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# the REDD

THE NEWSLETTER OF THE SKAGIT FISHERIES ENHANCEMENT GROUP

*Dedicated to Restoring Salmon for Future Generations*

# Respect Your Mother, Earth

*By* **MADDIE REID** *- Washington Service Corps Community Engagement Associate*

April 22, 1970 wasn't just the inaugural Earth Day but also the birth of something much larger, the modern environmental movement. If you can believe it, this year marks the 50th anniversary of that day. For that, we have Senator Gaylord Nelson to thank. 50 years ago Senator Nelson, an environmentalist from Wisconsin, founded Earth Day as a way to put a nationwide emphasis on environmentalism. There was a lot of support from the American people, with over 20 million citizens from across the nation demonstrating their support for this movement. This support led to the creation of the Environmental Protection Agency in December of that same year. However, the fight for a healthy Earth was not, and is not, an easy battle to win. It is, however, a very important battle nonetheless.

Just 20 years after its birth, Earth Day went global. The global mobilization of Earth Day began in 1990 with the support and participation of 147 countries. Since then, that number has ballooned to over 190 countries, with over a billion people supporting, and being affected by, the cause. People across the world have continued these environmental efforts by trying to do their part to celebrate Earth Day. Whether it be through hands-on conservation efforts, political rallies, a call to education, or just recognition, Earth Day has continued to be a shining example of how the environment matters.

For over a decade Skagit Fisheries Enhancement Group has held Earth Day volunteer events at habitat restoration sites with amazing partners including Skagit Land Trust, Mount Vernon Parks, Skagit County Parks, and Washington State Parks.

*Volunteer at Earth Day 2013 at Edgewater Park*

In the 10 years since we began to have these volunteer Earth Day events, we have never had to cancel. In fact, in 2013, we wanted to spread Earth Day joy so much that we had two Earth Day events, two weeks in a row! This year, however, has been a new experience for us. Due to public health concerns amid the coronavirus pandemic, we sadly had to cancel our Earth Day ivy pull. However, even during these uncertain times, nothing can alter the importance of Earth Day. This year especially, being the 50th anniversary, we came up with a different way to mark such a milestone anniversary. We created an Earth Day inspired photo contest to allow people to show their support without endangering their health. Each aspect of this contest was created to keep people thinking about their environment, more specifically, the environment in the Skagit. You can view the contest winners at **http://www.skagitfisheries.org/event/earth-day-photo-contest/**

*Young volunteer ready to plant at Earth Day 2019 in Hamilton*

It's been 50 years since Senator Nelson recognized that the environment needs to be an issue on everybody's mind. It's been 50 years since 20 million Americans gathered together to show their support for such an important cause. It's been 50 years since our very first Earth Day, and every single year since has been a reminder of the importance of our environment and our role in it. Regardless of where in the world it happens, Earth Day is always a celebration of the love and respect that people have for their mother earth.

**IN THIS ISSUE:**

the REDD

**REDD:** *A female salmon uses her tail to dig a nest in the gravel. After she deposits her eggs the male fertilizes them. The female then covers the fertilized eggs and the resulting nest is called a redd.*

## MISSION

Our mission is to educate and engage the community in habitat restoration and watershed stewardship to enhance wild salmonids.



## BOARD MEETINGS

The SFEG Board meets the 4th Tuesday of each month. The public is welcome.



## CONTACT US

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# How Will Climate Change Impact Life in Skagit County?

*By* **CLAIRE HOWELL** *- Washington Service Corps Education Associate*

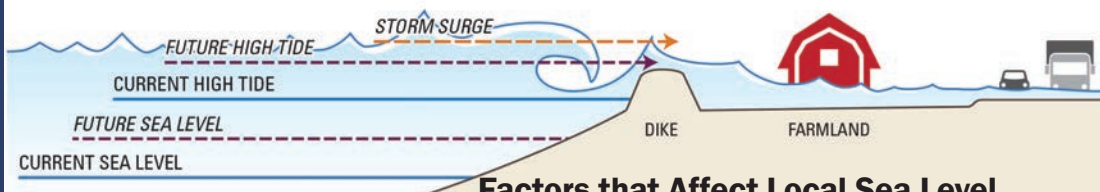
The global trends of climate change are well established, and include changing weather patterns, sea level rise and shifts in plant and animal distribution. How will these trends play out locally in Skagit County, and how will they impact salmon? I posed these questions to Carol Macllroy, a contractor with the Skagit Climate Science Consortium ($SC^2$). $SC^2$ is a non-profit that coordinates climate science research in Skagit County and connects communities addressing climate change with scientific resources. Carol emphasized that understanding the impact of local conditions is key to predicting and adapting to climate change.

