

# Vernal Pool Restoration

## notes for the future



Carol W. Witham, January 29, 2009

# Recent Improvements

*in approach and design*

- Since 2001, regulators have moved away from the on-site mitigation and consultants have worked hard to create more natural looking landscapes:
  - ✓ Fewer “postage stamp” preserves with the pools “packed in” like sardines
  - ✓ Improvements in design have lead to more “natural” looking mitigation wetlands
  - ✓ Off-site mitigation and banking allows for larger landscapes and enhanced management

# More Improvements Needed

*to ensure that mitigation is effective*

- Right now we are still operating on a wish and a prayer that the restored and created vernal pools are recreating what is being lost.
  - ✓ No one is gathering sufficient information about the impact site
  - ✓ Mitigation success criteria are too vague and monitoring is too short
  - ✓ Translocation of species may be a genetic “ticking time bomb”

# Insufficient Baseline Information

*about the impact and mitigation sites*

- We don't know enough about what is being lost to make any reasonable determination of whether or not mitigation is working or adequate.
  - ✓ Species distribution – abundance and persistence
  - ✓ Vegetation communities – not just plants
  - ✓ Hydrology – vernal pools are usually in complexes
  - ✓ Ecosystem processes – functions and values
  - ✓ Metapopulation dynamics – local extirpation and recolonization mechanisms

# Simplistic Success Criteria

*in a very complicated ecosystem*

- Because we have not taken the time to study the dynamics of the vernal pool ecosystem, success is generally based on a few superficial factors.
  - ✓ Does it hold water in the winter time, dry down in the spring and become desiccated in the summer?
  - ✓ Does it have a predominance of plants associated with vernal pools and an absence of marsh plants?
  - ✓ Does it contain one or more of the listed vernal pool crustaceans?

# Inappropriate Monitoring Timeline

*to ensure that the mitigation is successful*

- Generally, the required monitoring period to determine if the mitigation is successful is only 5 to 10 years.
  - ✓ Vernal pool organisms have a persistent seed/cyst bank
  - ✓ Current practice is to inoculate the (re)created pools
  - ✓ 5 or even 10 years is not enough time to tell whether the populations are sufficiently viable to be replacing the seed/cyst bank, or whether it is just being depleted
  - ✓ Most mitigation sites have declined over time

# Translocation Issues

*vernal pools are like clusters of islands*

- The further apart they are, the more their resident populations may have evolved unique genetic traits.
  - ✓ The practice of translocating seeds/cysts from one area to another could have significant consequences
    - ✓ Genetic swamping of closely related species
    - ✓ Crossbreeding that leads to mortality/extirpation
  - ✓ We have no idea how far is “too far” to be moving these organisms around

# Innovative New Ideas

*to overcome some of the problematic issues*

- ✓ Study the soils and aquatard of the mitigation site
- ✓ Design pools as hydrologically interconnected complexes
- ✓ Use local inoculum to preserve genetic integrity
- ✓ Use only small amounts of inoculum
- ✓ Base success criteria on demonstrating that the plant and animal populations are increasing over time
- ✓ Manage for ecosystem function, not individual species

# California Vernal Pools

*an ecosystem in peril*



# A Conservationist's Perspective

increase preservation ratios

- Vernal pool (re)creation is an inexact pseudoscience and will remain so into the foreseeable future. In the mean time we are losing natural vernal pools.
  - ✓ 94,000 acres converted between 1997 and 2005
    - ✓ 80% of known losses were unregulated
  - ✓ 13,000 acres in some stage of the planning process in Sacramento County alone
  - ✓ It just makes more common sense to preserve the real thing instead of assuming that mitigation is adequate

# Advantages of Preservation

*instead of in-kind mitigation*

- Large-scale preservation of vernal pool landscapes in lieu of current in-kind, “no net loss” mitigation provides numerous environmental advantages.
  - ✓ Takes a holistic, watershed approach to mitigation
  - ✓ Preserves full complement of ecosystem values including critical upland matrix functions
  - ✓ Larger area-to-edge ratio helps maintain integrity
  - ✓ “No net loss” can be achieved through out-of-kind (i.e. seasonal marsh) wetland buffers

