

Mattole Watershed NEWS

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2016



ISSUE # 6

Converting the Lower River Riparian Desert MRC digs into the Lower River and Estuary Enhancement Project

By Hugh McGee, *Mattole Restoration Council*



Completed trenched willow baffle site in the Mattole Estuary. Photograph by Hugh McGee

Over the past decade, the Mattole Restoration Council has focused much of our riparian work in tributaries throughout the Mattole watershed. Over those years we conducted riparian assessments in 55 tributaries, planted over 300,000 trees in 40 of those tributaries, and through our Good Roads, Clear Creeks Program stabilized thousands of feet of streambank and reduced hundreds of thousands of yards of sediment through landslide stabilization and road restoration. With much of that work being completed, biologists and restorationists continuing to focus efforts on estuarine and off-channel habitat, and the creation of the BLM's Five Year Plan for the Mattole Estuary, we now shift gears.

Working on lower river projects is not as straightforward as much of the revegetation projects we took on in the past. Oh, how I long to sink a 1-1 Douglas-fir bareroot into some nice loamy soil next to a cold bubbling creek. While many of the revegetation sites planted on Mattole tributaries actually had soil to work with, and natural microsite features to plant into, the floodplains of the lower river are hot, dry riparian deserts where getting native vegetation established is a challenge. Many floodplains and mid-channel islands are dominated by gravel and sand that rule out container planting, even with irrigation. In more stable floodplain areas where finer sediments have accumulated, soil is being built, and native vegetation has established itself, long-lived riparian trees like Douglas-fir and California black cottonwood are still few and

far between due to germination conditions being so inhospitable. And of course the biggest challenge to working in the lower river is the big elephant seal in the room: Nothing is static, IT MOVES. This is true for the entire river, but even more so when you are working below the mouth of the Lower North Fork and can see ocean waves from your project site. It is a risky place to work. Although these restoration sites pose these specific challenges, there are proven methods and techniques for getting riparian vegetation established on sites like these, and there are also ways to protect and enhance existing riparian vegetation.

The Mattole Restoration Council and Mattole Salmon Group, along with Bureau of Land Management, U.S. Fish and Wildlife Service, State Coastal Conservancy, California Department of Fish and Wildlife, National Oceanic and Atmospheric Administration, and National Fish and Wildlife Foundation, are collaborating to enhance riparian and in-stream habitat on these lower river islands and floodplains. While the MSG targets wood loading through the lower Mattole heli-wood projects, and enhancement of off-channel habitat through excavation of the south slough channel adjacent to the estuary, the MRC's Riparian Ecosystem Restoration Program is working to enhance riparian and floodplain habitat by implementing various riparian restoration projects in the lower five miles of the Mattole River.

See "Lower River" - 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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and MRC Members and Friends of
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From the Executive Directors

By Cassie Pinnell and Sungnome Madrone



Dear readers,

After a splendidly drenching December, we greet a new year, and with it new opportunities to continue our work in service of the Mattole River watershed and her native salmon. In this issue of our newsletter, you'll find information about how our two groups, the Mattole Salmon Group and Mattole Restoration Council, are working to address major ecological challenges across our watershed, from the ridgetops to the river bottom. We share information on MRC's latest efforts towards reclaiming open ridgelines for fire safety and habitat. You can find out more about exactly how the MSG determines which stream reaches to survey for adult and juvenile coho salmon each year, and MSG shares our latest findings about fish use of the new slough channel and adjacent estuary habitat in daytime versus night.

You'll also find a feature article focusing on the place where perhaps one of the largest looming restoration needs in our river system awaits: the lower river and estuary. The downstream-most five miles of the Mattole River has been, and continues to be, an ever-shifting labyrinth of river cobbles, gravel, sand, and silt, rearranging themselves in each modest storm. On pages 1 and 4, you can read about MRC's approach to establishing native vegetation within this dynamic floodplain environment.

We're also delighted to expand our vision - since long term successes in both of our groups' missions are certainly dependent on an ambitiously broad scope of work, beyond fish and trees - and so we are happy to look a little outside of our own projects and share the story, from Linda Yonts, of her family's experience dry-farming wheat in the Mattole last summer. For while we are inspired by the salmon, it is also the people of this place who continue to fuel us with encouragement. We are fortunate to live among hardworking, driven, and independent people, so many of whom are genuinely interested in living more sustainably.

Thank you for your support. As always, we welcome your participation and feedback. Please don't be strangers. Stop in to our offices and see us, or give us a call.

Sincerely,

Sungnome Madrone and Cassie Pinnell

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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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A New Way of Doing it...and Thank You!

By Kate Cenci, Mattole Salmon Group

The Mattole Salmon Group monitors salmon populations during two main seasons of the year: winter months for adults, and summer months for juveniles. For the past four years, this monitoring has been conducted in accordance with a standardized statewide effort. This means that the data we collect in the Mattole effectively contribute to assessing trends in California's larger anadromous salmonid populations.

You might be thinking, "So what's the big deal? The Salmon Group has been monitoring salmon for over 35 years. Haven't they figured everything out already?" The same questions might be asked of numerous other salmon restoration organizations and agencies throughout the state. In a nutshell, here is why monitoring of the past four years is significantly different than previous efforts: it's really the first time in the Mattole that we're using a focused method to estimate a watershed-wide population for adults, and the first time that we have comprehensively mapped juvenile coho distribution throughout the watershed. With regard to the state level, we're using the same standardized method as the California Department of Fish and Wildlife (which is responsible for salmon recovery in this state), as well as numerous other organizations from the Oregon border to San Francisco. Since everyone is collecting data in the same way, CDFW is able to combine all the monitoring efforts on the North Coast to get an accurate picture of coho and Chinook salmon populations...really for the first time.

Here in the Mattole, prior to the last four years, we'd oftentimes just look for fish in places where we knew they'd be, which seems to make enough sense at first. This, however, introduced a lot of bias into any sort of population estimate, skewing the numbers high or low from the actual number of fish. We had no way of knowing either the actual number of fish, or whether our estimates were high or low, or consistently high or consistently low from year to year. How do we know there aren't any fish elsewhere if we never look? And how can we ever look in every place every year? That is just not feasible. Were we even monitoring the right metric (i.e. number of adult fish, number of redds, number of juveniles, etc.)?

These challenges and questions weren't unique to the Mattole. In the early days of salmon restoration, nobody quite knew (or at least could decide on) what actually determined a healthy salmon population. How was it going to be measured? So everyone was kind of tailoring their monitoring to fit their watershed – even different offices of CDFW (then CDFG) were doing different things. All these different metrics collected in different ways made for a data nightmare. It was difficult to compare – let alone integrate – data sets, each with its own set of biases.