A complete understanding of local conditions is particularly important in the assessment of sea level rise. On a global scale, sea level rise is driven by the melting of glacial ice and by thermal expansion (warmer water taking up more volume than cooler water). However, the increase in sea level is not uniform along coastlines. Many local factors including topography, land movement, tides, ground water, wind patterns and air pressure influence average sea level at any given point along the coast. All factors must be considered for accurate projections to inform future city planning and adaptations. Flooding associated with sea level rise has already been observed along the Skagit County coastline, and is expected to become more frequent. Currently, projections show a 1 - 2 foot rise in sea level across Puget Sound by 2100. The general understanding of the relationship between sea level and flooding is that a sea level increase of 1 foot will turn a 100 year flood into 10 year event, and an increase of 2 feet will turn a 100 year flood into an annual event.

Freshwater systems are expected to change as well, as seasonal patterns in the Pacific Northwest shift towards warmer wet winters and hotter dry summers. River and creek temperatures are expected to warm during the summer as snowmelt is no longer meaningfully present in the system. This could make the preservation and restoration of groundwater sources key to successful salmonid management. Currently efforts are underway to identify groundwater sources and to analyze the best way to conserve these resources. Researchers such as Jon Riedel with the National Park Service are analyzing where ground water is available so that fisheries management can be strategic with land preservation and restoration.

As climate change progresses, the impact to salmon in Skagit County will differ based on the life history strategies of each population. Life history refers to how an organism accomplishes key life events such as rearing, feeding and reproducing. Salmon life history strategies differ by species, and by populations within a species. One area of variation is the amount of time salmon rear in freshwater vs brackish or salt water. Juvenile coho and sockeye salmon generally spend about a year rearing in freshwater environments, while pink and chum salmon spend less than a month in freshwater and rear instead in nearshore saltwater environments. This variation in life history will likely make species such as coho, that spend at least a year rearing in freshwater rivers and streams, among the most vulnerable to warming river temperatures associated with climate change.

The impacts of climate change in Skagit County will be widespread and challenging. Communities will have to adapt to flooding associated with sea level rise, and the natural resources that are so valuable to our communities will face new and intensified challenges. Some of these changes have already begun, and communities and researchers are mobilizing to address them. The efforts underway now aim to mitigate the effects of climate change. We, as individuals and communities can also work to reduce the acceleration of climate change directly. Adaptation is necessary to protect our communities in the short term, while direct actions against climate change are needed ensure that we can preserve our resources for future generations.




*NOTE: Sea, tide, and storm surge levels are for illustrative purposes only and do not depict actual or projected levels.*

### Factors that Affect Local Sea Level

- Amount of water in ocean basin (includes ice)
- Water temperature (warmer water expands)
- El Niño years (and other natural climate patterns)
- Bathymetry (shore slope affects wave height
- Atmospheric pressure
- Ocean circulation
- Land subsidence and uplift
- Wind and storms

GRAPHIC COURTESY OF SKAGIT CLIMATE SCIENCE CONSORTIUM

■ *Happy fisherman with pink off Waldron Island*

# Habitat Restoration *Makes a Difference*

*By* **BOB MOTTRAM** - ***Former SFEG Board Member***

The Washington Department of Fish and Wildlife offered sobering news this spring when it released forecasts for the return of adult salmon this year to Washington's rivers. Many of the numbers – but not all – were disappointing, something not unusual in recent times.

At least one Fish and Wildlife biologist says, however, that people who work hard to enhance salmonids should take heart, because without their effort the numbers might be worse.

