Bodega Land Trust Fall 1998 Volume III, Number 2

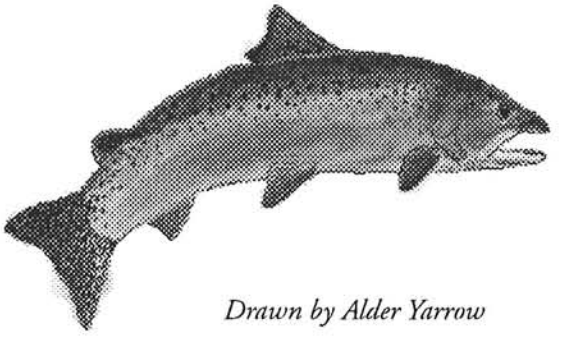
Bodega Land Trust Newsletter

"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), American Forester***

This newsletter presents articles based on talks and readings given at Salmon Creek Watershed Day on May 30 1998 at Harmony School, Occidental.

Watershed Monitoring: Becoming More Conscious

Rick Bennett, Environmental Science Advisor, University of California



Drawn by Alder Yarrow

Water issues will continue to become the focus of much concern and debate. In fact, in our future, water will have a huge role in every human and natural resource issue we encounter. There simply is not enough high-quality water to meet all the needs of this living planet. As populations grow and as we use and reuse water in its myriad of applications, the quality of water is altered. Virtually all water moves, at some point in the hydrologic cycle, as surface water. Surface waters flow most abundantly in the rainy season. Many watersheds have sufficient capacity to maintain stream flow throughout the year. There are many perennial streams through the Northwest counties of California and they provide for a great many natural and commercial uses. Similarly, the streams that flow only in the wet season are not to be discounted for they provide water resources, habitat, and important conduits for underground water aquifer recharge.

Given the migration of water on the land it is no wonder the interest in watersheds increases with each day. The watershed and the streams and creeks of all sizes attract interest from virtually every sector of society. School groups are "adopting" watersheds. Governments spend great sums to study and protect watersheds. The water quality law of the land speaks at length to polices that protect and enhance the water in all watersheds.

So, just how do we go about paying attention to the watershed in order that we can say with some objectivity that a watershed and the water in it is good or that it needs improvement? This question is one of monitoring. Monitoring is the systematic observation of conditions and places in the watershed, over time. Sound complicated? It can be; but monitoring a watershed need not be complicated at all. The most important aspect of citizen monitoring of watersheds is not a huge investment in equipment or advanced degrees in biology or hydrologic engineering, but a matter of systematic and well-documented observation. So, no matter the approach or intent of the monitoring project, the essence is a well thought-out plan and a consistency of observation.

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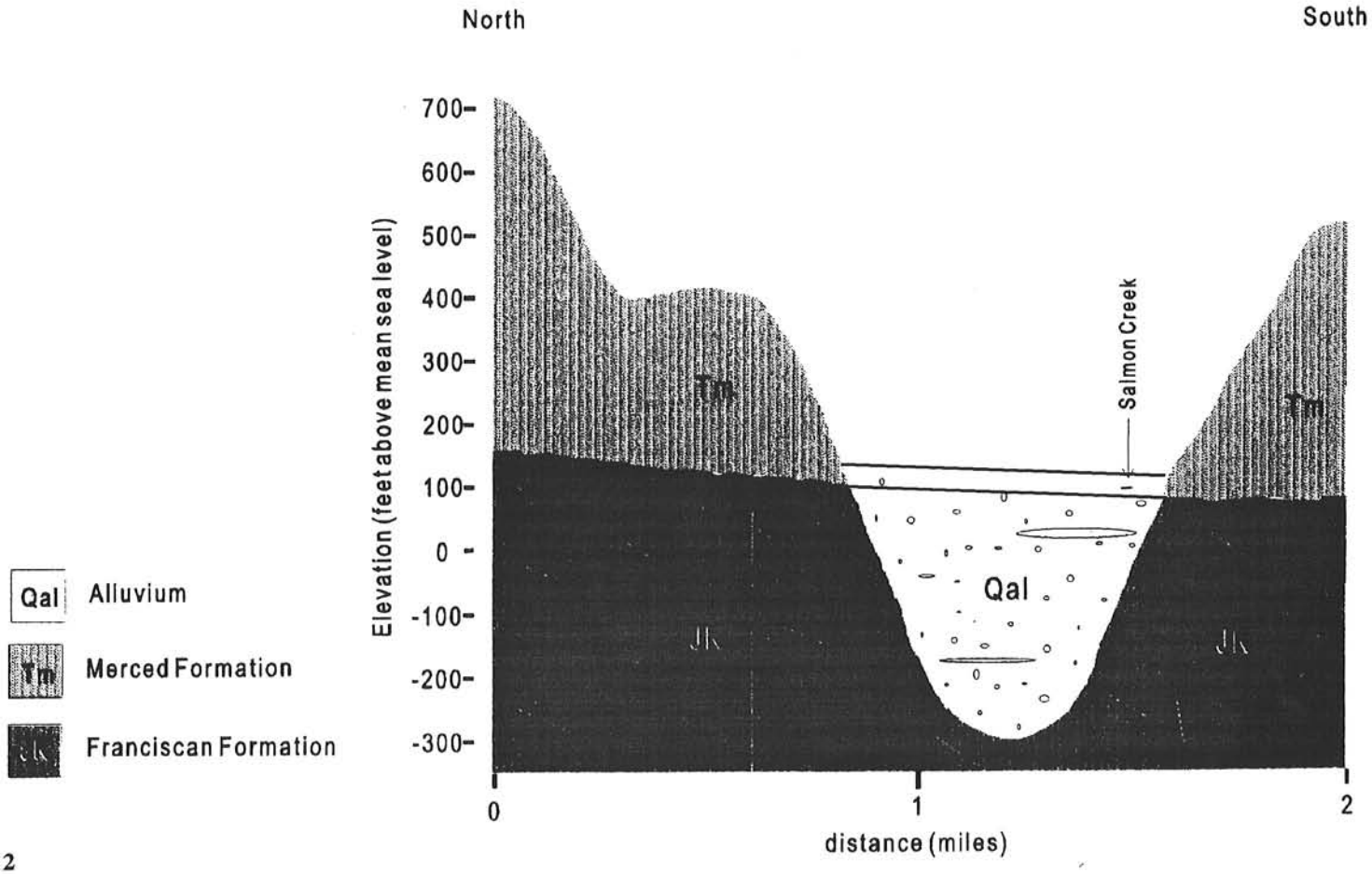
Surface and Ground Water Interaction in the Salmon Creek Watershed

