



A Steward Life

By: Amidia Frederick, placed at NOAA Southwest Fisheries Center

A day in the life of a watershed steward is a day in the life for me

Leaky waders, rocks, scales and slime are almost all I need

Last year was just the beginning, I, a WSPer newly formed

Ready to save the legendary salmon in an attractive blue ,brown uniform

Choose any of the 25 sites in California, you're lucky either choice

All you need is a sense humor and a tolerance for all things moist

"Whether North or South, Inland or Coast there's wonders for all to see. In the South, the fight is urgent to keep the Coho salmon here..."

- Amidia Frederick

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"We Are All A Piece of the Puzzle" by Richard Green, placed at Point Reyes National Seashore

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A program of the California Conservation Corps, WSP is one of the most productive programs for future employment in natural resources. WSP is administered by California Volunteers and sponsored by the Corporation for National and Community Service.



Restoration with Central Coast Wetlands Group, as Told by Dogs

By: Madeline Chavira, placed at Central Coast Wetlands Group



Puka, a rat terrier mix, takes a break from being in the office all day and has a stroll around CCWG's newly flooded 20 acre constructed wetland. Native wetland species have just been planted and are beginning to grow now that they have water. Photo by: Cara Clark



*After a few planting days and a wet winter, the constructed wetland turns into a new habitat for many different species like native dune birds such as avocets (*Recurvirostra americana*) and sanderlings (*Calidris alba*). Abbey, a Pit bull mix, enjoys exploring and running as fast as she can through the tall grasses that she barely has time to sit still for photos. Photo by: Madeline Chavira*

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Spawnr: Salmon Dating App

By: Maddie Halloran, placed at Point Reyes National Seashore

Why Spawnr?

Dating can be difficult for millennials, but it can be even harder if you're an endangered species. That's why we invented Spawnr, the first dating app made specifically for California salmonids. Your profile will be calibrated so that you only match with salmon that are headed back to your same natal stream, with an opportunity to chat and meet up casually on your own terms. Perfect for the salmon on the go - try Spawnr free today!



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About the Watershed Stewards Program

Since 1994, the Watershed Stewards Program (WSP) has been engaged in comprehensive, community-based, watershed restoration and education throughout coastal California.

WSP was created in 1994 by California Department of Fish and Wildlife (CDFW) biologists, educators, and the California Conservation Corps to fill critical gaps in scientific data collection, in-stream restoration, and watershed education. In collaboration with landowners, tribal communities, teachers, community members, nonprofit organizations, and government agencies, WSP works to revitalize watersheds that contain endangered and threatened salmonid species (Chinook salmon, Coho salmon, and steelhead trout) by using state-of-the-art data collection and watershed restoration techniques. WSP also engages members in education, outreach, and volunteer recruitment efforts to increase the capacity of partner organizations. WSP currently has Members working from the Oregon border to the Santa Monica Mountains.

Restoration with Central Coast Wetlands Group, As Told by Dogs, continued from page 2.



Our bioreactor is another feature of the constructed wetland. With its 12 channels, we hope to run experiments on which methods work best for reducing nutrients from agricultural runoff. These methods include heating woodchips which will help nitrite-eating bacteria thrive and using ulva and hydrocotyle which also takes up nitrites. The most valuable addition to the crew is Captain Cousteau, a cattle dog mix, who ensures all of the pipes are working and flow is consistent throughout all of the channels. Although, he can sometimes get distracted when someone starts throwing his toy. Photo by: Madeline Chavira

