



SUMMER/FALL

2016



ISSUE #7

By the Numbers: recent restoration work at a glance

By The Mattole River and Range Partnership: Sanctuary Forest, Mattole Salmon Group, and Mattole Restoration Council

The Mattole River watershed is well known for the length of time that local restoration practitioners have been engaged in ecological restoration. Our three local organizations—Mattole Restoration Council, Mattole Salmon Group, and Sanctuary Forest, aided by collaborating agencies, foundations and landowners—have been working since the early 1980s to accomplish a staggering amount of work. But what, exactly, has been done? For those of you who gravitate towards numbers, we offer here a short glimpse of some of the recent metrics of which we are most proud.


Just since 2000, in the roughly 300-square-mile Mattole River watershed, there have been to date:

- 41 fish barriers removed
- 52 miles of stream made accessible to fish
- 245 large wood structures added for instream habitat
- 72 miles of riparian corridor and 263,000 acres restored, including 516,000 plantings
- 600 lbs of riparian seed collected
- Over 200,000 native grass plugs installed on coastal prairie restoration sites
- 150 acres of encroaching vegetation removed from coastal prairie restoration sites
- 2.4 miles of streamside livestock exclusion fence installed
- 225 miles of roads decommissioned or upgraded to reduce sediment loading to streams
- 2 million cubic yards of sediment prevented from reaching streams
- 28,300 feet of streambank stabilized
- Over 1,400 stream crossings removed or upgraded
- 1.5 million gallons of water storage tanks installed, filled with winter runoff and eliminating summer creek domestic water use
- 24 forbearance agreements excluding use of riparian water rights during the low-flow summer season
- 1000 feet of entrenched stream restored: floodplain connectivity, groundwater, and streamflow enhanced; winter and summer juvenile habitat restored.



A snorkeler in Ettersburg swims with a school of steelhead in the Mattole River. Read these pages to find out how Mattole salmon populations, and the latest restoration efforts including groundwater recharge, sustainable forestry, and education are faring.
Photograph by Flora Brain

Of course, in the lifetime of the restoration movement, considerably more work has been done in the Mattole. Begun organically by passionate and inspired individuals in the 1970s, many early restoration projects were undertaken in a low-key manner with little interest in recording exact details. People across this watershed stepped up when needed, busted out shovels and rocks and did what the river, the roads, and the forests seemed to be asking for. Ask one of our elder restorationists and they can likely tell you vivid stories of some of those early endeavors. They are stories worth hearing, with lessons worth considering.

Above all, what we wish to convey is: we have not done it alone. We live in a community, a vibrant and sometimes challenging watershed community, a remote rural landscape filled with a diversity of ideas, ideals, and ways of life. We have worked together, and we hope to continue to do so for many years. If you haven't already, please join us in this very fulfilling work. 

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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 Cassie Pinnell and Sungnome Madrone



Dear readers, friends, and neighbors,

As summer comes into full force here in the Mattole River watershed, we find ourselves taking stock. Did we have a productive spring, filling our water storage tanks, taking care of fire safety needs, and otherwise preparing for a safe, responsible, fun-filled summer? While we each take stock of how to best steward our individual land and homes, we at the Salmon Group and Restoration Council are also revisiting some longer-term goals and projects.

This issue of our joint newsletter features some long-awaited numbers. From the Mattole Salmon Group, we are delighted to share redd population estimates for the last 4 years for our local native coho and Chinook salmon and steelhead trout. These numbers reflect the best available science on populations of native wild salmon in coastal watersheds across the state: scientific data that has been gathered and analyzed in accordance with California's relatively recently implemented Coastal Salmonid Monitoring Plan. This information constitutes an answer to the frequently asked question, "so how are the salmon doing in the Mattole?" We're also happy to report these recent metrics in conjunction with salmon population estimates from 1981-2000. This, we hope, will give readers a good sense of how the salmon are doing.

From the Mattole Restoration Council, we are excited to provide an assessment of how the three pilot Mattole Program Timber Harvest Plans (PTHPs) wrapped up. In this issue, we offer reflections on how these first three pilot PTHPs penciled out, with important lessons learned and considerations for landowners interested in harvesting their timber in sustainable, and hopefully profitable, ways in the future. We're also excited to share information about our new native plant nursery, and an upcoming opportunity for landowners interested in restoring their oak woodlands; see page 12.

Last, we mourn the loss – and celebrate the life – of Clarence Hagmeier, one of the watershed's most dedicated stewards. Clarence lived his ideals, and he brought those to his last home, the Mattole. Please join us in remembering him, and trying in some small way to live out his memory in our own lives.

Sincerely,

Cassie Pinnell
Sungnome Madrone

Cassie Pinnell 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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From Sanctuary Forest's New Executive Director

By April Newlander



Dear friends of the Mattole,

I am writing to you as the newly appointed Executive Director of Sanctuary Forest. Tasha McKee, who has been the Executive Director for the past five years, will continue to serve in the capacity as Sanctuary Forest's Stewardship Program Director, just as she has done since 2003. I have been the Development and Education Director and am honored and elated to take on my new role as leader of the organization. I have a Master's degree in Biology and a Bachelor's degree in Natural Resources Management with a focus in Conservation Biology. I have been involved in various oak woodland and native grassland restoration projects in southern California, and look forward to applying my scientific knowledge and passion for the conservation of precious habitats to continue restoration, conservation and education in the Mattole watershed.

Here in the headwaters of the Mattole we are feeling the relief of a cooler June with some unexpected rain; however, the effect of the drought prevails and we continue on our mission to create a drought-resilient watershed. In this issue we are delighted to report on our plan to implement the Baker Creek Groundwater Terrace Project, where a series of off-channel ponds will be installed upslope from our instream groundwater recharge project. This innovative project to enhance summer streamflow will subsequently raise the groundwater level, reconnect the stream to its historical floodplain, and restore riparian habitat for the health of the river and forests.

In addition, we will continue to educate our community through landowner outreach promoting responsible human use of water resources and concurrent respect for the wildlife and salmonids that inhabit the watershed. We are excited to be developing a lesson plan for elementary students that will connect the life cycle of the salmon with the need to have a clean, flowing river—for the survival of the salmon and humans alike.

We also continue to steward our own lands through sustainable forestry practices and thinning to maintain the health of our forests and protect our community from catastrophic wildfires.

Today, I stand proud to be a representative of an outstanding partnership with the Mattole Restoration Council and Mattole Salmon Group, who collectively with Sanctuary Forest constitute a powerful entity dedicated to protecting the Mattole River for the fish, wildlife and people. Let our accomplishments be a model for other watersheds and communities, instilling a legacy of sustainability and preservation for future generations.

Sincerely,

April Newlander

April Newlander

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Mission Statement

Sanctuary Forest is a land trust whose mission is to conserve the Mattole River watershed and surrounding areas for wildlife habitat and aesthetic, spiritual and intrinsic values, in cooperation with our diverse community.

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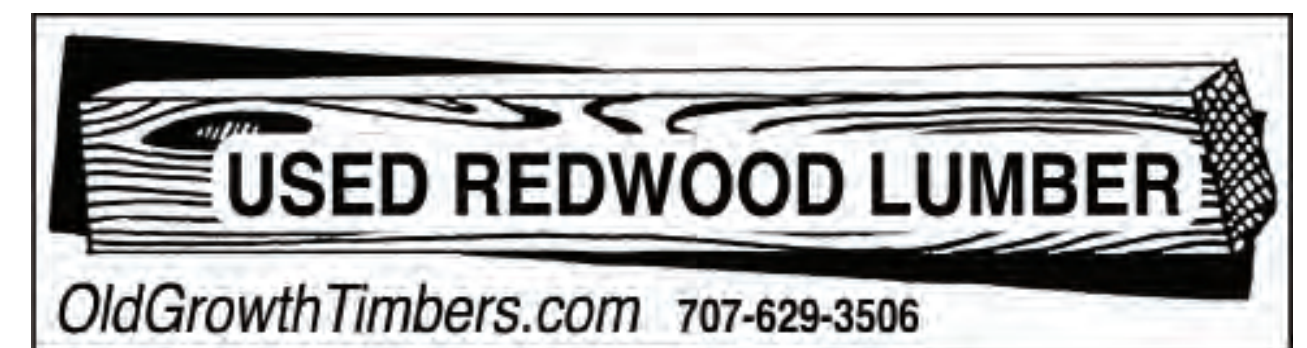
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How Many Fish Are There?

