Sub-Alpine/Alpine Zones of Mt Rainier

Prepared by Stewart Hougen & Cindy Luksus

What We Are Going To Cover

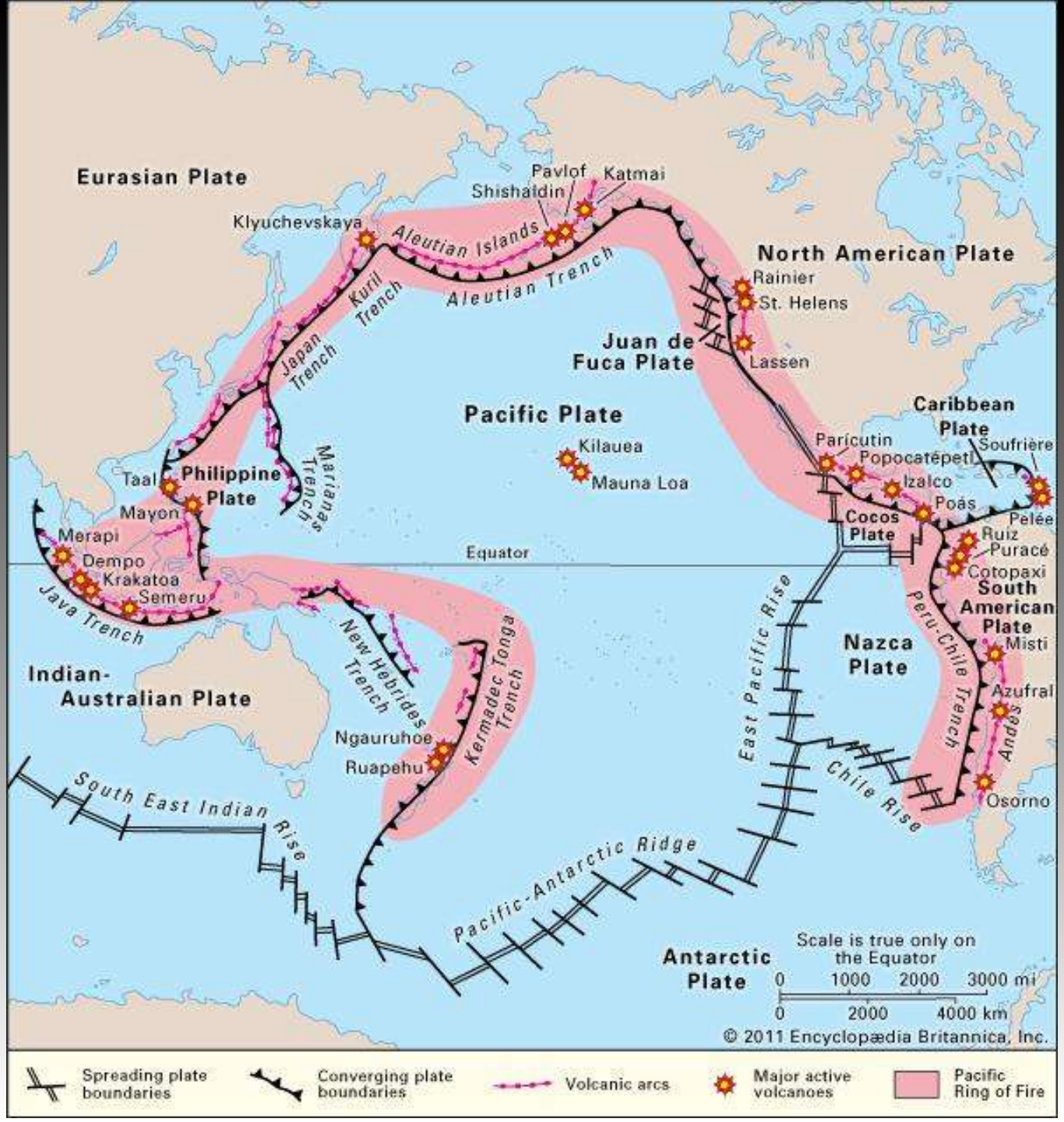
- Geology & Climate of Mt Rainier
- Forest and Plant Communities of Mt Rainier
- Common Birds, Butterflies & Mammals in the Sub-Alpine & Alpine Zones
- Common Flowers, Shrubs and Trees in Sub-Alpine and Alpine Zones in a few common Families
  1) Figwort Family
  2) Saxifrage Family
  3) Rose Family
  4) Heath Family
  5) Special mentions

- Suggested Readings and Concluding Statements

Bewildering Complexity & Numbers

Stunning Beauty

Recognizable Patterns & Plants


Eurasian Plate
Pavlof
Katmai
Shishaldin
Klyuchevskaya
Aleutian Islands
North American Plate
Rainier
St. Helens
Aleutian Trench
Kuril Trench
Japan Trench
Juan de Fuca Plate
Lassen
Pacific Plate
Caribbean Plate
Kilauea
Parícutin
Soufrière
Popocatépetl
Mauna Loa
Taal
Philippine Plate
Izalco
Poás
Pelée
Mayon
Mariana Trench
Cocos Plate
Ruiz
Merapi
Puracé
Dempo
Equator
Cotopaxi
Krakatoa
South American Plate
Semeru
Java Trench
East Pacific Rise
Peru-Chile Trench
Misti
Nazca Plate
New Hebrides Trench
Kermadec Tonga Trench
Indian-Australian Plate
Azufral
Andes
Ngauruhoe
Ruapehu
Osorno
South East Indian Rise
Chile Rise
Pacific-Antarctic Ridge
Antarctic Plate
Scale is true only on the Equator
0 1000 2000 3000 mi
0 2000 4000 km
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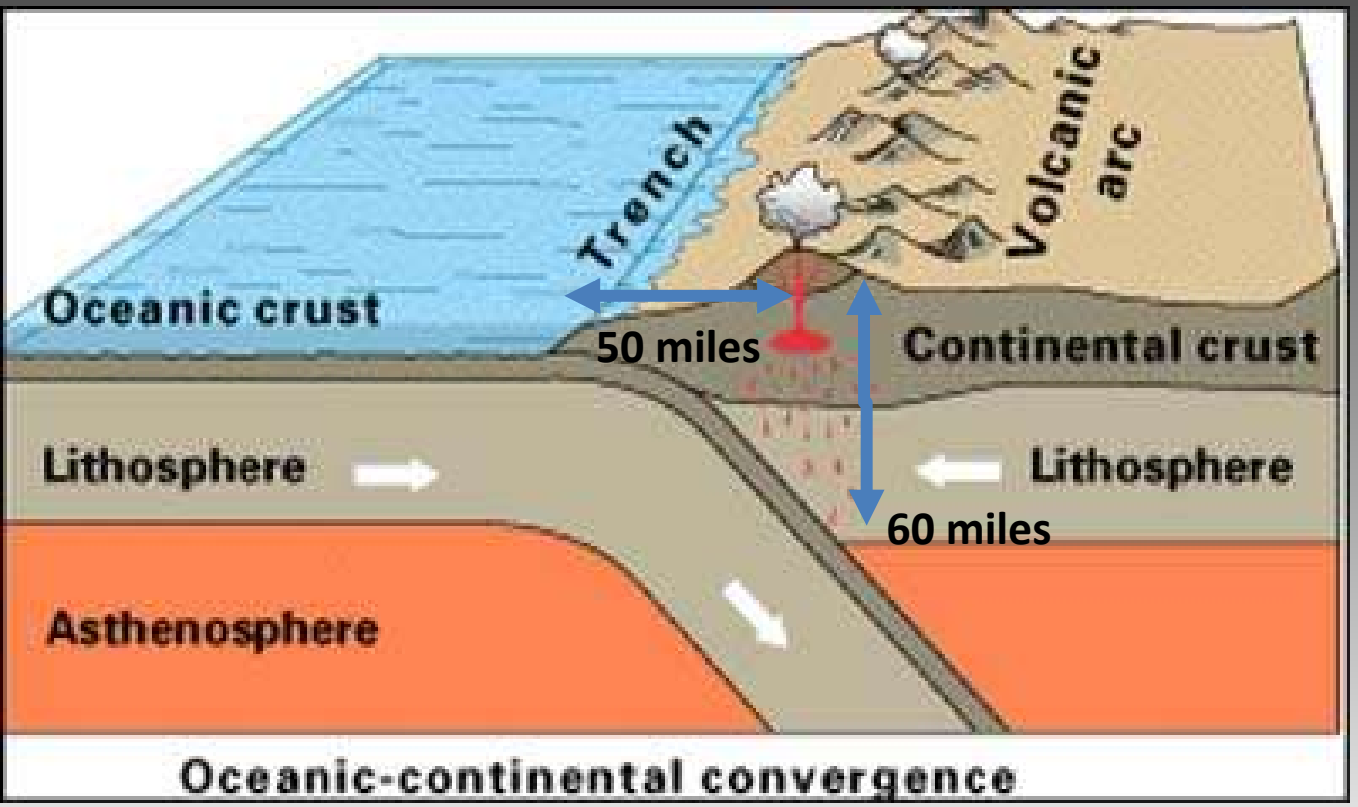
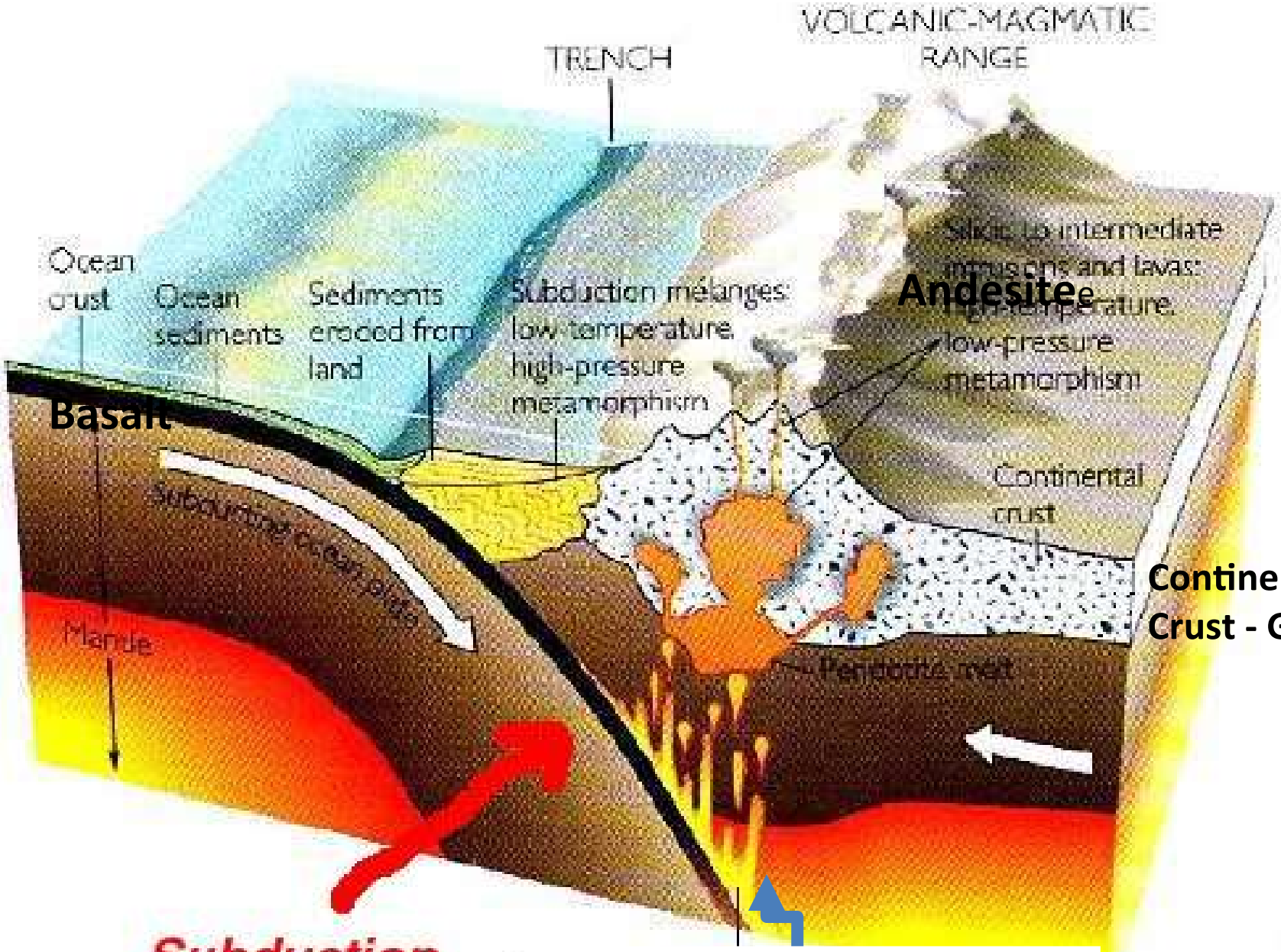
Spreading plate boundaries
Converging plate boundaries
Volcanic arcs
Major active volcanoes
Pacific Ring of Fire


Trench
Volcanic arc
Oceanic crust
50 miles
Continental crust
Lithosphere
Lithosphere
60 miles
Asthenosphere
Oceanic-continental convergence



Continental Crust - Granite

Water vaporizes & rises.
Partial melt of ocean crust.

