



Grazing as a Management Tool on the Sacramento River Floodplain



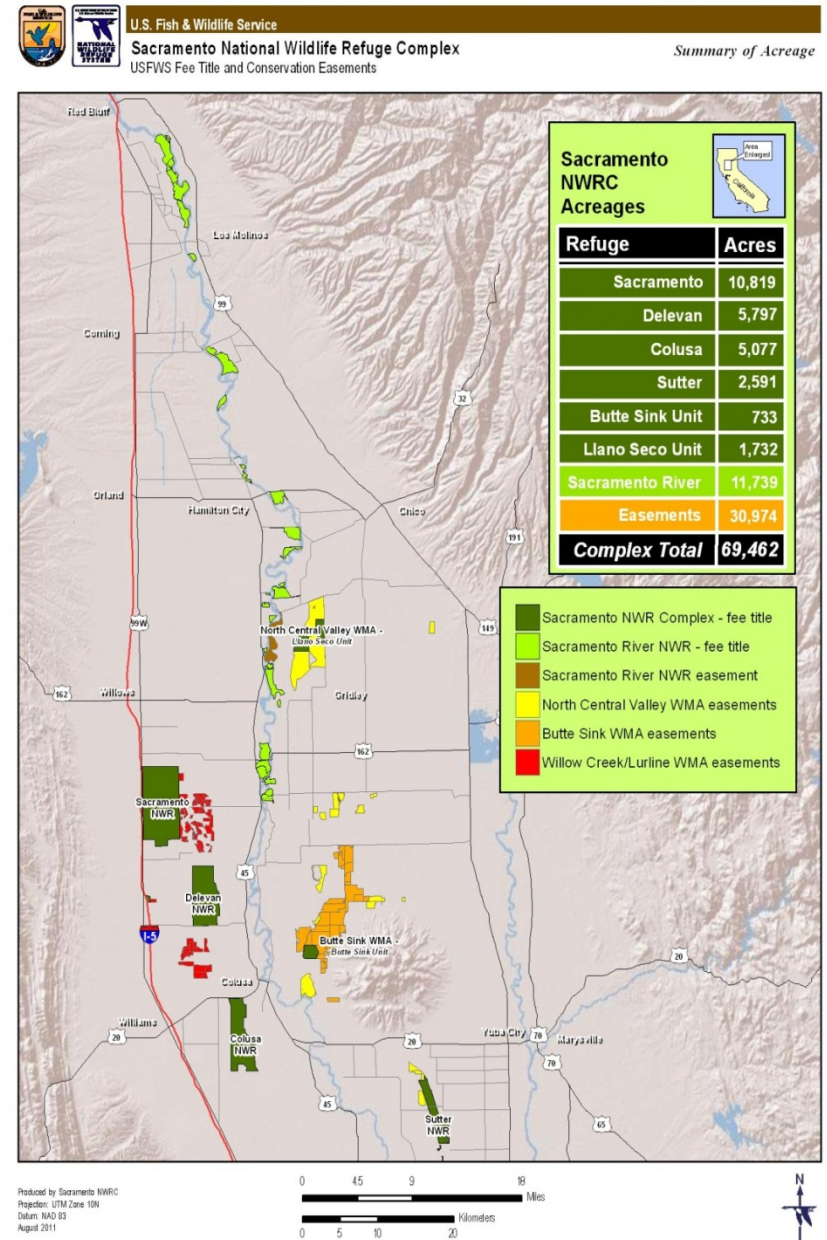
Kelly Moroney

Joe Silveira

Sacramento River National Wildlife Refuge

Sacramento River National Wildlife Refuge

- Established in 1989
- 18,000 acres authorized between Red Bluff and Colusa (Tehama, Glenn, Butte, and Colusa counties)
- One of five refuges in the Sacramento NWR Complex





