NEWS FROM MARIN CONSERVATION LEAGUE

Nov - Dec 2022

Community-centered restoration

New life for Marin County's native plant nursery

Nona Dennis, with Aja Mathews

The first question that comes to mind when Marin County Parks (MCP) deploys a crew on an operation that will require major removal of, or disturbance to, vegetation on open space lands is: What will replace the cleared vegetation? Such operations might include burning rampant acacia on Old St. Hilary's preserve, creating defensible space to reduce fire threat to adjacent residences in Blithedale Canyon, or decommissioning redundant social trails on Mt. Burdell, Giacomini, Rush Creek, and other preserves. Upland saltmarsh species have been reintroduced to replace invasive non-native species at Hal Brown Creekside Park over a number of years. A milkweed patch to host monarch butterflies has been established at Pacheco Valle. Next up: In the not-too-distant future,

Native plant nursery, cont. p. 6

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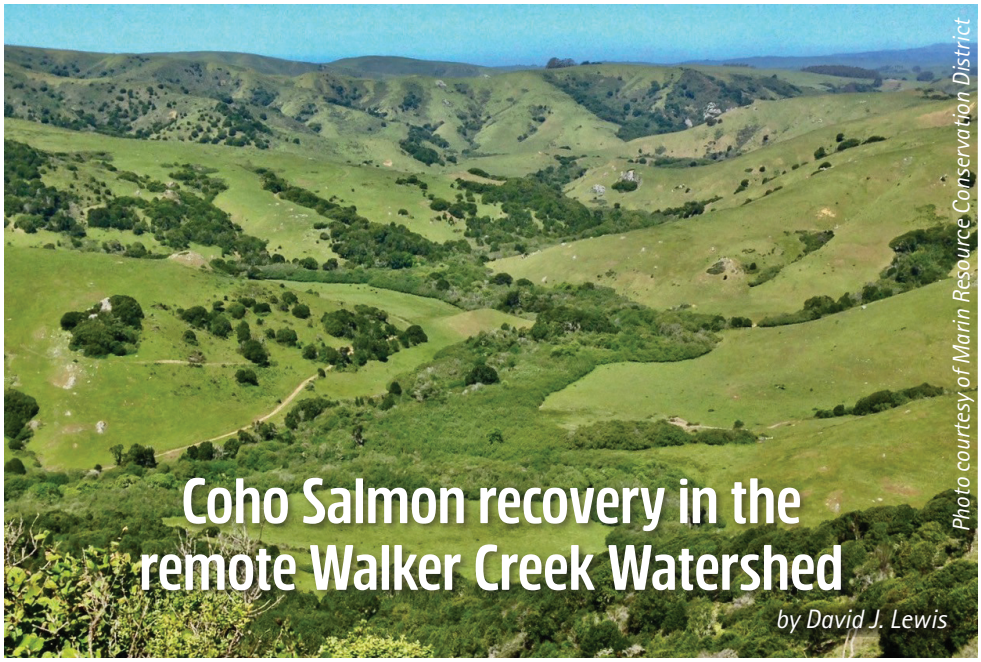


Photo courtesy of Marin Resource Conservation District

Coho Salmon recovery in the remote Walker Creek Watershed

by David J. Lewis

Located in a beautiful part of Marin County, the remote and rugged Walker Creek watershed has thickly vegetated stream corridors.

Threats, inspiration, hope

Amidst the evidence of shrinking and disconnected wildlife habitat, of decreasing diversity in plant and animal species, and of individual species on the brink of extinction, there are also stories of inspiration and hope—success stories of recovering both population size and geographic expanse of wildlife species. One notable example is the California condor (Gymnogyps californianus). As of 1982 only 23 condors survived, and in 1987 all remaining individuals were placed into a captive breeding program. Today the U.S. Fish and Wildlife Service and its partners have grown the population to 410 birds, and individuals have been reintroduced to locations in California, Arizona, and Baja California with successful breeding pairs in more than one location. Similarly under threat, the amount of genetic diversity, as well as the size, of Central California Coho Salmon populations have reached extreme lows. Prolonged periods of drought and climate change have exacerbated the numerous threats that have placed Coho survival in peril.

Coho Salmon (Oncorhynchus kisutch), specifically the Central California Coast Evolutionarily Significant Unit (See "CCC ESU explained", page 10), were listed as Threatened in 1996 and Endangered in 2005 under the U.S. Endangered Species Act. Similarly, the California Fish and Game Commission in 2005 listed Coho as Threatened north of Punta Gorda (west of Humboldt Redwoods State Park), and Endangered south to San Francisco Bay, adding to the existing 1997 Endangered listing for Coho from San Francisco Bay to Monterey Bay.

By the late 1990s it was confirmed that Central California Coast Coho Salmon were in decline throughout their range with remnant, compromised populations in the Russian River in Sonoma County, and in Scott Creek in Santa Cruz County. This triggered a combination of responses and interventions by numerous agencies and organizations, including the forging of partnerships and collaborations, protecting and restoring habitat, and breeding and release of individuals into high habitat-potential watersheds.

