

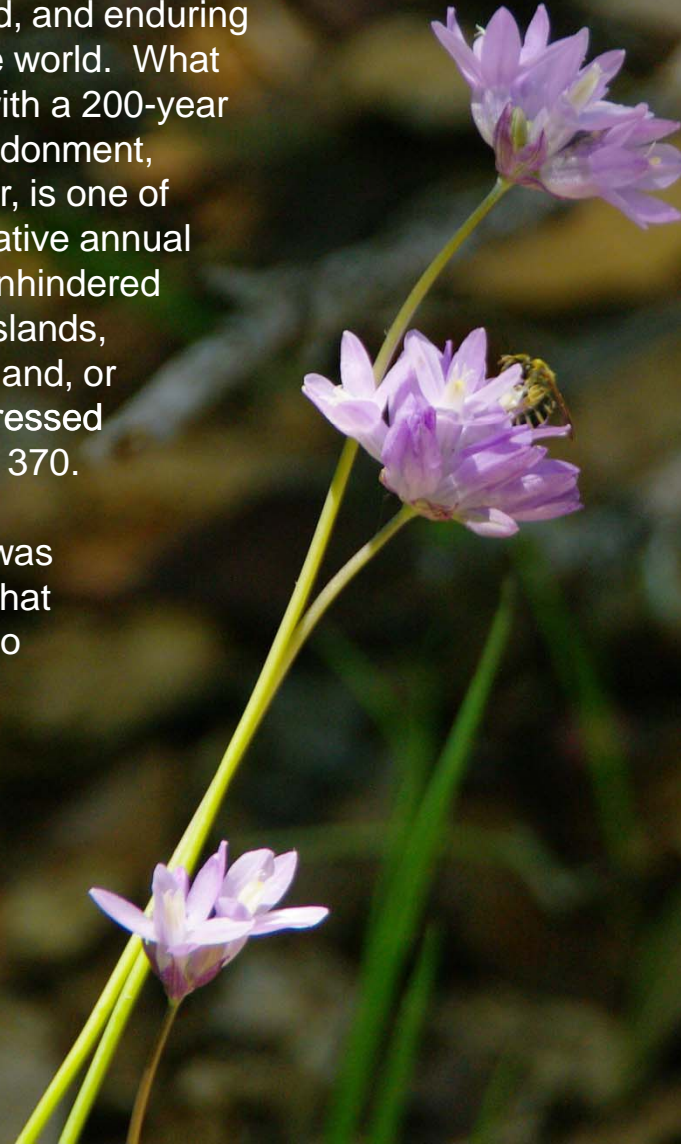
WILDERGARTEN



WILDERGARTEN

This book of over 1,000 pages in 30 separate files consists primarily of photographs. It documents perhaps the most ambitious, detailed, and enduring native plant restoration project in the world. What began as a badly damaged parcel with a 200-year history of invasion, abuse, and abandonment, today after 25 years of arduous labor, is one of the few places in California where native annual plants can express and reproduce unhindered by invasive exotics, whether in grasslands, sand hills, conifer forests, oak woodland, or chaparral. A property that once expressed only 60 plant species, now lists over 370.

Here you will learn why this project was begun, how it grew over time, and what was learned. This book is an effort to capture and share process research and development information for the inspiration and benefit of those who love the land enough to invest their own time and money to bring the land back to expressing its vitality, variety, and beauty.



WILDERGARTEN 4.0

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There is a reason for this. This is a dynamic work that will be updated over time. I have no intention of defending conditions that no longer exist or explanations that have since been relieved of unintentional ambiguity or error.

Please, use a link. Thank you.

Revision History This book was originally produced under the name *The Responsible Party* for which there were two revisions, 1.0 & 2.0. Major revisions are for complete rewrites. Decimal revisions are for revised chapters or navigational changes and are not archived. Back revs are viewable by the numbered links below.

[1.0](#) [2.0](#) [3.0](#) [3.1](#) [3.2](#) [3.3](#) [3.4](#) [3.5](#) [4.0](#)

Vande Pol, Mark Edward, 1954 –

Other writings by Mark Edward Vande Pol:

Natural Process: That Environmental Laws May Serve the Laws of Nature, ©Wildergarten Press, 2001, 454pp, ISBN: 0-9711793-0-1, LOC Control #2001092201.

Shemitta: For the Land is Mine: ©Wildergarten Press, 2009. Contains: 217pp text, 980pp overall, 14 picture books, 2 tables, 963 photographs, 9 maps, 2 drawings, 2 charts, 145 footnotes, 358 citations, and 216 other source references, not including external Internet links. ISBN 978-0-9711793-1-8

Articles at Wildergarten Press: collected writings on Constitutional history and regulatory racketeering by tax-exempt “charitable” foundations

Wildergarten Press
P.O. Box 98
Redwood Estates, CA 95044-0098
www.wildergarten.com



PEOPLE WHO HELPED

PEOPLE WHO TAUGHT ME SOMETHING

Dr. Grey Hayes, Elkhorn Slough Native Plant Reserve, who did more than anyone else in teaching me how to identify the plants we have here; Randy Morgan and Dylan Neubauer, botanists extraordinaire; Barrie Coate, Certified Arborist; Mark Hylkema, Archaeologist, California State Parks; Steve Rich, Rangeland Restoration Academy; Josh Fodor, Ecological Concerns, Inc.; Dr. Charles Kay, Utah State University (a hunter and generalist in Native Americans, archaeology, and wildlife biology); Fred Emery, who introduced me to Dr. Karl Butzer's ecological archaeology; Mike Duguay and Jerry Cone Registered Professional Foresters, and Natalie Vande Pol, one of my two wonderful daughters, who shared what she was learning and dug up papers for me. Yes sweetheart, you deserve my thanks.

PEOPLE WHO ENCOURAGED ME (IN ADDITION TO THE ABOVE)

John Fund, *The Wall Street Journal*; Steve Staub, RPF; Pat Regan, (then Rana Creek Habitat Restoration); Dr. Kat Anderson, UC Davis Ethnobotanist; Brett Hall, UC Santa Cruz Arboretum; Craig Dremann, Redwood City Seed Company; Dr. John Menke, Professor Emeritus Rangeland Ecology, UC Davis; Robert Alverts, Society of American Foresters; Karl Duff, People for the USA; Dr. Vic Kaczynski, Consulting Fisheries Biologist; Jim Hanson & David Amme, California Native Grasslands Association; Henry Lamb, *Eco-Logic Magazine*; Shauna Johnson, PFUSA; Dr. Kevin Rice, Grasslands Ecology and Dr. Sharon Strauss, Restoration Ecology, both at UC Davis.

