Wildergarten

Wildergarten 2.2

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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.

TRP: 1.0 2.0 Wildergarten: 1.0 2.0 2.1 2.2

Vande Pol, Mark Edward, 1954 –

Other books 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

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Preface

Since 1989, our family has labored to restore our once badly-damaged land to a varietal native plant reserve. The project began out of aesthetic considerations; I just wanted to save a little piece of the California I had loved as a child, perhaps for my children to inherit. I had no idea that what we would eventually accomplish had never been done before.

It wasn't long before, 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. 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 the document, the organizers published that I had agreed to it (their promised "consensus process"). Eventually, that document became statutory law.

Whether one agrees with the purported goals or not, I realized that the *process* posed a terrible threat to both representative and accountable government and private property. More importantly, I saw this kind of system as a systematic threat to the environment that is its principle justification, a threat so grave that I quit my engineering career to do something to stem the damage the process seems destined to deliver. The more I studied it, the more I learned that using government to "protect" the environment is the power to pick winners and losers in the marketplace. 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, I learned that this was but a microcosm of a corrupt corporate/government "environmental" juggernaut with global reach, its agents individually dependant upon continued and growing problems. This was what finally explained why so many of the regulations I saw proposed seemed inevitable no matter how stupid they were, and why so many were virtually guaranteed to backfire.

Land is both temporally and spatially varied, while government regulations are supposedly dedicated to equal treatment. Unfortunately, if everyone is forced to do everything the same way then no one ever could prove that said uniform rules are dysfunctional across diverse conditions or that there is 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. Worse, there is simply 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, and did as is described in my first book**:** *Natural Process: That Environmental Laws May Serve the Laws of Nature.* With the ideas developed for that book, 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 the book was out, 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 of restoration that I could never be regarded as a hypocrite, by anyone. Hence, our project at home was rededicated to attaining that level of excellence. So I cluelessly set arbitrary standards of attainment; i.e., perfection. At the time, I had no idea how demanding detailed restoration work would be (particularly in grasslands). I had read enough about “habitat restoration” that 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 more about such things than I do.

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 a proof of principle, 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, at least as a competitive alternative to the existing system. Needless to say, this commitment forced me to develop the means to deliver upon that product. Altogether, over the 17 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, 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, 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 we have accomplished, my guess is out of fear. Even the California Native Plant Society denied my offer to share our results at their convention. I have literally had academics told by their superiors that they were not to visit here. So, I have decided to share our accomplishments and challenges anyway, free to anyone who cares enough to read them.

This presentation is a work in progress, as I have more to learn, more sections yet to add, and a LOT more detail yet to communicate. Although I have nearly 10,000 photographs, that is the limitation, particularly as regards demonstrating technique. As time goes on, it is my intention to add video to that purpose. 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 mere technical, for (sadly) the liberty to experiment in land management on private property now operates within a suffocating 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 paradigm that is alienating people from the land. It is long past time to get to work rebuilding a better world.

Mark Edward Vande Pol

But First...

How To Find Your Way Around

This really is a 'picture book.' Hence, were this all one file, it would be an enormous download (as a pdf in 600dpi resolution almost 500MB). Accordingly, this "book" is broken into about 30 chapters, each of which is a separate Acrobat Reader .pdf file. Within the Table of Content at the end of each chapter, each title is a link that opens that chapter in a new Reader window. Some of the files are big (5-15MB), so they do take time to load. When you are done, the Table of Content comes up at then end of each chapter. If you get lost, click the Wildergarten Press logo usually at the lower right of each image and it will take you to the Table of Content page at the end of the chapter.

I suggest that everyone read all of Part I thence either to browse from there or go to Part V.

If you have a slower Internet connection, do not despair, very few of these files is longer than forty slides (25MB) and most are less than 20MB. Wait for the download to be complete before scrolling through the pages, else Acrobat can freeze the download, then requiring you to start over or quit.

