

Research & Resource Management at Cypress Grove Preserve

Audubon Canyon Ranch, Summer 1994

From Pasture to Swamp

TWENTY YEARS AT LIVERMORE MARSH

Two hundred years ago, Livermore Marsh was a subtidal inlet of Tomales Bay. Now, the biological character of this 26-acre coastal freshwater marsh at ACR's Cypress Grove Preserve reflects dramatic influences of human land use. Dairy ranching has accelerated watershed erosion and the delivery of sediments to the marsh. The old North Pacific Coast Railroad berm slows the release of sediment-laden storm water into Tomales Bay. Before acquisition by Audubon Canyon Ranch in 1971, Livermore Marsh was drained and used as sheep pasture. ACR has since created a raised spillway to maintain freshwater conditions, allowed wetland vegetation to proliferate, and created four twelve-month ponds that provide some open water even during periods of drought. However, this is just the beginning. Named in memory of conservationist Carolyn Sealy Livermore, this diverse and productive wetland requires careful ongoing management.

Ground and surface water levels fluctuate seasonally creating dramatically different habitats through the year. The winter marsh provides open-water habitat for Canvasbacks, Ring-necked Ducks, Ruddy Ducks, Bufflehead, and other diving ducks. This year, fewer wintering ducks were observed, possibly because of two visiting river otters -- a species known to occasionally take waterbirds! Receding water levels and spring growth of marsh plants provide nesting and feeding areas for Cinnamon Teal, Ruddy Ducks, Pied-billed Grebes, Marsh Wrens and Red-winged Blackbirds. By August/September, the surface water is low enough to support migrating Lesser Yellowlegs, Long-billed Dowitchers, Pectoral Sandpipers, and other migrating shorebirds

that prefer freshwater habitats. It is interesting that neither the pattern nor extent of winter rainfall affect the predictable rate at which spring and summer water levels drop (Figure 1), making water management easy and habitats dependable for birds. In some years, slight drawdown of late summer water level is used to enhance shorebird habitat.

Surface water occurs infrequently in the higher terraces of the marsh and some intrusion of upland plant species has occurred. To counter this trend, ACR has installed a series of check dams in the north marsh creek channel. Check dams raise the creek bed and water table, and consequently increase the duration of winter soil saturation in the upper marsh. Saturation of soils decrease oxygen exchange with plant roots by a factor of 10,000, and thus favors wetland-adapted plant species. By raising the creek bed, we have also increased winter sheet flow over the upper marsh, when runoff rises above the banks of the creek channel. Of course, ongoing deposition of sediment continues to threaten the wetland status of the marsh.

Monitoring results suggest that the marsh is accreting at an amazing average rate of about 12.5 mm per year (Figure 2). This represents about 1,750 cubic yards of sediment, on average, each winter!

Marsh vegetation has become increasingly complex over the last 20 years, with concomitant increases in biological diversity. During the late 1970s and most of the 1980s, California blackberries (*Rubus ursinus*) spread over much of the middle and upper marsh terraces creating a rather homogeneous habitat with limited plant and animal diversity. In 1983, following heavy floods associated with El Niño, arroyo willows (*Salix*

