



SalmonGRAM

Committed to Protecting and Restoring South Puget Sound Habitat



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The SPSSEG is administered by a nine-member volunteer board elected by the general membership.

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Cover: Clear Creek snorkel survey

Back Cover: Coho smolts, during Clear Creek snorkel survey, courtesy Andrew Berger

SalmonGram is published by the South Puget Sound Salmon Enhancement Group (SPSSEG), a 501(c)(3) non-profit, volunteer-based organization.

Message from the Executive Director

LANCE WINECKA



Salmon restoration has been going strong in the Pacific Northwest for the past few decades and it doesn't appear to be slowing down anytime soon. Even the theme of the upcoming Salmon Restoration Funding Board (SRFB) conference is titled "Facing the Future Together", reflecting the urgency we feel 20 years after the passage of Washington's Salmon Recovery Act. One goal of the conference is to discuss what we have collectively learned about salmon habitat restoration and what has changed over the years. This spring nearly 800 people from across the region will gather in Tacoma to learn from the past and to discuss how to build better restoration projects.

In order to build better projects in the future we need to monitor the effectiveness of all types of restoration projects built over the years. It's important to ensure that projects are good investments and that they continue to support diverse salmonid life histories. Without adequate monitoring and determining which types of projects offer the greatest benefits to fish, it might take another 20 years before we make significant progress in salmon recovery. Plus, scientific monitoring provides practitioners real-time feed-back on how these projects actually benefit fish in the stream and what we need to do differently next time. Each type of project compliments a certain salmon life history need. Some projects may increase spawning by replacing a culvert and other projects may provide flood refuge in the floodplains. It is critical for salmon that diverse projects continue to repair damaged habitat while also protecting intact habitat.

SPSSEG has been involved in habitat restoration since 1991 and has completed hundreds of projects that vary in cost, size and scope. Some early projects were as simple as planting trees, building fences along streams and adding spawning gravel to streams. Now many of our projects are large, expensive, and complex, and can impact hundreds of acres and/or miles of rivers. Both project types are built for a specific purpose in mind. It is important to continue to do both large and small scale restoration projects with willing landowners in Puget Sound and across Washington State to build stronger salmon runs.

To learn more about our work please attend our annual meeting on Thursday March 7th at the Lacey Community Center. It should be a great event and we would love to see you there.



The SPSSEG is one of fourteen Regional Fisheries Enhancement Groups created in 1989 by the Washington State Legislature. Base funding for the RFEG program comes from a grant from the U.S. Fish & Wildlife Service's Partners for Fish and Wildlife Program, a portion of state commercial and recreational fishing license fees, and excess egg and carcass sales administered by the Washington Department of Fish & Wildlife.



THURSDAY

March

7th

5:30-8:00 PM

LACEY
COMMUNITY
CENTER

6729 Pacific Ave SE, Lacey, WA

FREE



With special guest:

Langdon Cook



Upstream:
Searching for Wild Salmon,
from River to Table

And music from:



Vince Brown

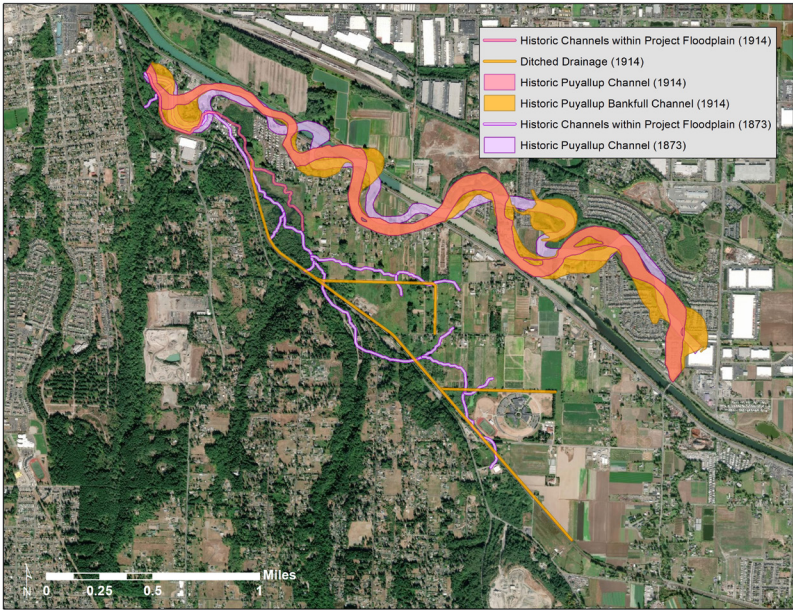
- * Oyster bar provided by Taylor Shellfish
- * Beer and wine available
- * 2018 year in review
- * Board elections