So we're human, and hopefully we learn, and grow, and evolve, and figure out what works and what doesn't work... hopefully. Salmon restoration and monitoring are no different. So in the first decade of this century, after a time of trial and error, and determining exactly what it was we restorationists wanted to know, a bunch of biologists figured out the best metrics for assessing different qualities of salmon populations: the number of redds for adults (which can then be used to deduce the number of spawning adults), and spatial distribution for juveniles (at least for coho). The next step was determining how these data were to be gathered, with the least amount of bias, and with knowledge and understanding of biases that were unavoidable (such as not being able to look everywhere).



Above: Michelle Dow traverses a previously unsurveyed reach of Squaw Creek in search of juvenile coho, thanks to new landowner permission. Photograph by Nathan Queener

Enter the California Coastal Monitoring Plan or CMP for short. This is the basic plan that everyone in the state is using or beginning to use. It basically means that we're all monitoring for the same things in the same ways, so that data can be integrated across the state. The CMP calls for a Generalized Random Tessellation Stratified (GRTS) sampling design. It's really just a fancy way to say the following:

- 1) Our study is limited to areas that salmon have the potential to spawn in or have a historic record of salmon spawning. In other words, sections of the mainstem and tributaries that aren't too steep and/or salmon have spawned there in the past.
- 2) All those miles of mainstem and tributaries that make the cut are divided up into reaches that can be surveyed in about a day (in the winter).
- 3) A nifty computer program sticks all those reaches into little compartments that are defined by different geographic sections of the watershed.
- 4) That same nifty computer program randomly selects reaches from each compartment, making sure that not too many reaches come from just one section of the watershed.
- 5) Each year, the reaches we do are randomly re-selected, sometimes with repeats, and sometime not.

This system allows us to monitor a bunch of different places throughout the watershed each year, but definitely not everywhere. However, we're able to take that data from places where we did look, and actually expand it to places where we didn't look, giving us a watershed-wide assessment of our salmon populations. Over the past few years, the GRTS system has definitely created the opportunity for some surprises, especially since we've never looked (or it's been a really, really long time) in some reaches. For example, we found juvenile coho in McGinnis Creek in 2014 and adult Chinook in Dry Creek in 2013, places where we least expected them to be. Less welcome surprises have also occurred when we haven't found fish in reaches where we thought we'd find many: in 2015, a handful of juvenile coho were only found in the lower few pools of Thompson Creek (usually a juvenile coho stronghold.)

With each year calling for different reaches to be monitored, sometimes getting in touch with landowners can be a challenge. Over the past four years, this study design has taken our monitoring crew to areas of the watershed that we've never been in before. With over 86% of the watershed in private ownership, it means we depend heavily on the cooperation and support of numerous Mattole landowners. Chances are if you own land in the Mattole with stream footage, you've probably received a letter or a phone call from us.

See "Fish Monitoring" - continued on page 6

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Lower River Riparian Restoration - continued from page 1

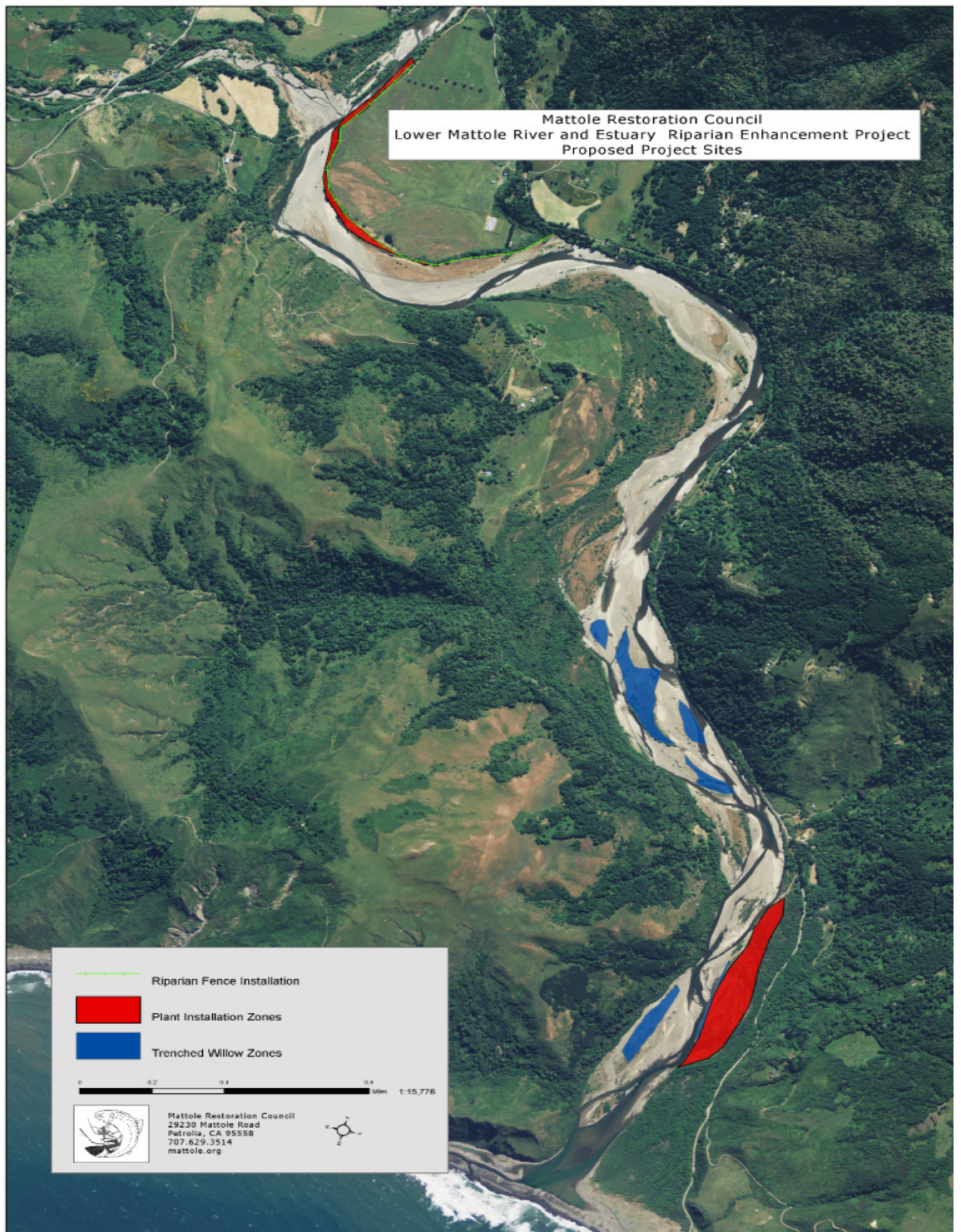
Protecting existing riparian habitat from damage caused by livestock is one way to ensure a diverse assemblage of riparian species can exist and thrive along our river. In August, MRC staff and ranch volunteers installed over 6,000 feet of riparian livestock exclusion fencing on Chambers flat, just downstream of the mouth of the Lower North Fork. This will protect habitat by excluding livestock from riparian areas along this reach. In addition to fencing, a riparian buffer will also be planted along this reach. Funding for this project was provided by USFWS with a matching equipment donation from the leasee of the ranch.