Walker Creek Watershed, cont. p. 3

President's Message

Key issues as we close out 2022

Last Last month, I wrote about current issues that Marin Conservation League is working on. Here are more:

- **Adapting State Route 37 to sea level rise** is a big project, literally and figuratively. The current highway acts in large part as a long dam with a road on top. It cuts through wetlands and has congestion and flooding that need fixing. What's not needed are "temporary" fixes that widen the roadway, cost a lot and will continue to block flow of water, sediment, and wildlife, long into the future. MCL along with other environmental organizations are supporting a proposed phased approach, with short-term fixes that are steps toward a longer-term elevated causeway solution that would help protect and restore large areas of valuable Bay Area wetlands. This is an evolving sea level rise adaptation and critical infrastructure project. Stay tuned.
- **Developing a Watershed Recreation Management Plan that also protects native habitats** is one of two current Marin Water (Marin Municipal Water District) planning processes underway. MCL is urging Marin Water to continue to focus its resources primarily on its purpose to secure and conserve water supply and maintain the biodiversity and health of its watershed. While we love recreation, we cannot afford to love these lands to death with excessive recreation. MCL has focused its advocacy for recreation on promoting a safe, comfortable experience for hikers and equestrians.
- **Ensuring water supply** is a second key Marin Water issue. While water conservation is environmentally the most efficient and responsible approach, we also know Marin will need a portfolio of water supply methods in an era of climate change. MCL has been tracking Marin Water's engineering study of supply options with an eye towards supporting options that both supply needed water AND protect the environment, including recycled water options and more regional collaboration on supply and storage.
- **Implementing the Greater Ross Valley Shaded Fuel Break with environmental sensitivity** is another important issue. The project is 38 miles long and up to 300' wide—up to 1300 acres of Marin's land surface. MCL has been participating with the Ecologically Sound Practices Partnership, and others, in advocating that the Marin Wildfire Prevention Authority adopt vegetation management guidelines that reduce wildfire risk while protecting native vegetation and biodiversity. Now that those guidelines have been adopted, we need to ensure the policies are implemented employing professional expertise, research and monitoring, and community input.
- **Connecting working lands to public lands** is crucial going forward. We strongly support improving the health of working lands, including their riparian habitats and woodlands that are foundational to biodiversity. As climate-change intensifies heat and drought, plant communities will move over time in response. Planning for connected open lands will allow plants and animals to have the room they need to move.
- In addition to advocating for planning for adaptation to climate change, MCL is advocating for effective ways to **rapidly reduce greenhouse gas emissions to slow the rate of climate change down**. One of those ways is through more rapid building electrification—using clean energy for space and water heating rather than natural gas (which emits methane, its primary component) and more rapid electric vehicle adoption in place of internal combustion engines. We are encouraging MCE Clean Energy and Marin jurisdictions to be statewide leaders with innovative clean energy projects that reduce emissions, that can be tested and proven, and that others can emulate.

While these are highlights of our work, we continue to advocate on other environmental issues in Marin, from stream conservation to restoration projects to housing that's compatible with the environment...and much more. Many thanks to our advocates in Marin Conservation League's Issue Committees: Parks & Open Space; Land Use, Transportation and Water; Climate Action; and Agricultural Land Use. If you want to participate in our advocacy, contact us. Let's talk!

Best wishes from Marin Conservation League for the holidays. We hope to see you at our holiday gathering in December and we hope you will consider renewing your membership before year's end. As always, we appreciate your ongoing support.

Robert Miller

Walker Creek Watershed *from page 1*

For those who have followed the plight of Pacific salmon in general, and more locally the status of Coho Salmon in Marin, you likely know of partnerships and efforts to safeguard and recover Coho and their habitat in the Lagunitas Creek watershed. What you may not know, is that some of those same agencies and local organizations, and in this case, many landowners, have formed a similar collaboration to realize Coho habitat potential in the Walker Creek watershed in hopes of increasing the species' ability to persist.

Recovery in the Walker Creek watershed

Walker Creek flows through a remote and rugged part of Marin's landscape. It connects the inland portions of Hicks and Chileno Valleys with the Creek's tidally influenced confluence with Keys Creek near the Highway 1 bridge, south of Tomales. Land use in Walker Creek is primarily agriculture and more specifically livestock agriculture, including pasture-based dairies and grass-fed beef operations.

Flows from the headwater tributary into Arroyo Sausal creek are regulated by operation of Marin Water's Soulajule Reservoir. Installed in 1979, the reservoir has a storage capacity of 10,572 acre-feet (capable of meeting the annual needs of an estimated 30,000 to 50,000 households). The entire Walker Creek watershed spans 76 square miles and approximately 35% of the Tomales Bay watershed. Historical accounts from the early 1900s indicate that both Coho Salmon and steelhead trout were present in high numbers in the watershed, although Coho were subsequently extirpated.

Representatives from National Marin Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), Marin Water Fisheries Program, and Marin Resource Conservation District (MRCD), have created a partnership for the recovery of Coho Salmon in the Walker Creek Watershed. The partnership includes the essential cooperation and contributions of ranchers in the watershed. Last July, MCL's Agricultural Land Use Committee hosted a meeting to learn more about the Walker Creek watershed and the inspiring story of collaboration by these partners to bring back Coho Salmon in the face extinction. (A full recording of the meeting is available at Marin Conservation League – YouTube channel, MCL Agricultural Land Use Committee July 2022 Meeting.)

Walker Creek watershed's Recovery Partnership

Wildlife recovery efforts invarably require coordination and collaboration between federal, state, and local entities. The differing and overlapping missions and jurisdictions, scales of influence and impact, and access to resources that can be deployed by these entities drives the impetus for joining forces and forming an integrated program. For the recovery of Coho in Walker Creek the partnership includes:

National Marine Fisheries Service, more commonly referred to as NOAA Fisheries, is an office within the National Oceanic and Atmospheric Administration "responsible for the stewardship of the nation's ocean resources and their habitat." It is NOAA Fisheries charge under the Endangered Species Act to recover protected recovery plan. And because California Central Coastal Coho Salmon are a species most at-risk of extinction, NOAA Fisheries includes them as a "species in the spotlight," establishing the 2021-2025 Priority Action Plan. Jodi Charrier, NOAA Fisheries Natural Resources Management Specialist, works with the Walker Creek partnership to bring the federal role for endangered species recovery.

California Department of Fish and Wildlife (CDFW) mission is "to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public." David Hines, as CDFW's Bay Delta Region Coho Salmon Recovery Coordinator, brings the State's plans and resources to the Walker Creek partnership. This includes networking with other watershed restoration and recovery efforts, including funding for stream enhancement, life-cycle monitoring, and Coho Salmon rearing and release strategies.

