

## SKAGIT (WRIAs 3 and 4)

### SKAGIT BASIN THREE-YEAR WORK PROGRAM 2012 UPDATE

#### SUMMARY NARRATIVE

*The three-year work plan/program updates should include a narrative to describe the progress, changes, and status of recovery implementation and your work program since the previous year's update. These narratives can be a summary. Some questions may not be answerable at this time, please note where you cannot answer the questions.*

#### **Overview**

The 2012 *Skagit Basin Three-Year Work Program* updates those projects and programs, active and planned, targeted at the recovery of Chinook salmon populations in the Skagit watershed for the next three years (2012, 2013, and 2014). The update on habitat capital projects was completed by Skagit Watershed Council staff using information provided by project sponsors in a pre-grant scoping process, current grant applications, and the status of active projects in PRISM. Eric Beamer, Research Director with Skagit River System Cooperative, provided updates on Research and Monitoring activities and needs. Ed Connor, fisheries scientist with Seattle City Light, provided the update on the status of Chinook stocks in the Skagit. The actions identified are consistent with the recovery needs found in the *Skagit Chinook Recovery Plan* (SRSC and WDFW 2005). The proposed actions also provide valuable habitat benefits to other listed and non-listed species including bull trout, steelhead, pink, chum, and coho salmon.

Until a forum exists locally for the integration of all elements of the Skagit Chinook Recovery Plan, our Three-Year Work Program is limited in scope to those elements contracted and funded under the lead entity authority. This includes the Habitat Capital program, non-capital needs related to the habitat capital program, and watershed research needs not identified in harvest and hatchery programs.

The Watershed Council has been engaged with Puget Sound Partnership and the Recovery Implementation Technical Team (RITT) in their development of a watershed-scale adaptive management framework (template) for the last three years. The RITT has used the Skagit as one of three watersheds to build an adaptive management framework for the watershed chapters of the Puget Sound Salmon Recovery Plan. We had anticipated waiting until the template was available to further dialogue about the technical components of recovery. As template development is delayed and the

Watershed Council is in the process of exploring organizational restructuring this year, the shape or form of future engagement on integration of the parts of the Skagit Chinook Recovery Plan cannot be projected at this time.

### **Summary of Changes to the Three Year Work Program for 2012**

Changes to the Skagit Three Year Work Program for 2012 include an update of the status of active projects from the 2011 list, and removal of three habitat capital projects for reasons explained in the list. Completed projects with proposed or planned post-construction monitoring have been moved to the place on the list labeled "15 Monitoring." The 2012 Habitat Capital projects list includes the five project proposals currently under review for the 2012 SRFB grant round. Our 2012 SRFB grant process gave priority to furthering projects already under development while remaining open to take advantage of new opportunities as they arise. Two of the projects received are new to our list and were accepted as consistent with our updated Strategic Approach. A reminder that the Habitat Capital Projects list is organized to reflect the Tiers and Target Areas (Table 1) adopted in the 2010 update of the Council's Strategic Approach.

Starting last year we interpreted the "20xx Estimated Cost" columns to be the year in which a funding request of a certain amount will be made. The "20xx Activity to be funded" columns indicates the type of work on the grant that is expected to occur during that year regardless the year the activity was funded. Estimated project costs for year 2012 include funding requested for projects under consideration in the 2012 SRFB grant round. Year 2013 and 2014 estimated project costs and activities are approximate.

Research and monitoring projects and needs have been updated this year and are reported on the list by life history stage as organized in the corresponding recovery plan chapters. Because these programs have been extensively updated, completed projects are included this year regardless the completion date. The costs associated with monitoring projects are the current or projected secured funds for those yearly monitoring activities. The costs of most of the research projects have not yet been provided, so annual and collective cost totals do not reflect needs. This coming year we plan to enter the Research and Monitoring projects in the Habitat Work Schedule.

We remain focused on developing projects in our target areas and out-planning. As with the last couple of updates, we are providing a longer-term context for viewing the collection of actions supporting the implementation of the Skagit Chinook Recovery Plan. Accompanying this summary and Three Year Work Program spreadsheet is a Gantt chart listing of habitat capital projects funded and planned from 2000 through approximately 2020. Projects funded in multiple phases are shown on a single line,

color-coded by different stages of development. Those projects in the 2012 Three Year Work Program are bracketed by dark vertical lines for reference. The Gantt chart is provided as a visual aid for understanding the stage of development and timeline for projects that exist beyond the 2012-2014 Work Program window. As planned projects are ready for implementation they will move into the three year planning window. We plan to include the Research and Monitoring projects in the Gantt chart next year.

Table 1. Summary of Target Areas from the Skagit Watershed Council 2010 Strategic Approach.