Igneous Rocks

Plutonic
Cools very slowly

Granodiorite **Diorite**

continuum

Granite
High in quartz

Gabbro
No quartz

Volcanic

Cools very fast

continuum

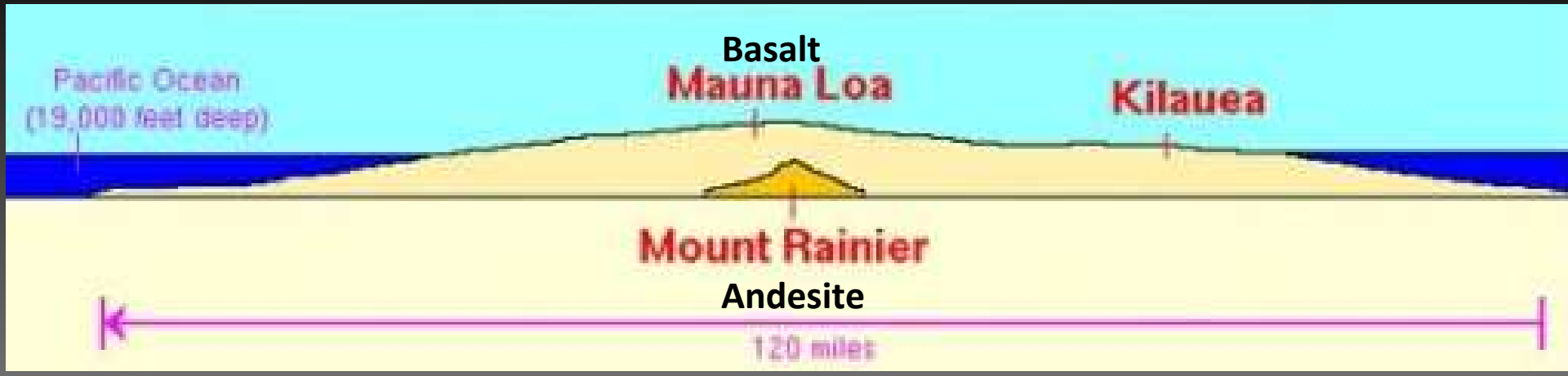
continuum

Rhyolite
High in quartz
Viscous
Lots of water

Andesite
Fairly viscous.
Imprecise.
Any medium gray volc. rock in Cascades.

Basalt
No quartz
Fluid
Little water

Shield Volcano vs Stratovolcano



Why steep & strong slopes?

For Mt Rainier, some andesite eruptions produced mostly ash & fragments, others lava flows. So the mountain has angular rubble with lava flows knitting the structure together.

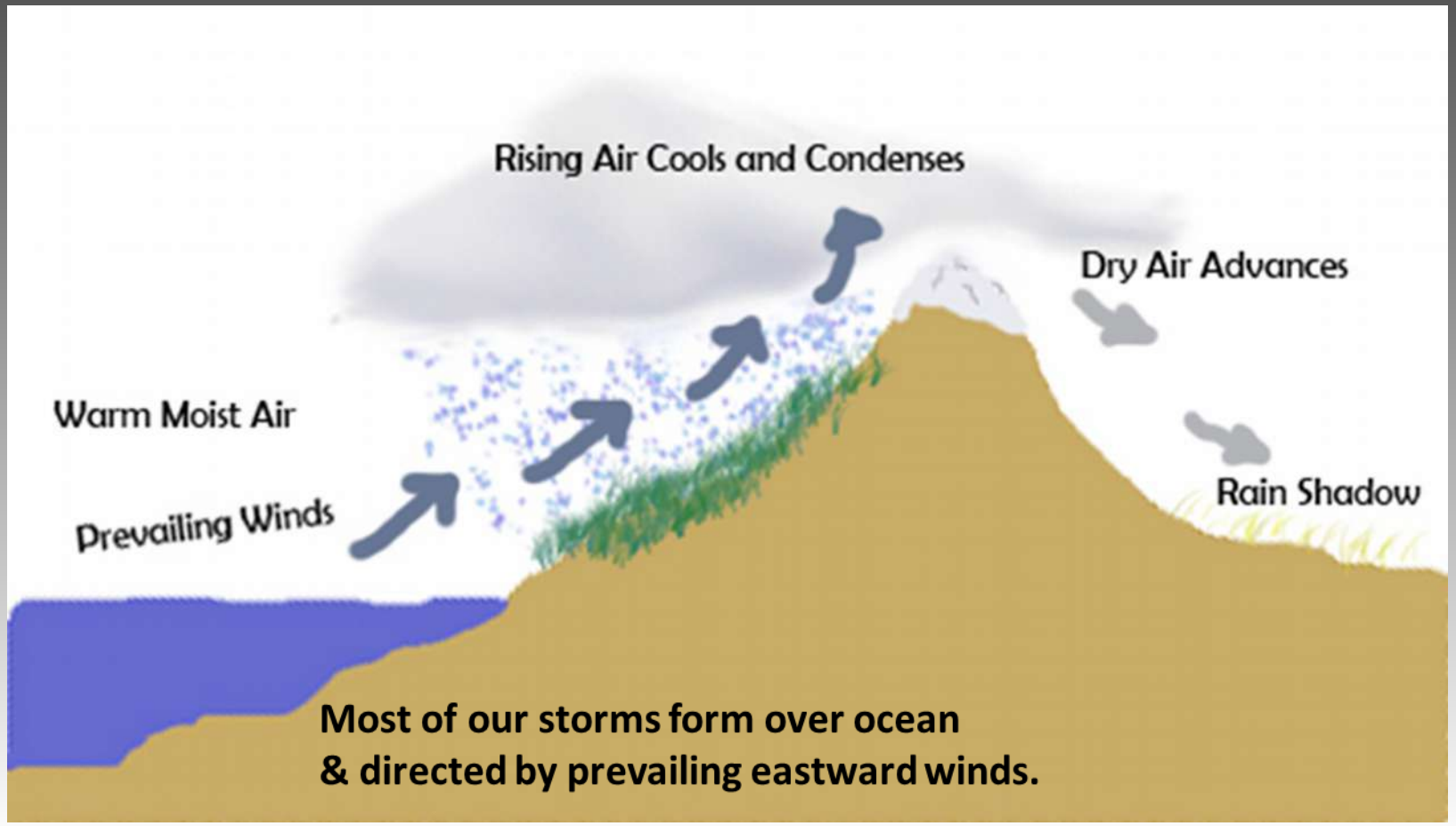
Life history

- About 50,000 years old. Typical volcano exists for 2 million yeas.
- High Cascade volcanic chain started activity 12 million years ago.
- Most Cascade volcano's career started by erupting basalt filling river valleys becoming a shield like volcano. But Mt. Rainier is not floored by basalt.
- It is erecting a large volcanic cone erupting varieties of andesite (without a lot of variation).
- Lavas are viscous & did not flow great distances & many of the flows are exceptionally thick.
- If it finishes with rhyolite lava, it may finally destroy itself in a great cataclysm.

The famous eruption of 1980 that destroyed the beautiful conical form of St. Helens produced lava that was very close to rhyolite.

Climate of Mt Rainier

- The location of the Park is on the west side of the Cascade Divide, but because it is so massive it produces its own rain shadow.
- Most moisture is dropped on the south and west sides, while the northeast side can be comparatively dry.



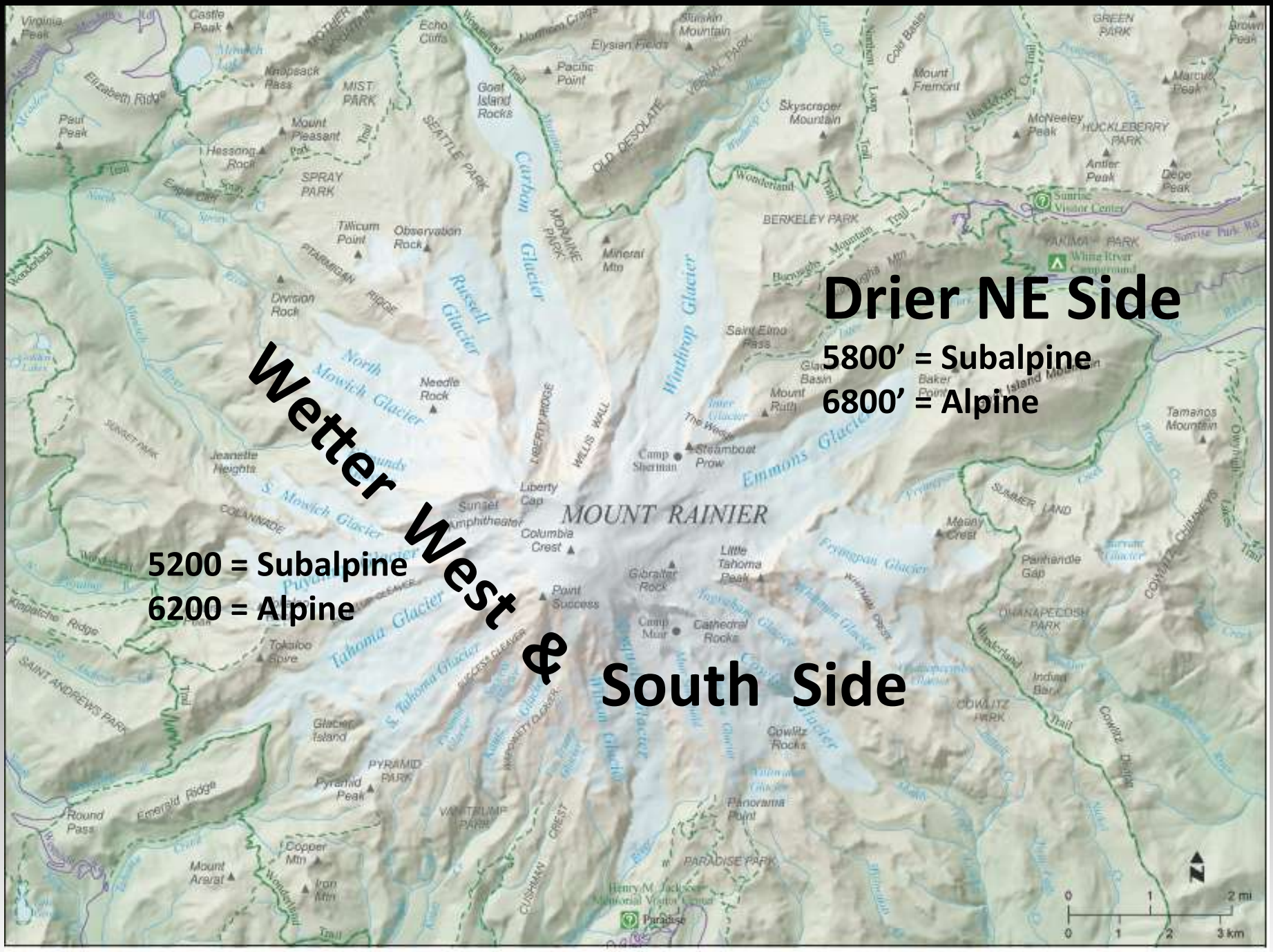


Figure 41. Mount Rainier's glaciers. Mount Rainier has the largest collection of glaciers of any single peak in the conterminous United States. The glaciers not only help carve the volcano's edifice, but

Climate of Mt Rainier

- Special microclimates result from unique interactions of landforms and weather patterns.

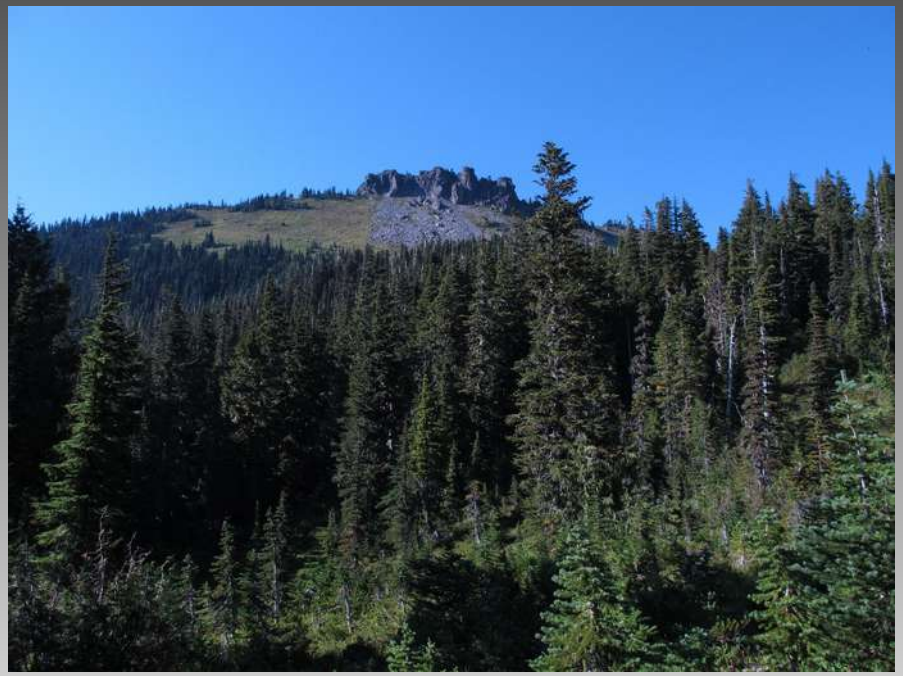
- Knowing the amount of snow/rainfall and how the unique microclimates affect the vegetation will give you an idea of what will thrive in the area you visit.

