BODEGA LAND TRUST

BODEGA LAND TRUST REPORT:

What's Going on in Salmon Creek?

by Cleo Woelfle-Erskine

Collaborative Research on Salmon Recovery

Summer streamflow dynamics strongly influence salmonid survival and growth rates because streamflow drives aquatic insect drift, temperature, and dissolved oxygen levels. As Salmon Creek residents have all seen this fall, streams become disconnected or dry completely as flows drop over the summer and fall. Ecologists have found that salmonids that survive in disconnected pools on intermittent streams possess different traits than those that grow up in continuously flowing streams. These different traits increase the overall fitness of the population by making it more likely that some fish will survive in any given year.

In 2012, I began a 3-year hydro-ecological field research program on in the Salmon Creek watershed (Sonoma Co., CA) that investigates how streamflow affects over-summer survival of Coho and steelhead. I chose two tributaries, Fay and Tannery creeks, as my study sites because earlier studies found good quality habitat that dried into a series of intermittent pools in the late summer. I have two study reaches on each stream, all of which are located on land owned by Delia Moon, with a conservation easement on the Fay Creek riparian corridor held by the Bodega Land Trust. Both tributary reaches have gravel and cobble beds, with some large woody debris, and low levels of nitrate and phosphate.

Observations by residents and scientists suggest that Fay has lower summer flows than Tannery. My study is the first to measure streamflow and water quality for extended periods and to assess how Coho and steelhead survival changes as flows decrease and the stream becomes a series of disconnected pools.

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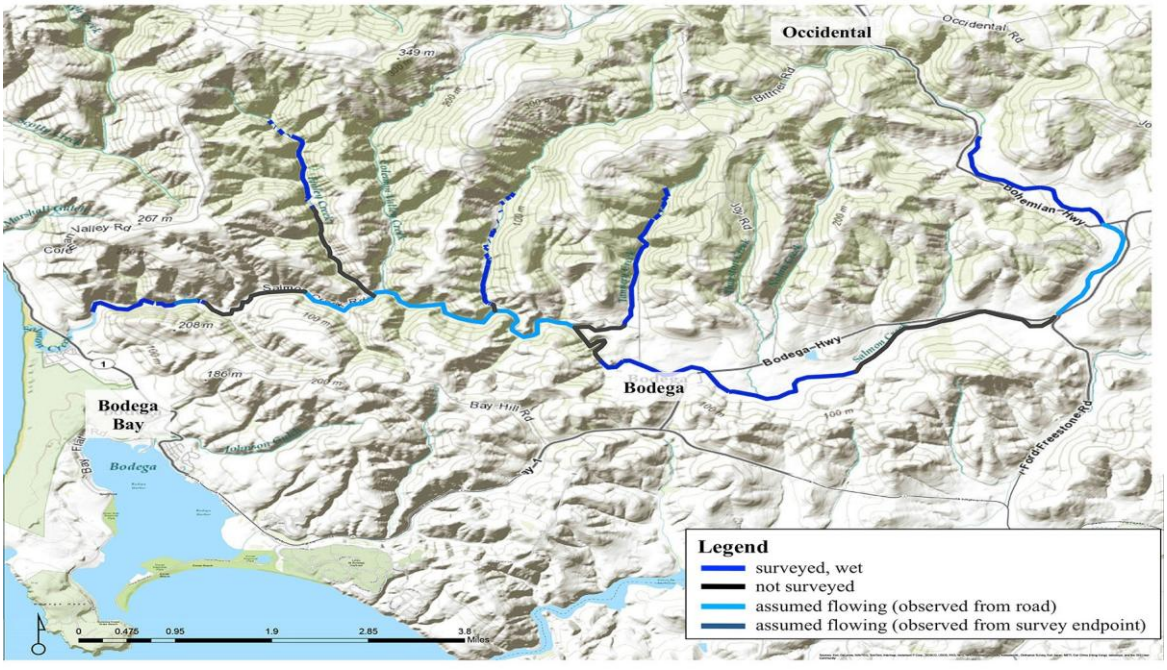

BODEGA LAND TRUST
is a 501(c)(3) tax-exempt organization that works to conserve the natural beauty and agricultural integrity of the Salmon Creek watershed and our community.

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MEMBER
Land Trust Alliance

"When we see land as a community to which we belong, we may begin to use it with love and respect."

- Aldo Leopold
(1886-1948)

A Letter from the President

Another year has passed, it seems very quickly.

In 2013 Bodega Land Trust put much effort into improving our contacts with supporters through the semi-annual journal, the e-newsletter, our website and Facebook page, and our very successful Walks and Talks series.

We have also been working to conclude an agreement to purchase a major new easement. This will be the largest easement we have ever acquired, and will require a large financial commitment. We are pleased and excited about this great opportunity.

Bodega Land Trust is pleased to have sponsored two well-attended community forums organized by Board member Eric Koenigshofer (now retired) to discuss the suggestions of the Open Space District and Regional Parks to increase access to publicly owned lands in the west county.

Every year we depend upon and appreciate the work of many volunteers, without whom Bodega Land Trust could not carry out its easement monitoring duties, organize its walks and talks, or put on our annual fall dinner.

Special thanks are due to Dan Arendt and Michael Fahmie for organizing the B50 event commemorating the 50th anniversary of the movie "The Birds," which financially benefitted Bodega Land Trust.

As always we appreciate the contribution we receive from the annual Fishermen's Festival in return for our volunteer work. If you would like to participate next year please contact us. The event is usually held in late April and volunteers get in free.