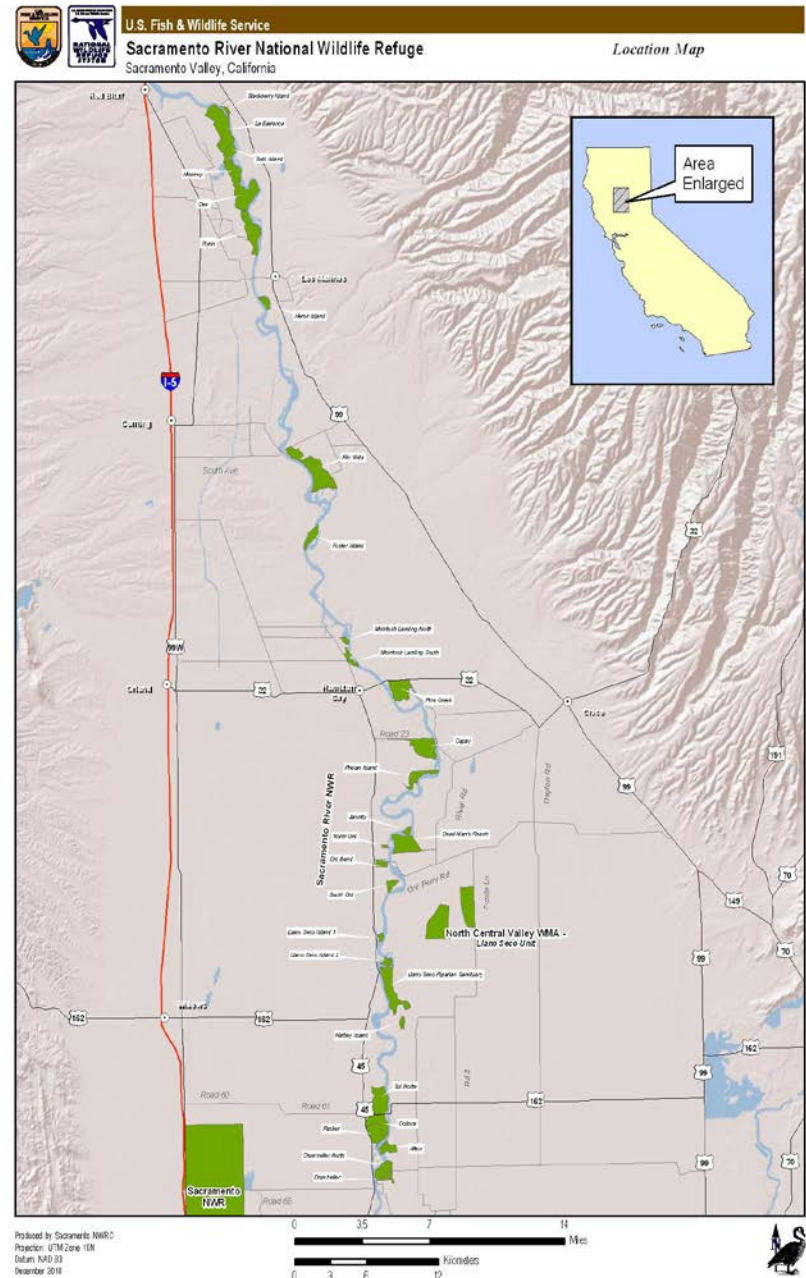
Purpose of the Refuge

- Conserve endangered and threatened species (In 1989, winter-run Chinook salmon, Valley elderberry long-horned beetle, Least Bell's Vireo, American Bald Eagle) and their habitats
- Provide riparian/floodplain wetland habitat for migratory bird conservation
- Manage for fish, wildlife and native plant resources



Sacramento River National Wildlife Refuge

- 10,353 acres acquired scattered along a 77 miles reach of the Sacramento River
- Currently 30 Units
- Existing land uses of riparian habitat, restored riparian habitat, production orchards, row crops & fallow lands