Forest and Plant Communities of Mt Rainier

- The zones show regular patterns that result in "associations" of certain shrubs and herbs relating to the dominant, climax tree species.
- The nature of the understory vegetation is largely determined by the amount of **moisture** available and the **microclimates** that exist.

Forest Zones of Mt Rainier

- Western Hemlock Zone – below 3,000 ft
- Silver Fir Zone – between 2,500 and 4,700 ft
- **Mountain Hemlock Zone** – above 4,000 ft
  - Mt. Hemlock
  - Subalpine Fir
  - Alaskan Yellow Cedar



Since most of the field trips will start above 4,000 ftwe will only discuss plants found in the Mountain Hemlock Zone and above.
This zone includes the Sub-Alpine and Alpine Plant communities.

Forest and Plant Communities of Mt Rainier

Subalpine Meadows

- An elevational zone just below timberline but above the reach of continuous tree or shrub cover. From 5000' to about 7000'. About 23 % of park.
- Tree cover & location of plant comm. is limited by the depth & duration of the snow pack.
- Rapid growing & reproducing plants = best forage for ungulates as well as smaller mammals & birds. More productive than dense, mature forest where nutrients are held in the biomass.
- Support relatively high bird & mammal populations.

Forest and Plant Communities of Mt Rainier

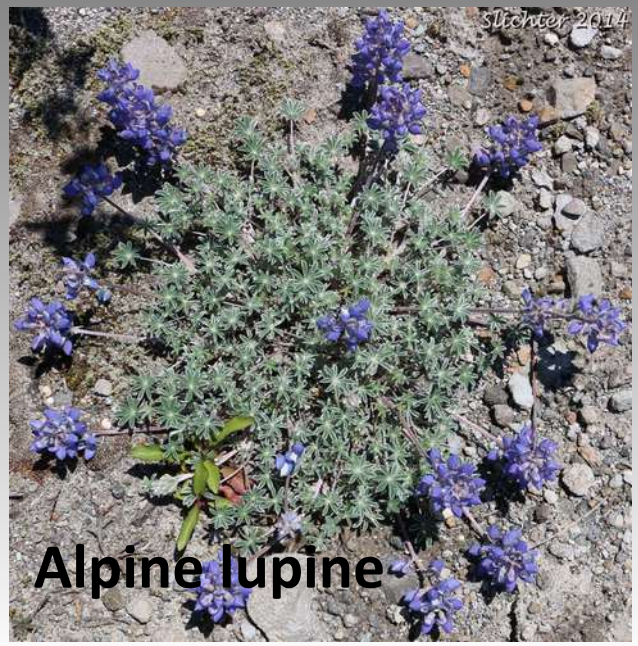
Alpine Zone

- Above the last outposts of trees to the mountain's summit. 50% is permanent snow & ice
- Plants grow in cushions or mats, leaves are often insulated and protected by hairs and roots dig deeply. Best growth on shallow slopes littered with small rocks.

- A very harsh environment with short growing season.
- Floral & faunal diversity decreases.


Typical lowland lupine


Summerland



Alpine lupine

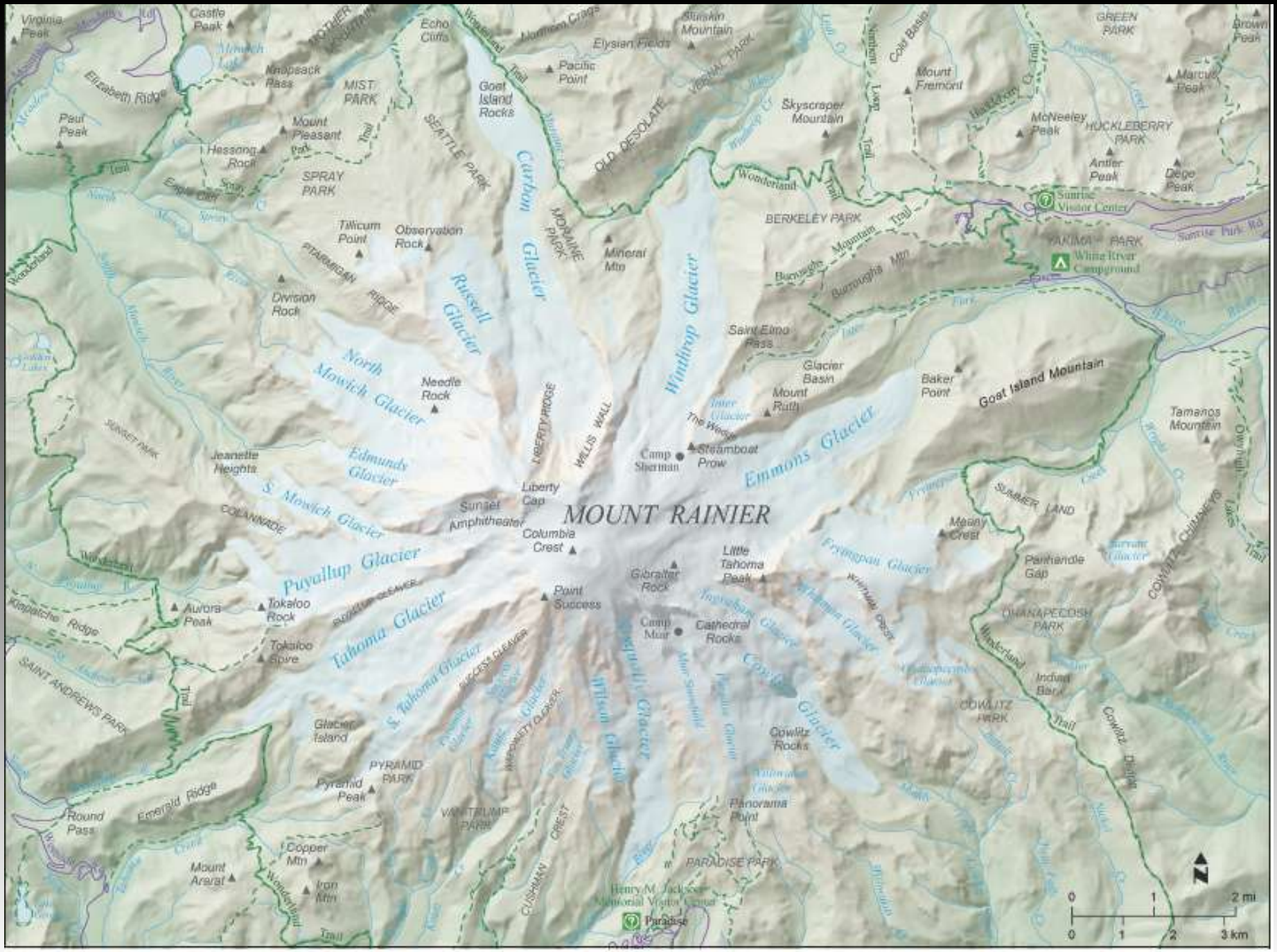
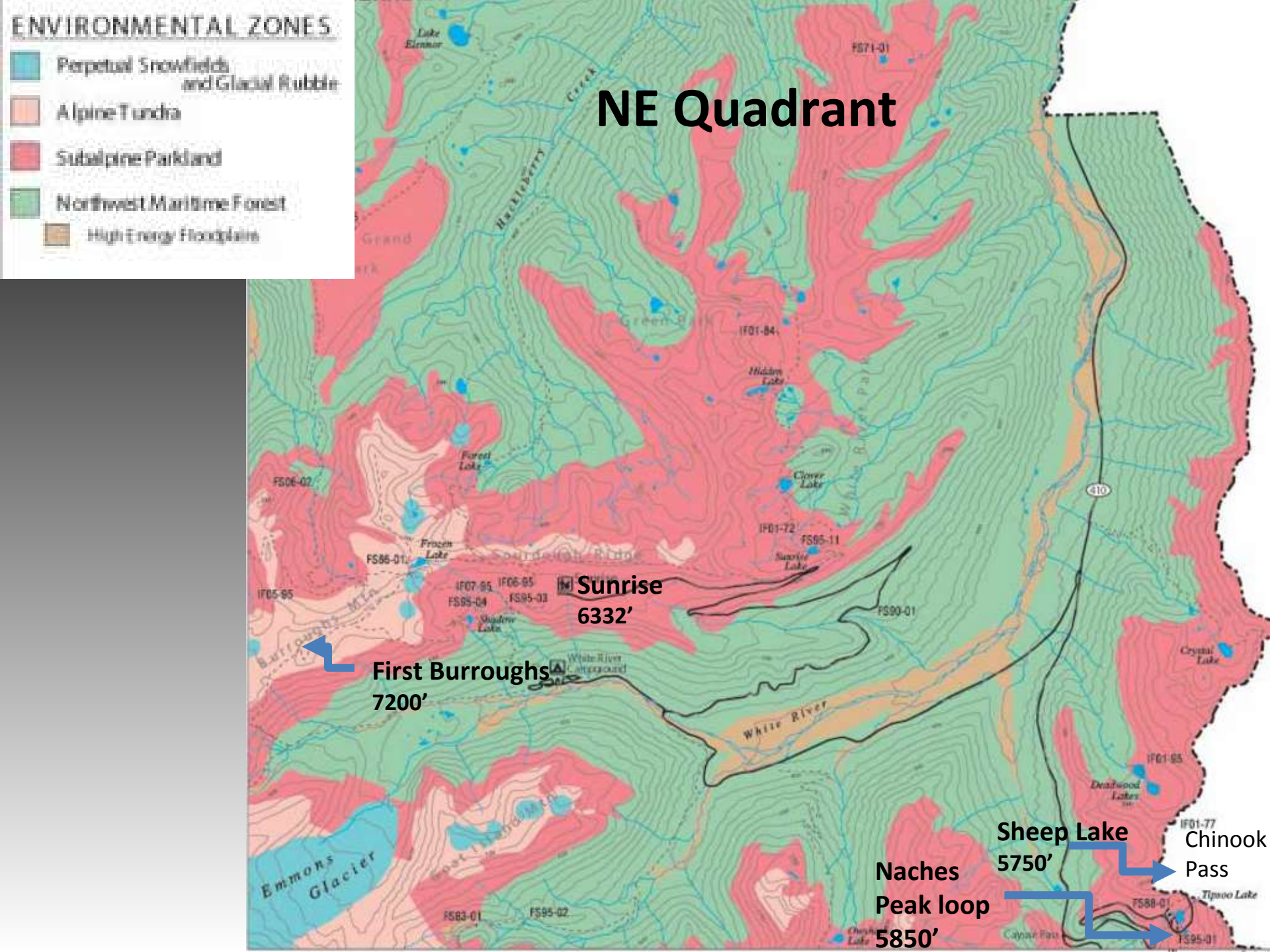
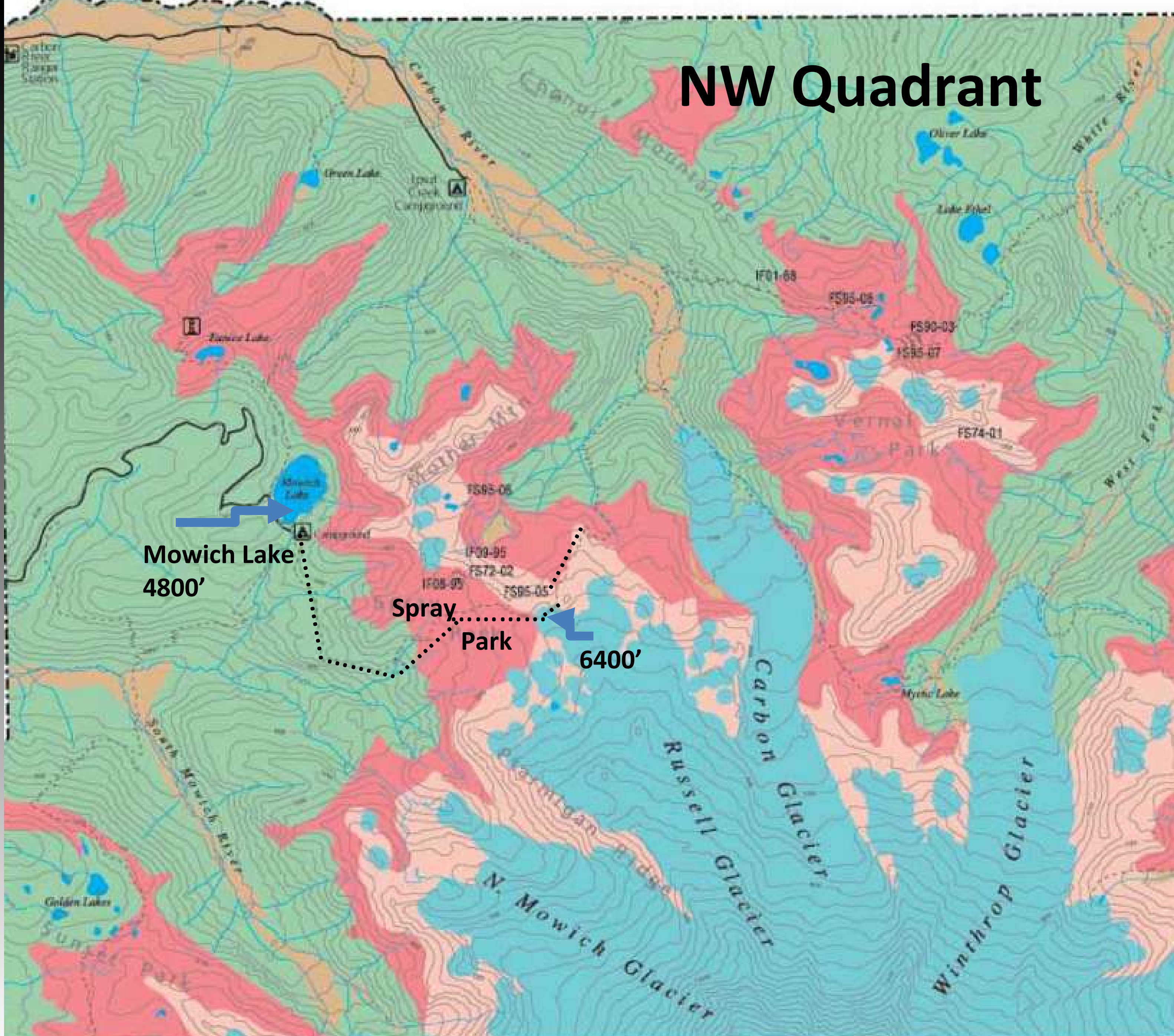


Figure 41. Mount Rainier's glaciers. Mount Rainier has the largest collection of glaciers of any single peak in the conterminous United States. The glaciers not only help carve the volcano's edifice, but also provide a source of water for lahars and are conductors for hydrothermal alteration.