Tier	Target Area	Description	Geographic Locations within Watershed	Importance to Skagit Chinook Production
1	Skagit Estuary	Estuarine emergent marsh, estuarine scrub shrub.* Saltwater-freshwater mixing areas. Most productive aquatic ecosystem in watershed. Remaining brackish habitats areas are highly compressed due to dikes and levees. Key habitat features include delta distributaries and blind sloughs.	Skagit Bay including Fir Island bay front; lower end of North and South Fork Skagit River; Swinomish Channel; and associated wetlands on Padilla Bay	Critical physiological transition zone for juvenile Chinook (all life history types). Highest growth rates for juvenile Chinook in watershed (hence high ocean survival). Loss of habitat substantially reduces juvenile survival in Puget Sound and ocean.
	Riverine Tidal Delta	Riverine tidal marshes and wetlands* are the second most productive aquatic ecosystems in watershed.	North and South Fork Skagit River up to and including Cottonwood Island	Historically expansive habitat area for delta-rearing Chinook juvenile life history type. Rearing habitat areas limited due to dike and levee system.
	Floodplains (mixed population rearing)	Broad large-river floodplain areas with prominent alluvial features formed by channel migration, including secondary (islanded) channels, backwater habitats, freshwater sloughs, and oxbows. Highly productive aquatic habitats due to frequent floodplain inundation and extensive wetlands.	Floodplains of the Skagit River from Cottonwood Island to Marblemount, and the Sauk River up to Darrington.	Historically expansive rearing habitat area for distinct riverine juvenile Chinook life history type. Middle Skagit provides rearing habitat for all six independent Chinook populations in Skagit. Growth rates of juveniles equivalent to tidal freshwater habitats. Major spawning areas for fall and summer Chinook.
2	Nearshore Pocket Estuaries	Isolated and relatively small estuary habitats located along nearshore areas of Skagit Bay (WRIA 3).	Pocket estuaries in Skagit Bay that are in close proximity to the delta	Rearing habitats for fry migrant Chinook salmon emigrate from Skagit River in large numbers. Ocean survival rates extremely low (near zero) for emigrating fry that don't rear in these habitats.
	Floodplains (single population rearing)	River floodplain areas with prominent alluvial features formed by channel migration, including secondary (islanded) channels, backwater habitats, freshwater sloughs, and oxbows. Highly productive aquatic habitats due to frequent floodplain inundation and extensive wetlands. Large tributaries that currently or historically provided extensive spawning and rearing habitat areas for Chinook salmon.	Floodplains of the upper Skagit (above Marblemount), upper Sauk (above Darrington), Suiattle, and Cascade Rivers. Day Creek, Finney Creek, Illabot Creek, Bacon Creek	Major spawning areas for single Chinook populations. Historically expansive rearing habitat area for riverine juvenile Chinook. Important to spatial structure and life history diversity of Chinook populations according to NOAA Viable Salmonid Population (VSP) criteria.
3	Sediment and Hydrology Impaired (High Risk) Watersheds	Watersheds that have been identified as major sediment risk areas to important downstream Chinook spawning and rearing habitats. Watersheds located in unstable soils, sedimentary geology, and which possess high densities of forest roads.	Major tributaries to lower Cascade River, lower Suiattle River, and middle Skagit.	Increased risk of severe habitat degradation and reduced Chinook survival due to high risk of landslides, road failures, combined with peak flows caused by historic land management (i.e., logging) and forest road development.

\* See Skagit Chinook Recovery Plan (2005) Appendix D for definitions.

## Responses to Watershed Questions for Three-Year Work Programs

1. *What are the actions and/or suites of actions needed for the next three years to implement your salmon recovery chapter as part of the regional recovery effort?*

Attached is our updated list of habitat, monitoring, and research actions and projects identified for some phase of implementation within the next three years. The format of the list complies with the regional template. As we have for the past several years, projects are color-coded by status as follows to assist review:

- Added to the list for 2012 (yellow shading)
- Removed from 2012 list (gray)
- In progress, phased implementation and funding (blue)

Also attached is a Gantt chart showing those habitat capital projects on our Three Year Work Program within the context of a larger time frame.

2. *What is the status of actions underway per your recovery plan chapter? Is this on pace with the goals of your recovery plan?*

About 12% of the restoration needed to achieve the recovery goals in the estuary has been done, and the Intensively Monitored Watershed (IMW) work corroborates this estimate (Greene and Beamer 2011). Most of that work has been completed in the South Fork Skagit River and to a lesser degree along Swinomish Channel. Skagit IMW investigators report finding a juvenile Chinook response to this amount of restoration (Greene and Beamer 2011). For a given outmigrant population size they found fish density in the South Fork, where rearing habitat capacity has increased, to have declined post-restoration (starting with Deepwater Slough restoration) relative to the North Fork where little or no restoration work has been completed.

We are currently keeping pace with estuary restoration if we assume the habitat goal is on a 50 year timeline. The Fisher Slough tidal marsh restoration was completed late last year. Completion of work is expected this year on a series of small marsh sites along the Swinomish Channel created by the removal of dredge spoils, and on expansion of tidal inundation at WDFW's Milltown Island in the South Fork. Progress on three tidal delta projects on WDFW land (Fir Island Farms, Cottonwood Island and Deepwater Slough Phase 2), are projected to occur in the next couple of years. Whether or not we can keep up this pace is debatable as many of the remaining identified delta restoration projects involve privately owned agricultural land.