Puyallup River Floodplains for the Future Initiative and the Clear Creek Floodplain Restoration Project

In 2013, Pierce County, along with 22 partner organizations, launched the Floodplains for the Future program for the Puyallup, White, and Carbon Rivers. The Floodplains for the Future program is a forward-thinking, long-term vision for the Puyallup River Watershed which envisions a floodplain where farms and fish can thrive, while vastly reducing the harmful risks to human health and infrastructure currently experienced by frequent flooding across the Watershed.

In 2016, SPSSEG was invited to serve as the lead organization coordinating fish and habitat interests for the Floodplains for the Future partnership. In order to best serve salmon recovery goals for Floodplains for the Future, SPSSEG created the Fish Science and Habitat (FiSH) Committee as a technical advisory group to ensure our work is rooted in scientific principles and executed with broad support from watershed stakeholders. The FiSH Committee is a multi-agency group comprised of technical experts from disciplines related to fisheries biology, aquatic ecology, geomorphology, and hydrology. One of the major tasks of the FiSH committee, led by SPSSEG, is to coordinate and implement a large body of work aimed at charting the course for a future fish habitat restoration in the tidally influenced marsh lands of the Clear Creek watershed on the floodplain bench of the lower Puyallup River.

The Clear Creek study area occupies an approximately 1,140-acre area. The future potential of this landscape offers one of the few remaining spaces to restore critical habitat to support rearing and growth for all Puyallup River salmon and trout as they leave the river to make their ocean migration. The Floodplains for the Future



Historic channels of the Clear Creek Floodplain, digitized from georeferenced Historic Maps

effort has shined a bright light on the Clear Creek Project area and provides a new hope for restoring functional delta rearing habitat to increase overall salmon survival rates in the lower Puyallup River, which has severely limited off-channel, delta rearing habitat. In 2019 and 2020, SPSSEG will be leading scientific assessment efforts to monitor and model: groundwater elevations, thermal diversity, salinity and dissolved oxygen gradients, prey resources, and energetic value of this important off-channel rearing habitat to inform restoration project design and evaluate feeding, growth, and survival benefits fish could derive from a large scale project is this study area. This is an exciting opportunity for our Group and we are eager to share our stories of success. You can follow our progress at <http://spsseg.org/clear-creek/> and at <https://floodplainsforthefuture.org/>.



Lake Lawrence: Outlet Bridge Project



PRE-PROJECT

Salmon rely on cold water. Excluding the hot springs people seek, groundwater springs are often colder than the rivers they feed. In 2003 the Department of Ecology (DOE) commissioned an aerial survey of the Deschutes River. Cold water inputs from springs were found at River Mile 28, because while the river in that location was 19 degrees Celsius, the outlet of Lake Lawrence was 2.2 degrees colder. This past summer, a host of landowners, including the City's of Olympia, Lacey and Yelm, completed two restoration projects to enhance fish access to this cold water.



POST-PROJECT

Cold water springs are important habitats referred to as 'off-channel'. These off-channel habitats provided safety and food abundance for small rearing salmon in the watershed. Access to off-channel habitat in the Deschutes is severely limited, by culverts, roads, dams and diversion ditches. On the mainstem Deschutes there remains over 50+ complete barriers to off-channel habitat, and there are over 75 in the larger Deschutes Watershed. The 108,562-acre Deschutes Watershed includes its tributaries as well as the McLane Watershed, Woodland Creek Watershed and other streams that flow directly into South Puget Sound.

Just outside of Rainer, WA, the Deschutes River Ranch stretches along the banks of the Deschutes River, in the shadow of Mount Rainier. Blocking access to the spring at Deschutes River Ranch, sat a submerged culvert. With funding from the Salmon Recovery Funding Board (SRFB) and Department of Ecology (WADOE), the culvert was removed and replaced with a bridge. In conjunction with

the bridge installation, a series of five horizontal wood structures were placed in the lower quarter mile of the channel. In total, 28 pieces of large woody debris put in this small area. Two floodplain benches were excavated. The area impacted by construction was planted with 1,200 willow and 200 cottonwood live stakes.