ENVIRONMENTAL ZONES
Perpetual Snowfields and Glacial Rubble
Alpine Tundra
Subalpine Parkland
Northwest Maritime Forest
High Energy Floodplains
NE Quadrant
Sunrise
6332’
First Burroughs
7200’
Sheep Lake
5750’
Naches
Peak loop
5850’
Chinook
Pass
White River
Emmons
Glacier
410


NW Quadrant
Mowich Lake
4800'
Spray
Park
6400'
Carbon River
Green Lake
Oliver Lake
Lake Ethel
White River
West Fork
Mowich Lake
Mystic Lake
Golden Lakes
Sunset Park
South Mowich River
Carbon Glacier
Russell Glacier
Winthrop Glacier
N. Mowich Glacier
Ptarmigan Ridge
FS95-05
FS95-06
FS95-07
FS90-03
FS74-01
FS72-02
IF01-68
IF09-95
IF08-95

Some Subalpine birds in Sunrise Area

A. For 3 miles to the road end, the road traverses large meadows with dense clusters of subalpine tree species.

B. Around the visitor's Center -- very good

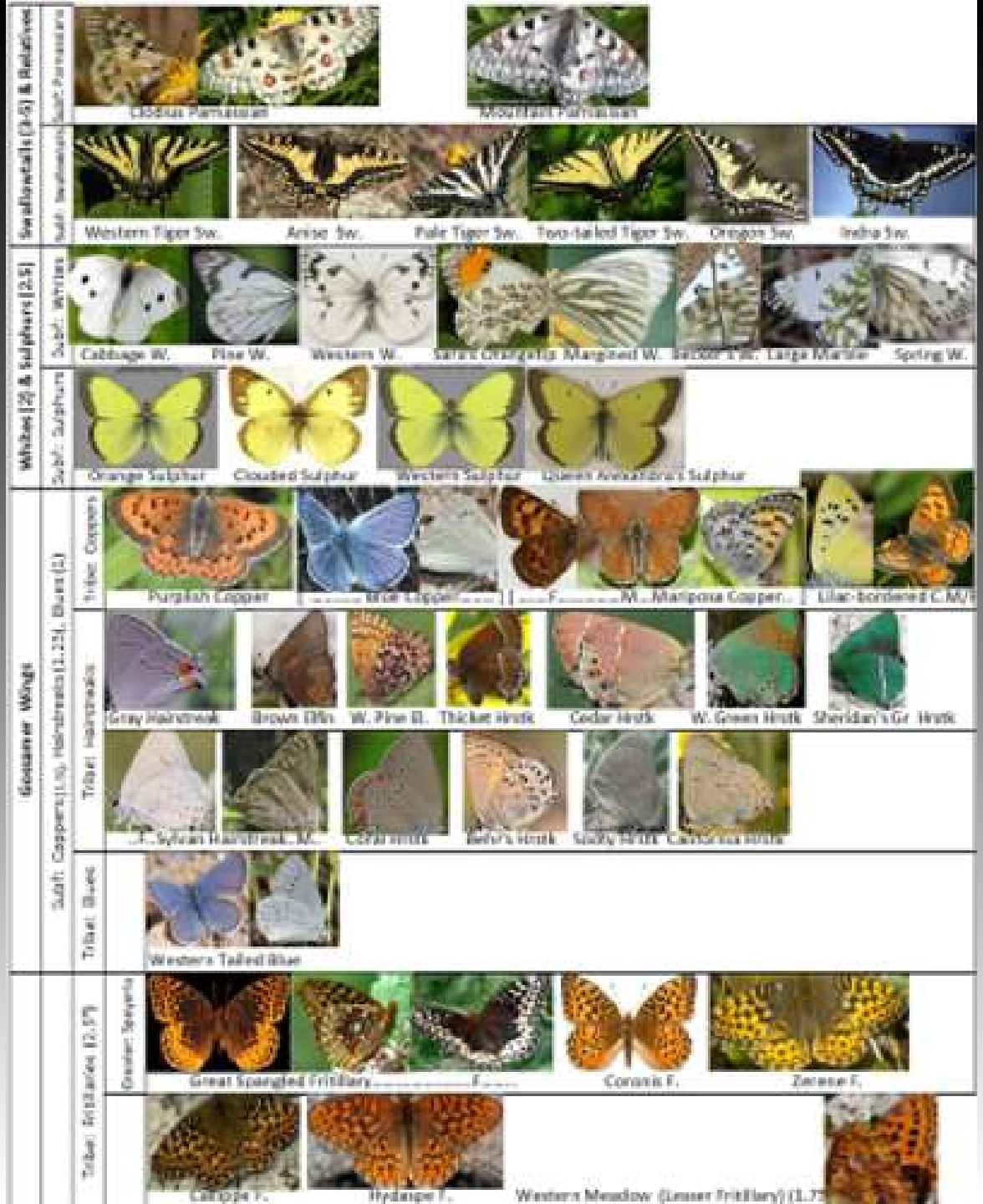
Some true Alpine birds in Sunrise Area (Frozen Lake, 6,750')


Horned Lark


Gray-crowned Rosy-Finch


American Pipit


White-tailed Ptarmigan



5 Families worldwide

Pay special attention to 8 groups

Size & color pattern.