Within WRIAs 3 and 4, two of the five pocket estuary restoration projects identified in the recovery plan have been completed. Connectivity was restored to the pocket estuary at Turners Bay this spring, and will be restored to the Dugualla Heights lagoon within the next year or two. The Dugualla Heights lagoon project is located in WRIA 6 with SRFB funding support from both Skagit and Island County.

In the freshwater, more progress has been made in acquisitions for protection of existing habitat than in restoration, with roughly 47 percent of Skagit SRFB funds applied to floodplain acquisitions to date. Post-recovery plan restoration projects in freshwater have largely included riparian plantings and sediment reduction work on Forest Service roads. Notable instream projects include a large-scale alluvial fan restoration in Hansen Creek completed in 2010, engineered log jams installed in lower Finney Creek and planned for lower Day Creek, and off channel enhancement under construction at Howard Miller Steelhead Park at Rockport. Restoration progress in freshwater is beginning to accelerate with feasibility and design work proposed or in progress on the following significant instream and off-channel enhancement and habitat reconnection projects:

- Barnaby Reach Restoration
- Illabot Creek alluvial fan restoration (phase 1 construction funded in 2011)
- Davis Slough hydrologic connectivity
- Savage Slough Acquisition & Restoration (South Skagit Highway Realignment)

The middle Skagit project development work completed last year will help us in moving more mainstem floodplain restoration projects forward in the next five years.

We are still in the process of finalizing templates for estimating the juvenile habitat capacity benefit of proposed restoration projects available for use by our project sponsors. Although not identified as an action in the recovery plan, it remains important work to track our progress of restoration goals. We are structuring the templates to facilitate updating the estimates of juvenile carrying capacity for individual projects upon changes in design, as-builts, and empirical model refinements. The current estimate of the contribution of individual projects to the juvenile carrying capacity recovery goal will reside on each project page in the Habitat Work Schedule. A proposal to update our juvenile carrying capacity model for the tidal delta by IMW investigators is included in the research section of the list.

#### Monitoring:

In general, 10 of the 12 specific monitoring programs identified in the monitoring chapter of the Skagit Chinook Recovery Plan (SRSC and WDFW 2005) are being implemented. Most of these support harvest management and hydroelectric dam

licensing, and we do not list them in our work program spreadsheet. The two actions not being implemented are: 15.3.5 (Fall Chinook Indicator Stock Program) and 15.6.1 (monitor and assess ongoing land use impacts to Chinook). The fall Chinook program was conducted but is currently not implemented due to funding. 15.6.1 is really status and trends monitoring of habitat and is listed here as an unfunded priority. It is also something RITT has stated is a major gap throughout Puget Sound.

#### Intensively Monitored Watershed (IMW):

In the cases of tidal delta and nearshore restoration, basin-scale monitoring is implemented according to the Intensively Monitored Watershed Plan as Appendix E in the Skagit Chinook Recovery Plan. The key findings of the most recent IMW report (Greene and Beamer 2011) showed that 1) restoration in the Skagit River tidal delta is needed to address capacity and connectivity limitations, 2) local restoration did improve rearing densities for juvenile Chinook salmon, and 3) system-wide responses can be detected using a before/after control impact (BACI) design. In addition, it appears capacity limitations still exist in the Skagit River tidal delta, as judged from recruitment patterns into shoreline habitat, and that further tidal delta restoration is warranted. Their monitoring work corroborates the estimate that the amount of restoration work completed in the tidal delta is 12% of goal of the Skagit River Chinook Recovery Plan.

#### Effectiveness Monitoring:

At the project scale the biological component of monitoring includes Chinook salmon presence or absence, fish density, community compositions, and Chinook size. Fish sampling at restoration sites was expanded this year, particularly in the natal estuary, as some new funding was obtained and put toward this. Fish monitoring is being done on the following built natal estuary restoration projects in 2012:

- Fisher Slough (2009-2012, intent is for ongoing)
- South Fork Dike Setback (2012 only)
- Wiley Slough (2012 and 2013)
- Milltown Island (2012 and 2013)
- Swinomish Channel Fill Removal (2009-2012)
- Smokehouse (Fornsby) Slough Phase I (2004-2011)
- Smokehouse (Fornsby) Slough Phase I and II (2012 and ongoing)

Fish monitoring is being done on the following built and designed pocket estuary restoration projects:

- Crescent Harbor (2010 and ongoing)
- Lone Tree Lagoon (2004-2009, completed)
- Dugalla Heights (2010 and ongoing)

Fish monitoring is also being done this year on the Edgewater Park constructed floodplain channel in the lower mainstem Skagit River. This project was completed in 2005 and is one of the initial SRFB effectiveness monitoring sample sites. Fish monitoring methods and timing from that work were unable to answer questions on densities and duration of fish use important for understanding the success of the project.

Research:

Eight of the 16 specific actions in the research chapter of the Skagit River Chinook Recovery Plan are being implemented (or have been completed). All 8 actions being implemented or completed were the most important to sequence first in plan implementation. The list includes next step research actions for previously listed actions or (in two cases) a completely new research action (not a previously listed topic in Chapter 14 of the Skagit Plan) identified as a result of completed research.