Mattole Salmon Group Releases Redd Population Estimates for Last Four Years

By Nathan Queener, Mattole Salmon Group

The Mattole is not a very big watershed, until you start trying to count the creatures that live within it. Just ask any census worker.

Counting fish is perhaps as difficult, particularly adult salmon and steelhead in this region. If most of them came into the river when it was low and clear, and warm and swimmable, it wouldn't be such a problem. But they don't. They enter the river when it is utterly inhospitable to us landlubbers. They swim in as autumn gives way to winter and the rain pounds down, turning the Mattole's clear water a milky green or chocolate brown.

But people want to know how many fish there are. Watershed residents are curious about the place they live or nostalgic for the days when a Mattole salmon could be dinner; government agencies are charged with preventing their extinction, and restorationists want to know if restoration work is in fact doing what we say it will, namely: produce better habitat and more fish.

So, every winter for over 30 years wader-clad humans have walked and boated the Mattole's streams, looking for the telltale flash of silver, sniffing for the rank stench of a fish carcass, and looking for the cleaned and turned gravel where eggs were laid.

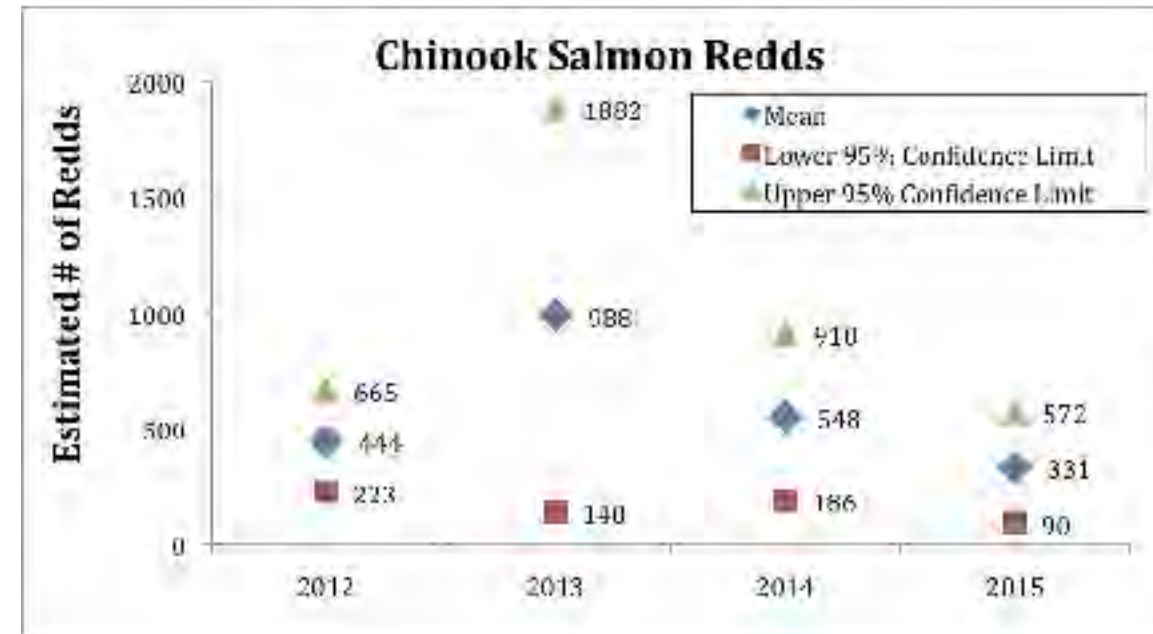
How do we estimate how many fish there are?

Surveying all 170 miles of streams with potential Chinook and coho salmon spawning habitat in the Mattole throughout the three to four month winter spawning season is not logistically or financially feasible (since we're not the Census Bureau). Instead, we survey a randomly selected subset of stream reaches from those 170 miles of streams, typically 30-40 miles of stream. We head out and survey those streams (where we have permission from landowners,) aiming to cover each reach at least once every 14 days.

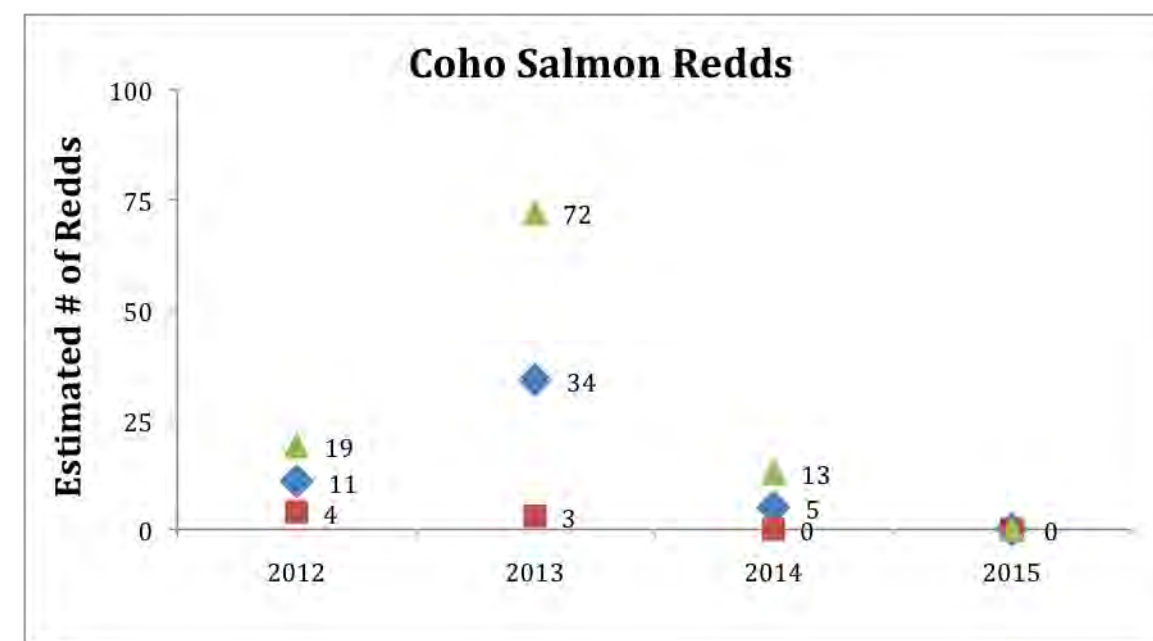
At the end of the season, we take the collected information on where and when fish and redds were observed and feed it into computer software that extrapolates the numbers from the sample reaches that were surveyed to arrive at a redd population estimate for the entire watershed.

Redds - those patches of churned-up gravel containing salmon eggs - are used as the population metric because they don't move, and thus can be counted more reliably than fish, which are prone to being both under- or over-counted. Fish get under-counted because they can be really good at hiding, and over-counted because they move and surveyors might see the same fish in multiple reaches of stream, or on multiple surveys. Redds stay put, and each female salmon generally builds one redd, so a redd population estimate can be viewed roughly as a surrogate for a female salmon population estimate, which could be taken as a rough assay for half of the returning salmon. This rough indicator, despite its shortcomings, is the best that salmon biologists can do in river systems where adult salmon race around and spawn in rainy, muddy, flood-prone rivers.