Chart → Book

** on the survey I am about to show you

- Generally see a lot

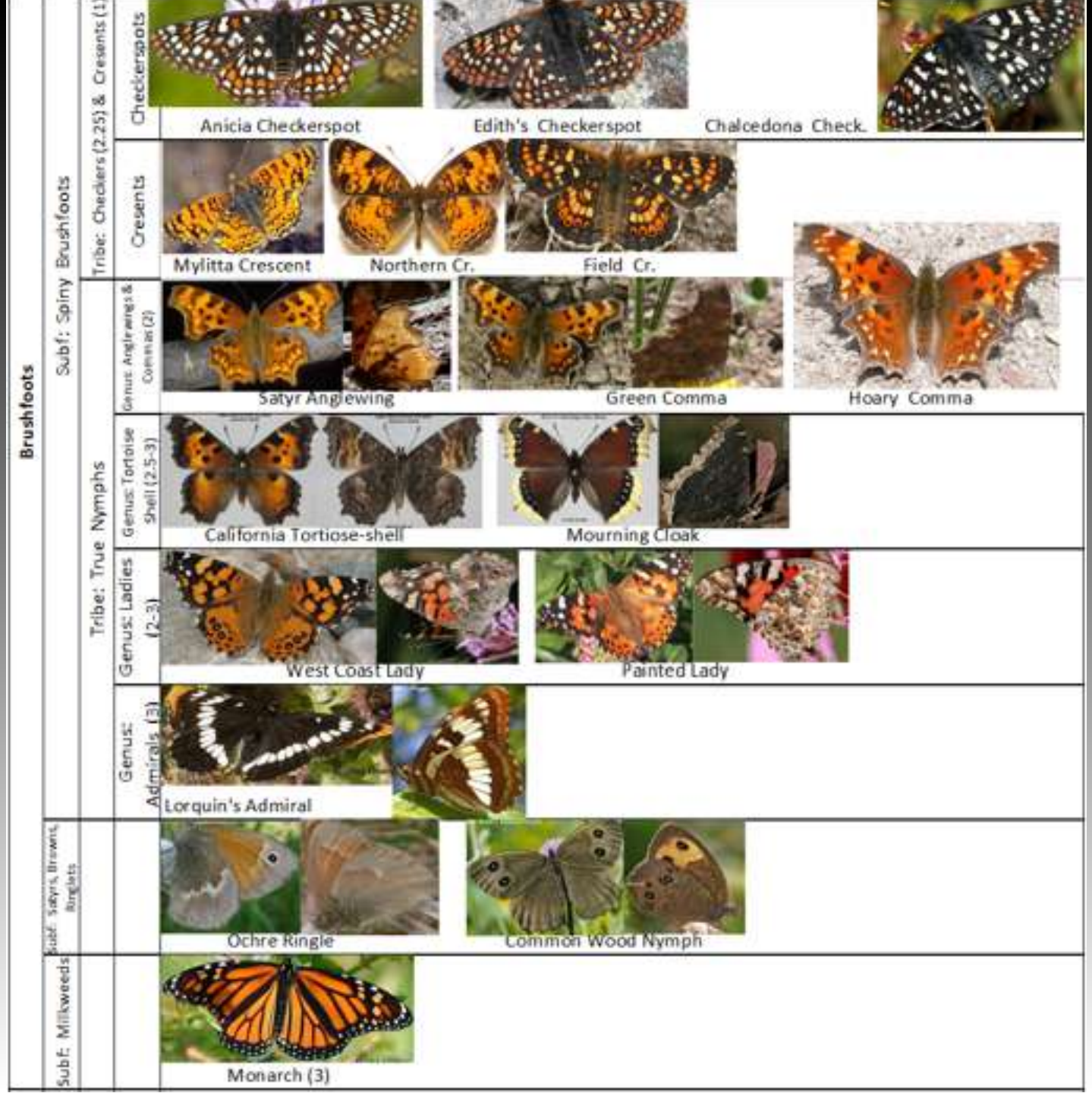
**

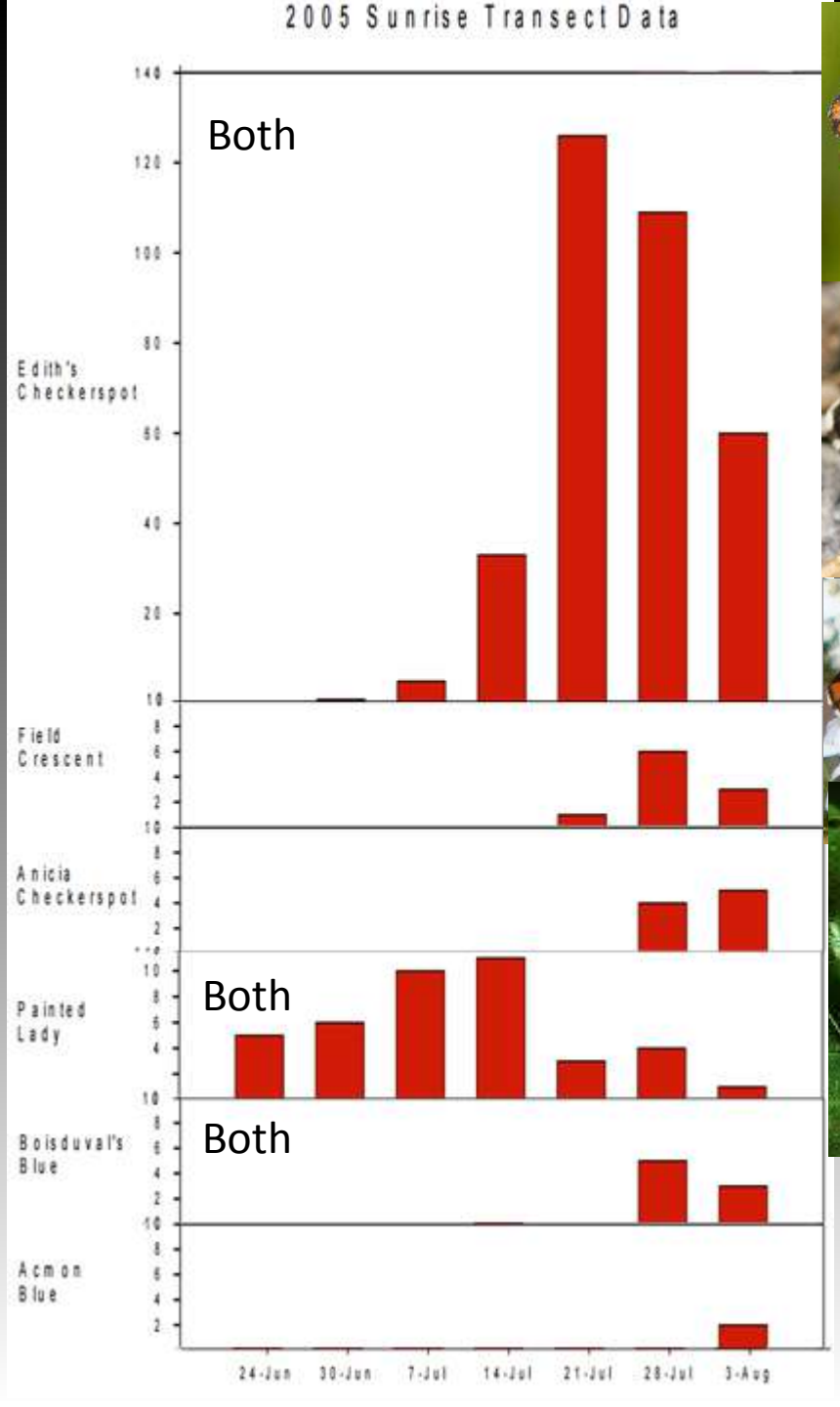
*

**

**

*


Brushfoots
Subf: Spiny Brushfoots
Tribe: Checkers (2-25) & Crescents (1)
Checkerspots
Anicia Checkerspot
Edith's Checkerspot
Chalcedona Check.
Crescents
Mylitta Crescent
Northern Cr.
Field Cr.
Tribe: True Nymphs
Genus: Anglewings & Commas (2)
Satyr Anglewing
Green Comma
Hoary Comma
Genus: Tortoise Shell (2.5-3)
California Tortiose-shell
Mourning Cloak
Genus: Ladies (2-3)
West Coast Lady
Painted Lady
Genus: Admirals (3)
Lorquin's Admiral
Subf: Satyrs, Browns, Ringlets
Ochre Ringle
Common Wood Nymph
Subf: Milkweeds
Monarch (3)



2 ¼”

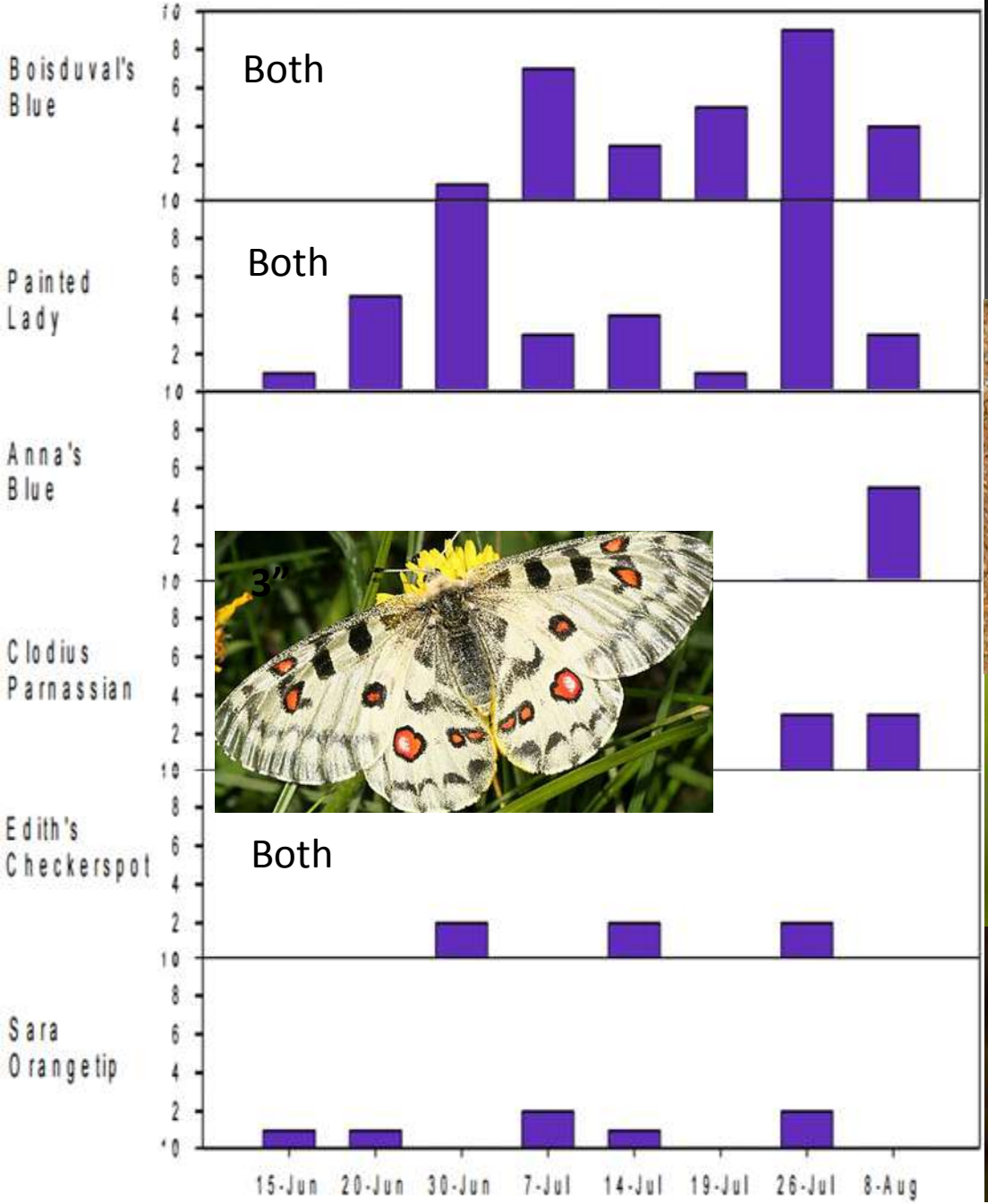
1”

Fritillaries 2 ½” similar

2 to 3”

1”

2005 Chinook Pass Transect Data



1”

2 to 3”

2 ¼”

2”

Subalpine Fauna in Mt. Rainier N.P.

1. Red fox
2. Washington weasel
3. Canada lynx
4. Mountain lemming mou
5. Rainier meadow mouse
6. Large-footed mouse
7. Oregon & heather voles
8. Rainier pocket gopher
9. Hoary marmot
10. Yellow pine chipmunk
11. Townsend chipmunk
12. Mantled ground squirrel
13. Snowshoe hare
14. Pika
15. Pine marten
16. Coyote
17. Black bear
18. Mountain lion
19. Elk
20. Black-tailed deer

Some Alpine Fauna in Mt. Rainier N.P.

These feed during the brief July through September summer.

1. Mountain goats
2. Pika
3. Marmots
4. Some small rodents

Forest and Plant Communities of Mt Rainier

Subalpine Meadows of Mount Rainier

- Divided into 5 groups (J Henderson 1988):
  1) Heather-Bell-heather-Huckleberry Communities
  2) Sitka Valarian-Showy Sedge Communities
  3) Black Alpine Sedge Communities
  4) Low Herbaceous Communities
  5) Mountain Bunchgress Communities

Subalpine Meadows of Mount Rainier

1. Heather-Bell-heather-Huckleberry Communities

- Dense, low shrubs dominated by heather & huckleberry.
- South and west sides of Mt Rainier.

- **Heath Family -** White, Pink and Yellow Heathers ; Cascade Blueberry

Also

1) ***Pea Family -*** *Sub-alpine Lupine*
2) **Aster Family -** Woolly Pussytoes
3) **Rose Family -** Partridgefoot
5) **Broomrape Family --** Magenta Paintbrush; Bird's Beak Lousewort
6) **Buckwheat Family-** American Bistort
7) **Grass Family-** Mountain Hairgrass

Subalpine Meadows of Mount Rainier

2. Sitka Valarian-Showy Sedge Communities

- Tall, dense, lush stands of perennial wildflowers that are found all around the park. Especially on the south and west sides of the Park,
- On moderate to steep slopes
- The growth of shrubs (including the heathers and huckleberries) and trees is suppressed by avalanches.
- In addition to **Sitka Valerian & Showy Sedge****, important species include:

Also:

1) **Pea Family** - Sub-alpine lupine **
2) **Buckwheat Family -** American bistort **
3) **False Hellebore Family** - Green false hellebore
4) **Lily Family** - Glacier lily; Avalanche lily
5) **Buttercup Family -** Western pasqueflower**
6) **Broomrape Family** - Magenta paintbrush
7) **Aster Family** - Subalpine daisy**
8) **Parsley Family**-Cow parsnip; Gray's lovage
9) **Rose Family** - Fan-leaf cinquefoil

Subalpine Meadows of Mount Rainier

3. Black Alpine Sedge Communities

- Dense mats of black sedge.
- Areas with persistent late-season snow.
- Very short growing season.

Also:

1) **Pea Family** - Sub-alpine lupine
2) **Aster Family** - Tundra aster
3) **Rose Family** - Fan-leaf cinqufoil , Partridgefoot
4) **Evening Primrose Family** - Alpine willow-herb
5) **Grass Family** - Mountain hairgrass

Showy Sedge

Sedge Family –
Black alpine sedge**
and Showy sedge**

Subalpine Meadows of Mount Rainier

4. Low Herbaceous Communities

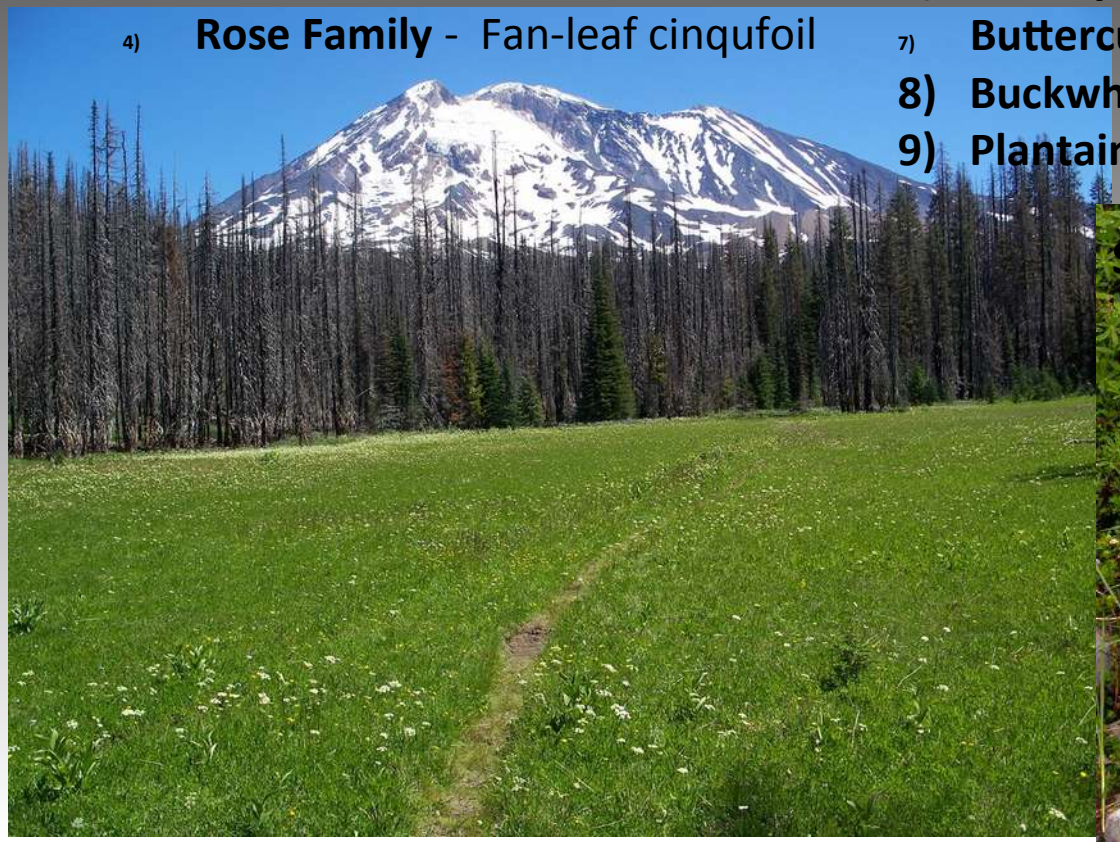
- Dominated by mosses, in areas of disturbance or unstable soil.
- Vegetation grows in clumps, possibly with patches of bare ground visible.
  1) **Sedge Family** - Black alpine sedge**
  2) **Saxifrage Family** - Tolmie's saxifrage**
  3) **Aster Family** - Slender hawkweed
  4) **Rose Family** - Partridgefoot**, Wooly pussytoes
  5) **Purslane Family** - Pussypaws
  6) **Valerian Family** - Sitka valarian
  7) **Grass Family** - Mountain hairgrass

Subalpine Meadows of Mount Rainier

5. Mountain Bunchgrass Communities

- Grassy meadows of Mountain Bunchgrass
- On the drier east side of the park, which receives less snow & rain (rain shadow)
- Soils are dry and loose. The prevailing wind has, over the centuries, favored the area with pumice and ash from eruptions (Sunrise timberline).