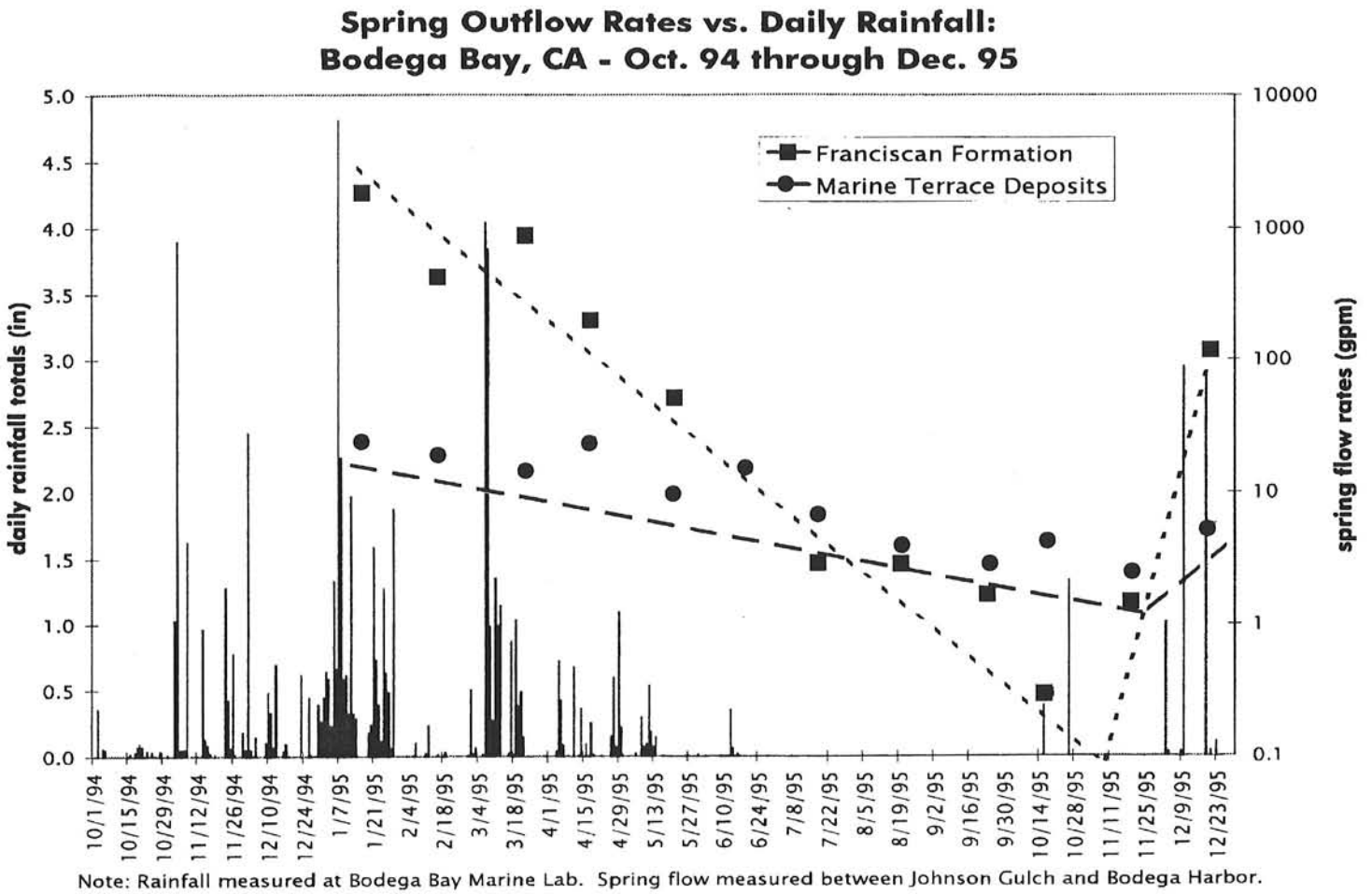
Greg Kamman, Kamman Hydrology

The geologic setting of south-western Sonoma County plays an important role in where surface and ground water are found. In general, the Salmon Creek watershed is underlain by two laterally continuous layers of rock; a thick (greater than 20,000 feet), lower layer called the Franciscan Formation and a thinner (50 to 1000+ feet) surface veneer called the Merced Formation. The Franciscan Formation consists of a diverse assemblage of well cemented rock types (e.g. graywacke, greenstone, chert, etc.) which are highly fractured and jointed. The deposition of the Franciscan is closely associated with the subduction of the Pacific Plate beneath the North American plate beginning almost 200 million years ago . Locally, the Merced Formation consists of relatively porous sandstone and claystone formed by the deposition of sediments in a shallow sea over 2 million years ago.

Modern creeks like Salmon Creek now occupy alluvial (sand, gravel, and clay) filled valleys which may contain sediments over 100 feet thick. These buried valleys were formed over the last 300,000 years by streams eroding down to a sea-level which was once up to 100 feet lower than the present. This period of valley formation corresponds to the most recent ice-ages when water was repeatedly tied up and released from continental sized glaciers causing wide fluctuations in sea level. It is over the most recent cycle of sea level rise, in which deeply incised coastal valleys filled with sediments eroded from the surrounding country side. Conversely, prehistoric wave-cut terraces along the coast mark prehistoric sea-level highs. Geologists call the beach sands and gravels stranded on these terraces "Terrace Deposits".

GEOLOGIC CROSS SECTION: SALMON CREEK BASIN NORTH OF BODEGA, CA





Note: Rainfall measured at Bodega Bay Marine Lab. Spring flow measured between Johnson Gulch and Bodega Harbor.

