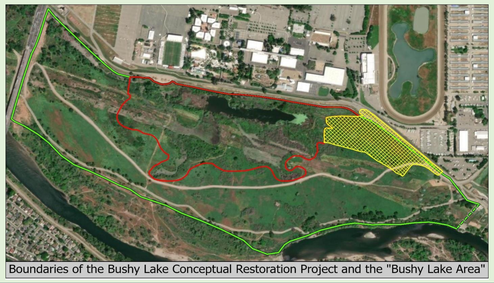
Boundaries of the Bushy Lake Conceptual Restoration Project and the "Bushy Lake Area"

Bushy Lake Eco-Cultural Restoration Project Design Integrating Cultural Keystone Species and Development of Culturally Significant Plant Alliances

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Abstract

The Bushy Lake Eco-Cultural Restoration Project (lower American River, Sacramento, CA) incorporates Indigenous Traditional Ecological Knowledge (ITEK), Western Ecological Knowledge (WEK), and Traditional Resource Management (TRM) of the Nisenan, Miwok, and Maidu traditions into restoration project site design and management (Zedler and Stevens 2018). The project demonstrates the development of Culturally Significant Plant Alliances based on cultural keystone species in the Bushy Lake Eco-cultural Conceptual Restoration Plan (CRP) designs. The planting palette includes developing proposed Cultural Plant Alliances to complement and expand upon CNPS Plant Alliances. Proposed alliances represent areas dominated by culturally significant species. Examples of cultural plant alliances include white root (*Carex barbarae*); mugwort (*Artemisia douglasiana*); dogbane (*Apocynum cannabinum*), and tarweeds (*Madia speciosa*). A 2021 wildfire provided an unplanned experimental variable to document vegetation response. Experimental results demonstrate that cultural plants (adapted to millennia of Traditional Fire Management) were resilient and recovered within one year. Indigenous Environmental Justice mandates hand-weeding invasive species (precluding use of herbicides), to prevent herbicide exposure to people gathering food, medicine, and fiber. The eco-cultural restoration planting palette recommends native, fire-resilient, and culturally significant species.

Complementary Knowledge Systems

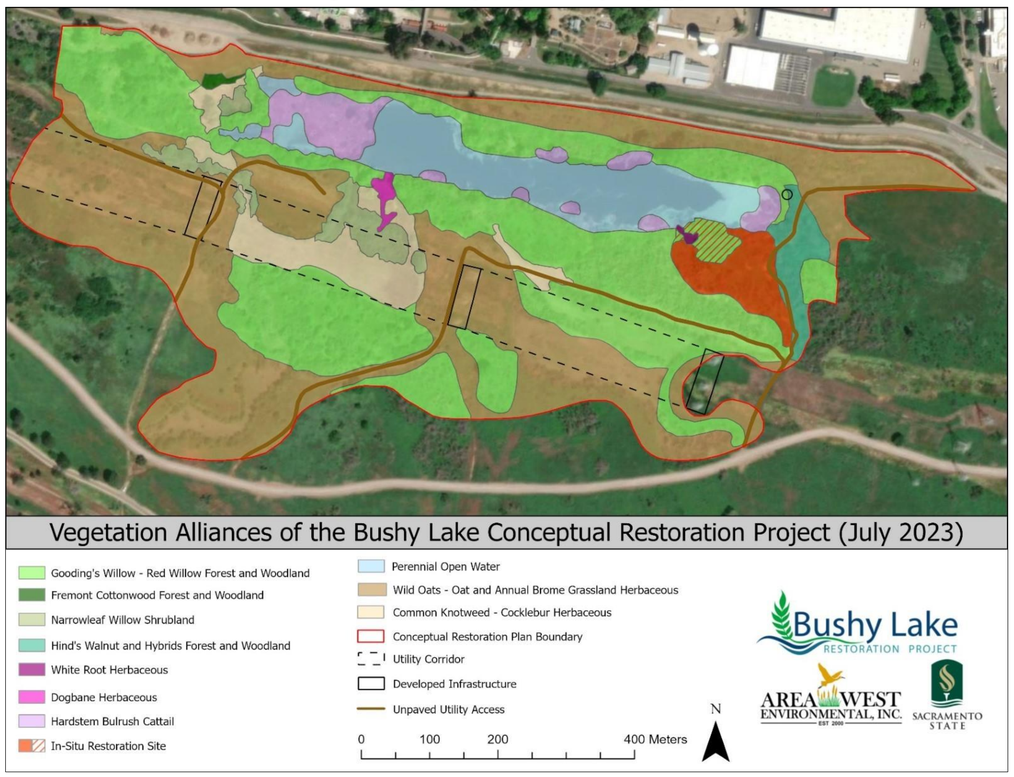
Western Scientific Knowledge (WEK)

- Synchronic data, at one time, from many sites and many attributes
- Often lack long-term view
- Academic culture – projects can be experimental; data are objective, "value-free"

