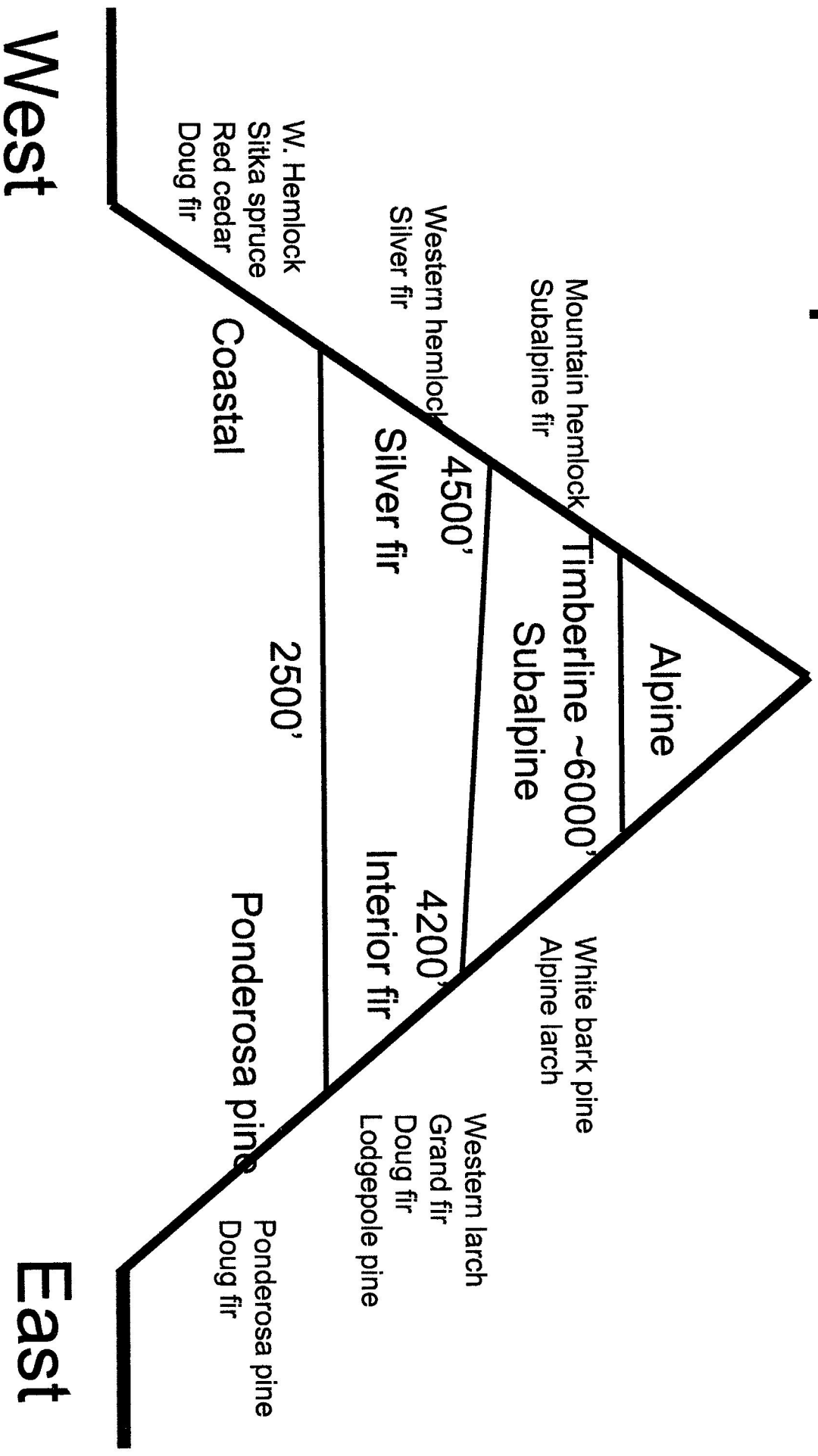


LIFE ZONES (FOREST COMMUNITIES) OF WESTERN AND CENTRAL WASHINGTON

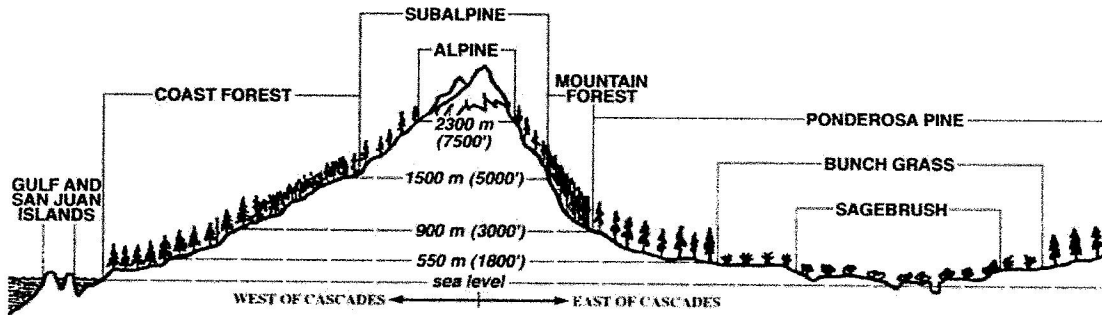
Life Zone	Location and Elevation*	Representative Trees
Coastal Forest	West slopes Sea level to 2,500 ft	Western Hemlock Douglas-fir Western Red Cedar
Silver Fir	West slopes 2,000 to 4,500 ft	Silver Fir Western Hemlock
Subalpine	West and East 4,200 to timberline	Subalpine Fir Mountain Hemlock
Alpine	Above timberline	
Interior Fir	East slopes 2,000 to 4,500 ft	Grand Fir Douglas-fir Lodgepole Pine Western Larch