Ground water can be found in varying quantities in each of these four types (Franciscan Formation, Merced Formation, alluvial valley fill, and Terrace Deposits). If a local layer of these rock-types can produce economic quantities of water, it is referred to as an aquifer. Because the Terrace Deposits are restricted to thin bands along the coastline, they are not typically major producers of ground water. Although widely distributed and quite thick, the non-porous nature of the Franciscan Formation and typical poor water quality also make this unit, in general, a poor aquifer. The best ground water supplies and water quality in the Salmon Creek watershed are found in the more permeable sands and gravels of the Merced Formation and the valley fill alluvium. Typically, the Merced Formation occupies the uplands and the valley fill alluvium the lowlands. Its also important to note that springs (places where the water table intersects a sloping ground surface) are typically seen where the permeable Merced Formation and less permeable, underlying Franciscan Formation merge. Coastal springs may also be found at the ground surface where Terrace Deposits and, again, the less permeable Franciscan Formation meet.

As one would expect, ground water supplies are replenished each year during the rainy season when precipitation infiltrates into the earth through surface soil and migrates into the underlying rock and/or sediments. Ground water recharge of this type is an important process in the Merced Formation. Recharge may also occur along stretches of rivers and creeks, where stream flow percolates through the stream bed down into the earth. This is the second important process in replenishing water to the valley fill alluvium. In turn, area creeks are sustained during dry periods in places where the ground water table intersects the channel or where they receive contributions from upland springs. Regardless, the seasonal rise and fall in ground water levels are well recorded in area wells and also manifest themselves in the varying flow rates (including no flow) of area springs and creeks.

The speed and degree to which ground water levels, and in turn stream and spring flows, rise are directly related to the amount of precipitation and physical properties of soil and rock. Over natural drought periods, the average ground water level may slowly decline. Human activities also cause ground water levels to decline. Withdrawing water from the aquifer (e.g. pumping a well) at rates greater than can be replenished also leads to long-term declines in water levels. Recharge is also inhibited by diverting water from streams and creating impervious surfaces (urban development) which can lead to long-term ground water overdraft in a watershed (impervious surfaces reduce the area of rainfall infiltration and acceleratethe flow of water out of the basin). Thus, it is important to recognize the interrelationship between surface and ground water supplies and incorporate such thinking into any watershed management and stream restoration efforts.

Birds in the Watershed

Ken Wilson

While walking Salmon Creek Road on a recent Saturday morning in mid-September, I reflected upon the diversity of birdlife I was seeing and hearing. Looking about me it became obvious that the diversity of vegetation of the Salmon Creek watershed contributed to the many different kinds of birds. A group of Turkey Vultures fed upon a recently deceased Black Tailed Deer carcass while two male Hairy Woodpeckers disputed territorial rights amongst the douglas firs. Higher up, along the ridge, a Red Shouldered Hawk fled the onslaught of an American Kestrel, our smallest falcon, while a Red Tailed Hawk circled slowly above.

Farther along the road, amidst the willows and alders bordering the creek, a flock of Chestnut Backed Chickadees escorted five species of Warblers and two species of Vireos working their way south toward Mexico and Central America, completing a part of their annual cycle.

Earlier that morning another group of migrants had perched, in large numbers, upon a wire over a farm pond. These were the Swallows, those small vacuum cleaners who help keep our insect numbers at a tolerable level.

The previous night, in the early hours of the morning, the forests of Willow Creek watershed had furnished the varied calls of several resident Owls. The first call came from a Barn Owl, followed a little later by the rising whistle of a Spotted Owl. Soon the call of a Western Screech Owl broke the still night air, then made way for the feeding cries of a distant Great Horned Owl.

I marvel at the good fortune of living in any area that hosts the phenomenon of fall migration, and of knowing that soon the migrants will move on and the resident birds will begin to share these precious coastal watersheds of Sonoma County with the Sparrows, Robins, Thrushes and Hawks that have raised families far to the north and now return to rest and replenish over the winter.

As co-compiler for the Madrone Audubon Society Western Sonoma County Christmas Bird Count, I have just received the official results of the National Audubon Society's 98th Christmas Bird Count. Once again we have been ranked in the top ten counts for North America. With over 1,700 counts participating, our tally of 190 species put us in ninth place, an indication of the importance of Western Sonoma County to wintering birds. Much credit goes to the birders whose dedication brings them out year after year in all weathers and whose skills enable them to accurately census the many different types of habitat. Credit is also due to the many landowners and conservationists who seek to maintain the health and wellbeing of our county.

Not only does a healthy watershed provide the essentials of a vibrant habitat for birds and other animals, it also slows erosion and filters inevitable pollutants before they reach the flowing waters of streams and rivers, home to fish, crustaceans and other riverine beings, so dependent upon clean water.

Downstream, where fresh water meets the ocean, varying habitats form to provide shelter and food for many diverse species of birds. The slow flowing creek spreads and forms marshes, both fresh and brackish, great breeding grounds for aquatic animals and feeding grounds for species such as Herons, Egrets, Bitterns and Rails. Sand bars form, providing rest stops for Gulls and Pelicans, and feeding areas for shorebirds such as Sandpipers, Godwits and Willets.

The open waters of Bodega Bay provide one of the most important coastal wintering stop-overs in the country. Huge numbers of many species of birds congregate as they rest up from recent breeding endeavors, and build up reserves in preparation for the next breeding season. Many species of Ducks, Geese and Pelicans grace the bay with their presence, while frequent visits from endangered Peregrine Falcons drive the huge flocks off the water, creating wondrous formations, and filling the air with their cries as they seek to survive another day.

By early spring the migrants are leaving for far off places, such as the Arctic Tundra. As the calls of loons disappear from the bay, the surrounding hills and valleys begin to resound with the songs of resident and returning migrant songbirds.

Serge Etienne

According to the Sonoma County Breeding Bird Atlas, edited by Betty Burridge, we are graced with approximately 160 species of breeding birds. Each of these birds is in some way dependent upon our watersheds for the success of their breeding efforts. As we know, change is a constant, and it is a lucky bird that, having made its way from Costa Rica or Panama, arrives to find its breeding territory still intact. Many others, such as the Golden Eagles which have nested above Salmon Creek for many years, or the Ospreys on the hillsides along the Russian River, set about adding to or rebuilding the nests which they use year after year.

