Pollinators of Washington's Federally Listed Plants

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Abiotic mechanisms of pollination

Wind

Abiotic mechanisms of pollination

Water

Abiotic mechanisms of pollination

Water

Biotic mechanisms of pollination

Bats

Animal pollination

Bats

Pollination by animals

Birds

Pollination by animals

Birds

Pollination by animals

Invertebrates

Slugs

Pollination by Insects

Moths	Ants
Beetles	Flies
Midges	Thrips
Butterflies	True bugs
Wasps	Gnats

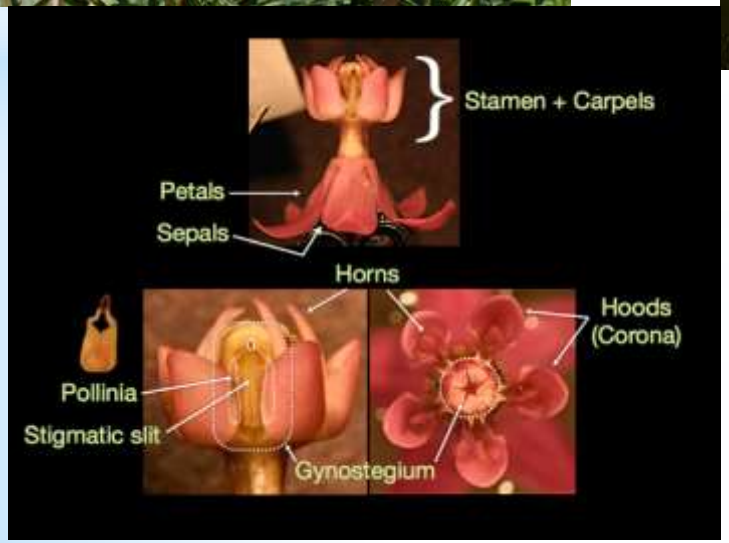
Pollination Mechanisms
Simple

Pollination Mechanisms

or not

Pollination Mechanisms

or not simple



Pollination Terminology

Plants

Acropetal – development of flowers in sequence, from base to top of inflorescense

Hermaphroditic – male and females parts both present on a flower

Protandry – development within a single flower of anthers before stigma, limiting self-fertilization

Protogyny – development within a single flower of stigma before anthers, limiting self-fertilization

Xenogamy – fertilization by pollen from a genetically different plant, usually from some distance away

Pollination Terminology

Pollinators

Floral constancy – degree to which a floral visitor will target a single species. May vary among individuals and over time.

Monolecty – Permanently fixed specialization of a species on the pollen of a single plant species.

Oliogolecty – Permanently fixed specialization of a species on the pollen of a few plant species. May take nectar from multiple species.

Polylecty – Pollen generalist.

Pollination Terminology

Interactive Factors

Does the pollinator have the right equipment?

- Size
- Position

Does the pollinator have the right calendar and clock?

Is the pollinator ill-behaved (from the plant's perspective)?

- How constant is it?
- Is it a thief?

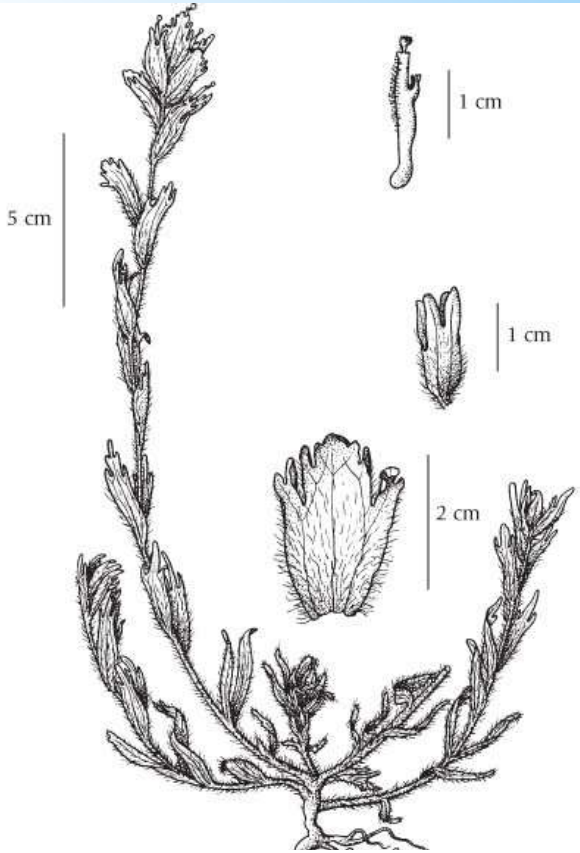
Is the pollinator's working distance appropriate?

If a plant requires a community of pollinators, are they present?

Nectar Thievery

Castilleja levisecta

Golden paintbrush



Eriogonum codium

Umtanum desert buckwheat

Hackelia venusta

Showy stickweed

Lomatium bradshawii

Bradshaw's desert parsley

Lupinus sulphureus ssp. kincaidii

Kincaid's lupine

Physaria tuplashensis

White bluffs bladderpod

Sidalcea nelsoniana

Nelson's checker-mallow

Sidalcea oregana var. *calva*

Wenatchee Mountain checker-mallow

Silene spaldingii

Spalding's catchfly

Spiranthes diluvialis

Ute ladies' tresses

Factors to Consider - Floral

Floral phenology
- Coincident with pollinator activity
- Is floral bloom pattern appropriate

Floral structural characteristics
- Vulnerability to nectar theft
- Appropriate size and structure

Pollen characteristics
- Size
- Stickiness

Factors to Consider - Pollinator

Behavior

- Floral constancy
- Dispersal distance
- Tendency to steal nectar

Anatomy

- Hairiness or other means of collecting pollen
- Ability to acquire and apply pollen

What Could Possibly Go Wrong??

- Asynchrony
- Fragmentation
- Herbicide
- Insecticide
- Stochastic events
- New predators or parasites

For More Information

Xerces Society – Xerces.org

Bumble bees including Bumble Bee Watch

Great general information on pollinators and pollinator protection

US Fish and Wildlife Service – www.fws.gov/pollinators/

Great broad introduction and in depth information on some groups

WA NHP - www.dnr.wa.gov/natural-heritage-program

Good information on rare plants

Lists of many groups of animals

This project https://www.dnr.wa.gov/publications/amp_nh_pollinators.pdf?q34p4b

Logan Bee Lab - https://www.ars.usda.gov/pacific-west-area/logan-ut/pollinating-insect-biology-management-systematics-research/

Go-to source for focused research

Various of the workers will help with identifications