PEOPLE WHO WORKED THEIR TAILS OFF

My two daughters Natalie & Katherine Vande Pol, both of whom have become outstanding people and now as graduate students for PhD degrees are also important sources of reliable information; Roger Wicht, (RIP) an artist with a bulldozer and the guy who did more than anyone to get me involved; David Wicht, ditto with a backhoe; Steve Liebenberg, chainsaw genius; Howard Liebenberg, maker of magic with base-rock and oil.

THE LADY WHO PAID FOR IT

My Dear Sweet Wife, Diane who had the faith in me to tell me to go for it, with no idea what that would entail.



HOW TO HELP

This has been an unrelenting, very expensive, and physically arduous process.

As to money, I have no time for (or interest in) managing the books for a 501(c)(3) or begging for money, but I will gladly accept assistance you wish to offer: temporal, professional, or financial as long as the latter remains anonymous (accounts for laboratory services would be especially helpful). I cannot and will not accept corporate, foundation, or government grants, because our family wishes to retain a reputation for **total** independence and integrity.

I do love to teach, and would be delighted to have students working here on their projects. We have a need for many hands, both on the land and in producing the communications to come.

As to professional help, we do have new and innovative ideas in the works, the most important of which is developing an engineering infrastructure to facilitate low-impact mobile communities dedicated to restoring the vitality of the world's wildlands. Anything you can do to facilitate these projects would be appreciated as they do present some very interesting engineering and logistical challenges.

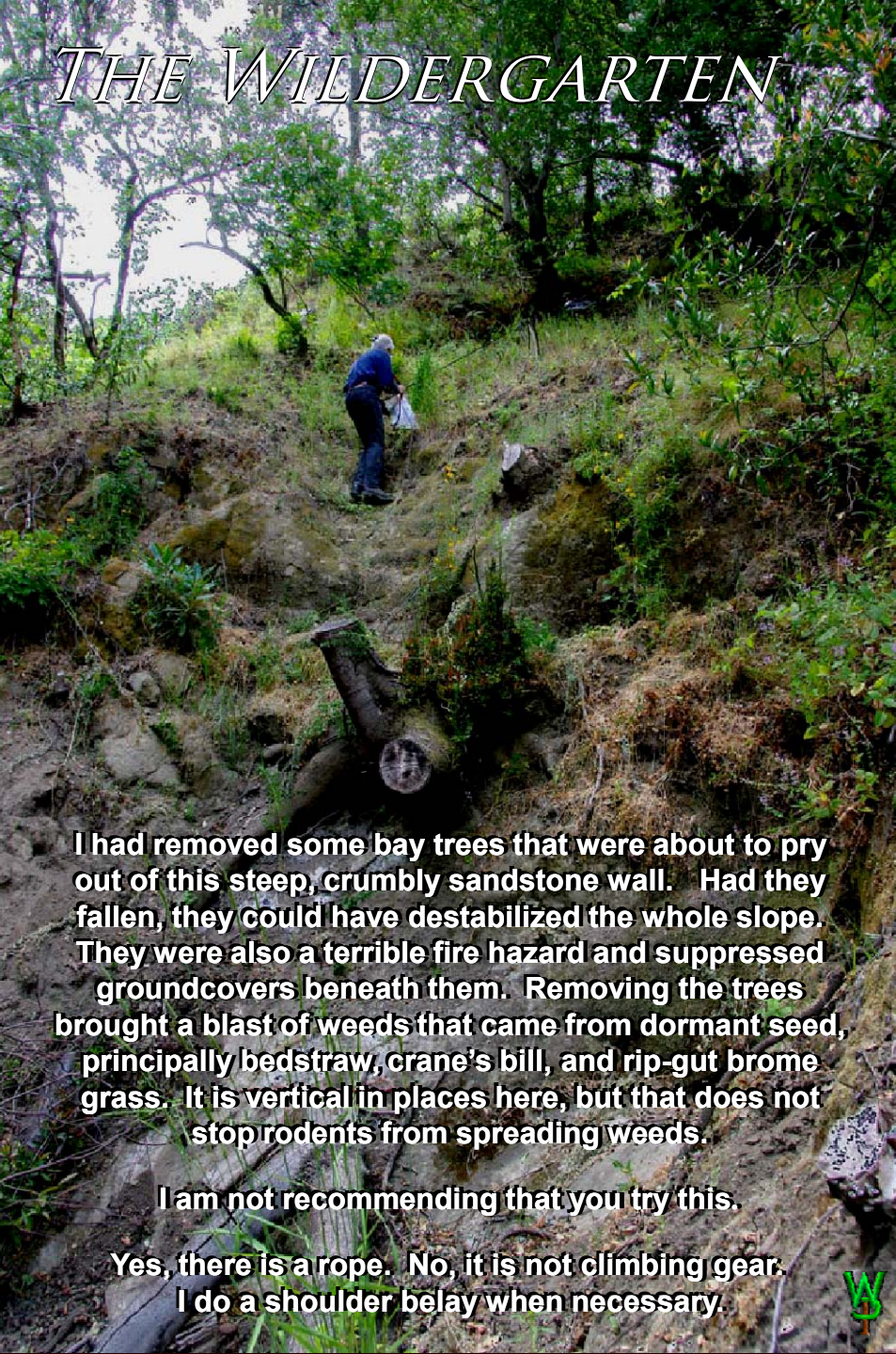
I ask that you support the work, not me. No, we don't have a lot of money; it's just how things must be for now.

If you do wish to help or have constructive critical comments, please contact us at [Wildergarten Press](#). Kudos, warm fuzzies, and criticisms are welcome, but please be polite. Qualified visitors by appointment only are welcome but please be advised: **If I catch you on our property without permission, then you will be arrested and prosecuted to the fullest extent of the law.** Sorry, but that had to be said; I have caught people representing the granddaddy of all real estate rackets (The Nature Conservancy, a tool of the major stockholders of British Petroleum) trespassing here already and have observed others seeking to establish a trespass easement. Both were tracking in exotic seed on their contaminated boots.

Thank you.



THE WILDERGARTEN



I had removed some bay trees that were about to pry out of this steep, crumbly sandstone wall. Had they fallen, they could have destabilized the whole slope. They were also a terrible fire hazard and suppressed groundcovers beneath them. Removing the trees brought a blast of weeds that came from dormant seed, principally bedstraw, crane's bill, and rip-gut brome grass. It is vertical in places here, but that does not stop rodents from spreading weeds.

I am not recommending that you try this.


Yes, there is a rope. No, it is not climbing gear. I do a shoulder belay when necessary.



This is a love story about our little piece of heaven in the Santa Cruz Mountains of California. It tells the history of our project and the innovations it has brought. It contrasts our restoration of native plant habitat with the surrounding area. This picture book chronicles the results of our efforts, over 900 slides that will change, **totally**, how you see the land around you. More importantly, it will change how you see its potential, both ecological, social, and economic, were it given the love and investment to realize that potential.