How do this year's figures play out? First, the good news: Fall chum salmon are forecast to return to the Skagit River system about 17,700 strong, a projected increase of about 6,000 over last year.

The Skagit River fall chinook run also is not too bad, comparatively. It is expected to total about 13,350 fish, down only slightly from a 2019 forecast of about 13,940. The spring chinook return is predicted to be about 5,700, down a bit from the roughly 6,100 predicted in 2019.

The forecast for coho on the Skagit is up significantly in 2020 for hatchery fish, with managers expecting a return of more than 19,640 this year compared to little more than 9,900 last year. However, predicted return of naturally reproducing coho is dwarfed by last year's figures, with an expectation of about 29,500 such fish this year to the Skagit compared to last year's 57,930. Cumulatively, that would amount to a forecasted deficit this year of more than 18,700 coho.

A similar trend is expected for the Samish River, where all coho reproduction is natural and where biologists anticipate a return this year of little more than 2,900 fish, compared to 4,860 last year.

Baker Lake sockeye also are expected to take a significant hit, with only about 13,240 forecasted to return this year compared to about 33,700 last year.

Pink salmon are not a factor in this year's forecast since this is an even-numbered year.

So, how do these numbers dovetail with the generous efforts that SFEG's volunteers and staff have put out for the last quarter-century? Since 1995, volunteers have provided nearly 178,000 hours of labor, planting hundreds of thousands of habitat-enhancing trees and other native plants. Contractors working for SFEG have repaired or replaced more than 60 tributary-strangling culverts, opening some 78 miles of spawning and rearing waters for fish. And those are only some of SFEG's efforts.

Brett Barkdull, district fish biologist for the Washington Department of Fish and Wildlife in northwest Washington, says the labor probably has benefitted the fish as conditions at sea have grown increasingly unfavorable.

He points to coho as an example. On average, in recent years managers have seen more coho go out of the rivers than they did 20 years ago, he said. But 20 years ago, those managers expected 8 to 10 percent of the fish to return as adults. In recent years, that survival rate has hovered near 1 to 4 percent.

Managers don't have a way to measure survival rates on Skagit River chinook, Barkdull said, but on the nearby Samish River, the rates are just half of what they were only 10 years ago. In both cases, the determining factor appears to be ocean conditions, which are not yet fully understood.

"Whatever happens once they hit the salt water seems to be the big driver at the moment," he said, and he thinks it is because of several things happening there at once. Acidification of the ocean and temperature increase of the water are two of them.

"Part of it has to do with climate change and the way upwelling is going," he said. Upwelling is a phenomenon in which cold water from the depths rises to the surface, bringing nutrients needed by the entire food chain.

Despite these problems at sea, Barkdull said, Skagit Fisheries volunteers do make a difference.

"I think you're on the right track," he said. "If it hadn't been for all the good work being done, the situation would be worse than it is now."

Spawning and rearing habitat drive salmon production in fresh water, he said, and that production has an impact on adult returns despite the ocean problems. More production means more adult fish than otherwise.

"The Skagit can produce only so many . . . smolts," he said. "If the production capacity were 2 million coho smolts instead of like 1.3 million, what we've been seeing lately," he said by example, "and the marine survival conditions were equal, you'd have more adults (coming) back."

# Riverfront Park Restoration *Grows*

*By* **KELSEY TAYLOR** *- Riparian Restoration Coordinator*

On March 20th, 2020, SFEG officially wrapped up planting at Riverfront Park. This has been a bittersweet time for me, as this is one of the first projects I started working on when I joined Skagit Fisheries over two years ago. The Riverfront Park project kicked off in 2018, when crews started working on the tangle of blackberry that covered the seven acre site. In the fall of 2020 SFEG hosted two planting parties, where hundreds of trees were planted and a wood chip walking trail installed by enthusiastic volunteers. One more planting party in the spring of 2020 helped SFEG finish up the second half of planting.

One of my favorite volunteers to talk to was Councilman Karl de Jong, who attended all three planting parties. I like talking to Karl because he is a big-picture thinker, and sees this planting project as the first of many steps to open recreational opportunities to the public along the waterways of Sedro-Woolley. There is nothing more rewarding than to share my passion for plants and all things native with people who want to learn and make a positive change for our environment, and I want to thank each and every one of you who attended any of the Riverfront Park volunteer events.

