

Conifers – Trees/shrubs that have needles, scale-like leaves, and/or cones

- **Genera (Key: ssp = species, N.A. = North America, USA = United States, CA = California)**
 - *Abies*: the firs w/ 43 ssp.; 10 N.A.; 7 CA
 - *Calocedrus* – the incense cedars w/ ssp.; 3 N.A.; 1 CA
 - *Chamaecyparis* – the white cedars w/ 7 ssp.; 3 USA; 2 CA
 - *Cupressus* – the cypresses w/ 20 ssp.; 15 N.A.; 10 CA
 - *Ephedra* – Mormon tea w/ 42 ssp.; 7 CA
 - *Juniperus* – the junipers w/ 60 ssp.; 13 USA; 4 CA
 - *Picea* – the spruces w/ 35 ssp.; 7 N.A.; 3 CA
 - *Pinus* – the pines w/ 95 ssp.; 42 N.A.; 19 CA
 - *Pseudotsuga* – the Douglas firs w/ 5 ssp.; 2 N.A.; 2 CA
 - *Sequoia* – the redwoods w/ 1 ssp.; 1 USA; 1 CA
 - *Sequoiadendron* – the giant sequoia w/ 1 ssp.; 1 USA; 1 CA
 - *Metasequoia* – the dawn redwood w/ 1 ssp.; 0 N.A.
 - *Taxus* – the yews w/ 10 ssp.; 3 USA; 1 CA
 - *Thuja* – the red cedars w/ 5 ssp.; 2 USA; 1 CA
 - *Torreya* – the nutmegs w/ 7 ssp.; 2 USA; 1 CA
 - *Tsuga* – the hemlocks w/ 10 – 17 ssp.; 4 USA; 2 CA

Pinaceae – The Pine Family

- Genera (for our purposes) include:
 - *Abies* – Firs: *Abies concolor*, *A. magnifica* var. *magnifica*, & *A. magnifica* var. *shastensis*,
 - *Picea* – Spruces: Sitka spruce
 - *Pinus* – Pines:
 - *Pseudotsuga* – Douglas Fir
 - *Tsuga* – Hemlocks
- 193 species
 - Mostly in northern hemisphere
 - Supply 1/2 of world's timber

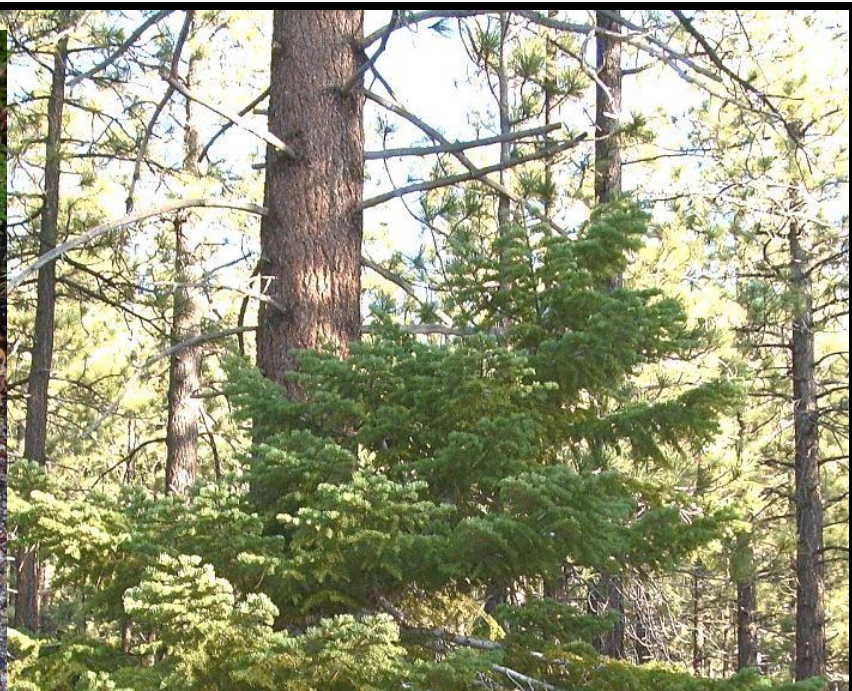
Conifers with Flat Needles: *Abies* – the Firs