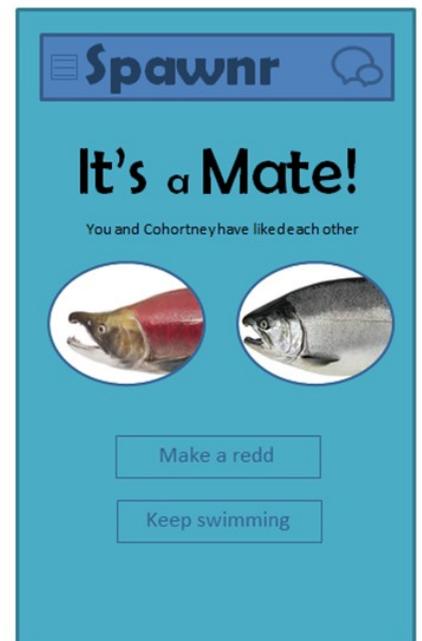
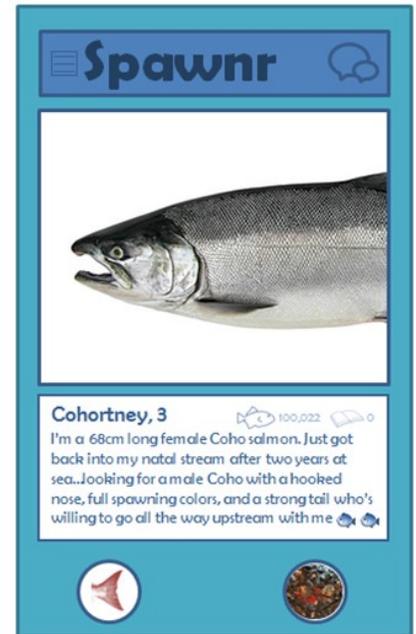


Noche, a German shepherd mix and expert morale booster on planting days, helps with potting California sagebrush and restocking the greenhouse for future restoration projects. After a long day, Noche likes to reward the crew by sharing her favorite toy. Photo by: Madeline Chavira

A Steward Life, continued from page 1.

Up in the North with the big red trees, swimming the Eel I found a prize
Steelhead, Coho, Chinook and Sturgeon, of many a shape and size
Once I encountered a mysterious fish, though like salmon, creatures of clout
Lamprey, oh those ancient eels, whom we know so little about
I loved the rivers in the North, many shades of blue and incandescent green
Rivers for campin', swimmin' and summer livin', prettiest places I've ever seen
But alas my time came to an end and off to the south I went
To never forget the glorious people with whom glorious times were spent
A day in the life of a watershed steward is a day in the life for me
Whether North or South, Inland or Coast there's wonders for all to see
In the South, the fight is urgent to keep the Coho salmon here
To track the endangered population with surveys, seining and weir
And oh how the winter tested us, slim chance of data in a torrent of rain
Kept inside our offices by epic storms with worry to occupy our brains
But alas spring arrived to save us as we observed new smolts and juveniles
They were migrating down our resilient creek, visiting for a just a short while
Each tiny salmonid carried the hope that our efforts were not in vain
That they were given the best shot, the greatest chance, in life's capricious game
And aren't we all just smolts and juveniles that grow and then are flung to the sea
Navigating the tides of our interchangeable lives
slightly guided by genetic memory
Home, for us a majestic vision, a destination where we return strong and wise
Yet aware of the risk of finding a place so changed we might not survive
For two years as a watershed steward, was certainly a lesson for me
That humanity's fate is inextricably intertwined with that of the salmon destiny

Spawnr, continued from page 2.



FWOGS

By: Brenna Fowler, placed at Marin Municipal Water District

My main focus at Marin Municipal Water District (MMWD) has been monitoring the federally endangered Coho salmon of Lagunitas Creek: notoriously an IPA as well as gorgeous waterway that stems from the Mount Tamalpais Watershed. Alongside Fisheries and various Watershed Management work, I adopted and led MMWD's Frog Docent Program. From January to June of 2017 I coordinated and trained a team of volunteers to aid in the education and protection of the Foothill Yellow Legged Frog (FYLF)—a threatened and endemic frog at Little Carson Falls. Little Carson is not only the critical habitat of the FYLF but it also is a popular hiking spot for waterfall-chasers all over the Bay Area. By basking and attaching their delicate egg masses on the edges of the rocky pools, FYLFs and their brood are at risk of dislodgment by wading hikers and off-leash dogs. Volunteers would hike out to the falls carrying spotting scopes and data sheets ready to educate and converse with visitors about the endemic species and their breeding pools.