Marin Water and its Fisheries Program, through its commitment "to the conservation of the native aquatic species" in Marin watersheds, provides "programs to monitor the different salmon populations." Jonathan Koehler, Marin Water Fisheries Program Manager, and Eric Ettlinger, Marin Water Aquatic Ecologist, lead these efforts including habitat condition assessment and additional life cycle monitoring.

Marin Resource Conservation District (MRCD) is a local special district with an elected board of directors that has been carrying out its mission to "conserve and enhance Marin's natural resources." With this charge in mind, MRCD operates from the understanding that the health of Marin's natural landscape and the viability of an individual ranch and the entire agricultural community are interdependent. Nancy Scolari, Executive Director, and Sarah Philips, Urban Streams Program Manager, have led technical and financial assistance programs to restore and enhance habitat in Walker Creek and implement studies on habitat conditions and restoration opportunities.

The Walker Creek watershed is 97% privately owned. Therefore, the ranch families in the area are critical partners for successfully recovering Coho in Walker Creek. Their commitment, including cost-sharing for habitat restoration and support through access for monitoring, is a significant contribution to the partnership. This is in addition to their long-term experience in the watershed.

Walker Creek Watershed, cont. p. 4

Walker Creek Watershed *from page 3*

The projects

Recovery of an aquatic and anadromous species requires a watershed and multi-pronged approach. In the case of Coho Salmon, the species depends on access and use of different parts of a given watershed at different life stages throughout a three-year life span (see "Coho life cycle"). Understanding these life stages and their corresponding habitat needs underpins the Recovery Partnership's drive to learn more about Walker Creek's habitat potential for protection and enhancement to execute Coho releases in the watershed and monitor Coho response. Full descriptions of partner projects are available at the MRCD website. The following is a summary from MCL's July Agricultural Land Use Committee panel presentations.

Understanding habitat potential

"One of the rules for reintroduction of wildlife is to confirm that the habitat is ready to hold and support the species," explained Jodi Charrier, NOAA Fisheries Natural Resource Specialist. NOAA Fisheries, in its CCC ESU Recovery Plan, evaluated habitat suitability in Walker Creek and its tributaries based on stream gradient, barriers to movement for both adult and young fish, and stream temperature, among other factors. Mainstem Walker Creek and its tributaries were identified to have 67.6 miles of medium and high intrinsic habitat potential for Coho Salmon. (For comparison, Lagunitas Creek Watershed has 54 miles of similar habitat potential.) This effort confirmed that the watershed contained the needed habitat for recovery and was poised for successful reintroduction of Coho Salmon. The recovery plan, written in 2012, builds upon this habitat evaluation and confirmation, prescribing a set of voluntary habitat restoration recommendations and coordinated strategies for Coho Salmon releases. It also identified gaps in the understanding of the watershed, its habitat, and Coho response to habitat.

To fill some of the gaps in understanding, Marin Water is conducting additional habitat evaluation. A reconnaissance survey in the reach of Arroyo Sausal below Soulajule Reservoir and in Salmon Creek was conducted to answer two questions: Is there habitat for fish to use? and Are fish using the habitat? explained Jonathan Koehler, Marin Water Fisheries Program Manager. Specifically, the Marin Water team's spawner surveys in 2021 and 2022 to determine if adult fish had spawned in the late fall and winter confirmed that, in this part of the watershed, though the stream is well vegetated and shaded, Arroyo Sausal lacks gravel of the size spawning adults prefer at the ten identified riffles where fish would typically spawn. Signs of spawning in Salmon Creek, however, included seven "redds" (gravel nests) where either steelhead or Coho had spawned.

Photo: Kristen Kirkby

Coho life cycle

Over the span of three years, Coho Salmon hatch and rear in freshwater, migrate to the ocean and grow to full adult size, and return to their natal streams to spawn. As young-of-the-year, Coho seek refuge in deep pools among boulders and woody debris, feeding on insects and macroinvertebrates for their first year. In year two, during the late winter and early spring, they reach the smolt stage and leave the watershed for the ocean where they first feed on invertebrates and small bait fish, reaching mature weights of 8 to 12 pounds. When year three winter storms increase stream and river flows, adult Coho return to spawn and die. There are some exceptions to this three-year lifecycle, including young males that return to freshwater in year two and some adults that remain in the ocean for an extra year, returning to spawn in year four. However, the magority of Coho are genetically programmed in follow a three-year life cycle relative to other salmon species, making each cohort unique with little mixing across cohorts.