"Nature is not a place to visit. It is home."
— Gary Snyder

Dark Skies

- by Eric Koenigshofer

The New York Times ran an article in October of 2012, reporting on international efforts to "keep night skies dark", noting that Rachel Carson "once wrote of seeing 'the misty river of the Milky Way flowing across the sky' as she gazed upward on a moonless night." Many will recall their own experience of gazing into the dark, night sky and marveling at the mystery of space and stars. As world population grows and night lighting increases, the impact of residential and commercial lighting continues to change the nighttime landscape (and skyscape). The cumulative impact of lighting reduces the experience of darkness as an important aspect of nature.

But there is more to excessive lighting than merely making the night darker. It is estimated that excessive lighting wastes energy worldwide valued at over $110 billion per year. Generating the electricity for this excess annually emits 750 million tons of Carbon Dioxide, a prime contributor to climate change.

The idea of protecting rural dark skies is gaining more awareness due to the efforts of the International Dark-Sky Association based in Arizona (www.darksky.org). Visit the website and enjoy some magnificent videos and informative conversation. The "dark sky" concept has great merit and should become part of our own efforts to protect the rural character of our county. BLT can bring this issue to light (forgive this curious reference please) by explaining the concept and providing encouragement that leads to awareness and, hopefully, a more traditional experience of night time in the country.

There are a few important steps we can all take. Avoid leaving lights on all night, just as you would a water faucet. Outdoor lighting should be on motion-detection switches. Outdoor lighting should be "shielded" and "down directed" to light the ground below the light and not the sky. Low watt florescent or LED bulbs are also a good idea. Soft light is just as effective as glaring, bright light to guide your path from car to door or to alert you to movement outside.

This idea may seem like a small thing but over time small things add up and can matter greatly. As we continue to preserve our West Sonoma County version of rural living, incorporating awareness and appreciation of the role of darkness will be beneficial to all in the long run.

Check your lights…mention the topic in conversation. Let's shed some darkness on the subject!

Bodega Red Potato News

- by Abby Killey

The Bodega Red Potato continues its slow and steady comeback with support of community enthusiasts, Slow Food promotion and at last, commercial farmers. You may recall that Bodega Land Trust helped Slow Food with the initial potato rescue, by uncovering the whereabouts of some of the few remaining Bodega Red Potatoes several years ago. With financial assistance from the Rancho Bodega Historical Society, part of the newly discovered handful of potatoes was sent to a seed potato lab in Washington to be "devirused". The lab determined through genetic analysis that the potatoes were of Peruvian origin, and had most likely arrived with Captain Smith's new bride as he took possession of his new Spanish land grant, Rancho Bodega. The first generation of seed potatoes was returned and doled out by the Bodega Red Potato Club, self-proclaimed protectors of the Bodega Red. Local gardeners were offered the Reds for a promise to give back part of their harvest in order to grow a local community supply. The community supply is indeed growing, and club members will return their 2014 shares at the Bodega Big Event next August 3. Come and get 'em for yourself!

Slow Food took the potatoes to local organic farmers and low-and-behold they are now showing up at Farmers' Markets! They have been successful enough to allow the delicious potatoes to be eaten! The following farms are now selling Bodega Reds from their farms or at Farmers' Markets:

Bernier Farms: www.bernierfarms.com
Front Porch Farm: www.fpfarm.com
Foggy River Farm: www.restoativefarming.com
DaVero Farms: www.davero.com
Tierra Vegetables: www.tierravegitables.com
Strong Arm Farm: www.strongarmfarm.com
First Light Farm: www.firstlightcsa.com
North Coast Native Nursery in Chileno Valley: www.northcoastnativenursery.com

Buy 'em…they're tasty!

January: New Lambs! - at Bodega Pastures

All articles by Hazel Flett unless otherwise noted

The Lamb Walk was so popular this year we had to hold two! It is a great event for children – our other little lambs. Participants learn about sheep farming, watch the newborns and their moms at the barn, and then go looking for more.

- Photos by Brian Cluer

"Something will have gone out of us as a people if we ever let the remaining wilderness be destroyed ...
We simply need that wild country available to us, even if we never do more than drive to its edge and look in."
"The Sound of Mountain Water"

—Wallace Stegner

February: Beavers in California, with Kate Lundquist

In February Kate Lundquist gave a fascinating talk about beavers. Kate works for the Occidental Arts and Ecology Center's WATER Institute, which teaches hydrologic literacy; as she observed, a lot of what they teach beavers do naturally.

I thought beavers had never lived around here, but I was wrong: they were driven to extinction. In California in general beavers are noticeably absent. A report on the status of beavers from 1942 showed only 1,300 in the state. Bringing them back would be an excellent example of rewilding.

Estimates of current beaver numbers in the US vary between 6 and 20 million. Before Europeans arrived, there were up to 400 million. There used to be 10 to 60 beavers per mile of waterway. Ten per cent of the land was wetlands, a mosaic of wetlands, woods and grasslands.

Beaver numbers declined with the Fur Rush, from about 1790 to 1850. Trappers exterminated every beaver they could find. Huge profits (1800%) were made selling beaver pelts in Asia; their castor glands were sold for medicine and perfumes. When Europeans settled and agriculture became established, the beaver wetlands were drained for agricultural use.

National Geographic, credit Michael S. Quinton

The beavers themselves? At 35 to 70 lbs. they are the largest rodent except the capybara. They live in colonies. Their kits are born from May to July in litters of two to eight, usually three to four. Yearlings remain with the colony and help out. Juveniles disperse to new habitat at two to three years and mate, but they may stay at "home" longer if population is dense and habitat scarce. Beavers are adult at 3 and may live to 12; they are socially but not genetically monogamous.

Beavers are more agile in water than on land. Their tail helps with swimming; it also regulates temperature and stores fat. Their tail leaves a track; their back feet are webbed but not the front, so their tracks are distinctive. Their teeth grow continually. At 3 days old the kit starts to cut its teeth on vegetation.

