

US EPA ARCHIVE DOCUMENT

# VERNAL POOLS: An Endangered Aquatic Resource in California

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# What are Vernal Pools?

- Seasonally flooded depressions on soils with an impermeable layer
- Periodic or continuous ponding during wet season
- Desiccation during the dry season
- Drastic seasonal change from wet to dry
- Rainfall quite variable from year to year

# Vernal Pool Complex



# Where are Vernal Pools Found?

- Central Valley – alluvial formations
- Inner Coast Ranges – alluvial formations in inland valleys
- Southern California – coastal marine terraces
- Modoc Plateau and Northeastern Sacramento Valley – volcanic mudflows



# Vernal Pool Regions

# Vernal Pool Plants & Animals

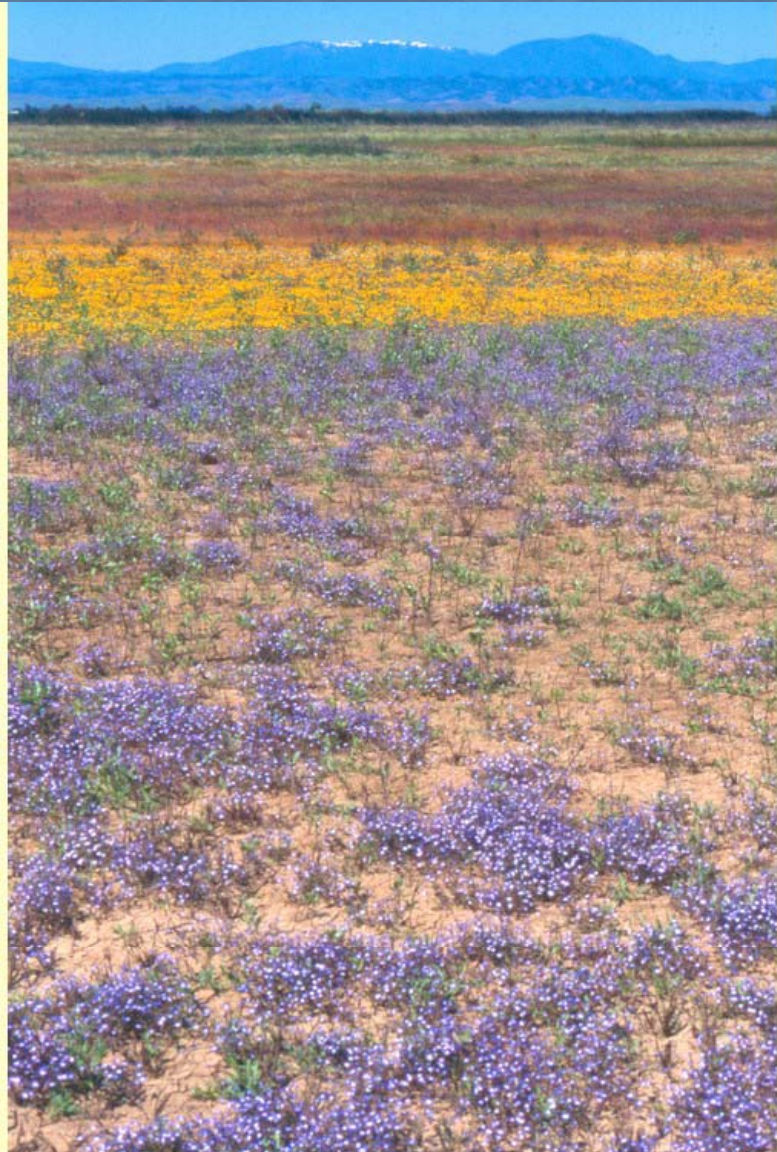
- Must be able to tolerate the wide range of hydrologic conditions
- Or complete their life cycles in the short time when the pool provides a suitable environment



# Vernal Pool Plants & Animals

- Regional and localized endemic plants
- ~200 plant species restricted to or closely associated with pools
- Animal species have specialized life histories
- Large proportion of sensitive species
- High percentage of native species

# Vernal Pool Plants



# Downingia



# Downingia



# Lasthenia (Goldfields)



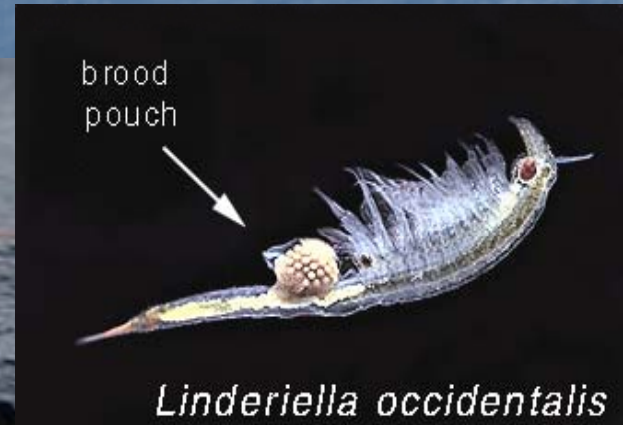
# Limnanthes (Meadowfoam)



# Blennosperma



# Vernal Pool Animals Aquatic Invertebrates



*Linderiella occidentalis*





# Vernal Pool Animals Amphibians



# Vernal Pool Animals Solitary Bees



# Solitary Bees Life Cycle



# Solitary Bees Life Cycle



# Vernal Pool Threats

- Vernal Pool Habitat Loss - ~90%
- Urbanization
- Agriculture – deep ripping and leveling

# Conservation Strategy

- Landscape Level Preserves
- Include Surrounding Watershed Areas
- Preserves Represent Diversity of Pool Types
- Vernal Pool Forum

# Regulatory Tools

- CWA Section 404 – permitting & enforcement
- CWA Section 401 Certification
- Mitigation Banks

# Vernal Pool Website:

## VernalPools.Org

- California Vernal Pools – 111,000 hits on Google
- VernalPools.Org provides links to:
  - Conservation
  - Mitigation
  - Publications
  - Places to See
  - Animal & Plants





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