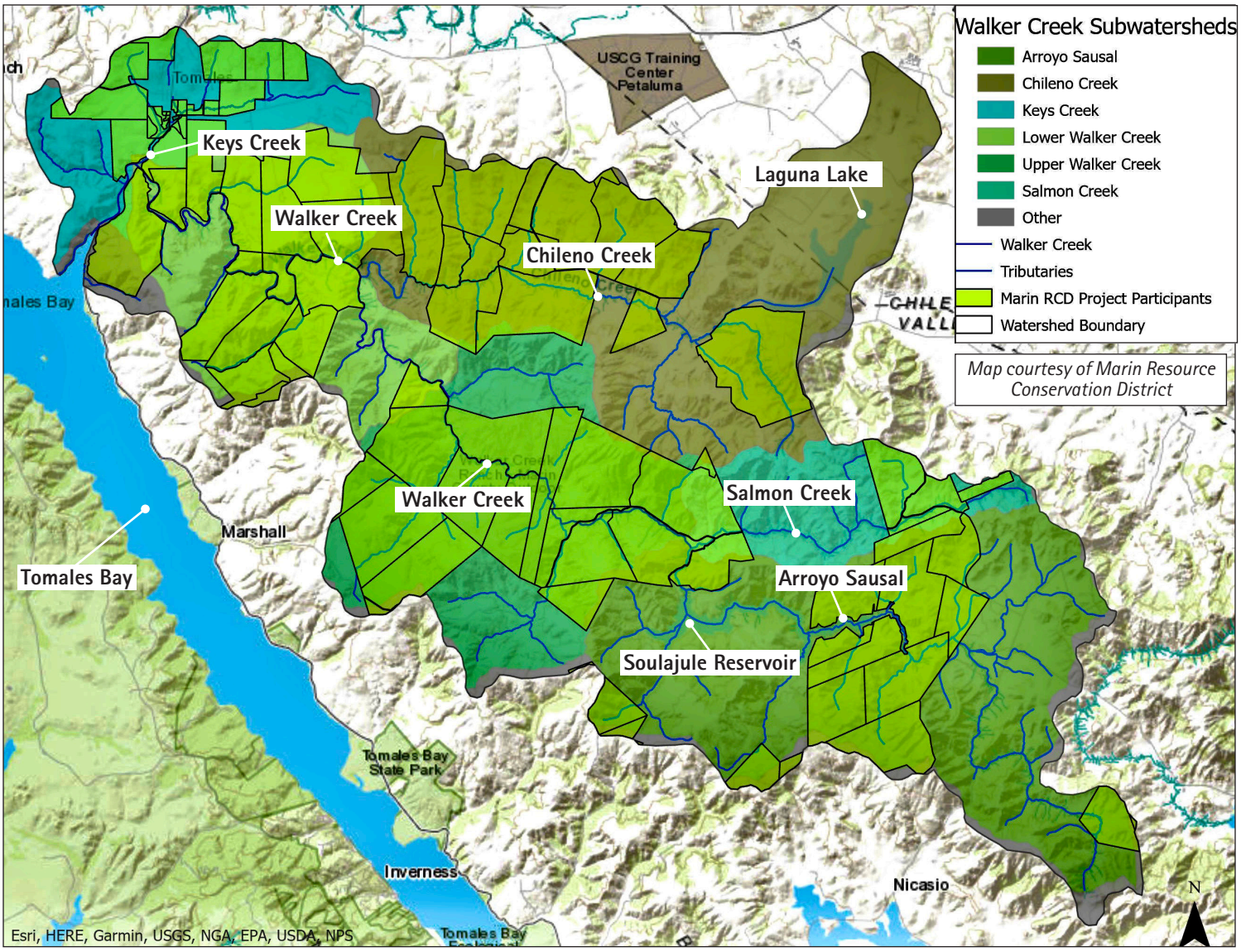
Marin Water is also documenting habitat connectivity and stream temperatures during extreme dry years and low flows, when releases are reduced from Soulajule Reservoir. During these years, Marin Water drops releases from Soulajule in half from 5 cubic feet per second (cfs) to 2.5 cfs. Monitoring reaches near the confluence of Walker and Salmon Creeks and the middle and lower portions of mainstem Walker Creek, in the summer of 2021, indicated that in all three locations the depth of flows over riffles, or the shallowest part of the waterway, were sufficient to allow for fish movement. Stream temperatures were warmest in the upstream reach and coolest in the lower Walker Creek reach. Marin Water is repeating these measurements this year, with the Soulajule reservoir full, to make comparisons.

Restoring habitat

Because the Walker Creek watershed is almost entirely privately owned "you probably don't see most of it," shared Nancy Scolari, MRCD Executive Director. However, it is an "amazingly beautiful part of Marin County with lush and vegetated riparian corridors." As early as 2001, MRCD organized planning efforts and outreach with ranchers and community members in the watershed. The outcome was the *Walker Creek Enhancement Plan*. Subsequently the MRCD has secured more than $4 million in grants to implement conservation practices and habitat restoration projects. MRCD has worked with over 29 ranch owners in the watershed to support different watershed studies and restore over 20 miles of stream. This work has been decades in the making. As Scolari related, "in Walker Creek it is very much about building trusting relationships with ranchers, starting small to build that trust that allows for bigger projects to be pursued." Working for more than 30 years in the watershed, MRCD and partners have built this trust and the resulting positive outcomes.

Another critical effort to improve Walker Creek habitat is the *Lower Walker Creek Floodplain Habitat Assessment and Design Project* being led by the MRCD and Prunuske Chatham

Walker Creek Watershed Conservation Project



More than 29 active ranch operations have partnered on stream restoration and other conservation practices as well as habitat monitoring.

Incorporated (PCI). One of the goals for this project is "to enhance or create off-channel habitat and in-stream complexity" explained Sarah Phillips, MRCD Urban Streams Program Manager. Work in other Coho-bearing watersheds has confirmed the important role of estuaries as rearing habitat for young-of-the-year. This project will grow the partnership's understanding of the potential for Walker Creek's intertidal portion to contribute to Coho recovery. It also will generate restoration design plans to realize that potential.

Coho releases

Recovering Coho Salmon in Walker Creek is not a new concept. In 1975, the option was studied in relation to the future operation of the then-proposed Soulajule Reservoir. And as recently as 2004, releases of adult Coho Salmon to Walker Creek were initiated by NOAA Fisheries and CDFW. This was followed by the only release of smolts in 2007, and the first release of juvenile fish in 2008. Annual releases of adults began in 2017 and for juveniles in 2010. To date a total of 1,157 adults, 3,400 smolts and 71,155 juveniles have been released in the watershed. These fish are from CDFW's Warm Springs Hatchery at Lake Sonoma and are offspring of captive brood stock from the Russian River, Lagunitas Creek and Olema Creek watersheds.