Quitting is not permitted. ☺

About the Name

"Wildergarten" has been the name of our property almost from the day we bought it. It derived in part from my father's Dutch heritage and my Mom's love of Nature, but took on the character of a pun. It is pronounced as a glom of two words, "wilderness" and "garden," with the latter 'Germanized' to sound much like 'kindergarten.' It *is* a place of learning and play, as conducted by one learning his way around, making pretty things, falling down, and getting up a very dirty boy. After only 200 years of white settlement in this area, we really do not know very much about what we are doing with the land and our place in it, especially having done a very thorough job of purging that knowledge from the trace memories of its remnant former managers. As you will see, trying to replicate aboriginal processes in the expectation that everything will go back to normal is just as likely to fail as is our current policy preference for mandated neglect. But I'm getting ahead of myself; you'll see all that in due time.

It *is* a garden (albeit more freeform than is usual), in the sense that all of what grows here does express my intentions (with the obvious exception of the larger trees). It is meant to be beautiful, it is meant to be instructive, it is meant to express an ideal within the limitations of the medium. It is an art-form, the expression of will to self-expression, one I hope to inspire in you. It is also a very serious scientific discipline, as will soon become more than evident.

How to Help

This has been an unrelenting, very expensive, and physically arduous process. 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 (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. We really need help with laboratory tools and services. We have new projects in the works, the most important of which is developing an engineering infrastructure to facilitate mobile low-impact 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 it has to be.

Publications

Natural Process: That Environmental Laws May Serve the Laws of Nature (2001), an exposition on corporate and governmental corruption in environmental regulation, and what to do about it

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

Shemitta: For the Land Is Mine 2009), an amazing discovery of the original purpose of the Biblical Sabbath for the Land, lost for over 3,000 years (includes 14 picture books demonstrating the damage to wildland habitat inflicted by government environmental "preservation"). This book is currently in reconstruction due to new findings.

This free online picture book, to be incorporated into a site for networking native plant restoration work.

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 The Nature Conservancy trespassing here already and have observed others seeking to establish a trespass easement, both tracking in exotic seed on their contaminated boots. Such clandestine, destructive, and unethical behavior will not be tolerated. Thank you.

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; Josh Fodor, Ecological Concerns, Inc.; Dr. Charles Kay, Utah State University (a hunter and generalist in Native Americans, archaeology, and wildlife biology); Randy Morgan, botanist extraordinaire; Steve Rich, Rangeland Restoration Academy; Dr. Lyle McNeal, Utah State University, friend to sheep; Tom McDonnell, American Sheep Industry Association; Barrie Coate, Certified Arborist; Mark Hylkema, Archaeologist, California State Parks; 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 to read. Yes sweetheart, you deserved that.

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.

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 technical bibliography. No, I don't have an aversion to citations (the bibliography in my more recent book goes on for 16 pages), but this "picture book" format does make citations problematic. In its construction, it was often that a single character would add a new line, then necessitating a smaller photograph. So, footnotes were out because it would have otherwise been too destructive to the graphical format. With some ideas referring to multiple sources, links sufficient to meet an academic standard would have been similarly adverse to communicating the content. 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 them and time permits, but I do have another book to finish first.

Units will be English, because that is what most people reading this will find more 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.org web site upon which there is to be posted more than one reference bibliography.