Ponderosa Pine	East slopes 1,000 to 2,500 ft	Ponderosa Pine Douglas-fir

- The listed elevations are not absolutes. There will be a transition between life zones and the elevations depend on aspect, latitude, soil fertility, annual rainfall and snow pack, and other factors.

Location: zones and predominant trees



LIFE ZONES OF WASHINGTON

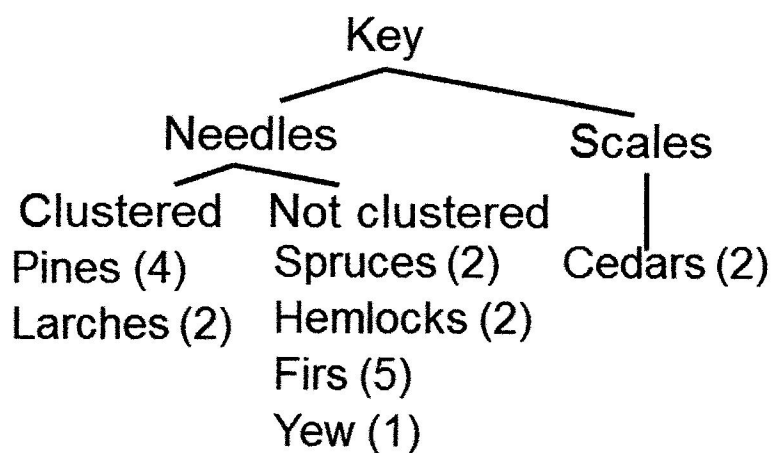
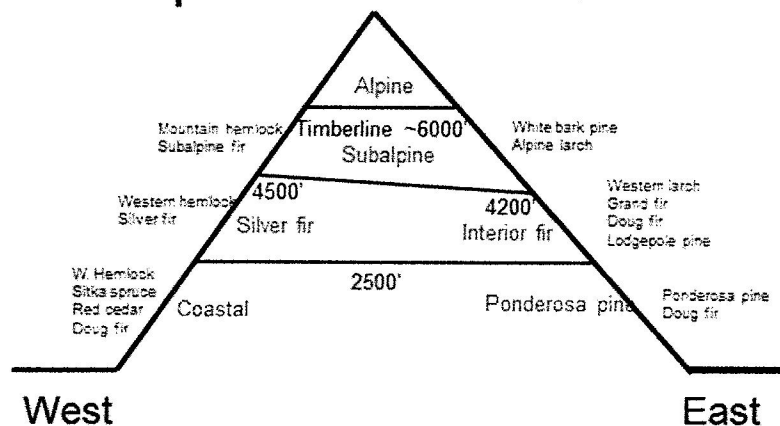


Conifers of Washington (by Mickey Eisenberg)

Conifers: Only 18

Pines (4)	Playing in the
Firs (5)	Forest
Spruces (2)	Should
Hemlocks (2)	Help
Yew (1)	You
Larches (2)	Learn
Cedars (2)	Conifers