Monitoring Coho response

With habitat potential confirmed or being restored and Coho released to watershed streams, monitoring is a critical element to confirm recovery effectiveness. David Hines, CDFW Bay Delta Region Coho Salmon Recovery Coordinator, explained that to achieve the goal of "reestablishing a self-sustaining population of Coho in Walker Creek" answers to some key questions are needed, including: Are juveniles

Walker Creek Watershed, cont. p. 10

Native plant nursery *from page 1*

crews will begin decommissioning a maze of social paths and reconfiguring Larsen Creek in Roy's Redwoods Preserve, in order to consolidate public access and inclusive access, restore the natural floodplain, and replenish the denuded redwood forest understory with native flora.

Leaving these disruptions vacant is to invite weeds like non-native annual grasses, thistles, broom, acacia, or many other weedy species from surrounding lands to rapidly invade the newly open and disturbed soils, replacing removed vegetation. Which native plants (reintroduced) will begin restoring the disturbed land to natural habitat? And where can they be found? Not a new concept, and one that is integral to MCP's operations, that is, anticipating the actual disturbance area in advance and following up wherever possible by reseeding and/or replanting natives grown in several native plant nurseries in the Bay Area. The quick answer to the "where" question, currently, is a small but bountiful **native plant nursery** tucked in a far corner next to a complex of MCP field offices and equipment storage beyond the Marin Civic Center Lagoon lawns.

Story of revival

A year ago, the bare bones of a nursery greenhouse—tables, pots, and other miscellany transported in 2016 in the County's move from Lucas Valley—were just that: bare. Over the years, previous efforts to revive a local native plant nursery had languished from lack of funds and the lack of a champion. COVID halted any further efforts, although a trove of local native seeds had been collected over the years. All the more remarkable, then, that in the past nine months, since being hired as a nursery technician in the MCP's seasonal aide program last February, Aja (pronounced "Asia") Mathews, with prodigious labor and a natural affinity for engaging volunteers in the work, has filled the greenhouse with 6,600 young plants, representing some 50 species native to Marin, most of them ready for outplanting later this fall.

In two recent briefings before the County Parks and Open Space Commission and the Environmental Roundtable, Aja presented the fruitful results of the past nine months of work. The nursery itself has transformed during this time. Formerly empty shelves are now filled with equipment for processing seeds, and a stockpile of special potting mix lies next to a small soil steamer to ensure weed and disease-free growing media. A tiny office (the "seed shack") contains a small refrigerator full of bags of seed stored and/or stratified for future sowing. A tool shed constructed by Eagle Scouts houses clean pots, and a picnic table under a couple of redwood trees provides work space for groups of volunteers. Aja has hosted a wide range of groups at the nursery this year, including folks with autism, elderly volunteers, and many Marin Master Gardeners who are regulars. Sanitizer sprayers are ubiquitous, used to spray down shoe soles to prevent the spread of pathogens such as Phythophora ramorum (Sudden Oak Death). Other equipment, from trays to grow tubes, are clean and ready to receive seed and be nurtured by volunteers from germination to greenhouse to outplanting.

In the middle of the nursery space is a ripe patch of milkweed, with seed pods splitting and spilling out floss-propelled seeds, fluffed and ready for collection or wind dispersal. The most recent addition to the space is a demonstration garden boasting all natives grown in the nursery from seeds sourced in Marin. To accomplish all of this, the nursery has hosted over thirty volunteer events since mid-April of this year, totaling over 500 person hours. Numerous volunteers have

Photos of volunteers courtesy of Marin County Parks; other photos: Kate Powers

(1) Nursery volunteers collecting local seed, (2) clean gloves and sterile soil stored in the "seed shack", (3) germination tray of Woodland Strawberry, (4) nursery volunteers potting in grow tubes, (5) natives in shade tent ready for outplanting at Marin County Park restoration sites, (6) Monarch caterpillar on seed pods.

rallied to wash 10,000 pots, transplant over 6,000 seedlings and cuttings, and prune 3,000 plants. Truly a community-centered effort!

From collection to outplanting

At the picnic table during a recent tour of the garden, Aja sketched out the general process at MCP, from project concept to implementation to restoration. A project manager (often a landscape steward or volunteer coordinator), working with the nursery, establishes a timeframe of 12 to 24 months required by the nursery to prepare plants for outplanting. Seed, cuttings, bulbs, or other propagules of species for restoration must be collected, preferably on site, in the appropriate seasons—seeds at various times throughout the growing season, bulbs and cuttings during winter dormancy. Seeds are then pretreated for germination, often by stratification (chilling in moist media) or other means, sown in germination trays, potted in grow tubes or other receptacles, and nurtured in the greenhouse until ready for outplanting from October to January to take advantage of the rainy season. Hand watering during the first year's dry season is essential for the survival of many species. Remote restoration sites pose a challenge, but beyond that, the plants, all native to our Mediterranean climate, are on their own.

Restoration as reciprocity – a guiding ethos

Dig a little deeper with Aja, and one soon discovers the ethos that animates her efforts at reviving the Marin County Parks' small and previously semi-defunct nursery. Her work is grounded in a lifetime of being and working with both people and plants in the out-of-doors. She likens the nursery's role to the center of a Venn diagram that brings ecological restoration, aesthetic landscaping, and community outreach and engagement together all in one integrated whole. Quoting author Robin Wall Kimmerer ("Braiding Sweetgrass") as a mentor, she sees her work as ". . . ecological restoration [that] can be viewed as an act of reciprocity in which humans exercise their caregiving responsibilities for the ecosystems that sustain them." Collecting seed in the field with others, one of her favorite programs to lead, is just one of the activities that brings her closer to fulfilling that responsibility.

Like many seasonal aides hired by MCP every year, Aja brings a zeal for the outdoors that is born out of being in the outdoors most of her 32 years. Raised in Palo Alto, the second of three children and the only girl, she knew from an early age that she would work in the outdoors. The family backpacked frequently – Trinity Alps was a favorite destination – and hiked across nearby coastal hills to the ocean.