1) **Grass Family** - Green mountain bunchgrass **
2) **Sedge Family** - Showy sedge**
3) **Aster Family** - Cascade aster**
4) **Rose Family** - Fan-leaf cinqufoil
5) **Purslane Family** - Western springbeauty
6) **Parsley Family** - Gray's lovage
7) **Buttercup Family** - Western pasqueflower;
8) **Buckwheat Family** - American bistort
9) **Plantain Family** - Cusick's veronica



Alpine Meadows of Mount Rainier

- From treeline to the mountain summit. Type and location of vegetation is controlled by length of the growing season, slope, and exposure to the sun
- Permanent snow and ice covers about 50 percent of the zone. Alpine vegetation covers the remainder---divided into four broad vegetation types (Edwards 1980):
  1) **Fellfields** - Areas with gentle slopes covered by small rocks, and small persistent patches of snow. Has small dispersed groups of plants.
  2) **Talus Slopes and Ridgetops** - Steep, unstable areas. First to be snow free so have a longer growing season. Small, groups of plants often overlooked
  3) **Snow beds**-have the shortest growing season. Areas can have meadows with cold wet soil, streams and tarns.
  4) **Heather Communities**. Oldest known community of vegetation in the park. Persisted for up to 10,000 years.

Alpine Plants

Pussypaws, Golden draba, Golden daisy, Elegant Jacob's Ladder, Dwarf lupine, Tolmei's Saxifrage, Alpine buckwheat, Alpine willow-herb, Smelowskia, stonecrops--- and of course the heathers.


Pussypaws

Dwarf Lupine


Smelowskia


Elegant Jacob's Ladder


Alpine Buckwheat


Pink Mt. Heather

Some common flowers, shrubs & trees in the subalpine & alpine zones of Mt. Rainier N.P.


The Figwort* Family (Scrophulariaceae) includes some of the NW's most interesting flowers.
Mount Rainer is a great place to see all of the Figwort* species.

Family Key

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 → Mint
Figwort

Petals free → Pea
Violet
Buttercup - some

Flowers with radial symmetry

Many **small flowers in tight bunches** → Buckwheat
Parsley
Waterleaf
Valerian
Rose - some

Flowers not in tight bunches

Flowers with **central clusters** or seemingly so
(more than 10 stamens crowding the center) → Buttercup
Rose
Sunflower – technically belongs with "Many small flowers in tight bunches"

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

Petals fused → Heath
Phlox
Primrose
Borage

Petals free (or nearly so) → Pink
Purslane
Saxifrage

The Figwort* Family was recently split into other families as the result of genetic studies:

- Broomrape Family (Orobanchaceae)
  - Louseworts
  - Paintbrushes
- Lopseed Family (Phrymaceae)
  - Monkey-flowers
- Plaintain Family (Plantaginaceae)
  - Penstemons
  - Veronicas

The Figwort* Family was recently split into other families as the result of genetic studies:

- Broomrape Family (Orobanchaceae)
  - Louseworts
  - Paintbrushes

Family: **Broomrape Family** (Orobanchaceae)

- The Broomrapes are annual or perennial herbs or shrubs.
- They are either fully (holoparasitic) or partly (hemiparasitic) parasitic on the roots of other.

- The traditional family included only genera lacking chlorophyll and fully parasitic, which are easy to recognize since the vegetation isn't green.

- Taxonomists have expanded the family to include partially parasitic (hemiparasitic) genera, which were formerly included in the Figwort family. These plants have chlorophyll and produce their own energy through photosynthesis, so they are not wholly dependent on their host plants.

- Because broomrapes appear several meters away from their hosts, it is inadvisable to assume that the closest or most numerous plant species in the broomrape's vicinity are the hosts, particularly if the broomrapes in question are of a type that use more than one species of plant as hosts.

Naked broom-rape
(Orobanche uniflora)
fully parasitic plant

The Figwort* Family was recently split into other families as the result of genetic studies:

- Broomrape Family (Orobanchaceae)
  - Louseworts (a genus) (6)

Louseworts *or Pedicularis* have perhaps 500 *hemiparasitic* species that produce *haustorial* connections upon contact with roots of surrounding host plants. There is no known host specificity. With a few exceptions, species in our area are restricted to high elevations.

- Name comes from ancient superstition that cattle gets "lousy" (having lice) by eating louseworts.
- Each flower shape fits the anatomy of a particular species of insect pollinator and in a few instances, hummingbirds.
- Irregular tubular flowers The upper lip is 2-lobed, the lower lip is 3-lobed.

Hemiparasitic – a green plant that obtains nutrients via parasitism, but also manufactures its own food through photosynthesis.

Haustorial---the portion of a parasitic plant or fungus that penetrates the host's tissue and derives nutrients from it.

Figwort (Broomrape)Family

Louseworts (Pedicularis) (a genus)

General
1 – 2’ high

Leaves
Mostly basal
Mostly fern like

Several species of Louseworts

Sickletop Lousewort

Bracted Lousewort

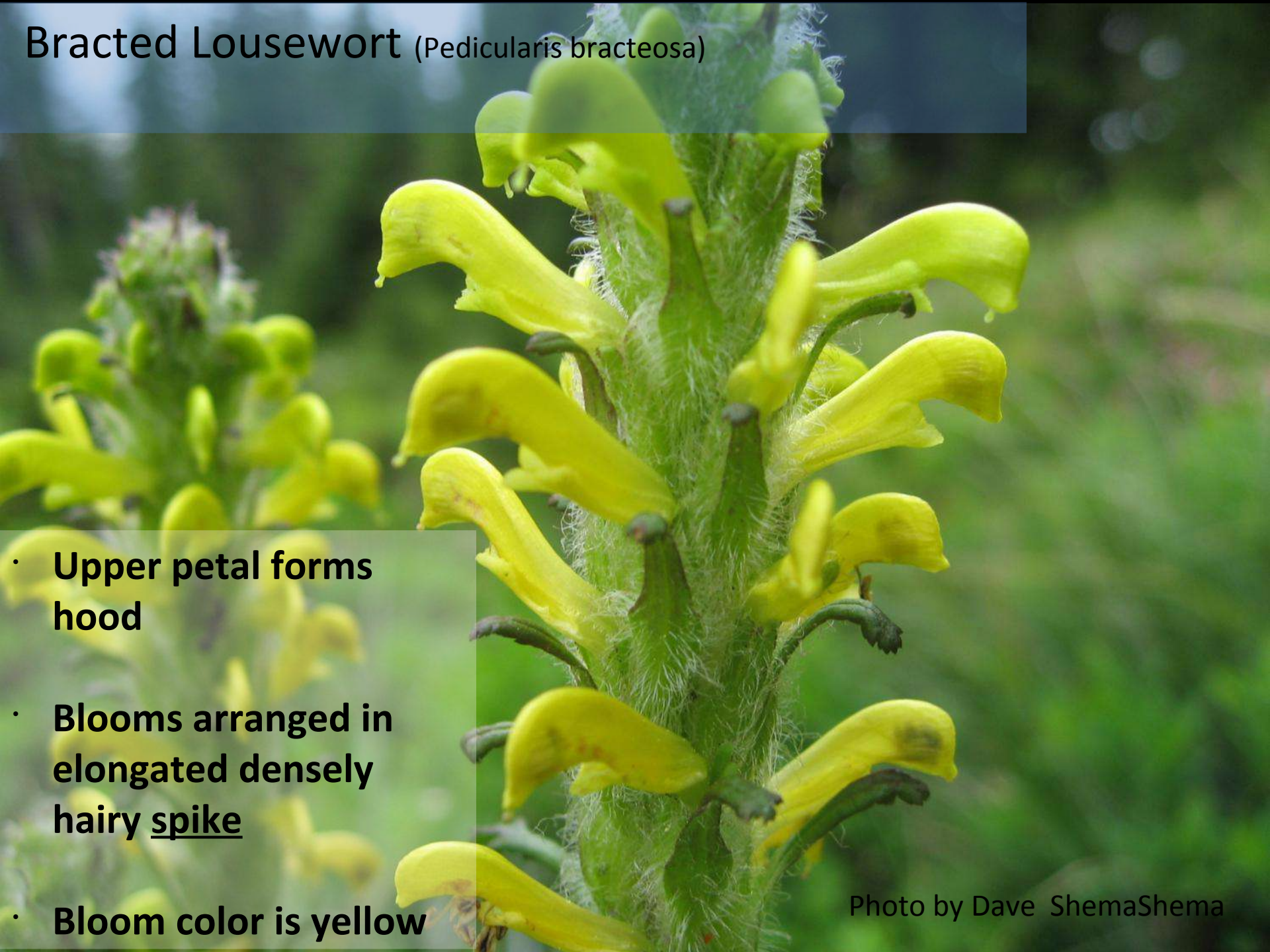
Bird's Beak Lousewort

Elephant's Head

Mt. Rainier Lousewort

Coiled-Beak Lousewort

Bracted Lousewort (Pedicularis bracteosa)



- **Upper petal forms hood**
- **Blooms arranged in elongated densely hairy spike**
- **Bloom color is yellow**

Photo by Dave ShemaShema

Bracted Lousewort

- **Leaves alternate up stem and are <u>ferny looking</u>**
- **Plant grows to be the <u>tallest</u> lousewort in the NW, 1’-4’**
- **<u>Common</u>**

Mt Rainier Lousewort (Pedicularis rainierensis)

- **Blooms are clustered at the top**
- **Plant is smaller than the Bracted Lousewort, 6”-14”**
- **Endemic to Mt. R. +**

Photo by Dave Shema

Mt Rainier Lousewort

- **Looks like a <u>pinwheel</u> from above**
- **Way cool**

Photo by Dave Shema

Coiled Beak Lousewort (Pedicularis contorta

- **Top Petal forms <u>downward</u> <u>twisted beak</u>**
- **Flower mostly white with <u>freckles</u>**

Coiled Beak Lousewort

- **Leaves are <u>fern-like</u>**

Note: Red color in louseworts' leaves is undistinctive. Usually just means plant has gotten more sun.

Photo by Dave Shema and Drawings by Ed Dominguez

Bird's Beak Lousewort (Pedicularis ornithoryncha)

- **Top petal forms a <u>downward bird beak</u> shape**
- **Blooms in pink/purple color**

Bird's Beak Lousewort

- **Blooms near <u>top</u> of stem**
- **Leaves near <u>base</u> of plant**

Sickletop (or Rams Horn) Lousewort

- **Flowers pinkish**
- **Top petal forms <u>downward twist</u>**

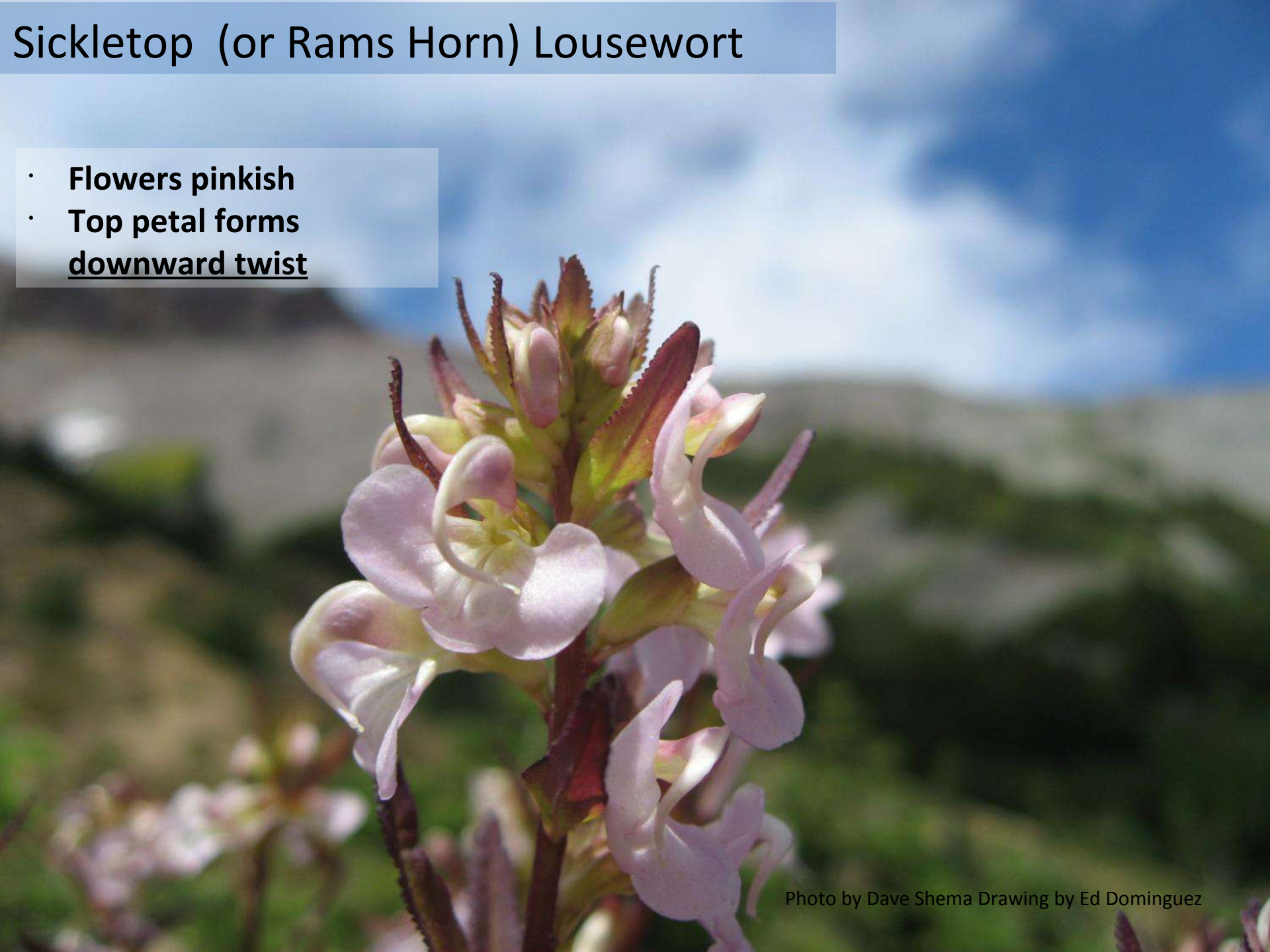


Photo by Dave Shema Drawing by Ed Dominguez

Sickletop (or Rams Horn) Lousewort

- **Leaves are <u>lance-shaped</u>**

Photo by Dave Shema

Elephant's Head Lousewort (Pedicularis Groenlandica)