Beavers are herbivorous. They have a diverse diet, eating forbs, grasses, roots, bulbs, as well as tree bark. They like deciduous trees more than conifers. They store food under water, which may leach out some of the plant chemicals; their castor gland collects plant chemicals. They ingest their own scat to obtain nutrients released by bacteria. They use scent to communicate; this includes scent-marking things with their castor and anal glands to define their territory.

- from "Linda's Learning Links" website: www.lindaslearninglinks.com

Wetlands protect beavers from coyotes, wolves, mountain lions, bobcats and bears. Their lodges have underwater entrances, often several, so that land predators cannot enter. Dams are built with wood, cattails, rocks, etc. Beavers move from dam building to lodge building when the water depth is right. It takes 20 days to build a lodge and 3 tons of materials. A beaver can lift its own body weight in timber. In northern latitudes they may be in their lodge for eight months of the year because of the ice.

Beavers change the environment more than any other creature except humans. They are considered a "keystone species" because so many species depend on the habitat they create through their dam building. Their effect on water is to slow it, spread it, sink it, (just as the WATER Institute urges us to do). Their dams increase the amount of water stored, filter out pollutants, and cool the water (that has sunk in the earth and later resurfaces). Beaver dams increase stream flow; in droughts there is 60% more open water in beaver territory.

Salmon benefit from floodplain reconnection, groundwater recharge, cool water upwelling and pools for juveniles; in these off-channel pools with diverse temperatures, abundant food and cover, more juveniles survive and gain more weight before heading out to sea. There is a common misperception that beaver dams prevent passage of native fish yet numerous scientific studies refute this.

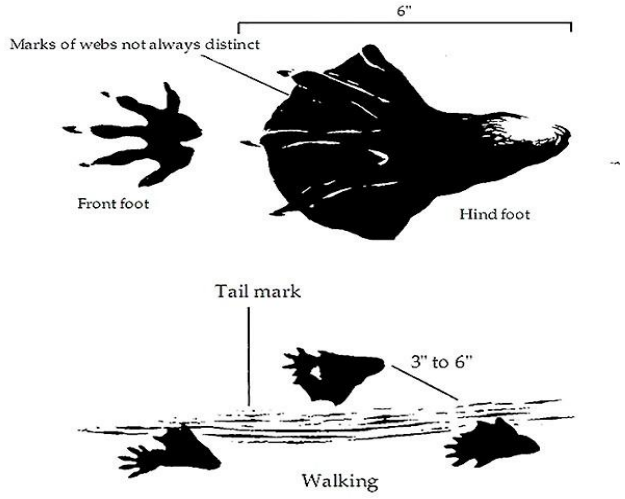
Beaver wetlands benefit endangered songbirds, insects and amphibians. In northern latitudes beavers also benefit Canada geese as the ice melts sooner on their lodges and nesting on top and then migration can happen sooner. The economic value of beaver ecosystem services is high.

So what is the problem about restoring them? Beavers can cause lots of damage. For example, they plug culverts causing flooding and damage to roads. They burrow in dykes and levees. They destroy valuable plants such as grapevines and young trees. They can destroy cover near creeks, though they also cool water with their structures, which is good for the fish. In California beaver policy is that they can be hunted with a permit in 42 counties. If there is a threat of, or actual damage, they can be killed by land owners with a depredation permit. The USDA APHIS is often called in to take beaver. Solutions exist for many of the practical problems. For instance, protective fences can be put around culverts and electric fences around vineyards. Further information may be found at the Beaver Management Forum on Facebook, and at Beaver Solutions www.beaversolutions.com, or call OAEC's WATER Institute to be put in touch with a local non-lethal beaver management professional.

On the relocation question: only the California Department of Fish and Wildlife can relocate, and since beaver can travel overland only about 20 miles, restoring them to areas not adjacent to existing colonies usually means having them reintroduced by CDFW. Many other western states have active beaver relocation programs.

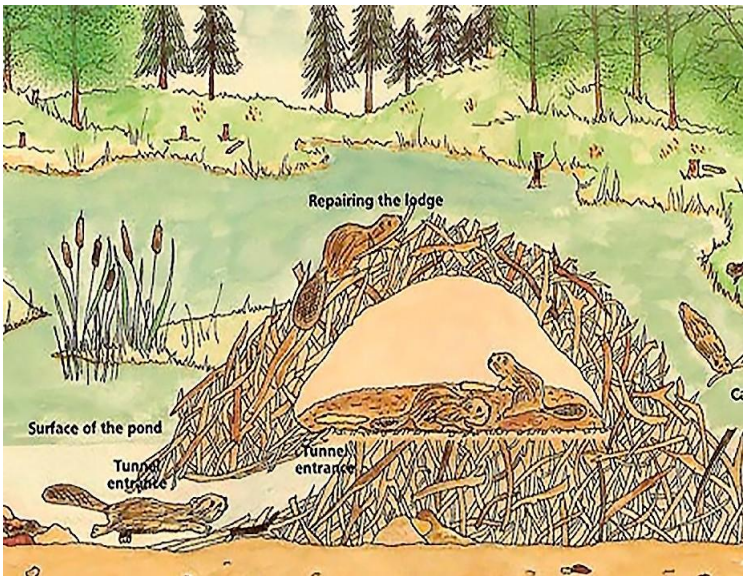
CDFW has no beaver management plan or relocation program, though NOAA's Coho Recovery Plan does include language promoting the use of beaver to recover endangered coho salmon habitat. Utah has a great beaver management plan that they were able to draft in 6 months, whereas Oregon's Dept. of Wildlife spent 7 years on a management plan.