The following research actions identified in the recovery plan have been completed with reports available and are shown as out-going (gray shading) on the Three Year Work Program:

14.4.2 Impact of Beaver Activity in the Tidal Delta

14.4.3 SRT Evaluation (i.e. Fish-Friendly Tide Gates)

14.5.1 Chinook use of pocket estuaries

14.5.2 Origin of Chinook salmon in mixed stock nearshore rearing habitats

14.5.6 Forage Fish Ecology

3. *What is the general status of implementation towards your habitat restoration, habitat protection, harvest management, and hatchery management goals? Progress can be tracked in terms of 'not started, little progress, some progress, or complete' or in more detail if you choose.*

Please see the discussions above relative to the habitat capital and research/monitoring programs. This narrative does not attempt to speak to harvest and hatchery management goals. As harvest goals are currently limited by habitat, however, habitat restoration and protection is actively and aggressively pursued in the Skagit. We don't yet have the complete yardstick by which to measure our progress, however.

4. *What are the top implementation priorities in your recovery plan in terms of specific actions or theme/suites of actions? How are these top priorities being sequenced in the next three years? What do you need to be successful in implementing these priorities?*

The Skagit Watershed Council updated our Strategic Approach in 2010 and refined target areas based on the Skagit Chinook Recovery Plan (Table 1). These target areas are divided into three tiers based on their importance to Chinook salmon recovery and on the number of populations that will benefit from habitat protection and restoration actions within each area. While projects in all tiers are consistent with the Chinook Recovery Plan, projects within the Tier 1 target areas are the primary focus as they are the habitats used by all six Skagit Chinook populations.

In terms of sequence, our restoration community is making progress in important areas where they can. Last year we completed a Habitat Protection and Restoration Master Plan for the Middle Skagit River, a large-scale planning effort to identify reaches and projects with the greatest benefit in the Tier 1 floodplain target area of the middle Skagit River. Proposals for two new projects in the identified priority reach were received for SRFB funding this year.

5. *Do these top priorities reflect a change in any way from the previous three-year work program? Have there been any significant changes in the strategy or approach for salmon recovery in your watershed? If so, how & why?*

No changes in strategy or salmon recovery approach have occurred in the last year. However, the Watershed Council identified completion of previously-funded projects as a priority for the 2012 SRFB grand round.

6. *What is the status or trends of habitat and salmon populations in your watershed?*

No organized status and trend monitoring of habitat in the Skagit is conducted, although this is a priority. Sixty percent of the habitat needed for achieving the recovery goals in the Skagit is in protecting existing habitat; so tracking the existing available habitat is an important need for recovery plan implementation. The RITT has also stated this is a major gap throughout Puget Sound.

The number of wild Chinook salmon outmigrants leaving freshwater, as estimated by counts at the Skagit smolt trap, has shown a slightly increasing trend between 1994 and 2010 (WDFW data). However, this trend is not statistically significant. The number of juvenile Chinook (mostly fry migrants) outmigrating from the Skagit watershed increased substantially during the early and mid 2000s from values estimated in the 1990s, but have declined over the past five years (Figure 1). An analysis of whether we would expect to see a signal at the smolt trap because of restoration efforts in freshwater has not been done, and is a monitoring/analysis gap. This analysis would have to account for a number of variables that are known to affect Chinook outmigrant

numbers in the Skagit, especially peak flows and brood-year escapement numbers. That said, the majority of freshwater restoration projects completed to date have been sediment reduction work on forest roads in tributary systems and mainstem floodplain riparian plantings. We are just now seeing more projects that would increase juvenile Chinook freshwater rearing habitat being queued up and implemented.

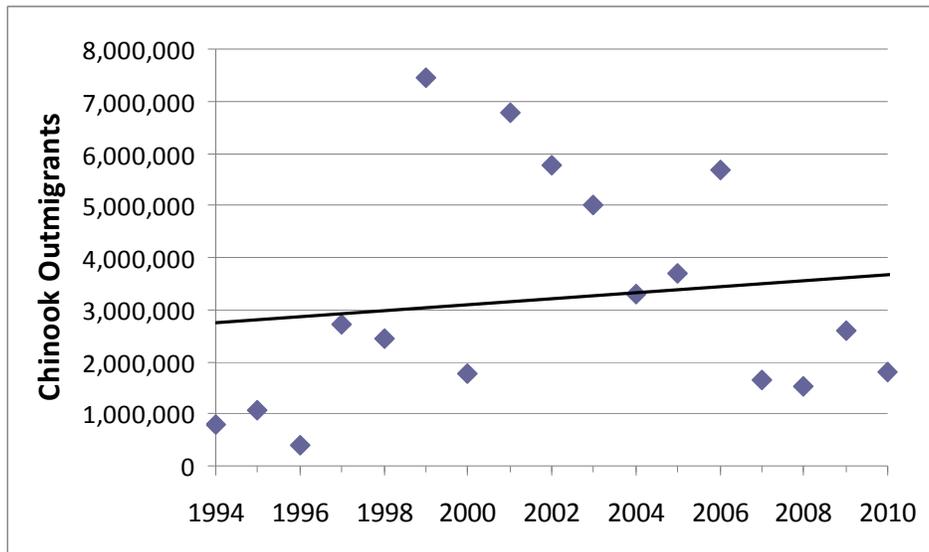


Figure 1. Trends in the abundance of juvenile Chinook salmon outmigrating from the Skagit River, as estimated at the smolt trap in Burlington, 1994 - 2010 (WDFW data).