- **Blooms pinkish-purple to reddish purple**
- **<u>Top petal long and curling upward</u>**

Elephant's Head Lousewort

- **Flower arrangement is <u>dense</u>**
- **Basal leaves, lance shaped, <u>pinnately divided</u> into slender toothed lobes. Often reddish in color**

The Figwort* Family was recently split into other families as the result of genetic studies:

- Broomrape Family (Orobanchaceae)
- Paintbrushes (2)

Indian Paintbrush or Castilleja are also partially parasitic on other plant roots---hemiparasitic.

What is commonly thought of as the flower are the showy and colorful bracts. The actual flower is crowded in the axils of the bract's and the flower's petals are greenish.

The flowers of Indian paintbrush are edible and sweet, and were consumed in moderation by various Native American tribes as a condiment with other fresh greens. However, these plants absorb and concentrate selenium in their tissues from the soils in which they grow, and can be potentially very toxic if the roots or green parts of the plant are consumed. So, you need to be confident of the actual edible part before eating.

Paintbrushes (Castilleja)

General
1 – 1 1/2’ tall

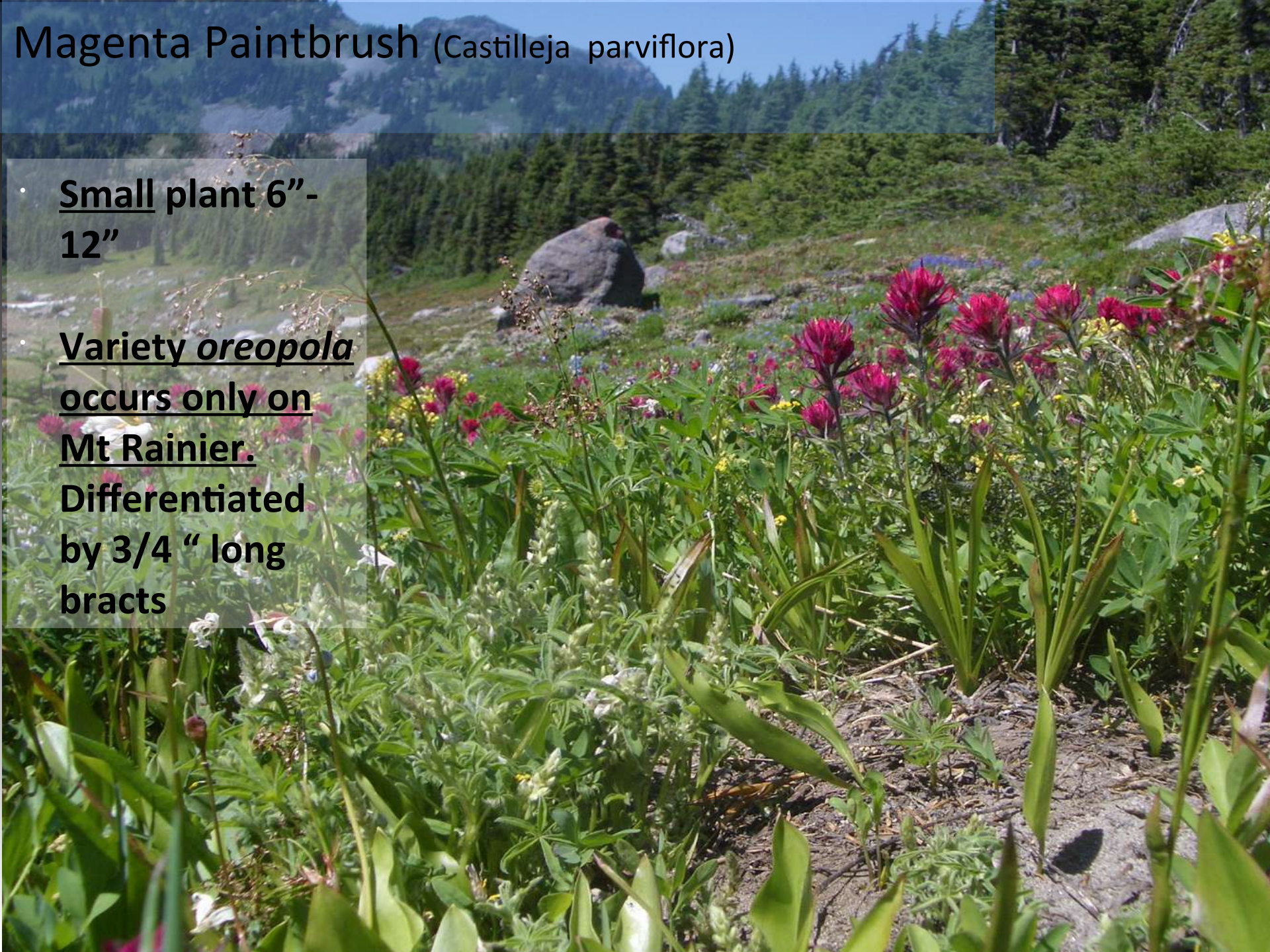
Bracts
“Brush” is not flower. The leafy bracts surround flowers & resemble brush dipped in paint.
Yellowish or reddish.

Leaves
All along stem
Tip lobed or not

Flower
Crowded in axils of showy bracts.
Long, tubular with beaklike tip
Often greenish.

Several types of Paintbrush (species & subspecies)

Magenta Paintbrush (Castilleja parviflora)



- **<u>Small</u> plant 6”-12”**
- **<u>Variety *oreopola*</u> <u>occurs only on Mt Rainier.</u> Differentiated by 3/4 “ long bracts**

Cliff Paintbrush (Castilleja rupicola)

- **Found <u>above 6000 ft</u>**
- **<u>Small</u> plant, 6” high max.**
- **Common on <u>cliffs</u>**

The Figwort* Family was recently split into other families as the result of genetic studies:

- Lopseed Family (Phrymaceae)
  - Monkey-flowers (2)

Family: **Lopseed Family (**Phrymaceae) , (formerly Figwort Family)

A small family, concentrated in two centers of diversity, one in Australia, the other in western North America.

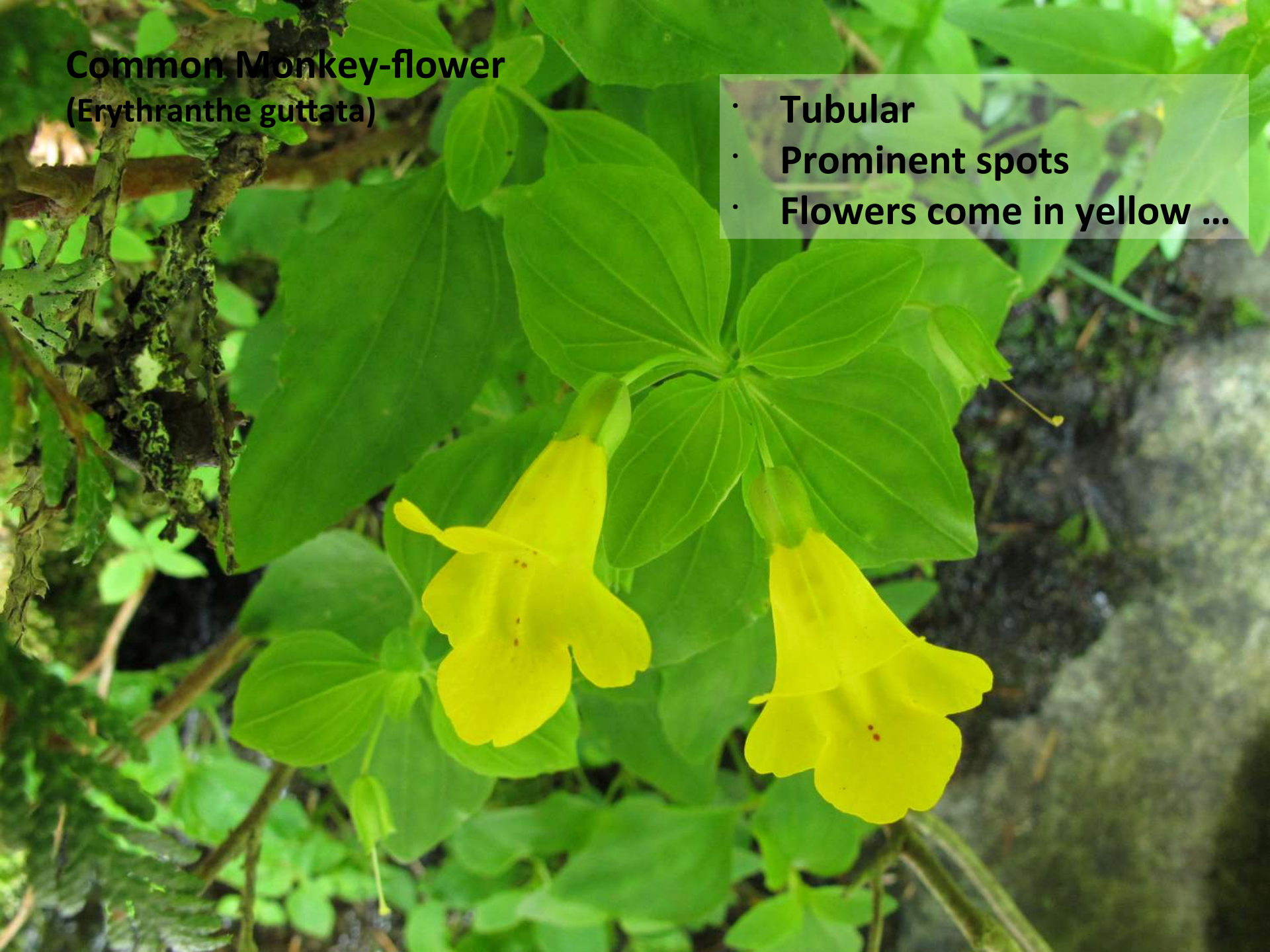
- Members of this family occur in diverse habitats including deserts, river banks and mountains.
- Mostly wet, wet, wet.
- Bearing tubular, bilaterally symmetric flowers---2 upper 3 lower

Lopseed Family (Figwort Family)
Monkeyflower (Erythranthe)

General
Erect – 1-3’
Wet areas .

Leaves
Prominently veined.
Toothed.

Flower
Yellow or pinkish.
“Ahhhh” with
tongue out.


Common Monkey-flower
(Erythranthe guttata)
· Tubular
· Prominent spots
· Flowers come in yellow …

Lewis's monkey-flower- Erythranthe lewisii)

… and pink

There are two upper flower lobes, and three lower

Leaves are opposite and simple

The Figwort* Family was recently split into other families as the result of genetic studies:

- Plaintain Family (Plantaginaceae)
  - Penstemons (2+)
  - Veronicas (1)

Penstemon

Family: **Plantaginaceae**, the **plantain family (Formerly Figwort Family)**

Genus: Penstemon

- 250 species in North America-They are difficult to identify, because the most distinctive feature of the genus is the prominent staminode---an infertile stamen. The staminode takes a variety of forms in the different species.
- Native Americans used penstemon roots to relieve toothache.