As co-president of her high school's environmental club, she encouraged her peers to "Go Green." Interested in immersing herself in the woods before diving into college, she spent a gap year with the Student Conservation Association in the Massachusetts Berkshires, where she cleared trails and taught environmental education in a local school. She was hooked on a life outdoors, and after her first two years of college, her mom sensed her restlessness in the classroom and proposed something that she herself had always wanted to do – take time off to hike the Pacific Crest Trail (PCT), all 2,650 miles of it from border to border. The five-and-a-half-month journey included plenty of pains and perils to overcome (blisters, mosquitos and lots of snow!) as well as abundant opportunities to rejoice in spectacular landscapes and relish the hard-earned rest of sleeping under the stars.

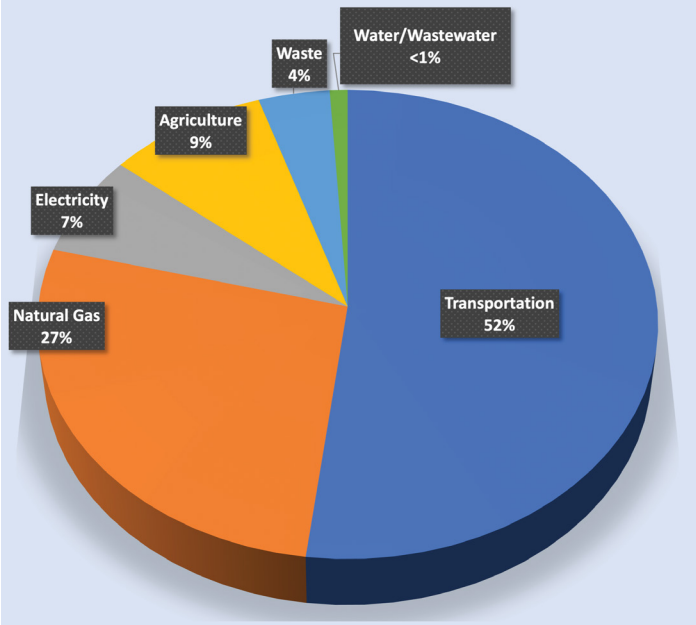
Life for Aja was not a let-down after the PCT. Upon finishing college, she took off again

Native plant nursery, cont. p. 11

Marin's Green Building Code Update By Kate Powers

On November 15, the County Board of Supervisors will consider adoption of Marin's Proposed 2022 Green Building Code Update. If adopted, the code will go into effect January 1, 2023. A key focus of the update includes a continued "ramping-down" of burning natural gas in buildings, as well as increased requirements to make buildings ready for electric vehicle (EV) charging infrastructure. Adoption of the Code will continue the County's transition toward decarbonization.

Marin County 2019 GHG Emissions by Sector



Data courtesy of Marin County Community Development Agency

The use of natural gas in buildings currently produces about a quarter (25%) of Marin's greenhouse gas (GHG) emissions, which include high levels of nitrogen oxide and create harmful indoor air pollution. Transportation emissions account for more than half (50%) of the County's emissions. Electrification of buildings – switching from fossil fuels to electricity for space heating, water heating, cooking, and clothes drying – and electrifying transportation therefore are both critical strategies in reducing GHG emissions. Rapid implementation could support long-term climate change mitigation as impacts become greater with each passing year from extreme weather-related events including drought, wildfire, heat waves and flooding, as well as sea level rise. MCL's May June 2022 newsletter describes more on the context of why building electrification is important.

The County, and all of Marin's towns and cities, have adopted Climate Action Plans that share California's climate goals of 40% GHG emissions reduction from 1990 levels by 2030 and achieving carbon neutrality by 2045. The greatest opportunity to cut GHG emissions from buildings is to eliminate onsite combustion of natural gas. The longer it takes to initiate significant progress toward building electrification, however, the more difficult and precipitous the intervention needed to achieve those climate goals. Currently, Marin's electricity mix is relatively clean, since the majority of it is generated from solar and other renewable energy sources. Switching to electricity to power homes automatically reduces carbon emissions, and carbon savings will increase over time as the grid continues to become cleaner due to the state's zero-carbon generation goals. Even better, switching now to MCE's Deep Green 100% Renewable Energy will increase carbon savings in the short term and eliminate fossil fuels altogether when a building transitions entirely to electric appliances.

If adopted as expected, Marin's Green Building Ordinance will go into effect on January 1, for all areas of unincorporated Marin County. Each city or town is responsible for adopting their own building codes. The countywide goal is for all of Marin's cities and towns 1) to pass building reach codes for new construction and renovations by year's end and 2) to adopt uniform building codes that are consistent across all jurisdictions. Coordination among the jurisdictions increases the potential for achieving widespread results in the short term and provides uniform standards that are easier for the construction industry to understand and follow.

The what and the why of Reach Codes

Every three years, the state of California updates its Building Standards Code (Title 24 of the California Code of Regulations). When this happens, local jurisdictions can choose to adopt the state's standards, or concurrently implement reach codes – building codes that are more advanced and "reach" above and beyond state standards in encouraging or requiring all-electric or all-electric readiness for new buildings. Adopting and implementing reach codes are a critical opportunity for cities and towns to move their jurisdictions more rapidly forward in achieving their Climate Action goals in energy and emissions savings.

Studies have determined that all-electric buildings are comparable or slightly less expensive than gas plus electric (or mixed fuel) buildings from a 20-year lifecycle cost perspective, factoring in both capital and energy costs. While initial capital costs can be higher, factoring in available rebates and incentives and lower costs over the life of the equipment makes going all-electric cost effective, especially for new construction. And all-electric homes are more comfortable, and safer and healthier to live in, than fossil-fuel heated homes. Today's state-of-the-art electric appliances are more efficient than natural gas appliances, and electric heat pumps significantly improve building energy efficiency, using less energy and therefore costing less to operate.