As mentioned above, successfully establishing native vegetation on gravel bars and floodplains with little soil is a challenge. Because container plants cannot be established at most of these sites, we use a common technique that has proven to be very successful on previous riparian restoration sites throughout the Mattole: planting large 15'-25' willow cuttings into trenches that have been excavated down to groundwater by an excavator. Gravel bars are mostly void of organic matter or soils that can maintain moisture for these rooting willows throughout the summer months. To address this issue, we place 16"-24" diameter Douglas-fir and grand fir logs into the planting trench. This provides some structure to the trench and acts as a sponge, maintaining soil moisture throughout the hot summer months. Trenches are backfilled and watered throughout the summer to increase rooting potential. This year we installed over 6,000 large cuttings that made up 3,000 feet of baffles. Over the next two summers, we will install an additional 8,000 feet of trenched willow at MSG heli-wood loading sites, as well as terrace margins and mid-channel islands.

But willow islands are not the only type of habitat needed in the lower river. Establishing a diverse mix of long-lived riparian species on more stable floodplains (floodplains that have had established vegetation for a couple of decades) is an important component to increasing floodplain stability, shade, and food and habitat for fish and wildlife. In January 2016, we began implementation of the riparian container planting component of the project on lower river floodplain enhancement sites. Establishing

container plants on these sites is a challenge, but is possible when targeting areas with better soils and irrigating plants for 2-3 years, as we are doing on this project. This year we will plant over 12,000 container plants of a diverse riparian species mix including California black cottonwood (*Populus trichocarpa*), big-leaf maple (*Acer macrophyllum*), California buckeye (*Aesculus californica*), Oregon ash (*Fraxinus latifolia*), and Douglas-fir (*Pseudotsuga menziesii*). In order to increase shrub diversity and wildlife forage, shrub species will also be installed and include black-capped raspberry (*Rubus leucodermis*), thimbleberry (*Rubus parviflorus*), ocean spray (*Holodiscus discolor*), red-flowering currant (*Ribes sanguinum*), coffee berry (*Rhamnus californica*) and toyon (*Heteromeles arbutifolia*). All the seed for these plants was collected in the lower Mattole River and grown at the MRC Native Plant Nursery. After planting, these sites will be mulched and watered throughout the summer months for a two-year period.

Working in the lower river is an exciting and challenging task and our team is keen to continue work in this dynamic system. As we move forward, we acknowledge and understand that the lower river and estuary are a constantly changing ecosystem, and we try to be humble when developing projects in this area. We will continue to work with the Mattole Estuary Technical Advisory Committee to propose work on new sites, and monitor the success of previously completed projects to assess project effectiveness. 🐟



Above: John Summers and Bob Anderson assist with a trenched willow site. Wood is placed in groundwater at the base of the willow cuttings in order to provide dry-season moisture for rooting willows, as well as structure to the trench.

Photograph by Hugh McGee

2015 Dryland Farming in the Mattole

By Linda Yonts, Mattole Salmon Group



Above: Wheat growing in the Yonts' field. Photograph by Cosmo Free

Below: Laurence Hindley gleaning the wheat in August. Photograph by Linda Yonts

The weekend of January 17 and 18, 2015, Laurence Hindley began wheat planting preparations on approximately 9 of our alluvial plain acres located just upstream of Squaw Creek on the Mattole River. Historically our homestead, founded in the late 1880s, had been used for hay production, egg production, as a dairy, a blacksmith, a fruit orchard, a nut orchard, a bull farm, a horse farm and a hunting and fishing lodge. Since we moved here in 1994 we had mostly grazed livestock, grown hay and worked our half-acre registered organic farm. We were excited to try something new on our property that required no watering on our part and aligned with our organic beliefs and practices.

The acreage was plowed using a 1970 International 856 tractor. My husband, four teenagers and another handful of adults spent considerable time clearing the field of rocks during and after the plowing. Allowed to sit fallow for approximately 8 weeks, the acreage received 13.73" of rain during this period. The weekend of March 21 and 22 the field was tilled and limed, using 25 tons of lime applied with a 1960s spreader. During the next six days we received 1.99" of rain. A week later on March 28 and 29, 600 pounds of organic chicken manure and 1,080 pounds of organic seed were planted using a 1966 MF seed drill, a 1980 AC tractor and a 1996 AgCo 4wd tractor. From March 29 through harvest we received just 4.94" of rain. Rainfall was graciously provided at critical times during the process. However our "normal" recorded rainfall prior to the five-year drought was 80-90." The winter of 2014/2015 we received just 45" of rain.

The majority of the machinery used was provided by Laurence and Lisa Hindley, who own the Farm Shop in Ferndale. We were amazed at the smooth running operation, and as a testament to Laurence's mechanical prowess and meticulous care for his equipment, not a single breakdown occurred during the entire process of soil preparation, seeding and harvesting. As anyone knows who homesteads and relies on equipment for certain tasks, this is an uncommon occurrence.



Three varieties of wheat were planted: Hard Red Hollis, Hard Red Glee and Soft White Alturas. All three varieties are resistant to pests and striped rust, semi-dwarf and early maturing, and chosen for their suitability in direct-seeded and non-irrigated conditions. Both the Hollis and Glee are a hard red spring wheat. They provide superior bread baking qualities and are high in grain weight volume. Hollis produces a high protein grain; average protein is produced with Glee. High protein content is desirable for yeast breads. Often used for cake flours, the Soft White Alturas is a soft, white wheat, lower in protein, with excellent milling quality (flour yield) and baking quality.