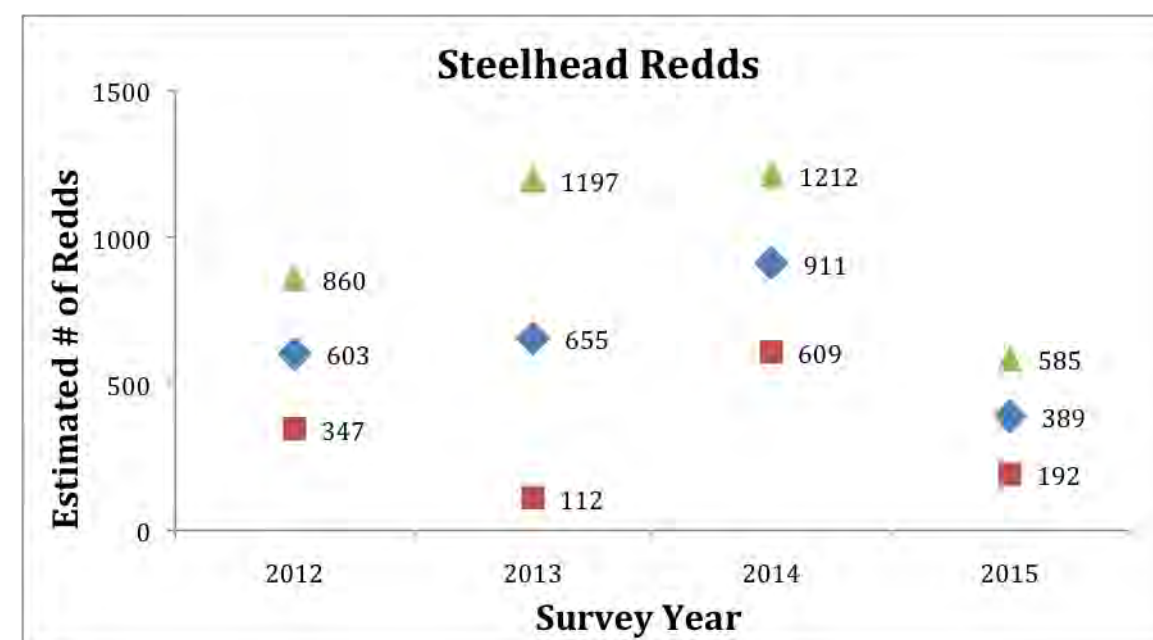
Because this is a mathematical endeavor, the products are in the form of a mean redd estimate with upper and lower confidence limits. What this means is that the middle number you see on each graph (the mean) is the redd population estimate, but because it's an estimate, there are 95% confidence intervals attached to it. A 95% confidence interval tells you, in effect, that - using last winter's Chinook numbers as an example - if the redd population estimate for Chinook salmon is 331, that there is a 95% probability that the actual redd number was somewhere between 90 and 572. The wide span between upper and lower confidence intervals is primarily because of the natural variability in abundance of fish among different surveyed streams.



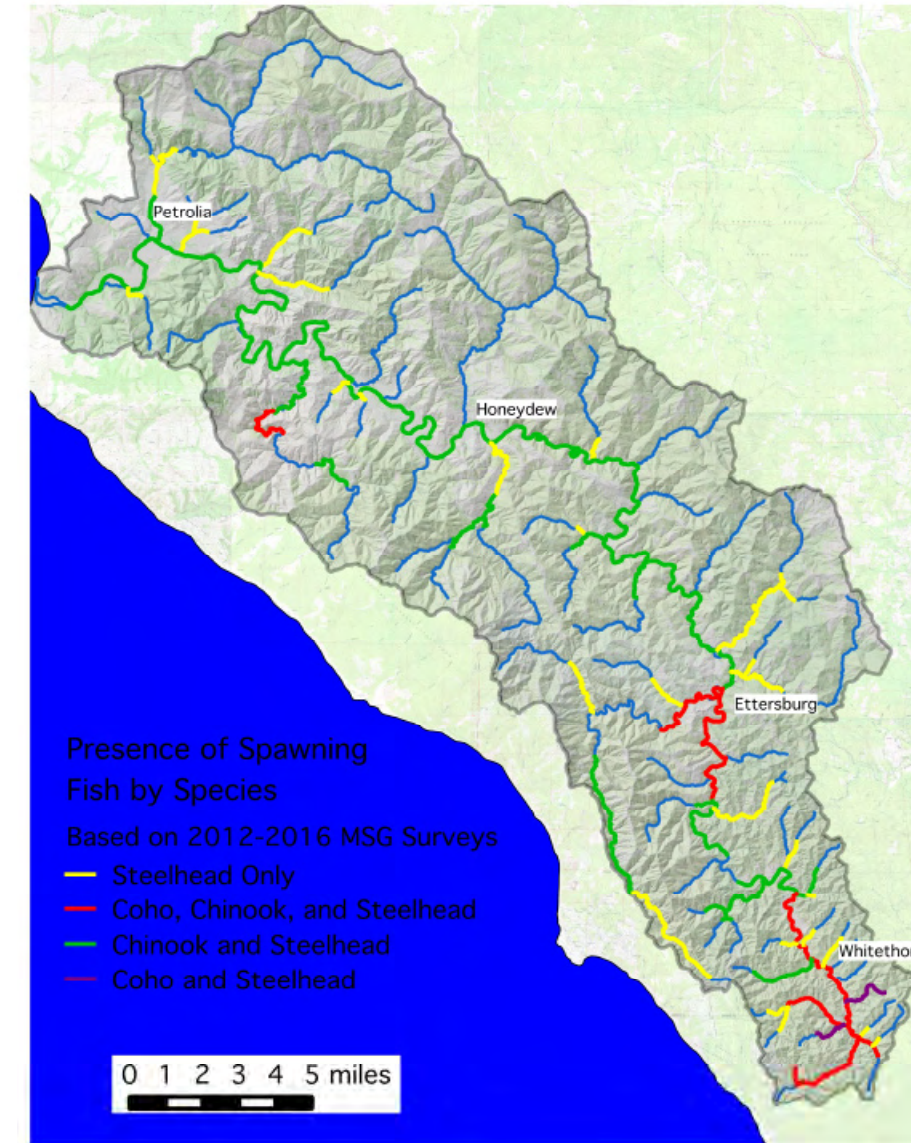
Recall that each female salmon typically builds one redd, so doubling mean redd estimates can give you a rough estimate of total numbers of adult Chinook per year for these last two winters. All maps and graphics this article by Nathan Queener.



In the winter of 2015-16 no live coho salmon were seen, so the redd population estimate is zero, although six carcasses (the most since the 2006-07 season) were recovered by surveyors.

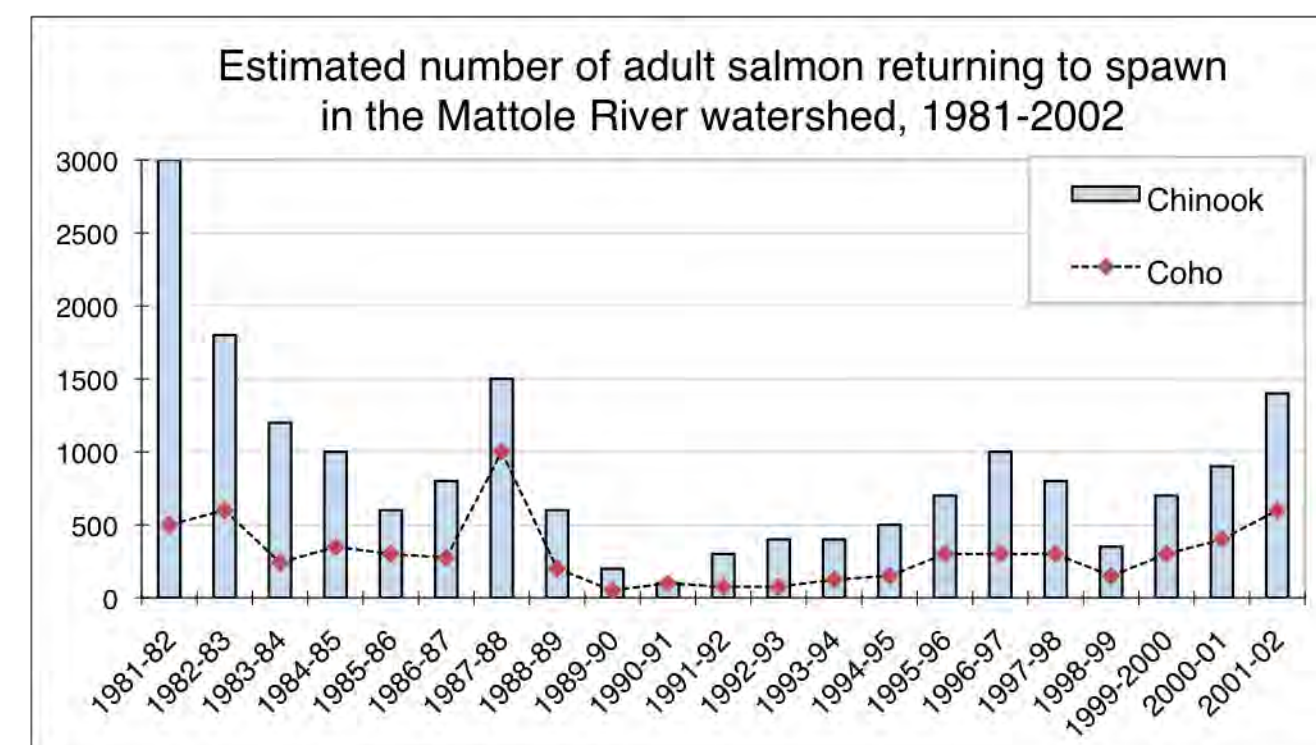


The winter survey season is driven by the need to primarily assess salmon, not steelhead. Thus the survey season typically concludes at the end of February, which is prior to the peak of steelhead spawning; as such, steelhead redd population estimates are a significant underestimation of the total number of winter-run steelhead in the watershed.