Reliability and resilience of the grid

Both the County of Marin and Marin Clean Energy (MCE) have addressed concerns about moving toward increased dependence on electricity to meet Marin's energy needs. For a more extensive response, see the County's FAQ's on Reliability and Resilience. We have reprinted MCE's responses below:

Can the electric grid handle the increased electricity demand from building electrification?

Yes. Load Serving Entities, like MCE and PG&E, forecast electricity demand years in advance. Because reach codes typically apply to new construction and, in some cases, renovations of existing buildings, the change is gradual and allows time for forecasting trends

in electrification. MCE's Operational Integrated Resource Plan covers trends in energy procurement. Additionally, the California Independent System Operator – the agency that oversees the operation of California's bulk electric power system, transmission lines, and electricity market – approved the transmission plan for the next 10 years, which accounts for increased energy efficiency and electrification.

If there is an unplanned power outage or Public Safety Power Shutoff event, won't all-electric buildings be at a loss?

MCE, other utilities, and the state of California are working diligently on increasing the reliability of our electricity grid. Energy efficiency improvements and shifting energy usage away from peak hours (4 p.m. – 9 p.m.) are helping to reduce the risk of power outages. PG&E's wildfire safety plan is also working to reduce the need for Public Safety Power Shutoff events and to make them as short as possible. Installing a home energy storage system (commonly known as a battery) can also help to keep electricity on when the power goes out.

The proposed ordinance includes three key features:

1) **All-electric for new construction:** This is one of the most promising near-term applications. Completely new buildings, including residential, multifamily, and commercial, will be required to be all-electric, including having high-efficiency electric heat pump space and water heaters. No natural gas/propane equipment, meters, or hookups will be allowed. There will be some exceptions allowed for hardship, commercial kitchens, low-income, seniors and those aging-in-place.

2) **Energy Efficiency and Electrification for Renovations:** Remodels and additions to existing single-family residences (projects of 750 square feet or greater with some exceptions), will be required to meet a target energy score using a point system (developed by the state with cost effectiveness guidelines) that allows for a flexible range of building energy efficiency and/or electrification measures such as installing heat pumps for space or water heating, or induction stoves to replace gas appliances. Electric readiness and lighting will be required for all projects.

3) **Electric Vehicle (EV) Infrastructure for New Construction and Renovations:** Additional electric vehicle infrastructure requirements including:

a) EV-ready panel upgrades and/or parking lot modifications for new single family and two-family homes and townhomes with private garages

Marin's Green Building Code, cont. p. 11

Resources, incentives and rebates:

Marin County's 2022 Green Building Model Reach Code

Marin County Resources, Incentives, and Rebates for your next project:

- Electrify Marin find rebates for gas-to-electric appliance changes and service panel upgrades for Marin residences, current examples:
  - Heat Pump Water Heater: $1,000 ($2,000 income-qualified)
  - Ducted Heat Pump: $1,000 ($2,000 income-qualified)
  - Ductless Heat Pump: $800 ($1,600 income-qualified)
  - Induction Range: $500
  - Induction Cooktop: $250
- BayREN Home+ Participating Contractors find a qualified contractor in Marin and throughout the Bay Area to provide service and installation for qualified home energy improvements. Current BayREN Home+ Rebates for Gas-to-Electric Appliance Upgrades:
  - Ducted Heat Pump: $1,000
  - Ductless Heat Pump: $1,000
  - Induction Cooktop or Range: $750
  - Heat Pump Clothes Dryer: $300
- California Energy Smart Homes find incentives for residential new construction and alterations including single family, duplex, multifamily low-rise, additions, alterations, and accessory dwelling units
- The Switch is On tools, support, contractors, rebates/incentives, and resources to electrify your home
- The Watt-Diet Are you upsizing your panel when electrifying? Calculate your watt-diet and learn why you may not need to upsize by Redwood Energy
- IRA tax credits and rebates (with dates of availability noted)

MCL's July 20, 2022 and November 2, 2022 advocacy letters to jurisdictions supporting adoption of Green Building Reach Codes by January 2023 and a countywide Comprehensive Electrification Plan for all buildings by January 2024.

MCE's Electrification Reach Codes for a Carbon-Free Future: resources and answers to FAQs.

MCE's Deep Green 100% Renewable Energy

Marin Green Home Tour recordings: See how neighbors have integrated resource-efficient systems in beautiful ways into their homes:

Marin Green Home Tour 10/19/22 Part 1

Marin Green Home Tour 10/20/22 Part 2

Walker Creek Watershed *from page 5*

overwintering and leaving the watershed as smolts? Are adults distributing themselves in the watershed to spawn? Are stocked juveniles returning as adults? And are natural-origin fish present in the system? To answer these questions is a major undertaking, so the partnership is collaborating on monitoring in Walker Creek and applying relevant information from other Coho-bearing watersheds.

Working with the nonprofit organization CalTrout, CDFW is using "passive integrated transponder" devices (PIT tag) and coded wire tags (CWT), similar to technologies veterinarians and pet owners use for pet identification, to track the movement of adults, juveniles, and smolts through these different life stages and watershed reaches. In the case of Coho and the CCC ESU, they have confirmed the straying of Coho between watersheds, important in bolstering genetic diversity. Tracking the December 2020 released adults, CDFW confirmed that these fish moved upstream past lower and middle reaches of the Walker Creek watershed, starting almost immediately after release and continuing through March and April of 2021. Hines hopes to complement this work with comprehensive spawner surveys. This in-the-field confirmation of live adults, spawning redds, and carcasses is something the partnership is exploring. Monitoring in Chileno Creek is also needed to understand adult use of that part of the watershed.

The first efforts to confirm smolts leaving the watershed began in 2022 with CDFW's installation of a smolt outmigration trap in lower Walker Creek. A total of 2,016 smolts were counted and released to continue their journey through Tomales Bay and to the Pacific. This result indicates that young-of-the-year can overwinter in Walker Creek and that smolts will leave the watershed.