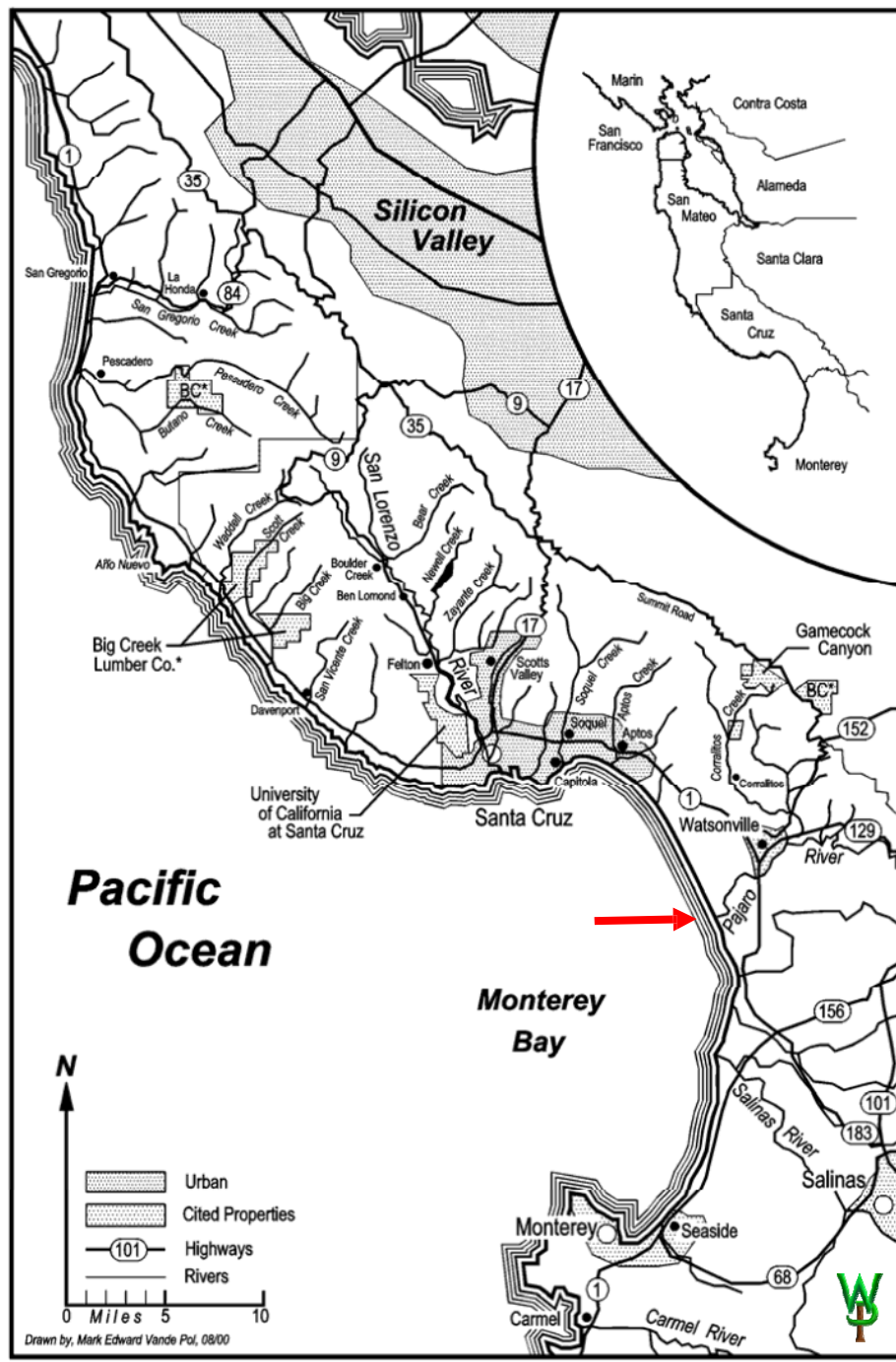
The purpose is to impart the importance of individuals working to improve the total productivity of *their* land for two principle purposes:

1. To restore and sustain living constituents of a functioning native system and
2. To optimize the interplay of human use with native habitat large or small, rural or urban.

Some of it gets rather technical, so you might not be interested in all of it. Accordingly, these front sections will discuss the introduction and background. Each chapter has a **Table of Content** page at the end accessible by clicking any  logo.

This book is not the usual green alarmism. It is not a call for more government control and wildland preservation. I am not suggesting more mandates, rules, regulations, permits, or subsidies; indeed, quite the opposite. This is about restoring the function of damaged land, not about "preserving Nature." "Nature" doesn't care what it becomes, even if it is a lifeless rock in space. Caring for the world is our job as people.

This is about sustained efforts to learn-by-doing, to undo the damage of ignorance and neglect, and to restore functional, productive, and varied plant and soil habitats. It is a process of discovery of how the world around us really works. It is a wonderful motivator for both children and adults. Join me in this walk, as we explore how things look in our back yard!



The setting for this story is in the Santa Cruz Mountains of California, a range of steep and densely-faulted hills parallel to the Pacific, extending from San Francisco south to the Pajaro River (red arrow at left). It is a highly erosive and geologically active system. The seismic activity of the area produces a complex array of soil types which vary frequently from crumbly sandstone, to clay, to shale, or to decomposed granite. Most stream beds are deeply incised. Steep canyon walls receive a wide range of sun and shade conditions depending upon orientation.

The climate is coastal Mediterranean. Summers are almost entirely dry with temperatures sometimes varying 50°F the same day. The coastal hills complicate onshore winds inducing inland summer temperatures on ridges that often rise to over 100°F, while canyons 100' below can have a marine climate 15° cooler. The winters can produce anything from 8.5 to 125 inches of rain in five months (20-50 inches being “usual”).

This region is one of the great biodiversity reserves of the world. The North Coast redwood ecotype ends at the southern tip of the range while the Central Coast ecotype overlaps north to San Francisco near our place. There is even an island of Sierra Nevada foothill species. These three genetic overlays produce unique vegetative combinations that, because of the terrain, can change completely in a few feet. Habitats include grasslands, chaparral, forests, rivers, and an ocean interface with beaches, sand dunes, rocky tide pools, and estuaries.

The favorable weather conditions and a turbulent history of mining, timbering, farming, development, and abandonment have resulted in a series of long-established and still spreading infestations of noxious weeds. Our property alone once hosted over 120 exotic plant species. Fire-suppression has allowed forest to cover over much of that exotic seed bank, making the situation for native post-disturbance forbs particularly dire. This biological system is far more damaged than is commonly understood and it is rapidly getting worse.



For over 25 years, out of what could only be called Pyrrhic sentimentality (or extreme hubris), our family has been converting our mere 14 acres back to native plant habitat (the name “Wildergarten” was on our plot plan when we applied for a building permit in 1990). A landscape that then hosted perhaps 60 plant species is now approaching 400.

