



Mattole Watershed NEWS

WINTER/SPRING

2018



ISSUE # 10

Release the Oaks!

Oak Woodland Restoration Projects Underway in the Mattole

By Hugh McGee, Mattole Restoration Council



Above: Pre- and post-treatment photos of a site on the Upper North Fork of the Mattole. Photographs by Hugh McGee.

Oak woodlands are some of the California's most diverse ecosystems, with over 300 terrestrial vertebrates utilizing this habitat throughout the year. Douglas-fir encroachment has a detrimental impact to grassland and oak woodland ecosystems. In the Mattole, we have lost over 50% of our grasslands to Douglas-fir encroachment. We are still trying to understand how many acres of California black oak (*Quercus kelloggii*) and Oregon white oak (*Quercus garryana*) woodlands have been lost, or are about to be lost. Douglas-fir encroachment is typically due to a lack of fire on the landscape that oak woodland ecosystems evolved with. Once encroachment of Douglas-fir into oak woodlands takes place, there is decreased availability of water and nutrients for oaks below the woodland floor, and eventually Douglas-fir will overtop the oak canopy, shading out and killing oak trees.

After a couple years of planning, the Mattole Restoration Council's Oak Woodland Enhancement (OWE) Program has finally hit the ground to address this issue. This fall, with funding from the US Fish and Wildlife Service, MRC crews removed conifers from approximately 60 acres of oak woodlands along the Upper North Fork of the Mattole River. We have also partnered with UC

Cooperative Extension and other oak woodland practitioners on the North Coast to implement oak woodland restoration projects through Natural Resources Conservation Service's Regional Conservation Partnership Programs. These are exciting new projects for the Mattole. Below is a summary of what we have completed and what we have learned along the way.

Pre-Project Assessments and Mapping

To help us better understand the general site conditions of oak woodland units prior to field assessment and treatment, we use historic air photos and the Ecognition mapping program to classify vegetation and to assess oak distribution prior to conifer encroachment. Ecognition classifies vegetation based on a set of parameters you identify (shape, color, etc.), and the program then differentiates between vegetation types (see map on page 4). Although this does not give you any information on what conditions are like under the canopy of the oaks or conifers, it does give you a general understanding of how many acres of oak woodlands are on the property and what their distribution is.

See "Release the Oaks" - continued on page 4

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MATTOLE RESTORATION COUNCIL MISSION

The mission of the Mattole Restoration Council is the restoration of natural systems in the Mattole River watershed and their maintenance at sustainable levels of health and productivity, especially in regards to forests, fisheries, soil, and other plant and animal communities.

MATTOLE RESTORATION COUNCIL VISION

"We look forward to a Mattole that has healthy, self-sustaining, productive forests, meadows, and streams, with abundant native fish and wildlife populations. We envision a community that draws its sustenance from and lives in harmony with the environment. We seek to understand processes of natural healing and enhance them using best land practices in harmony with the local environment. We seek to enhance the exchange of knowledge among all community members toward that goal. We look forward to a time in the Mattole watershed when "restoration" will no longer be needed."

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From the Executive Directors

By Nathan Queener and Sungnome Madrone



Dear readers and friends of the Mattole,

It's a new year, and with it come changes in the Mattole River watershed.

After four and a half years of great excitement, rewarding challenges, and meaningful experiences, Cassie Pinnell has departed as Executive Director of the Mattole Restoration Council. As she moves on to focus on the conservation and restoration of San Francisco Bay Delta tidal marshes and Central Valley wetlands, she will draw upon the many experiences and lessons that working collaboratively here have given her. We are grateful for all her hard work, and have brought together various voices to express that gratitude on page 12.

The MRC is excited to welcome Nathan Queener as its new Executive Director. Nathan brings ten years' experience working in the Mattole, plus a Master's degree from Humboldt State University in Watershed, Wildland, and Forest Science. Most recently, he has been the Fisheries Biologist at the Mattole Salmon Group, and the Watershed Science and Information Program Director at the MRC. His role at the MRC has included designing and implementing approaches to monitoring instream sediment conditions in the watershed, and analysis of stream habitat conditions. In this newsletter, he reports on his most recent work for the Mattole Salmon Group.

The Mattole Salmon Group continues to monitor fish populations and restore fish habitat. The Chinook population is currently making a comeback and the coho are still holding on. Stray coho from other nearby watersheds continue to migrate up the Mattole and this straying mechanism may help the Mattole hang onto its coho population. Like the coho, the residents of the Mattole continue to be resilient, weathering many changes in our habitats. Together we can adapt to change and continue our swim into the future.

Sincerely,

Nathan Queener and Sungnome Madrone

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MATTOLE SALMON GROUP MISSION

The Mattole Salmon Group works to restore salmon populations to self-sustaining levels in the Mattole watershed.

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Another Banner Year for Mattole Chinook?!?

By Nathan Queener, Mattole Salmon Group



Left: In order to avoid double-counting, a flag is hung near each redd with information about the redd's date, condition, and location. On the mainstem near Ettersburg, there are so many redds in some riffles that space for flags is at a premium. All flags are removed at season's end.

Below: MSG Field Technician Matt Knoedelseder records information on Chinook salmon carcasses on Bear Creek near Ettersburg. Photographs by Mattole Salmon Group staff.

Winter 2017-2018 appears to be bringing one of the best returns of adult Chinook that the Mattole River has seen in decades. Surveyors with the Mattole Salmon Group started seeing Chinook spawning in the mainstem in the Whitethorn valley and in mid-sized tributaries (Thompson Creek, South Fork Bear downstream of Shelter Cove Road, Fourmile Creek, upper reaches of Honeydew Creek) just before Thanksgiving, and while the peak of activity in these reaches has passed, there were new Chinook redds and at least a few live fish left in most of them in late December. In mid-December, as the dry sunny days continued and river flows started to restrict the fish's ability to move upstream, we began to see a considerable amount of spawning activity in larger reaches - the mainstem Mattole River between Ettersburg and the Stansberry Ranch, Bear Creek at Ettersburg, and even the mainstem between Honeydew and the Hadley Bridge.



The numbers of Chinook seem to indicate that this year is probably better than last year (which was the best for at least a decade), and may be one of the best for the last couple decades - perhaps as good as any since the early 1980s. Just for example, we've recorded:

- nearly 100 Chinook redds in the mainstem between Stanley Creek (just upstream of Whitethorn School) and the Mendocino County Bridge.
- 50+ Chinook redds in Thompson Creek (max season total from 1994-2010 was 10), and about the same in South Fork Bear between Horse Mountain and Tolkam Campgrounds (max season total from 1994-2010 was 19),
- 20 Chinook redds and 68 Chinook on a single survey in Bear Creek from the mouth to Jewett Creek (max season total from 1994-2010 was 9)
- 75 new Chinook redds and ~200 live Chinook on a single survey just before Christmas on the mainstem from Ettersburg downstream to Grindstone Creek, bringing the total number of redds in that reach to over 100 (max season redd total from 1994-2010 on a much longer reach was 27), with fairly similar numbers extending down to Gilham Creek halfway between Honeydew and Ettersburg.