So How Many Fish are There?

Chinook - known to many residents as king salmon - mean redd population estimates from the last four winters ranged from 331 to 988, leading us to believe that the number of adult fish was likely over 500 in all years, and greater than 1000 in 2013 and 2014. These numbers compare fairly favorably with Chinook population estimates for the past 30 years. From 2012-2015, evidence seems to suggest that we had Chinook salmon returns as large as any since the mid-1980s (see graph below showing 1981-2000 estimates,) although we should note that the estimates for the two periods were arrived at using very different methods. (In 2012, the MSG began using the survey approach described in California Department of Fish and Wildlife's Coastal Salmonid Monitoring Plan; see article in the winter/spring 2016 Mattole Watershed News.)



Above: Escapement estimates made by Gary "Fish" Peterson using information from spawner surveys, adult weir counts, talking to anglers and locals, and best professional judgement.

"The number of adult Chinook was likely over 500 in each of the past four years, and greater than 1,000 in 2013 and 2014.

Evidence seems to suggest that from 2012-2015, we had Chinook salmon returns as large as any since the mid-1980s."

"As for coho, the loss of the Mattole coho population is a very real possibility...

Their continued presence is no small miracle."

Where are the Fish?

The greatest numbers of adult Chinook over the last four years have been observed in the South Fork of Bear Creek, Thompson Creek, the Mattole River in the Whitethorn Valley, and Sholes Creek (a medium sized tributary flowing east from Wilder Ridge). Chinook spawning seems to be fairly well distributed in larger streams throughout the watershed, notable exceptions being Mattole Canyon and Blue Slide Creeks, where we have not documented any Chinook spawning recently.

Coho salmon numbers are much, much lower, with adult numbers apparently less than 50 individuals over the last four years (see middle graph on page 4. The slightly higher estimate in 2013 is likely an over-inflated estimate, a quirk of the strange dry winter we had in 2013-14.) These low numbers are corroborated by summertime dive data assessing the presence of juveniles spawned by adults (see map, above). Both wintertime spawner surveys and summertime juvenile surveys indicate that nearly all coho salmon in the Mattole spawn and rear over the summer in the Whitethorn valley.

With this few coho returning every year, and nearly all of them spawning in just a few stream reaches, the loss of the Mattole coho population is a very real possibility. Restoration efforts over the last decade have been heavily focused on improving coho habitat, especially in regards to increasing summer streamflow

See "Where Are The Fish?" - continued on page 11

Restoring Groundwater: A Vision of a Resilient Watershed

By April Newlander, Sanctuary Forest, Inc.

An emerald green river winds through the ancient forest. Countless juvenile salmon find refuge in the shaded, cold pools of the headwaters as they await their journey to the sea, and later return home to spawn. This is the folklore of the Mattole River watershed. Sadly, the story today has changed dramatically. Past and current land-use practices, combined with changing climatic conditions, have altered the hydrology of the watershed, resulting in entrenched streams, low summertime flows and disconnected pools. The Mattole River headwaters is critical rearing habitat for threatened juvenile coho salmon who over-summer there, and poor conditions have left thousands of salmon stranded to die. In addition to ecological impacts, water quality and quantity have been compromised for residents who rely on pumping from the river for their everyday uses. In response to this crisis, Sanctuary Forest has been working with our community and collaborating agencies and organizations to restore summer streamflow to the river: to bring back historic salmon populations, and to build a resilient watershed for fish, wildlife and people.

From 2012 through 2015, Sanctuary Forest implemented the Baker Creek Groundwater Recharge & Coho Habitat Recovery Project, a pilot project where instream habitat work resulted in the return of spawning coho after none had been observed there for five years. The project aimed to increase groundwater storage and streamflow by raising the stream and reconnecting it to its floodplain. Due to the extent of entrenchment—the stream had actually down-cut into the bedrock—the increase in groundwater storage was only 50% of expected and not sufficient to provide adequate water for fish and people in extreme drought years. In the spring of 2015, the Baker Creek collaborative team (Sanctuary Forest, Mattole Salmon Group, BLM, USFWS, NOAA Fisheries, and consulting engineers, hydrologists, fisheries biologists and fisheries resource agencies) began planning for a terrace groundwater recharge project adjacent to the instream project at Baker Creek. This project consists of installing five groundwater recharge ponds with the potential to increase groundwater storage by 10 million gallons. Thanks to a grant from the Wildlife Conservation Board (WCB), Sanctuary Forest will implement this project in the summer of 2016.

The planning process for the design of the groundwater recharge ponds is no small feat. Site assessment includes the installation of soil test holes, groundwater monitoring, analysis of soil depth and soil clay content, and a topographic survey of the land. The terrace project is located upslope from Baker Creek and the five ponds are designed with the topography of the land: with overflow from the top pond filling the next pond downstream and so on to the pond at the lowest elevation, which will then overflow into Baker Creek or slowly infiltrate into the ground. Assessing the soil depth to bedrock is crucial in the planning process, as it determines the capacity for groundwater storage. For example, when a creek is incised down to the bedrock layer there is a limited capacity for groundwater storage (See Figure 1, panel b). Creating ponds upslope from an incised stream where depth to bedrock is deeper creates a larger reservoir for groundwater storage and raises the adjacent groundwater level. In turn, the wetland habitat around the creek expands and creates more wetland vegetation and an increase in the water-holding capacity of the soil. Our methodology is based on scientific studies and groundwater and rainwater harvesting techniques from the Mattole and other parts of the world, including the work of Tarun Bharat Sangh in Rajasthan, India, a grassroots group who revived the centuries-old technique of installing johads (check dams) in the streams and ponds in swales to capture rainwater and recharge groundwater.

Sanctuary Forest has been working with collaborating partners for over six years on groundwater recharge and coho habitat recovery projects, but has been hampered with the obstacles of permitting and funding for such projects. The California Water Action Plan addresses the urgency for innovative solutions to drought, and was the foundation for Proposition 1, the 2014 water bond that provided \$2.7 billion for water storage projects. The Proposition 1 Stream Flow Enhancement Program administered through the WCB has created a pathway for funding the Baker Creek Terrace Groundwater Recharge Project. Additionally, a simplified and faster permitting process for small-scale restoration projects has been facilitated by the Habitat Restoration and Enhancement Act, and the Regional Water Board is now formally assisting restoration groups with permitting, a request made ten years ago from our partner organization,