OAEC has a "Bring Back the Beaver Campaign" and is part of the California Beaver Working Group, along with NOAA, SSU, the Institute for Historical Ecology, Sierra Wildlife Coalition and Worth a Dam (in Martinez). OAEC received a grant from the Nature Conservancy to research and report on the historic evidence of beaver in the north coast of California where coho salmon occur. This report and other relevant beaver information are available at www.oaecwater.org/beaver. Help OAEC map current locations of beaver at The Beaver Mapper, www.riverbendsci.com/projects/beavers, a map showing locations of beaver sightings in California and Oregon. Beavers are native to California, yet there are conflicting opinions about whether they are native to the Sierra Nevada, the Coast Range south of the Klamath River, the San Francisco Bay Area and Southern



California. Among the evidence are words for beaver in many coastal California Indian languages, pictographs in the foothills and the Santa Barbara area, numerous historic accounts throughout the Bay Area and buried beaver dam wood, dated from 580A.D. to 1850A.D. in the Sierra. Among early European sources for Sonoma County, Vallejo's report of 1833 describes the Laguna as "teeming with beaver", and an 1841 map by Duflot de Mofras gives evidence of beaver in Salmon Creek near Bodega. The WATER Institute has contributed to two of three peer-reviewed papers describing this evidence. Those describing evidence found in the Sierras (Lanman et al. 2012 and James and Lanman 2012) are available at www.oaecwater.org/beaver, and that describing evidence found in coastal California (Lanman et al., in press) will become available in 2014.

OAEC asks you to help find more historic evidence. Any more buried beaver wood found in the coast range could be really helpful. "What to look for: when walking in incised stream channels and/or eroded gully areas with exposed banks, especially in low gradient meadows, look closely at the banks for a cross section of a beaver dam with soil deposited on top and chew marks on the ends of the old sticks. DO NOT touch the evidence; take digital photos of it and get GPS coordinates if you can. Contact kate@oeac.org, or phone OAEC's WATER Institute (707) 874-1557 x 118.



- from "Worlds of David Darling" website: www.daviddarling.info

Other ways to help promote the benefits of beaver are educating others about the importance of beavers to our watersheds, working with local landowners to help with non-lethal management strategies, and with agencies involved in coho recovery for protection of beavers where coho occur. Beaver, or their signs, have been observed right here in Sonoma County in Sonoma Creek, Santa Rosa Creek and the Russian River watersheds. After over a century's absence they are finally returning to their native territories. Let's do all we can to welcome them back by providing them with good habitat and managing conflicts non-lethally.

March: Habitat Connectivity for Wildlife – Con - serving and Restoring the Natural World, with Jeanne Chinn

Jeanne has been a naturalist from childhood; she works for the CA Department of Fish and Wildlife and is also part of the project "Being with Wolves."

Jeanne placed connectivity in the context of impending extinction. We are facing a potential sixth mass extinction. The rate of extinction has speeded up. The time to act is now.

Should we be saving a few large areas or many small ones? All the national parks have lost species; i.e. they are not big enough to contain the largest predators. As an example Jean introduced a wolf named Pluie who covered 10,000 miles looking for a mate. Of wolf deaths studied recently 27% of the wolves were killed by railways, 60% by highways and only 5% were natural deaths.

Rewilding and connectivity

The 3 Cs that we need:

Core areas
Critical for wildlife, with limited roads and human access

Connectivity
What role does it have in ecological restoration?

Carnivores
They exercise influence far greater than their numbers, regulating both predators and prey.

For some ecological effects of ousting predators look at Yellowstone, which for 85 years had no wolves; elk hung out by the streams with harmful effects on the creek banks and consequently on other species, especially songbirds.

Our conservation priorities must include connected habitat reserves. We also need to preserve areas of every identifiable ecosystem, and we want to preserve hotspots, to save unique areas of high endemism. Sonoma County is recognized as a diversity hotspot.

Problems associated with fragmented habitats include: (1) restricting species movement, with numbers being reduced by high road kills – cars are the biggest predators of deer, and (2) genetic isolation, with the problems both of inbreeding and the risk of populations going extinct because they cannot travel to find mates.

How to provide connectivity? We need many different solutions because of species considerations, site constraints and design, and considerations such as fencing and lighting. In considering roads, for example, avoidance of the core area is a good approach. Successful corridor designs include underpasses and bridges.

Jeanne had many examples of connectivity work. The California Essential Habitat Connectivity Project, by the Dept. of Fish and Game and CalTrans, identified 850 natural landscape blocks of from 2,000 to 3,700,000 acres each. Their map is

available online. They used a relatively fine resolution (100 meters). There are also California Regional Plans, such as for Monterey. Working with local partners can be very useful. Tanya Diamond of "Connectivity for Wildlife", for example, does photographic wildlife surveys and other projects.

In the Winter 2013 Newsletter of the Sonoma Land Trust, an article called "Keeping the Sonoma Valley Wildlife Corridor Open and Wildlife Friendly" discusses a local corridor 5 miles long stretching from Sonoma Mountain across the valley floor to the top of the Mayacamas. It touches on the use of new tools to keep the corridor open, collaborating and monitoring, assessing barriers, simple things a landowner can do to improve wildlife movement, and using wildlife cameras, some of them to photograph nocturnal migrants. "People are thrilled to know that they have wild animals moving through their property...and that they can play an important role in protecting them into the future."

Night camera image of a passing cougar on a ranch south of Sebastopol.
- photo by Josh Asel

In the Valley of the Moon, residents helping assisting in the project have been provided with movement sensitive night vision cameras. These cameras may flash invisible infrared light to take shots of nocturnal migrants. Locals have been excited to download images of who traveled through their property in the wee hours.

The clearest way into the Universe
is through a forest wilderness.