*Cascade Middle School Jr. Stream Steward planting at Riverfront Park*

A big thanks to our funders, the Department of Ecology and the Rose Foundation, for making this project possible, and for purchasing the informational signs that now follow along the trail. Thanks also to the City of Sedro-Woolley for being a stalwart partner in all of our restoration efforts, including a donation of snacks for volunteers by the Sedro-Woolley Police Department. Thank you to Mount Vernon Red Apple for donating individually packaged snack bags for volunteers during early spring planting. I would also like to thank the AmeriCorps members from Washington Conservation Corps, Washington Service Corps, and EarthCorps for their service on the project.

*AmeriCorps Member Molly Van Dam Planting*

*Sedro-Woolley City Councilman Karl de Jong helped build a trail with AmeriCorps member Natalie Cumiford*

On

Our smallest volunteer at Make a Difference Day

The work out at Riverfront Park is far from over. SFEG will go back to the site this summer and mow around plants to minimize competition from non-native species. As time goes on, SFEG will work with the City of Sedro-Woolley to replace dead plants, clean up trash, and spruce up the walkway. We look forward to seeing all of you out there, and hope you enjoy exploring the new trail. I can't wait to see what the next few years hold for Riverfront Park, and the forest we see emerge out of our hard work.

# Volunteer Spotlight

**RICH SHAUGHNESSY**

Rich planting trees with students at Riverfront Park

I began volunteering with SFEG last October. Brickyard was my beat as I stalked the illusive spawning salmon. Then in November, I began working with Claire in local classrooms. This community outreach was perfect for me, a retired elementary classroom teacher. I have been involved with environmental education since the 1980's and SFEG has a great program. As a highly productive river, home to all five salmon species, the Skagit is the perfect classroom.

We live on Big Lake with a view of the Skagit Land Trust property. I also volunteer with this group, helping with their Amphibian Survey. Basically clomping through the shallow wetland looking for egg clusters. This activity really brings back childhood memories.

I feel very fortunate to have the time and energy to devote to these organizations. We are all gob-smacked daily with gloom-and-doom reports of man-made environmental disasters. I can watch the news and tear my hair out. Or I can go outside and get muddy and excited with a bunch of school kids. SFEG makes this choice simple.

Rich Shaughnessy planting with Jr Stream Stewards

Knotweed patch in the Middle Skagit

# Knotweed Control Efforts in the Upper Skagit Watershed

*By* **BENGT MILLER** *- SFEG Stewardship and Knotweed Coordinator*

If you've spent much time in the Skagit River Watershed upstream of Rockport you may have noticed, or more accurately, not noticed something that makes the Skagit unique. I'm, of course, referring to knotweed (polygonum spp.). This non-native invasive species is present in nearly every watershed on the west slope of the Cascades. It is so widespread that some people assume it is native. The Skagit Fisheries Enhancement Group (SFEG) has been working to eliminate this insidious invader since 2010. Due to the diligence and hard work of SFEG and partner organizations the odds are that you will never encounter this species in your recreational endeavors in the Upper Skagit. If you are one of the few, excluding the knotweed control crew, that actually encounters knotweed please let SFEG know so we can deal with it.

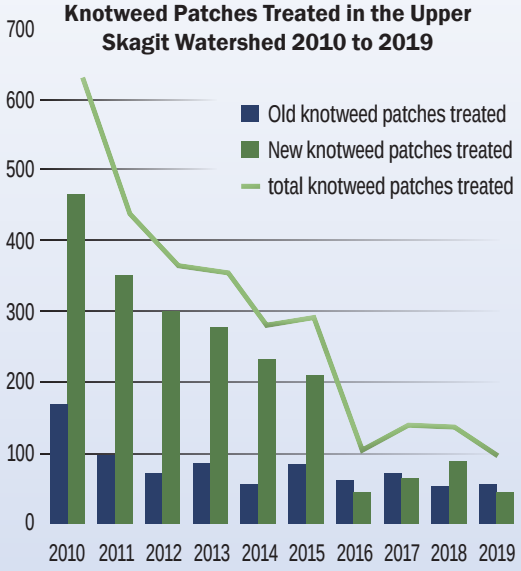
Due to the success of the Upper Skagit Knotweed Control Program upstream of Rockport the decision was made to expand the control area downstream. The initial thought was to expand downstream to the Grandy Creek confluence to tie in with the work Skagit County has been doing on Grandy Creek. After a recon survey the decision was made to expand downstream only as far as the Baker River confluence. The amount of knotweed in the 10 mile reach between Concrete and Rockport will keep SFEG and partners busy for years. If you live in this area be prepared that SFEG is about to begin an outreach effort to landowners along the Skagit in this section informing them about knotweed and offering treatment.