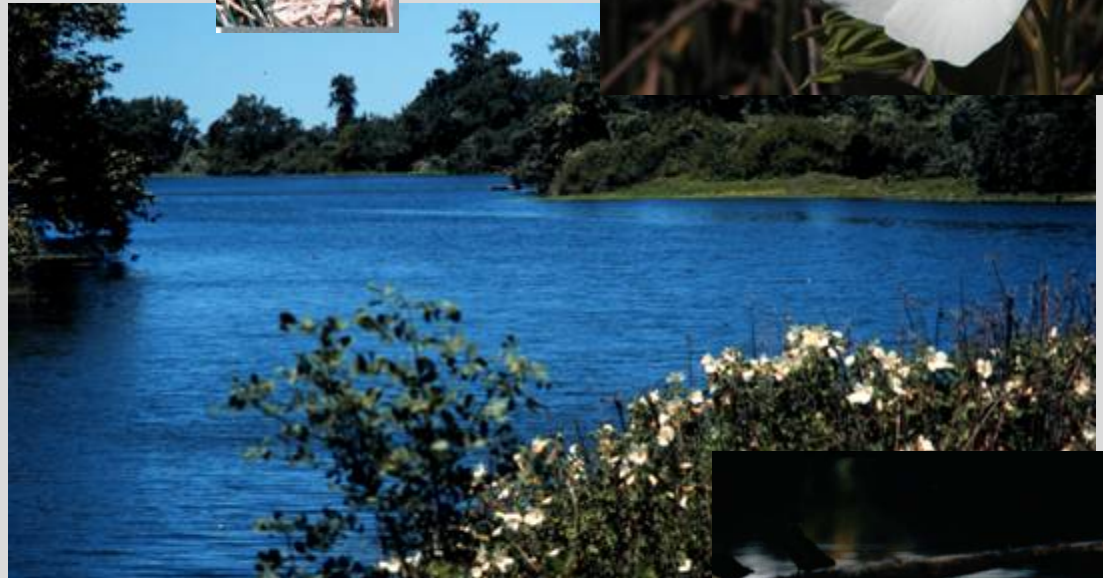
Sacramento River Floodplain Meanderbelt Zone



Willow Scrub

Cottonwood Forest

Sacramento River Floodplain Meanderbelt Zone



Mixed Riparian Forest

Valley Oak Riparian Forest Oxbow Lake

Sacramento River Floodplain Meanderbelt Zone



Elderberry Savanna



Mugwort in silty loam



Telegraph-weed in sand

Riparian Herblands



Sacramento River NWR Acreage

Natural Riparian Lands 4,832

forest, scrub & herb land, sand & gravel

Agriculture Lands 605

Walnut & dryland crop

Restoration Lands 4,952

cultivation & natural restoration

Total Acres 10,353



Riparian Floodplain Restoration



Orchard Removal

Revegetation



Riparian Floodplain Restoration

Local Ecotypes of Indigenous Species

- Restoration Success
- Natural Diversity Conservation
- Adaptations for Climate Change

Nursery Propagation

- Woody plant seedlings
- Herbaceous seedlings & seeds



CSU CHICO



Native Perennial Grass Seed Drilling

Sacramento River National Wildlife Refuge



Grassland & Understory Establishment



Understory Management Objectives

Cows eat grass, sheep eat grass & forbs, goats eat....



- Fuel Reduction
- Native Plant Vigor
- Vertical Habitat Structure

- Noxious Weed Control

- Firebreaks

Fuel Reduction & Plant Vigor

Fuel build-up & dry matter
(duff)