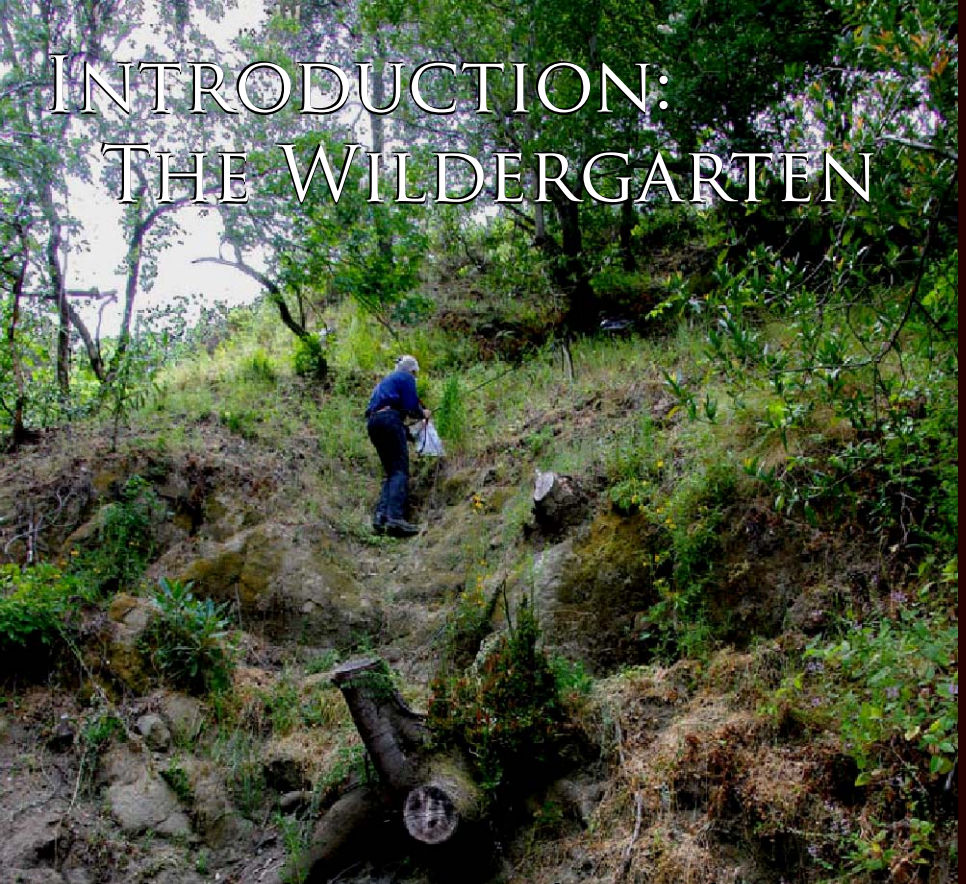
Further, and unfortunately, many academic source documents are closed to most readers without paying very stiff "library fees." I wish more scientific publications were open source (especially because the public has already paid for most of them as they are usually at least subsidized by government grants) 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 visual distraction (mostly an aesthetic consideration, but external links are a also huge pain to maintain). These are tradeoffs.

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 the questions arise leading to new knowledge.

This work began well before 1080p was taking hold and I still had a CRT monitor, so it was constructed and formatted for 7.5"X10" PowerPoint slides out of habit. 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.

Introduction: 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. I am consequently weeding for 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 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 it is our job as people.

This is a love story about our little piece of 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 700 slides, dedicated to teaching the value of what has been learned here. That might seem like a long book, but it can be read easily in a day. 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 of which has a Table of Content page at the end accessible by clicking any "WP" logo.

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.