We were amazed and thrilled a year ago when, in the winter of 2016-17, the numbers of Chinook returning to spawn in the Mattole were off the recent charts. This year seems to be exceeding that. Of course the question is, why?, and there is no easy answer, although it seems possible that we may be seeing the benefits of decades of land stewardship and restoration by watershed residents. Conditions in most tributaries and much of the river are clearly improving, with abundant and persistent

riparian growth and decreasing sediment loads. It is more important than ever that watershed residents new and old make choices that allow natural recovery to continue.

The abundant numbers of Chinook are especially heartening given that the Sacramento and Klamath River systems had dismal returns this year, and ocean conditions have been generally poor - with warmer than average water temperatures and weak upwelling - throughout most of the time when the returning adult fish were at sea. Surveyors are on the lookout for the marks of fish originated in different river systems - for example, adipose-clipped fish from the Sacramento River - but as of yet, we have not encountered any. In the summer edition of this newsletter we will be able to report on the total Chinook redd abundance for the season and will have also completed a more thorough comparison with the three decades of data the MSG has from surveys in the watershed.

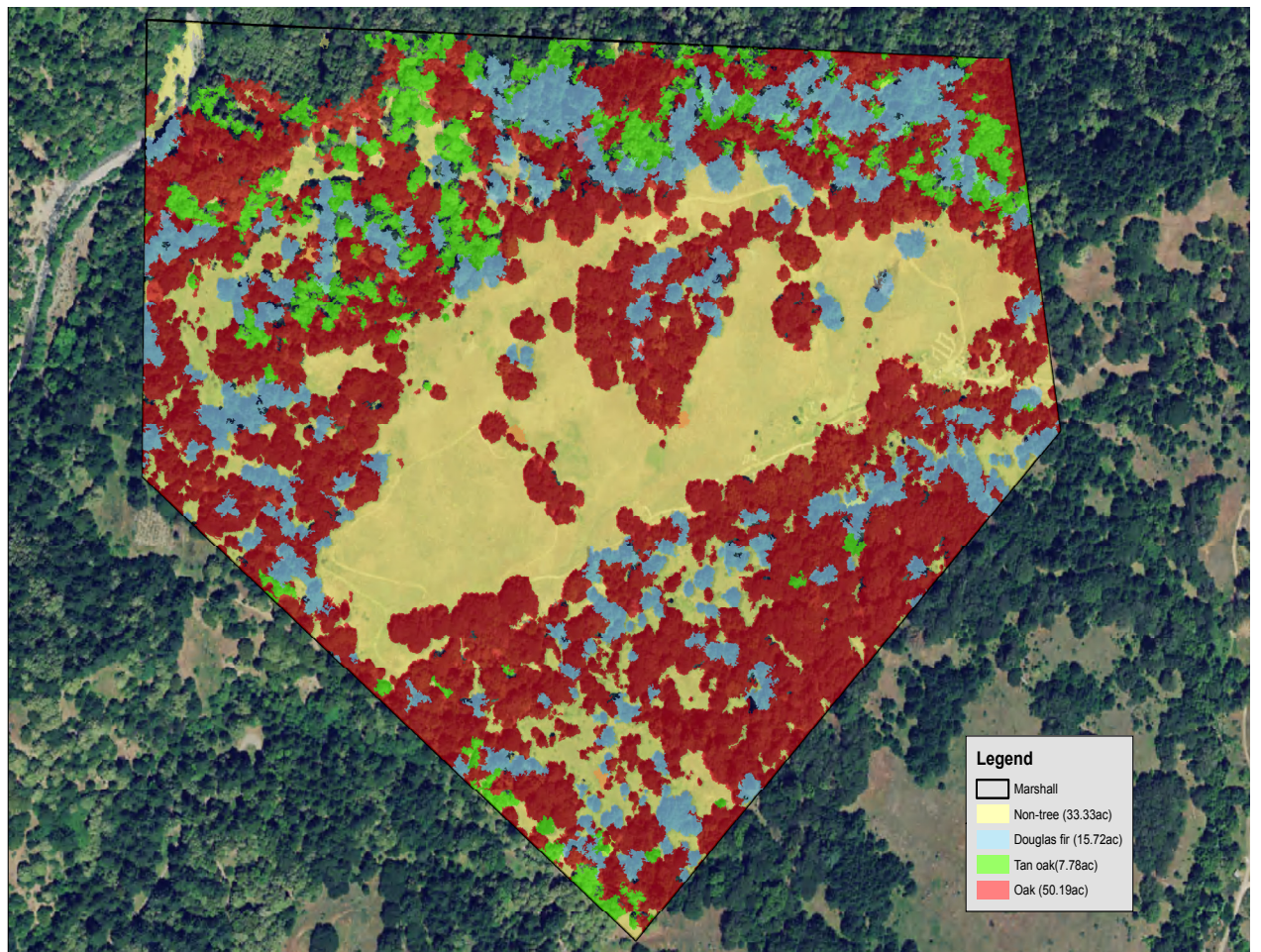
Many thanks are due to the California Department of Fish and Wildlife's Fisheries Restoration Grant Program for providing the majority of funding for this survey effort. Additional financial support has come from the Bella Vista Foundation and the Bureau of Land Management. Thanks also to the many landowners who have graciously allowed us to access their properties multiple times through the winter survey season, and to all the surveyors. While this is one of the world's better field jobs, the glamour does wear off eventually on the long cold days, and we're lucky to have a great crew. Special thanks to Zane Ruddy with the BLM for his help and support. 🐟

Release the Oaks

-continued from page 1

Ecognition also allowed us to assess which oak woodland stands were in close proximity to grasslands and other oak woodlands versus mixed evergreen forest. This helps us to prioritize which units will be the most effective to treat.

Once we have this information, we then conduct site visits to map treatment units, develop a prescription, and set up photo points. For our first sites, we were also able to use a drone on both properties prior to, and after, treatment. This allowed us to capture current pre- and post-treatment aerial imagery of the units above and below the canopy. This is challenging work in a high-density encroachment area, not for the novice drone operator. Because the drone was able to fly the same path pre- and post-treatment below the canopy, we will be able to create side-by-side video of the treatment units, which will give a great visual evaluation of the work completed.



Above: A map created using Ecognition classifies vegetation on an oak woodland restoration site.

Project Design and Implementation

We have completed a lot of fuels reduction and grassland reclamation work within the watershed over the last decade, but treating oak woodland stands for conifer encroachment is a new project for us. Because this is a new project, it is important for us to take the time to understand project costs, labor production rates, and site-specific logistics so that we can fine tune our site design and budgets for future projects. Before implementation, we collect data on stand type and develop polygons of treatment units. Within the general treatment units there is a lot of variation in slope, stand densities, tree diameter and tree height. Recording data on the different site conditions, and comparing that data to on-the-ground project costs, allows us to better estimate what can be treated with the budget we have. The sites we treated in the fall of 2017 varied in density, diameter and height, from carpets of 2-6" diameter 10' tall trees at 2000 trees per acre to patches of 6-12" diameter trees 20-40' tall at 500 trees per acre. Most of the sites were lopped and scattered, with piling completed in extremely dense areas. Whenever possible we girdled larger trees above 16" diameter.