This season for the frogs was one of note—not only because of the considerable rainfall events ending California's drought, but this season held the highest count of egg masses since the monitoring program commenced in 2005. I joined Garcia and Associates Consultants (GANDA) on a survey of Little Carson Falls and Big Carson Creek—the two surviving populations of FYLF on Mt. Tam—where I was able to see the final (51st!) egg mass of the season. Having spent the day in search of the frogs and appreciating their picturesque homes, my heart grew from not just fish, but to frogs, too. The FYLF Docent Program is essential for the protection of their population and sensitive habitat as well as inspirational and educational for watershed visitors to learn about these charming aquatic organisms.



Male FYLF found at Big Carson Creek. Photo by: Brenna Fowler



FYLF found at Big Carson Creek. Photo by: Brenna Fowler

The King of the Salmon isn't a Chinook??

By: Rebecca Howard, placed at NOAA Southwest Fisheries Center

After sorting through piles of squid and pyrosomes (a type of numerous pelagic chordate) in our latest haul aboard the R/V Reuben Lasker, I spotted something shiny in my basket. It looked like a ribbon, thin and shiny with red edges.

After bringing it to the Chief Scientist, I learned that the organism I found was known as the King-of-the-Salmon (*Trachipterus altivelis*), and that there was actually an interesting story to go along with the strange looking fish.

Little is known from a scientific standpoint about the group of uncommon fishes the King-of-the-Salmon belongs to: the ribbonfish family (*Trachipteridae*). It contains six members that are not of commercial interest, which explains the lack of interest in studying them. They live in deep coastal waters from Alaska to Chile, feeding on prey that salmon also target: small crustaceans, squid, and small pelagic fishes.

Rarely seen alive, they are often caught as bycatch in commercial fisheries targeting their prey or salmon. These bizarre fish can be found at depths up to 900 meters and swim in an undulating motion, similar to how snakes move (Froese and Pauly 2017). Not much is known beyond these few facts, and it seems unlikely that there will be an increased interest in them due to their relative rarity.



Close-up on King of the Salmon. Photo by: Rebecca Howard

These fish are actually better known for the story behind their name, since they look nothing like salmon and it is peculiar that a fish completely unrelated to the salmonids would be considered their king. The name is derived from a Makah tribal legend about the start of the salmon runs.

Located in the Northwest corner of Washington State, the Makah believe that the King-of-the-Salmon leads the salmon to their natal rivers every year. Killing one of these strange fish is taboo, as it could cause the salmon runs to end (Jordan and Evermann, 1898). Because of their importance to the Makah traditions and food supply, they have become known as the King-of-the-Salmon.

While not a salmon, nor something you would see in a creek, the King-of-the-Salmon is an important character in the cultural history of salmon. Perhaps one day we will know more about their life in the deep, but for now they'll remain a mystery.

References

Froese R, Pauly, D. 2017. FishBase.

World Wide Web electronic publication. www.fishbase.org.

Jordan DS, Evermann BW. 1898. The fishes of North and Middle America: a descriptive catalogue of the species of fish like vertebrates found in the waters of North America, north of the Isthmus of Panama: Part 3. Washington DC: Government Printing Office.



The research vessel, R/V Reuben Lasker, leaving San Francisco Bay.

Photo by: Rebecca Howard



Bioreactor at Central Coast Wetlands Group. Photo by: Blair Libby

The 5 Plagues of the Bioreactor

By: Blair Libby, placed at Central Coast Wetlands Group

I wish I could say, “it went flawlessly” or “I love mud”. But at our non-profit wetland research group, the pioneering work of the organization can be an uphill battle; one that faces off well-meaning scientists against the realities of our natural world.