Location: zones and predominant trees



Seattle Naturalists Quick Guide to 18 Cascade Conifers



Mountaineers.org
May, 2013

18 Cascade conifers
Douglas Fir <i>Pseudotsuga menziesii</i>
Western Hemlock <i>Tsuga heterophylla</i>
Mountain Hemlock <i>Tsuga mertensiana</i>
Silver Fir <i>Abies amabilis</i>
Grand Fir <i>Abies grandis</i>
Noble Fir <i>Abies procera</i>
Subalpine Fir <i>Abies lasiocarpa</i>
Ponderosa Pine <i>Pinus ponderosa</i>
Lodgepole Pine <i>Pinus contorta</i>
Western White Pine <i>Pinus monticola</i>
White Bark Pine <i>Pinus albicaulis</i>
Sitka Spruce <i>Picea sitchensis</i>
Engelmann Spruce <i>Picea engelmannii</i>
Western Red Cedar <i>Thuja plicata</i>
Alaska Cedar <i>Chamaecyparis nootkatensis</i>
Alpine Larch <i>Larix lyallii</i>
Western Larch <i>Larix occidentalis</i>
Pacific Yew <i>Taxus brevifolia</i>

18 Cascade Conifers	Description	Elevation	Cones	Needles	Stomata	Other
Douglas Fir	Bottle brush	Up to 4500	3-4 in, 3 pt bracts	1 in, flat, pointy tip	2 bottom	Not true fir
Western Hemlock	Droopy top	Up to 4500	.5-.75 in	Unequal	2 bottom	State tree
Mountain Hemlock	Less droopy	Over 4000	1-3 in	More equal	Top & btm	
Silver Fir	Pale btm need	2000-5000	3.5-6 in	Sides & top	2 bottom	Silver bark
Grand Fir	2 rows of needles	2000-5000	2-4.5 in, gm-brn	Equal, side by side	2 bottom	
Noble Fir	Blue green	3000-5000	4-7 in, bracts	4 sides, top groove	2 top	Rainier and south
Subalpine Fir	Bottle brush	Over 4500	2.5-4 in	Equal	2 top, faint	Steeple
Ponderosa Pine	Distinctive	Up to 4500	3-6 in	3, 5-10 in		East only
Lodgepole Pine			1-2 in	2, 1-3 in		L = 2
Western White Pine		Up to 5000	6-11 in	5, splayed		W = 5
Whitebark Pine		5000+	2-3 in	5, stouter, bundled		W = 5
Sitka Spruce	Coastal most	Up to 2000	2.5-4 in	++Prickly	2 top	
Engelmann Spruce	Mountains	3000-6000	1.5-2.5 in	4 sides, prickly, blue green	Top & bottom	Can roll needles, East most
Western Red Cedar	Reddish bark	Up to 4000	.5 in, rosebud	Smooth scales		West mostly
Alaska (Yellow) Cedar	Droopy branches	3000-6500	.5 in, roundish	Prickly scales		West only, krummholz
Alpine Larch	Deciduous	Over 5000	Bracts	Clusters	4-sided need	East only
Western Larch	Deciduous	3000-5000	Bracts	Clusters	3-sided need	East only
Pacific Yew	Bush in shade	Up to 8000	Red berry	Like Grand	No stomata	West only

A Simple Key to Conifers (cone-bearing plants) of the Washington Cascades

Leaves scale-like (Cypress Family)

- Western Red Cedar
 - Cones have scales, up to 3,500 ft
- Alaska Yellow Cedar
 - Cones are round, 3,000-6,000 ft
- Common Juniper
 - Low-growing with sharp needle-like scales, 2,500-7,500 ft

Leaves needle-like (Pine Family)

Needles in bunches of 2-5 (Pines)

- Lodgepole Pine
 - 2 needles per bunch, mostly east
- Ponderosa Pine
 - 3 needles per bunch, mostly east
- Western White Pine
 - 5 needles per bunch, 2,000-5,000 ft
- Whitebark Pine
 - 5 needles per bunch, 5,000+ ft

Needles single

Needles flat and round at base, buds round, cones point up (Firs)

- Silver Fir
 - Needles on top half of branch, 1 in, 2,000-5,000 ft
- Grand Fir
 - Needles two-ranked on branch, 1 in or more alternating longer and shorter,
- Subalpine Fir
 - Needles whitish on top, purplish cones 2-4 in, 4,500+ ft
- Noble Fir
 - Needles whitish on top, cones 4-8 in, more common in S. Cascades, 3,000-5,000 ft