These projects allowed us to fine tune our prioritization methods and specifications for future projects. A summary of this is found below:

* As always, safety is the most important aspect of any project. Wearing all required personal protective equipment, high visibility shirts, understanding potential hazards and fire dangers, and



Above: The crew heading into a treatment unit near Little Rainbow Ridge. Photograph by Hugh McGee.

developing clear methods of communication between members of the crew is essential to a successful project.

* Treating isolated islands of oak woodlands surrounded by grasslands is a more cost effective and ecologically valuable approach. If you remove 100% of the Douglas-fir within the isolated unit, you have far less chance for Douglas-fir encroachment in the future, as opposed to treating a unit that transitions from oak woodland to mixed evergreen with no grassland buffer in between. Treatments in units that can provide connectivity between oak stands and grasslands are also a high priority.

* It is important to consider the aspect of the treatment unit. North-facing units have far superior growing conditions for conifers than south-facing units, so we tend to prioritize treating south-facing units when possible.

* It is more cost effective to girdle trees with larger diameters and heights than to fell them, due to the cost of labor to deal with slash. Lopping and scattering is more cost effective than piling.

* Landowners' concerns and desires for the site must be taken into account. If there are structures close to the unit, landowners may want all slash materials piled and burned as opposed to a unit that is remote and far from any structures, where it is more cost effective to lop and scatter.

* When the primary means of dealing with slash material is lop and scatter, a ratio of 5 sawyers to 1 swamper is most effective.

* When native grasslands are present within or adjacent to the unit, it is important not to lop and scatter or pile on those sites if it will inhibit growth of those native species.

* It is possible to address on-site erosion with slash material. Where gullies are present, adjacent slash material can be used to stuff the gully and create check dams. On steeper sites with erosion potential, trees should be dropped parallel to the contour of the slope to reduce surface erosion.

* Although developing prescriptions prior to treatment is important, there is a lot of field engineering that takes place during implementation.

It is an incredibly satisfying feeling looking back on an oak woodland that has been released, and hoping that all the critters that depend on this important habitat will return. We are grateful to be a part of the effort to restore oak woodlands on the North Coast. We will continue mapping and assessing oak woodland areas in the Mattole, and bring back the oaks, acre by acre.

If you would like to participate in the MRC's OWE Program, please contact hugh@mattole.org or call 629-3514. 🐟

The Needles in the Haystack: Finding Mattole Coho Before they Disappear

By Nathan Queener, Mattole Salmon Group

It has been obvious for at least a decade that coho salmon in the Mattole are very rare, and becoming more so. Snorkel surveys this past summer seem to show that the Mattole coho population has hit a new low, with coho seen in only 90 pools out of 1,044 snorkeled in 57 stream reaches – selected particularly for their coho habitat potential – throughout the watershed. The average number of coho observed within pools where coho were present was less than three, and no more than 10 individuals were seen in any one pool.

In the Mattole, the Whitethorn valley has been the coho stronghold, due to its cold, well-shaded, low-gradient streams: in particular, the mainstem Mattole upstream of Whitethorn and the Thompson Creek drainage. This year marked the third in a row that there was no sign of coho spawning in Thompson Creek. Coho numbers in the mainstem Mattole were so low that it appears the only spawning activity in the watershed last winter was upstream of Gopherville, and it appears that there may have only been one or two successful redds in the winter of 2016-17.

Why are coho doing so poorly, when steelhead are widely distributed throughout the watershed (juvenile steelhead have been observed in 95-99% of the pools snorkeled on coho surveys over the past five years), and we are currently experiencing consecutive winters of some of the best Chinook runs in the past 20 years? (See article on page 3.)

“We want agencies and stakeholders, residents and high school students to be prepared for the likely extinction of the Mattole coho run.”

I don't know. Many things about coho habitat seem to be improving, but it is possible that the Mattole population, with multiple generations of adult returns of less than 100 fish, possibly only a few dozen, has reached a point where the deleterious effects of inbreeding are counteracting other positive factors.

This situation is not unique to the Mattole. Coho populations throughout California are struggling. A recent comparison of 2003 and 2015 population size from 32 watersheds using genetic techniques found over 50% more full siblings in 2015, indicating declining genetic diversity and population size in over 80% of the watersheds sampled.




*One of only two coho parr observed in Baker Creek in the summer of 2017.
Photograph by Kris Schultz.*

We have been talking about the extinction of the Mattole coho run for some years now. We want agencies and stakeholders, residents and high school students to be prepared for this likely inevitability. Miraculously, we continue to see one coho here, one coho redd there, but this year's numbers seem to indicate the somber reality of the situation.

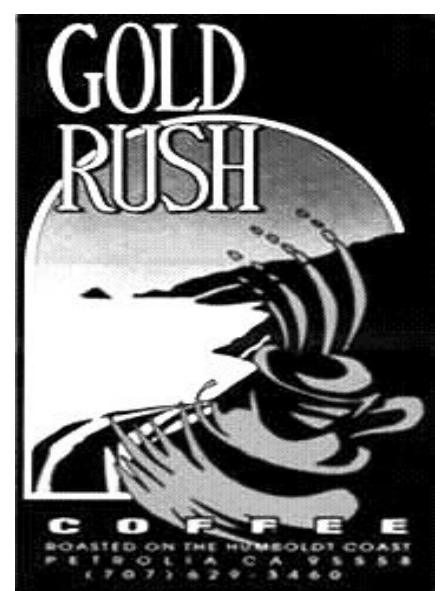
Some years back, a group of agency staff gathered with the Mattole Salmon Group to discuss the possibilities of a coho captive rearing program. In such a program, some of the last surviving adult Mattole coho would serve as captive broodstock (raised to spawning age in captivity – likely along with coho from other watersheds, in order to boost genetic diversity) to maintain the Mattole population. Ultimately those discussions ended, in part because CDFW and NOAA Fisheries coho captive rearing resources were focused on other struggling populations further south, in the Russian River and the Santa Cruz Mountains. However, barring a miraculous recovery, the current population status in the Mattole seems to suggest that such extraordinary measures are likely necessary here as well. 🐟

Primary funding for this project comes from the California Department of Fish and Wildlife's Fisheries Restoration Grant Program. Additional funding comes from the Bella Vista Foundation and Bureau of Land Management.