When we began this project, I was not what any rational person would call an expert in restoration ecology, but then neither was anyone else. The first formal classes in the subject were offered not long after we began. As things are now, experts in the field have brought their students here to witness what can be accomplished.

Habitat restoration is an all-consuming multidisciplinary occupation, sometimes as much engineering as it is biology. It is a physically, mentally, and financially demanding enterprise. Most of what little has been attempted has been confined to very expensive government or corporate-funded projects, most showing debatable results or worse (including complete failure). Altogether, **since 2000, tax-payers have spent over \$24 billion “protecting habitat” in California.** Yet after all that money, there is only one (1) place that has returned long infested grasslands to **99.6% or better native purity**, including small annuals, and yet it hasn’t cost you a dime.

That place is the Wildergarten.





April 2015

This view is from in front of my office window. I know every inch of it intimately, having individually planted, pruned, or "pardoned" every tree, shrub, grass, and forb in this picture. This landscape is NOT "Natural" as people think of it, if it ever was. When the Awaswas Sayante tribe managed it, there were probably few to no trees or shrubs here at all!

Note on photography: In mixed forest, lighting contrast levels on sunny days are very high. I try to shoot on days like this, with thin clouds or sometimes at dawn to reduce the contrast, but that is not always practicable. Dynamic variations in lighting then make adjusting white balance problematic.



May 2010



Besides oak woodland, there are “Santa Cruz Sand Hills,” spread with a quilt of clover and strange little annuals with names like filago, fairy mist, navarretia, claytonia, cammissonia, miniature lupines, and tiny madia... In an area like this there are over fifty plant species. If the plants look “yellow” to you, it is real. Most of the soil here is fine sand, which has very poor capacity for nitrate retention.



May 2010



Yet one hasn't seen a sand hill until one gets closer to the ground...



April 2012

...really close.





April 2009 – (before weeding)

Grasslands are also intensely varietal places, although this one contains a number of species also found in sand hills.





April 2015 – Turkey Hen



But more important than grass to many animals, are the leafy annual forbs that provide protein, seed, or bugs if that is in their diet.



April 2015

I have been told by several grasslands experts that our focus on annual forbs is unique. One such guru with some 35 years' experience all over the American West said that he had *never* seen anything like this intense mix of perennials and annual forbs, calling it the “Best native grassland restoration in North America so far” ([source](#)).



April 2015



And as spring progresses, the forbs dry off and drop seed, bringing their own kind of "fall color."



April 2015 Chalcedon Checkerspot (*Euphydryas chalcedona v. chalcedona*) on *Dichelostemma capitatum* with *Sanicula crassicaulis* in back

Yes, there is “spring color” too, as the wildflowers make a comeback, and with them, their friends come to dine and show off.



February 2015

There are even relic botanical evidences of Indian farming! From left to right: discrete patches of soap lilies (*Chlorogalum pomerindanum*), *D. capitatum* (prior page), and various clovers, some with linear boundaries over a considerable distance.



April 2015

Most of the property is forested, but in a configuration seldom seen here any more. These oak woodlands were once so dense that there was no groundcover at all. Forests have been thinned in phases to develop intense groundcovers while still controlling exotics.

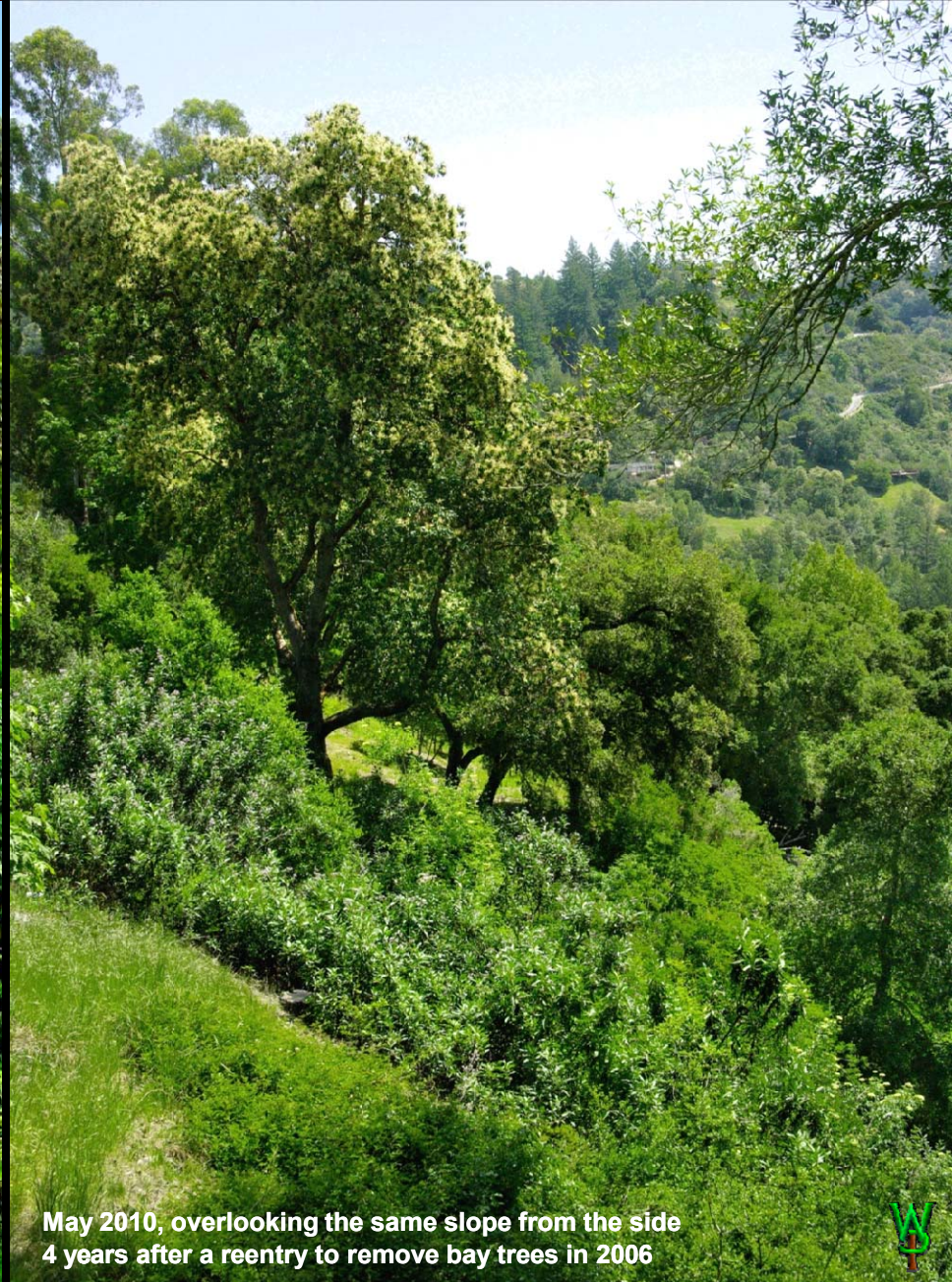


May 2015

As the thinning process continues, there are now occasional openings supporting more fruit-bearing shrubs.