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

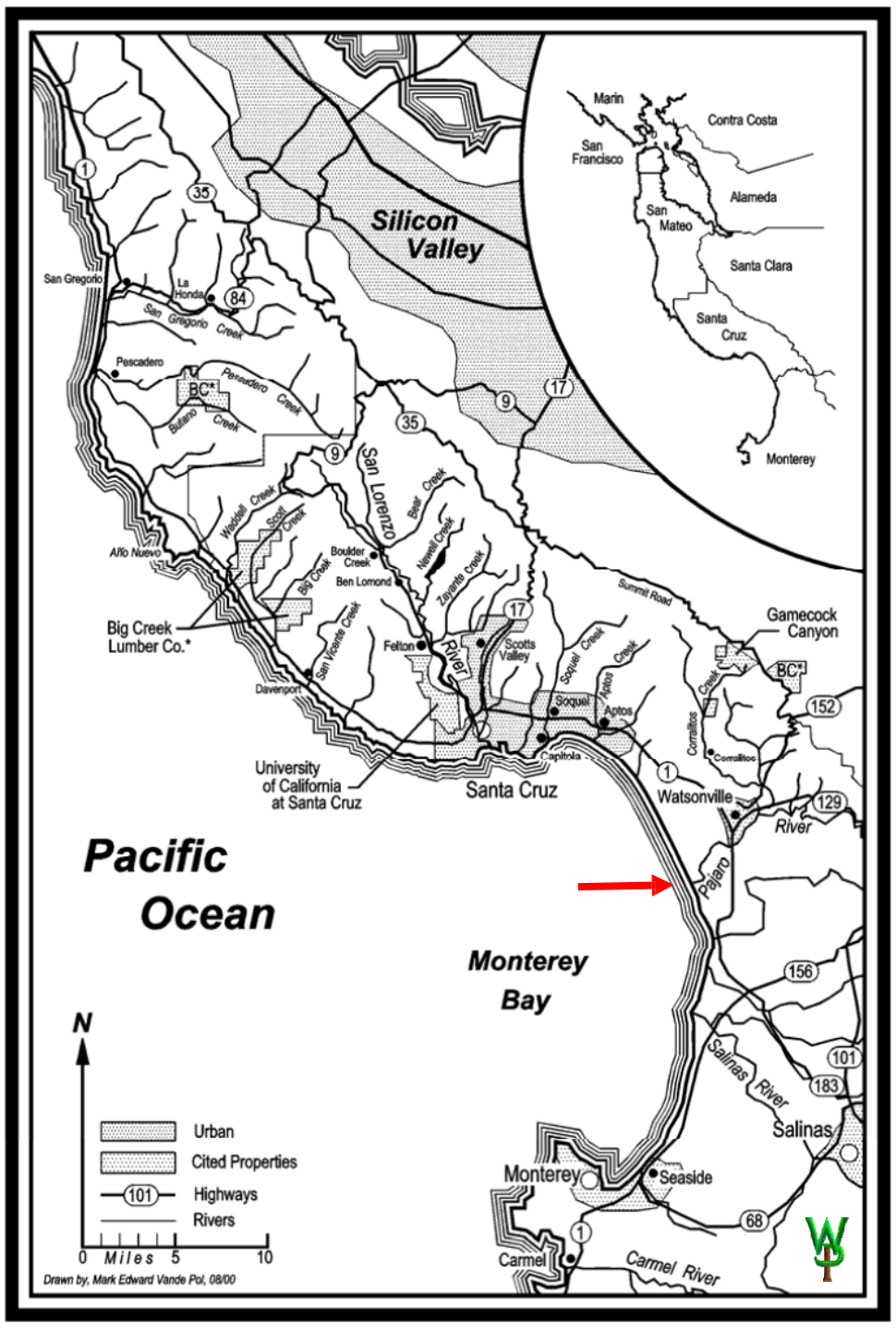
For nearly 25 years, out of what could be called Pyrrhic sentimentality (or extreme hubris), our family has been converting our mere 14 acres back to native plant habitat (the name “The Wildergarten” was on our plot plan when we applied for a building permit in 1990). A landscape that then hosted perhaps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

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 of which show debatable results, or worse.

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 see what can be accomplished. You see, since 2000, tax-payers have spent over **$24 billion dollars** “protecting habitat” in California, yet there is only one (1) place that has returned long infested grasslands to 99.6% or better native purity including small annual forbs, and it hasn’t cost you a dime.

That place is the Wildergarten.



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). 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. Steep canyon walls receive a wide range of sun and shade conditions depending upon orientation. Most stream beds are deeply incised. Habitats include meadows, chaparral, forests, rivers, and an ocean interface with beaches, sand dunes, rocky tide pools, and estuaries.

The climate is coastal Mediterranean. Summers are almost entirely dry with temperatures often 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 (30-50 inches being usual). It is a highly erosive and geologically active system.

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. There is even an island of Sierra Nevada foothill species including our place. These three genetic overlays produce unique vegetative combinations that because of the terrain can change completely in a few feet.

The favorable weather conditions and a 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.

This view is from my office window. It represents a small part of 25 years of arduous work. I know every inch of it intimately, having individually planted, pruned, or "pardoned" every tree, shrub, grass, and forb in this picture. All of them are native.