Within months, SPSSEG staff informally monitoring the site, caught site of hordes of fish utilizing habitat above the bridge. GoPro video shot under the wood structures demonstrated something Squaxin Tribal Biologist Scott Steltzer has often said; "that Coho are attracted to wood in water, no matter where in the watershed they were." SPSSEG staff were able to identify juvenile salmonids and native Red-sided Shiners near wood installed in an upstream, related project. Monitoring efforts will continue monthly. Staff are on the lookout for fish presence, beaver activity, planting success, as well as water-levels and temperature.

The continuing story of the Greenwater River Floodplain Restoration Project

The Greenwater River is located along the border of Pierce and King Counties in the Cascade Mountains north of Mount Rainier. Historically, the Greenwater watershed supported healthy populations of Spring Chinook, coho salmon, and steelhead, and was one of the essential spawning areas in the White River watershed for the now threatened Spring Chinook.

Anthropogenic changes to the landscape throughout the 20th century resulted in the degradation of fish habitat and a reduction of once healthy populations of fish. The installation of logging roads separated the river from its floodplain, and in the 1960s, clear-cut logging activities around the Greenwater River removed all but some small stands of trees close to the river. In December of 1977, a rain-on-snow event generated a record peak flow of 10,500 cubic feet per second (cfs). The flood flushed large logs, landslide debris and remnant logging material downstream, with much debris racking up on the Highway 410 Bridge, leading to record flooding in the town of Greenwater. By 1979, reactions to the flooding led managers to remove all woody debris from the river greater than 3-inches in diameter and 3-feet in length. The lack of riparian forests and instream wood led to the further degradation of fish habitat caused by increased water velocities and shear stresses scouring the river bed, resulting in an incised main channel further removed from its floodplain. Restoration of the Greenwater River is focused on improving aquatic and riparian habitat, by reconnecting the floodplain and adding large woody debris back into the system.

The Greenwater River Floodplain Restoration Project was started in 2010 by the South Puget Sound Salmon Enhancement Group (SPSSEG), with the completion of Phase 3 in 2014. The project involved a number of restoration activities including large woody debris (LWD) placement in the form of 17 engineered log jams (ELJ), the removal of an abandoned forest road posing a barrier between the river and its floodplain, and riparian plantings. Successful restoration would increase floodplain and off-channel habitat connectivity, and reduce high flood velocities which can scour salmon redds and flush out rearing fish. ELJs provide increased roughness to reduce velocities, promote activation

of relic side channels, encourage natural wood and sediment recruitment, and increase pool frequency—all with the goal of improving salmon habitat. Riparian plantings contribute to habitat complexity and provide future instream cover to help keep water temperatures low.

Since restoration SPSSEG has been monitoring the Greenwater floodplain restoration project area, collecting data on wood, habitat, and fish use. Snorkel surveys of the project reach, performed by SPSSEG in 2014 and 2016, observed rearing coho and Chinook salmon in pools and side channels, and coho salmon were observed to be spawning in the upper reaches of the project area.

In December of 2017 Flight Evolved flew drone based lidar of the project area. Collecting lidar data for this study using an unmanned aerial vehicle (UAV), more commonly known as a drone, provided a more detailed cost-effective product than using the manned aircraft option. The terrain model derived from this flight was then used to model water flow over the post-project landscape in order to shed some light on how well the Greenwater River Floodplain Restoration Project was able to achieve projected goals, with a focus on the reconnection of the floodplain and seasonal side channels in order to reduce high flow velocities and increase flood resiliency.