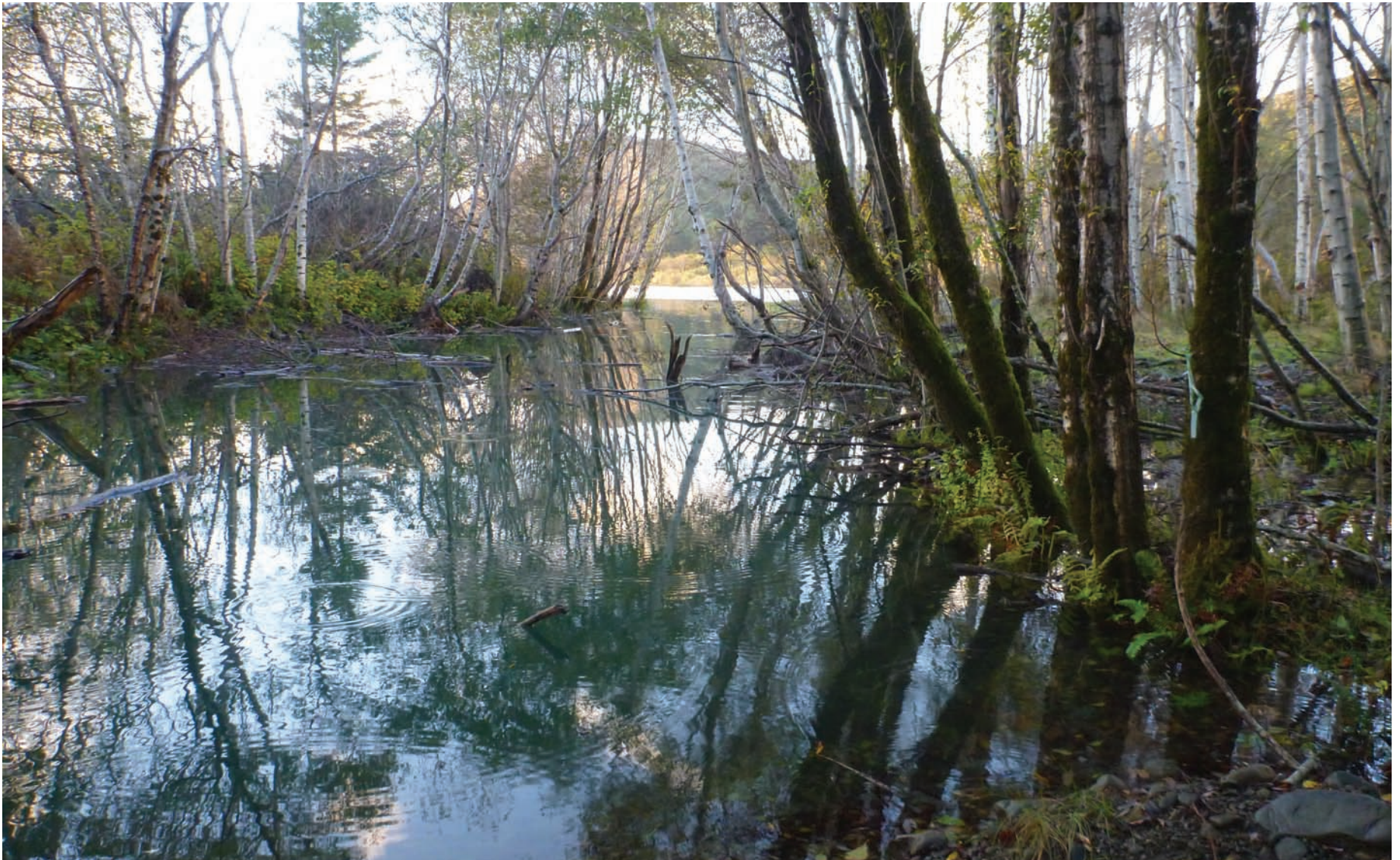
The wheat grew for 4 ½ months, growing only 18" high compared to the expected 24" height, probably due to the unusually low rainfall: only 4.94" received during the entire growing season. Luckily, the slightly stunted wheat growth did not affect the wheat yield. On August 2 and 3, the 1964 Model E Gleaner was used to remove the top seed heads, leaving the "headless" wheat stalks standing in the field. A total of 13,600 pounds of wheat were harvested, averaging 1,500 pounds per acre. (1,080 pounds of seed produced 13,600 pounds of wheat.) The wheat was taken to the Hindley Ranch where Laurence's 1920s #2 Clipper Grain Cleaner was used. In addition, the "byproduct," over 200 bales of wheat straw, was sold to a dozen local families who used it for garden and landscape mulch and livestock pen bedding. All things considered, this was an extremely productive yield during an extremely dry series of years and the hottest summer on record.

The majority of the wheat was sold to Beck's Bakery. You can purchase the flour from the Hindleys at the Honeydew Store, Golden Gait Mercantile, the Northcoast Coops in Arcata & Eureka, local farmers markets, Eureka Natural Foods, Wildberries, Kneeland Farm Stand, and the Kettenpom Store. Some of the wheat also went to Alchemy Distillery, where it was used to make their first batch of "white whiskey!"

There are lots of fun facts about wheat, like its deer resistance by design. I was delighted to see our land used to grow a staple food that required no irrigation, and the use of historic farm equipment deepened the charm. Thanks to everyone who volunteered their time with this project: Laurence and Lisa Hindley, John LaBoyteaux, Nicholas Krautkramer, Joe, Brian and Bodie Yonts, Maya and Gilly Garber-Yonts, Dylan and Dave Smock and Frank and Harold Hough. I hope you might get a taste of some of the wheat we grew, maybe in the warm kitchens of Mattole Valley homes this winter. And even if you don't, I hope our story of growing it might inspire you to think creatively about local food production that doesn't stress our valley's resources. It tastes better that way. 🐟

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Swarms of Schooling Steelhead Swim... socially in the slough while the sun is up, sally forth singly and sally



Above: The excavated slough channel on November 15, 2015.

Below: Juvenile Chinook and steelhead shelter in bulrushes on the north side of the lagoon on September 10, 2015. Photos by Nathan Queener

In June and July of 2014, 250' of slough channel was excavated on the south bank of the Mattole River estuary, in a depression last occupied by the main channel of the river in the early 1980s, but since left disconnected except in high flows. Since March of 2015, we've snorkeled the slough and a couple of nearby habitats multiple times a month to document fish abundance.

Are fish using the slough? In early November 2015, there were about 2000 steelhead and a few Chinook cheek to jowl in a couple of tight schools in the slough channel. This is a lot of fish – so many that you can easily see the schools while standing on the bank, and you might be looking around for the coin-operated fish pellet dispenser, thinking you've ended up at a hatchery raceway.

However, things change once the sun goes down. In September and October we twice snorkeled the slough after dark, and again the next morning, and the differences in where fish are and what they are doing has been dramatic. On nighttime dives the large, tightly packed schools of fish in the slough have vanished. The fish in the slough number in the dozens, not thousands, and they are dispersed in ones and twos. In the area just outside of the slough mouth, where we haven't seen more than a dozen salmonids during the day in the last two months, fish have been everywhere at night – in deep water, in shallow water, near woody cover, and out in the open.

Why would fish school in the slough in thousands during the day, and disperse at night?

Fish behavior is driven by opportunities to eat, and the risk of being eaten. Salmon and steelhead are primarily visual feeders, and as visibility decreases, they become less efficient at filling their bellies, and consequently under some conditions do not actively

feed at night. But when prey density is high, active feeding at night is "worth it" even though it is less efficient than daytime feeding.

In contrast, daytime behavior seems to be driven more by the risk of predation, coupled to a lesser extent with feeding opportunities. Both the slough and the area we've been snorkeling outside the slough contain ample woody cover but in the past couple of months we haven't really observed the fish using it. The fish in the slough are near cover, but not in it, and they are schooling in the upper third of the water column, and while often evenly spaced and relatively still, they do sometimes feed from the surface and near-surface. Schooling in the slough reduces predation risk during the day while still allowing for some feeding.