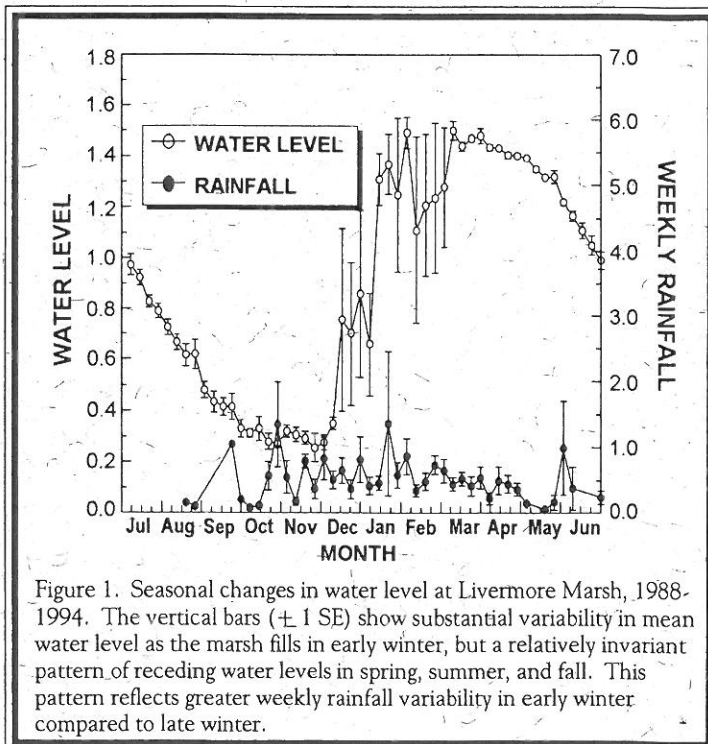


Figure 1. Seasonal changes in water level at Livermore Marsh, 1988-1994. The vertical bars (± 1 SE) show substantial variability in mean water level as the marsh fills in early winter, but a relatively invariant pattern of receding water levels in spring, summer, and fall. This pattern reflects greater weekly rainfall variability in early winter compared to late winter.

(Please turn to page 2.)

FROM THE BOTTOM OF THE CREEK

Five Years on the Walker Creek Delta Flats

Rich Stallcup



We're knee deep in old growth pickleweed and *Grindelia* just west of Ocean Roar staring at the afternoon sky in silent awe. Gulls in squadrons of ten, hundreds, then thousands slide over on set wings heading for the vast mudflats where Walker Creek empties into Tomales Bay. Someone whispers "It feels like being at the bottom of a clear stream watching groups of ash or maple catkins flowing on the surface far above."

Once clear of the hills and unloading thermal air from beneath their wings, the gulls peel off toward Hog Island or slightly to the north where they will gather on exposed bars with Harbor Seals near Lawson's Landing. Others fall with half-closed wings and droplocked landing gear toward the oyster racks at the edge of Walker Creek Delta. We are in the belly of a magnificent wildlife spectacle unknown to most humans. Jeeeeezz these birds are wonderful.

It is February 1994 and we are finishing up the last set of Walker Creek Delta shorebird censuses conducted by biologists from Audubon Canyon Ranch for the California Department of Fish and Game. We have done this for five years now, each winter, nine censuses per day on twelve days per year at extreme low tides. The purpose of the project is to determine what, if any impact aquaculture (oyster farming) has on the use of intertidal mudflats by wintering shorebirds. The data we have gathered is accurate. The science is sound and we have nearly accomplished the goal...but there has been so much more.

Sixty winter evenings, our hip-boots pegged in five inches of mud or three feet of water in the virtual center of Tomales Bay, inspire a certain oneness with things like Moon Snails, godwits, sculpins, sandpipers and...weather. There were a couple of times that would be considered good weather to most people but most of the time we were faced with the challenge and drama of wild stuff. Driving north-west wind, swirling fog, pelting rain and hail, sometimes in rapidly changing combinations, were common. Interestingly, such conditions have made the Walker Creek Delta Surveys beautiful

This year, ACR completed field work on a five-year study of shorebirds at Walker Creek Delta, near the north end of Tomales Bay. The study was designed to detect possible effects of oyster farming on the use of intertidal mudflats by shorebirds. Field work involved multiple simultaneous counts of shorebirds among six study plots — some plots with and some without oyster growing operations — as foraging shorebirds followed the ebbing water's edge through the study area. By nature's design, the extreme winter low-low tides appropriate for this study usually occurred late in the day. Consequently, we were often counting shorebirds until the last usable light. I am currently analyzing the field data and should complete the final report by fall. The results will probably describe a mixture of selection and avoidance behaviors. Audubon Canyon Ranch owes special thanks to Rich for offering this personal account of the project, and much appreciation to Jules Evens, Terry Nordbye, Rich Stallcup, and David Wimpfheimer for excellent observations and good times. Valuable field assistance was also provided by Rod MacDonald, Dan Reinking, Forest Tomlinson, and Chris Wood. —John Kelly

and memorable.

Standing on the flats half a kilometer from shore, alone in "nasty" weather with a telescope and a clipboard might not be thought of as a good time by most people but we have treasured all of those many hours. Rafts of Bufflehead and Scaup, loons, grebes, cormorants and mergansers cover the bay, just offshore. Whistling wings of flying scoters are exceptionally clear beyond the bleating drone of a thousand brant. Three thousand peeps explode into chaos by the sudden presence of a Merlin or Peregrine; they twist, whirl and wind in flocking flight all as one, becoming a single organism, flashing white then dark then white. The last school bus rumbles south along curvy Route One towards Point Reyes Station.