Diversity in the forest itself is essential for the many birds we know as 'cavity nesters'. Old trees, dead trees and 'soft wood' trees provide cavities for Woodpeckers, Wood Ducks, Mergansers, Pygmy Owls, Nuthatches and many others. Removal of these wondrous old trees ensures the decline of these birds.

By the end of summer the annual cycle is again complete and beginning again. The phenomena of song, color, feathers, flight and migration fill me with gratitude for having witnessed this spectacle, and ensure my interest in and commitment to the continued renewal of this cycle. As humans it is within our ability to ensure the health and wellbeing of the watersheds which support it.

Ken leads bird walks for beginners and, as owner of Talon Tours, offers birding and natural history tours to Central America and New Zealand. He is a landscape contractor creating habitats for birds and butterflies.

Everything You Need to Know
You Can Learn from the Salmon

It's best to be born in a clear stream

Stay home until your body changes
When you are ready, travel into the world

travel in groups, swim strong
stay in your element, eat well

As you age, recognize the time
trust your instinct to guide you home

No two streams smell alike
(Every child knows this about their mother)

follow your passion, your will to create

find a partner and do it
moving together with perfect timing

protect your progeny with your last gasp

relax into death
litter the streams with your earth body
and the skies with the myth of yourself

become the streambed
live in your children, the roots of trees, the song of the river.

give.

Patti Trimble

On Language

Before the telephone and faxes and e mail
we spoke salmon

O supernatural one O salmon
we stood by the riverbank and called
We stood by the ocean edge and listened
Honorers and caregivers and ritual keepers
We stood by the streambed to throw back bones to build the earth
We hummed in the fields temulating fish running the sea wide.

We've forgotten this language of deer and whipporwill and coho
And when you stop speaking a language
you can no longer dream in it

I want to dream in salmon dream one slap onto the sand
clap of blue echoed in the sky
clap hands silver
this one and this one and that
sing songs swimming in arcs through thicker space
call the stars down to fish
walk in the unheard rhythm
embedded only in salmon tongue
blossoming water tongue
ripple speech
belly movement
tail spin
million year syllables
grunted deep in the gill and salt flesh

We could talk with the salmon about sacrifice
about shedding the flesh for some hope
We could talk about the actual length of rivers
and an unusual understanding of pink
We could talk about the folly of hesitation,
About addition and subtraction
Giving and receiving in the wild

Remember how to speak and how to watch for signs
Remember there is nothing more interesting to watch
than the night fire/ and the day season of multitudes
running upstream
like an independent river of muscled will

Remember in this forgotten love language
clap hands silver
the intimacy of an old love
this one and this one and that
Remember what we have known
ripple speech
belly slap
might someday know

Patti Trimble

SIMPLE APPROACHES TO MONITORING

Observational Monitoring: Find areas of the watershed or waterway of interest and visit them on a scheduled basis throughout the year. What do you see? Describe the vegetation. Describe the water and its flows. What is happening to the soil? Does the stream have a gravel bed? *Keep a journal and note the date and weather conditions.* Over a period of months, a pattern or baseline may appear. Over a period of years significant changes may be seen; document them.

Measurement Monitoring: Simple measures can add great objectivity to the descriptions of the watershed. Measures such as stream bed width and depth are useful for gauging erosion in a stream course. Vegetation types, numbers, and sizes may also indicate a trend. Photographs taken from the same reference point can, over time, provide important information about the condition of the watershed.

These simple approaches can provide powerful baseline and trend information about the condition and changes in the watershed. These data alone can be far more convincing and persuasive than the best of someone's recollection.

MORE COMPLEX MONITORING

Bio-Diversity: To assess very specific conditions, more complex and highly-specific monitoring tools may be needed. For example, if the concern in a watershed is the decline in the biological diversity, then it may be necessary to engage the skills of a biologist that can do the counting of plant or animal species and their distribution in the watershed. A good resource for this expertise are the biology departments at the local colleges. Instructors and students are often eager to get involved in projects of local interest and concern. Similarly, the Department of Fish and Game has biologists that are trained to assess the quality of habitats in a variety of watershed ecosystems.

Water Flow Rates: Monitoring the quality of water flowing in a watershed requires a little more technology, yet it need not be costly. The quality of water is influenced dramatically by some simple factors. These factors include flow, temperature, and the pH of the water. Measuring the flow is simple and requires only a measuring tape and a watch with a second hand. Estimate the width and depth of the stream. Measure off 10 feet along the bank and mark it plainly. Place a buoyant natural item in the stream and count the seconds needed for the stream to flow 10 feet. The volume of flow is expressed as cubic feet per second (CFS). A stream that is 10 feet wide and five feet deep and flowing at 1 foot per second has a volume of 50 CFS. Estimating flow is essential for the interpretation of a stream's quality contribution to the watershed. Be careful; fast flowing streams can be dangerous.

Water Chemistry: Measuring temperature, pH and conductivity is also important. Temperature effects the chemistry of many important factors that are essential to the health of the streams' life forms. For example, high temperature reduces the amount oxygen the water can hold. It also makes some toxic compounds more toxic. The pH is a measure of the chemistry of water. Changes from a neutral pH may also adversely effect stream chemistry and the aquatic life itself. Conductivity of water is the measure of the water's ability to conduct a electric current. High conductivity (from excessive salts, for example) interferes with the metabolism of aquatic organisms. The nitrogen-containing compounds in water—ammonia and nitrate—are not harmful in very low concentrations. Yet elevated ammonia from animal and human wastes is very toxic, especially when the water is slightly warm and has an elevated pH. Nitrogen in water can promote algal growth and cause a stream to "suffocate" from a lack of dissolved oxygen.

Another measure of surface water quality is the presence of fecal bacteria. Elevated fecal bacteria in surface water is a indication of fecal matter contamination beyond the incidental wild animal contribution. Elevated fecal bacteria indicates the lack of containment of human and animal waste as required by state and federal policies. Fecal bacteria can be monitored; however, some skill working with bacteria and some special supplies—like an incubator—are needed. One organization in the region, the Surfrider Foundation, is currently monitoring fecal bacteria in the ocean water near public beaches.

