



USA-NPN Plant and Animal Phenophase Definitions

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PLANTS

INTRODUCTION

The USA-NPN standardized phenophases for plants are outlined below. Phenophases in use for each plant functional group are summarized in tables, and written definitions are included in following sections. Intensity measures for each phenophase are included below each definition. These represent either an estimate of the abundance of plant structures (e.g. buds, flowers, fruits) in one of several categorical bins representing different orders of magnitude, or an estimate of the percentage of plant structures in a phenophase in one of six percentage ranges. Note that some phenophases do include an intensity measure.

These phenophases are designed for an observer audience with intermediate botanical knowledge. Additional phenophases for a more advanced audience exist only in draft form and are not included in this document.

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SUMMARY TABLES

Angiosperms and Gymnosperms

	Phenophase title	Forb	Evergreen Forb	Grass/Sedge/Rush	Deciduous Tree/Shrub	Drought-deciduous Tree/Shrub	Broadleaf Evergreen Tree/Shrub	Cactus	Evergreen Conifer (excluding pines)	Pine	Deciduous Conifer
Vegetative phenophases	Initial growth	X		X							
	Breaking leaf buds				X		X				
	Young leaves		X			X	X				
	Leaves	X		X	X	X					
	Increasing leaf size				X						
	Colored leaves*				X	X					
	Falling leaves				X						
	Breaking needle buds								X		X
	Emerging needles**									X	
	Young needles								X	X	
	Needles										X
	Colored needles										X
	Falling needles										X
Reproductive phenophases	Flowers or flower buds***	X	X	X	X	X	X	X			
	Open flowers	X	X	X	X	X	X	X			
	Pollen release****	X	X	X	X	X	X	X	X	X	X
	Pollen cones								X	X	X
	Open pollen cones								X	X	X
Fruit phenophases	Fruits	X	X	X	X	X	X	X			
	Ripe fruits	X	X	X	X	X	X	X			
	Recent fruit or seed drop	X	X	X	X	X	X	X			
	Unripe seed cones								X	X	X
	Ripe seed cones								X	X	X
	Recent cone or seed drop								X	X	X

* excluded for species with no noticeable color change leading up to leaf senescence

** "Emerging needles" is included for pines instead of "Breaking needle buds" in order to capture the period when needles unfold from their fascicle sheaths after the bud has broken and the candle has elongated

*** entitled "Flower heads" for grasses and sedges

**** in angiosperms, only included for allergen species in *Nature's Notebook*

Historic Lilac and Honeysuckle

	Lilac	Honeysuckle
Phenophase title		
Breaking leaf buds (previously "First leaf")	X	X
All leaf buds broken (previously "Full leaf out")	X	X
Open flowers (previously "First bloom")	X	X
Full flowering (previously "Full bloom")	X	X
End of flowering (previously "Last bloom")	X	X

ANGIOSPERM PHENOPHASE DEFINITIONS

Leaf Phenophases

Initial growth

(Forb) New growth of the plant is visible after a period of no growth (winter or drought), either from above-ground buds with green tips, or new green or white shoots breaking through the soil surface. Growth is considered "initial" on each bud or shoot until the first leaf has fully unfolded. For seedlings, "initial" growth includes the presence of the one or two small, round or elongated leaves (cotyledons) before the first true leaf has unfolded.

(Grass/Sedge) New growth of the plant is visible after a period of no growth (winter or drought), either as new green shoots sprouting from nodes on existing stems, or new green shoots breaking through the soil surface. For each shoot, growth is considered "initial" until the first leaf has unfolded.

(Rush) New growth of the plant is visible after a period of no growth (winter or drought) as new green shoots breaking through the soil surface. For each shoot, growth is considered "initial" until the exposed, green portion of the shoot has reached approximately 2 inches (5 cm) in length.

Breaking leaf buds

(Tree/Shrub) One or more breaking leaf buds are visible on the plant. A leaf bud is considered "breaking" once a green leaf tip is visible at the end of the bud, but before the first leaf from the bud has unfolded to expose the leaf stalk (petiole) or leaf base.

How many buds are breaking?