- 43 species in *Abies* genus with 7 or 10 North American genera native to California
 - Common Species
 - ***Abies concolor* – White Fir**
 - ***Abies magnifica* – Red Fir**
 - *Abies grandis* - Grand Fir –
 - *Abies procera* – Noble Fir
 - Rare species
 - *Abies bracteata* - Bristlecone Fir: Santa Lucia Range of San Luis Obispo & Monterey Counties
 - *Abies amabilis* - Pacific Silver Fir: Klamath Mts of Siskiyou County, but wide spread elsewhere
 - *Abies lasiocarpa* - Subalpine Fir: Klamath Mts of Siskiyou County, but wide spread elsewhere
- Evergreens that grow in cool moist environments
- Leaves are linear short needles arranged spirally around branches or in flat sprays if needles twisted at base
- Erect seed cones in highest branches and droopy pollen cones in upper to mid canopy

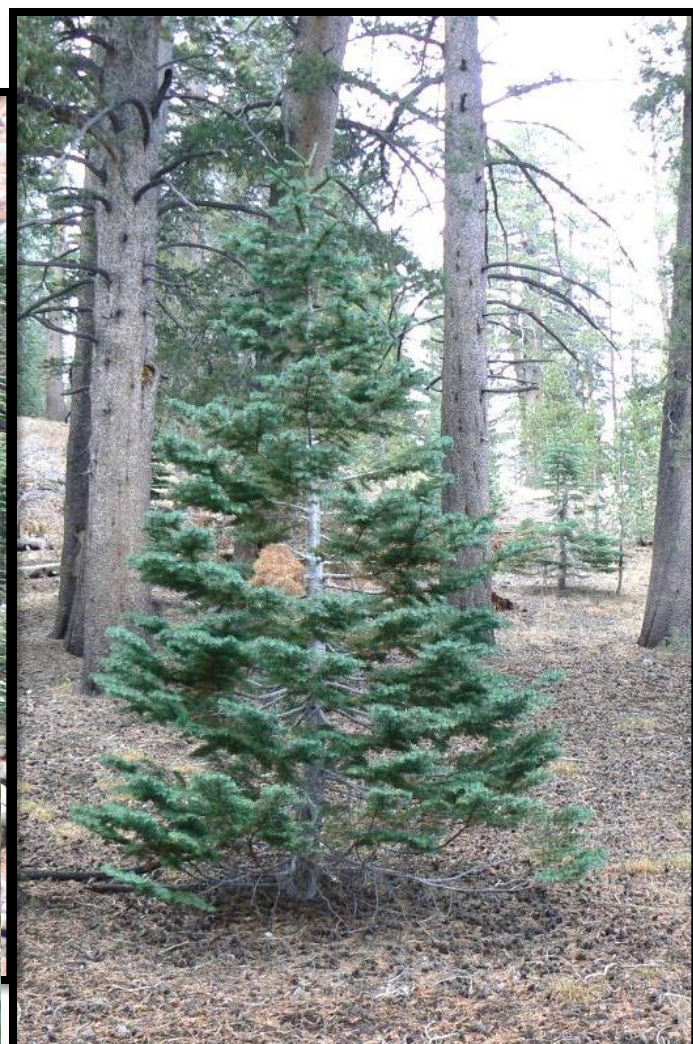
Abies concolor - White Fir



Abies concolor (of the same color) - White Fir



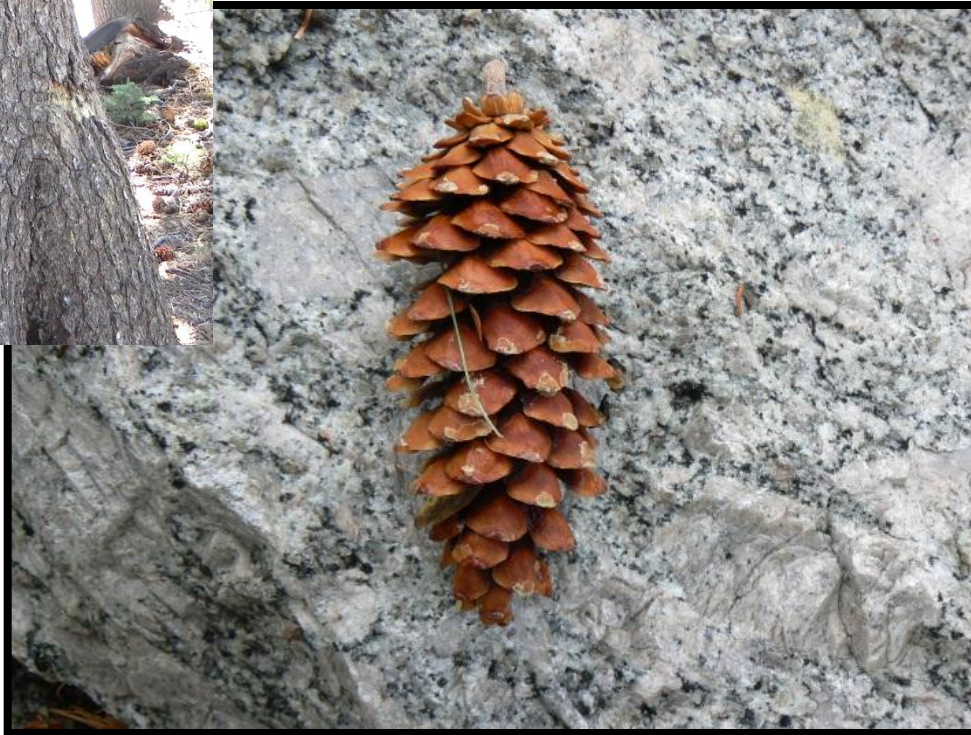
Abies magnifica – Red Fir



Conifers with Round Needles – The Pines

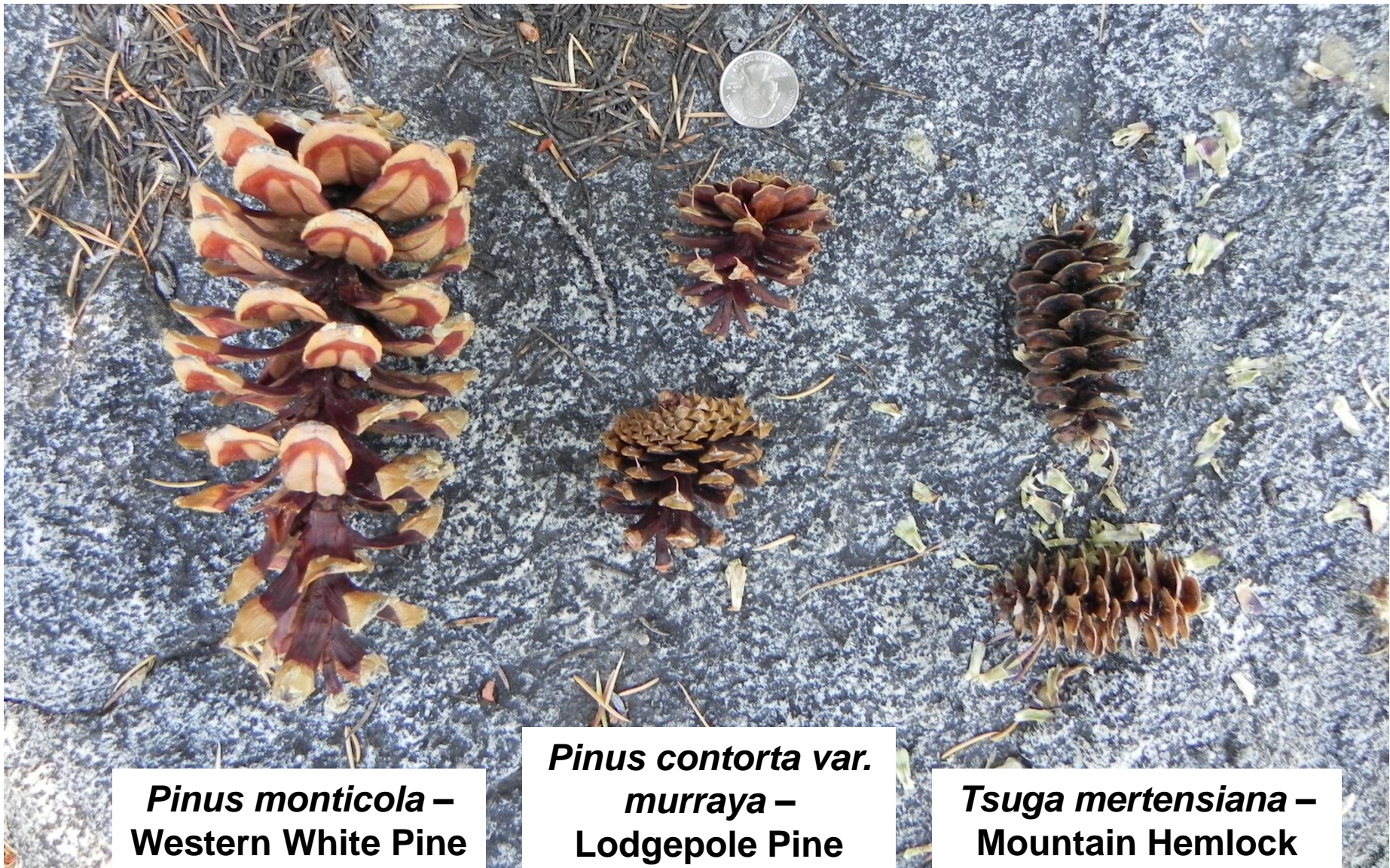
- Pinus most diverse of all conifer genera
- Pines have two sub genera
 - Soft or white pines; subgenus strobus
 - Sugar Pine, Western White Pine, Single Leaf Pinyon Pine, and Whitebark Pine
 - All have 5 needles accept single leaf pinyon
 - All have 1 vascular bundle per needle
 - All have no permanent vascular sheath
 - Hard or yellow pines; subgenus pinus
 - Ponderosa Pine, Jeffery Pine, Gray Pine, Coulter Pine, Lodgepole Pine, Monterey Pine, and Knobcone Pine
 - All have 2 needles (Ponderosa and Monterey have 2 – 3)
 - All have 2 vascular bundles per needle
 - All have a permanent vascular sheath

