PSAR FUND
Puget Sound Acquisition and Restoration

Linkages Between PSAR REGIONALLY SIGNIFICANT PROJECTS *(Large Capital)* and LOCAL WATERSHED PRIORITY PROJECTS *(Small Capital)*

HOW DO SMALL CAPITAL PSAR PROJECTS SUPPORT AND LINK TO LARGE CAPITAL PSAR PROJECTS?

- Small capital PSAR funds provide a relatively consistent source of funding that watershed groups can use to either fully implement smaller projects or move larger projects forward by funding the feasibility and design in steps.
- The larger, regionally significant restoration projects, which promise improvements to habitat on a larger scale than the small capital projects, are more costly to implement and less able in the construction phase to be partitioned into sequential phases that take place over a longer time.
- By the time a large capital project is proposed for implementation funding, it has been through numerous rounds of comments and review by technical committees and has the full support of the technical committee, local community members and citizen's advisory members.
- The mixture of small and large capital PSAR projects has proven effective in unifying local and regional priorities and ensuring support for these efforts at all levels.

WHAT ARE A FEW EXAMPLES OF HOW THE LARGE CAPITAL AND SMALL CAPITAL PSAR PROJECTS LINK TO ONE ANOTHER?

FROM THE NORTH OLYMPIC LEAD ENTITY

Cheryl Baumann, Manager, North Olympic Lead Entity for Salmon, Clallam County

#1 RANKED LARGE CAP PROJECT	PSAR AMOUNT
Lower Dungeness Floodplain Restoration	**$3,000,000**
PROPOSED SMALL CAP PROJECTS IN RANKED ORDER:	
#2 – Dungeness Floodplain Restoration Kinkade Phase	$1,041,845
#3 – Upper Elwha River Protection	$40,659
#4 – Lower Hoko River Restoration Planning	Alternate
#5 – Lower Elwha River Protection	Alternate

The **Dungeness River** projects are connected to the overall effort to restore the Dungeness River and recover Puget Sound Chinook salmon populations. Small capital project funding supports project planning, feasibility studies, and property acquisition. This was the case in 2007, when Clallam County received its first PSAR grant to help fund the work needed to prepare for setback of the Lower Dungeness Levee.

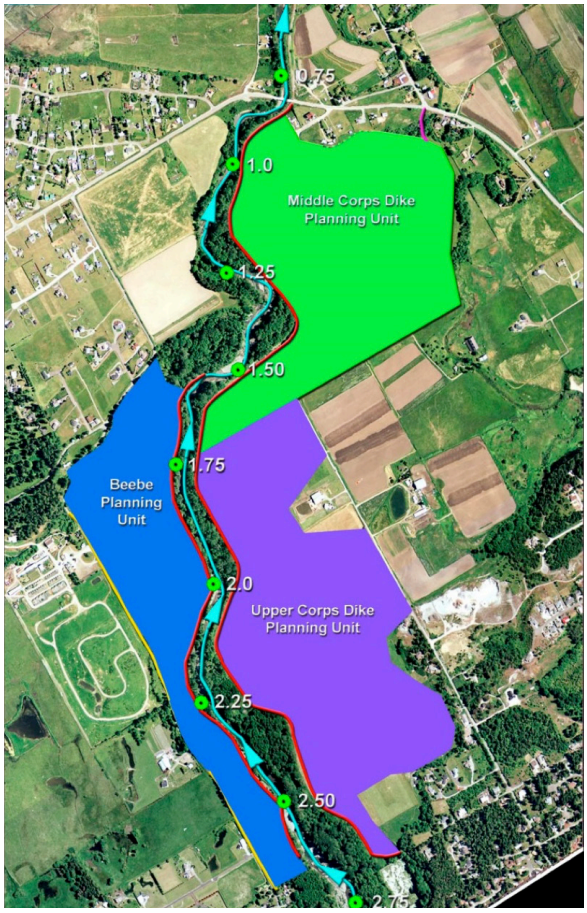
The **Lower Dungeness floodplain restoration** currently proposed for PSAR large capital funding is shown in Figure 1 as the lime green area labeled "Middle Corps Dike Planning Unit". Figure 1 also shows the Beebe Planning Unit, to be included in a planned later phase of floodplain restoration, assuming the current landowner is willing to participate. The Upper Corps Dike Planning Unit in Figure 1 will also be included in a future restoration phase. As each unit is restored, the associated reaches of the river and

floodplain are improved, but the full benefits of restoration aren't fully realized until work in all the units is complete.

About 8 miles upstream of the Middle Corps Dike Planning Unit lies the Kinkade reach of the river, an important area for Chinook salmon spawning. Restoring the Lower Dungeness River and floodplain enables the salmon to access the Kinkade reach. Restoration of the Kincaid reach will involve acquiring floodplain properties that are currently threatened by river flooding.

The previously funded and now nearly completed large capital PSAR **Elwha River Revegetation Project** is similar to the Lower Dungeness River floodplain project. Both projects involve a coordinated effort to restore a large river system. For the Elwha project, the federal government paid for dam removal (about $383 million). The system restoration also comprised smaller projects, like recovering the **Little River** (a tributary of the Elwha) to improve degraded lower river habitat in an effort to maximize salmon returns after dam removal.