Based on dive observations, this literally night and day difference in where fish hang out began in mid-August. By the time you read this, conditions will surely have changed. The opportunities for eating, and risks of being eaten, will be altered. And the salmon will continue to alter their behavior in response to their ever-changing environment. Hopefully many have migrated out to the ocean as well-fed and wary survivors, some of whom may grace us again when they return as spawning adults in the years ahead. 🐟



Fish Monitoring - continued from page 3

I want to take this opportunity to sincerely thank all landowners and residents who allow us access to creeks and sections of the mainstem through their properties. You really are making it possible for us all to gain a much better understanding of the numbers of returning adult salmon and steelhead each winter, and the distribution of juvenile coho (and Chinook and steelhead) in the summer. We hope that you will continue these valuable relationships into the future, as we still have a lot of work to do. Although we are using the GRTS system, we still have a lot of work that we're trying to reduce. We know a lot more about certain areas of the watershed where landowner access has been easier. Areas of the watershed where landowner access is limited or nonexistent do represent gaps in our knowledge and data. But as the last few years have gone on, we've reached out to more and more landowners who are cooperating. Maybe you or your neighbors are already on board. If so, please spread the word about the work we're trying to accomplish and that we're all working to better the watershed we all love and call home.

coop snacks near the substrate after sunset

By Nathan Queener, Mattole Salmon Group



Above: Juvenile steelhead swimming in a thick soup of *Neomysis*, aka opossum shrimp, in isolated pool of the estuary.



Left: Close up of *Neomysis* sampled from same pool. Photographs by Flora Brain

Below: Mattole Riverbed colonized by *Corophium* (thermometer for scale is 6 inches long) Photograph by Nathan Queener



So What DO Fish Eat Down There?

As noted in the article at left, fish abundance in the slough changes dramatically between day and night, beginning in mid-August. Presumably, fish avoided the shallow areas adjacent to the slough that were devoid of cover in the daytime because of the risks of predation (primarily from avian predators.) At night, they were seen utilizing all sorts of habitats that we commonly think of as sub-par. What are they doing out there – or, more pointedly: what are they eating? Casual observations by snorkelers and weekend explorers turned up a couple of interesting discoveries.

Paddlers in a canoe on the lagoon on November 8, 2015 noticed a shallow area upstream of the slough mouth and out in the open where the muddy bottom was carpeted in tiny black tubes. Scooping up a handful of this sediment (with the tubes and presumably their builders hidden deep inside) we brought it home and investigated, learning that the tube-builders are amphipods in the genus *Corophium*.

Corophium come out at night – not unlike the fish feeding on them, who take advantage of unimpeded access to open areas when many of their predators, the birds, are snoozing.

Then later in the season, just after the river mouth opened and the large volume of brackish lagoon water drained, we came upon small puddles that were previously underwater in the lagoon. These puddles contained a few stranded fish but what was really noteworthy was the thick soup they were swimming in: less water than a roiling gumbo: thousands of small shrimp! Upon closer observation, we learned that these shrimp belong to the genus *Neomysis*, also known as opossum shrimp.

Both *Neomysis* and *Corophium* were mentioned in previous research on salmonid use of the Mattole estuary/lagoon (Busby, 1991) so these were not new discoveries, but the sheer quantity of how many of them we saw surprised us.

Busby M.S. 1991. The abundance of epibenthic and planktonic macrofauna and feeding habits of juvenile fall Chinook salmon (*Oncorhynchus tshawytscha*) in the Mattole River estuary/lagoon, Humboldt County, California. M.S. Thesis, Humboldt State University, Arcata, CA.

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Sometimes gaining landowner access is just a matter of getting a hold of someone, which can be a rather difficult task given that most of us who live out here do so for the very reason of being difficult to get a hold of. We understand. The Mattole Salmon Group was founded in 1980, and has grown up within the culture of the Mattole. We understand the desire for privacy and the need for discretion when it comes to matters of private property. Things have gotten slightly unnerving around here in the past year or two, and I want to stress that we are in no way a regulatory agency. We're just out there with our heads down, counting fish, which is the only thing we are obliged to report on.

So again, here's a big heartfelt thank you to all those landowners who make our work possible. And if you're a streamside landowner that would like to join your neighbors and grant us access, or if you just want some more information before you make that decision, please do not hesitate to email me: kate@mattolesalmon.org. 🐟



Above: Nathan Queener collecting redd data during a spawner survey on the middle Mattole, winter 2015. Photo by Kate Cenci

You Have to Plant the Seeds to Grow a Forest:

We bid farewell to Monica Scholey, MRC Native Plant Nursery Manager and all-around awesome person!

By Hugh McGee, *Mattole Restoration Council*

When I first arrived at the MRC Native Plant Nursery nine years ago, I was a bit taken aback: it was a small 8x10 greenhouse with some little sad-looking Douglas-fir trees growing in it. The nursery had just started and definitely had some growing to do. When I look back to that day, I am amazed and grateful for what our nursery has become between then and now. Over the years we all watched our Native Plant Nursery flourish and grow into a place where Mattole native plant diversity is preserved, knowledge is shared, and in my opinion, the best native plant nursery in Humboldt County, if not the north coast, was created. This was all due to the hard work and dedication of Monica Scholey.

Monica came to the MRC as an AmeriCorps WSP member in 2008. One of the first projects she worked on was a riparian planting project in the middle Mattole. When I saw her swing the hoedad from a distance, I knew right away that she was a tree planter at the soul. She had a knowledge and love of native plants and a deep curiosity for ecology. Throughout her term Monica was an incredible asset on all of our projects and took a particular interest in the native plant nursery. When her WSP term was complete, there just happened to be an opening for Native Plant Nursery Manager and Monica got the job. We were all just starting to learn about propagation and restoration of native coastal prairie species, and Monica was tasked with making sure we grew a diverse mix of native grasses that were formerly common to the Mattole and King Range, but were now rare and uncommon. As you may imagine, there isn't really a Wikipedia page for growing native plants, especially the plant assemblages of the Mattole and King Range. Over the years, Monica mastered the propagation of a native plant assemblage that is unique to the Mattole, and produced hundreds of thousands of plants that are an integral component of all of our native plant restoration projects. Many of our coastal prairie, oak woodland, and riparian restoration projects would not exist without the Native Plant Nursery. It is the backbone of the entire Native Ecosystem Restoration program, and Monica has been the brain.

Growing native plants is not an easy task. There are not many people on Earth who understand the intricate knowledge of taking seed from a diverse variety of plants in the wild and turning that seed into thousands of high-quality container plants for revegetation projects. This is a unique skill that takes attention to detail and dedication, and a bit of tinkering in the lab that is



our nursery. Many of these species are rare and uncommon and many nurseries have not grown them. Monica fine-tuned our propagation methods, keeping track of every little detail, to get us high-quality plants suitable for our restoration projects.

During her time at the MRC, Monica did much more than just grow native plants. She was our Invasive Plant Control Coordinator for a year, led the Mattole Youth Environmental Stewards Program, worked as a crew leader and crew member on many native ecosystem restoration projects, and was a role model and mentor to hundreds of Mattole youth, AmeriCorps members, and college and high school interns. She is the ideal team member and did everything from washing pots with the nursery crew to collecting seed, to writing grants. During her time as Nursery Manager she grew over 350,000 native plants, worked with hundreds of students, volunteers, and interns, and served as our unofficial staff botanist.