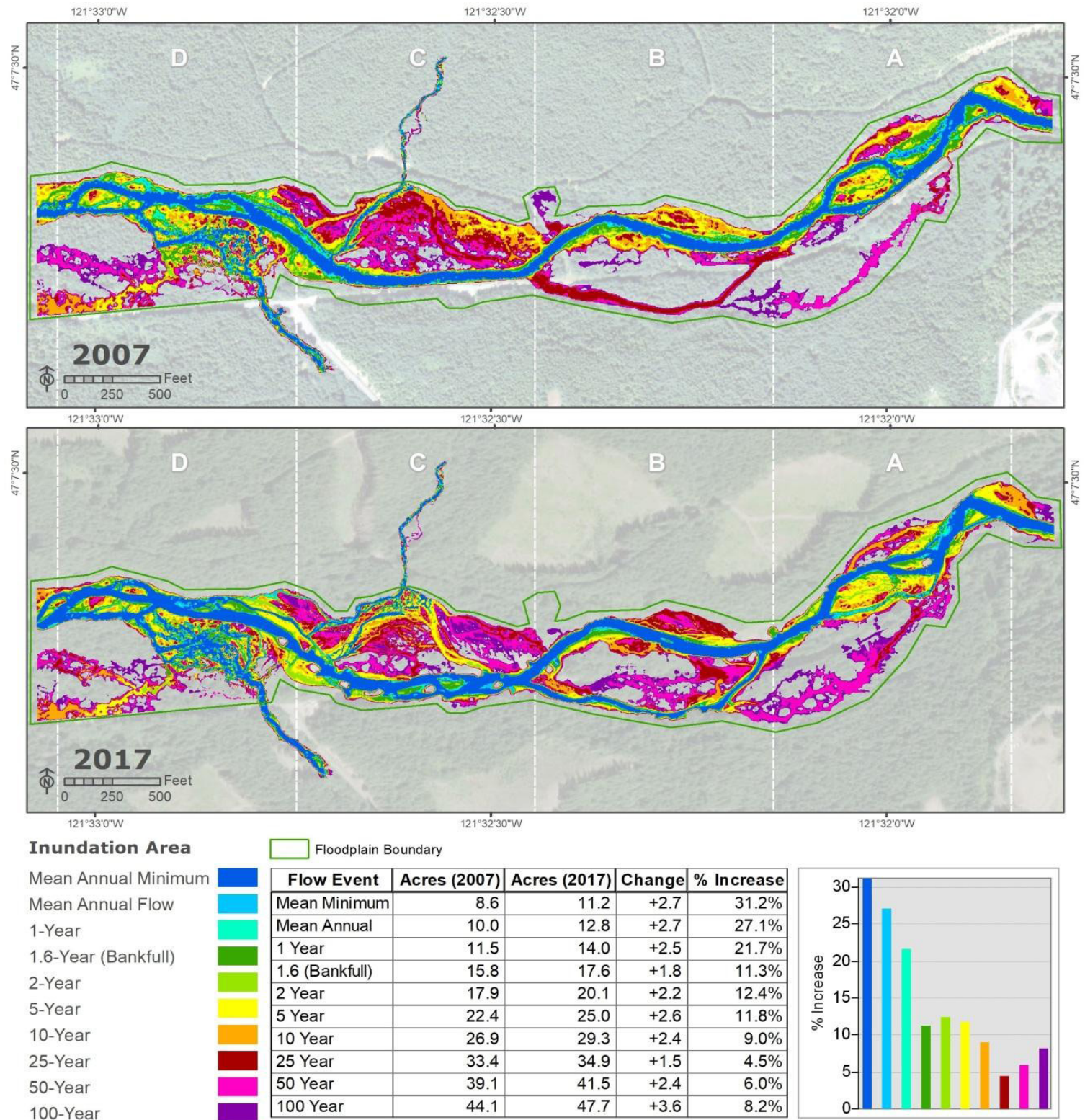


Lidar drone flight over the Greenwater River

Hydraulic modeling was performed on the post-project landscape using the US Army Corps of Engineers Hydrologic Engineering Center’s River Analysis System (HEC-RAS). HEC-RAS was chosen for use in this research because it is a reputable 2D hydraulic model provided free of charge by the USGS. Results show that the Greenwater River restoration had a positive impact on project metrics, with an 8.2% increased inundation area for the 100-year event, an average area gain of 14.3% across all flow events modeled, and an average 9% gain for events above bankfull flow (see Inundation Area figure on next page). Mean velocities in the main channel were modeled to decrease 9.16% at the 10 year flood and 8.46% at the 100 year flood.

The Greenwater River Floodplain Restoration Project was largely focused on the restoration of salmon habitat. The need for this and future restoration has become more apparent as shifts in the global climate, seen to be occurring now, have resulted in higher and more frequent flooding during months of salmon egg incubation and rearing, posing an increased risk to populations of Pacific salmon. When examining the hydrology of the Greenwater River in the past ten years

compared to the previous eight decades of gage flow data, it is observed that there has been an increase in 10-year peak flood occurrences in the last ten years of over 5 times the expected and historic occurrence. Continued efforts to restore and conserve rivers and streams are vital in ensuring the health and survival of not only the salmon, but the rest of the ecosystem that they are an integral part of.