FIGURE 1. LOWER DUNGENESS FLOODPLAIN RESTORATION



FROM THE GREEN, DUWAMISH, CENTRAL PUGET SOUND WATERSHED (WRIA 9) LEAD ENTITY

Karen Bergeron, Habitat Projects Coordinator, King County

#2 RANKED LARGE CAP PROJECT	PSAR AMOUNT
Lower Russell Levee Setback and Habitat Restoration	**$10,255,524**
#4 RANKED LARGE CAP PROJECT	
Downey Farmstead Side Channel Restoration	**$4,835,743**
PROPOSED SMALL CAP PROJECTS IN RANKED ORDER:	
#1 – Porter Levee Setback Construction (Approved for $238,113 Salmon Recovery Funding Board grant.)	$0
#2 – Riverton Creek Flapgate Removal	$551,070
#3 – Lones-Turley Restoration Final Design	$250,000
#4 – Maury Island Aquatic Reserve Protection 2	$300,000

The projects proposed for large and small capital PSAR funding are coordinated to provide the habitat needed for each life stage of the juvenile Chinook salmon. The **Porter Levee Setback** and **Lones-Turley Levee Setback** projects are located within the Middle Green River sub-watershed, where most of the Chinook salmon spawning in the watershed takes place. These projects will move levees back toward the hillslope, allowing the river to access its floodplain, which will naturally improve salmon spawning habitat.

As the salmon fry emerge from the riverbed gravel, they move downstream seeking areas to grow and find refuge

from the high streamflows. The **Lower Russell Levee Setback** and **Downey Farmstead Side Channel** restoration projects in the Lower Green River sub-watershed will create rearing and refuge habitat for use by juvenile salmon in the winter and spring months. This rearing time is critical for the juvenile salmon to grow; research has shown that larger juvenile salmon have a much higher chance of surviving and returning as adults to spawn.

The **Downey Farmstead Restoration Project** will create more than 1,875 linear feet of side-channel, 6.34-acres of intermittently inundated aquatic habitat, and 130 acre-feet of additional floodplain storage, thus lowering peak flood levels by approximately 6 inches. The project requires removal of a large quantity of fill material from the floodplain, and the excavation must be accomplished in one season. Project sponsors have assessed the cost of phasing projects of this size and note that phasing would add $400,000 to $500,000 to the overall cost. Large capital PSAR funding for this project helps avoid the extra cost of phased construction.

Riverton Creek Flapgate Removal will allow the fish access to a tributary in the lower portion of the Green River, known as the Duwamish River. As the juvenile fish move downstream to enter the ocean, they use this portion of the river to acclimate to saltwater, a necessary step before entering Puget Sound. The **Maury Island Aquatic Reserve** project will acquire more than 1,000 feet of marine shoreline (Figure 2). The acquisition will benefit Chinook salmon by protecting eelgrass, marine nearshore, and forage fish spawning habitat. The acquisition will also allow the future removal of about 375 feet of shoreline armoring and reconnection of historic feeder bluffs with the nearshore.

FIGURE 2. PARCELS PROPOSED FOR ACQUISITION THROUGH THE MAURY ISLAND AQUATIC RESERVE PROJECT.

FROM THE STILLAGUAMISH LEAD ENTITY

Donald "Kit" Crump, Stillaguamish Co-Lead Entity Coordinator, Snohomish County Public Works Surface Water Management

#3 RANKED LARGE CAP PROJECT	PSAR AMOUNT
Leque Island Estuary Restoration Construction	**$3,406,283**
PROPOSED SMALL CAP PROJECTS IN RANKED ORDER:	
#1 – North and South Forks Stillaguamish Engineered	$850,000
#2 – Stillaguamish Riparian Crew 4	$550,000
#3 – Stillaguamish Floodplain Acquisitions	$506,954
#4 – Stillaguamish e-DNA Pilot Project	Alternate
#5 – Secret Creek Culvert Replacements Project	Alternate

Leque Island is the most significant salmon recovery project for the Stillaguamish Lead Entity to date. It would not be on course to succeed without PSAR funding. The large capital restoration construction project, in combination with the small capital projects, helps to ensure that the greatest number of healthy fish return to the ocean to spawn and produce new juveniles.

Small capital restoration projects (which include such tasks as installing large wood debris jams) compliment the large **Leque Island Estuary Restoration Project** by ensuring that Chinook salmon have key food sources all along the river and estuary. The combination of freshwater and saltwater habitats are key to supporting Chinook as they grow and transition from smaller freshwater juveniles to larger estuary smolts (large marine juveniles). The smolts need to be large enough to survive in the ocean and return to the river to spawn as adults. The main limiting factor to Chinook is having sufficient habitat for juveniles to feed and grow.

The small cap PSAR **Stillaguamish Riparian Crew 4** project supports juvenile survival by cooling stream temperatures and adding the nutrients that support the insects that juvenile fish eat. The **North and South Forks Stillaguamish Engineered Log Jam small capital PSAR project** provides juvenile salmon with cover from predators and provides pools that trap nutrients generated by riparian trees. The **Stillaguamish Floodplain Acquisitions** protection and restoration project provides critical habitat for juvenile salmon during high flood events, when the log jams no longer provide safety. Floodplains also create additional side channels that trap nutrients and allow juvenile salmon to escape predation. The **Stillaguamish e-DNA Pilot Project** enables us to learn where the critical small streams are that also support juvenile survival and growth. The **Secret Creek Culvert Replacements Project** creates access to small streams that are also key to juvenile survival and growth. Secret Creek is a tributary of Pilchuck Creek, which is a tributary to the Stillaguamish River.

These small capital projects are key to preserving a large enough number of juveniles so that they can move into the estuary and grow ever bigger. The estuary has the most productive food supply in the river system, so this is where the fish that survive grow larger. It is also where fish transition to salt water. Smaller juveniles that have less time to adapt to salt water and grow are much less likely to survive when they enter the ocean.

updated 3.31.17

PUGETSOUND PARTNERSHIP

WASHINGTON STATE Recreation and Conservation Office

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