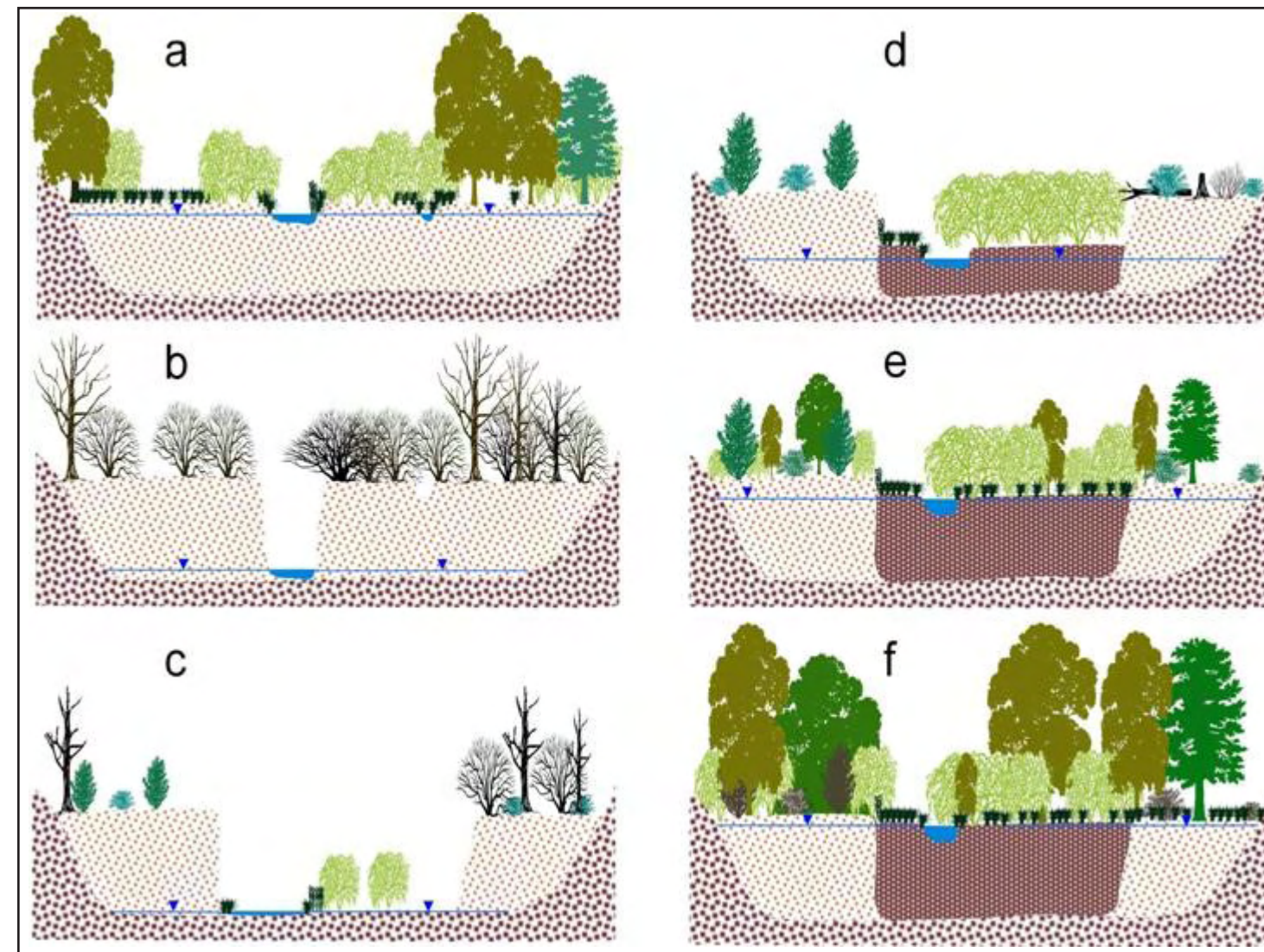


Figure 1, above: Process of stream entrenchment and loss of groundwater storage (panels a,b,c). Process of reconnecting stream and floodplain and restoring groundwater (panels d,e,f). Note: The Baker Creek project area had entrenchment similar to (b) and the instream habitat project results were similar to those shown in panel (d), with the stream elevation raised up halfway to its floodplain for approximately 500 feet of stream channel. Figure courtesy of Michael Pollock.

Below: Location of one of the groundwater recharge pond sites along the swale. Photograph courtesy of Sanctuary Forest.



the Mattole Restoration Council. These new pathways for permitting and funding represent a major breakthrough for implementing strategies for innovative solutions to drought. Sanctuary Forest would like to express gratitude to the North Coast Regional Water Quality Control Board and WCB for making it possible to implement the Baker Creek project this summer. We further acknowledge our community, collaborating partners and funders who have helped us realize our shared dream of restoring drought resilience to the Mattole River watershed.

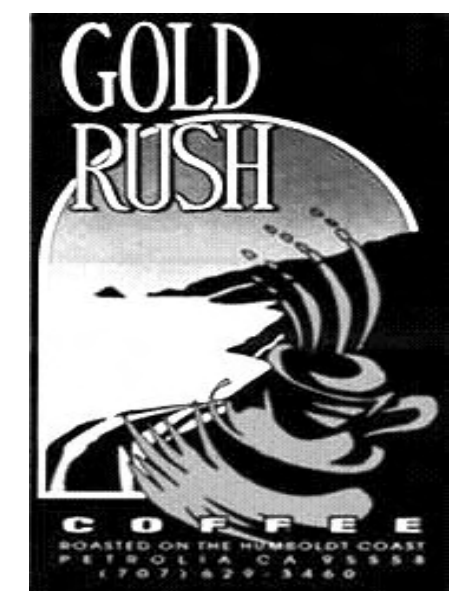
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MRC Has a New Native Plant Nursery

High-quality native plant materials, using local genetic plant stock, are the foundation of all the Native Ecosystem Restoration projects we implement in the Mattole. The Mattole Restoration Council's native plant nursery has been operating for over 10 years and has provided over 300,000 native plants for our ongoing riparian, coastal prairie, and oak woodland restoration projects. To address the need for more space to grow more native plants for our projects, we moved the nursery and broke ground on our new native plant nursery site in March of 2016. As of July we have successfully moved the nursery and constructed a new native seed processing and storage building, two greenhouses, a shade house, and a native plant demonstration garden.

The new nursery will give us the capacity to grow over 200,000 native plants annually, develop a willow coppice nursery for the Mattole Estuary project, install native grass row crops for seed production, and provide a place for local landowners and students to learn about the importance of native plants. In the coming months we will install a solar electric system and a rainwater catchment system that will hold 12,000 gallons of water for our propagation activities. If you are interested in volunteering at the native



The Upshot of the Pilot Mattole PTHPs

By Ali Freedlund, Mattole Restoration Council

When the Mattole Restoration Council took on the process of developing the Mattole Program Timberland Environmental Impact Report, or PTEIR, a main goal was to create a lower-cost alternative to a standard Timber Harvest Plan (THP) for landowners wanting to carefully harvest their second-growth forests without incurring the expense of a standard THP. We knew that this expense often forced landowners to harvest beyond what they wanted in order to make it worthwhile. The Mattole PTEIR was approved in 2011 after four years of input from landowners, organizations and agencies.

Concurrently, three pilot Program Timber Harvest Plans (PTHPs) were developed through the Mattole PTEIR with between full (\$15,000) or partial (\$9,000) grant funding in pursuit of this new permit process to ascertain the value to landowners. Choosing a Mattole PTHP is a voluntary process open to Mattole landowners who agree to stronger watershed protections in return for an easier and thus less-expensive permit process. What we are finding through the evaluation of these pilot PTHPs, which are all relatively small, is that the cost of the development of the PTHP permit (approximately \$15,000) is a small savings over a standard THP (\$30,000-\$40,000) but what remain significant are the overall operational expenses of harvesting timber in remote areas. Logging costs are the biggest expense, and much will depend on the size of your plan, the type of harvest (i.e., selection is more expensive in a bid than clearcut), and the quality of your trees. Hauling costs, the next biggest expense, depend on your distance from a mill or, ideally, on whether or not you can find an alternate market for either your hardwoods or conifers.

