


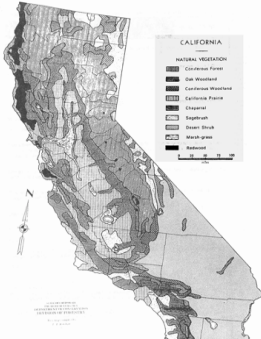
### Characteristics of Oak Trees

- \_\_\_\_\_ pollinated flowers
- Long lived
- Complex wood
- \_\_\_\_\_:
  - Fresh acorns, buds and young leaves of oak tree have the highest concentration of toxins.
  - Young cattle weighing 400 pounds or less are more susceptible to these toxins

Wind Pollinated Flowers



### Oak Woodland Distribution




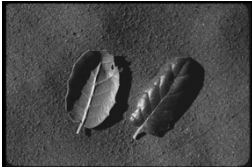
- Oak Woodlands almost entirely restricted to California
- High species richness of oaks in California

### Deciduous & Evergreen



- \_\_\_\_\_
  - Winter deciduous
    - Lose leaves at end of growing season
  - Drought deciduous
    - Lose leaves in response to dry conditions
- \_\_\_\_\_
  - Leaves remain green all year long

### Coast Live Oak, *Quercus agrifolia*

- Gnarled limbs & branches
  - Grows horizontal & vertical
  - Not so good for timber
- Multiple trunks often result from stump sprouting after fire
- Evergreen
- Commonly exceed 250 yrs

### Valley Oak, *Quercus lobata*

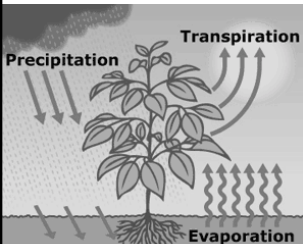



- Round spreading canopy
- Large size
  - Largest North American oak
- California endemic
- Deep rich soils
  - Moist soils
    - Parallels riparian zones (along creeks)
- Winter **deciduous**
- Root system may tap groundwater sources

### Evapotranspiration

## Tree Sweat!

Do plants want to decrease or increase this?



- Why?

---

---

---


---

---

### Water Conservation

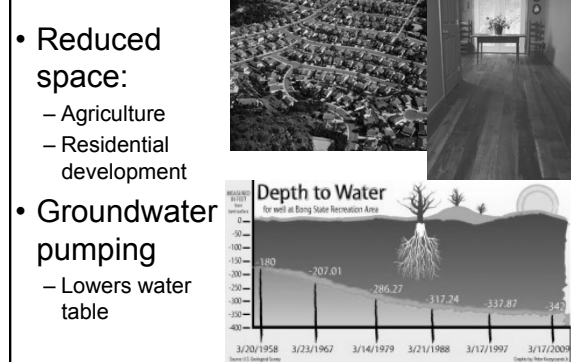
**Reduce Evapotranspiration**

- Seedlings invest in root systems rather than shoot systems
- Adult canopy proportionally smaller
- Leaves with thick waxy



### Human Activities

- **Reduced space:**
  - Agriculture
  - Residential development
- **Groundwater pumping**
  - Lowers water table




Date	Depth to Water (feet)
3/20/1958	100
3/23/1967	207.01
3/14/1979	286.27
3/21/1988	317.24
3/12/1997	337.87
3/17/2009	347

### Grazing


**Cow**

- Second most impacted plant community in California
- Grazing pattern
- Grassland understory of perennials replaced by non-native annuals




**Deer**

- Overpopulation of natural predators
  - Deer & Seed eating mammals
    - Mice, ground squirrels, birds
- Reduced large predators
  - Like cougars



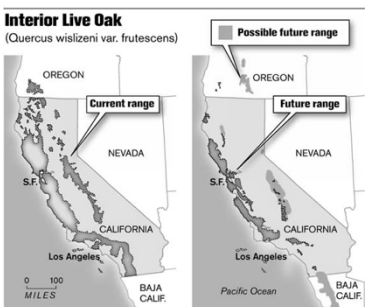
### Germination

- **LOW** \_\_\_\_\_ -
  - Absence of successfully reproducing populations - Since 1900s
  - Existing populations are \_\_\_\_\_
- **Lack of acorns & seedling success**
  - Livestock
    - Herbivory & Trampling
  - Overpopulation of natural predators
    - Deer & Seed eating mammals
  - \_\_\_\_\_ with introduced species



### Global Temperature Changes

**Interior Live Oak**  
(*Quercus wislizeni* var. *frutescens*)



Source: University of California, Berkeley | JOHN BLANCHARD / The Chronicle

### Daily Debbie Downer

- More than a third of all oak woodlands have been lost since the settlement of California by Europeans
  - Of an estimated 10-12 million acres, only some seven million remain.
  - Of that 7 million, little recruitment is being observed.
  - Overgrazing plays a large role in that
- What is recruitment:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_