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

Young leaves

(Forb) One or more young leaves are visible on the plant. A leaf is considered "young" before it has reached full size or turned the darker green color or tougher texture of mature leaves on the plant. Do not include fully dried or dead leaves.

(Tree/Shrub) One or more young, unfolded leaves are visible on the plant. A leaf is considered "young" and "unfolded" once its entire length has emerged from the breaking bud so that the leaf stalk (petiole) or leaf base is visible at its point of attachment to the stem, but before the leaf has reached full size or turned the darker green color or tougher texture of mature leaves on the plant. Do not include fully dried or dead leaves.

How many young leaves are present?

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

Leaves

(Forb) One or more live, fully unfolded leaves are visible on the plant. 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.

(Grass) One or more live, green, unfolded leaves are visible on the plant. A leaf is considered "unfolded" once it unrolls slightly from around the stem and begins to fall away at an angle from the stem. Do not include fully dried or dead leaves.

What percentage of the plant is green?

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

(Sedge) One or more live, green, unfolded leaves are visible on the plant. A leaf is considered "unfolded" once it has grown long enough that the two halves of the leaf blade have begun to spread apart like an open book. Do not include fully dried or dead leaves.

What percentage of the plant is green?

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

(Rush) One or more live, green, unfolded leaves are visible on the plant. A leaf is considered "unfolded" once the exposed, green portion of the leaf (or shoot) has reached approximately 2 inches (5 cm) in length. Do not include fully dried or dead leaves.

What percentage of the plant is green?

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

(Tree/Shrub) One or more live, unfolded leaves are visible on the plant. A leaf is considered "unfolded" once its entire length has emerged from the breaking bud so that the leaf stalk (petiole) or leaf base is visible at its point of attachment to the stem. Do not include fully dried or dead leaves.

What percentage of the canopy is full with leaves? Ignore dead branches in your estimate.

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

Increasing leaf size

(Tree/Shrub) 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.

What percentage of full size are most leaves?

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

Colored leaves

(Tree/Shrub) 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 on the plant.

What percentage of the canopy is full with colored leaves?

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

Falling leaves

(Tree/Shrub) One or more leaves are falling or have recently fallen from the plant.

Flower Phenophases

Flowers or flower buds

(Forb/Rush/Tree/Shrub/Cactus) One or more fresh open or unopened flowers or flower buds are visible on the plant. Include flower buds that are still developing, but do not include wilted or dried flowers.

How many flowers and flower buds are present? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), simply estimate the number of flower heads, spikes or catkins and not the number of individual flowers.

(Forb/Rush/Cactus) Less than 3; 3 to 10; 11 to 100; 101 to 1,000; More than 1,000

(Tree/Shrub) Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000

Flower heads

(Grass/Sedge) One or more fresh flower heads (inflorescences) are visible on the plant. 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 have all wilted or dried.

How many fresh flower heads are present?

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

Open flowers

(Forb/Rush/Tree/Shrub/Cactus) One or more open, fresh flowers are visible on the plant. 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). Do not include wilted or dried flowers.

What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all individual flowers that are open.

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

(Grass/Sedge) One or more open, fresh flowers are visible on the plant. A flower is considered "open" when reproductive parts (male anthers or female stigmata) can be seen protruding from the spikelet. Do not include flowers with wilted or dried reproductive parts.

What percentage of all fresh flowers (unopened plus open) on the plant are open?

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

Pollen release

(Forb/Grass/Sedge/Rush/Tree/Shrub/Cactus) One or more flowers 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.

Fruit Phenophases

Fruits

(Forb/Grass/Sedge/Rush/Tree/Shrub/Cactus) One or more fruits are visible on the plant. *Species-specific description included here.*

How many fruits are present?

(Forb/Grass/Sedge/Rush/Cactus) Less than 3; 3 to 10; 11 to 100; 101 to 1,000; More than 1,000

(Tree/Shrub) Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000

Ripe fruits

(Forb/Grass/Sedge/Rush/Tree/Shrub/Cactus) One or more ripe fruits are visible on the plant. *Species-specific description included here.*

What percentage of all fruits (unripe plus ripe) on the plant are ripe?