It is a long way back to our trucks but it always seems short. We talk about what we've seen; wonder if the pipits and Least Sandpipers talk to each other where they roost in sparse *Salicornia* with a net-like canopy of dead eel grass. We check all the Marsh Wrens and Savannah Sparrows for rarities and twice have flushed Black Rails. We talk about feral cats, wounded Marsh Hawks, other people's garbage, river otters and restoration of Waldo's (diked) pasture.

It's getting dark. A Golden Eagle is escorted over the ridge by an unkindness of ravens. Tree frogs chorus their happiness over freshwater from yesterdays rain. Mule deer and Holsteins stare at the ground and Great Horned Owls chant from the cypress.

I can tell you, and maybe I can speak for my friends John, Jules, David and Terry, this aquaculture study has been a great delight and a wonder-filled adventure.

Livermore Marsh . . . (from page 1)

lasiolepis) began to appear, and have since grown into thickets over 20 feet tall. In the late 1980s, several species of native riparian shrubs began to emerge from the blackberry canopy. Coast dogwood (*Cornus sericea*), ninebark (*Physocarpus capitatus*), twinberry (*Lonicera involucrata*), and other woody shrubs are now clearly overtopping and shading out the blackberries in many areas.

The result is a vastly more complex habitat, dominated in parts by tall woody shrubs that create patches of swamp when flooded, and a greater diversity of birds and other wildlife. New breeding bird species include several riparian songbirds such as Swainson's Thrush, Wilson's Warbler, Yellow Warbler, and Black-headed Grosbeak (Figure 3). However, other changes in vegetation threaten to simplify the habitat. We will soon need to actively reduce the extent of cattail (*Typha latifolia*) in the lower marsh

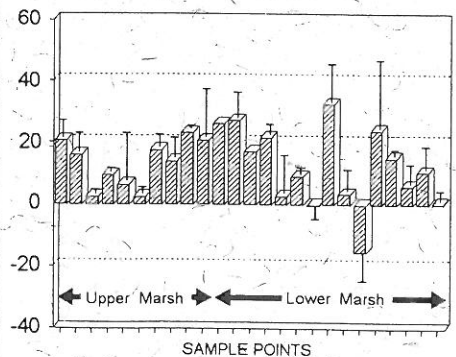


Figure 2. Sedimentation (mm) at Livermore Marsh, 1988-1993. Negative values indicate scouring in the main channel. Error bars indicate standard errors.

to avoid loss of valuable shorebird feeding areas in fall and open water in winter (Figure 3).

Tricolored Blackbirds rarely breed along the outer Coast Range but have nested at Livermore Marsh in three of the last seven years. Each time, they have built *several hundred* nests in the lower marsh bulrushes (*Scirpus* sp.). ACR has

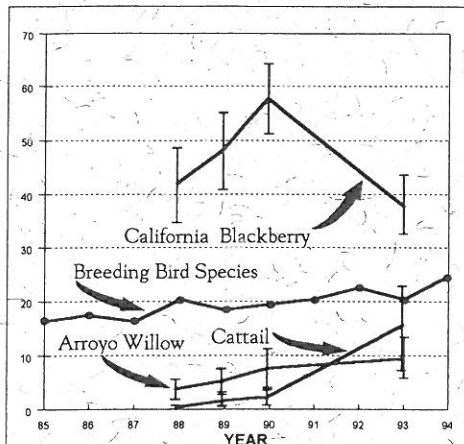


Figure 3. Changes in numbers of breeding birds and percent vegetation cover (bars indicate standard errors) at Livermore Marsh.

closely monitored each Tricolored breeding event and hopes to learn something about their reluctance to breed along the coast.

Future plans for Livermore Marsh include continued monitoring of sedimentation rates, ground and surface water, vegetation, and breeding and wintering bird populations. Key wetland songbirds, such as Common Yellowthroats, are the subjects of ACR research to learn about local habitat preferences that could guide vegetation management. Other species of concern include California red-legged frog (*Rana aurora* sp. *draytonii*), western pond turtle (*Clemmys marmorata*), and Northern Harrier (aka "Marsh Hawk") that nests in adjacent coastal prairie vegetation.

Immediate management concerns involve controlling cattails, installing more check dams, and changing circulation in the lower marsh to enhance flow-through of sediments. We cannot simply "restore" this marsh, because there is no previous model of undisturbed conditions. Therefore, ACR continues to enhance and protect its productivity and diversity. As Livermore Marsh becomes more complex, wildlife values are enhanced and challenges become greater to protect this diverse and changing wetland.

