles (conifers only)	One or more young, unfolded needles are visible. A needle is considered "young" and unfolded once it begins to spread away at an angle from other needles in the bundle (and is no longer pressed flat against them), but before it has reached full size or turned the darker green color or tougher texture of mature needles.
FLOWER PHASES	Flower heads (grasses only)	One or more fresh flower heads (inflorescences) are visible. Flower heads, which include many small flowers arranged in spikelets, emerge from inside the stem and gradually grow taller. Include flower heads with unopened or open flowers, but do not include heads whose flowers are wilted or dried.
	Flowers or flower buds	One or more fresh open or unopened flowers or flower buds are visible. Include flower buds that are still developing, but do not include wilted or dried flowers. For <i>Populus tremuloides</i> , both male and female inflorescences are catkins, which are initially compact, but eventually unfold to become longer.
	Open flowers	One or more open, fresh flowers are visible. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower parts (petals, floral tubes or sepals), or can be seen protruding from the spikelet (grasses). Do not include wilted or dried flowers. For <i>Populus tremuloides</i> , the flowers will open once the initially compact catkin has unfolded and is hanging loosely.
	Full flowering (lilac only)	For the whole plant, virtually all (95-100%) of the flower clusters no longer have any unopened flowers, but many of the flowers are still fresh and have not withered.
	End of flowering (lilac only)	For the whole plant, virtually all (95-100%) of the flowers have withered or dried up and the floral display has ended.
	Pollen cones (conifers only)	One or more fresh, male pollen cones (strobili) are visible. Cones have small overlapping scales that are initially tightly closed, then spread apart to open the cone and release pollen. Include cones that are unopened or open, but do not include wilted or dried cones that have already released their pollen.
	Open pollen cones (conifers only)	One or more open, fresh, male pollen cones (strobili) are visible. Cones are considered open when the scales have spread apart to release pollen. Do not include wilted or dried cones that have already released their pollen.
	Pollen release (non-conifers)	One or more flowers on the plant release visible pollen grains when gently shaken or blown into your palm or onto a dark surface.
	Pollen release (cones)	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.
FRUIT PHASES	Unripe seed cones (conifers only)	One or more unripe, female seed cones are visible. For <i>Pinus ponderosa</i> , an unripe seed cone is green or brown with scales tightly closed.
	Ripe seed cones (conifers only)	One or more ripe, female seed cones are visible. For <i>Pinus ponderosa</i> , a seed cone is considered ripe when it has turned reddish-brown or 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.
	Recent cone or seed drop (conifers only)	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.
	Fruits	One or more fruits are visible. For <i>Achillea millefolium</i> , the fruit is very tiny and seed-like and is crowded into a tiny spent flower head; the seed-like fruit changes from whitish-yellow or yellow-green to tannish and drops from the plant. For <i>Amorpha canescens</i> , the fruit is a very small, hairy pod that changes from green to dark brown. For <i>Aquilegia caerulea</i> , the fruit is five-pronged and capsule-like and changes from green to tan or brown and splits open to expose the seeds. For <i>Bouteloua gracilis</i> , the fruit is a tiny grain, hidden within tiny bracts and grouped into a few short comb-like branches that are staggered along a spike-like seed head, that changes texture from soft or watery to hard when squeezed and difficult to divide with a fingernail, or when it drops from the plant. For <i>Chamerion angustifolium</i> , the fruit is a capsule that changes from green to reddish-brown and splits open to expose seeds with white fluff. For <i>Populus tremuloides</i> the female catkins turn green and lengthen as the fruits develop, a tiny capsule that changes from green to brown and splits open to expose seeds with white fluff. <i>P. tremuloides</i> trees are either male or female, so you won't see fruit if the tree is male!
	Ripe fruits	One or more ripe fruits are visible. (See "Fruits" above for specific descriptions of ripe fruit.)
	Recent fruit or seed drop	One or more mature fruits or seeds have dropped or been removed from the plant since your last visit. Do not include obviously immature fruits that have dropped before ripening, such as in a heavy rain or wind, or empty fruits that had long ago dropped all of their seeds but remained.