Knotweed

Knotweed is such a threat to riparian areas because it out-competes native species and has an overwhelming reproduction strategy. Any part of a knotweed plant that breaks off from a parent plant is capable of growing new roots if it comes to rest on ground with enough moisture. This strategy works especially well in floodplains where there is a lot of moisture and river banks are constantly eroding. The other reason knotweed is especially troublesome in the Pacific Northwest has to do with its phenology. All the above ground parts of knotweed die back each winter. This wouldn't be a problem, except that the knotweed canopy is so dense that no plants are able to grow beneath it. So when it dies back after the first frost there are large expanses of bare soil exposed just as the seasonal rains arrive. This negatively impacts water quality by causing soil erosion and increasing turbidity. It may look like the knotweed has died because all that remains above ground are the crunchy, brown stalks. Don't be fooled; once spring arrives the energy that was stored in the roots all winter is harnessed and the shoots begin to emerge. Knotweed is one of the first plants to break after winter dormancy and its canes are capable of reaching nine feet tall by June.

Knotweed is not just a threat to natural systems; it also has detrimental impacts to infrastructure. In the UK, knotweed infestation has reached such extreme levels that many banks refuse to give mortgages for properties that contain knotweed. The roots of the plant have been known to crack foundations and infiltrate asphalt roadways.

You may be wondering what this has to do with salmon. Aside from the previously mentioned water quality



impacts, studies have shown that streams with large knotweed infestations have up to 40% fewer macroinvertebrates. These aquatic bugs are the main food source for juvenile salmon during their fresh water residency. The main reason for the fewer macroinvertebrates is that knotweed leaves contain more lignin and less nitrogen than leaves from native tree species. Lignin is an organic polymer that provides the rigidity to cell walls. It provides lots of structure but has little nutritional value. Deciduous trees along streams provide continuous nutritional input for aquatic macroinvertebrates. However, knotweed drops all its nutritionally inferior leaves in one event after the first frost.

I don't want to give the impression that all hope is lost. There are some silver linings. Botanically knotweed is in the buckwheat family (Polygonaceae). One of the more well-known members of this family is rhubarb. Unlike rhubarb which has poisonous leaves, no part of the knotweed plant is toxic. Foragers pick young, tender knotweed shoots and roast them. They say the taste is similar to asparagus. There is also resveratrol in knotweed roots. This is the same compound that gives red wine its health benefits. Beekeepers like knotweed because it produces prodigious flowers late in the season. Perhaps you have seen knotweed honey for sale? While these are all silver linings the best case scenario would be if knotweed could be eliminated. There are plenty of plants foragers can consume. Resveratrol can still be obtained from red wine. There are numerous native species that produce flowers bees enjoy. The most important lesson learned here is that with enough time, determination and dedication knotweed can be controlled. Partnerships are one weapon in the arsenal. Together we can accomplish more than any one group could do alone. SFEG is very grateful for the participation off all the organizations that work cooperatively to control knotweed in the Upper Skagit Watershed. Landowner buy-in is also essential. While they don't participate in the control efforts, landowners that allow knotweed treatment on their properties are an integral part of the program. Every landowner that agrees to participate does so voluntarily. Each has their reasons for participating in the Upper Skagit Knotweed Control Program. Whether to be the good stewards of the land or comply with Skagit County noxious weed laws or a desire to see salmon runs return to their former glory. There are as many reasons as there are participants, but we're all working together towards a common goal.