John of the Mountains: The Unpublished Journals of John Muir(1938)

April: A Visit to Singing Frogs Farm

This was our second visit to Singing Frog Farm, and on both Walks I was so impressed by the huge amount of energy that goes into this organic vegetable farm and by how much thought has gone into every aspect of the operation.

Paul and Elizabeth Kaiser started the farm in 2007, buying their 9 acres from some organic farmers who were the first to use the land since the Pomo. This land near Ragle Ranch Sebastopol has abundant spring water, which is caught in ponds and used later for irrigation. The wind picks up at supper time, sucking up the heat. Frosts start in September, so all the squash, melons and tomatoes have to be ready by then. These are the parameters within which the Kaisers farm.

They run a Community Supported Agriculture (CSA) program for 100 subscribers who can pick up a box of vegetables weekly (bi-weekly in winter) at the farm or their choice of drop site. Extra produce is sold at farmers' markets in Occidental, Windsor, the Wells Fargo Center, Santa Rosa, and seasonally in Sebastopol.

Paul starts from the position that agriculture is the single most destructive activity on the planet. Most farms, even organic ones, are machinery based. Singing Frog is entirely hand based. Paul's beds are never weeded. He showed us a new field created 3 months ago; they dug paths, put the extra topsoil on the beds, added compost and planted into it. The compost acts as a mulch and suppresses weeds. Everything here, except carrots, beans and radishes, is transplanted. After harvesting one crop they will aerate the soil with a broadfork, spread 2 to 3 inches of compost and plant new transplants from the greenhouse into it. This System allows for 3 to 7 crops per year on each unit area, compared with a norm of 1 to 3 crops. So whereas the national average income for machinery based farming is $3,000 to $4,000 per acre the Kaisers make $45,000 per acre.

Many local farmers use drip irrigation for 4 to 5 hours a day. Here they use drip for 45 minutes every 5 days; every 12 inches there is an emitter; the soil has high water holding capacity and the mulch minimizes evaporation.

Paul experiences little pest damage because the plants are transplants and are outside for a shorter time. They use no pesticides since even organic ones kill life in many forms. Instead they use beneficial insects, encouraging them by planting suitable habitat in the form of 3,000 woody perennials (thanks to NRCS).They have planted hedgerows throughout the farm, every 100 to 150 yards; the recently planted hedgerows are all natives; both these and the earlier non-natives were chosen to benefit

insects. Gophers are trapped from March to May; the rest of the year they are not a problem. Snakes deal with gopher babies and act as deterrents.

Chickens are an important part of Singing Frog Farm, providing pest control and fertilizer as well as eggs. There are 250 laying hens here, 40 plus in each chicken wagon; the wagons are pulled by wheelbarrow to different parts of the farm, where the chickens eat insects and fertilize the garden; it is important to keep enough biomass on the fields to hold the nitrogen in the manure.

Since the Kaisers use compost as mulch for almost every planting, composting is a key activity on the farm. Paul's tractor is used mostly for turning and moving compost. The compost pile, made of leftover crops after harvest, heats up to 155 to 165 degrees in two days when covered with a felt blanket. It cools to 120 after a few days then heats up again after turning and re-covering with the blanket. Compost takes five to six months to break down, three months at best. They make 250 cubic yards of compost in a year and buy 150 cubic yards from Sonoma Compost, whose compost is very nutritious. When asked whether food grown in a compost- based system is more nutritious than food grown in a fertilizer- based system, Paul gives an emphatic Yes.

The garden is a delight to tour. There are tomatoes planted one per width of row, which works well for trellising to avoid fungus, with lettuce and escarole at the edges. Two crops mean less bare dirt and more root systems.

Fast growing lettuce and Chinese greens are planted along with slower growing broccoli. They plant summer squash against the hedgerows, so that the windbreak reduces the effects of frost and drying winds. From the beginning of May three plantings of squash are made, which will provide 8 to 10 weeks of harvest. Six hundred pounds of blueberries will be harvested from their 150 bushes; the Kaisers organize a U-pick day in the summer. Here is another block of plants: egg plants, peppers, tatsoi (all started in the greenhouse) along with strawberries that are grown with 3 – 4 inches of mulch with a little straw on top. Paul had tried planting in mulch but found the berries decomposed quickly. He tried planting in straw, but this gave a cold microclimate. He used plastic mulch, but it broke up too quickly. And so the experimentation continues to improve technique and crop production.

May: Coastal Prairie - A Nature Walk through the Coastal Prairie at Bodega Pastures, with Kathleen Kraft

May is when most of the native grasses flower so it's a great time to look at coastal prairie.

We began by talking about coastal prairie. These are grasslands occurring in areas where the climate is influenced by coastal fog. They are characterized by disturbance levels intolerable to other ecosystems – drought, fire, grazing and digging. They are wonderfully diverse, having nearly twice as many species as other North American grasslands, and support 80 species found only in California.

We also discussed the Coastal Prairie Enhancement Feasibility Study, with its three branches: education through a website and through training Sonoma State students in grassland man- agreement, mapping the extent of coastal prairie in the region, and testing techniques for reducing invasive velvet grass on the prairies. Bodega Pastures is one of the test sites.

But for today we were looking not at invasives but at the glorious native grasses in flower. For those who know their grasses here is a list of what we saw: purple needle grass, California oatgrass, blue wild rye, tufted hair grass, Idaho fescue, June grass, and California brome. These are all perennial bunch grasses with extensive root systems. Between the bunches are spaces for forbs (wildflowers) to grow, and the huge biodiversity within prairies is largely due to the number of these wildflower species. The spaces between the bunches also provide pathways for voles, an abundant species in prairie.