Monica will be impossible to replace and sorely missed. But we are happy for her and her family in their new adventures in Oregon. Farewell Monica! Please be sure to come back and visit often. 🐟

Top to bottom: Monica enjoying a laugh with nursery volunteer Marcia Ehrlich in 2014; Monica and intern Lindsey Baris rejoice while setting up a new nursery greenhouse in 2009; Engaging a group of kids during a nursery visit; A rich assemblage of container plants, and a blooming native plant garden, flourish under Monica's hand at the nursery; Monica and crew enjoy a beautiful sunset moment after planting on Paradise Ridge in 2009; Monica planting native Mattole bunchgrasses on Prosper Ridge in December 2015 just before moving, leaving the watershed better than she found it. All photographs courtesy of the Mattole Restoration Council, except bottom photograph courtesy of Sonny Anderson

Reclaiming Open Ridges...for habitat and fire safety

By Ali Freedlund, Mattole Restoration Council



A meadow within the project: above left is the before image, prior to treatment. Above right shows the same meadow after removal of brush, trees, and lower limbs of remaining trees. Photographs by Ali Freedlund

"The hills are alive with the sound of music, la la la LA..." This is the song I return to when bounding down a grass-covered ridge albeit looking more like a lumberjack than Julie Andrews. There is something soulfully expansive about open vistas. More importantly, however, are the multitude of life-enhancing benefits open ridges offer: navigation direction (trails), fire suppression access, habitat for deer, rabbits, bobcat and rodents and other mammals, reptiles, butterflies and other insects, numerous birds of prey, native plants, and the list goes on and on.

Our watersheds were historically adapted to periodic fire, whether via lightning strikes or indigenous burning, prior to the Smokey Bear campaign which has significantly increased fuel loading in our forests while also causing a loss of open prairie. Reclaiming open ridgelines are an important strategy for building resilience on the land from the impacts of fire and drought, but also for access by firefighting crews. There are several ridgelines in the Mattole watershed and throughout the North Coast that were historically clear of forest favoring native prairie ecosystems that could now benefit from fuels reduction and prairie reclamation treatments.

Treatments to restore open prairies include removal of encroached brush and trees, and disconnecting the forest edge from the grassland by reducing the brush layer, thinning the density of trees and removing the bottom branches of the remaining older trees. This reduces the ladder fuels and has been shown to reduce the spread and intensity of wildfire, depending on conditions. In this case, the majority of the ladder fuels were composed of young Douglas-fir trees that are highly flammable and once they 'torch,' can lead into the canopy and cause a crown fire. Add wind and you have a running crown fire that is usually catastrophic, resulting not only in high tree mortality but also the possibility of burned homes and structures.

The Lower Mattole Fire Safe Council, sponsored by the Mattole Restoration Council, began its second ridgeline fuels reduction/prairie reclamation project on private property in 2014. Ridgelines are identified for treatment based on historic photo analysis. In places where ridges that were once open grassland but have steadily been encroached with brush and young Douglas-fir trees, and are near residential communities, and have project enthusiasm from the landowners, a project proposal is born.

The Mill Creek Road and Ridge Fuel Break Project is the second MRC ridgeline treatment project and follows an historic jeep trail between Mill Creek and Stansberry Creek in the lower Mattole. At the top of the ridge are intact native bunch grasses that will be enhanced by the treatments. As the project nears completion this winter, and we want to take the time to expand on the challenges and successes of the project.

This project required a 50/50 match of non-federal funds. Match can come from the sponsoring organization, the participating landowners, Cal Fire, and other sources. In this case it came from all of the above and PG&E. Six private landowners participated in a variety of ways from working alongside crews with their backhoe to providing up-front cash.

One of the project's challenges was a match inclusion for Cal Fire crews to help with the treatments. We had done this on a previous project with much success. Cal Fire crews are composed of inmates from one of the conservation camps. What we didn't anticipate was the reaction from some neighbors about the use of such a crew.

Many people do not know that WHEN there is a large wildfire in a rural neighborhood, it will be these inmate crews that will come to help protect your homes. Working with them ahead of time provides them valuable training which they can also use toward securing a job once they are done with their time. But, once emotions and opinions flared, we alleviated the concerns by not utilizing Cal Fire crews. Cal Fire staff still provided a large match including an archaeological report, project consultation, and the use of their chipper. But, the project was left with the need to secure more match or we would not be able to fully complete the project. Thankfully, PG&E offered to help in 2015 with a one-time \$10,000 grant.

Since August 2014, local crews consisting of sawyers and swamper worked various stints pushing back the treeline to open up more prairie where appropriate. This consisted of limbing up trees that were older and established, and reducing fuels along road segments to allow for safe evacuation and access for fire personnel. Disposing of the resulting biomass was another challenge. Some firewood was taken to people in the community. Some fuels were chipped on site. But the majority was piled for a later burn with either the landowner's backhoe or MRC's new skidsteer. Some piles were burned last winter, and the rest will be burned this coming season with the help from the Petrolia Volunteer Fire Department. All in all, treatments have expanded an historic prairie footprint along a strategic ridgeline and reduced the threat of a crown fire for forests and residents in the neighborhood. Many thanks to all who have supported this project and to those who steward the land in ways that reduce fuels while promoting diversity and resiliency for all of us. 🐟

Funding provided by the Cooperative Fire Program of the U.S. Forest Service, Department of Agriculture, Pacific Southwest Region, through the California Fire Safe Council. In accordance with federal law and USDA policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age or disability. Not all prohibited basis apply to all programs. To file a complaint of discrimination: write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

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The Many Public Phases of Prosper Ridge Prairie Project

In memoriam: Gary 'Bub' Haga Jr. (1986-2012) *By Ali Freedlund, Mattole Restoration Council*

A fundraising banquet of the Humboldt Blacktail chapter of the Mule Deer Foundation (MDF) awarded \$35,000 to the Prosper Prairie Project in memory of Gary 'Bub' Haga, Jr. 'Bub,' as he is affectionately known by his family and friends, died suddenly in an accident which stunned many in the Mattole valley. His obituary reveals that Gary was infused with a passion for hunting, fishing, and family. The reason for the memorial fund was to conserve blacktail deer habitat as part of the Prosper Prairie project of the King Range, his stomping grounds.



Photo courtesy of the Haga family

The purpose of the Prosper Prairie Project is to promote ecological processes that recover and maintain the extent of coastal prairie. These once-open grasslands are historically documented from the Township Descriptions of Humboldt County in 1904: "The slopes rising from the ocean are usually grassy, but before reaching the summit of the Cooskie King Range, they are covered with brush." A glance at the 1965 photos tells the same story, so the rapid advance of trees and brush has come about in the past five decades.