MASHEL RIVER: 10 years of in-stream restoration

It was last summer, 2018. The setting was along the Mashel River at its confluence with the Little Mashel River, downstream from the town of Eatonville. The last log was put in place, the machines all pulled out, and the river was left to greet the nine newest log jams installed for salmon habitat restoration along the Mashel. After two years of intensive summer construction, in-stream restoration of ‘Reach 7’ was complete. This was the final chapter of a nearly two-decade long planning and construction campaign to restore the Mashel River back to its prominence as one of the region’s great salmon and steelhead rivers. Or at least we thought it was the final chapter.



Aerial image of log jam construction area showing diversion dam.

In the context of modern salmon recovery efforts in the Nisqually Basin, the Nisqually Indian Tribe generated comprehensive and integrated multi-species management plans for the Nisqually River and its tributaries, culminating in the release of the Nisqually Chinook Recovery Plan in 2001. Subsequently, a 2004 analysis of the Ecosystem Diagnosis and Treatment (EDT) model identified the Mashel River in the vicinity of Eatonville among the highest priority reaches for habitat restoration. A multispecies action plan and comprehensive reach-specific restoration plan were developed. In 2004, the Mashel River Restoration Design



Decade old log jam in reach I-II

Technical Memorandum, completed by the Watershed Professionals Network, identified seven important reaches of the Mashel for restoration targets.

The EDT model identified the loss of ‘Key Habitat’ such as pools and tailouts, and the loss of ‘Habitat Diversity’ as major factors affecting salmon and steelhead. As with many of our local rivers, one of the biggest factors in this loss of habitat is attributed to the lack of large wood in the Mashel basin. In short, the modern Mashel River has only a small fraction of log/wood recruitment it historically had, due to intensive logging and intentional wood removal efforts. The lack of in-stream wood in turn leads to a reduction in key habitat and habitat complexity. Without wood, the river becomes simplified and the formation of pools, edge habitat, sheltered rearing areas, and other habitat types becomes limited. Enter the landscape-scale restoration plan to install dozens of engineered log jams throughout the seven priority reaches identified along the Mashel.

Here we are 10 years after the first log jams were installed in Reaches 1 and 2 between Boxcar Canyon and Eatonville. With the completion of the Reach 7 work last summer, the prescribed in-stream treatments in all seven reaches have been completed. More than 30 log structures, representing thousands of strategically placed logs have been installed. The effects of these habitat structures can be seen from Highway 161 in Eatonville and other river access points. Upstream of Highway 161, what had been a simplified river channel with a torrent rapid and bony rocks has been transformed into a series of back-watered pools with intermittent riffles; complex river edges interlaced with logs and branches line the banks. Rearing and spawning habitat for salmon and steelhead is much improved in the restoration treatment areas. But wait, this is not the end of a rosy story. Ten or twenty years isn’t very much time for a river to recover from a hundred years of degradation. Trees don’t grow that fast. Since the original Chinook Recovery Plan came out in 2001, the input of natural logs into the Mashel has not increased much. With the upper watershed coming under protection and the reduction of logging, trees can once again play a critical role in river habitat, but it’s going to take more time. So for now, the Mashel and its salmon still need our help.



Newly constructed log jam in reach 7

The Kennedy Creek Salmon Trail offers salmon enthusiasts, nature lovers, students, teachers and curious community members alike an amazing opportunity to get up close and personal with the salmon who call Kennedy Creek home.



Interested in diving deeper into the salmon world? Become a Kennedy Creek volunteer! Email kennedycreek@spsseg.org for more information!



SEPTEMBER 14, 2019

Put it on your calendar, folks! The very first Kennedy Creek Chum Run approaches. Check out our website for updates and information!

Stay on the lookout for Puget Sound Brews & News 2019!



Summer is on it’s way and so is SPSSEG’s annual science talk series! New research, new scientists, same delicious brews! Look for the first installment of the 2019 series in June!