2,000-5,000 ft

ft

Needles flat and thin at base, cones hang

- Douglas Fir (not a true fir, nor a hemlock)
 - Needles encircle branch, 1 in, buds pointed, bracted cones 2-4 in, up to 4,500 ft
- Western Hemlock
 - Needles vary in length from ¼-¾ in, top droops, cones less than 1 in, up to
- Mountain Hemlock
 - Needles ½ in, same length, cones 1-2 inches, 4,000+ ft

4,500 ft

Needles soft, cones fruit-like (Yews)

- Western Yew
 - Shrub-like, 2,000-4,000 ft

Needles sharp and woody at base, cones hanging (Spruces)

- Engelmann Spruce
 - Generally east, cones 2-4 in with papery scales, 3,000-6,000 ft
- Sitka Spruce
 - In coastal forests, rare in Cascades, up to 2,000 ft

Needles in clusters, deciduous (Larches)

Western Larch

Needles pale green in summer and yellow in fall, cones 1.5 in, east, 3,000-5,000 ft

Alpine Larch

Subalpine, needles green in summer and yellow in fall, cones 2-3 in, east, 5,000+ ft

Tips for using your field guide to identify shrubs and flowering plants

Shrubs, which have woody stems, are shown by family on pages 157-179. Note that some shrubs, such as kinnickinnick, are low-growing. To identify a shrub, flip through the pictures and seek a match. Details about the flowers, leaves, or other features are listed on the opposite page to confirm the identity. Don't be disappointed if you can't identify a shrub by the leaves alone; sometimes you need to see flowers, leaves, and fruit to make a positive identification.

Wildflowers are arranged by color, then by family, on pages 87-155 (read the cautions about using color to aid identification on pages 85-86). When you find a wildflower that you don't know, flip through the pictures of flowers that color and seek a match. Again, confirming details are listed on the opposite page. Not all flowers are pictured, so if you don't see an exact match read the description to see if it mentions similar species or just satisfy yourself that you are close.

For both shrubs and wildflowers there is a good illustrated glossary on pages 78-85 that will help you with the botanical terms. With experience you will start to see how plant families are related, and this will help your identification skills. For example:

- Plants in the Lily family have flower parts in 3s or 6s and the leaves have parallel veins.
- Flowers in the Violet family look like small pansies. In the Northwest they may be yellow, purple, or white.
- Flowers in the Orchid family look like tiny orchid corsages.
- Plants in the Mustard family have flowers with 4 petals in a cross (though other families also have flowers with parts in 4s).
- Plants in the Aster or Sunflower family have composite flower heads, which means that the "flowers" are actually groups of many little flowers. Dandelions are an example with all ray flowers and daisies are an example with both disc flowers and ray flowers (take a close look at them with a magnifying glass).
- Plants in the Rose family have 5 petals, 5 sepals, and many stamens.

Flowering parts in 3s (or multiples)
Leaves with parallel veins

Lily, Orchid, & Iris

Flowering parts in 4s

Leaves with veins in branching pattern

Evening Primrose
Mustard

Flowering parts in 5s (leaves with branching veins)

Flowers with **bilateral symmetry**

Petals fused

Petals free

Flowers with radial symmetry

Many small flowers in tight bunches

Flowers not in tight bunches

Flowers with **central clusters** or seemingly so
(more than 10 stamens crowding the center)

Pink

Purslane

Saxifrage

Petals free (or nearly so)

Normal flowers (10 or fewer stamens)
(or just use the "handles" to id. these 7 Families)

Petals fused

Petals free (or nearly so)

Mint
Figwort

Pea
Violet
Buttercup - some

Buckwheat

Parsley

Waterleaf

Valerian

Rose - some

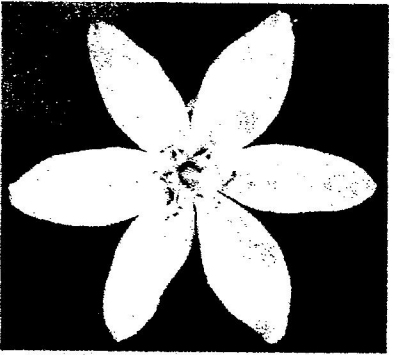
Buttercup
Rose

Sunflower – technically
belongs with "Many small
flowers in tight bunches"