Reduced fuel loads, improved
native plant vigor & vertical
habitat structure



Noxious Weed Control



Firebreaks

Before



After





Sacramento River NWR

Grazed Acreage — 4 Cooperators

Natural Riparian Lands 1,040
forest, scrub & herb land,
sand & gravel

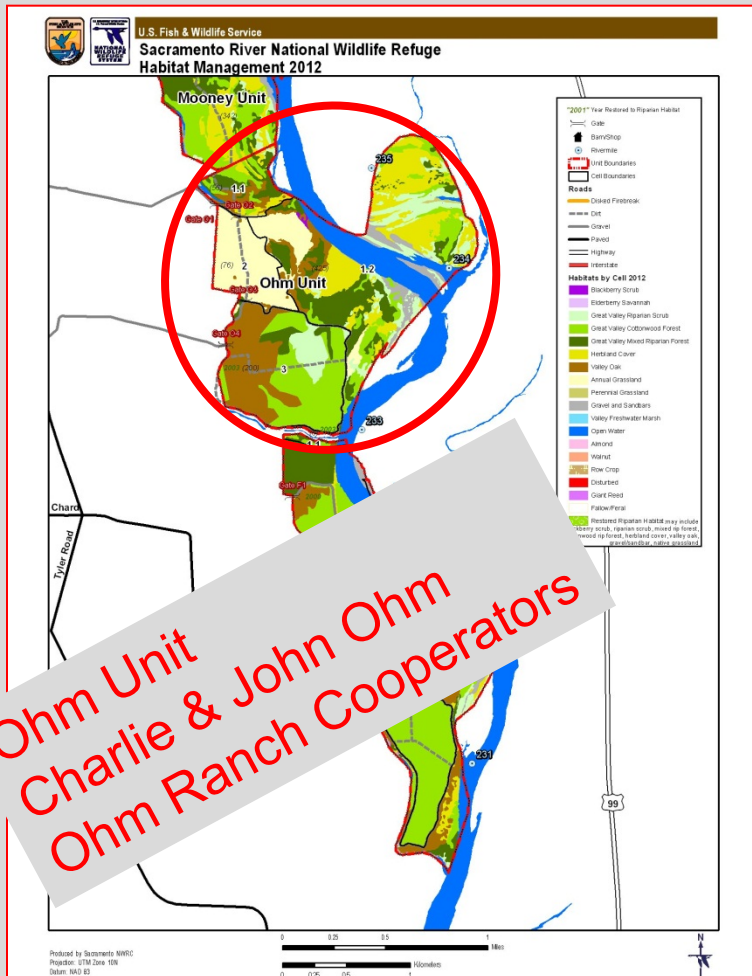
Agriculture Lands 214
dryland crop

Restoration Lands 2,786
cultivation restoration

Total Acres 4,040
(39% of Refuge Total Acres)

Annual Grazing Planning Meetings

Sacramento River NWR & Llano Seco Unit



Prescribed (Rx) grazing plans developed with the cooperators, by Refuge unit & individual tract





Annual Grazing Prescription



Sul Norte Unit

The Cooperative Land Management Agreement (CLMA) with Llano Seco Rancho for cattle grazing applies to specified areas of the Sacramento River National Wildlife Refuge–Sul Norte Unit.

FY 2013 CATTLE GRAZING PLAN FOR THE SUL NORTE UNIT

| Refuge Tract | Habitat/Vegetation | Grazing Objective ^{1,2} | Prescribed Field Condition | Target Date for Prescribed Field Condition | Turn-in Date ³ | Turn-out Date | AUM |
|--------------|--|---|---|--|--|---------------|-----|
| T1 | Mixed Riparian Forest (192 total ac; approx. 60 forage ac) | 1) Reduction of hazardous fuels 2) Enhance native grassland 3) Control non-native invasive plant species 4) Improve nesting habitat for grassland nesting birds 5) Improve foraging habitat for grassland species | Reduction of hazardous fuels by 60% and treatment of nonnative annual grasses Variable 3–8-inch residual dry matter (RDM) on annual grasses height depending on soils: | June–July | May 15 (w/ T3.1) | July 15 | |
| T3.1 | Native Perennial Grassland approx. (86 ac) | Grazing on hold until native grasses are established and non-native grasses require control | Variable 3–6 inches residual dry matter on annual grasses, remove/reduce thatch layer build-up | June–July | May 15 (w/T1) | July 15 | |
| T3.2 | Elderberry Savanna, and Valley Oak woodland Annual Grasses/Forbs (approx. 210 ac) | 1) Reduction of hazardous fuels 2) Control non-native invasive plant species 3) Improve grass/sedge nesting substrate | Reduction of hazardous fuels by 60%– reduce woody foliage to 6 feet above ground with 1–3 inch residual dry matter (RDM) on annual grasses, remove/reduce thatch layer build-up | July | June 15 (open gate between T1/T3.1 & T3.2) | July 15 | |