The Skagit River watershed contains six independent populations of Chinook, the most for any watershed in the Puget Sound DPS. Three of the populations are summer and fall run Chinook, and three of these populations are spring run Chinook. The summer/fall run populations fell to historic low spawner escapement numbers during the 1990s (Figure 2). The upper Skagit summer and lower Skagit fall populations showed substantial increases in abundance and productivity from the late 1990s through 2005. The lower Sauk River summer population showed a positive increase during the period, but not to the extent observed in the other two summer/fall populations. All three populations have declined from 2005 through 2011, with the greatest decline observed in the upper Skagit summer population. Chinook populations throughout the Puget Sound declined during this same period, which indicates external factors including ocean conditions are partially responsible for the decline in summer/fall Chinook escapement in the Skagit. The ocean productivity of Puget Sound Chinook salmon, including the six Skagit stocks, has been declining to among the lowest levels observed over the past 30 years (Ford et al. 2010). It will be

important to identify and account for the effects of ocean productivity cycles and hydrological variability (major floods occurred in the Skagit River in 2003 and 2006) on Chinook spawner abundance in order to identify the long-term benefits of restoration on these populations. Flooding in 2006 resulted in low Chinook smolt outmigration numbers as a result of high mortality rates to eggs and fry (Kinsel et al. 2008), which reduced Chinook spawner returns starting in 2009.

The total escapement of summer/fall run Chinook in the Skagit was 5,537 spawners in 2011. This number is just above the 4,800 low abundance threshold level (LAT) established under the Puget Sound Chinook Recovery Plan (Shared Strategy for Puget Sound 2005), below which there is an increased risk of population instability, loss of genetic integrity, and increased probability of extinction (PSIT and WDFW 2010). The summer/fall stocks are considerably below the combined 14,500 upper management threshold (UMT), which is the value used to identify when Chinook stocks achieve optimal productivity under current habitat conditions (PSIT and WDFW 2010). Skagit summer/fall Chinook populations are substantially below UMT, implying that spawner populations are currently at low levels in relation to the habitat capacity of the watershed.

The 5-year mean abundance for upper Skagit summer Chinook is 7,020 spawners for 2011. This population shows a positive trend in long-term productivity, with a 25-year productivity ( $\lambda$ ) value of 1.02 (meaning that the population is increasing at an average annual rate of 2 percent). This population is undergoing a short-term decline in productivity with a  $\lambda$  value of 0.89. The 5-year mean abundance of the lower Skagit fall population is 1,403 spawners as of 2011. This population has remained stable in term of productivity over the last 25 years with a  $\lambda$  value of 1.00. The 5-year abundance for the lower Sauk summer Chinook population is currently 353 fish, which is below the low abundance threshold of 400 fish. This means that the lower Sauk summer Chinook have declined to critical levels, and should be identified as a high priority for habitat, harvest, and hatchery based recovery efforts. The lower Sauk has been undergoing a long-term decline, with a 25-year  $\lambda$  of 0.99. Productivity has experienced a significant short-term decline, with a 10-year  $\lambda$  of 0.85.

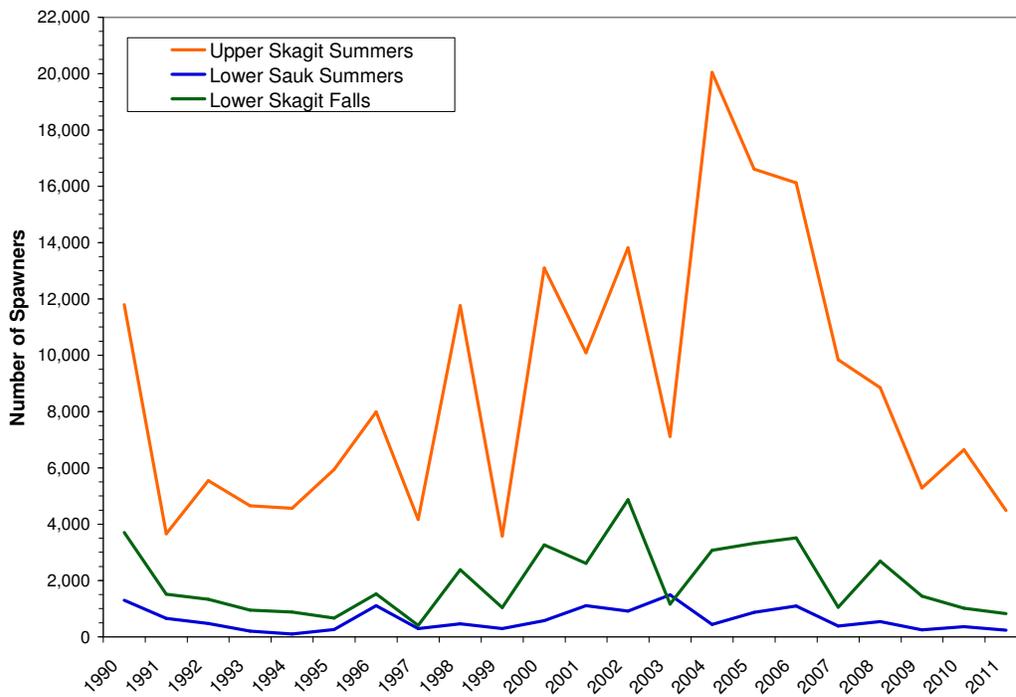


Figure 2. Trends in the abundance of spawners (escapement) for the three summer/fall Chinook populations in the Skagit River watershed, 1990-2011 (WDFW data).