For more information about coastal prairies, please visit this wonderfully informative website: www.sonoma.edu/preserves/prairie/index.shtml. The website is one of the products of the Coastal Prairie Enhancement Feasibility Study. The study's final report is in process and will be featured in the next Journal.

June & October: Rail History Walks & Talks, presentation and report by Rick Coates

On June 15 I had the pleasure of leading the first in the Bodega Land Trust's Walks and Talks on the historic right-of-way of the North Pacific Coast Railroad. This was the narrow gage steam railroad that ran through Occidental. Built in 1873 and extended from Sausalito to the Russian River by 1876. Traces of this historically significant railway are still visible today although they are often overlooked.

This railroad was the reason for many towns and villages in western Marin and Sonoma Counties including Valley Ford, Freestone, Occidental and Monte Rio. We then carpooled to the south and explored some of the traces of the rail grade south of Freestone as far as Valley Ford.

The second Walk and Talk was held on October 19. It started behind Salmon Creek School where a portion of the railroad right-of-way serves as a nature trail. Then we carpooled to the site of the Brown's Canyon Trestle, the highest wooden trestle in the United States at the time it was built. Only a few timbers now remain thanks to two fires. Then it was on to Westminster Woods camp where

the management generously allowed us access to a portion of the historic right-of-way on the west side of Dutch Bill Creek. We walked the rail grade (now a trail) through the beautiful redwoods along the creek until we encountered one of the six tunnels on the NPCRR. Although the tunnel is closed for safety, we were able to see the portal where the rails once entered solid rock.

After many years of financial troubles and a number of serious accidents, the NPC was sold to a group of investors with ties to the electricity industry. They had plans to electrify the railroad, renamed the North Shore, but only electrified it as far as Fairfax before they too ran out of money. Finally, the railroad fell into the hands of a Southern Pacific-owned business called the Northwestern Pacific Railroad. It was dismantled in the mid-1930s.

We are looking forward to more railroad history "Walk and Talks" in this ongoing series so stay tuned!

September: Creating Rain Gardens, talk by Cleo Woelfle-Erskine

If you missed Cleo's talk and are a gardener, I urge you to read Creating Rain Gardens – Capturing the Rain for Your Own Water-Efficient Garden, by Cleo Woelfle-Erskine and Apryl Uncapher, published by Timber Press in 2012. It is delightful.

Some context: "By the late 1980s, when the term rain garden emerged in the United States, most people agreed that the rivers, lakes and wetlands of the industrialized world were in trouble. Dams and levees blocked and shifted rivers. Sewers and factories spewed pollutants into rivers. As roofs and pavement replaced forest, field and prairie, the amount of runoff increased as well, filling or even overtopping streams and flood control channels designed for much smaller settlements. Where storm drains have been combined with sewers, storms now send raw sewage overflowing into rivers and estuaries. City planners turned to rain gardens to solve these two pressing problems caused by urbanization: pollution and flooding" (p. 17-18). Vegetated depressions can infiltrate runoff. Rain gardens are all about infiltrating water, in the home garden as well as at restoration sites. A rain garden can also recharge the aquifer and restore native habitat in your landscape. It can easily be integrated with other home water systems like rain barrels and living roofs. "Rain gardens provide so many benefits for so little upfront and ongoing labor, they should be your primary rainwater harvesting strategy – supplemented by rain cisterns, permeable pavement and living roofs and walls."

Why plant a rain garden? Cleo and Apryl give three compelling reasons. "The first is practical: a rain garden allows you to conserve resources by working with nature rather than against it. The second is personal: a rain garden can be a visually interesting, low maintenance feature of the home landscape. The third is cultural: on the scale of a neighborhood or city, rain gardens can create new watershed relationships. Along with stream, lake and wetland restoration and water conservation strategies like greywater reuse, rain gardens are a daily reminder of our dependence and influence on our local watery environments" (p.14).

Cleo's talk and the book are intensely practical. You may feel empowered to make your own rain garden! Cleo and Apryl explain how to map your home watershed and follow water as it flows through your landscape. You will learn how to measure how much water falls on your home watershed in a typical storm and figure out how much of that water you can capture and use. Cleo took us through the entire process: planning, designing, building, planting, and maintaining your rain garden, as does the book.

Following Cleo's power point presentation we moved outside to the Salmon Creek School campus where several

rainwater harvesting features have been installed. The native plant garden beside the Environmental Center is watered by a downspout from the roof. Part of the Center has a living roof which absorbs rainfall; the heavy roof was built strong enough to support the weight of the soil and water it holds. After the Center was finished, runoff from the asphalt parking lot was recognized as a problem, so a bioswale was added to reduce the speed of the runoff and to let much of this water infiltrate the soil, rather than entering the creek. We finished our walk at the creek overlook; the view of this beautiful stretch of Salmon Creek served to emphasize the importance of keeping runoff out of the creek.

Also in September: the Real Birds of Bodega,

With Gordon Bebee

On September 2 as part of B50, the celebration of the 50th anniversary of 'The Birds' movie in Bodega, BLT offered 'The Real Birds of Bodega' Walk and Talk.

This was a one hour bird walk down Salmon Creek Road with Audubon birder Gordon Beebe. I'm a novice and so were a couple of the other birders; it was a treat to learn from Gordon how habitat, behavior and song helped identify the birds, some of which we could not even see, however hard we craned our necks (warbler neck, Gordon called it).

The day was beautiful and so was the place, a section of Salmon Creek Road close to the creek, winding through firs, redwoods and oaks. We were all enthused and ready for the next bird walk.

