

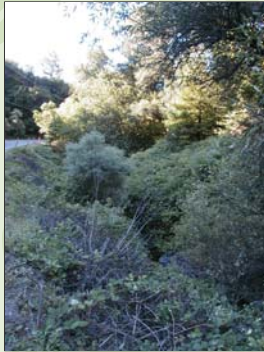
CWA §319 PROGRAM



DRY CREEK RANCHERIA
BAND OF POMO INDIANS

Dry Creek Rancheria Creek Restoration Project

Addressing Nonpoint Source Pollution
Through Habitat Restoration



PURPOSE & NEED

“Rancheria Creek”

- Primary Drainage of Dry Creek Rancheria
- Tributary to Russian River
- Endangered species
- Agriculture

The Problem

- Invasive species (Himalayan Blackberry, Vinca, Scotch Broom, star thistle)
- Large solid waste (telephone poles)
- Assorted trash
- Waste covered by blackberries (hard to estimate volume)



GOALS

- Improve water quality on the Rancheria and downstream
- Decrease flooding and erosion
- Improve habitat (fish and wildlife)
- Increase awareness (Tribal and public)
- As outlined in *Dry Creek Rancheria Nonpoint Source Assessment and Management Plan*

Work Accomplished

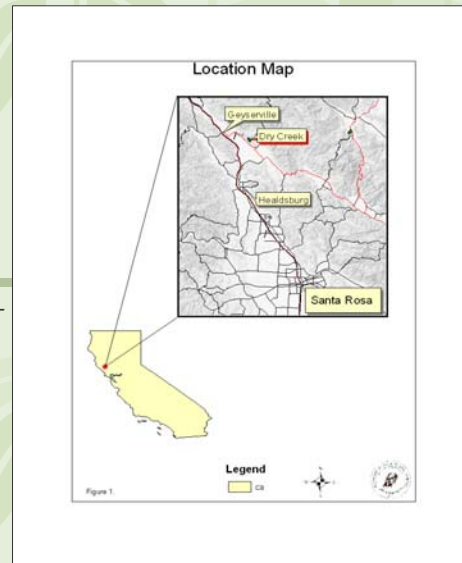
Under the Dry Creek Rancheria
CWA §319 PROGRAM

- 1000+ linear feet of stream bank restored
 - FY 04 ~600 feet
 - FY 05 ~300 feet
 - FY 06 ~100 feet
- 40 tons of solid waste removed
- 1000+ native plants
- 3 years of combined upkeep and restoration

SITE DESCRIPTION

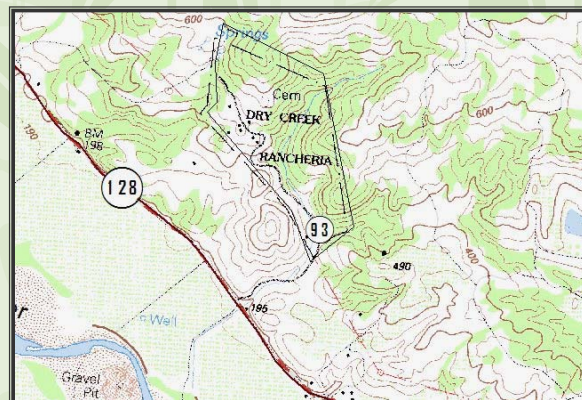
SITE LOCATION

- Northern California
- Sonoma County
- Alexander Valley (wine region)
- Mediterranean climate wet winters-dry summers



Dry Creek Rancheria

- Established in 1915
- 75 Acres
- Hillside Terrain
- Mixed oak forest
- Grassland
- Thin clay rich soils
- Franciscan series bedrock
- Prone to landslides

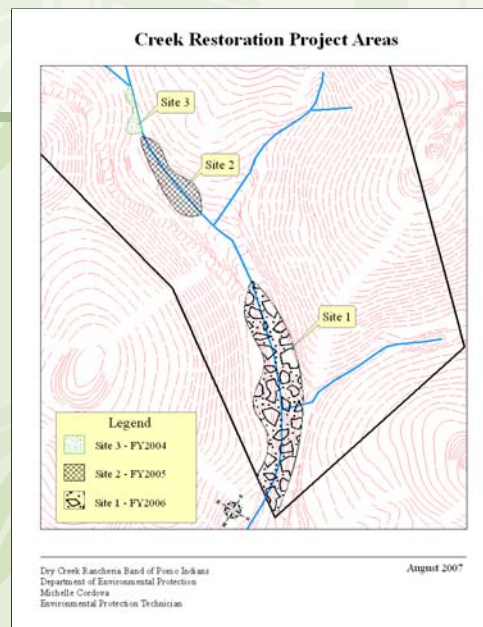


Project Site

- 12 miles of stream
- Ephemeral tributaries (storms)
- Intermittent upper channel (pools remain throughout the year)
- Perennial lower channel (spring fed)
- Several small wetlands
- Approximately 1.5 Acres
- 1000 feet of stream
- Some of the sites have a well established riparian corridor
- Entire site is covered in blackberries and Vinca (periwinkle)

Project Areas

- Sites 1-3
- Each represents an area and time of original clearing
- Maintenance (weeding, mulching, and planting occurred at least annually at every site