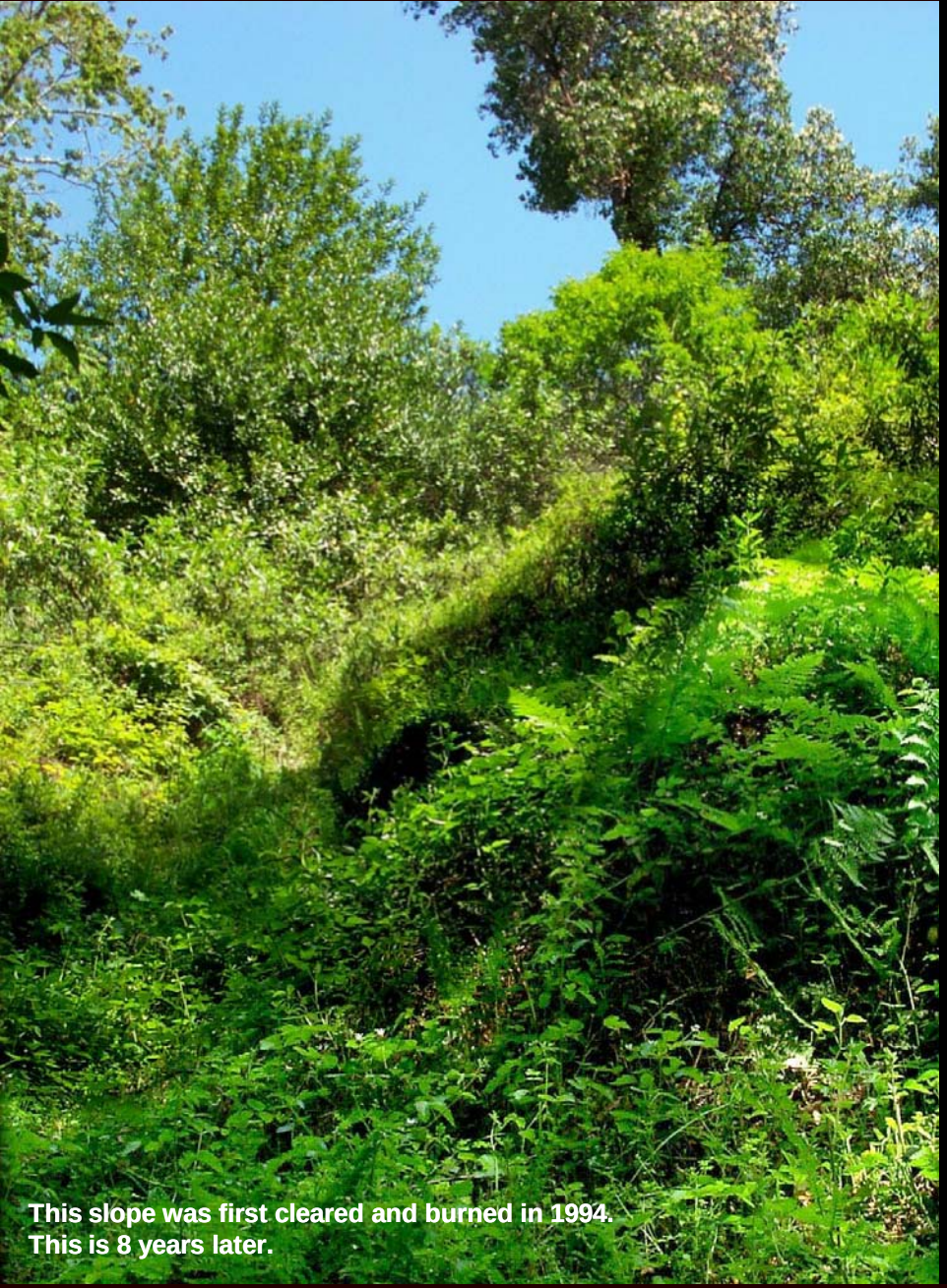
One note on the photographs: In mixed forest like this, lighting contrast levels on sunny days are usually *very* high, making it *very difficult* to get good photographs. So although many of these images make the weather look like it is typically cloudy here, that is not at all the case. I try to shoot on days like this, with thin clouds for color, but that is not always practicable. Variations in lighting then make adjusting white balance very problematic.

Here 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 nitrogen retention capacity.

The meadows too contain an impressive array of small forbs. By the time weed season is over, it is hard to find a non-native plant here, but that only represents a starting point for further study in what might be done with it. This meadow now produces enough small-flowered lotus *(Acmispon parviflorus)* seed to be useful in helping other meadows repopulate after removing weed infestations.

April 2009 (Yes, I saw the *G. parisiense*, *T. hirtum*, and *C. glomeratum*; this photo was taken *before* weeding)

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



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

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 and berries that will provide food for wildlife while retaining the soil and managing the fire hazard on such a steep slope.

These being the Santa Cruz Mountains, we do have redwood, but unlike many places in this County, the forest has been thinned enough that there are groundcovers working their wonders against the erosive forces of rainwater. The crowd of trees in the mid ground are over four feet in diameter and 180 feet tall. They make wonderful lumber, but are expensive to remove when thinning.