Heath
Phlox

Primrose

Borage



Lily Family

- Flowers: radial
- 6 tepals & 6 stamens



Iris Family

- Flowers: radial
- 6 tepals & 3 stamens
- Leaves: basal in flat plane



Orchid Family

- Flowers: bilateral
- Lower petal forming lip or bowl



Leaves

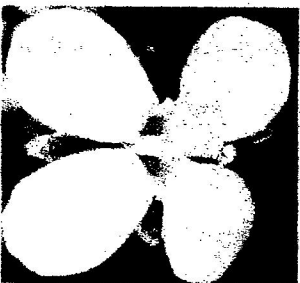
Parallel veins

- Lily Family
- Iris Family
- Orchid Family



- Flowers: petals 4
- Ovary inferior & elongate
- Leaves: often opposite
- Long seed pods & 4 sections

Evening-Primrose Family



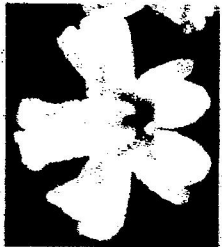
Mustard Family

- Flowers: petals 4
- Ovary superior.
- 6 stamens – 4 long, 2 short usually
- Leaves: alternate
- Seed pods in many shapes. 2 sections





Figwort Family



- Flowers: bilateral symmetry
- Petals fused
- Leaves: opposite or alternate



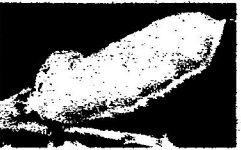
Mint

Family



- Flowers: bilateral symmetry
- Petals fused
- Leaves: opposite
- Square stems
- Aromatic usually

Pea Family



- Flowers: bilateral symmetry
- Petals free or nearly so
- Upper petal the largest
- Leaves: compound

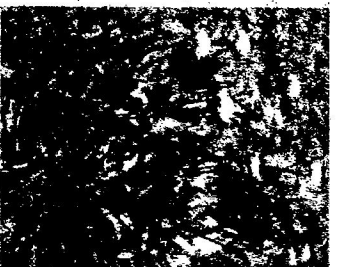
Violet Family



- Flowers: bilateral symmetry
- Petals free
- Lower petal the largest
- Leaves: simple



Buckwheat Family



- Flowers: small & in tight bunches
- 6 tepals form small flowers
- Leaves: basal or on stem
- Leaves entire & usually not toothed

➤ Flowers: small - forming bottlebrush

or oval clusters

➤ Stamens long exerted

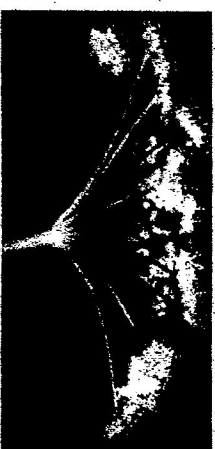
➤ Leaves: usually pinnately compound

Waterleaf Family

(In Borage Family now)



Parsley Family



- Flowers: small & in true umbels
- Leaves: usually compound & often fern-like or carrot-like