There are other reasons to harvest timber besides banking on a financial return: reducing fuels, increasing stand vigor, and/or offsetting road and other restoration costs were some of the goals included in the pilot PTHPs, all three of which have now been completed and evaluated. The plans include one in Ettersburg (the Wilson PTHP), and two in Whitethorn (Whitethorn Grove PTHP owned by Sanctuary Forest Inc., and the Metz PTHP owned by Lost Coast Forestlands). The table at the top of page 9 displays some of the attributes of the individual plans. Usually, the smaller the size of any timber harvest plan, the harder it is to make a return. All of these PTHPs were below the size we would recommend in planning a harvest for revenue. The conifer composition is important, as a redwood (RW) log receives a higher price than a similar-aged Douglas-fir (DF) log. Factors that affect overall profitability include size of the plan, price at the mill (which can be affected by defects in the wood, as determined by the mill), logging and hauling costs, and whether or not a local or niche market can be found. Most important in considering a harvest from a feasibility standpoint is the cost of the logging and hauling in our remote area. Because of the limited seasonal window that loggers can contract with landowners, smaller remote plans are not as attractive when put out for bid. Therefore, working in tandem with other landowners to secure more of a package deal is suggested and did work for all three PTHPs. Finally, we found that selection forestry is considered more difficult and less lucrative when putting a project out to bid to a logging contractor (who also hauls). A typical clearcut THP could close a logging bid for \$140/thousand board feet of lumber, whereas a small remote selection plan might not get a bid for under \$240/thousand board feet. And the haul hurts as well, averaging an additional \$142/thousand board feet for the two plans that supplied industrial mills.

Additional important considerations for all 3 PTHPs

Prices for logs fetched a generally good to high price: between \$450-\$540 for Douglas-fir and \$650 for redwood. However, since the PTEIR approval, one of the three local industrial mills has closed, leaving less flexibility in the log price.

Logging and hauling costs accounted for 80-90% of total revenue for the two plans that shipped to local mills, but if the harvest were larger (what we originally wanted to avoid but would be fine if it were on a larger property), the percentage would decrease, making profit margins higher.



Above: Whitethorn Grove, post harvest. Photograph by Galen Doherty

Very little expenses were necessary for road maintenance and upgrade, which can be daunting depending on the condition of your roads and stream crossings.

Local or Niche Markets

MRC had hoped that sourcing some kind of niche market for our wood products would not only help a landowner's bottom line but would boost the local wood products industry and marketing in general. We had researched the ability to "brand" PTEIR lumber to help offset hauling/logging expenses, but the reality is that there isn't a reliability of product supply sufficient to justify a brand at this time, since no additional PTHPs have been submitted. That said, all three PTHPs benefited from either a local or niche market. The Wilson plan was fortunate to sell hardwood logs to a neighbor that operated their own firewood processor, barely covering the expense of logging the hardwoods, which typically is paid for with conifer revenue. Both Whitethorn plans were fortunate to benefit from selling hardwood logs to our local lumber mill and yard, Whitethorn Construction.

Moving Forward

All in all, we are finding what we already knew: that timber harvest in the Mattole is generally not lucrative due to our remoteness from mills; that local or niche markets can help a harvest's bottom line; and that parcels with well-stocked forests (100+ acres or more) might be the only feasible properties to harvest with a PTHP or a THP, unless you have redwood. So, if you are needing to manage your larger forests to increase their vigor through a selection harvest, a PTHP permit will save some of the expense. Finally, because of the difficulties in contracting a logger, it would benefit landowners to work together on timing harvests to attract a better price through a package bid and to increase the capacity for local processing.

PTHP name	# of Acres	Conifer Composition	Price Lost through Defect	Local or Niche Markets	Profit above Permit cost?
Wilson	67	100% DF	unknown	Hardwoods only	No
Whitethorn Grove	20	70% RW, 30% DF	5%	Yes-read on	No
Metz	61	100% DF	9%	Yes	No

The Whitethorn Grove Property

By Galen Doherty, Sanctuary Forest, Inc.

Last summer, the final and smallest pilot PTHP was implemented. Located just outside the town of Whitethorn in the Mattole headwaters, the Whitethorn Grove restoration harvest was a one-time re-entry into a maturing stand of second-growth redwood with mixed Douglas-fir and hardwoods. The goal of this project was to restore the forest to healthy (lower) stocking levels to accelerate the return to old-growth conditions. For Sanctuary Forest (SFI) this project was meant to help achieve our stewardship goals for the property and to demonstrate what active land stewardship can look like, without losing money.

Due to important resource protection needs on this site, rubber-tracked equipment was required so as not to disturb the forest floor. In addition, this project used some of the best timber fallers available in Humboldt County to ensure minimal damage to the surrounding trees. All of this resulted in a very costly project, but enabled us to achieve a very low impact harvest.

Sanctuary Forest's longtime partner and forester, Tim Metz (RPF, Restoration Forestry) coordinated the harvest, and in a stroke of good luck, also located a niche market in Forever Redwood, a sustainably sourced redwood outdoor furniture manufacturer located in Sonoma County. Metz was able to negotiate for a very short haul time (8.5 miles one way) from the Whitethorn Grove, significantly reducing costs. Thus, despite the high costs, by utilizing the value-added market and working with a diverse array of partners, Sanctuary Forest was able to come out ahead on this project. However, had it not been for a grant-funded permit process for the pilot PTHPs, the Whitethorn Grove plan

would have been a financial loss.

At the same time, Sanctuary Forest was working with the Natural Resources Conservation Service (NRCS) and the CA Department of Fish and Wildlife on everything from stream habitat improvement projects, a substantial road upgrade, and comprehensive forest stand improvement and fuel load reduction projects on the portions of the property outside of the PTHP. The revenue generated from the harvest was directly reinvested into these stewardship projects, ensuring their successful completion. Through collaboration, perseverance, and a little bit of luck, we experienced success on all levels: creating a demonstration property to teach others ways to be active stewards of the land on which they live.

Sanctuary Forest is dedicated to working with landowners to find ways to make it economically viable for them to actively steward their land. Through our working forest conservation easements, we have been able to cut the costs of land ownership and promote sustainable forestry, keeping land in production and out of development. In addition, working with agencies such as NRCS and CalFire, landowners can secure financial assistance to enter younger stands of mixed forest and increase forest health and conifer stocking levels through forest thinning, fuel hazard reduction, and replanting. While these programs may not give forestland owners what they need financially to harvest today, it can enable them to actively steward their property, reduce the risk of wildfire, and ensure the stocking needed to sustainably harvest their forests in the future.



Educating our Children: A Lasting Legacy

By Eric Shafer, Sanctuary Forest, Inc.

"When we try to pick out anything by itself, we find it is hitched to everything else in the universe." ~ John Muir

When asked to pretend they are wild salmon about to embark on a perilous journey, young children can engage their imaginations and thoroughly enjoy the experience. Learning while having fun is the philosophy behind a series of lessons being prepared for implementation this fall at Whitethorn School. Whitethorn School became a participant in Sanctuary Forest's Storage and Forbearance Program in 2013, providing an on-the-ground example for students to learn about the importance of water conservation and stewardship. The lessons will provide students with an opportunity to become knowledgeable ambassadors and be able to share the reasons why Whitethorn School became a participant in the Storage and Forbearance Program.

Storing abundant seasonal rain in tanks conspicuously located on the Whitethorn School grounds allows the school to meet its needs for clean, treated water even when the Mattole River, the school's water source, is flowing slowly. Prolonged dry weather creates drought conditions that endanger young salmonids in the Mattole. By abstaining from pumping this scarce resource when the amount of flowing water reaches a predetermined critical low-flow rate, the school and Southern Humboldt Unified School District have made a legally binding contract to comply with the Storage and Forbearance Program. The program is based on the dedicated stewardship goals of Sanctuary Forest: to preserve the flow of the river, help protect endangered salmonids, and improve the health of the delicate Mattole River ecosystem.

Sanctuary Forest was awarded a grant from the California Department of Fish and Wildlife as part of their Fisheries Restoration Grant Program. A component of the grant is to provide outreach education in Mattole elementary schools. The lessons developed about forbearance will satisfy the grant requirements and be available to schools throughout the Mattole and Eel River watersheds. Field trips to Whitethorn School will enable this model of forbearance to inspire others, and potentially benefit humans and wildlife in the Mattole watershed and beyond.



Sign at Whitethorn School's water conservation project. Photograph courtesy of Sanctuary Forest.