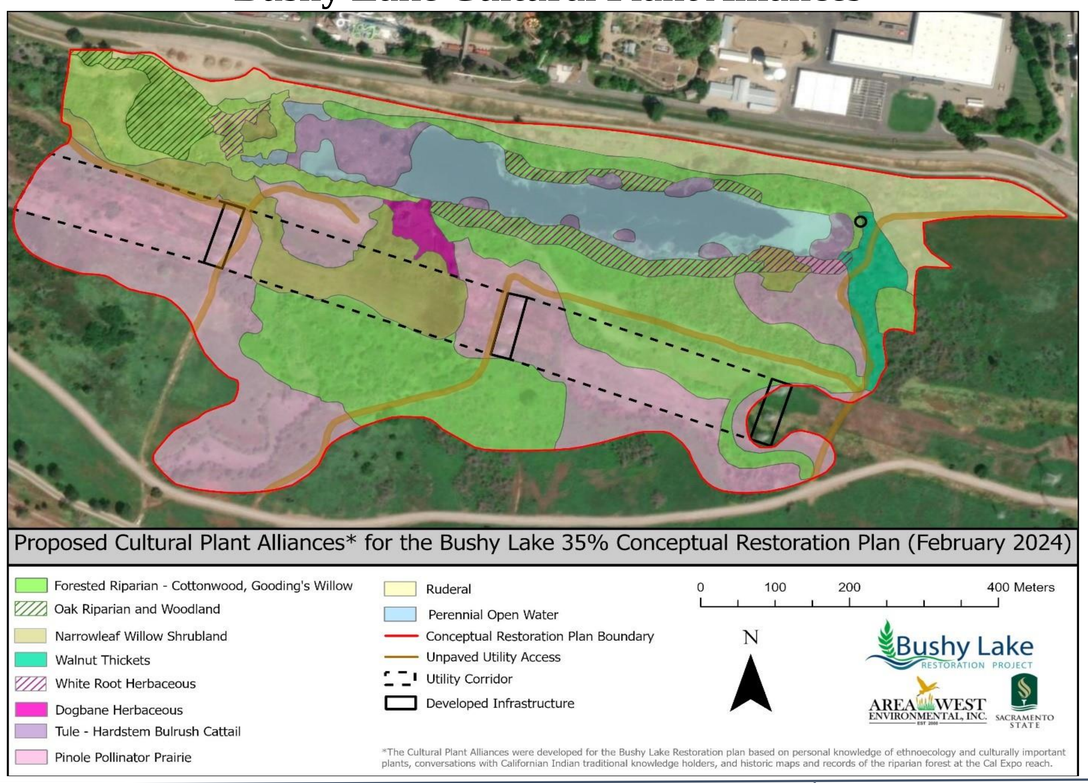
Indigenous Traditional Ecological Knowledge (ITEK)

- Diachronic database over a long period of time (chronosequence)
- Observers tend to be the resource users
- Harvests of resources depend on the quality and reliability of ecological observations.

CNPS Plant Alliances



Bushy Lake Cultural Plant Alliances



Left: Bushy Lake *in-situ* restoration with reference conditions. Vegetation represents native, culturally significant, fire-resilient species, including elderberry, white root, mugwort, and creeping wildrye

Right: Dereck Martinez-Goodwin implementing Traditional Fire Management

Above: Diana Almendariz (Wintun-Maidu Elder and Traditional Knowledge holder) standing in the white root beds at Bushy Lake

White root (*Carex barbarae*)

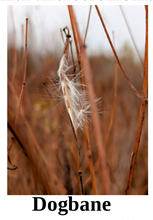
- A major source of rhizomes for Native Californian basket weaving
- A riparian understory dominant plant
- Engineering/ streambank stabilization

Tarweed (*Madia elegans*)

- Tarweed seeds are harvested for pinole, a staple food.
- Pollinator habitat

Mugwort (*Artemisia douglasiana*)

- Medicinal and ceremonial plant



Dogbane (*Apocynum cannabinum*)

- Important fiber plant for ropes, nets, baskets, and ceremonial regalia

Conclusions

1. The Bushy Lake eco-cultural conceptual restoration project demonstrates the development of Culturally Significant Plant Alliances, expanding the concept of CNPS Plant Alliances, as the basis of restoration design.
2. Plant adaptations evolved from generations of reciprocity with Native people and fire. Our experiments document post-fire recovery and resilience of culturally important plant species.
3. Cultural keystone species selected as examples of fire resilience, cultural values, and adaptation to site conditions include white root (*Carex barbarae*) (basketry); mugwort (*Artemisia Douglasiana*) (medicine); dogbane (*Apocynum cannabinum*) (fiber); and showy Madia (*Madia elegans*) (pinole food and pollinators).
4. Indigenous Traditional Ecological Knowledge (ITEK) in conjunction with Western Scientific Knowledge (WEK) are complementary knowledge systems to restoring a highly disturbed, novel urban ecosystem.
5. We have planted and tended native plant species for ten years, collaborating with California land-based tribal members to gather and tend cultural materials at the Bushy Lake site.
6. We promote establishing an Indigenous Protected Conservation Area for gathering/ tending areas as well as spaces for additional cultural/ spiritual practices.
7. Advocate for implementation of Traditional Fire Management at Bushy Lake, in alliance with traditional knowledge holders and firekeepers.
8. Educate the public and showcase tribal use and reciprocity with non-human relations and ecosystems of the lower American River Parkway.

Acknowledgments

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