Rapid Bio-assessment: Bio-assessment is also becoming an important tool for monitoring the quality of surface waters. Many insects go through life cycles that include a nymph form which lives in water; bio-assessment involves the quantitation of these nymphs. Looking under larger rocks in a stream bed often reveal the presence of many insect nymphs. Biologists have determined that when stream conditions are compatible with aquatic life the number and types of nymphs are abundant. When water conditions are deleterious, the numbers and types of nymphs diminish.. Unlike point-in-time chemical analysis of water, the life in the stream becomes the indicator. Events as far back as one year may effect nymph populations today. Hence, monitoring nymph populations may provide the best historical or best intermittent tool for examining water quality. Bio-assessment requires some training and experience, yet is well within the scope of citizen water monitoring. Those seeking more information on this new tool for water monitoring can contact the Dept. of Fish and Game State Wide Bio-assessment Program at (916) 358-2858. or on the Internet at http://www.dfg.ca.gov/cabw/

WHY MONITOR: We all live down-stream; water moves through and past our lives in a vital biological relationship. Water is indeed life's blood. Unfortunately, most of us have little knowledge of how we individually and collectively impact the water resource. Becoming aware is the first step to beneficial change. One very effective way to increase awareness is to monitor local water bodies. Simply through monitoring, consciousness is altered. Pick a favorite watershed anywhere and begin.

Riparian Restoration Techniques

Mike Jensen, Prunuske Chatham, Inc

A riparian corridor is the area adjacent to a creek, including its soil and vegetation. A healthy riparian corridor is the key to a healthy creek. Mature riparian corridors are diverse in their vegetation and fauna. Riparian vegetation provides shade for cool water, helps filter runoff and slow floodwaters, grows dense root systems for streambank stabilization, and produces food and cover for fish, amphibians and wildlife.

So how do we protect and enhance these arteries of life? The most important tools in a riparian restoration project area first fencing, and second revegetation. Sometimes there are sites that are too eroded for fencing and planting alone to fix and a bank repair is needed. We will examine some basic techniques for planning and constructing fencing, revegetation and streambank repair projects.

Fencing Tips

When planning a fencing project you need to consider the terrain, vegetation, soils, climate and land use. These factors will determine the type of fence used, such as barbed wire for livestock or chain linked for 4-wheel drives. The fencing must work for the landowner's management needs. When dealing with livestock there are several methods to consider, permanent exclusion fencing, or temporary/seasonal fencing for riparian pasture creation. Riparian pastures are managed with short duration high intensity grazing during times of the year that will have low impacts on the creek. Once the creeks have been fenced revegetation planning can begin.

- Fencing setbacks are always site specific and vary accordingly due to management needs, stream sinuosity, stream stability and cost. A common rule of thumb is a 30 foot minimum setback, although these can range from 10 to 100 feet. The bigger the setback the more healthy the corridor!
- Fencing costs are driven by the number of corners, gates and wet crossings.
- Fencing cost for a standard 5 strand barbed wire fence is $3 to $8 per linear foot for restoration projects using public funds and grants. The cost varies due to terrain, soil and vegetation (i.e. steep slopes with heavy vegetation will be on the high end. Flat grassland areas that allow for straight, long runs will be on the low end.)
- Most landowners/ranchers will tell you they can build fence for less. This is true. Most publicly funded projects require workers to be paid prevailing wages. Marin County's prevailing wage for fence labor is $8.25/hour. Remember to include overhead costs (i.e.equipment maintenance.)
- High tensile fences may appear to be the most cost effective. However, they are only cheaper than barbed wire fences when runs are long and straight.
- In flood prone areas,temporary/portable electric fencing is a more cost effective solution than permanent fencing. The key to success for these types of fences is livestock training (i.e.train livestock to become familiar with electric fencing in a confined corral before going to pasture.)
- Availability of livestock watering sources must be considered with all fencing projects.

Planting Tips

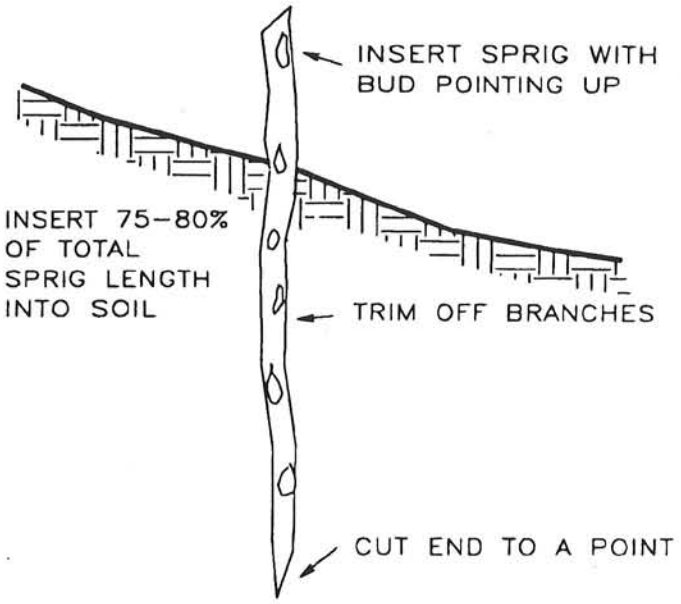
Walking the creek is the best way to determine what to plant on your local creek. Listed below are some basic tips for planning a revegetation project

- Determine the purpose of your planting project, such as erosion control, water quality enhancement, fish and wildlife habitat, aesthetics, etc.
- Consider all plant species native to the stream and/or watershed.
- Determine local availability of plants at nurseries and/or on-site for cuttings, transplanting, seed collection and purchase.
- Consider availability of water and soil type before selecting plants.
- Determine if plant protectors are needed for protection from wildlife, livestock grazing and competing weeds.
- Consider funding availability for the planting project. This will be a key factor in selecting which plant species are used, size of plants and their spatial distribution.
- All planting projects should have a three year establishment period for maintenance.
- Successful volunteer projects require considerable up front coordination for supervision, tools, safety, material collection, access, etc. Who ordered the Port-O-Toilet?