Project Planning

- **Estimating the number of plants needed for restoration**

Example (Plant quantities for a 1 .3 acre forested riparian area)

- $1.3 \text{ acre} \times 43,560 \text{ ft}^2 / \text{acre} = 56,628 \text{ ft}^2$
- Trees: 14 ft off center (o.c.) $56,628 \text{ ft}^2 \div 196 \text{ ft}^2 = 289 \text{ trees}$
- Shrubs: 6 ft o.c. $56,628 \text{ ft}^2 \div 36 \text{ ft}^2 = 1,573 \text{ (shrubs)} - 289 \text{ (trees)} = 1,284 \text{ shrubs}$
- Herbaceous/groundcovers: 1.5 ft o.c. (average spacing) $56,628 \div 2.25 \text{ ft}^2 = 25,168 \text{ herbaceous} - 289 \text{ (trees)} - 1,284 \text{ (shrubs)} = 23,595 \text{ herbaceous/groundcovers}$

Project Planning

- **Scale Drawings to help estimate number of plants needed and irrigation design. (used basemaps from AutoCAD and GIS)**

- **Decide on Best Management Practices**

- Heavy Equipment out of the creek
- Weed eaters and hand tools only
- Erosion control (jute netting straw wattles and hydroseeding)

- **Gather estimates**

- Heavy equipment
- Invasive species removal
- Waste hauling
- Native Plant Stock



PROJECT PLANNING

Native Plants

- Two microclimates in the project area (full sun, and shade)
- Surveys of plants currently found on the Rancheria
- Lists of available Native Plants from local nurseries
- Compile a preliminary plant list (what's on site vs what's available)
- Submit plant list to Tribal Cultural committee for review and approval
- Order plants



Final Plant List (SUN)

Trees

California Bay
Madrone
Black Oak
Coast Live Oak
Buckeye
Big Leaf Maple
Arroyo willow

Shrubs

Manzanita
Coyote Bush
Western Spice Bush
Toyon (Christmas Berry)
Redbud
Wild Rose
Coffeeberry

Perennials and "soft plants"

Columbine
Butter cup
Yarrow
Coyote mint
Bush Monkey Flower

*Umbellularia californica**
*Arbutus menziesii**
*Quercus Kelloggii**
*Quercus agrifolia**
*Aesculus californica**
*Acer macrophyllum**

*Arcostaphylos manzanita**
*Baccharis Pilularis**
*Calycanthus occidentalis**
*Heteromeles arbutifolia**
Cercis occidentalis
Rosa Californica
Rhamnus californica

Aquilegia exima
Ranunculus occidentalis
Achillea millefolium
Monardella odoratissima
Mimulus aurantiacus

Final Plant List (SHADE)

Shrubs

Dogwood
Snowberry
Hazelnut

Blue Eldeberry
California wild grape

Perennials and "soft plants"

Angelica
Wild Iris
California Strawberry
Western Sword Fern
Giant Chain Fern
California Polypody
Bracken Fern
Clover

"Redwood sorrel"
"Wood sorrel"

Cornus stolonifera
*Symphoricarpos rivularis**
Corylus rostrata
var. *californica*
*Sambucus mexicana**
*Vitis californica**

Angelica tomentosa
Iris douglasiana
Fragaria californica
*Polystichum munitum**
*Woodwardia fimbriata**
Polypodium californicum
Pteridium aquilinum

Oxalis oregano
Oxalis Corniculata

IMPLEMENTATION

Removal of large solid waste

- Tribal labor and operators
- Heavy equipment kept on established roads
- Removed 30+ telephone poles and an abandoned Trailer



IMPLEMENTATION

Removal of Brush and Trash

- Tribal and contracted labor
- Hand tools and weed eaters
- Blackberries are classified as trash by local landfills (cannot be composted)
- Disposed of 40 tons of waste



IMPLEMENTATION

Erosion Control and Irrigation

- Jute netting
- Hydroseeding of native grasses
- Fresh water irrigation with well water



IMPLEMENTATION

Planting and mulching

- Tribal labor
- 1000 + plants
- Individual plants mulched with straw



Before
Site 1
originally
restored
FY04



After Site 1



Before and After Site 2

Originally restored FY05



Before Site 3
Restored FY06



After Site 3



LESSONS LEARNED

- Plant selection-keep it simple
- Avoid “soft plants” that can be damaged in planting
- Order plants early
- Our local Nurseries try to have their stock at planting maturity by early fall, time your planting accordingly
- If possible have the nursery care for the plants until just before planting

LESSONS LEARNED

- Hydroseed before laying erosion control
- Water several times before installing jute netting and again before planting
- Use a power auger to dig the holes
- Secondary invasive plants
 - Removed blackberry and vinca
 - Star thistle and scotch broom appear

FUTURE

UPKEEP

- weeding, mulching
- Pull blackberries and other invasives as they appear (reappear)
- Replant as necessary
- Clean litter as needed
- Address erosion concerns as necessary

Site specific plant propagation

- Gathering cuttings and seeds of plants on the Rancheria
- Propagate plants on site for maintenance and future restoration



FUTURE

Continue restoration upstream

- At least another 1200 feet of stream is inundated with invasive species and trash