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

Recent fruit or seed drop

(Forb/Grass/Sedge/Rush/Tree/Shrub/Cactus) 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 on the plant.

How many mature fruits have dropped seeds or have completely dropped or been removed from the plant since your last visit?

(Forb/Grass/Sedge/Rush/Cactus) Less than 3; 3 to 10; 11 to 100; 101 to 1,000; More than 1,000

(Tree/Shrub) Less than 3; 3 to 10; 11 to 100; 101 to 1,000; 1,001 to 10,000; More than 10,000

CONIFER PHENOPHASE DEFINITIONS

Needle Phenophases

Breaking needle buds

(Evergreen conifer, excluding pines) One or more breaking needle buds are visible on the plant. A needle bud is considered "breaking" once a green needle tip is visible at the end of the bud, but before the first needle from the bud has unfolded and spread away at an angle from the developing stem.

How many buds are breaking?

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

(Deciduous conifer) One or more breaking needle buds are visible on the plant. A needle bud is considered "breaking" once a green needle tip is visible at the end of the bud, but before the first needle from the bud has unfolded and spread away at an angle from the developing stem, or from other needles in a bundle.

How many buds are breaking?

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

Emerging needles

(Pine) 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 others in the bundle.

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

Young needles

(Evergreen Conifer, excluding Pine) One or more young, unfolded needles are visible on the plant. A needle is considered "young" and "unfolded" once it has spread away from the developing stem enough that its point of attachment to the stem is visible, 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

(Pine) 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 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 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

Needles

(Deciduous Conifer) One or more live, unfolded needles are visible on the plant. A needle is considered "unfolded" once it begins to spread away at an angle from the developing stem enough that its point of attachment to the stem is visible, or from other needles in a bundle so that it is no longer pressed flat against them. Do not include fully dried or dead needles.

What percentage of the canopy is full with needles? Ignore dead branches in your estimate.

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

Colored needles

(Deciduous Conifer) One or more needles (including any that have recently fallen from the plant) have turned to their late-season colors. Do not include fully dried or dead needles that remain on the plant.

What percentage of the canopy is full with colored needles?

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

Falling needles

(Deciduous Conifer) One or more needles are falling or have recently fallen from the plant.

Pollen Cone Phenophases

Pollen cones

(All conifers) 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 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

Open pollen cones

(All conifers) 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

Pollen release

(All conifers) 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 Cone Phenophases

Unripe seed cones

(All conifers) One or more unripe, female seed cones are visible on the plant. *Species-specific description included here.*

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

(All conifers) One or more ripe, female seed cones are visible on the plant. *Species-specific description included here.*

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

(All conifers) 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

HISTORIC LILAC AND HONEYSUCKLE PHENOPHASE DEFINITIONS

Leaf Phenophases

Breaking leaf buds

(Lilac/Honeysuckle) In at least 3 locations on the plant, a breaking leaf bud is visible. A leaf bud is considered "breaking" once the widest part of the newly emerging leaf has grown beyond the ends of its opening winter bud scales, but before it has fully emerged to expose the leaf stalk (petiole) or leaf base. The leaf is distinguished by its prominent midrib and veins. *(This phenophase was previously called "First leaf".)*

All leaf buds broken

(Lilac/Honeysuckle) For the whole plant, the widest part of a new leaf has emerged from virtually all (95-100%) of the actively growing leaf buds. *(This phenophase was previously called "Full leaf out".)*

Flower Phenophases

Open flowers

(Lilac) For the whole plant, at least half (50%) of the flower clusters have at least one open fresh flower. The lilac flower cluster is a grouping of many, small individual flowers. *(This phenophase was previously called "First bloom".)*

(Honeysuckle) For the whole plant, at least 5% of the flowers are open and still fresh. *(This phenophase was previously called "First bloom".)*

Full flowering

(Lilac) 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. *(This phenophase was previously called "Full bloom".)*

(Honeysuckle) For the whole plant, virtually all (95-100%) of the flowers have opened, and many of the flowers are still fresh and have not withered. *(This phenophase was previously called "Full bloom".)*

End of flowering

(Lilac/Honeysuckle) For the whole plant, virtually all (95-100%) of the flowers have withered or dried up and the floral display has ended. *(This phenophase was previously called "Last bloom".)*

ANIMALS

INTRODUCTION

The USA-NPN standardized phenophases for animals are outlined below. Phenophases in use for each animal group are summarized in tables, and written definitions are included in following sections. Abundance measures for each phenophase are included below each definition. In almost all cases this represents a count of the number of individual animals of a given species at a given site observed in that phenophase at the time of observation. “Vocalizing” in frogs and toads is the only exception, where a series of categorical qualitative options are provided in lieu of asking observers to count the actual number of individuals.