To comply with this component of the grant, retired teachers and members of the Sanctuary Forest Board of Directors Eric and Victoria Shafer have compiled factual information and lesson plan ideas from the Mattole Restoration Council's Mattole Ecological Education Program, the Bureau of Land Management's King Range office, the Lost Coast Interpretive Association and the Mattole Salmon Group. A modified version of a Project WILD lesson called Hooks and Ladders will be used to reinforce information taught to the students in the classroom. They will learn about the life cycle of the salmon, identifying its stages of development: egg, alevin, fry, parr and adult. The game also gives participants a simulated experience, from the perspective of a fish, to encounter the challenges faced when these anadromous beings return from the ocean and spawn in the river where they were born. Sharing a variety of stories from various cultures of people who have lived in close relationship with salmon throughout human history will enrich and expand the students' awareness of the significance of these fish. A fun, competitive team game of "Jeopardy" will allow students to showcase their learning and further reinforce the information presented in the lessons.

The lessons—walking field trips to the Mattole River—and guided tour of Whitethorn School's water storage system are anticipated to empower students and motivate them to share their knowledge. As children mature and become aware of the challenges faced by humankind, they need to feel that they can make a positive difference. Knowledge about the interrelationships and interdependence of all life forms, and the need to protect and preserve the fragile ecosystems that sustain our lives and the lives of all other species on earth, are values we need to impart if we want to pass down to our children and grandchildren for generations to come a legacy of loving stewardship.

Staff and Intern updates at MRC's Native Ecosystem Restoration Program

By Hugh McGee, Mattole Restoration Council

Our incredible AmeriCorps Watershed Stewards Program members Chris Harris and Veronica Yates will be finishing up their 11-month term at the Mattole Restoration Council in August. Also, our Native Ecosystem Restoration intern Sean Rowe has finished his 6-month internship with the MRC and will be hired on as staff to help coordinate seed collection projects this summer. These three have been absolutely essential in completing many of the projects we implemented this year. They have braved the rain, wind, and poison oak to help us complete many high-priority restoration projects in the Mattole and King Range National Conservation Area including:

- Installation of 12,000 riparian plants on the Lower River Riparian Project and Baker Creek
- Installation of 20,000 grass plugs and seedlings on Prosper Ridge
- Installation of 2,000 plants on the Salt River Restoration Project
- A successful move and re-build of our Native Plant Nursery including the start of our native plant demonstration garden
- Propagation of native plants at the nursery for next fall's riparian and grassland work
- Ongoing maintenance of our seed farms
- Fuels reduction work on Mill Creek
- Sudden Oak Death monitoring throughout the Mattole, and
- In-class and field education of Mattole students.

Quite a resume for the short time they have been with us.



Thank you Chris, Sean, and Veronica!

Please welcome our new NER interns Mae Maclean and Taylor Cain, who will be helping us out on projects this summer. Mae grew up in Ventura, CA and will be graduating from HSU in 2017 with a BS in Environmental Science with a focus on restoration.

Taylor grew up in Kelly, ID and will also be graduating from HSU in 2017 with a BS in Environmental Science with a focus on restoration. Welcome to the team, Mae and Taylor!

Where Are The Fish? - continued from page 7

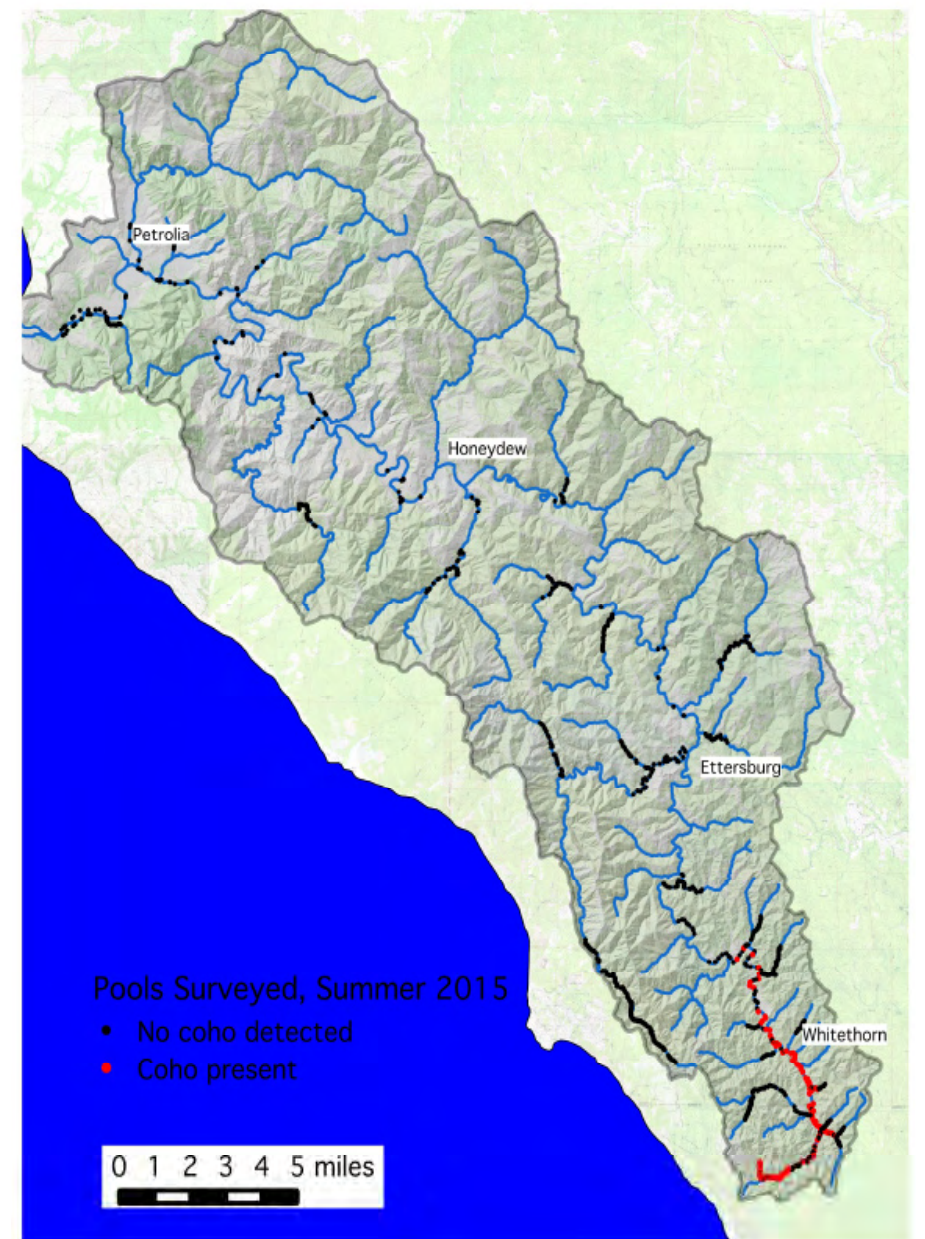
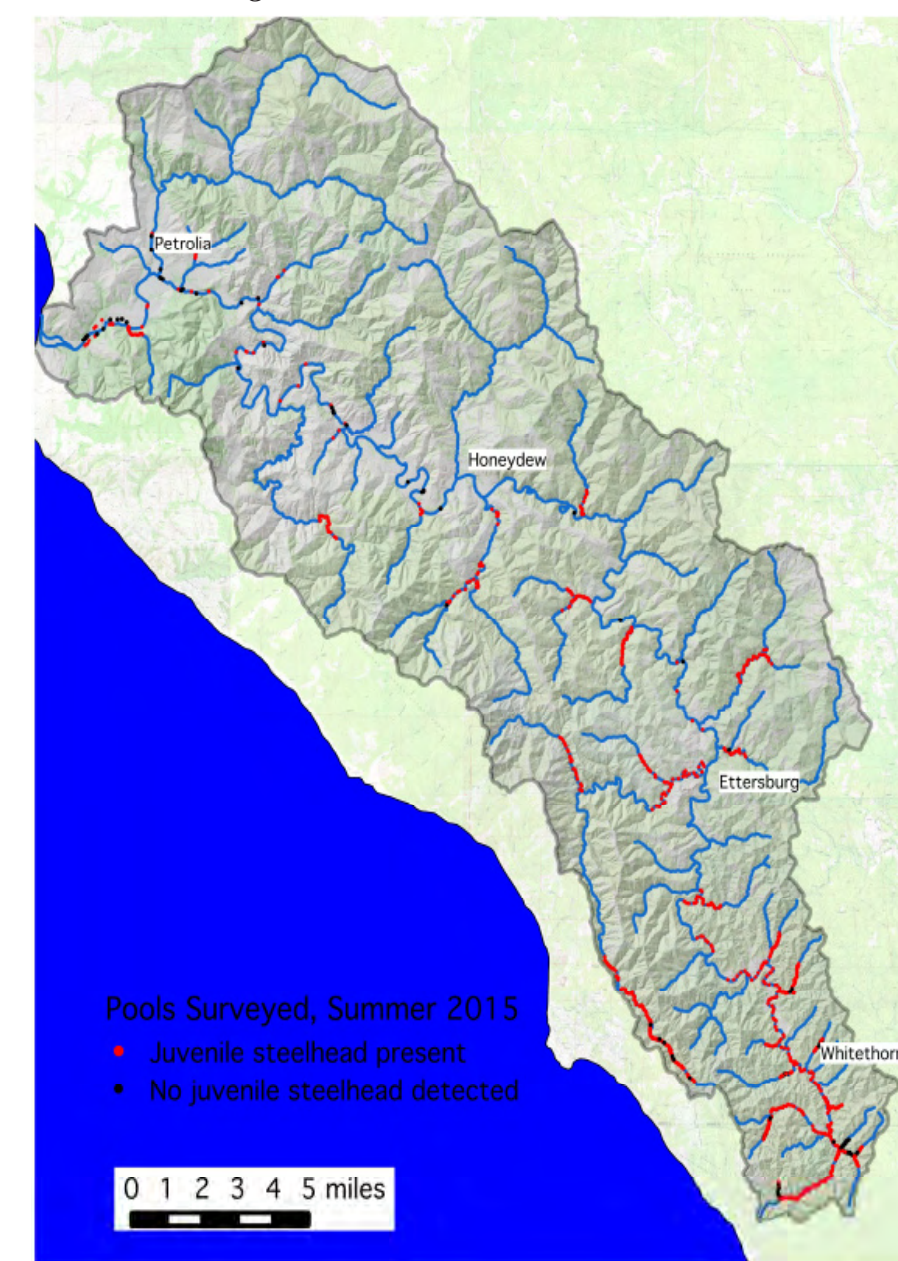
and placing wood in streams to provide better rearing habitat for juveniles. While we certainly have not seen an increase in the population, their continued presence is no small miracle. The redd population estimate of zero from this past winter might cause justifiable concern, and while we saw no live coho nor coho spawning, we did find six coho carcasses - the most found of this species since the winter of 2006-2007. Our summer snorkel surveys are just getting underway for the summer of 2016, but we have documented juvenile coho in multiple tributaries, so thus far their numbers seem to be comparable to the last three years.