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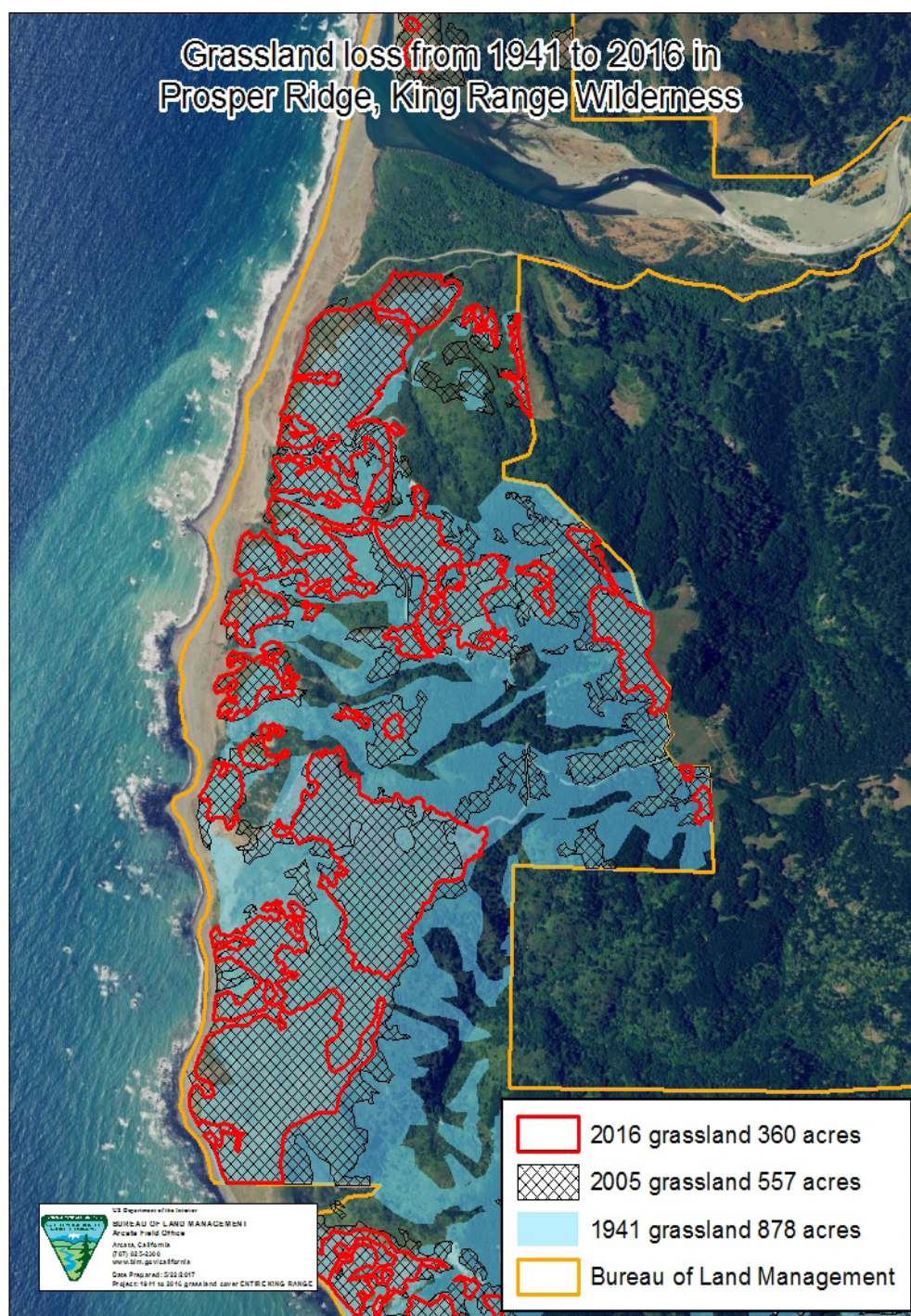


Prosper Ridge Prairie Restoration: Res

By Hugh McGee, Mattole Restoration Council

The King Range National Conservation Area (KRNCA) is home to some of the last remaining native coastal prairie habitat in California. The KRNCA has seen a loss of coastal prairie, approximately 45%, since 1941 from Douglas-fir and coyote brush encroachment due to lack of fire and other natural disturbance on the landscape. The Prosper Ridge area of the KRNCA has specifically seen a drastic increase in vegetation encroachment, especially over the past decade. Over the past several years, MRC staff have been working closely with BLM Arcata staff, local contractors, and interested landowners to address this issue through designing and implementing coastal prairie restoration projects in the northern part of the King Range. In 2013, BLM staff wrote the Prosper Ridge Prairie Restoration Plan, which planned and permitted the 800-acre Prosper Ridge Prairie Restoration Project. The goal of the project is to restore coastal prairie habitat for flora and fauna. The plan has several objectives: 1) reduce encroachment of Douglas-fir (*Pseudotsuga menziesii*) and coyote brush (*Baccharis pilularis*) in grasslands, 2) reintroduce and establish native grass and forb populations, 3) reduce hazardous fuels and reintroduce fire to maintain grassland habitat, and 4) reduce non-native invasive species.

With support from BLM, the Rocky Mountain Elk Foundation, and the Humboldt Blacktail Chapter of the Mule Deer Foundation, the MRC has been implementing vegetation removal projects and native plant restoration projects since 2014.



Between 1941 and 2005, prairies were reduced by 36%; between 2005 and 2016 an additional 35% of prairie was lost. Map courtesy of BLM Arcata.

Mapping and Assessment

MRC staff work with BLM staff to prioritize treatment units within the larger 800-acre project area. Prioritization is driven by available funding and a determination of which types of treatments, in which vegetation types, will allow us to achieve our objectives. To better understand the different vegetation types and density of vegetation we are going to remove, we use several mapping and assessment methods.

Initially, we used current air photos to assess topography, vegetation type, and stand densities. We would then conduct site visits to assess the above attributes and try to estimate costs per unit. Once we purchased the Ecognition mapping program, we were able to assess much of the proposed treatment units from a computer. Ecognition has allowed us to understand the amount of acreage of each vegetation type present within each treatment unit. During implementation, we track the time, and associated cost per equipment type, that is used on each vegetation type. After several years of tracking the cost of removal of each different vegetation type and density, we have a very good understanding of cost per acre of the various vegetation types and densities. This helps us budget appropriately for future projects and understand true costs during the contractor bidding process.

Implementation

Once mapping and assessment have been completed, we seek qualified licensed contractors through a bid process and contractors are selected based on lowest bid and experience. This project is primarily focused on: 1) removal of Douglas-fir-dominated stands, mixed Douglas-fir and coyote brush stands, and grass dominated stands with various densities of coyote brush; 2) revegetating those areas with native grasses and forbs, and 3) monitoring vegetation removal and revegetation success.

Vegetation is removed with an excavator and piled with either an excavator or wheel loader. Typical Douglas fir dominated stands consist of trees that are 10'-15' in height, 6"-12" in diameter, with densities of approximately 500 trees per acre (TPA). Mixed Douglas-fir and coyote brush stands consist of trees that are 5'-15' in height, 4"-12" in diameter, with 250 TPA. Coyote brush stands range from consisting of individual plants that are 1'-6' in height to dense patches 2'-6' in height. Grass-dominated stands mostly consist of non-native grasses.