¹ Thatch and mulch reduction to increase germination of native species.

² Short, clipped (thin cell walls) grass, which increases digestibility/nutrition.

³ Turn-in dates depend on germinating rains and availability of sufficient green annual grass for cattle forage, and closing of Wild Turkey spring hunting season.

⁴ The Sul Norte Unit will be temporary closed to public access during the grazing to minimize the potential of conflicts and safety issues between cattle operations and the public. We considered both the grazing objectives and public use needs (low public use during July) when determining the time period of grazing.



Annual Grazing Rx Projects



FY 2013 CATTLE GRAZING SPECIAL USE PERMIT PROJECTS FOR THE LA BARRANCA/TODD ISLAND UNITS

| Refuge | Projects | Materials¹ | Responsibilities² | Concerns / Issues & Notes |
|--|---|--|--|---|
| Todd Island, LAB T1.1, T2,T 3.1 & T3.2 | 1) Install fences, cattle gates, water trough and place salt blocks for cattle distribution | 1) Hot-wire and charging system, water trough, salt blocks | 1) Permittee provides materials, constructs and maintains gates, fencing and cattle water systems and salt blocks. 2) Refuge provides solar pump and water storage tanks. | 1) Un-grazed Control Plots: monitoring vegetation & bird response to cattle grazing to improve habitat structure and native forb germination conditions, to reduce non-native annual plant thatch, and reduce hazardous fuels. to reduce non-native annual plant thatch and reduce hazardous fuels 2) Fence cattle out of neighboring properties 3) Area is open to public use including hunting LAB T3.2 is control plot for grazing program monitoring. |

¹ Only herbicides and pesticides approved by the Refuge may be applied on National Wildlife Refuge lands. Approved herbicides include: Roundup glyphosphate for over-land applications; Rodeo or Aquamaster glyphosphates for over-water applications; 2-4,D; Garlon; Transline; Telar; Habitat; Forefront; Milestone; or equivalents.

² Tony Turri provides materials, labor, and monitoring of cattle.



Challenges with Grazing on public lands on the Sacramento River floodplain

Timing of grazing

- Public use conflicts
- Targeted lifecycle of weed
- Flood frequency
- Ground Nesting Birds