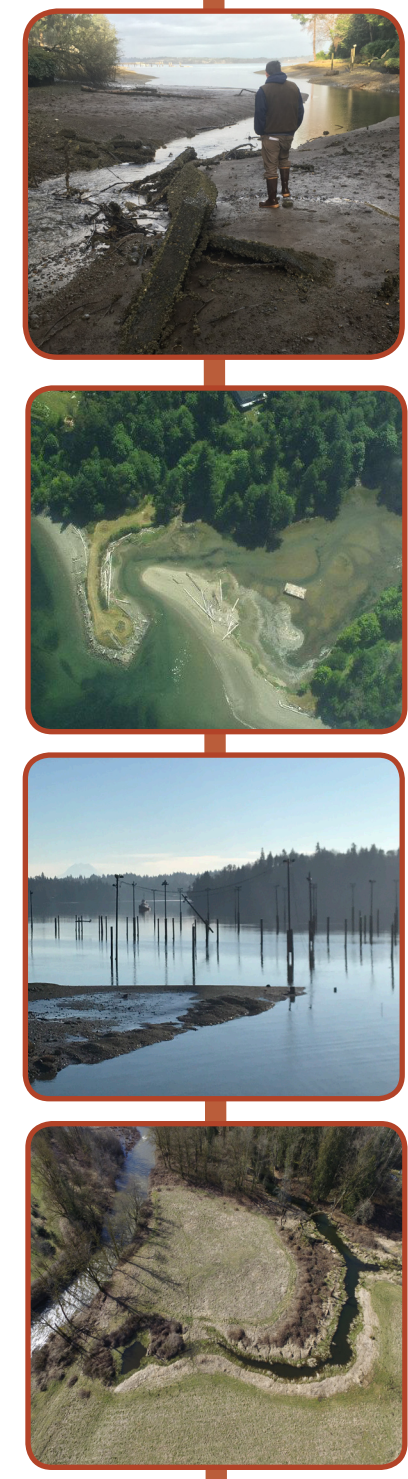
BUTLER COVE

Butler Cove is steeped in local South Sound history. Serving as the primary wharf for steamships in the South Puget Sound during the 1870s, it was later modified to serve as a fish-rearing site in the 1930s. The legacy of these fish-rearing ponds remain as concrete debris that has impounded sediment in the upper-estuary and degraded the estuarine habitat. The Butler Cove Estuary Project, located on the west side of Budd Inlet, will remove a series of derelict fish rearing ponds. The goal of this project is to re-establish natural habitat processes and restore the estuary to a condition where it is able to serve as a place where local and resident salmon can seek refuge and find food. Pocket estuaries like Butler Cove and important nurseries for rearing Chinook salmon, Coastal Cutthroat, Chum, Coho and Steelhead.

LITTLE FISH TRAP

If you salmon fish in the South Puget Sound, you know Little Fish Trap. Long has the rock pile been the site of fishing boats and happy anglers. The shoreline however, bears a legacy of alteration and desiccation. The small estuary was formed over millennia by sediment transport processes. The spit extended east of a bluff located west of the creek mouth. In the 1940s a ditch was cut through the middle of the channel, and rubble was installed to armor the shore, cutting off the connection between creek, estuary and the Puget Sound. This project will restore the pocket estuary to a small freshwater salmon stream and tidal channel by removing the armoring located at the mouth of the estuary. This project will benefit our local and regional salmon species, and fulfill the dream of both the former and current landowners to see the spit returned to its natural state.

WHAT TO LOOK FOR IN 2019



OAKLAND BAY

Oakland Bay has been a project that spans numerous years. With many partners and phases this next round of construction will continue the Goldsborough Creek Delta Restoration by importing sediment to expand the creek delta and create saltmarsh in the western lobe of a much larger project. The created microtopography allows for various intertidal plant communities and will capture mobile sediment. By virtue of being a marine area, the site is a known feeding and migration corridor for salmonids and is linked to non-salmonid species that are important contributors to the ecosystem, such as forage fish, marine invertebrates and numerous migratory and resident shorebirds. The restoration of Oakland Bay addresses rapid and widespread development of the waterfront in the late 1800's/1900's. In winter 2019 we removed over 300 toxic creosote pilings from the waterfront. The next step is to begin restoration of the saltmarsh this coming summer.

SOUTH PRAIRIE CREEK

South Prairie Creek is a tributary to the Carbon River and is one of the principle salmon streams in the Puyallup/White River watershed supporting ESA listed Chinook and steelhead as well as coho, chum, pink, and cutthroat trout. This impressive project starts the process of reversing the effects of a century of agricultural practices and mainstem channel incision to create a fully functional and complex network of floodplain side channels and logjam habitats. Wood and rock structures will be placed throughout more than half a mile of river, a system of side channels will be constructed throughout the floodplain to restore sediment transfer and water storage and over 30 acres of native plants will be planted across the banks and floodplain. Keep an eye out for the new nature trail that will be built at the site in the next phase, where you will be able to get up close and personal with salmon, restoration and our beautiful northwest ecosystems!