These phenophases are designed for a beginner animal observer audience, and only phenophases that are relatively easy to observe and/or evaluate are included. Phenophases for which evaluation could endanger an observer (e.g. trying to catch bees in a net), or disturb and animal (e.g. following shorebirds closely enough to observe nest building) are not included. These additional phenophases for a more advanced audience exist only in draft form and are not included in this document. Note that there are many animal groups for which we have not yet developed phenophases (e.g. bats, ticks, intertidal invertebrates, etc.)

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SUMMARY TABLES

Reptiles, Fish and Amphibians

Phenophase title	Snake/Lizard	Alligator	Turtles	Freshwater Fish	Saltwater Fish	Anadromous Fish	Eels	Frog/Toad	Salamander
Individuals on land	X	X	X						
Adults on land								X	X
Individuals in water*	X	X	X						
Adults in water*								X	X
Adults in freshwater				X		X	X		
Adults in saltwater					X	X	X		
Feeding	X	X	X						
Adults feeding				X	X	X	X	X	X
Adults migrating upstream						X			
Adults migrating downstream				X		X	X		
Juveniles in saltwater					X				
Juveniles moving upstream							X		
Vocalizing								X	
Adults vocalizing		X							
Mating								X	X
Nesting			X						
Fresh eggs								X	X
Young individuals	X	X	X						
Dead individuals	X	X	X						
Dead adults								X	X
Dead or dying adults				X	X	X	X		
Individuals on a hook				X	X	X	X		
Individuals in a net				X	X	X	X		

* excluded for species that are solely terrestrial

Birds and Mammals

Phenophase title	Bird (general)	Songbird	Hummingbird	Shorebird	Mammal (general)	Squirrel/Chipmunk	Sheep/Deer	Pinniped
Active individuals	X	X	X	X	X	X	X	X
Individuals on land								X
Individuals in water								X
Feeding*	X	X	X	X	X	X	X	X
Fruit/seed consumption*	X	X				X		
Insect consumption*	X	X	X					
Flower visitation*		X	X					
Nut gathering*	X					X		
Calls or song	X	X	X	X				
Singing males*	X	X						
Males vocalizing*							X	
Male combat*							X	X
Mating*	X	X	X	X	X	X	X	X
Nest building**	X	X	X					
Young individuals					X	X	X	X
Summer coat*					X			
Winter coat*					X			
Dead individuals	X	X	X	X	X	X	X	X
Individuals at a feeding station	X	X	X					

* excluded for species where this stage or behavior is never exhibited or is very difficult to observe

** excluded for shorebirds so as not to encourage nest disturbance by observers

Insects

Phenophase title	Butterfly	Moth	Bee	Dragonfly/Damselfly	Mayfly	Stonefly	Grasshopper	Tiger Beetle
Active adults	X	X	X	X	X	X	X	X
Adults feeding				X			X	X
Flower visitation	X		X					
Migrating adults*	X			X				
Mating	X	X	X	X	X	X	X	X
Egg laying				X				
Active subadults					X			
Active caterpillars*	X	X						
Caterpillars in tent*		X						
Caterpillars feeding*	X	X						
Dead caterpillars*	X	X						
Active nymphs							X	
Nymphs feeding							X	
Dead nymphs							X	
Dead adults	X	X	X	X	X	X	X	X
Individuals at a feeding station*	X	X						
Individuals at a light*		X						X
Individuals in a net	X	X		X	X	X	X	X

* excluded for species where this stage or behavior is never exhibited or is very difficult to observe

REPTILE PHENOPHASES

Individuals on land

(Snake/Lizard/Alligator/Turtle) One or more individuals are seen active or at rest on land, including individuals found under cover of a rock, log, or burrow.