Fencing

- Interior fencing and movements
- Hardwire fences on borders

Water source

- River access/trespass
- Modifying facilities

Timing of Grazing

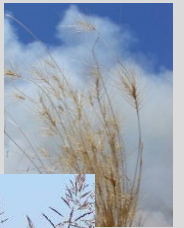
Hunting



Wildlife Observation Photography



Weed Phenology/Control



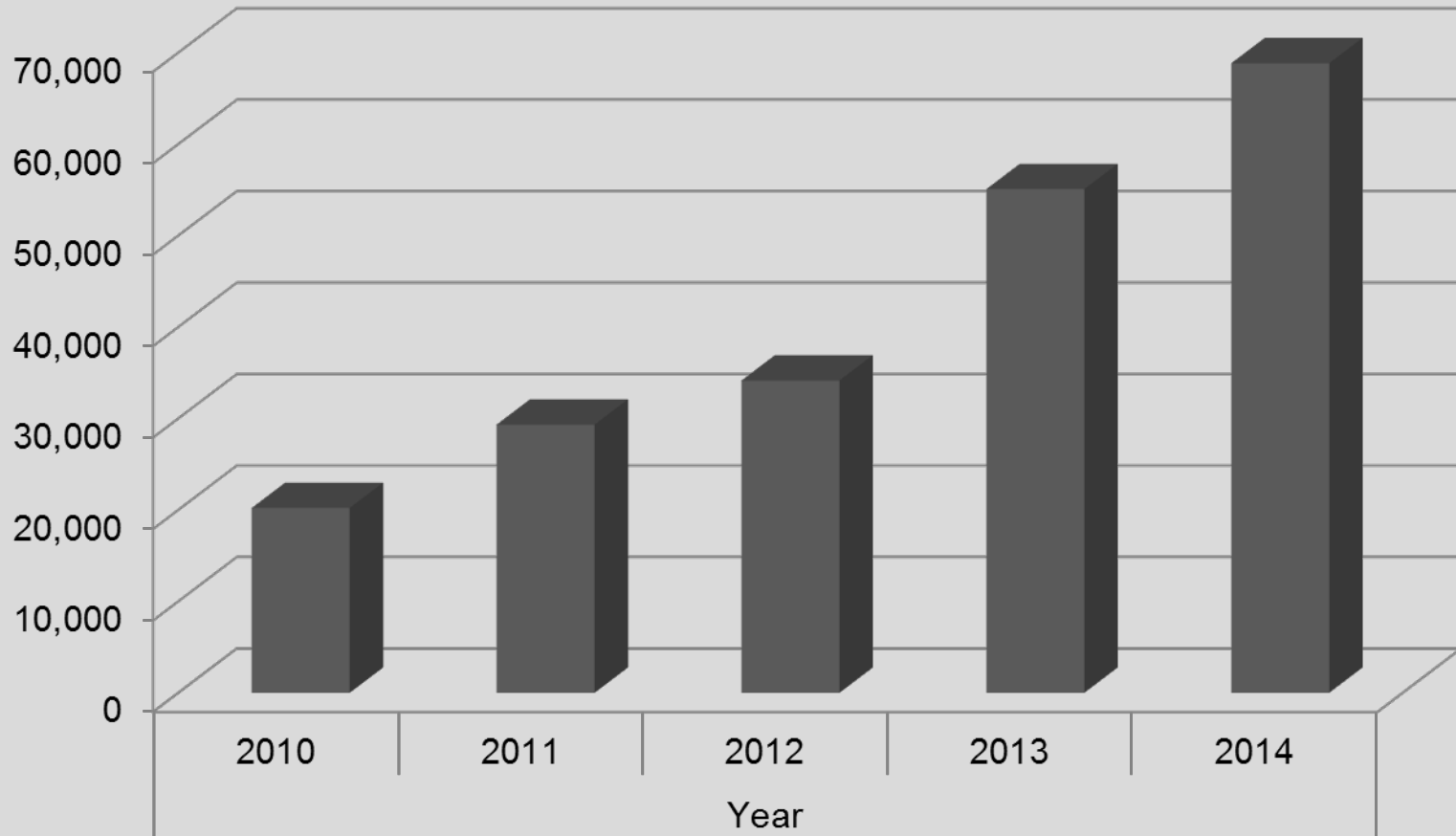
Flooding





Sacramento River NWR Visitor Use

SRNWR Annual Visitation



Fencing

Hot-wire



Barbed-wire



Water Sources

Natural Sources

Solar-powered Lift Pump,
Tanks & Troughs



Habitat Management & Monitoring

Riparian Bird Diversity & Floodplain Vegetation Structure



Illustrated by
Zac Denning



Monitoring

- Routine site inspections by refuge manager, biologist & livestock cooperator
- Photo stations by refuge staff (& sometimes livestock cooperator)
- Quantitative measurements by refuge and/ or various partners