Steelhead, in contrast, seem to be nearly everywhere (as shown on the map of juvenile distribution below,) and the redd population estimates from the last four years indicate that returning adults number in the thousands, not hundreds. Surveys cease at the end of February, which is probably not even yet the peak of steelhead spawning in the Mattole, so there are likely at least twice the numbers shown. And because our efforts are designed to target the more-threatened salmon species and thus primarily survey salmon habitat, we are not seeing the many steelhead that spawn in steeper tributary streams outside of our survey universe. Steelhead have probably benefited greatly from decreasing erosion and sediment in the river in the last few decades, and their population seems likely to remain stable if sediment levels continue to decline and juveniles have ample streamflow for summer rearing.

In summary, the current adult Mattole coho population appears to number less than 50 individuals; adult Chinook returns in the last four years have been between 500 and 1,500 and appear to be slightly more abundant than most years of the last few decades. Mattole River steelhead are all over the place and number in the low thousands. The continued efforts of watershed residents and landowners to care for the Mattole's land and waters are essential to ensure that these creatures grace us with their presence every winter.

Survey work and data analysis was made possible by funding and support from the Arcata office of the Bureau of Land Management, the California Department

Below: Map of juvenile steelhead observations for summer 2015. As you can see, in summer 2015, we observed juvenile steelhead essentially everywhere we looked. Juvenile steelhead are distributed throughout the watershed.



Above: Map of juvenile coho observations for summer 2015. In summer 2015, all observations of juvenile coho salmon were in the Mattole headwaters.

Below: Nick Tedesco collects a tissue sample from a coho salmon in Baker Creek, January 2016. Tissue is sent to a genetics lab for analysis of the Mattole population's relationship to other coho salmon populations in the region. Photograph by Nathan Queener.



Above: A pair of steelhead spawning in Baker Creek in January 2016. Photograph by Nathan Queener.

In Memoriam: Clarence Hagmeier (1944 - 2016)

A Dedicated Weed Warrior and Friend

By Unity Minton, Mattole Restoration Council

With great sadness, this year we said goodbye to one of the MRC's most dedicated weed warriors and board members.

When I think of Clarence, I see him covered in dirt, gloves and a weed wrench in hand, plowing through blackberry brambles and poison oak to pull that last scotch broom or tansy ragwort of the day. As one of our most dedicated restorationists, Clarence would work, rain or shine, paycheck or volunteer, to remove the numerous invasive plants that grow in the Mattole watershed. With dedication in his step and an indescribably deep and growly laugh, he could spot invasive weeds from a mile away and off we would go, scouring the countryside for those naughty weeds, taunting us from afar. Driving along the bumpy country roads to project sites in the Mattole, with Clarence in the passenger seat, there was not an invasive plant in sight that could escape our path.



Clarence Hagmeier. Photograph by Shinichi Iova-Koga

Clarence's passion for non-herbicide removal of invasive plants began long ago on the Salmon River, where the community banded together to manually remove knapweed in an attempt to prevent the Forest Service from using chemicals. This proved to be a success and the Salmon River Restoration Council has since dedicated their noxious weed removal efforts to remain chemical-free. With this experience and passion, Clarence came to the Mattole and spent many long hours working to keep the native ecosystem free of invasive weeds. Clarence held steadfast to his beliefs and ideals throughout his life and was one of the most fascinating

people because of it. With intelligence and wit, he could discuss many subjects for hours on end. In addition to his dedication to restoration work, Clarence was also a loyal father, grandfather and friend.

So, if you find yourself driving or strolling through the beautiful Mattole watershed and happen upon a pompous invasive plant waving its showy plumage in the wind, grab your gloves and give it a yank, and think of Clarence. For it was his love of the natural world, his passion for life, his spirit of adventure and that certain twinkle in his eye, that will live on in our hearts forever. 🐟

Are you Losing your Oak Woodlands to Conifer Encroachment?

By Hugh McGee, Mattole Restoration Council



An Oregon white oak above Granny Creek. Photograph by Hugh McGee

As with many of our prairies in the Mattole, many of our oak woodlands are overtaken by Douglas-fir and other vegetation due to lack of fire on the landscape. To address this issue, the MRC has partnered with an Oak Woodland Working Group, led by UC Cooperative Extension and local land trusts and non-profits to raise funding for oak woodland restoration on the North Coast. Recently, the group was awarded \$2.6 million to design and implement oak woodland restoration projects throughout the North Coast.

The MRC was awarded a portion of this funding to identify oak woodland restoration projects and work with landowners to develop oak woodland restoration projects. If you have California black oak and Oregon white oak woodlands on your property that are in need of restoration, you may be able to participate in the program. To set up a time for an assessment and to find out more, please contact Hugh McGee at hugh@mattole.org. 🐟

Helicopter Wood Placement: Summer 2016 in Mattole Estuary

By Sungnome Madrone, Mattole Salmon Group

Three years ago the Mattole Salmon Group hired a helicopter to place 200 whole trees in the lower river and estuary for fish habitat. The trees were Douglas-fir and grand fir that were choking out native meadows and raising fuel loads and fire danger. The removal of the trees was integrated into fish habitat.

Later this summer, we will be implementing a similar project. We will start tipping trees this July and August and hope to fly the trees with a Chinook helicopter in September. We will have a public presentation on this and the past project at the Mattole Valley Community Center in August. Look for announcements on Google Groups and a poster at the Petrolia Store. 🐟