Townsend's Warbler

2013 Monitoring Overview & Monitor Thank-You!

The 2013 training was held March 3rd and attracted quite a few new local monitors including Devin Granahan, Andrea Granahan, Bradley Gordon, Janet Drucker, Sarah Herbst, Cythia Poten, Paula Smith, Jackie Screechfield, Cliff Buchanon and Kelley Moore. Veteran monitors Carol Sklar, Lori Curtis and Dan Arendt all returned to get a tune-up and graciously contributed their monitoring experience to the training. The training included working in pairs, a Power Point presentation, information about Bodega Land Trust's history and some training games to familiarize the attendees with the language of easements, local ecological features and monitoring.

At the end of the training the trainees went out in crews and did a sample monitoring of the Salmon Creek Campus where they had an opportunity to practice using a compass, maps and written directions to find photo points, taking photos and notes and working together. The Resource Conservation District folks very graciously loaned us their projector and screen for the Power Point show.

It was a very successful monitoring year. There were so many new people working now with the experienced leaders that taking on our 12 easements required significantly less time from the Monitoring Coordinator to accompany the trips.

Also very successful were the 'stewardship crews' for our newest and largest easement, on Tannery Creek Canyon. There are three different trail sections that are monitored on this 187-acre property. Everybody on those three teams was particularly dedicated and enthusiastic. They came into the office before going out a couple of times to plan a monitoring strategy and to put together the monitoring books.

Jack Proctor returned and went on two monitoring trips, especially taking on the Tannery Creek easement with much attention to detail, and creating a more complete baseline monitoring protocol for the steepest part of the canyon (Tannery Creek Trail), along with Walt Drucker and Janet Drucker.

Kathleen Kamins, Kit Illingworth and Gabe Nelson returned, as did Steve Pye who has now graduated from Sonoma State. Mark Burchill returned and very efficiently led two trips. Two other community members Reese Love and Mark Hickman also accompanied Jeremy Sharp and Lori Curtis on the monitoring trek to Finley Creek North. Jay Sliwa took on the lead to Coleman Valley Creek for the fourth year in a row.

It was a lovely surprise to have Leif Mortenson as the unexpected but very welcome 'fearless leader' of the Fay Creek Corridor expedition. He works internationally training local people to monitor forests and grew up roaming these hills. He was the note-taker, Joan Mortenson aced the compass and Kelly Moore and Cliff Buchanaon rounded out the crew.

Congratulations to board members Ellie Fairbairn and Mary Biggs for tackling the formidable Sone Easement.

In all a total of 30 monitors contributed to the 2013 Monitoring Program . We are grateful for your involvement in the Bodega Land Trust community, your stewardship and dedication. I hope to work with all of you next year.

If you have any questions or are interested in the training please call Sharon Sadler at 707-876-3195.

Cont'd from pg. 1

On July 12, 2013, I convened a Salmon Creek Research Collaborative Workshop to bring together residents, agency scientists, restoration practitioners, and citizen scientists involved in salmonid restoration in the Salmon Creek watershed. Our project was to understand who is collecting data, what their different research and restoration goals are, what resources would advance these efforts, and what barriers hinder collaboration. I wanted to better understand adaptive management processes that are unfolding along Salmon Creek, where people are trying to adapt land and water management practices so that salmon and steelhead can recover, even as climate change and human interventions will likely further increase demand for dwindling flows. The twenty-seven people who attended the workshop had connections to institutions ranging from neighborhood groups to watershed councils to county, state, and national agencies, and brought different knowledge, experience, research methods, habits of thought, and ways of talking to bear on this topic.

Wet/Dry Mappers Robert Blasdell, Charon Vilnai & Hazel Flett
- photo by David Hines

The day-long workshop began with a panel discussion that included Kathleen Kraft (Salmon Creek Watershed Council and watershed resident), Sierra Cantor (Gold Ridge RCD biologist), Brian Cluer (NOAA-NMFS geomorphologist), Lauren Hammack (Prunuske-Chatham geomorphologist / designer and local resident), and me. Participants then broke into groups by interest area to talk about specific problems, and knowledge gaps. After lunch, everyone walked down to Salmon Creek. I asked people to share their field methods - what they look for when they are out surveying the creek, what kinds of equipment they use, and what specific observations they record. Not surprisingly, biologists paid attention to fish and in-stream habitat, while geomorphologists paid more attention to sediment, and how flow shaped the stream channel. Both groups considered how the available habitat changes at different flows. Local residents shared specific observations of salmon sightings and memories of high-water marks. Many participants remarked that they learned new ways of seeing the stream through the activity. At the end of the day, the group discussed concrete steps that individuals or collaborative groups can take to improve collective understanding and action in the watershed. Participants agreed to take action on three proposals:

Fay Creek, September 2013 - photo by Joe Mortenson

1. plan another Watershed Day to share information with the local community,

2. pursue partnerships with UC Berkeley faculty and students to analyze the large amount of data that agencies and the watershed council have collected, and

3. organize a citizen mapping effort to map which reaches of the stream remain wet during the driest time of year.

Wet / Dry Mapping

In September 2012, I organized a wet-dry mapping study in collaboration with local residents. Wet-Dry Mapping is a method developed by the Nature Conservancy on Arizona's San Pedro River, and has been used there for the last 12 years. Here's how it works: on one day during the driest time of year, citizen volunteers walk along the stream channel with GPS units and record where the channel is wet or dry. Landowners either grant access to citizen volunteers, or volunteer to walk the stream reaches on their own property. By comparing data across several years, researchers can tell which reaches always remain wet, which always go dry, and which fall in between. The Salmon Creek Wet-Dry Mapping group decided to spread the mapping over a week in late September. We chose this period because the main reason for collecting this data is to identify sanctuary reaches where salmonids can survive the late-summer dry period. Habitat enhancement projects could then target those reaches.