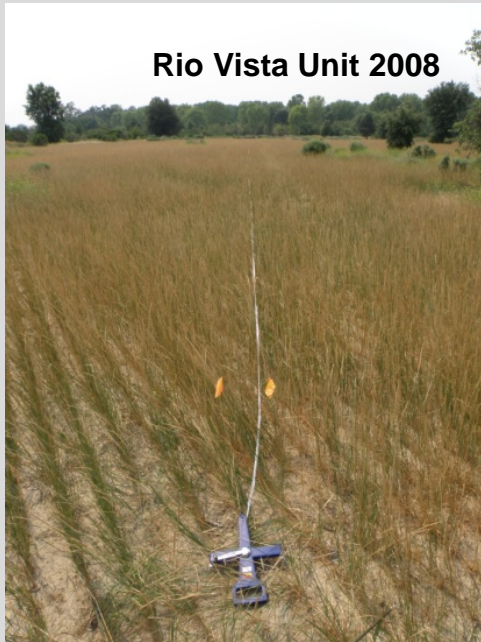




Restoration Monitoring



Rio Vista Unit 2008



Rio Vista Unit 2011



Vegetation/ Native Grasses

- Frequency
- Cover
- Density

Wildlife/ Landbirds

- Vital rates
- Species diversity
- Nesting success

RIPARIAN & FLOODPLAIN RESTORATION BENEFITS TO A DIVERSITY OF TAXA

INSECTS

- VELB
- Ground-dwelling Beetles
- Bees

BIRDS

- Landbirds

SMALL MAMMALS

- Rodents
- Bats

Wildlife Response to Riparian Restoration on the Sacramento River

Gregory H. Golet, The Nature Conservancy*
Thomas Gardali, PRBO Conservation Science
Christine A. Howell, PRBO Conservation Science
John Hunt, California State University, Chico
Ryan A. Luster, The Nature Conservancy
William Rainey, University of California, Berkeley
Michael D. Roberts, The Nature Conservancy
Joseph Silveira, U.S. Fish and Wildlife Service
Helen Swagerty, River Partners
Neal Williams, Bryn Mawr College

*Corresponding author: ggolet@tnc.org

ABSTRACT

Studies that assess the success of riparian restoration projects seldom focus on wildlife. More generally, vegetation characteristics are studied, with the assumption that animal populations will recover once adequate habitats are established. On the Sacramento River, millions of dollars have been spent on habitat restoration, yet few studies of wildlife response have been published. Here we present the major findings of a suite of studies that assessed responses of four taxonomic groups (insects, birds, bats, and rodents). Study designs fell primarily into two broad categories: comparisons of restoration sites of different ages, and comparisons of restoration sites with agricultural and remnant riparian sites.

Older restoration sites showed increased abundances of many species of landbirds and bats relative to

younger sites, and the same trend was observed for the Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), a federally threatened species. Species richness of landbirds and ground-dwelling beetles appeared to increase as restoration sites matured. Young restoration sites provided benefits to species that utilize early successional riparian habitats, and after about 10 years, the sites appeared to provide many of the complex structural habitat elements that are characteristic of remnant forest patches. Eleven-year old sites were occupied by both cavity-nesting birds and special-status crevice-roosting bats. Restored sites also supported a wide diversity of bee species, and had richness similar to remnant sites. Remnant sites had species compositions of beetles and rodents more similar to older sites than to younger sites.



Baseline Grazing Study

Sacramento River National Wildlife Refuge



UC Santa Cruz



North State Resources, Inc.



- Contracting & science partner
- Vegetation effects
- Winter & breeding birds & habitat effects
- Small mammals effects
- Cattle grazing cooperator
- Cattle grazing cooperator





Concluding Thoughts

Benefits of Grazing for Habitat Management

- Native Plants & Vegetation / “Plant Communities”
- Wildlife Habitat: Improve Nesting Structure, Nutrition
- Invasive Plant Species Control
- Reduced risk of catastrophic fires
- Flood Conveyance
- Partnerships & flexibility
- More is better – more habitat / less weeds

You've got to start somewhere, pick the right spot & just do it