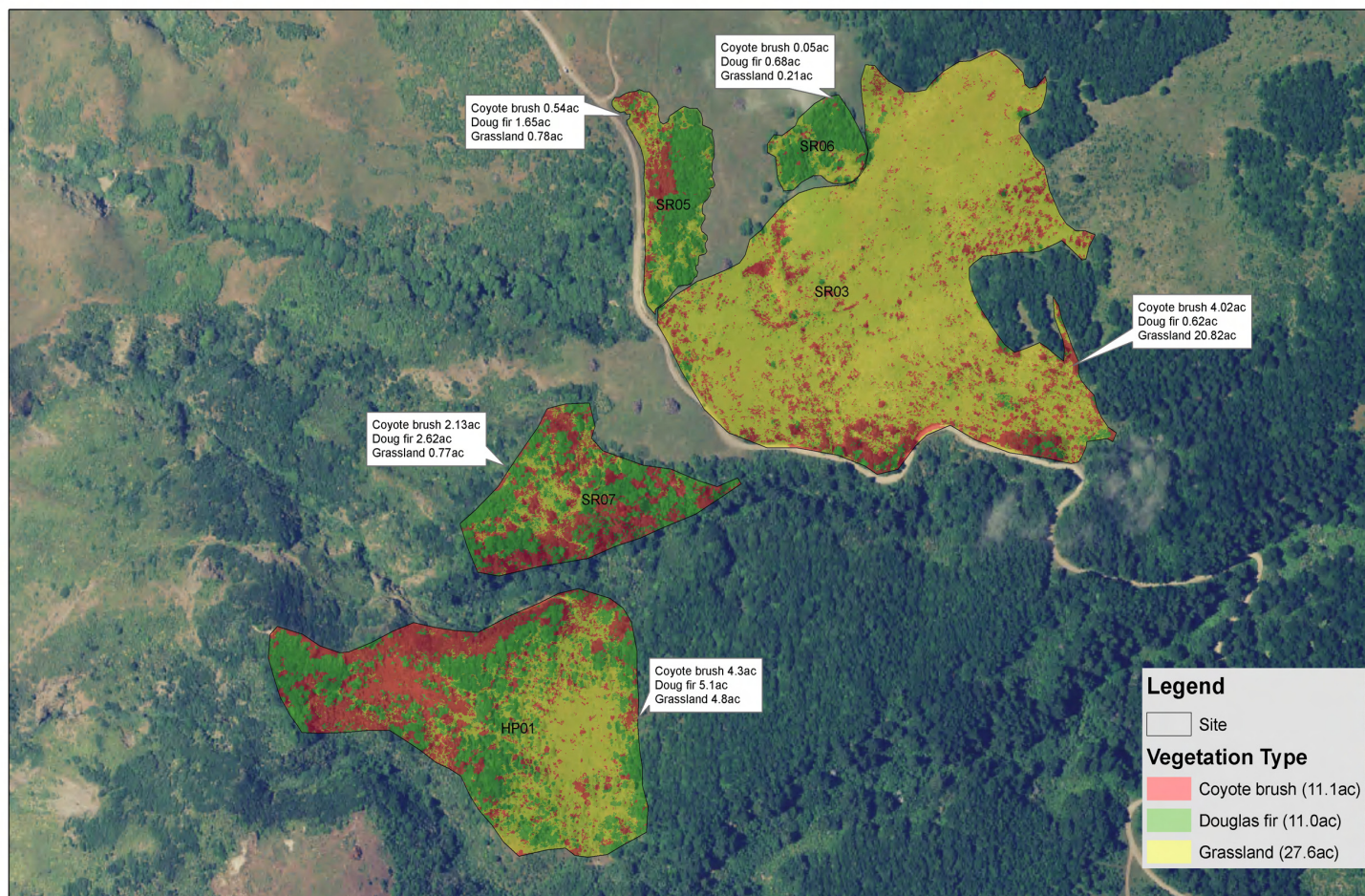
Revegetation projects take place in the fall, after vegetation removal projects are complete and when adequate soil moisture has been reached. We use various native plant installation methods depending on site conditions and availability of funding for native plant materials. On bare soil, we use both plug planting of native perennial grasses and broadcast seeding of native grasses and forbs. On areas already vegetated with grasses, or grass-dominated stands where coyote brush has been removed, we use a seed drill to install native grass and forb seed. We then monitor the success of the various treatment methods.

Over the past several years we have had an incredible team represented by BLM Arcata staff, volunteers and local contractors. Together we have accomplished an incredible amount of work. Below is a summary of the work completed to date:

- Removed over 200 acres of encroaching vegetation
- Installed over 75,000 native grass plugs grown from KRNCA seed at the MRC native plant nursery
- Installed over 200 lbs of native grass and forb seed on 15 acres
- Drill seeded native grass and forb seed on 6 acres

Please see the map on page 11 to get a visual sense of the scope of these achievements.

Storing Coastal Prairie in the King Range



Ecognition map produced by Mattole Restoration Council.

The Right Machine for the Job

Over the years we have used several different types of equipment to remove vegetation and have learned a lot along the way.

Early on in 2014 and 2015, during Phases 1 and 2, we used a CAT 308 to go after grassland areas that had been invaded by coyote brush and smaller height and diameter Douglas-fir. We considered this the low-hanging fruit because the sites were mostly dominated by grass (mostly non-native grass), with light-density coyote brush and Douglas-fir. The CAT 308 was a good machine for the funding we had and was effective for smaller-sized vegetation. Over 100 acres of light-density sites were treated during these phases.

During Phase 3 (2016) we received significantly more funding, which allowed us to go after larger, denser stands that were dominated by Douglas-fir in the Windy Point Project area. Here, stands were dominated by Douglas-fir that on average measured 15' in height and 6"-12" in diameter with stand densities of approximately 500 trees per acre. During this phase we began to use the Cat 312, a larger machine that was far more cost effective than the CAT 308. Because these areas were dominated by dense Douglas-fir, there was no vegetation growth in the understory. Once trees were removed, we were left with a clean slate of bare soil which allows for far more native plant revegetation opportunities than sites treated in Phases 1 and 2. Over 60 acres of heavy density sites were treated during this phase.

During Phase 4 (2017) we focused our efforts on a mix of project sites, using the CAT 312 for removal of primarily coyote brush from a 25-acre grassland unit, and a larger excavator, a John Deere 250G, to treat areas dominated by high density stands of larger Douglas-fir. We found the John Deere 250G to be the most cost-effective machine when dealing with larger vegetation, especially sites dominated by Douglas-fir. Over 50 acres of light and heavy density sites were treated during this phase.

Monitoring

Although removal and piling of vegetation is straightforward, establishing native perennial grasses and forbs on project sites through plug planting and seeding can be challenging. The presence of velvet grass (*Holcus lanatus*) and other non-native annual and perennial grasses within, and adjacent to, the treatment units makes native plant

establishment efforts extremely difficult due to competition from these species. To better understand which revegetation methods are most effective, we monitor several factors on our sites and ask a number of questions, such as: what are the characteristics of the soil we are working with? What is the most cost-effective method for establishing native plants on project sites: planting plugs, broadcast seeding, drill seeding, or a combination of the three? How many pounds of seed per acre and/or plugs per acre do we need to install to achieve our native cover goals? What species will have the best success for each projects site? Do soil amendments increase survival and if so, which amendments?

With recent funding from the US Fish and Wildlife Service, we were able to establish study plots within our vegetation removal and revegetation plots to better answer some of these questions. This is a two-year study that began in 2017 that will help us guide our native plant restoration efforts on this project, as well as others in the future.