Pinus monticola – Western White Pine



Pinus contorta var *murrayana* – Sierra Lodgepole Pine





***Pinus monticola* –
Western White Pine**

***Pinus contorta* var.
murraya –
Lodgepole Pine**

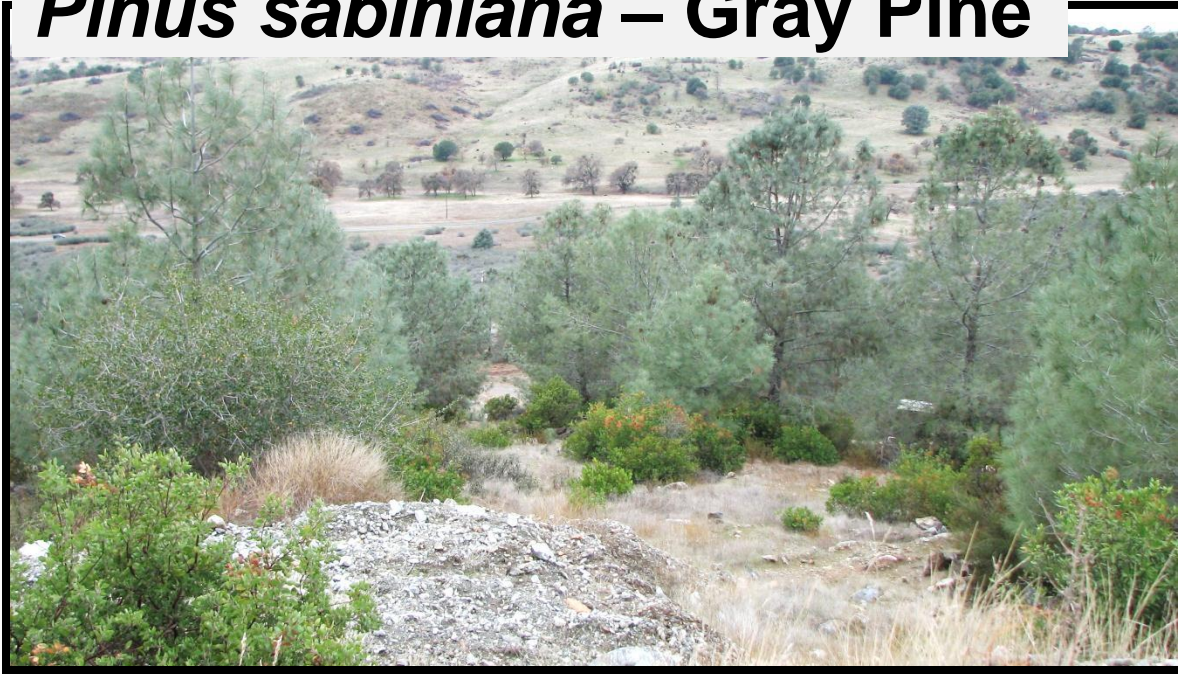
***Tsuga mertensiana* –
Mountain Hemlock**

Cone comparisons of a few moderately high elevation conifers

Pinus radiata – Monterey Pine



Pinus sabiniana – Gray Pine



Pinus lambertiana – Sugar Pine



**SUGAR PINE
BLISTER RUST
EVALUATION**

This tree has been selected
to evaluate genetic
resistance to white pine
blister rust.

Tree No. 57438

Date 9/29/85

Selected By S. J. ...