IN PROGRESS

PLANT WARS

Grant Fletcher has completed a four-year study on the use of mowing to control exotic weeds. Mowing twice each year during flowering dramatically reduced poison hemlock and virtually eliminated Italian thistle. However, annual mowing may be required for extremely long periods of time for poison hemlock. Mowing of Italian thistle appears promising as an efficient restoration tool. The effects of seasonal mowing on bull thistle were not clear.

TOMALES BAY PLANT SPECIES INVENTORY

We are continuing to enter plant species field data, and are using a standard classification system (Holland 1986) to map plant communities around Tomales Bay.

COASTAL PRAIRIE

The California vole population index is the highest in six years. This should be a good year for higher grassland consumers, but when will the prey base crash? Mowed grassland restoration plots are showing greater species richness than other plots, reflecting the value of disturbance in managing for biodiversity in grasslands.

HARBOR SEALS

We have completed the fourth year of monitoring disturbance behaviors and pupping success of harbor seals near ACR's Tom's Point. Thanks go to Project Coordinator Mary Ellen King and other Field Observers who braved heavy spring winds to gather these valuable data.

SHOREBIRDS

We have completed five years of monitoring Tomales Bay shorebird populations! Experienced birders are needed to continue the study. *Please call CGP if you can help.*

LIVERMORE MARSH

Mysteriously, American Coots produced no "cooties" this year, although other species bred successfully. In 1994, cattails expanded at a much greater rate than in previous years (see lead article, Figure 3).

COMMON YELLOWTHROATS

ACR Field Biologists have completed field work on a three-year study of Salt Marsh Common Yellowthroat foraging "niche." Results will help guide management of Livermore and Olema Marshes, and contribute to our knowledge of this "species of special concern."

NORTH BAY COUNTIES

HERON/EGRET PROJECT

Reproductive success during the 1994 nesting season was apparently near normal throughout the northern San Francisco Bay area. For the second consecutive year, decreases in the number of Snowy Egrets nesting at West Marin Island coincided with increases at several other sites.

WINTER WATERBIRDS

Five years of Tomales Bay waterbird counts have been completed! Spawning biomass of Pacific herring, one source of available food, decreased this year but overall waterbird numbers held steady.

AQUACULTURE

We have completed the final year of a five-year study of possible effects of oyster farming on the use of intertidal habitat by wintering shorebirds (see article on page 2).

HERON/EGRET

VOCAL AGEING

Philip Greene has been recording vocalizations of known-age chicks. We hope to develop methods for ageing chicks and comparing reproductive timing at other colonies in the region.

BLACK RAILS

Chris Wood is studying vocalizations of California Black Rails (listed as Threatened in CA) at Olema Marsh, and has discovered some undescribed calls.

The Ardeid

Ardeid (Ar-DEE-id), n., refers to any member of the family Ardeidae, which includes herons, egrets, and bitterns.

The Ardeid is published twice yearly by Audubon Canyon Ranch as an offering to Field Observers, volunteers, and supporters of Cypress Grove Preserve. To receive *The Ardeid*, please call or write to Cypress Grove Preserve. Subscriptions are available free of charge - however, contributions are gratefully accepted.

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T H E W A T C H

The following Field Observers have contributed to CGP projects since the last newsletter:

- A = Aquaculture Project
- D = Harbor Seal study
- G = CGP gardens
- H = Heron/Egret Project
- I = TB Plant Spp. Inventory
- M = Marsh Monitor. Project
- P = Coastal Prairie
- S = TB Shorebird Project
- V = Heron vocal ageing
- W = TB Waterbird Census
- O = Other activities

- Dan Abraham (PMG)
- Russ Agnew (S)
- Nancy Angelesco (W)
- Bob Baez (SW)
- Norah & Hugh Bain (S)
- Nancy Barbour (H)
- Jeanette Berekman (H)
- Sue Baty (O)
- Tom Baty (WM)
- Gay Bishop (S)
- Edith Black (D)
- Alistar Bleifuss (P)
- Patti Blumin (H)
- Janet Bosshard (H)
- John Boyd (H)
- Tom Bradner (H)
- Mary Brezner (H)
- Tom Burke (G)
- Ken Burton (W)
- Phil Burton (H)
- Diane Carpenter (O)
- Ann Cassidy (P)
- Susan Chase (G)
- Courtney Cline (D)
- Marianne Constable (G)
- Walt Creber (P)
- Eric Davis (H)
- Mark Deah (S)
- Cora Disney (H)
- Roberta Downey (PM)
- Dick and Jenny Downing (H)