Building an experimental bioreactor to reduce the high nutrient levels found in agricultural runoff offered us an eerily biblical series of obstacles to overcome.

1. The Flood

This winter’s onslaught of atmospheric rivers resulted in an immediate halt to construction. The bioreactor, essentially an 8,000 square feet, 6 feet deep ditch, did just what it was meant to do, hold water. Of course, we wanted to be working inside the ditch, not helplessly watch it turn into a swimming pool. We persevered with the help of sunny days and water pumps.

2. Mosquitoes

Although each of our 12 channels inside the bioreactor is designed to convey *flowing water* through the material it holds inside (woodchips, helophytes, or empty space in controlled temperatures), the water was mostly stagnant during construction – hence, the birth of our blood-sucking friends.

Luckily, the local Mosquito Abatement (a non-regulatory, taxpayer-funded agency) was quick to act with predatory mosquitofish (*Gambusia affinis*), and plans are in the works to attach seeds of a threatened freshwater mussel to the fish before their dispersal.

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The Grassroots of Restoration

By: Melisa Cambron Perez, placed at Grassroots Ecology

Nymphus, midge and a scud

So tiny but never dull

Keep the water clean



Sorting Macroinvertebrates at McClellan Ranch Preserve.
Photo by: Melisa Cambron Perez

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The 5 Plagues of the Bioreactor, continued from page 7.

3. Rats

What rodent doesn't love a dark, warm, and moist environment, with plenty of nesting material for their young? Upon discovering multiple, rat-sized holes chewed into the bioreactor's channel walls, and consequential draining, we knew what we were dealing with. We're currently in the process of eradication.

4. Disease

The Castroville Slough, our source of inflow, meets 303(d) Impaired Waters minimums for an impressive number of unhealthy reasons, including high ammonia and phosphorus, sedimentation and low dissolved oxygen. In other words, bacteria are thriving. For scientists like me that practically bathe in this water a few times a week, precautions are taken by way of Purell Hand Sanitizer.

5. Frogs?

In this case, we welcome the plague. The endemic California red-legged frog (*Rana draytonii*) frequents the area so often that we restored its habitat in a wetland downstream of the bioreactor. So bring it on, Yahweh.



District C Members at Orientation. Left to right (Bottom): Madeline Chavira, Melisa Cambron Perez, Yerae Seo, Brenna Fowler. Left to right (Middle): Blair Libby, Rebecca Howard, Maddie Halloran, Katey Schmidt, Michelle Pond, Andrea Biniskiewicz. Left to right (Top): Richard Green, Chris Corvetti, Amidia Frederick.

Photo by: WSP Staff

The Grassroots of Restoration, continued from page 7.



*Arastraderi field full of Amsinckias.
Photo by: Melisa Cambron Perez*

Amsinckia sing

Their music is in the air

Light like a fiddle



*Water Quality Monitoring Site on Stevens Creek.
Photo by: Melisa Cambron Perez*

Heat seeps from the sun

Grasses shuffle in the wind

Ouch, I have a tick

Water ripples fast

Hits the sediment and stops

Turbidity low



Mercury in Suisun Marsh

By: Yerae Seo, placed at San Francisco Bay Regional Water Quality Control Board

Legacy mercury from mining in the 19th century still persists today in the San Francisco Bay Region. When mercury is present in anoxic environments (I.e., in the backwaters of Suisun Marsh) it transforms into methyl-mercury, which is the bio-available form. Bioaccumulation of mercury in fish tissue, fish eggs, and sediment in Suisun Marsh could lead to contamination levels that are harmful to wildlife and human health.

Suisun Marsh is one of the largest estuarine marshes in North America and provides habitat for millions of birds, mammals, and fish year-round. Currently, the San Francisco Bay Regional Water Quality Control Board is investigating water quality in the marsh to identify “healthy” target levels for oxygen and mercury.