Penstemon (Penstemon)

Flower

<u>Tubular</u>

Blue to purple

General

Cushion to erect

Leaves

<u>Opposite.</u>

<u>Toothed or not.</u>

<u>Small or large.</u>

Several types (species) of Penstemon

Small-Flowered Penstemon 1.3’
P. procerus

Hot-Rock Penstemon 2’
P. deustus

Coast Penstemon
or Cascade 2’
P. serrulatus

Davidson’s Penstemon 4”
P. davidsonii

Cliff Penstemon (Penstemon rupicola)

Small plant, 2”-6” high and dense <u>matt forming</u>

Blooms pink or <u>reddish to rose purple</u>

Oval, hairy, evergreen <u>leaves</u>

Photo: Jim Riley-Burke Museum Herbarium

Shrubby Penstemon (Penstamon fruticosus)

- **Spreading semi-evergreen shrub up to 16 in tall, mats to 36 in across**
- **Blooms pink, lavender, or purple**
- **Leaves lance-shaped with pointed tips.**

Woodland beardtongue to 2 ½’

Nothochelone nemorosa

The Figwort* Family was recently split into other families as the result of genetic studies:

- Plaintain Family (Plantaginaceae)
  - Penstemons
  - Veronicas

Plaintain Family (Figwort Family)
Speedwell (Veronica)

General

Erect . 4-8”

Wet areas .

Flower

More weakly bilateral.

4 lobed. 2 stamens.

Generally, long stamens & pistil.

Leaves

Opposite.

Ovate generally.

Cusick’s Speedwell

Veronica cusickii

Saxifrage Family (5)
Leaves

Medium sized &
broad shaped

Leaves

<u>Clearly basal</u>

or tiny & linear

Saxifrage Family Flowers

Most often in <u>clusters, loose or tight</u>

Small. White (usually).

Related to Rose Family: mainly 5s & have hypanthium

Family Key

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 → Mint
Figwort

Petals free → Pea
Violet
Buttercup - some

Flowers with radial symmetry

Many **small flowers in tight bunches** → Buckwheat
Parsley
Waterleaf
Valerian
Rose - some

Flowers not in tight bunches

Flowers with **central clusters** or seemingly so
(more than 10 stamens crowding the center) → Buttercup
Rose
Sunflower – technically belongs with "Many small flowers in tight bunches"

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

Petals fused → Heath
Phlox
Primrose
Borage

Petals free (or nearly so) → Pink
Purslane
Saxifrage

Rusty Saxifrage 1+’

Micranthes ferruginea

- **Anthers have rusty/orange tips**
- **Petals have 2 yellow spots**
- **Flowers irregular---3 upper petals and 2 lower.**

Tolmie's Saxifrage (Micranthes tolmiei)

- White flower with firm green mound (ovary) at center
- Mat-forming plant with short branches crowded with leaves

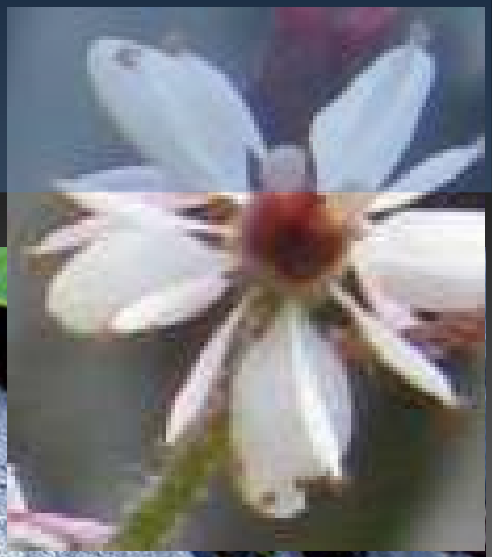
Leatherleaf Saxifrage (Leptarrhena pyrolifolia)

- **Tough evergreen leaves that form rosette at base of plant**
- **Stems are reddish**
- **Congested fl. head**
- **Fruits are purplish red**
- **Found in streambanks, flushes, seepage areas**

Fringed Grass of Parnassus (Parnassia fimbriata)

- **Hairless plants with broad, <u>kidney-shaped</u> untoothed leaves**
- **Single flower on stalk**

Nelson's Brook Saxifrage (Micranthes nelsoniana)



- **<u>Flowers</u> in <u>open clusters</u>**
- **Flowers white with 2 yellow spots at base**
- **Leaves round to kidney-shaped <u>coarsely toothed</u> all around**

Family: Rosaceae-Rose Family (5)

We have already discussed the Rose Family in past classes. Our intent here is to introduce you to some of the genus' that are unique to the alpine and sub-alpine areas.

Partidgefoot (Leutkea pectinate)
Rose Family

- **<u>Mats</u> with rooting runners creating new plants thick with evergreen leaves**
- **<u>Upright stems</u>**
- **Flowers small 5 white petals in <u>dense spikes</u>**
- **Found where snow persists**

Fan-leafed Cinquefoil (Potentilla flabellifolia) Rose Family

- **Low, clustered perennial**
- **Flowers bright yellow. Two to five flowers at the tip of erect stems**
- **Leaves mainly basal and look a little like a <u>strawberry leaf---three leaflets</u> roundish and deeply toothed.**
- **Found in subalpine meadows, stream banks and seeps**

Subalpine Spirea (Spiraea denisflora) Rose Family

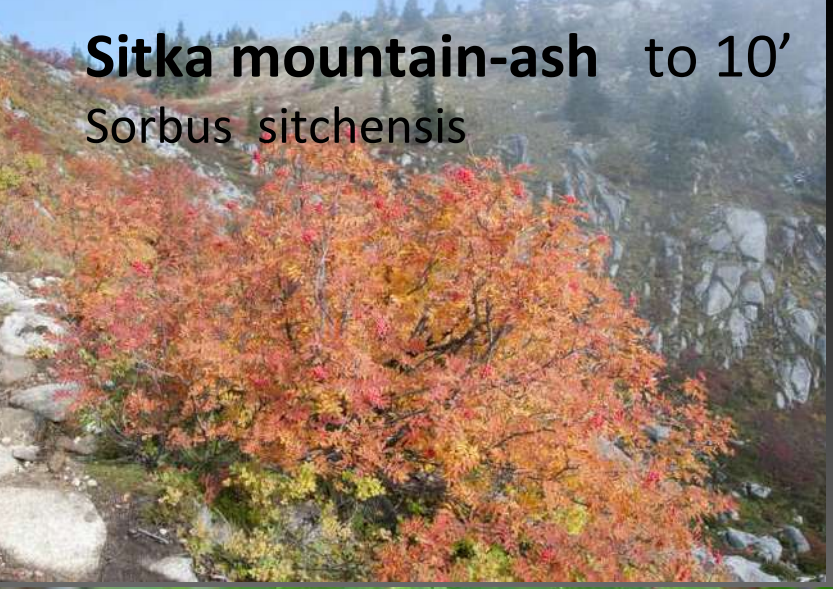
- **A deciduous shrub that can reach 1-4 ft in height**
- **Flowers are rose-pink in showy flat-topped clusters**
- **Alternate leaves ovals**
- **serrated ½ length**

Cascade Mountain Ash (Sorbus scopulina)
Rose Family

- **Large deciduous shrub – to 16 ft tall**
- **Leaves deciduous, alternate--- 9-17 leaflets that are toothed along the full length and sharp pointed.**
- **Inflorescence 2-4 in round-topped cluster. Flowers white, small, petals nearly round.**
- **Also has red-orange berries in the fall**

Sitka mountain-ash to 10’

Sorbus sitchensis

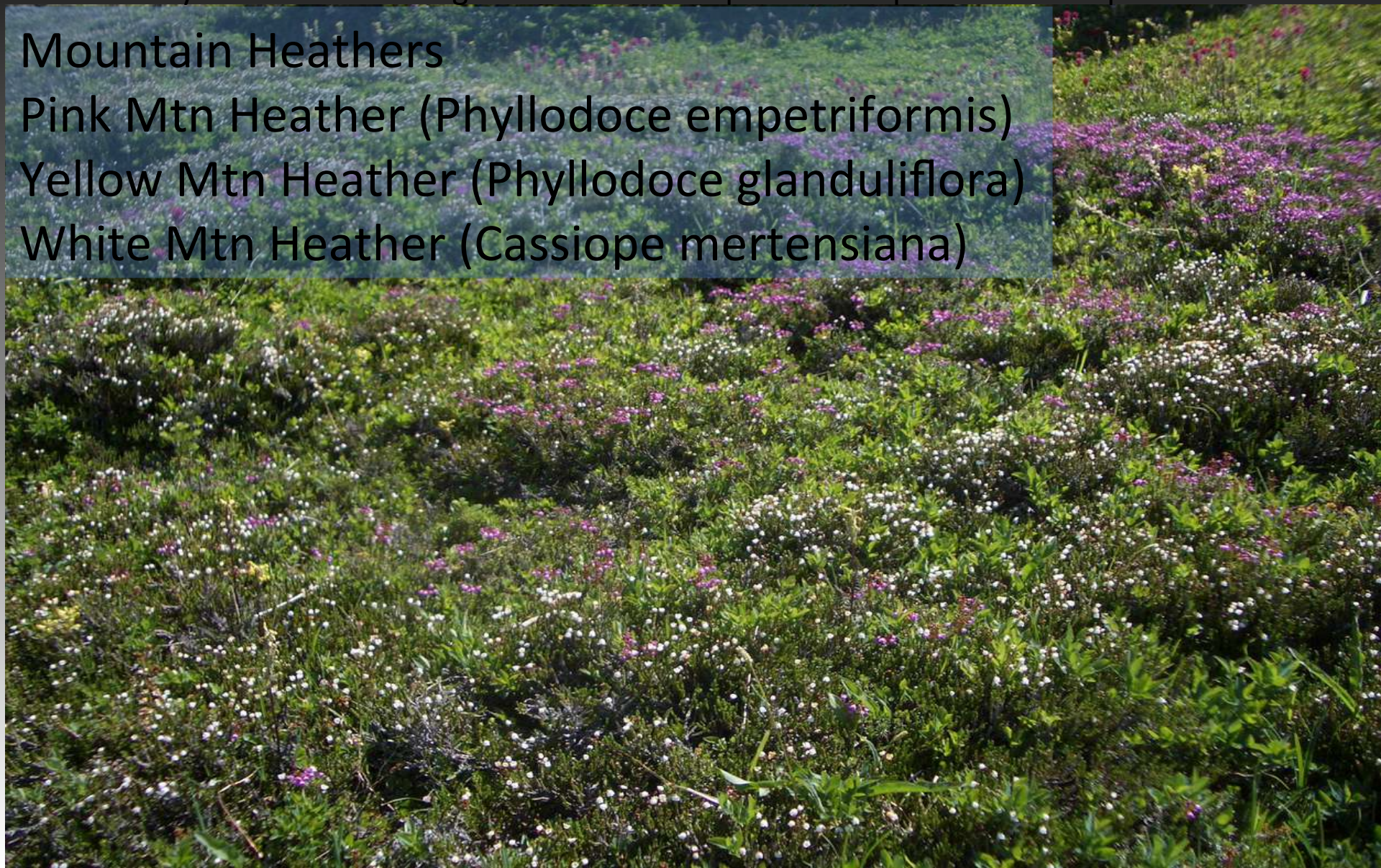


Shorter leaflets & rounded tips

Serrations no more than ½ length

Family: Ericaceae-Heath Family (4)

We have already discussed the Heath Family in past classes. Our intent here is to introduce you to some of the genus' that are unique to the alpine and sub-alpine areas.



Mountain Heathers
Pink Mtn Heather (Phyllodoce empetriformis)
Yellow Mtn Heather (Phyllodoce glanduliflora)
White Mtn Heather (Cassiope mertensiana)

White-flowered Rhododendron (Rhododendron albiflorum) Heath Family (Ericaceae)

Without the flowers these two can look very similar.

- The Rhododendron leaf is pointed at both ends; wavy-margined to minutely saw-toothed, shiny green on top, paler beneath with fine rusty hairs.
- The False Azalea leaf is egg-shaped, light green to blue-green, pointy-tipped (mid-vein protrudes beyond leaf tip). Hairy both surfaces.

False Azalea or Fools Huckleberry (Menziesia ferruginea)

Huckleberry, Blueberry (Vaccinium Sp)
Heath Family (Ericaceae)

- **Tasty fruit!!!!**
- **Range from low and matted to tall and strongly branched**
- **Flowers are urn or bell-shaped. White to pinkish**
- **Fruits are red to blue-black**

And a few special mentions……

Alpine false candytuft (Smelowskia Americana)
Mustard Family (Brassicaceae)


Mountain Bog Gentian (Gentiana calycosa)
Gentian Family

Tongue-Leaf Rainiera (Rainier stricta) Aster Family

Found only at Mt Rainer

Disc flowers only

Western Pasqueflower or Old Man of the Mountain (Anemone occidentalis) Buttercup Family (Ranunculaceae)

Drummond's Anenome (Anemone drummondii)
Buttercup Family (Ramunculaceae)

Marsh Marigold (Caltha leptosepala)
Buttercup Family (Ranunculaceae)

Sitka Valerian (Valeriana sitchensis)
Valerian Family (Valerianaceae)

- Tall plant. To 3’
- Compound leaves, basal, opposite---leaves coarsely toothed

Suggested Readings

1) Biek, David, Flora of Mount Rainier National Park
2) Pojar & MacKinnon, Alpine Plants of the Northwest-Wyoming to Alaska
3) Taylor, Ronald J. & Douglas, George W., Mountain Plants of the Pacific Northwest
4) Turner, Mark & Gustafson, Phyllis, Wildflowers of the Pacific Northwest

Websites

Mount Rainier National Park website – http://www.nps.gov/mora/learn/nature/plants.htm

flowersofrainier.com

The End
Enjoy the flora & fauna!!!!!