Bank Repairs

If a streambank repair is needed and revegetation alone cannot control the erosion,there are two choices.One is a traditionally engineered repair, such as rock riprap, gabions (wire baskets filled with rock), or concrete. All these have been proven over time to control erosion. The problem is that these solutions do not provide aquatic and wildlife habitat. The alternative, "bio-engineering", can provide habitat while controlling soil erosion. Bio-engineering is a combination of traditional engineering principles and techniques with living vegetation to stabilize soil. Bio-engineered repairs can provide erosion protection as strong as many traditional repairs, provide native habitat, improve water quality, look aesthetically pleasing, can often be built without large equipment, and most often be less expensive than traditional repairs. Below are brief descriptions of some **common bio-engineering techniques.**

Willow sprigging (cuttings) can be an effective, in-



WILLOW SPRIGGING

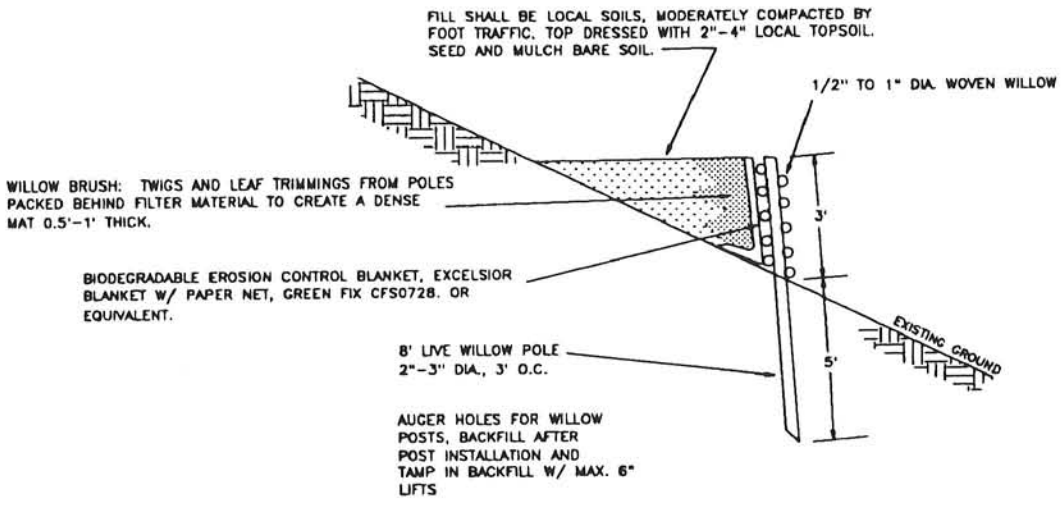
expensive way to stabilize streambanks, gullies and small landslips. Willows must be planted in sunny areas where the soil stays moist throughout the dry season. Willow sprigs should be collected and planted when the willows are dormant (fall through winter). The cuttings should be 1/2 to 1 1/2 inches in diameter and 3 to 4 feet long. The sprigs can be driven with a wooden mallet or a stone bar can be used for hard soils. They should be driven 2/3 to 3/4 of their entire length into the soil. The bottom of the sprig should be cut to a point to ease in planting and to ensure the buds are pointing up. Along streambanks sprigs can be spaced from 10 feet on center for revegetation to as close as 1 foot spacing for severely eroded areas.

Along streambanks appropriate spacing may be as close as one foot. Since cattle, sheep and deer tend to browse heavily on young willow, the revegetated areas may need protection by fencing, or plastic protectors. For more severe bank erosion **pole planting** can be used Poles consist of cuttings 2 to 5 inches in diameter 5 to 10 feet long; in this case an auger or post hole digger is required to dig planting holes. Willow sprigs and poles can be planted through rock riprap; this is known as **joint planting.** It is a good repair where a traditional erosion control approach is desired while providing habitat.

Willow wattles (fascines) are bundles of live willow brush tightly tied together. The wattles are flexible rooting logs placed in trenches along streambanks, upland slopes and across small gullies. Take small brush, lie them on the ground staggering the brush ends and tie with twine every two feet. The wattle can be 6 to 9 inches in diameter when completed. Install wattle on streambanks (following contour) with half the diameter placed in a small trench. Stake wattle down with live willow sprigs or wood stakes.

Willow wall revetments can be used for eroded or failed stream banks or for protection against toe scour. Willow poles are installed vertically 3 feet on center with 2/3 their length in the ground. Willow branches 3/4 to 2 inches in diameter up to 12 feet long are woven horizontally through the poles creating a tight and sturdy wall to a maximum height of 3 feet. Behind the woven branches erosion control fabric is placed and then 6 to 12 inches of willow brush is packed behind the wall. Soil is then back-filled and compacted behind the wall. The structure becomes a living retaining wall. If more than one wall is to be built up a slope, there should be a three feet space between successive walls; the upper ones may need summer irrigation for one to three years for establishment.

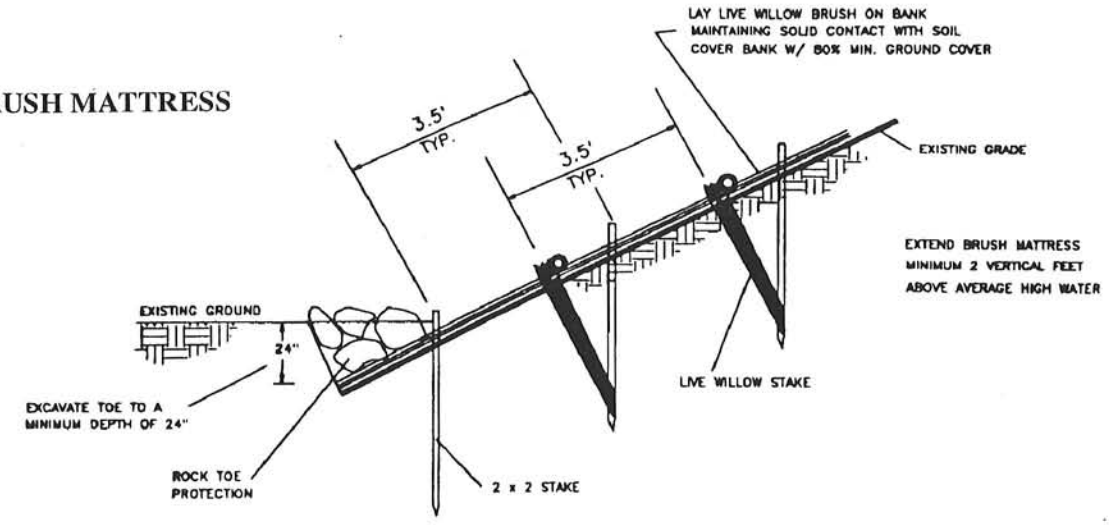
Brush mattresses work well for bare eroding streambanks where the bank can be sloped back and a backhoe can be used. First lay the bank back, to a 2:1 slope, then dig a toe trench 2 feet deep at the toe (below the streambed level at the base of the bank). Drive three