**This slope was first cleared and burned in 1994.
This is 8 years later in 2002.**



**May 2010, overlooking the same slope from the side
4 years after a reentry to remove bay trees in 2006**



Twenty years ago on these steep hillsides, you could not even see the valley below for the dense canopy of fallen exotic acacia trees interspersed with eucalyptus and fir. It was a fuel bomb. There was no groundcover. Now we are fostering various herbs, sedges, grasses, and berries that will provide food for wildlife while retaining the soil and managing the fire hazard on such a steep slope.



November 2014

It grows so fast that from time to time, I get to whack it again. In places, it takes a rope.





May 2015

Cutting brush is a disturbance that regenerates new life the next spring.



May 2015

We also have stands of redwood, the second-growth trees in the mid-ground being over four feet in diameter and 205 feet tall. Yet as you will read in the site history, those “old growth” trees may not have been here when Spanish explorers arrived! Second growth redwood forests are so dense that the total amount of habitat to support wildlife is greatly reduced from what it once was.



May 2015



There were no forage groundcovers or shrubs in this forest when we started this project. They need sun too. This is a road.



May 2015

Redwood makes wonderful lumber, but felling trees carries the risk of crunching up the adjacent oak woodland. It is very expensive to get the logs out carefully, requiring roads like this one for heavy equipment that can otherwise scar the surface and spread weeds.





April 2015 – The sprouts at right are from trees logged in 2000

Despite these concerns, in some cases logging *must* be done before the trees grow to sizes capable of taking out large chunks of the supporting hillside. The scarpred grade at left suffered just such a rotational failure. The clump in the back is ready to do likewise.





May 2015 – The white sheet is used billboard material with a cut piece on top

One ecological problem with logging redwood here is not as much the trees one removes, but the trees one will get. They sprout from the stumps in densities and numbers that overwhelm forest understory species and make water competition among the trees an issue. One often can't simply treat the stumps because they are usually connected to other trees by roots underground.



May 2015 – Not far from here



Sprouts are not only a problem for groundcover biodiversity, untreated, they can become a fire hazard.



December 2012



Here, research is confined to what produces easily documentable and repeatable results. It's cheaper, faster, and allows for more trials. It reduces the chance that background variation from site to site will render the observed distinctions inapplicable.



February 2015



Here, relationships between plants and fungi are observed unhindered by weeds and overgrowth...



February 2015 – *Trifolium microdon* is known symbiote of the mycorrhizal fungus (*Glomus mosseae*) also known to exude gibberellic acid, which may have played a key role in stimulating the simultaneous germination of the surrounding *Dichelostemma capitatum*



It is only in recent years that science has started to grasp the crucial role fungi and microbes play in soils as much more than nitrogen and carbon cycles. From digesting geological parent material into usable nutrients, to the transporting those nutrients to plants, providing protective coatings, to literally cloud seeding for rain, the life systems of this planet do not run without them. Here at the Wildergarten, it looks as if fungi may also play a critical role in stimulating germination of native plants that feed wildlife as the clovers above can feed fungi that exude hormones known to promote germination. Yet without early successional plants to process solar energy into sugars, they may be unable to do that job. We may have got that process going again here, by simply weeding.



December 2014 – Probably a type of *Hypholoma*

Besides, something has to reprocess woody vegetation back into soil, for which this saprophyte is well suited indeed.





April 2015



Here, there are more interactions among plants and insects because there is plenty of habitat. This checkerspot butterfly (*Euphydryas chalcedona*) is using this *Dichelostemma capitatum* as a perch to attract a mate.



April 2015 - *Plebejus acmon*

Not to be outdone were the Acmon blue butterflies, doing a mating dance among lotuses and tarweeds.



April 2015 – on *Verbena lasiostachys*

While this sunning jumping spider, methinks she lies in wait.
Insect food largely depends upon native plants.



July 2011 - fork-tailed bush katydid (*Scudderia furcata*), by Natalie Vande Pol

Which then become tasty nymphs for jumping spiders and their avian competitors.



April 2015 – *Vanessa virginiensis* munching on *Gamochaeta argyrinea*

This Painted Lady larva is munching on the inflorescence of a cudweed. This perennial plant sucks nitrate out of the soil to the point that it is toxic, also depriving nitrate to surrounding plants. Insect larvae are often host-specific because they can tolerate the toxins those plants produce. This kind of herbivory helps keep weedy plants from destroying even native biodiversity.



March 2013, *Aphanes occidentalis* underlying *Acmispon pariflorus*, *A. americanus*, *Trifolium microdon*, *Bromus carinatus*, and *Stipa lepida*

No food, no animals. Food starts with converting gases into organic compounds in soil. Here, we can observe tiny nitrogen-fixing grassland plants like this *Aphanes occidentalis* (the fan-shaped leaf), because they don't have to deal with their exotic competitors.



April 2012 burn

Here we do factorial array experiments to identify soil deficiencies due to historic grading...





**First Time
Next Year**

**2012 Burn &
2016 (planned)**

April 2012 Burn

**2012 Burn &
January 2015**


**2013 Burn &
January 2015**

2014 Burn

April 2015



...or to test means of stabilizing successional processes (and more) by instigating periodic disturbance.



**Same Day
February 2, 2014**

| Wet Season Conditions | Our Place | “Your” Place^Ω |
|----------------------------------|------------------|---------------------------------|
| Mean annual rainfall* | 43.4” | 41.18 |
| 1/1-4/30/2013 | 4.6 | 4.82 |
| 5/1-8/31/2013 | 0.2” | 0.13” |
| 9/1/13-2/1/14 | 2.5” | 2.2“ |
| Frost days | 15 | 25 |
| Dry Season Conditions | | |
| Fog days | 15-20 | 100 |
| 100+° days | 10-15 | 3-5 |
| +90+° days | 50 | 10 |
| Peak Monthly average high | 93° | 86° |

* Rainfall data from the City of Scotts Valley Wastewater Treatment Plant, two miles toward the coast from the image at right.

^Ω This disaster belongs to the Land Trust of Santa Cruz County,
It is virtually 100% non-native.



Establishing native grasslands results in a ruggedness against the ravages of drought that ought to get your attention.
Such conditions as at right are the usual in grasslands among parks and open space districts.

When one takes a close look at similar (and worse) conditions in National Parks, conservancies, open space districts, greenbelts, land trusts, conservation easements... they all suffer from the same problem: lack of management. The cause of the problem is not as much technical or financial as it is a cultural archetype that holds people as inherently harmful to Nature.

Really? All of us? No matter what we do it is bound to be destructive? The idea defies reason. Its corollary is worse: that Nature, if left alone, will recover its former glory... eventually. From anything? No matter how bad? Obviously not.