For abundance, record the number of individual animals observed in this phenophase.

Individuals in water

(Snake/Lizard/Alligator/Turtle) One or more individuals are seen active or at rest in water, including individuals basking on a log or rock in the water.

For abundance, record the number of individual animals observed in this phenophase.

Feeding

(Snake/Lizard/Alligator/Turtle) One or more individuals are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Adults vocalizing

(Alligator) Vocal sounds produced by an adult are heard.

For abundance, record the number of individual animals observed in this phenophase.

Nesting

(Turtle) One or more adult females are seen nesting. This includes actual laying of eggs or excavating the nest cavity. It does not include turtles that are likely engaged only in basking.

For abundance, record the number of individual animals observed in this phenophase.

Young individuals

(Egg-laying Snake/Lizard/Alligator/Turtle) One or more recently hatched or young individuals are seen, living or dead, including those individuals found dead on a road.

For abundance, record the number of individual animals observed in this phenophase.

(Snake/Lizard with live birth) One or more recently born or young individuals are seen, living or dead, including those individuals found dead on a road.

For abundance, record the number of individual animals observed in this phenophase.

Dead individuals

(Snake/Lizard/Alligator/Turtle) One or more dead individuals are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

FISH PHENOPHASES

Adults in freshwater

(Freshwater/Anadromous/Eel) One or more adults are seen in a freshwater stream, lake, or pond.

For abundance, record the number of individual animals observed in this phenophase.

Adults in saltwater

(Saltwater/Anadromous/Eel) One or more adults are seen in an ocean, an estuary, a saltwater or brackish wetland, or other body of saltwater.

For abundance, record the number of individual animals observed in this phenophase.

Adults feeding

(Freshwater/Saltwater/Anadromous/Eel) One or more adults are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Adults migrating upstream

(Anadromous) One or more adults are seen moving upstream, for example, in a river or fish ladder.

For abundance, record the number of individual animals observed in this phenophase.

Adults migrating downstream

(Freshwater/Anadromous/Eel) One or more adults are seen moving downstream.

For abundance, record the number of individual animals observed in this phenophase.

Juveniles in saltwater

(Saltwater) One or more juveniles are seen in a bay, an estuary, or other near-shore habitat.

For abundance, record the number of individual animals observed in this phenophase.

Juveniles moving upstream

(Eel) One or more immature individuals are in or entering a river mouth, moving from salt water or brackish water to freshwater stream habitat, or are moving upstream, for example, through a fish ladder, a counting station, or around a dam relatively near the mouth of a river.

For abundance, record the number of individual animals observed in this phenophase.

Dead or dying adults

(Freshwater/Saltwater/Anadromous/Eel) One or more dead or dying adults are seen.

For abundance, record the number of individual animals observed in this phenophase.

Individuals on a hook

(Freshwater/Saltwater/Anadromous/Eel) One or more individuals are seen caught on a hook.

For abundance, record the number of individual animals observed in this phenophase.

Individuals in a net

(Freshwater/Saltwater/Anadromous/Eel) One or more individuals are seen caught in a net.

For abundance, record the number of individual animals observed in this phenophase.

AMPHIBIAN PHENOPHASES

Adults on land

(Frog/Toad/Salamander) One or more adults are seen at rest or active on land.

For abundance, record the number of individual animals observed in this phenophase.

Adults in water

(Frog/Toad/Salamander) One or more adults are seen at rest or active in water.

For abundance, record the number of individual animals observed in this phenophase.

Adults feeding

(Frog/Toad/Salamander) One or more adults are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Vocalizing

(Frog/Toad) One or more individuals are heard vocalizing.

What is the intensity of vocalizing?

Single calls: *There is space between calls and individuals can be counted.;* **Overlapping**

calls: *Calls of individuals can be distinguished but there is some overlapping of calls.;* **Full**

chorus: *Calls are constant and overlapping.*

Mating

(Frog/Toad/Salamander) A female is seen grasped and held by a male.

For abundance, record the number of individual animals observed in this phenophase.