➤ Flowers: small & in dense clusters

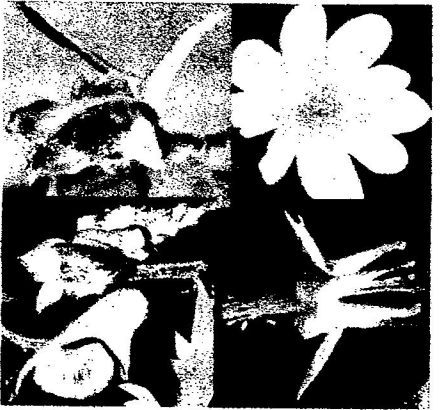
➤ Petals fused into narrow 5-lobed tube

➤ Small family

Valerian Family

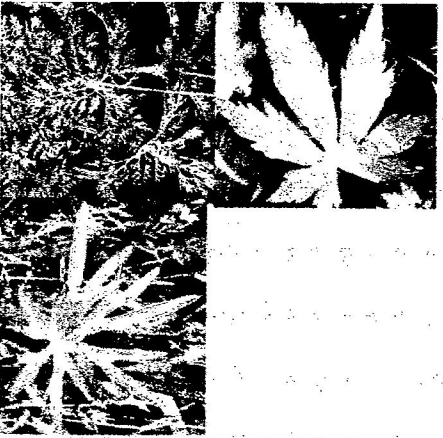
Family





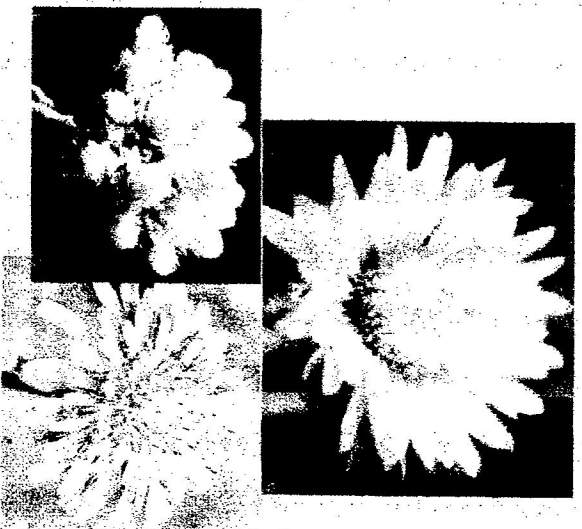
Buttercup Family

- Flowers: petals 5 to 12
- Flowers radial or bilateral
- Flowers simple to elaborate
- Leaves: compound or deeply divided



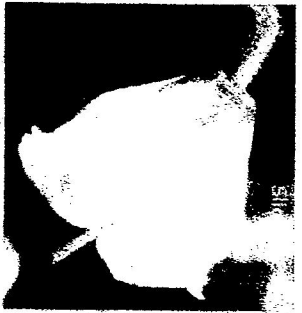
Rose Family

- Flowers: petals 5
- Flowers radial
- Leaves: often oval & serrated



Sunflower Family

- Flowers: appear many "petaled"
- Central cluster present or appears to be absent entirely.
- A compound flower: tiny flowers with 5 fused petals. All flowers packed into a single head.



Heath Family

- Flower: Petals fused into bells or urns



Phlox Family

- Flower: petals fused forming a tube with nearly perpendicular lobes
- Leaves: often narrow or like ladder

Primrose Family

- Flower: petals fused & sometimes reflexed
- Leaves: often basal



- Flower: petals fused
- Some flowers with central ring
- Fiddleheads often
- Plant often hairy

Borage Family

(Includes Waterleaf now)



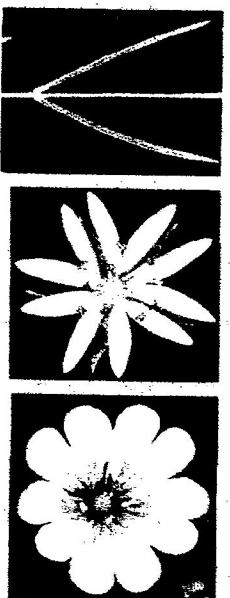


Purslane Family

- Flowers: petals free, pink strips often, 2 sepals
- Leaves: often succulent

Saxifrage Family

- Flower: petals free, stigmas 2 & often flaring apart
- Leaves: often basal



Pink Family

- Flowers: petals free, often notched or divided
- Leaves: opposite, often narrow & borne on enlarged nodes



Appendix

Unique Plants

Sedum Family

- Small, very succulent plants with short fleshy leaves
- Flowers: petals free & yellow



Current Family

- Medium sized shrub to about 6'
- All have maple shaped leaves
- All have berries
- Flowers: petals fused



Basic Birding – Tips

Resources:

The Nature Shop – Seattle Audubon – 8050 35th Ave NE – www.seattleaudubon.org

Cornell Laboratory of Ornithology – www.allaboutbirds.org

(Macaulay Library of Natural Sounds)



Burke Museum – University of Washington – www.burkemuseum.org/ornithology

Mountaineers bookstore

Methodology:

Size & Shape

Behavior

Habitat & Season

Sounds & Plumage



BASIC BIRDING HOMEWORK

Get or borrow some binoculars

Get or borrow a field guide or buy birding app (lots of good ones – The Nature Shop)

Get a check list for your area (at Visitors' Centers, The Nature Shop (Magnuson Park list))

Use the field guide (or go online) to identify the bird family silhouettes on the next page.

Go for a walk around your neighborhood/park/bird feeder, **BUT** leave the field guide at home and take a notebook instead!

Detect a bird (sound, motion, silhouette ...)

How big? What shape? What's it doing? Any sounds? Identify family if possible.

Move closer – Use binoculars – Plumage patterns, bill shape, wings, tail shape ...

Take notes before it flies away!! A photograph is an excellent idea.

Detect another bird – Repeat five times.

Return home and use your notes to identify species