# Disadvantages of Preservation

*over the status quo*

- Large-scale preservation of vernal pool landscapes will also provide new challenges for regulators, land use authorities, developers, planners, environmentalists, and consultants.
  - ✓ Requires long-term and large-scale planning
  - ✓ Can be more expensive than on-site mitigation unless third party preservation banks are available
  - ✓ Will result in the overall loss of some vernal pools and the species that occupy them

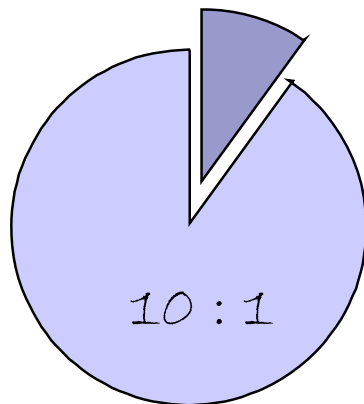
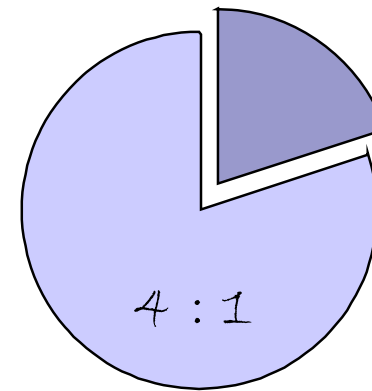
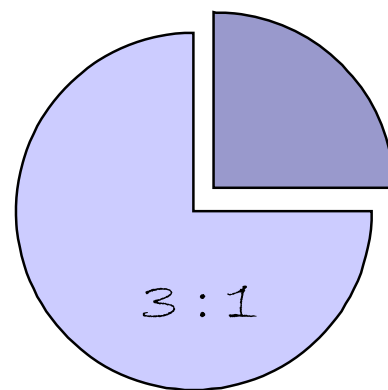
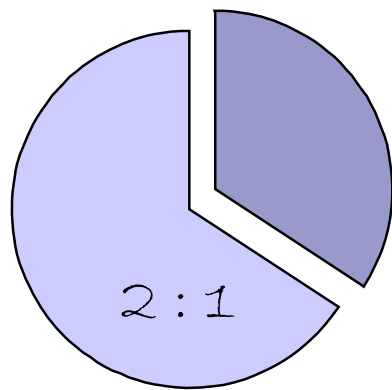
# How much Preservation?

*current vernal pool mitigation ratios*

- Vernal pools are typically subject to both U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service mitigation requirements. For “smaller projects in fragmented or degraded habitat” the usual mitigation requirement is:
  - ✓ 2:1 preservation of vernal pool wetted acres, and
  - ✓ 1:1 (or greater) recreation to satisfy “no net loss”
  - ✓ These ratios are being applied to very large projects
  - ✓ May result in the loss of 33% of all natural vernal pools and indirect degradation of the remaining 67%

# Preservation Ratios

how much more can we afford to lose?



*The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005)* calls for protection of 85 or 95% of vernal pool habitat within numerous large core recovery units. That translates to 6.5:1 and 19:1.

# A Conservation Strategy

## for California vernal pools

- Given the current condition of only 13% remaining, and the speculative nature of (re)creation, it is imperative to formulate a vernal pool mitigation and preservation strategy that maximizes protection of the remaining vernal pool landscapes in California. To achieve vernal pool conservation, we must strive toward:
  - ✓ A comprehensive vernal pool classification system that includes quantitative assessment of function and value
  - ✓ Knowledge and distribution of locally rare vernal pool types and special status vernal pool endemic species

# A Conservation Strategy

for California vernal pools (continued)

- ✓ An understanding of larger scale watershed function and value with respect to vernal pool preservation areas
- ✓ Increased knowledge of landscape-scale vernal pool hydrology and how disruptions might impact long-term ecosystem viability
- ✓ What is the balance between the desire to preserve wetlands and endangered species habitat with the need to feed and house our growing population?

# VernalPools.Org

dedicated to saving California's vernal pool landscapes

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