All three spring Chinook populations present in the Skagit watershed have shown a decline since 2005 and 2006 (Figure 3). Like the summer/fall populations, the abundance of the three Skagit spring populations increased from low levels observed in 1990s to much improved abundance values from 2004 through 2007. This suggest that the same trends in ocean conditions and peak floods that impacted the summer/fall populations also impacted the spring run populations. Of the three-populations, the upper Cascade spring run population continues to be doing the best, and the Suiattle spring run population continues to do the worst. The total abundance of spring-run Chinook in 2011 was 825 spawners, which is above the low abundance threshold value of 576 fish. The current abundance of spring-run Chinook is substantially below the upper management threshold of 2,000 spawners. The 5-year abundance values for the upper Cascade, Suiattle, and upper Sauk spring Chinook populations are 288, 212, and 549 spawners, respectively. The upper Cascade population shows a strong long-term increase in productivity as of 2011 with a lambda of 1.03. In comparison, upper Sauk spring run populations have remained relatively constant with a 25-year lambda of 1.00, while the Suiattle population is showing a strong decline in productivity with a 25-year lambda of 0.97 over this same period. The Suiattle is also undergoing a substantial

short-term decline in productivity, with a 10-year lambda of 0.94. Based upon these trends, the Suiattle population should be given the highest priority in terms of habitat recovery efforts in the Skagit watershed.

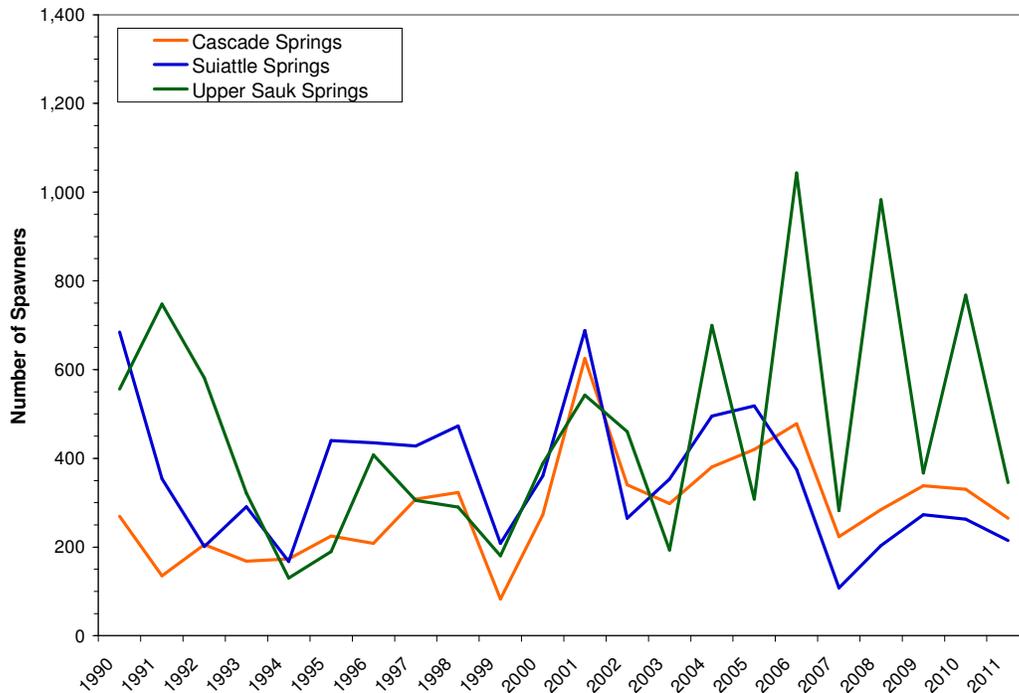


Figure 3. Trends in the abundance of spawners (escapement) for the three spring Chinook populations in the Skagit River watershed, 1990-2011 (WDFW data).

The diversity of six Chinook populations in the Skagit has been undergoing a significant long-term shift, with a trend for increasing dominance by the upper Skagit summer run population (Figure 4). The upper Skagit summer population remains the most dominant in the watershed, presently contributing approximately 80% of the total abundance of Chinook spawners among the six independent populations. The diversity of Chinook in the watershed is undergoing a long-term and statistically significant decline caused by the increasing strength of upper Skagit Chinook summer run, and the increasing weakness of the lower Sauk summer, lower Skagit fall, and Suiattle spring run populations.