This premise of "Nature" as alien from people, is a **creation of 16-18th Century intellectuals**, urban elitists who neither worked the land nor wanted to. Theirs was a precept born from philosophical theory, not experience. It was the source of the popular (and racist) ideas of the American conquest: the "New World," the "empty continent" (that wasn't), or "manifest destiny." These ideas allowed us to discount how the PEOPLE who lived there *made* the landscape they thought was so glorious and wanted to occupy. Indians imposed regular disturbances over thousands of years: burning, hunting, harvesting, and habitation. From bushes, to bugs, to bears, every life system in the hemisphere had adapted to and therefore depended upon the regularity of those anthropogenic inputs. The settlers were so enamored with their projected ideals about Nature they couldn't even see people as elemental to the landscapes with which they fell in love.

Once European diseases had devastated aboriginal tribes, and civilization had converted their cultures, for the most part, their knowledge of the land was lost. Centuries of European cultural management preferences completely replaced Indian land management with fire-exclusion, deforestation, overgrazing, farming, abandonment, and exotic introductions that have since distorted pre-colonial habitats beyond recognition and made much of that ancient knowledge inadequate. Yet somehow, most Americans still hold this psychotic idea that "Nature" will be just dandy if only we bring back large predators, or light it on fire and institute a policy of mandated neglect! That same belief in a primal "Eden" that never was, a "balance of Nature" in fact maintained by people, is the belief which blinds us today, just as it did the European explorers.

Today, "preservation" and "protection" are promised to restore these lands choking with weeds and aging vegetation that suppresses native germination. Even if it does blow up in a catastrophic fire, the dominance of weeds assures that the native plants will then have little chance to germinate, mature, and breed. It has been so long since the natives have generated fresh seed that dormant seed in the soil is slowly losing its viability. Lose that seed, and the foundation of productive land: microbial relationships between soil bacteria, fungi, and native annual plants, many of them specific, may soon be unrecoverable. That same belief maintains us oblivious to the damage still being done.

Public education and mass media feed this sentiment, that everything will be just fine... if we leave it all alone. "We" get to visit "Nature" occasionally, or see glowy propaganda about it on TV, and force landowners to "protect" "our environment" on their dime... If people are so destructive, why does anyone think *they* know how to fix it? So perhaps it is really not so radical that some iconoclastic engineer would want to try something different. The Wildergarten is intentionally not "Natural." You can be the judge as to how we are doing compared to the competition.





October 2013, an Acacia stand not far from here

We took this property from a pending inferno of exotic monocultures...



May 2015



To a virtually 100% native landscape, expressing its variety...



May 2015

...vitality,





May 2013

... and beauty,





March 2015



...in all of its magnificent detail.

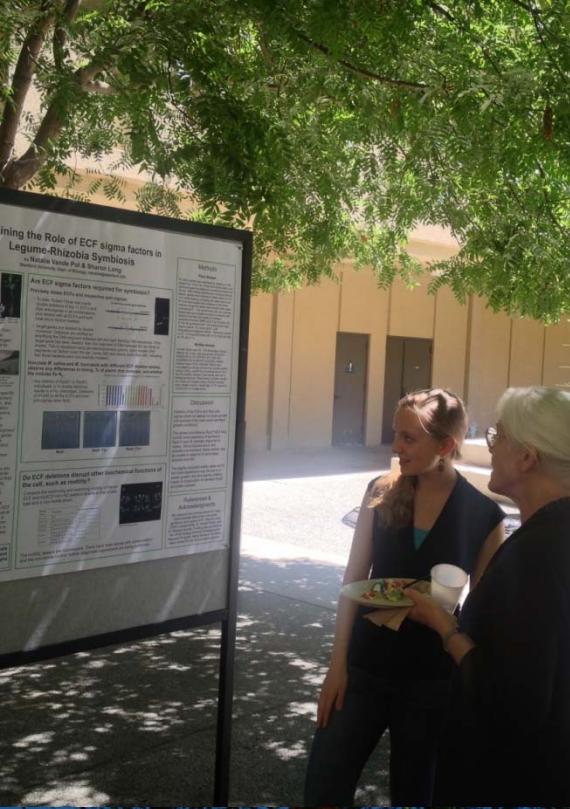
Clearing for an experiment to establish native groundcovers as a way to retard the rate of succession



November 2014



...with the goal of fostering a new culture, focused upon developing new knowledge of the earth in intimate contact with it.



...where PEOPLE, free to take risks and responsible for their consequences, learn how to find the answers and not be the problem.



Protecting seedlings of *Trichostema lanceolatum*

A world of learning is in your hands...





THIS IS
WILDERGARTEN

Trichostema lanceolatum breeding and feeding



BUT... WHY?



This project began out of aesthetic considerations; I just wanted to save a little piece of the California I had loved as a child with a home perhaps for my children to inherit. I had no idea that what we would accomplish had never been done before.

It wasn't long after I finished building the house that I was roped into supporting friends I knew to be ethical in their futile battle with the aggressive and destructive agenda of our local anti-logging community. From what I could tell, the laws these activists wanted seemed destined to ruin the forests they were ostensibly intended to protect. In 1994, I joined the Santa Cruz County Local Agenda 21 Biodiversity and Ecosystem Management Roundtable with the intent to engage similar activists, primarily in the importance of weed control and our overgrown forests as an accumulating fire-bomb.

Unfortunately, the product of the process was not the open consensus promised, **but a document rewritten in secret by unidentified people who had not attended a single meeting**. Despite my refusal to sign it, the organizers published that I had agreed to it (their promised "consensus"). Appallingly, that document became statutory law!

I realized then that this *political* process posed a terrible threat to representative and accountable government. More importantly, I saw this *process* as a systematic threat to the environment that is its principle justification, so grave that I quit my engineering career to do something to stem the damage I believe it will ultimately deliver. How? This kind of regulatory bureaucracy is a direct threat to private property, **without which an economy will eventually collapse**. After all, it is the private economy that *funds* environmental restoration. The more I studied, the more I witnessed that allowing government to "protect" the environment gives politicians, courts, and bureaucrats the power to pick winners and losers in the marketplace, usually in the interest of the politically dominant and not the environment. As if I needed an example, it turned out that our local "anti-logging" activists were being used to support the agenda of a closed group of local developers and real estate interests. Over time, it became obvious that this was but a microcosm of a corporate "charitable" foundation-government-university "environmental" juggernaut with global reach, its agents dependant upon continued and growing problems. This was what finally explained why so many supposedly well-intentioned but eventually-destructive regulations I saw proposed seemed virtually inevitable. These findings became my first book: *Natural Process: That Environmental Laws May Serve the Laws of Nature*.