Collection of photos by Yerae Seo. Left: Suisun Marsh. Top right: Suisun Marsh. Bottom right: blackwater in Suisun Marsh.



Photo of gloves used for planting *Toxicodendron diversilobum*. Photo by: Chris Corvetti

An Ode to Environmentalists

By: Andrea Biniskiewicz, placed at WSP Office San Luis Obispo

Freshwater to salt
Migration at a halt
Salmonids in search of food
Environmentalists queued
Restoration, only a piece
Funds decreased
Research seized
Fish deceased
The only end to the cycle
Is to overcome the denial

Ode to *Toxicodendron diversilobum*

By: Chris Corvetti, placed at Grassroots Ecology

Today, people circumvent your reaching branches.
In the past, we sought you out as an aid.
Your roots and sap were once used as medicine;
Your woven stems carried crops and transported tools;
Your soot provided markings and tattoos.
Today, animals still take shelter under your tangled limbs.
Your lianas provide food for native fauna,
And nurse other plants from seedling to adult.
Your gifts have been shrouded in distant memory.
Yet you still stand silently strong!



Group picture taken before attending a Watershed Awareness Project in Point Reyes. Photo by: Andrea Biniskiewicz



Andrea teaching about pH. Photo by: Priscilla Sisommout

Awareness is Written on the Walls

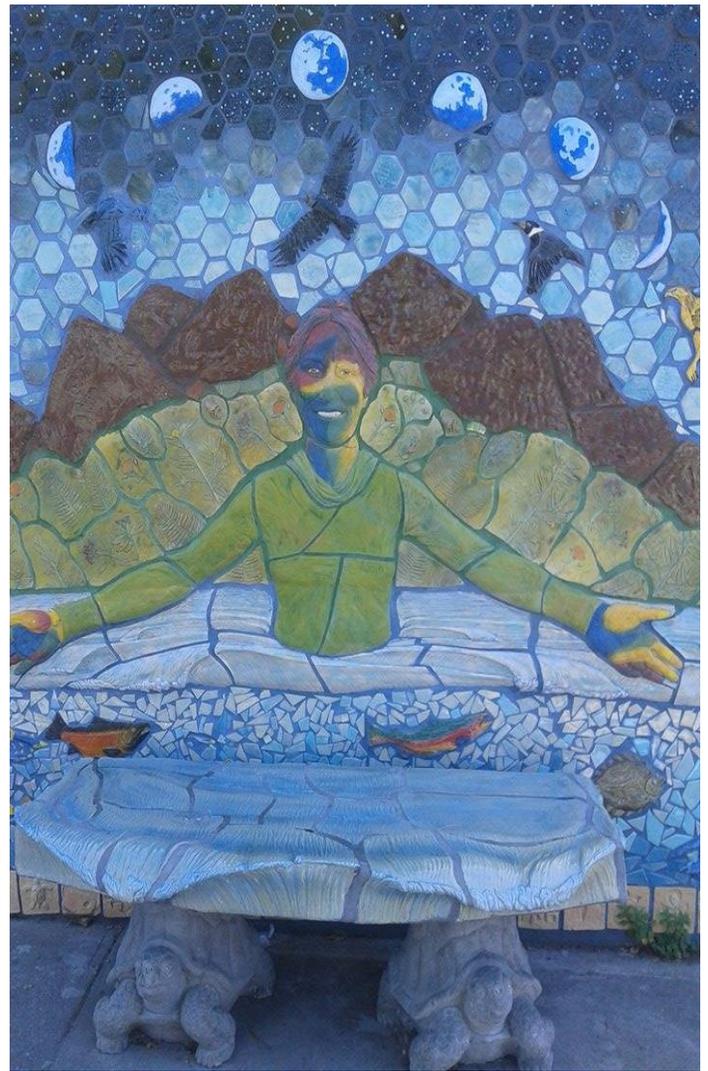
By: Michelle Pond, placed at San Francisco Regional Water Quality Control Board