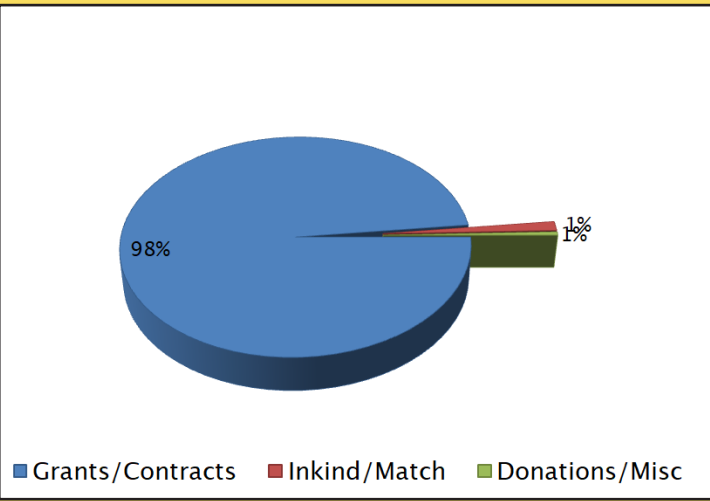
SPSSEG by the Numbers

Below is a brief look at SPSSEG's financials for the 2017-2018 Fiscal Year. For a full copy of this year's financial audit, please contact Lance Winecka at Lance@spsseg.org.

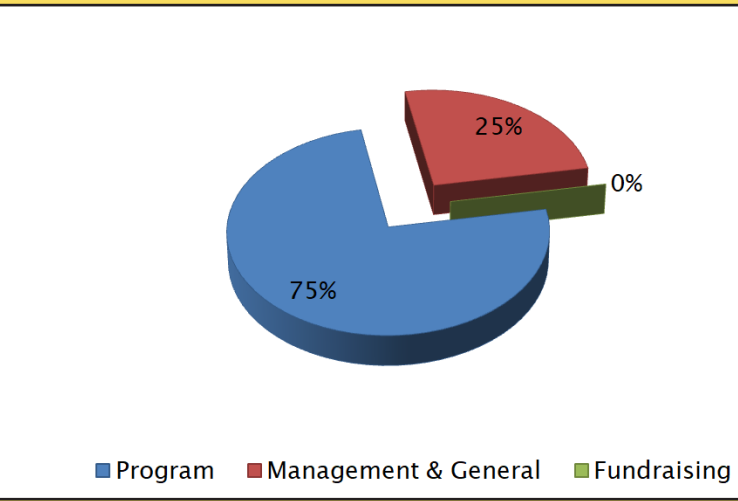
Abbreviated Statement of Financial Position as of June 30, 2018		
Assets	06/30/18	06/30/17
Cash	\$24,460	\$51,328
Receivables	\$332,901	\$598,281
Prepaid Expenses	\$4,064	\$3,826
Equipment (less depreciation)	\$12,198	\$15,353
Total Assets	\$373,622	\$668,787
Liabilities	\$225,815	\$576,104
Net Assets	\$147,806	\$92,683
Total Liabilities & Net Assets	\$373,622	\$668,787

Abbreviated Summary of Activities for the Year Ending June 30, 2018		
Support & Revenue	06/30/18	06/30/17
Grants/Contracts	\$1,880,708	\$2,439,513
Inkind/Match	\$25,250	\$14,967
Donations/Misc	\$9,123	\$6,888
Membership Dues	\$502	\$2,175
Misc/Interest Income	\$212	\$215
Total Support & Revenue	\$1,915,795	\$2,463,759
Expenses		
Program	\$1,478,575	\$2,221,307
Admin	\$496,375	\$370,138
Fundraising	\$561	\$0
Total Expenses	\$1,975,511	\$2,591,445
NET RESULT	-\$59,716	-\$127,686

Income



Expenses





South Puget Sound Salmon Enhancement Group
6700 Martin Way East, Suite 112
Olympia, WA 98516

Please forward this newsletter on to a friend. Thank you!



OUR MISSION:

To protect and restore salmon populations and aquatic habitat with an emphasis on ecosystem function through scientifically informed projects, community education, and volunteer involvement.