Yet the system is worse than merely corrupt, it is also structurally maladapted. Land is both temporally and spatially varied, while government regulations are supposedly dedicated to equal treatment. Yet if everyone is forced to do everything the same way, then no one could prove that said uniform rules were dysfunctional; no one would have the latitude to demonstrate a better way of doing things. The environment is too dynamic, complex, and varied for one set of rules to take everything into account, much less produce a just and efficient product. There is too much money to be made calling the shots on who gets to control access to resources. To make such a system global is to assure the ecological ruin the system is supposed to prevent.

As an engineer by training, I *had* to find a solution. I went on to obtain the first **patent for a free-market environmental management business method**, primarily as a means to keep said corporate-sponsored government juggernaut from deriving monopoly profits by doing it first (it constitutes "prior art" against the carbon trading patent, now owned by Fannie Mae... yes, your electric power bill is to be used to bail out the mortgage meltdown).



Once *Natural Process* was in print, I knew that since I was claiming to have a better way to manage the environment our property had to be such an inarguable paragon that I could never be regarded by anyone as a hypocrite, hidden threat or corporate agent. At that time, I had no idea how demanding detailed restoration work would be (particularly in grasslands). I honestly thought lots of other people were doing this kind of work. I had no idea that our family would achieve results that are apparently unprecedented in this region (if not the world), but that is what I am being told by people who know much more about such things than I do. Yet even that standard is far from what I think we should be seeking.

This was and is a “lives, fortunes, and sacred honor” sort of commitment, the kind of thing from which there is no turning back in life. The aesthetic project became an investigation to develop the expertise and evidence to support the claim that a free-market alternative to regulatory government should be given the latitude to provide superior stewardship, as at least a competitive alternative to the existing system. Needless to say, this commitment forced me to develop means to deliver upon that promise. Altogether, over the 18 years since I quit my career, this has probably cost me at least \$2 million dollars in lost income. No matter how many disappointments there were, no matter how futile the effort seemed to be, no matter how miserable things got out there weeding in the rain or heat, the goals were obvious and the mandate inescapable: I would succeed or face failure, then to watch both the land I love and my country die, knowing that I had quit, not because it was wrong to try, but because it was too hard. One can’t do that when one has children watching.

The results have been gratifying albeit I am far from “done.” I have met some amazing people in many walks of life and have had the privilege of raising two more, some of whom have become friends. Yet there was little to no advice upon which I could rely, never mind any accolades. I have a few supporters among the academic community, but the more common response has been to ignore what has been accomplished here, my guess is out of fear. Even the California Native Plant Society denied my offer to share our results at their convention. Literally, academics have been told by their superiors *not* to visit here. So, I have decided to share our accomplishments and challenges free to anyone who cares enough to read them.

This book and site are a work in progress, as I have more chapters to add, and a LOT more detail yet to communicate. Although I have over 18,000 photographs, that is the limitation, particularly as regards demonstrating technique and it is my intention to add video to that end. It may seem like these are needlessly detailed distinctions, but when you are removing a million or more weeds per year, small differences in detection and reducing the time and motion for removal add up to substantial differences in productivity, yield, and repetitive motion injury.

Finally, this book does have purposes beyond the merely technical, for (sadly) the liberty to experiment in land management on private property now operates within a suffocating and potentially dangerous political, economic, and legal context, that itself has significant and adverse environmental impacts. Accordingly, this book is intended to inspire recognition of the opportunities in dissolving **a destructive historic mythology that is alienating people from the land**. It is long past time to get past our past, and get to work rebuilding a better world.

– Mark Edward Vande Pol



THE SENSE OF PURPOSE

People keep asking me “What is the goal?” as if there really could be a fixed attainment target with known properties and specifications. How can one be “done” with a living changing thing? The best one could hope for is a sort of steady state maintenance level, but even that must be interspersed with occasional disturbance, project, or experiment. Engineers suffer particularly from this latter malady, known among us as “creeping elegance.” It is an obsession with adding features and improving performance that has driven many a marketing manager and accountant to despair. Hence the joke: “Shoot the engineer and go into production.” So much for “goals.”

“Purposes” on the other hand are ongoing. Over time they have multiplied as one desperately searches for reasons to keep doing something so difficult for so little tangible reward. Thus, it should be no surprise that the purposes of this project have increased in scope over time, both as a matter of increased understanding and extending applicability.

1. To establish pure native cover at all successional stages across the entire property. We’re almost there.
2. To cleanse the land of non-native seed bank. This has been done in several places but to an unknown degree.
3. To redeposit a wide variety of native seeds, such that the land responds to disturbance with native germination, particularly with small post-disturbance forbs (please see our [species list](#)). This has been accomplished.
4. To produce a varied, dense, and beautiful groundcover that is productive for insects and wildlife. Ditto.
5. To mitigate erosion damage, reverse incised channels, and stabilize slopes. 80% complete.
6. To observe native colonization and adaptation behavior when reentering the site. Ongoing.
7. To improve native plant restoration technology in a cost-effective manner. This is a current focus.
8. To harmonize successional processes of “wildland” habitat with agro-urban land use given that modern demands upon the landscape differ from those of aboriginal tribes. People don’t want broadcast fire, and don’t eat many acorns, but perhaps they would have fewer allergies if they gnoshed an acorn tortilla upon occasion.
9. To return excess biomass to the soil system in a stable form while restoring original trace mineral balances.
10. To increase our knowledge of the relationships between migratory species and native foods, including insects.
11. To establish precedents in law for freedom of action in demonstrably-responsible habitat restoration research and process development toward establishing TRULY free-enterprise environmental management.
12. To precipitate a cultural transformation that invests the public in the health of the land around them.

The evidence is in this picture book. You are free to judge how we’re doing.



BUT FIRST...



A WORD ON CITATIONS

This work is to be part of a larger site with many other works that refer to overlapping sets of sources. Accordingly, and given that all such work is dynamic, I have chosen to maintain a single bibliography with the exception of the site history. No, I don't have an aversion to citations ([the bibliography in my more recent book](#) goes on for 21 pages), but this "picture book" format does make maintaining citations problematic. In this format, often a single character adds a new line, then necessitating a smaller photograph. So, footnotes were out because it would have otherwise been too destructive to the visual content. With some ideas referring to multiple sources, links sufficient to meet an academic standard would have been similarly complicating. Worse, too many links makes reading harsh and unpleasant, not only because of character and color variation but because it interrupts the larger flow of ideas. I may put invisible links in some day, but only if interest or controversy warrants and time permits. I do have another book to finish first.

Most units will be in English, because that is what most people reading this will find understandable.

There are a few links that will open a new tab in your browser. I am not guaranteeing that they will be maintained but please do let me know if you find an invalid destination. There is a contact page at the [Wildergarten.com](#) web site upon which there is to be posted more than one reference bibliography.

Further, and unfortunately, many academic source documents are closed to most readers without paying *very* stiff "fees." I wish more scientific publications were open source (especially because they are usually at least subsidized by tax-payer supported government grants) for I could then simply offer direct links to academic sources. The good news for you is that the best kind of evidence will be before your eyes.