WILLOW WALL REVETMENTS

rows of willow sprigs or wood stakes 3 feet on center along the sloped backbank Leave a foot of the stakes above the ground. Next lay live willow branches 10 to 12 feet long on the bank with their butt ends in the trench. Once the bank has been covered with a thick layer of willows (80% minimum coverage), rope or willow branches can be tied to the vertical stakes with wire or

BRUSH MATTRESS



string. The stakes should then be driven into the ground tightening the brush to the bank. The toe trench can be back filled with rock or with soil and a willow wattle staked on top of the fill (depending on location). Cover the mattress lightly with soil leaving about 50% of the willow exposed. This will allow for an even amount of rooting and leaf growth.

Within a year the willows can be 4 to 8 feet tall and within 2 years can push up to 15 feet if properly maintained. Most bioengineering techniques use willow,but in shady areas which will not support willow other vegetation can be used. For example, in the redwoods dead brush can be used for the mattress, and seedlings can be planted through it.

There are numerous variations of the structures discussed above that can be used depending on site specific conditions. There are other bioengineered structures that can be used for controlling landslides, gully, wind, wave and stream erosion. The benefit of protecting and enhancing riparian corridors on your property is far- reaching. These techniques will not only protect the resources on your property but also contribute to the health of our local watershed and community.

Opportunities for Volunteers

BLT invites you to participate in a 4 acre riparian habitat restoration project at Fay Creek, a tributary of Salmon Creek. Many of the techniques described above will be learned and applied. Call 876-3422 or 876-3551.

Phase 1: Streambank Stabilization with Mike Jensen — Saturday and Sunday, Oct. 17 and 18, beginning at 8 am
Phase 2: Install Drip Irrigation, led by Harold Appleton — Saturday and Sunday Oct 31 and Nov 1 beginning at 9 am
Phase 3: Planting Riparian Trees and Shrubs — 4 Sundays: Nov.15 and 22, Dec.6 and 13 beginning at 9 am

The project is supported by the U.S. Fish and Wildlife Service's Partners for Wildlife Program, the Natural Conservation Service's Wildlife Habitat Incentives Program, and the Sonoma County Fish and Wildlife Advisory Board.

BODEGA LAND TRUST MEMBERSHIP FORM

I would like to become a member or continue my membership at: ☐ $10 ☐ $20 ☐ $50 ☐ $100 Other _____

Please complete this form and return to:

Bodega Land Trust, P.O. Box 254, Bodega, CA 94922 Phone: 876 - 3422

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

Name: _____

Address_____Phone: _____

My special interests are: _____

My special skills are: _____

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

I am interested in being involved as: ☐ an interest group participant, ☐ an advisor,
☐ a Board member, ☐ an occasional volunteer, ☐ other _____

Revelation

Laura Gildart Sauter

I am trying to learn to love fog. As a transplanted Easterner, I hold a deep-seated belief that summers should be hot. But if I am going to live here, and endeavor to be at home in this small town on the coast of California, I must accept that, on many summer mornings, I will wake to the thick enshrouding silence of fog. Today, I take my coffee and go to sit on the front porch swing and watch the fog lift.

The fog is alive. It moves in a slow graceful dance, rising and falling. It hides the church on the hill, built over a hundred years ago by ship's carpenters and, more recently, repaired by my husband, Gary. For a moment, I catch a glimpse of the church steeple and then it is again concealed. Some mornings I cannot see across the road, but today the fog hangs just beyond the fence line whose barbs are strung with drops. The fog seems to gather more thickly in the cypress trees, layered among the dark branches.

When I was a child in the East, fog was a rarity. I remember being enchanted by the sense of mystery it brought to the mundane world. I try to regain that sense of wonder now, walking in the front field. The wet grass soaks my canvas shoes. As the fog drifts, things hidden suddenly appear. Objects become symbolic; they take on new significance through the fog's revelation, as if nature were sending me an urgent message. The apple tree materializing in front of me might well be the tree from which Eve first picked fruit; the pumphouse assumes the aspect of an ancient temple. In fog, objects stand alone, against a blank gray background, their essence momentarily disclosed; it is up to me to decipher their meaning.

The pumphouse is hexagonal, made of rough redwood boards. The door is low, I have to bend my head to pass though, but once inside I can stand upright under the conical roof. When Gary built this structure, replacing the falling-down shed which originally sheltered our one-horse-power pump, I had trouble understanding why he was wasting his careful craftsmanship on such a humble structure. That was, until I looked down into the well. Normally, the well is covered with a redwood floor two inches thick, but for this project Gary had removed the floor boards, and I peered cautiously over the lip of the concrete foundation into a world of mystery. Our well is forty-six feet deep and six feet in diameter; it was dug by hand with pick-axe and shovel. The marks of the digger's tools are still visible in the clay of the damp walls. Far at the bottom, sporadically catching the light from the surface, lies the mirroring disk of water. A faint noise emanates from the walls of the well: muted trickle and splash seeping through layers of subsoil, echoing into this subterranean pool. Small green frogs hop around the well's edge. Once, springs and wells were considered holy places, the haunts of spirits; our ancestors revered wells like this, awed by the quiet mystery of gathering water—life's essential element. When I looked down into the well I could see a faint, pale reflection—my face trapped in the darkness. I thought of stories I had heard of children fallen into wells; there was something fascinating in the remote pool dimly reflecting the world above, something that drew one deeper, some answering resonance from the dark column of the unconscious.