White Pine Blister Rust

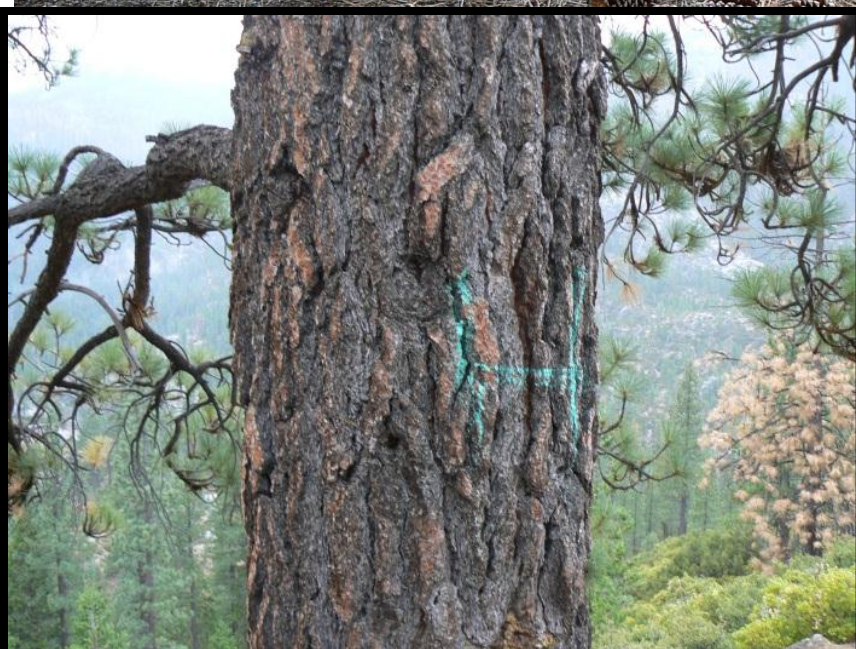
Pinus albicaulis – Whitebark Pine



Pinus ponderosa – Ponderosa Pine



Pinus jeffreyi – Jeffrey Pine





***Pinus jeffreyi* cone**



***Pinus ponderosa* cone**

Pinus aristata – Bristlecone Pine



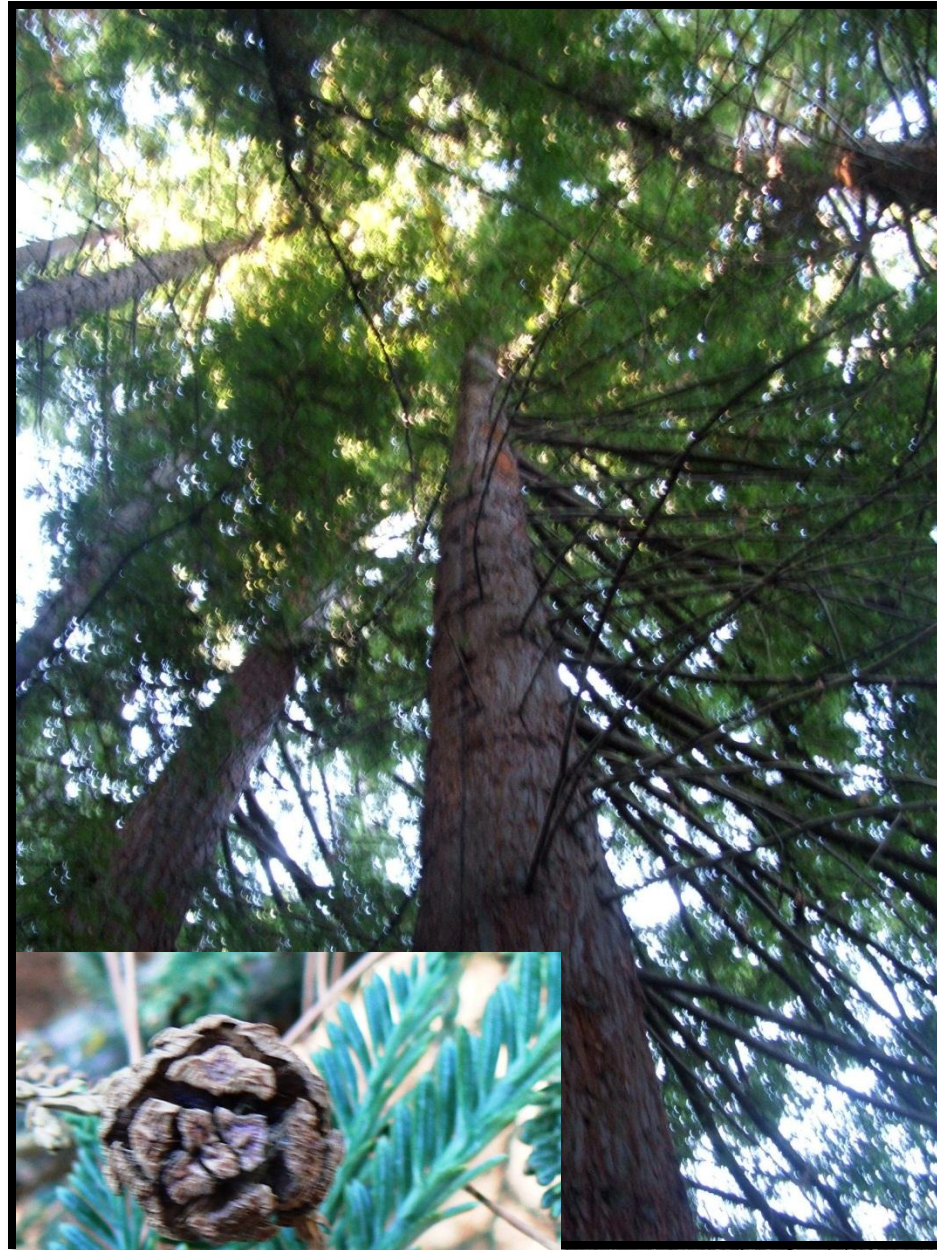
Pinus attenuata – Knobcone Pine



***Taxodiaceae* – The Bald Cypress Family**

- Until 1970's redwood was viewed as member of the bald cypress family.
- Since then there is debate as to whether or not they are more closely related to the cypress family.
- The Flora of North America supports this concept
- The Jepson Manual keeps them in the bald cypress family
- That is what we will do