- Leslie Doughty (M)
- Lew Edmonson (S)
- Ted Elliot (H)
- Jules Evens (ASM)
- Gary Falxa (SW)
- Binny Fischer (H)
- Virginia Fletcher (SHIPO)
- Grant Fletcher (SWHIPO)
- Carol Foley (H)
- Carol Fraker (H)
- Gail Garmon (W)
- Patrick Garmy (PMW)
- Rich Gibson (P)
- Keith Gish (H)
- Margaret Greene (H)
- Philip Greene (HV)
- Gayle Greeley (S)
- Chris Griffin (G)
- Madelon Halpern (H)
- Daphne Hatch (W)
- Holly Heinzmann (W)
- Catherine Hickey (H)
- Catherine M. Hickey (H)
- Edna Hickok (H)
- Maggie Hynes (HW)
- Daniel Jacobs (MG)
- Lynnette Kahn (SH)
- Mary Ellen King (DHW)
- Richard Kirschman (SW)
- Felix Knauth (D)
- Judith Lamoure (G)
- Jim Larkin (D)
- William LeGro (W)
- Robin Leong (H)
- Michele Liapes (WP)
- Ruby Long (H)
- Paul Loudon (G)
- Christina MacInnes (H)
- Flora MacClise (MHO)
- Jo Maillard (H)
- Aspen Mayers (W)
- Chris McAuliffe (H)
- Fred McCullan (H)
- John McDonagh (S)
- Harmony Mercedes (P)
- Maggie Metcalf (H)
- Jean Miller (HPM)

- Dan Murphy (W)
- Murid Niehaus (W)
- Terry Nordbye (ADHMWS)
- Alexis Osantrich (G)
- Don Pagnac (MOG)
- Ray Paula (H)
- Karen Paull (D)
- John Petersen (H)
- Yvonne Pierce (W)
- Richard Plant (W)
- Myrlee Potosnak (H)
- David Potter (H)
- Grace Pratt (H)
- Helen Pratt (HV)
- Linda Reichel (H)
- Erich Reineker (W)
- Ellen Sabine (HS)
- Barbara Salzman (H)
- Fran Scarlett (H)
- Vincenza Scarpaci (G)
- Craig Scott (D)
- Elaine Senf (M)
- Brian Simon (W)
- Hillary Smith (W)
- Joe Smith (D)
- Hildie Spautz (S)
- Anne Spencer (HS)

- Rich Stallcup (ASM)
 - Jean Starkweather (H)
 - Robert Stewart (P)
 - Sarah Tappen (WP)
 - Judy Temko (HS)
 - Gil Thomson (H)
 - Don Tieman (H)
 - Janet Thiessen (HW)
 - Forest Tomlinson (WA)
 - Susan Van Der Wal (G)
 - Bill Van Schaick (S)
 - Janet Walker (M)
 - Tanis Walters (S)
 - Mike Warren (D)
 - Ralph and Rosalie Webb (H)
 - Ken Wilson (H)
 - Adeline Whitmore (H)
 - Diane Williams (S)
 - David Wimpfheimer (AWSH)
 - Chris Wood (HMOA)
- Field Biologists
- Jules Evens
 - Terry Nordbye
 - Rich Stallcup
 - Forest Tomlinson

- David Wimpfheimer
 - Chris Wood
- Research Associates
- Sarah Allen
 - Faith Duncan
 - Jules Evens
 - Grant Fletcher
 - Philip Greene
 - Mary Ellen King
 - Flora MacClise
 - Helen Pratt
 - Rich Stallcup
 - Chris Wood
- CGP Staff
- Resident Biologist
 - John Kelly
 - Land Steward
 - Patrick Garmy
 - Administrator
 - Sarah Tappen
- The Ardeid
- John Kelly, editor
 - Sarah Tappen, design

IN THE FIELD

July	19	Native grass seed collecting (Please call CGP @ 663-8203 for information)
August	26	Fall shorebird count and Tomales Bay Shorebird Project Meeting (Please call CGP @ 663-8203 for information)
September	17-18	Tom's Point Overnight Work Party (Please call ACR @ 868-9244 for information)
October	8	Heron/Egret Project End-of-Season Potluck Meeting
November	10	Tomales Bay Shorebird Census (early winter count)
	25	Tomales Bay Shorebird Census (early winter count)



Audubon Canyon Ranch, 4900 Shoreline Hwy, Stinson Beach, CA 94970
Cypress Grove Preserve, P. O. Box 808, Marshall, CA 94940
(415)663-8203

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