Today, I stand in the doorway and listen to the faint electric hum of the pump. I know what lies there, under the cover of boards. I know why Gary built this careful hexagon that appears like a temple out of the fog.

The water in our well comes from the hills that rim the valley, comes, before it falls on the hills, from the sky. A watershed is a complex and fascinating system, an interaction of moisture, plants, and soil. The hills are covered with trees and grass; this vegetation gives off moisture which is returned to the earth in the form of rain—or fog. The fog condenses on the trees, the rain falls on oaks and redwoods and firs, the moisture drips off their leaves into the soil around the rootline. If the sky provides more water than the tree can use, it is stored in the soil: the soil both holds and transfers water. Some of the water moves along the surface of the ground, forming tiny rivulets that become streams flowing into Salmon Creek. Much of the water sinks into the soil; heavily vegetated watersheds act as sponges; the trees and grasses hold the soil in place, retard the water flow, and promote percolation. This groundwater sinks below the surface until it hits a layer of impermeable rock, then it moves downhill. The water in our well has been on a long journey, slipping in darkness between layers of sandstone and clay, pooling here in a low spot, waiting underground until it is drawn up for use on lawn and garden, and the cycle begins anew.

As I walk back to the house, the garden is a brilliant green in the filtered light. Each plant, each leaf, lifts itself eagerly to receive the fog's moisture, which, in minute transparent globes, condenses on the leaves and runs down vein and seam to drip on the earth. Each leaf of lettuce, each bean vine, behaves in much the same way as a watershed, the tiny crumpled canyons acting as rivulet and creek and river, flowing downwards, until the water is channeled where the plant can make use of it. The more I look, the more I discover that Nature has a number of basic patterns, but uses the same design in many disparate applications; a great economy of means. If it works, stick with it, seems to be Her philosophy.

I wander back to the porch. It occurs to me that the fog is a metaphor for the way my life is now. I can't see very far ahead of me; my way is only revealed a few

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Bodega Land Trust Calendar

Bodega Land Trust Dinner and Silent Auction
Nov.7, 6 p.m. at Bodega fire hall
Last year's first Annual Dinner and Auction was memorable for its conviviality, its fine locally grown food and its high quality auction items (an opportunity to shop early for Christmas). Here is a chance to meet together and to raise funds for the Land Trust. Please support this event:
Tickets $8 for adults, $4 for children under 12
Reservations are recommended and make things easier for the cooks. Call 876 3422.
If you have items to donate for the auction please call ahead 876 3422.

Salmon Creek watershed day 1999 planning meetings: Please call 876 1806 or 874 3353 for dates.

Walks and talks: Thanks to Lisa Baiter for leading the children's hike in June, and to Darrell Sukovitzen and Laura Sousa for guiding us through redwood forest ecology in August. With so much volunteer activity on Fay Creek (see calendar) there will be no autumn walk.
Our winter outing will be a visit to a sheep ranch during lambing on the first Saturday in the New Year. This is for children and others. Place to be announced; please call 876 3422 or 876 3402.

Benefit: Bodega Theater Company is doing a benefit performance for themselves and the Land Trust at the Casino in Bodega. Date to be announced.

Ranch Planning Course: Remember the ranch planning course, taught by U.C. Extension and sponsored by Bodega Land Trust? Several of the ranchers who took the course are now applying for and receiving grants to implement parts of their plans. Grants are mostly for fencing animals out of creeks, building animal crossings and repairing creek banks. Other ranchers interested in taking a course or finding out about grants can call Stephanie Larson at U.C. Extension, 527 2621.

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steps at a time. I must choose a path without being able to see where it leads. Things happen that seem to have significance, but I have trouble understanding just what that significance is. Perhaps, in a wider sense, my lack of clarity is also a lesson in becoming indigenous. If I am to be at home anywhere, I must be at home in the spirit. Knowing I belong, I cannot go astray. In fog, all paths are equal; the one I follow is mine. My only choice is to trust that I will be led in the right direction and that whomever is doing the leading wishes me well.

Dates for your calendar
Oct. 17 and 18 Streambank stabilization
Oct. 31 and Nov.1 Drip irrigation
Nov. 7 **Dinner and Auction**
Nov. 15 and 22, Dec. 6 and 13 Planting
Jan 2 Lambing visit

Send in your local photos and drawings
Bodega Land Trust wishes to follow up its successful cookbook and notecards with a calendar or cards on the theme 'Salmon Creek Watershed'. Contributions are invited: line drawings, black and white photos, color photos. No decisions yet on media.

Bodega Land Trust Shop

T shirts with Bodega Land Trust logo price $15

The Potluck Cookbook - Bodega Cooks for Bodega Land Trust.
Now in its third printing, this collection of recipes by Bodegans and friends makes a great present. $13.50 from BLT (876 1806) or from Artisans' Co-op or Roadhouse Coffee in Bodega.
Also available in Occidental at Hand Goods, in Guerneville at River Reader and in Sebastopol at Copperfield's, Food for Thought, Frizelle-Enos and Quicksilver Mine Co.
Notecards $8 for 8 different cards of "Wild Plants of the Salmon Creek Watershed" drawn by Bodega artist Nancy Conkle.

Animal Whistles
Please add to your Christmas list a bunch of animal whistles for your friends' cars. Animals can hear them as the vehicle approaches and get off the road. They can be a real life-saver for a mere $5.99 from Kragen and other auto supply firms. Real Goods do a superior version. No benefit for BLT but passing two squashed animals on the mile of Joy Road I walked to reach this computer convinced me the whistles should be in here.

You are invited to Bodega Land Trust's

DINNER & SILENT AUCTION

SATURDAY, NOV. 7TH AT 6 PM

Wonderful items to bid on valued from $10 to $200

A bountiful meal served by Bodega's young people. Choice of main courses (including a vegetarian dish) salad and dessert. Many organic ingredients. Menu created by gourmet chef, Edgar Furlong. Corkage on request.

Adults: $8/Children (Under 12): $4

Dinner reservations suggested. Please call 876-3402 or 876-3422

Dinners available as long as they last for those without reservations.

McCaughey Fire Hall, Bodega

Report from Watershed Day

Bodega Land Trust
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