This project could not happen without all of our great partners, but special thanks goes out to Dan Wooden, BLM Forester, Jennifer Wheeler, BLM Botanist, Queen Construction, and Sonny Anderson, local landowner.

See page 11 for a map of all Prosper Ridge Prairie restoration accomplishments to date. 🐟



Above: Vegetation removal (lower right portion of photo) in the Strawberry Rock area. Vegetation piles from previous projects are visible on left as brown patches. Photograph courtesy of Sonny Anderson.

Converting the Lower River Riparian Desert: Part 2

By Hugh McGee, Mattole Restoration Council

Lower Mattole Riparian Enhancement Phase 1 Completed

A couple years ago I wrote an article for the *Mattole Watershed News* about enhancing riparian habitat on barren areas of lower river floodplains (see “Converting the Lower River Riparian Desert,” in our Winter/Spring 2016 issue). Over the past couple years, MRC crews have been hard at work doing just that. With funding from the California Department of Water Resources, CA Department of Fish and Wildlife, National Fish and Wildlife Foundation and in partnership with Mattole Salmon Group, Bureau of Land Management, US Fish and Wildlife Service, and the National Oceanic and Atmospheric Administration, the MRC has been implementing the recently completed Phase 1 of the Lower Mattole Riparian Enhancement Project. Phase 1 accomplishments include:

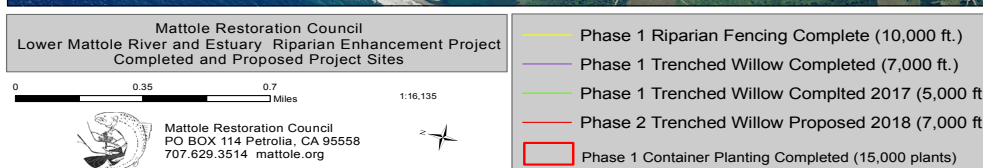
- Installation 11,000 feet of trenched willow, including 15,000 large willow cuttings,
- Propagation of 17,000 trees and shrubs at the MRC Native Plant Nursery,
- Installation of 17,000 native trees and shrubs on floodplains of the lower Mattole River and estuary,
- Installation of over 10,000 feet of livestock exclusion fencing to help prevent livestock from entering riparian areas and the river.

Trenched Willow

When attempting to establish riparian vegetation on gravel bar floodplains where no soil is present, planting large (15'-25') willow cuttings in an excavated trench is an ecologically and cost-effective way to establish that vegetation. Between May of 2014 and September of 2017, we installed over 11,000 feet of trenched willow, including 15,000 cuttings, on terrace floodplains, unvegetated banks, and instream in the estuary area. All willow was sourced from natural coppice nurseries adjacent to project sites. When funding was available, root wads, whole trees, and logs were installed in the trenches along with the willows. Project sites were watered with overhead irrigation and flood irrigation until first fall rains arrived. Of the 11,000 feet of trenched willow project sites, over 85% is still alive and intact.



Trenched willow installation, 2017. Photograph by Hugh McGee.



Propagating Local Native Plant Materials

Having our own native plant nursery has been an incredible asset to our native plant restoration projects over the past decade. Many restoration projects in CA are forced to accept whatever plant materials are available from large-scale native plant nurseries, and most of the time these are not of the highest quality and are rarely sourced from local seed. Having our own nursery allows us to always provide plant materials with local genetics, create our own site-specific plant palates, and make certain that all of our plant material going in the ground is of the highest quality. It is also far more cost effective to grow our own as opposed to purchasing from larger nurseries. For this project, all of our seed was sourced from collection sites adjacent to the project area. The nursery produced over 17,000 high-quality native trees and shrubs for the project.

Riparian Container Planting

After propagation of plants was complete, they were then installed on lower river and estuary floodplain restoration sites in areas suitable for container stock. Because we previously had very low survival (less than 10%) planting in these areas over the past decade, we chose to install a drip irrigation system to the majority of the plants, and install mulch around plants to maintain soil moisture. The system was installed in the spring of 2016, where it provided water to seedlings through the hot, dry summer months. Because survival was so high (over 80%) in the summer of 2017, we removed the irrigation system to cut labor costs. Tree protection was installed on species that are prone to deer browse. Over the past decade of riparian revegetation projects I have implemented in the Mattole, this project has been one of the most successful.



Above: Drone photo of trenched willow installed in 2015 (on bank,) 2016 (upper floodplain terrace,) and 2017 (lower floodplain/gravel bar). Photograph courtesy of Sonny Anderson.

Keeping Livestock Out of Riparian Areas

Livestock are an important economic and cultural component of our community, and in some situations they can be ecologically beneficial as well. However, removing access for livestock to riparian areas and waterways has a beneficial impact on water quality and riparian vegetation.

To reduce use of riparian areas by livestock, and protect our restoration sites from damage by livestock in the lower river and estuary, we installed livestock exclusion fencing on two project sites with funding from USFWS. Over 11,000 feet of wildlife -friendly barbed wire fences were built using specifications from US Department of Agriculture, which allows for migration of wildlife under and over the fence, but prohibits cattle and other livestock from access to waterways. Fences will be maintained by landowners in perpetuity. With the completion of these fencing projects, over 90% of ranchlands along the lower five miles of the Mattole River have riparian livestock exclusion fencing.

Looking Forward to Phase 2

As we look back over the past three years of Phase 1 implementation, we assess our successes and failures, and use that information to plan for Phase 2. We currently have two proposals submitted to State Coastal Conservancy and CA Department of Fish and Wildlife for continued riparian enhancement projects on lower river floodplains, with anticipated funding expected in the spring of 2018. We will continue our efforts to enhance the desert-like conditions of the lower river riparian areas and look forward to reporting back to you on our progress. 🐟



Above: Placing wood in willow trench, 2017. Photograph by Hugh McGee.

Annual Meeting of the Mattole Restoration Council January 20, 2018

All MRC members are encouraged to attend.

This meeting is open to the public -
please come learn about our work!

3-6pm - potluck to follow
Mattole Camp and Retreat Center
More info at www.mattole.org



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Headwaters Large Wood Installations: Partnerships at Work

By Campbell Thompson, Mattole Salmon Group

As we have since 1980, the Mattole Salmon Group continues to work at restoring and enhancing freshwater habitat for salmon. For the Mattole Salmon Group, returning salmon populations to their historic levels that allowed abundant human harvest and generous ecosystem inputs has always been our defining mission. Today we find that achieving that mission is accomplished by working hand in glove with a variety of other organizations. Working in cooperation with others not only makes the work feasible, but makes it far more efficient and enjoyable.

Let's talk about what this work entails and then show how our partnerships make it happen.