Fresh eggs

(Frog/Toad/Salamander) Eggs are seen being extruded, an egg mass is seen with jelly not expanded to full size, or embryos that are more or less spherical are seen.

For abundance, record the number of individual animals observed in this phenophase.

Dead adults

(Frog/Toad/Salamander) One or more dead adults are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

BIRD PHENOPHASES

Active individuals

(Bird/Songbird/Hummingbird/Shorebird) One or more individuals are seen moving about or at rest.

For abundance, record the number of individual animals observed in this phenophase.

Feeding

(Bird/Songbird/Hummingbird/Shorebird) One or more individuals are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Fruit/seed consumption

(Bird/Songbird) One or more individuals are seen eating the fleshy fruits, seeds, or cones of a plant. If possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Insect consumption

(Bird/Songbird/Hummingbird) One or more individuals are seen eating insects. If possible, record the name of the insect or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Flower visitation

(Songbird/Hummingbird) One or more individuals are seen visiting flowers or flying from flower to flower. If possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Nut gathering

(Bird) One or more individuals are seen taking acorns or other nuts from a plant or from on the ground. If possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Calls or song

(Bird/Songbird/Hummingbird/Shorebird) One or more individuals are heard calling or singing.

For abundance, record the number of individual animals observed in this phenophase.

Singing males

(Songbird/Hummingbird) One or more singing males are heard. Singing refers to stereotypical, simple or elaborate vocalizations used as part of a territorial proclamation or defense or mate attraction. It does not include relatively simple calls used for other forms of communication.

For abundance, record the number of individual animals observed in this phenophase.

Mating

(Bird/Songbird/Hummingbird/Shorebird) A male and female are seen coupled in a mating position, usually with the male on top of the female.

For abundance, record the number of individual animals observed in this phenophase.

Nest building

(Bird/Songbird/Hummingbird) One or more adults are seen constructing a nest or carrying nesting material.

For abundance, record the number of individual animals observed in this phenophase.

Dead individuals

(Bird/Songbird/Hummingbird/Shorebird) One or more dead individuals are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

Individuals at a feeding station

(Bird/Songbird/Hummingbird) One or more individuals are seen visiting a feeder, feeding station, or food placed by a person.

For abundance, record the number of individual animals observed in this phenophase.

MAMMAL PHENOPHASES

Active individuals

(Mammal/Squirrel/Chipmunk/Sheep/Deer/Pinniped) One or more individuals are seen moving about or at rest.

For abundance, record the number of individual animals observed in this phenophase.

Individuals on land

(Pinniped) One or more individuals are seen active or at rest on land.

For abundance, record the number of individual animals observed in this phenophase.

Individuals in water

(Pinniped) One or more individuals are seen active or at rest in water.

For abundance, record the number of individual animals observed in this phenophase.

Feeding

(Mammal/Squirrel/Chipmunk/Sheep/Deer/Pinniped) One or more individuals are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Fruit/seed consumption

(Squirrel/Chipmunk) One or more individuals are seen eating the fleshy fruits, seeds, or cones of a plant. If possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Nut gathering

(Squirrel/Chipmunk) One or more individuals are seen taking acorns or other nuts from a plant or from on the ground. If possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Males vocalizing

(Sheep/Deer) Vocal sounds produced by an adult male are heard.

For abundance, record the number of individual animals observed in this phenophase.

Male combat

(Sheep/Deer) Two or more adult males are seen touching antlers or horns or butting heads, or one male is seen chasing another.

For abundance, record the number of individual animals observed in this phenophase.

(Pinniped) Two or more adult males are seen wrestling or biting, or one male is seen chasing another.

For abundance, record the number of individual animals observed in this phenophase.

Mating

(Mammal/Squirrel/Chipmunk/Sheep/Deer/Pinniped) A male and female are seen coupled in a mating position.

For abundance, record the number of individual animals observed in this phenophase.

Young individuals

(Mammal/Squirrel/Chipmunk/Sheep/Deer/Pinniped) One or more recently born or young individuals are seen, living or dead, including those individuals found dead on a road.

For abundance, record the number of individual animals observed in this phenophase.