Not only has there been a loss of coastal prairie habitat, there has been an increase of hazardous fuels near homesteads. Local resident Sonny Anderson tried to encourage BLM to remove the encroaching trees and brush in the prairies since the 1980s. In 2006, the BLM proposed to treat an area with prescribed burning near Strawberry Rock. Many in the community felt threatened as the dense stands of trees were already 10-15 feet high and full of volatile fuels. The proposal was abandoned. In 2010, a small fuels reduction project was implemented utilizing a masticator to reduce the cover of young trees, but was discontinued due to the community's concerns about aiding the encroaching coyote brush.

In 2012, the BLM Arcata Field Office began planning and scoping for the present, and more comprehensive, prairie restoration project. Included in this plan was more mastication

and prescribed burning on 800 acres. Again, the community reacted, spearheaded by Sonny Anderson who felt that the proposed treatments were going about it all wrong. He strongly urged the BLM to begin by careful removal of coyote brush including its rootwad (to prevent resprouts) in each unit followed by Douglas-fir trees. The BLM listened, reworked its strategy of the project to integrate the community's concerns and asked MRC to direct an excavator in the removal of vegetation. Treatments began in the spring of 2014, beginning with the removal of several fields

of coyote brush. Funding came from BLM's Hazardous Fuels, Native Plant Materials and Healthy Lands accounts.

Treatments continued this summer with further BLM funding and the Haga Memorial Fund. This time fifteen acres of medium to dense Douglas-fir were removed. These sites will also be planted with seed and plugs of a variety of native grass and forb species to introduce the native plants that are unique to and make up coastal prairie. MRC is tracking different treatment styles and strategies. The great part is witnessing an explosion of more deer, soaring birds of prey and sweeping vistas. Gary would be pleased, or, maybe he is.

The Humboldt Blacktail chapter of the MDF have longer connections to the Prosper prairies than this one memorial award. In 2011, volunteers from this Fortuna-based organization removed 720 pounds of hazardous wire fencing in the Strawberry Rock area of Prosper Ridge. Many thanks to this conservation organization!

Gary was known for his hunting skills but he was also a volunteer firefighter with the Honeydew Fire Company (HFC). In September 2014, HFC dedicated their new Fire Hall up on Wilder Ridge to Gary 'Bub' Haga Jr. The ripples of this young man continue in the watershed. So it is with gratitude we write this article in honor of Gary, with extra thanks to our Arcata BLM staff for working so closely with the community on this and other projects. 🐟

A Visit From Far Afield *By Ali Freedlund, Mattole Restoration Council*

This fall we discovered a new CCC group: the Chile California Council. The mission of this non-profit organization is to promote mutually beneficial relationships between Chile and California with a focus on sharing climate change solutions. The similarities in geography and climate between California and Chile are well known, but learning that Chile has also been experiencing prolonged drought was news for us.

The CCC sponsored a visiting delegation from Chile's National Forestry and Fire Department (CONAF) to learn from Californians about our fire, forests, and fuels projects. Four people from CONAF toured Northern California agencies and Fire Safe Councils to explore a variety of issues, strategies and projects to reduce fuels and decrease fire threats. The organizer was none other than Tracy Katelman, our sheroe who started a fire and fuels career with the Lower Mattole Fire Plan in 2002. She now lives in Chile and was hired by CONAF last year to help them develop a fire-adapted communities program at the national level.

On October 20, 2015, MRC's Fire and Fuels Project Coordinator Ali Freedlund led a tour of the Lower Mattole's fuels reduction projects for this delegation. We toured projects reducing fuels on private ridges, public prairies, and along county roads. They were a fun and interested group, gracious and grateful to see a variety of projects. 🐟



Nick's Interns and Their Own Words

By Theresa Vallotton, Mattole Restoration Council

Working with collaborating agencies on their priority projects, our recent Nick's Interns have proven to be a valuable resource, accomplishing many environmental objectives. But more importantly - as intended by founders Ray and Marie Raphael - this program is designed to be an opportunity for our youth to not only get work experience, earn money and take pride in what they do, but to learn about and explore what environmental restoration may inspire. Nick Raphael's passion and legacy is one that remains vibrant and remarkable. As well as writing about the projects to which these interns have made a valuable contribution, some of them reflect upon their experience and what it has meant for them.

Israel Dellamas, working with Mattole Restoration Council's Invasive Plant Control program, gives this report. "Not many kids get the chance to understand their environment and Nick's shows us a lot we need to know...Our perspectives have been changed on how invasive plants affect our environment. European beach grass covers a great deal of the beaches and dunes in Humboldt County... Trying to be invasive-free was truly inspiring...On Prosper Ridge we pulled Malta star thistle, a highly competitive invasive that infects our prairies and grasslands. Up Mill Creek we took care of tansy ragwort, a toxic biennial, which poisons cattle and farm animals. Our invasive removal really does some good. This work really opened my perspective, figuratively and literally. I look around and I see what needs to be done, and I see how we as a human race can help."

BLM interns joined MRC's crew for a day of pulling invasive beach grass, and James Wilde says, "Nick's Interns was a great experience of collaborating with fellow youth toward a common goal and contributing to something meaningful. It's great to have opportunities like these available in our community!" Interns also prepared and flagged a future trail route in Hidden Valley, and brushed trails in the Sinkyone Wilderness State Park down to Jones Beach, where they also cleaned around campsites. Davida Bettencourt looks back fondly on "that moment when, after you've worked on a trail and you look back, seeing all you've accomplished."

Working at the Southern Humboldt Community Park, interns cleared an existing labyrinth walkway, and then brushed around a house and the barns. Luke Johns says, "Nick's Interns was a learning experience. We live in such a rich and beautiful environment. Keeping it as pristine as possible while making it so others can enjoy the wonders of it was the goal I felt I accomplished."

At the BLM Education site, interns installed fence posts for a fence surrounding a native plant demonstration garden. Interns removed debris at Miranda, Redway, and Mattole beaches and Windy Point. Michael Carter reflects, "Through Nick's Interns I learned a lot about myself, the forest, and the ones who support my home... Nicks is an experience well worth the ride." Some interns worked with Sanctuary Forest monitoring Mattole River stream flows. At Baker Creek, where they patched holes in liner fabric between logs designed to hold water in ponds for groundwater recharge, Asa Lynne says, "Being a part of Nick's Interns was rewarding in several ways but I really enjoyed getting a chance to come back to Humboldt and help out the community. It was a very special experience." Interns were trained in the practice of "Leave No Trace," and then taught these skills in a summer youth program at Redway School. Julien Taylor Savage reflects, "Nick's Interns definitely changed how



Above: Nick's Interns at work in Baker Creek.