Salmon have both a freshwater and a saltwater portion of their life cycle. Both are very important but of course only the freshwater part occurs in the Mattole River. So how can we make habitat conditions better for salmon in the freshwater portion of their life cycle? We know that salmon thrive in cold and clean water. We know they need places to grow where they can hide from all the many animals that want to eat them. We also know that before European settlement of the Pacific Northwest, there were many more salmon than there are today. What changed with European settlement? The two main things from a salmon's perspective, in a stream like the Mattole, are that humans removed all the wood everywhere and put all the adult salmon into their mouths. In some places, humans went on to poison and pave over all the streams, but here in the Mattole that has not been the case yet. So our basic issues in the Mattole are to bring streams back to their natural condition, full of wood and with intact forests surrounding them, and to lower adult harvest to a level that reflects the productivity of the population in the watershed. How do we match adult harvest to watershed productivity? The first step is to set harvest levels at the watershed scale rather than pretend we can drive all over the ocean harvesting whatever we can find and then pretend we are only harvesting from one watershed.

On the freshwater side, we can easily see that the forest is full of stumps: really large stumps. We look around and there are not a lot of really large logs lying around. We can go to our parks and see that the streams there are full of really large logs. What's missing from most of our streams? Really large logs! We know salmon did well with lots of really large logs lying around in the streams, so we want to put as many really large logs in the streams as we can. Of course, those logs take a long time to grow, and the old ones have already been turned into boards, so we do our best with what we have now. Sometimes we use steel anchors to attach small logs together in a way that makes them act like large logs. They don't last as long as really large logs, but they do function hydraulically like large logs. They stay in one place and force the stream to go around them. This means they make the stream deeper around them and they are still there in summer, with water under them so that juvenile fish can hide beneath them.



Above: A very complex wood structure located in the mainstem of the Mattole River in Mendocino County. Photograph by Campbell Thompson.

So the Mattole Salmon Group sets out to put logs in the stream to help fish. Can we do that alone? Not easily. To start, the California Department of Fish and Wildlife (CDFW) has legal authority over any human actions in the stream. We need at least a permit from them to do anything like this. The CDFW also has a mission to preserve and protect and create fishable populations of species like salmon. So they want to see this work happen. They have programs to help fund this work, so they become a partner, paying for the work and permitting it.

Another group that wants to see this work happen is the Natural Resources Conservation Service (NRCS). They have a mission to make sure natural assets remain available. Edible salmon qualify. They also have programs to help fund this work. Small landowners can register as farmers, which can include growing forests on timberland. Sanctuary Forest, Inc. (SFI), a small local non-profit land and water trust, owns properties in the Whitethorn area along the upper Mattole River and tributary streams. SFI registered with NRCS as a beginning farmer and became eligible for funding to help restore stream habitat.

The Mattole Salmon Group's 2017 instream habitat work in the upper river was jointly funded by these two agencies, CDFW and NRCS. Both agencies want to see a high level of detailed planning for a proposed action before they will fund it. The grant proposals require landowner access agreements, surveys, drawings, photos, background information, prior experience



Partnerships at Work -continued from previous page

with implementation and field inspections to even be considered for funding. In order to accomplish all this on multiple projects at a time, SFI partners with a variety of professional consultants in engineering, restoration, hydrology, forestry and geology. In the case of this summer's work in the headwaters, Pacific Watershed Associates was engaged in the creation of the drawings and participated in the engineering supervision of the work as it was implemented. The permits were completed as part of CDFW's "programmatic" permits. This is a case where CDFW gets permits from all the necessary state and federal agencies (U.S. Army Corps of Engineers, CA State Water Resources Control Board, National Oceanic and Atmospheric Administration) so that small groups like MSG need only one simple process with CDFW to get all these permits. This is another great example of how by partnering together, a very complex regulatory system can be made accessible for small organizations.

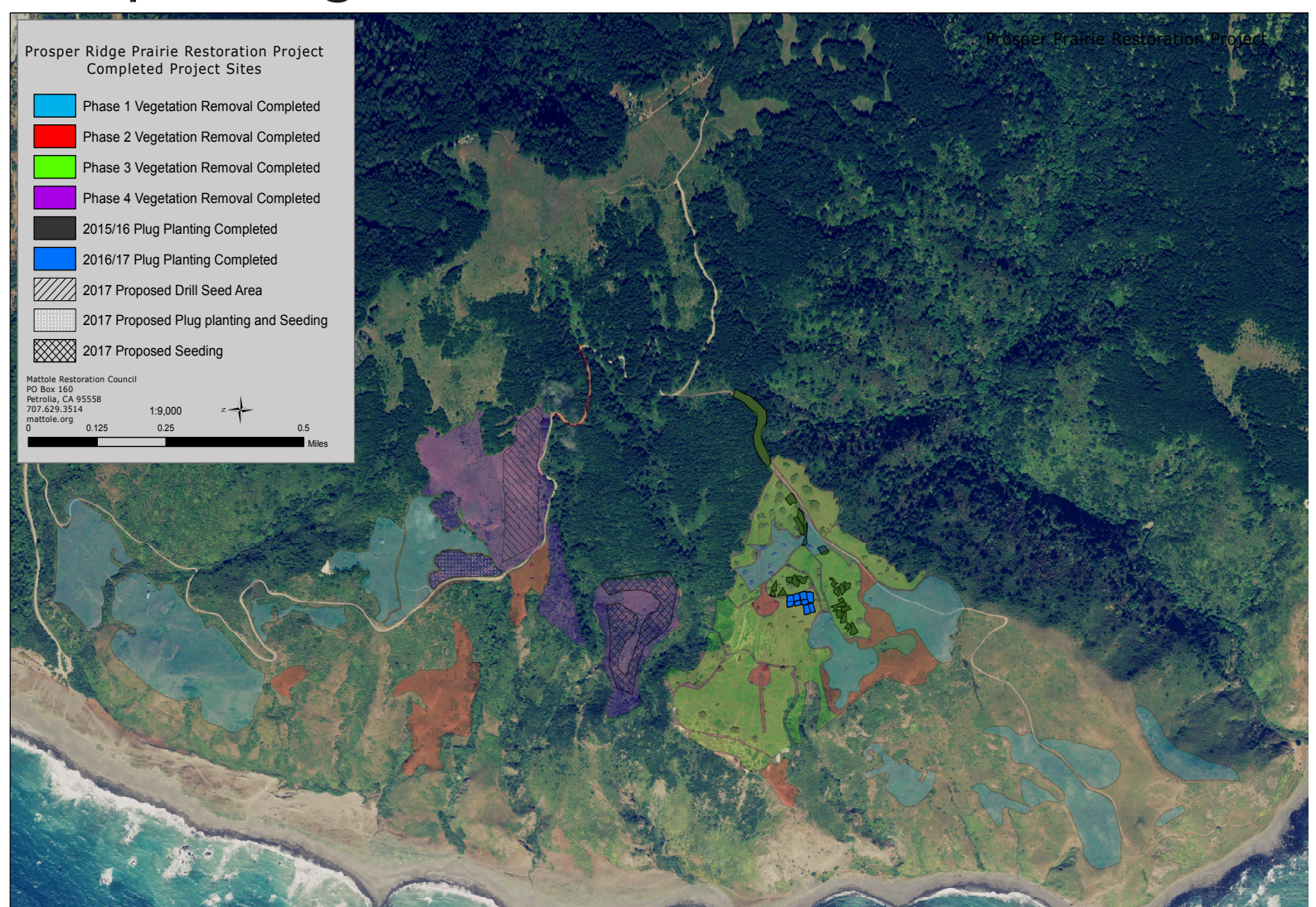


Actually getting the work done on the ground requires further creative partnering. Sanctuary Forest, having secured the necessary funding and permitting for stream restoration on its land, faces another hurdle. As a small organization with limited resources, it doesn't have staff, appropriate insurance, a contractor's license and the tools and equipment on hand for implementing this work. So they turned to their local experts in this work, the Mattole Salmon Group. Which is also too small to have the necessary heavy equipment available. So the MSG in turn goes into partnership with a small forestry company, Restoration Forestry Inc., to rent the needed forestry equipment for working in the field with large logs. As a result, the project work gets done right by skilled and experienced personnel and all the many layers of legality get covered. The Mattole Salmon Group looks forward to continued and expanded partnering with groups, agencies and individuals in the future as we pursue our mission of restoring native Mattole salmonid populations to self-sustaining levels of abundance. 🐟