Wet / Dry Mapping continued

More than 20 landowners agreed to participate in the project, and 15 other residents signed up as volunteers. A surprise rainstorm on September 22 dropped about an inch of rain over the area on the first day of surveying on lower Fay Creek. However, the dry ground absorbed much of the rain, and flows had dropped back to previous levels a day later, when teams began surveying the upper Salmon Creek mainstem and Tannery Creek.

Wet-Dry mappers recorded the location of dry reaches on a GPS, and also noted sanctuary pools and the presence of salmonids. I aggregated the GPS data into a map (see map for detail of Fay and Tannery Creek sections). Based on the experience with the pilot survey in 2013, the mapping team is planning a larger effort this year--please contact me at waterunderground@gmail.com if you would like to walk the creek that day, or if you are a landowner willing to grant access to creek walkers.

Spring and well sampling

The final piece in the streamflow puzzle is understanding which aquifers are most important in supplying late-summer flow to streams. During the summer months, all water in the stream is groundwater, which discharges via springs in the stream banks or beneath the stream bed. One goal of my study is to determine whether increasing groundwater flow to the tributaries during the late summer will improve conditions for juvenile salmonids. Additional groundwater could improve survival by increasing the volume of sanctuary pools, or by maintaining flow over riffles, which adds oxygen to the water. Groundwater is low in dissolved oxygen, however, so increasing groundwater flow may not improve salmonid survival if low oxygen levels are responsible for salmonid mortality.

However, if people pump too much water from the stream or aquifer, these sanctuary reaches dry up completely, or shrink to small puddles that leave fish vulnerable to raccoon and avian predators. Once streamflow goes subsurface, dissolved oxygen levels drop because water no longer cascades over riffles (which add oxygen). My goal is to understand how long salmon can survive in disconnected pools and identify sanctuary reaches—perhaps fed by springs or tributaries—where large numbers of Coho and steelhead can seek refuge during dry spells. I then plan to identify which aquifers provide water to these reaches using natural tracers. With this data in hand, I would like to work with local landowners to develop aquifer protection and recharge strategies that can safeguard residential and agricultural water supplies while preserving minimum in-stream flows that salmonids require.

In December 2012, I collected samples from 12 wells and springs along Joy Road. These wells and springs tap aquifers that feed Fay and Tannery Creeks. Landowners granted access to their properties, approached their neighbors on my behalf, and helped me collect samples from their well heads. The procedure is fairly simple--we lower a thirty-foot-long 1/2" diameter tube directly into the well casing, then pump out a few ounces (40 mL, to be exact) using a peristaltic pump. If the well can't be accessed directly, we can sample from the pump, although this may introduce other carbon compounds into the sample.

Back at the lab, we use a fluorimeter and a dissolved organic carbon analyzer to identify which carbon compounds each sample contains. By comparing the well samples to one another statistically, we can determine which wells tap into the same aquifer. Comparing different well samples to samples collected from the streams allows us to calculate what percentage of streamflow originates from a given aquifer.

I plan to expand the well and spring sampling effort to include 50 wells and springs within or near the Fay and Tannery Creek watersheds. If you are interested in participating in the study, please contact me.

Concluding thoughts

As I prepare for my third and final field season in the Salmon Creek watershed, I am thinking about how lessons from this small watershed can inform salmon recovery efforts across coastal California and beyond.

Although the story of how streamflow influences summer salmonid survival is complex, researchers are slowly piecing it together. I have found that on Salmon Creek, as on most coastal streams, temperatures never get high enough to cause mortality. I have also found that Coho and steelhead can survive for several months in streams with dissolved oxygen levels below 4 parts per million--levels reported to be lethal in other streams. I have also been amazed by the detailed and specific records that local landowners keep about rainfall, spring and well levels, and bird and fish sightings. I look forward to bringing together all of these different kinds of knowledge in the future.

Fay Creek Spawners - Photo by Steve Killey

Many Thanks to our 2013

Artisans' Co-op
Barndiva
Barley & Hops Tavern
Bellwether Farms
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Bistro des Copains
Bliss Organic Day Spa
Bloomfield Farms
Bodega Country Store
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THANK YOU 2013 DINNER VOLUNTEERS – you made it happen!

Abby Killey, Ann Cassidy, Boone Vale, Carita Lynch, Cathi Bruton, Charon Vilnai, Charlotte Cassidy, Cynthia Ramirez, Olivia Ramirez, Diane Wenslawski, Eric Menuez, Hazel Flett, Ian Cracknell, Ida Rotto, Jay Sliwa, Jill Davison, Jodie Rubin, Matt Burnham, Olivia Ramirez, Reggie Cooperman, Robert Blasdell, Sandy Sharp, Sandy Wilds, Sarah Molica, Sarah Shaefer, Scott van Cleemput, Sharon Sadler, Steve Killey, and young servers Demetri and Moses Voelker, and Orion and Trinity Burnham-Pohlmann

And lastly, a big Thank You to all our Dinner-Goers and Auction-Bidders who helped make this event such a big success!

Inside:

Don't miss the hike in Tannery Creek Canyon on June 28, 10 am to 2 pm
with Darlene Lamont,
and
"Russian bodega and beyond" on July 12 from 10 am to 1 pm
With Hank Birnbaum, Fort Ross historian

.

Information at walks@bodegalandtrust.org Watch for flyers!

Please copy, and print name and address on reverse

I would like to join or continue my membership at ☐ $20 ☐ $50 ☐ $100 ☐ $500 ☐ Other

Please mail to: B.L.T., PO Box 254, Bodega, CA 94922

Make checks payable to: Bodega Land Trust **All donations are tax-deductible**

I am interested in being involved as:

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- ☐ a Board member
- ☐ an occasional volunteer
- ☐ other

My special interests are:

_____

My special skills are:

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A project I would like to see the Bodega Land Trust consider is: _____ _____

_____

Bodega Land Trust Journal staff

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