Here, water is almost a hidden thing. San Francisco Bay's historic salt marshes and wetlands have long been drained or filled, and creeks have been culverted and buried under concrete to make way for the dense urbanization that has taken place in the East Bay over the past century and a half. It would be easy to dismiss nature and water issues as an abstract, far-off non-concern. Yet water is part of the subconscious of the city and it still manages to bubble up in strange and beautiful ways. Murals dot the cityscape declaring boldly that water is relevant, a human issue, and ensuring that it is not forgotten or ignored. Just biking the few miles from my home to work in downtown Oakland, this is evident:



"The Spill" by Michelle Pond

First I come across an image on a liquor store of a human skeleton shooting itself in the head with a gas pump. The sky is burning, full of smoke from oil rigs, and the sea is full of oil and dead marine life. This is sandwiched between one wall covered in poetry asking, "do we have the courage to care?" and another wall answering, covered in raised fists of resistance.



"Visions of Mother Earth" by Michelle Pond

A few blocks later Mother Earth can be found rising from the water, welcoming her creatures, and inviting you to sit and take a rest from the city rush between her arms. Each tile in the sky has a hand written quote lauding nature: one quoting Aristotle, one Psalms and another a child's, "I like fish."

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"Agua es Vida" by Michelle Pond

Down the street another Mother Earth figure appears again, simply stating that water is life.



"Water Writes" by Michelle Pond

Nearing the San Francisco Bay's Regional Water Quality Control Board, tucked along an alley parking lot, is a massive mural showing water's connection to family, religion, food production and wildlife on the left and a sea full of plastic and pollution on the right. Standing between the two sides are people taking action to protect water.

Alumni Spotlight featuring Allie Watts

What year did you serve with WSP, and at which Placement Site?

Year 21, WSP SLO Office.

How did WSP aid in your future career goals and where you are

now? WSP allowed me to pursue my love of the environment and marketing all at once. I was able to help build out the digital marketing plan with WSP and become involved in a local SLO Creek Restoration Project that I am still working on today with the help of a Yr. 22 WSP Member, Alyssa. WSP truly opened up so many doors for me in the world of marketing and environmental restoration. Now I work as a Digital Marketing Manager and Demand Generation Specialist at Experts Exchange, local tech company, and consult on digital marketing for Wild-note, an environmental tech startup.

What advice would you give to a Yr. 23 WSP Alumni? Say yes to as many opportunities as you can. You never know who you will meet, what organizations you will begin to work with, and what contacts you will make. Always be ready to interact and explain your environmental work and expertise!

Do you have any advice for job searching following graduation from

WSP? One thing I believe helped me in the interview process post-WSP was not just describing my experience but, displaying my passion for the work I did. AmeriCorps doesn't pay you much and future employers know that for the most part. So it becomes your job to show them why you would just barely make it financially. What drove you to do this? Honestly, employers want to hire passionate people who will love what they do, be that person!



Contact Us

WSP Region 1 Office

1455 Sandy Prairie Ct, Suite C
Fortuna, CA 95540

(707) 725-8601

WSP Region 2 Office

PO Box 1380
San Luis Obispo, CA 93406

(805) 542-8461

wsp.info@ccc.ca.gov

Find out more about the program on our website:

www.ccc.ca.gov/go/wsp

Our Mission

The Watershed Stewards Program's (WSP) mission is to conserve, restore, and enhance anadromous watersheds for future generations by linking education with high quality scientific practices.

WSP Staff

Reg I Program Coordinator: Zia Schatz
Reg II Program Coordinator: Jody Weseman
Office Manager: Katey Schmidt
Program Assistant: Nicole Rahman

Credits

Editor: Andrea Biniskiewicz
District C Team Leader

**Become a WSP Member! Learn more about the program and find our application at:
www.ccc.ca.gov/go/wsp**