We have oak woodlands with fragrant herbaceous groundcovers. There are even relic botanical evidences of Indian farming! There are herbs and spices here unknown to the culinary arts, and they are heavenly in food. This is the Wildergarten.

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.” OK, so much for “goals.”

Purposes on the other hand are ongoing and 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 cleanse the land of non-native exotic species, particularly in the seed bank.
2. 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).
3. To produce a varied, dense, and beautiful groundcover that is productive for insects and wildlife.
4. To mitigate erosion damage, reverse incised channels, and stabilize slopes.
5. To observe genetic processes during colonization of and adaptation to the site.
6. To improve native plant restoration technology in a cost-effective manner.
7. 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 eat many acorns, but perhaps they would have fewer allergies if they ate an acorn tortilla upon occasion.
8. To restore aboriginal soil conditions and manage them to improve productivity.
9. To return excess biomass to the soil system in a stabile form while restoring trace original 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.

You are free to judge how we’re doing.

What Do I Mean by 99.6% Native Purity?

The first such measurement was performed by an independent party who taught me the technique of a "toe-point-transect"**:** You take a step, record what plant is closest to your big toe, and then take another, 100 times. His first was 100% native. He was giddy; he'd never seen more than 90% anywhere, ever. I repeated that test four times elsewhere on the property that year. That is how I got to three significant figures. That was 2010 and it just 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 measurement technique, because when dealing with plants as small as occur here, one has their choices about which of several is "closest" to the toe which means that it would be hard not to skew the test. More importantly, this distinction of "native cover" understates the damage that can be done by some very small weeds (such as *Cerastium glomeratum*, which can breed at 1-2mm tall but can suppress the germination of a great many native plants). Hence, I long felt that such a metric is to understate what has been accomplished here. It is quick to perform and is understood by professionals, so I use it here.

In 2014, I became aware that there is a distinction between *Cardamine oligosperma* (native) and *Cardamine hirsuta* (not). Both are known as "pop-weed." I thought I had the former and so did every other botanist who had visited (including Randy Morgan, who I consider to be the best there is, if only because of his integrity). *Cardamine* anything can be a *really* annoying plant because it is small and pops seed in your face as you crawl along. For years, I culled it as an annoyance, but not as if it was an exotic, a strategy I call "resistance." The difference is that I wasn't going after every one of them like it needed to be eradicated. So there never were very many because I jut don't like them. 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 biggest problem is that the definitive key in making the distinction between the two species is the number of pollen anthers on the flowers**:** *C. oligosperma* has five and *C. hirsuta* four. For management purposes, this is a useless key**:** If I wait for flowers to appear with a plant that makes that much seed that fast, my project is toast because it can go from flower to seed in just a few days. So the first step is to cull ***all*** *Cardamine* until the numbers are low enough that I am sure the *C. hirsuta* is gone or until I can identify a vegetative key so that I can afford to make the distinction in process.

Chances are that nobody visiting the property would see the difference, but I would know while leading them about, and I'm not going to let a nagging annoyance like that perturb 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 not giving a rip.

This Is the End of the Beginning of the Beginning

You have just completed the first chapter of Part I, the introductory part of this book, of which there are six more chapters. Because of the photographs, I had to break this book into separate files with options simply because most people aren't ready for a 500MB download and not everybody wants to read all of the details on every topic.

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 contextual issues regarding the large-scale damage being done to native habitat by the current public preference for politically-determined "environmental protection."

This project progressed through 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 according to 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.

Try it! → 

Table of Content

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

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2. Why Native Plants?
3. Native Is Not Enough
4. Site History
5. Repeat Photography
6. Germination of Native Annuals
7. Project Overview

Part II – Forestry

1. Phased Thinning of Broadleaf Forest
2. Control of Understory Weeds
3. Conifer Forestry
4. Drainage
5. Roads
6. Aerial Photographs over 25 Years

Part III - Grasslands

1. War, Famine, Disease, and… What?
2. Colonization Behavior of Native Annual Forbs
3. Sand Hills
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Part IV - Miscellaneous

1. The Vegetable Garden as a Research Tool
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3. Fungi (not yet)
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Part V – Project Context

1. Periodic Disturbance and Feed-Forward Stability
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3. Control Boundaries
4. Central Planning
5. Our “Ownerless” Backyard

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