To the point, this work represents my opinion and experience, which you can judge for yourself by the photographic evidence. Given that the photographs are the main confirmation of what I am saying and making them bigger helps with communicating detail, I have endeavored to maintain the text as brief as possible and only with critical links to keep them from becoming a distraction.

As should be obvious, I would be delighted to see someone repeat these experiments and methods. That is the best truly valid scientific confirmation anyway. It is when we identify and characterize the exceptions to the rule that questions arise. This is how we grow knowledge.

The process of writing "picture books" began well before 1080p was taking hold. I still had a CRT monitor, so it was constructed and formatted for 7.5"X10" PowerPoint slides so that people could easily print pages onto 8.5"X11" paper. Were I to do it over I would format in 1.78:1. Sorry, that's another of those, "if time permits," sort of changes.



WHAT DO I MEAN BY 99.6% NATIVE PURITY?

The first such measurement was performed by a third party who taught me the “toe-point-transect”: You take a step, record what plant is closest to your big toe 100 times. His was 100% native. He was giddy; in 35 years, he’d never seen more than 90%, anywhere. I repeated that test four times elsewhere on the property that year. That is how I got to three significant figures. That was May 2010 and it keeps getting better. At this point the difference between 99.9% and 100% is a matter of where one samples and how one does the test. I have objections to this technique, because with very small plants one has their choice about which is “closest” to the toe, which means that it would be hard *not* to skew the test. More importantly, this distinction of “native cover” is deceptive with a multi-layered groundcover, not to mention that it understates the damage that can be done by very small weeds that suppress the germination of a great many native plants. Hence, although I consider the metric rather suspect, it is quick to perform and is understood by professionals in the field, so I use it.

In 2014, Randy Morgan (whom I consider the best botanist in the area because of his integrity) brought to my attention that there is a distinction between *Cardamine oligosperma* (native) and *C. hirsuta* (not), both known as “bitter cress.” I had believed I had the former, because **all** of the published sources list only the native in this area. The 1993 Jepson I was using showed the exotic only in Siskiyou County, 500 miles north with the 2012 Jepson showing it only along the coast. Every botanist who had visited here was so blown away as to conclude the same. Since 2007, **there have been two reports of its presence in the County**. Yet I am now certain it has long been ubiquitous and the botanists had made a mistake of inattention to a seemingly innocuous weed simply because other weeds suppress it. Bitter cress is an annoying plant because it kicks seed in your face as you crawl along, so I have culled it as an annoyance but not as an exotic (a strategy I call “resistance”). Without competition from other weeds, it does spread like wildfire. So, the plant never became a disaster because I just didn’t like it and acted accordingly. When Randy (who hates “pop-weed” as much as I do) raised the question last spring, I took a look with a magnifying glass (what it takes) and went on the predictable rampage.

The problem was that the definitive key to distinguishing the two species was the number of pollen anthers on the flowers: *C. oligosperma* (usually) with five and *C. hirsuta* four. For management purposes, this is a useless key: If I waited for flowers to appear, my project is toast because it can go from flower to popping seed in a week. So I developed a vegetative key (the shape of the second pair of leaflets) by which to make the distinction earlier in the process. Not a single native so far.

Chances are that **nobody** visiting the property would know the difference, but I would know while leading them about, and I’m not going to let a nagging annoyance like that impugn the diligence of what I am seeking to teach here. Pop-weed will be a nagging annoyance for the next few years, but at least it won’t make my conscience squirm or affect the numbers substantially. Nobody is perfect and certainly not me, but I try (oh hell do I ever try) because it’s better than giving up. This is a pest of a plant and thus will be the biggest weeding job here in a good many years, especially because fall 2014 was a fantastic season for germination. Results in May 2015 were just as good as before.



*BUT BEFORE TEARING
OFF INTO THE REST
OF THE BOOK...*




THIS IS THE END OF THE BEGINNING OF THE BEGINNING

You have just completed the first chapter of which there are six in Part I:

- Chapter 2 – Going Native discusses why “native versus not” is more complicated than one might think
- Chapter 3 – Why succession and environmental preservation may be more destructive than even weeds
- Chapter 4 – “Before and After” repeat photography
- Chapter 5 – A demonstration of nearly pure native germination
- Chapter 6 – An overview of how this project has been directed toward its increasingly technical goals.

Accordingly, this picture book suggests two alternative paths:

1. Read this book linearly, going through the remaining 29 chapters, OR
2. Finish the first six chapters of Introductory Part I and then jump to Part V, the Project Context indicated with the “Globe” icon  on the next page: These are five chapters discussing how our project survives when inundated with weeds resulting from the large-scale damage being done to native habitat by the current public preference for politically or (failing that) legally-determined “environmental protection.”

This project continues to progress over time while the book’s chapters are arranged by topic. When possible, the topics in the detailed section are arranged in temporal order because our emphases changed over time both because conditions improved and because of what was learned. To avoid redundancy, the detailed path presumes that you have read each chapter in order.

Navigation


1. There is a Table of Content the end of every chapter (next page).
2. Each line in the Table of Content is a link that opens the corresponding chapter in a new file.
3. The Wildergarten Press logo  on any page is a link that takes you to the Table of Content at the end of that chapter.

TABLE OF CONTENT

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2. Going "Native"?
3. "Native" Is Not Enough
4. A Site History Like No Other
5. Repeat Photography, Before & After
6. Proof: Pure Germination of Native Annuals
7. Project Overview

Part II – Forestry

1. Phased Thinning of Broadleaf Forest
2. Conifer Forestry – Thinking Really Big
3. Drainage – When Hill Goes Downhill
4. Roads – From Curse to Blessing
5. Making WOW! - Restoration of Forest Understory
6. Aerial Photography over 25 Years

Part III - Grasslands

1. "The Onion": Weed Management by Species
2. Colonization Behavior of Native Annual Forbs
3. Sand Hills: A Model Post-Disturbance Habitat
4. Grassland Variety in Meadows & Forests
5. Grassland Restoration and Soils Rehab
6. Comprehensive Weed Management
7. Vegetative Identification & Weeding Technique
8. Pre-Emergence Selection for Native Germination
9. Drought Tolerance in a Pure Native Grassland

Part IV - Miscellaneous

1. The Vegetable Garden as a Research Tool
2. Pollinators and Native Forbs
3. Fungi (not yet)
4. Specialized Tool Development

Part V – Project Context

1. Periodic Disturbance and Feed-Forward Stability
2. Weeds: A Tragedy of the Commons
3. Control Boundaries: Fragmentation Is Your Friend
4. Central Planning
5. Our "Ownerless" Backyard



Each line in the TOC is a link that opens the corresponding chapter in a new file

These are LARGE files; they do take time to load

Please offer suggestions and comments [HERE](#)