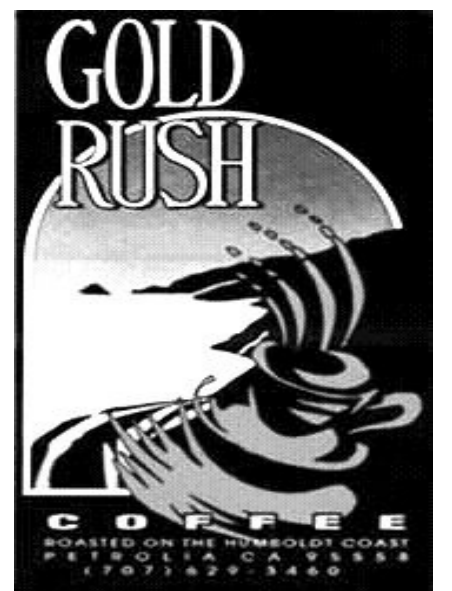
Bottom left: Interns remove invasives in the King Range.

Photographs courtesy of Nick's Interns Program

I look at the environment and the work that goes into maintaining it." Many interns joined the Mattole Salmon Group for the annual Summer Steelhead Dive in the Mattole River. On their last day of the season, interns did river and road cleanup along the headwaters of the Mattole River. Kaliaan Keegan reflects, "Nick's Interns was a great experience. There were a few days that were rough, but I'm happy that I did it."

Damian Alatorre is one of those young people in whom we could see leadership potential. He stepped up as college lead for our BLM interns. "Nick's Intern's was a great experience and opportunity. It started off just being a job, but I started to appreciate the kind of work I was doing. The community appreciation for our work was really satisfying. I value the community and the place we live in so much more through Nick's Interns. I learned much, work-wise, about myself and even what to go to school for. When asked to come back I didn't hesitate...Now that I've been Co-leader and Crew leader I've learned so much from a working perspective, and from the staff...Nick's Interns is such a good program. It gives teenagers an opportunity to possibly get started on their careers, or an idea of what they would like to do in the future. That's what this program did for me and I'm hoping it'll all work out in the end. If it does, Nick's Interns is where it started. Personally one of the great things of being a part of this program is the people you meet and the relationships you build. I owe them a lot for bringing me up to where I am now. I will always be thankful to them for possibly jumpstarting my career and for all the experiences I've had through the program."

At this conclusion of our 12th season, we sincerely thank each of our interns for their hard work and important contributions. This year Nick's Interns have once again been supported by many individual donations, the Tarbell Family Foundation, Whale Tail, BLM, and Grace Us. If you would like to make a donation to Nick's Interns, you can send payment to MRC/Nick's Interns, PO Box 160, Petrolia Ca. 95558. 🐟



Mattole Field Institute Students Tackle Big Questions

By Flora Brain, Mattole Restoration Council

In August 2015, ten graduate students - all starting studies in Humboldt State University's Environment and Community Social Sciences Masters Program - came out to the Mattole for the better portion of a week. Their goal? To immerse themselves in our remote, rural valley and hear firsthand from residents about life here. Their professor, Dr. Erin Kelly of HSU's Forestry Department, was particularly interested in exposing the students - many of whom come from social science backgrounds - to research ideas involving natural resources. The course was to provide a peek into what graduate-level social science research might look like, particularly when shaped by the needs of the people and places it focuses on.

The student group, with Kelly, had a packed five days. It's not at all easy to give people who've never been here before, and never LIVED here, a real sense of this place in five days, but we did our best. First the group hiked to the Mattole River mouth to soak in some of that reality. Then we met with Julie Simpson of the Mattole Valley Resource Center and a group of Petrolia's community leaders to hear about some of the challenges we face. Needs that residents expressed included affordable housing for low-income residents, positive opportunities for teens, community response to crime, and care for our elders. Discussing community issues with an interested yet detached group of students provided a unique space for reflection. As participant Josie Brown reflected, "You brought together quite a gathering there in the apple orchard on that summer afternoon. It was rare to bring "outsiders" into a circle of our community leaders. Because the forum was sponsored by the MRC, I thought the focus would be on the environment, but the discussion was much broader. A lasting memory for me was a moment when several shared thoughts on the struggles of at-risk families here and what help can be developed by individuals and the new Community Resource Center. Thanks for mixing us in with all those great listeners from HSU. I bet they will help build better communities wherever they go."

Other highlights from the field week included a whole day up on Bob Stansberry's ranch, where he shared his perspective on changes he has seen in the land and local culture. At an evening campground circle with Mattole forest landowners and people active in statewide timber policy creation, sustainable forestry initiatives, conservation, and marijuana cultivation, students heard different perspectives on the use of local forests. As one student recalled, "I found the fireside chat to be of most value. We were able to see some hot topics in the community come to light and those individuals address them from their points of view. It was apparent that even disparate residents shared some similar feelings."

When asked, "What was the most valuable segment of the field course?" one student responded, "The most valuable aspect of the field course was the diverse groups of individuals we met. They shared a variety of perspectives and worldviews...It also made for interesting research question development."

After their time here, each student was required to design a research question. They were asked to draw upon their experiences, conduct a literature review of their chosen topic, describe how the research would (theoretically) be carried out, and explain how they would analyze their findings. Please see the sidebar at right for a peek into some of the research questions the students proposed.

The Mattole Field Institute thanks Erin Kelly, Mark Baker, and the entire faculty of the Environment & Community Masters program for their enthusiastic support of this new field course, as well as each of the brilliantly vibrant students who gave our home place so much thought. We also want to extend a huge thanks to all the people here in the Mattole who participated in many different ways to make this course a success: many gave generously of their time, some cooked delicious meals, and others opened their homes, ranches, and life stories to the group. Funding for development of this Mattole Field Institute course came in part from the Bella Vista Foundation, to whom we are grateful. 🐟

A graduate student visits with Bob Stansberry on his ranch.
Photograph by Flora Brain



Students' Mattole-inspired research questions:

In the context of Buddhist cosmology, what alternatives to consumer capitalism are expressed in the Mattole Valley?

In what ways are shame and shunning used as a social control and social adhesive?

How is restoration in the Mattole watershed informed by Indigenous perspectives, and how are the rights of genocide survivors being included in restoration of their traditional homelands, if at all? How can restorative justice eliminate the hegemonic power and privilege dynamic in environmental restoration? How, if at all, has restorative justice already been implemented in the watershed restoration process?

Since 1990, what social movement or activism work have residents been involved with? How have the back-to-the-landers seen their version of activism change?

What contributes to successful or unsuccessful outcomes for youth in rural areas? What are the risk factors associated with these outcomes? How do protective factors increase the likelihood of success?

How have trust, reciprocity, social norms, and networks influenced residents' participation in, and maintenance of, water storage and forbearance practices?

How were the new back-to-the-land residents able to integrate into the rural community in the Mattole? How were the back-to-the-landers and the multigenerational ranching community able to find common ground? What has this accomplished in terms of community development and natural resource management collaboration?

How does social and human capital influence Community-Based Conservation and Community-Based Natural Resource Management in the Mattole River Valley?

How do community networks become a spokesperson for salmon habitat restoration? How does salmon habitat restoration build culture? How does salmon habitat restoration create support systems in the community?

How does land ownership alter the perception of the relationship between the worker tending the land and his/her ethical responsibility toward the environment?