A smolt outmigration trap operated by California Department of Fish and Wildlife and partners to monitor the population of Coho Salmon in Walker Creek.

Indications of natural-origin fish in Walker Creek and elsewhere in the CCC ESU, as a result of recovery actions, are promising. During the 2022 smolt trapping, 59% of the Coho smolts were not from the hatchery release, 18% were released or stocked that year, and 23% unknown. Genetic analysis is pending and will further confirm the percentage of natural-origin smolts that out-migrated in 2022. In the Salmon Creek watershed in Sonoma County, where CDFW has released adult Coho Salmon for over a decade, genetic results from 86 young-of-the-year individuals in 2017 identified that 28% came from matings between natural-origin fish and another 24% came from pairings between natural-origin and hatchery-origin fish.

Sizeable long-term goals and small successes

Considering the entire CCC ESU, Charrier issued the challenge that we need to "move faster and act bigger if we are to be successful, while holding on to the small successes. Getting natural reproduction in Walker Creek is really exciting" as one example of those small successes. The NOAA Fisheries Recovery Plan, using a 100-year timeline, sets goals for recovery in specific streams and rivers. For Walker Creek, the goal for downlisting Coho from 'endangered' to 'threatened' is 1,300 spawning adults, and for delisting it is twice that or 2,600. While acknowledging those are large numbers set for nearly 90 years from now, Charrier emphasized that "Walker Creek has huge potential and is on everyone's radar for Coho recovery."

CCC ESU explained

Successful conservation and management of a wildlife species, or population of that species, is organized around the concepts that the species or populations in question are distinct because of geographic or genetic separation. These distinct populations are considered Evolutionary Significant Units or ESUs, representing populations that are reproductively isolated from other populations and contribute to the biological species evolution. The Central California Coast Coho Salmon ESU (CCC ESU) was established based on these concepts. Although part of the entire Pacific Coho Salmon species, the subpopulation of naturally spawned Coho Salmon from Punta Gorda, California in the north to Aptos Creek in the south is held as an ESU for conservation and recovery planning purposes.

Native plant nursery *from page 7*

to hike the Appalachian Trail, and then stayed in the east to work on a small-scale organic farm. There, in growing plants for food, she began to understand the meaning of reciprocity as an ecosystem caregiving responsibility. The opportunity to put that ethos into practice and learn from people for whom agriculture was and is their primary way of life, she enrolled as a Food Security volunteer with the Peace Corps and spent two years living in a remote village in Nepal. It was, in her words, "some of the most difficult and rewarding years" of her life. With the help of her adopted "didi" (sister), she was able to work with women from the Dalit (untouchable) caste to design and build a nursery for vegetable seedlings, a project catalyzed with the help of a $1,000 Small Projects Assistance grant from U.S. Agency for International Development. The nursery served as a resource for villagers seeking local, low-cost vegetable starts, as well as an income generator for the women running the operation.

Once back in the U.S., she enrolled in The Conway School, an intensive 10-month Master of Science program in ecological landscape design, notable for its hands-on, project-based curriculum. During her studies, Aja gained real-world experience working with stakeholders in landscape design and planning projects at different scales. Drawn back to California by her partner's work, she soon began working as a Project Manager at the Watershed Nursery in Richmond, where she spent two years growing hundreds of thousands of plants for restoration projects throughout the Bay Area. Then, with the better part of a decade growing plants under her belt, she turned her attention to the small but struggling Marin County Parks nursery and got to work!


Photo: Kate Powers

Aja in the nursery's shade tent among the native plants cultivated by this year's community volunteers.

What's next for Aja and the nursery?

After she concludes her 9-month term in November, Aja plans to return to her Nepalese village for two months, to be reunited with her "didi" and other village friends. Then she will wait patiently. Will she be hired for another stint as "nursery technician" seasonal aide? Or is it possible that the County would entertain the idea of a full-time nursery manager to continue building the community-centered restoration program she has created? Already tri-lingual (Spanish, Nepali), Aja also has new ideas: working with indigenous land stewards to grow medicinal and other culturally important plants—a key piece in cultivating the reciprocity necessary for long-lasting, sustainable restoration.

Marin Green Buildings *from page 9*

b) 100% access to charging capabilities for tenant spaces in new multifamily developments with parking spaces (15% with EV charging stations installed and 85% with Level 2 EV-ready receptacles installed)

c) For existing multifamily and nonresidential properties that modify their parking lots and/or their electrical panel, the ordinance would require additional EV support infrastructure be installed to support future EV charger installation.

In addition, the County continues to promote funding incentives, such as the Electrify Marin and BayREN programs and the new federal Inflation Reduction Act tax credits and rebates are beginning to roll out this January, to encourage replacement of gas appliances with high efficiency electric appliances in existing buildings.

Please support the Board of Supervisors' adoption of the County's reach codes at its November 15 meeting and check with your local jurisdiction to track timelines, learn what reach codes are being considered, and promote uniform building reach codes countywide. Your voice and your action make a difference.

This article is based on a presentation made by **Brian Reyes, Marin County's Sustainability Planner**, at MCL's September 16, 2022, Climate Action Working Group (CAWG) meeting. Thank you, Brian!

To receive agendas for future MCL CAWG meetings, please contact mcl@marinconservationleague.org or call (415) 485-6257.

MCL's Leadership Circle

connected in-person on a bright October fall day.

Steve Moore, General Manager of Ross Valley Sanitary District, led a reflection on the important "Round-trip Journey" water makes to support our lives emphasizing "waste" is not an option anywhere in that journey.


Photo: Minna Kim

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We wish you health, happiness and joy this winter and holiday season

Photo: Sue Mace

Please plan to join us for

MCL's Holiday Party

December 9th,
5:00 to 7:00 pm

The Club Restaurant
at McInnis Park
in San Rafael

Details coming soon.