*Top right: A series of log and boulder structures on SFI land in the mainstem Mattole River near Whitethorn.
Above: A log structure located on SFI land in the mainstem Mattole River, Mendocino County. Photographs by Campbell Thompson.*

Prosper Ridge -continued from page 7



Map of project sites completed in Phases 1-4. Map by Mattole Restoration Council.

In Gratitude to Cassie Pinnell

Cassie Pinnell resigned from her role as Executive Director of the Mattole Restoration Council in December. She served as the leader of the MRC for four and a half years, and did an outstanding job in sometimes tough circumstances. Here we wish to recognize her hard work and celebrate all she did for the organization and the Mattole Valley.

It's not just anyone who makes an outstanding Executive Director for our unique council. One must first be able to listen and relate well to private landowners and residents, for our watershed is largely private land. But a good ED must also be able to network with an array of federal and state agencies and private foundations, who often hold the key to getting our projects permitted and funded, and our diverse partner groups, who we work with towards common goals. Cassie, with her abilities to listen, think critically, and come up with creative ideas, was able to work well with nearly everyone, and you never got the feeling that she was putting on a different hat: she was just being herself. She was grounded in a commitment to treat people professionally, no matter what. I believe that brought out the best in many of us.

Cassie worked her tail off for the MRC, almost always maintaining a sunny disposition while she did it. Remarkably she did this while also becoming a mom, balancing her responsibilities to her organization, family, and community with unusual grace. I can't say enough to thank her for all she did for the MRC. So I'm going to let some other voices chime in. Together may our thanks to Cassie be a long-lasting song of gratitude that follows her as she moves toward a different future.

- Flora Brain, MRC staff

Cassie was such a stellar ED in more ways than I can describe here. She accomplished all the normal things EDs are supposed to do but she did it with class and some sort of professional wisdom and humor hitherto unknown in these parts. She was always incredibly efficient at the same time as inspiring enthusiasm. I cannot lie and say that nothing roiled her, but almost nothing. She was always willing to do what we as staff asked of her and more than willing to appropriately delegate. She nurtured and grew all the necessary relationships with our partner groups in the Mattole, the agencies and foundations that fund our projects, with board and staff but most importantly she was passionate and motivated on behalf of the residents in our watershed, human and otherwise. Yup, she rocked it. And I will miss her dynamic Cassieness terribly.

- Ali Freedlund, MRC staff

It has been a wonderful gift to work with Cassie. She has been very encouraging of our work to improve streamflows in the headwaters and always willing to consider new approaches and collaborations. She is also a great communicator and has taught me by her example. She listens well and speaks directly about her concerns with respect. She has strengthened the Mattole River and Range Partnership with her emphasis on positive solutions and thoughtful consideration of issues. We will miss her very much and will continue to appreciate all that she has contributed in the years ahead.

- Tasha McKee, Sanctuary Forest, Inc.

Cassie has been a dream to work with, naturally taking on leadership roles, keeping a level head, keeping our partnership on track and organized, making sure everyone is heard, and coming up with creative solutions. The world needs more leaders like her – I keep telling her I wish she'd run for President! We will miss her and her wonderful disposition here in the Mattole and King Range but know she is destined for great things.

- Cheryl Lisin, Lost Coast Interpretive Association

The last four years under Cassie's truly exceptional leadership of the MRC have been a delight to be a part of. We were a somewhat stressed organization when Cassie came on board as Executive Director. She quickly stabilized our budget and staff and led the hard work of setting us on a programmatically and financially sustainable course. Through great working relationship with the board (thanks for gently explaining "admin" – repeatedly) she made MRC efforts more understandable, transparent and visible. She has strongly supported staff (e.g., health care) and developed new initiatives (e.g., fee for service, nursery). She has been a blessing to this community and in her service as MRC Executive Director. We wish her and her family all the best. Thank you, Cassie! Well done!

- Loren Miller, MRC Board of Directors



Cassie and her daughter June lend their hands at the MRC Native Plant Nursery. Photograph by Veronica Yates.

In the 4 1/2 years Cassie's been at the MRC's helm, she's steered us with so much grace, intelligence, and maturity and has created great organizational stability. Cassie's innate kindness, wisdom, and integrity have guided the MRC's 'ship' throughout her tenure. An organization isn't just the effective restoration successes it achieves. It's also the overarching approach to fellow groups and to its staff. And on both counts, Cassie has been a great facilitator.

Cassie has also been a staunch advocate for youth programs, and speaking on a personal programmatic level, I've greatly appreciated her support for Nick's Interns.

The organization Cassie will be working for in Sacramento will be very lucky to have her onboard. We'll miss you, Cassie!

- C. Moss, MRC staff

In the short time I worked with Cassie in the capacity of the MRRP I always admired her as a leader. She is professional, smart, articulate and dedicated. I have only heard positive things said about her tenure at MRC and I only wish I could have worked with her longer. She will be missed in the Mattole.

- April Newlander, Sanctuary Forest, Inc.

Cassie came to the job at a perfect time to help our communities and watershed. She had some time on the board already, so she understood the working aspects of the MRC. It has been a joy to work with Cassie and with her leadership, our Mattole River and Range Partnership between the MRC, MSG, and SFI has flourished and we continue to work in a cooperative fashion. We will miss Cassie and wish her and her family all the best.

- Sungnome Madrone, Mattole Salmon Group

Cassie Pinnell is simply an amazing human being. Not only has she proven that she is a remarkable leader and eloquent spokesperson for our very small organization, she has also been a profound community member with a heart as big as the moon.

Her innate ability to listen thoughtfully to questions and concerns and to ask poignant questions in return has lent itself immeasurably to profound progress within the MRC. I greatly admire her aptitude for problem solving – everything from calculating the best way to model population dynamics within a coastal ecosystem, to making the internet work by jiggling the Ethernet cord (I swear, I tried everything!), to hunting for and securing funding during a challenging era, and oh so much more. I know I am not alone in saying that the MRC will be losing an incredibly compassionate, thoughtful, receptive, caring, intellectual, motivated, and productive leader. My love and well wishes to Cassie, Nelson, and June as they open this new chapter of their life in the city of trees. You will always have a home away from home in the Mattole!

- Veronica Yates, MRC staff