Summer coat

(Mammal) One or more individuals are seen with more than half of their coat consisting of dark hairs.

For abundance, record the number of individual animals observed in this phenophase.

Winter coat

(Mammal) One or more individuals are seen with more than half of their coat consisting of white hairs.

For abundance, record the number of individual animals observed in this phenophase.

Dead individuals

(Mammal/Squirrel/Chipmunk/Sheep/Deer/Pinniped) One or more dead individuals are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

INSECT PHENOPHASES

Active adults

(Butterfly/Moth/Bee/Dragonfly/Damselfly/Mayfly/Stonefly/Grasshopper/Tiger Beetle) One or more adults are seen moving about or at rest.

For abundance, record the number of individual animals observed in this phenophase.

Adults feeding

(Dragonfly/Damselfly/Grasshopper/Tiger Beetle) One or more adults are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Flower visitation

(Butterfly/Bee) One or more individuals are seen visiting flowers or flying from flower to flower. If possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Migrating adults

(Butterfly) Multiple adults of the same species are seen flying steadily in a uniform direction without stopping.

For abundance, record the number of individual animals observed in this phenophase.

(Dragonfly/Damselfly) A swarm of adults of mostly the same species is seen flying overhead.

For abundance, record the number of individual animals observed in this phenophase.

Mating

(Butterfly/Moth) A male and female are seen coupled in a mating position, usually end to end. This can occur at rest or in flight.

For abundance, record the number of individual animals observed in this phenophase.

(Bee/Grasshopper/Tiger Beetle) A male and female are seen coupled in a mating position, usually with the male on top of the female.

For abundance, record the number of individual animals observed in this phenophase.

(Dragonfly/Damselfly) A male and female are seen coupled in a mating position, usually forming what looks like a circle with their bodies. This can be at rest or in flight.

For abundance, record the number of individual animals observed in this phenophase.

(Mayfly/Stonefly) A male and female are seen coupled in a mating position, usually one on top of the other.

For abundance, record the number of individual animals observed in this phenophase.

Egg laying

(Dragonfly/Damselfly) A female is seen laying eggs directly onto the water surface, or attached to aquatic plants.

For abundance, record the number of individual animals observed in this phenophase.

Active subadults

(Mayfly) One or more subadults are seen moving about or at rest. *Species-specific description included here.*

For abundance, record the number of individual animals observed in this phenophase.

Active caterpillars

(Butterfly/Moth) One or more caterpillars (larvae) are seen moving about or at rest. When seen on a plant, if possible, record the name of the plant or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Caterpillars in tent

(Moth) Caterpillars are seen in their tent. If possible, record the name of the plant on which the tent is built or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Caterpillars feeding

(Butterfly/Moth) One or more caterpillars are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Dead caterpillars

(Butterfly/Moth) One or more dead caterpillars are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

Active nymphs

(Grasshopper) One or more nymphs are seen moving about or at rest. Nymphs look similar to adults, but their wings are absent or only partially developed and they cannot fly.

For abundance, record the number of individual animals observed in this phenophase.

Nymphs feeding

(Grasshopper) One or more nymphs are seen feeding. If possible, record the name of the species or substance being eaten or describe it in the comments field.

For abundance, record the number of individual animals observed in this phenophase.

Dead nymphs

(Grasshopper) One or more dead nymphs are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

Dead adults

(Butterfly/Moth/Bee/Dragonfly/Damselfly/Mayfly/Stonefly/Grasshopper/Tiger Beetle) One or more dead adults are seen, including those found on roads.

For abundance, record the number of individual animals observed in this phenophase.

Individuals at a feeding station

(Butterfly/Moth) One or more individuals are seen visiting a feeder, feeding station, or food placed by a person.

For abundance, record the number of individual animals observed in this phenophase.

Individuals at a light

(Moth/Tiger Beetle) One or more individuals are seen at a light, whether flying or at rest.

For abundance, record the number of individual animals observed in this phenophase.

Individuals in a net

(Butterfly/Moth/Dragonfly/Damselfly/Mayfly/Stonefly/Grasshopper/Tiger Beetle)

One or more individuals are seen caught in a net.

For abundance, record the number of individual animals observed in this phenophase.

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