# 2020 Membership

SKAGIT FISHERIES ENHANCEMENT GROUP

### SFEG IS A MEMBERSHIP BASED ORGANIZATION

If you are enjoying reading this newsletter, perhaps it's time that you became a member! Your membership dollars are critical to support the operation of SFEG (including producing this newsletter), allowing us to develop new projects with landowners, providing education programs to kids throughout our watersheds, and collecting monitoring data regarding restoration project sites to document successes.

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*Skagit Fisheries Enhancement Group is a 501(c)3 nonprofit organization. All contributions are tax deductible to the extent that the law allows. Tax ID#: 94-3165939*

# Amazing Alders

*By* **MOLLY VAN DAM**, *Washington Service Corps Riparian Restoration Associate*

*Nitrogen fixing nodules on red alder roots*

A year and a half ago, I had no idea what an alder tree looked like. I think the extent of my knowledge of alders was that its wood chips were good for smoking fish. Once I joined the Washington Conservation Corps and spent my entire 2018-2019 winter planting a wide variety of native species and being surrounded by crewmates with environmental science degrees, I quickly learned that alders are unique among their peers. One of our restoration sites was really struggling with its vegetation survival rates, and my crewmate Sam asked why we weren't planting alders there. I spent my time in college studying rocks and glaciers, so I knew very little about the living parts of ecosystems. But I was hungry to learn as much as I could and catch up to all my new friends.

Red alders, or *Alnus rubra* for those in the know, are a crucial and fascinating species commonly found in riparian areas. Their flowers actually present as catkins. Their bark is thin and gray, but once cut the inner bark turns a rusty red, giving them their name of red alder. But one of the coolest qualities of red alder trees is that they are able to "fix" nitrogen. This means they can take in atmospheric nitrogen (N2), and convert it into ammonia (NH3), a form of nitrogen that other surrounding plants can now use. This is possible thanks to a symbiotic relationship with a genus of bacteria called Frankia, which lives in little nodules on the roots of alder trees.

**CONTINUED ON PAGE 8**

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# Amazing Alders

CONTINUED FROM PAGE 7

This allows alders to grow in soils that are newer and nutrient deprived, because they can supply their own nitrogen. This quality is what gives alders the term of pioneer species, as they are usually one of the first species to colonize an open and disturbed area. The presence of alders in a forest increases the biodiversity, but they aren't typically found in old growth conifer stands, since conifers provide too much shade for alders to thrive. Alders typically live up to 100 years, providing excellent habitat for a wide variety of native species. Once they have fulfilled their life span, those alders located in riparian areas will die off and fall to the ground, where they can span creeks and provide shelter and habitat complexity for salmonids.

One of my favorite parts of being the Riparian Restoration Associate for SFEG is being able to teach what I know about plants to others. I helped lead a few volunteer parties at Riverfront Park in Sedro-Woolley this past fall and spring, and red alders were in our planting list. I fondly remember multiple volunteers

*Red alder catkins*

coming to me asking in a panic if these little bumps on their roots meant that they were diseased. "No, no, those little bumps mean they're healthy and will help all the plants around them to be healthy as well!"

Sometimes plants can be hard to identify, especially deciduous trees. We have several beds of red alders at our native plant nursery, so I've been studying their features for months now. Their buds appear in an alternate pattern, as opposed to opposite branching like bigleaf maple trees. In their winter form, especially when they're so young and small, sometimes they can be easy to confuse with cottonwoods. When you crush a cottonwood bud, they are very sticky and emit a strong smell. Alders do not. Now that spring is upon us, the leaves make everything easier to identify as well! Alders have deeper serrated edges on their leaves than cottonwoods do, and alder leaves are the same color on both sides, whereas cottonwood leaves have a lighter color on the underside. When alder trees grow older and bigger in their riparian homes, they start to accumulate many different species of lichen growing on their bark, which can be another good identifying feature. Since many lichens are sensitive to air pollution, their presence is an important bioindicator of the overall health of the ecosystem.

Next time you see a red alder, stop and appreciate all the work bacteria does beneath the soil to provide a usable form of nitrogen for other plants. Teamwork makes the dream work!