Sequoia sempervirens - Coast Redwood



TAXODIACEAE 2003.10

Sequoia

sempervirens

-Blue Redwood



Sequoiadendron giganteum - Giant Sequoia



***Metasequoia glyptostroboides* – Dawn Redwood**



Cupressaceae – The Cypress

- **There estimated 25 cypress species worldwide with 10 species and 4 subspecies in Calif. (maybe)**
- **2nd most numerous genus in Calif. after pines**
- **Classification is difficult**
 - Perhaps too young of a species
 - Isolated in small groves in vastly different environments
 - They really haven't been studied to the depth needed
 - They are pretty site specific
- **Almost all are at risk with 1 endangered and 4 rare**
 - Development
 - Agriculture
 - Urbanization
 - Environmental changes, ie: lack of fire

Cupressus macrocarpa – Monterey Cypress



Cupressus macrocarpa – Monterey Cypress



***Cupressus goveniana* – Gowen Cypress**



***Genus calocedrus* – Incense Cedars**

- Originally lumped with the cedars under the genus *Libocedrus*
- Due to some minor technical difficulties among species separated into its own genus without much complaining.
- New genus: *Calocedrus*
 - Three species
 - Other two are native to Southern China, Taiwan and Burma
 - Unusual cones and super tough wood

Calocedrus decurrens – Incense Cedar



Juniperus – The Junipers

- Sometimes hard to place these in the same family as the hard cone bearing cypresses, as junipers have fleshy, berrylike fruits.
- There are 4 native to California
 - *J. communis* – Common Juniper is a shrub
 - *J. occidentalis* - Sierra or Western Juniper is a massive tree
 - *J. osteosperma* (*utahensis*) – Utah Juniper grows on the Great Basin side of the Sierra Nevada
 - *J. californica* - California Juniper is shrub that is most often, but not exclusively, found on the west side of California.

***Juniperus occidentalis* ssp *australis* – Sierra Juniper**



Juniperus californica – California Juniper



Pseudotsuga (means false hemlock)

- Cousin to the pines and spruces
- 2 species in California
 - Douglas Fir – *Pseudotsuga menziesii* var. *menziesii* (CA pop.)
 - Big Cone Spruce (also called big cone douglas fir) – *Pseudotsuga macrocarpa*
 - Eastern population Rocky Mountain Douglas Fir – *P. menziesii* var. *glauca*
- Pioneer species: does especially well after fire or logging, etc.
- Shade intolerant, needs almost full sun
- Mutualistic relationship with mycorrhizal fungi
- Flat needles joined at branch by short, thin stalk
- Cones have 3 lobed bract projecting from cone scales
- Occupies a broad habitat from coastal wet redwood forests to Sierra Nevada mixed conifer forests w/ very dry summers

Pseudotsuga menziesii – Douglas Fir



Tsuga - Hemlocks

- 2 species in California
 - *Tsuga heterophylla* – Western Hemlock (our of range: Coast Range Oregon border to Sonoma Co.)
 - *Tsuga mertensiana* – Mountain Hemlock
 - Tips droop – the most droopy of all Hemlocks
 - Klamath, Cascades, and Sierra down to Tulare Co.
 - In Sierra it is a high elevation plant
 - Krummholz
 - Blunt needles that can be rolled tween fingers and bristle in all directions from branches
 - Bloom on needles impart a bluish cast
 - Debate about this species genealogy.

Tsuga mertensiana – Mountain Hemlock