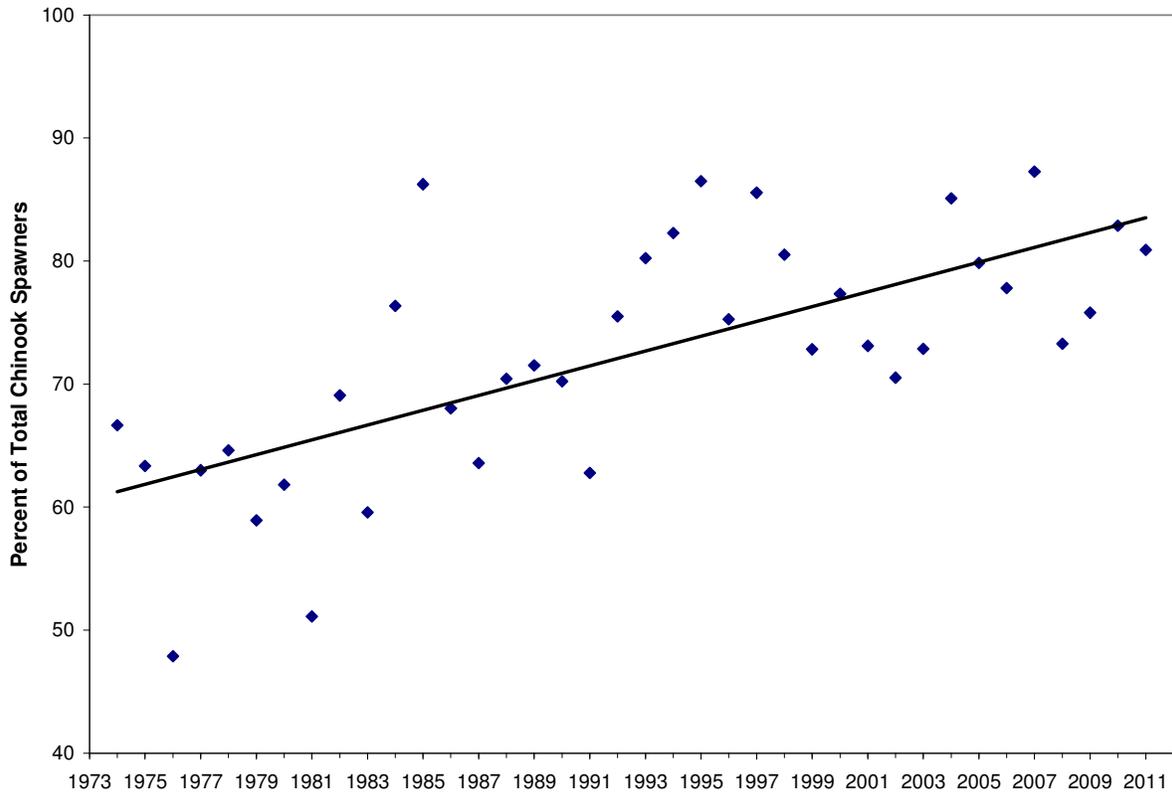


Figure 4. Percentage of Skagit River Chinook spawners that are upper Skagit summer run fish; 1974-2011. Upper Skagit summer run Chinook have been becoming increasingly dominant since the 1970s, indicating that the diversity of the six independent populations is undergoing a long-term decline.

7. *Are there new challenges associated with implementing salmon recovery actions that need additional support? If so, what are they?*

The list of challenges to salmon recovery in the Skagit is long and persistent. As lead entity, we ask for and receive support from the RITT and the regional organization as necessary.

In years past we wrote that we were expecting the delayed adaptive management framework from the RITT that would enable us to better develop the information necessary to inform and adaptively manage our Chinook recovery work or the structure by which to engage in the dialog or process. The RITT is expecting to finish that work soon.

From a technical standpoint, there is still a need for the region and the state to identify how to roll information up from the watershed level to make any statements about salmon or Chinook recovery at the regional or state levels. A proposal for reporting a limited number of habitat metrics on projects in the Habitat Work Schedule is under discussion at the regional level.

References:

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Restoration	Hobbit Corners Floodplain Restoration	Riparian restoration of	1	1	Skagit Chinook Recovery Plan	Riparian	Floodplain Restoration	20 acres; 30 logs	Chinook		Active	Planting, LWD design, permits	Planting, maintenance, LWD Construction	Maintenance, invasive control	2016	SFEG	\$162,308	\$24,346	SRFB	
Restoration	Ross Island Inlet Side Channel Restoration	Removal of rip rap and restoration of riparian vegetation on ~40 acres of floodplain between Kosbab Slough and an unnamed Slough. Project identified in middle Skagit asmt.	1	1	Skagit Chinook Recovery Plan	Instream	Floodplain Restoration	40 acres	Chinook		Conceptual			Feasibility assessment	\$150,000	2017	SFEG	\$550,000	\$60,000	SRFB
Restoration	Lower Day Creek Slough Habitat Enhancement	Upgrade 2 farm access roads over slough chnl; riparian plantings	1	1	Skagit Chinook Recovery Plan	Riparian	Floodplain Restoration	1.7 ac habitat; 28 acres riparian	Chinook	Steelhead	Proposed	Grant app for construction	\$348,088	Design, permits, planting	Planting, maintenance	2015	SFEG	\$348,088	\$216,345	SRFB, PSE
Restoration	Upper Skiyou Slough floodplain restoration	Riparian restoration of portion of 220 ac USFS floodplain parcel;	1	1	Skagit Chinook Recovery Plan	Riparian	Floodplain Restoration	52 acres riparian	Chinook	Bull Trout	Proposed	Grant apps for restoration	\$594,100	Site prep, planning	Planting, maintenance	2017	SRSC, USFS, SFEG	\$235,535	\$358,565	SRFB, PSE
TOTAL FLOODPLAIN TIER 1												\$1,415,603		\$2,770,000	\$150,000			\$21,957,482	\$1,858,199	
<b>Nearshore (Tier 2)</b>																				
Restoration	Turners Bay	Restore connectivity to pocket estuary by removing road fill	2	Loss of habitat	Skagit Chinook Recovery Plan	Nearshore embayments	Estuary or nearshore	7.8 acres	Chinook	Bull Trout	Active, construction	Construction	Monitoring	needs funding		2012	SRSC	\$904,394		SRFB, PSNERP
Acquisition for Protection	Kiket Island Conservaton Acquisition	Protection of 2+ miles of shoreline, 96 ac upland peninsula island, 3.4 ac pocket estuary	2	Loss of habitat	Skagit Chinook Recovery Plan	Nearshore (Beaches), Nearshore (Embayments), Nearshore (Rocky Coast)	Nearshore or Estuarine Areas Protected	44.9 acres	Chinook	Bull Trout	Acquisition complete	Stewardship Planning				2012	WSP, Swinomish Tribe	\$15,060,000	\$1,000,000	PSAR, CELCP, NCWCG, WWRP, ESRP
Restoration	Similk Bay	Restore intertidal pocket estuary by replacing road fill w/bridge & constructing channels	2	Loss of habitat	Skagit Chinook Recovery Plan	Nearshore (Beaches), Nearshore (Embayments)	Estuary or nearshore	23.6 acres	Chinook		Conceptual			Grant app for feasibility study	\$150,000	2015	SRSC	not evaluated		
Restoration	Dugualla Heights Lagoon Restoration	Restore tidal lagoon to provide access for juvenile Chinook in WRIA 6; joint WRIA funding considered. Feasibility & design work funded through WRIA 6; construction funded jointly w/WRIA 6 2011 SRFB grant round	2	Loss of habitat	Skagit Chinook Recovery Plan	Nearshore (Beaches), Nearshore (Embayments)	Estuary or nearshore	25 acres	Chinook		Active	Design/ Permitting	Construction	Construction	\$150,000	2015	WCLT	\$1,755,716	\$241,557	SRFB, PSAR
TOTAL NEARSHORE TIER 2												\$0		\$0	\$150,000			\$17,720,110	\$1,241,557	
<b>Floodplain (single Chinook population rearing areas) Tier 2</b>																				
Restoration	Day Creek Habitat Restoration	Instream & floodplain restoration in lower Day Creek funded in two phases but designed & constructed simultaneously. Includes design and installation of LWD jams in chinook tributary	2	1	Skagit Chinook Recovery Plan	Instream	Instream	4.7 miles stream; 21 ac riparian	Chinook		Active	Riparian planting & maintenance	Riparian planting & maintenance	Construction		2015	SFEG	\$407,160	\$61,100	SRFB, PSAR, DOE
Restoration	Lower Finney Supplemental Instream (LWD treatment)	Design and installation of LWD jams in chinook tributary	2	5	Skagit Chinook Recovery Plan	Instream	Instream	3.2 miles stream; 30 LWD jams	Chinook	Steelhead	Construction	Construction				2012	SFEG	\$283,200	\$42,480	SRFB, PSAR
Combination	Hansen Creek Reach 5 Acquisition & Restoration (previously titled Martinez Acquisition and Restoration)	Acquisition and restoration of key floodplain parcels on Hansen and Red Creeks and associated wetlands; potential for additional restoration in coordination with mgmt plan in area	2	Floodplain Connectivity & Function, Loss of habitat	Skagit Chinook Recovery Plan	Instream	Floodplain Restoration	8.5 ac acquired; 10 ac riparian; 0.25 mi instream; 30% design	Coho	Chinook	Active, funded 2010	Planning	Grant apps for acquisition; design; construction	Add'l acquisition, restoration, design	\$395,000	2017	SRSC	\$1,044,500		SRFB, Skagit Co.
Restoration	Illabot Creek alluvial fan restoration	Relocate Illabot Creek to historic channel; phase 1 construction funded 2011	2	1	Skagit Chinook Recovery Plan	Instream	Instream	440' of channel bank	Chinook	Steelhead	Active, funded 2011	Permitting	Construction	Final design phase 2	\$950,000	2017	SRSC	\$1,558,572	\$248,966	SRFB, PSAR
Restoration	Finney Riparian	Conifer plantings in hardwood dominated riparian in important chinook tributary	2	3	Skagit Chinook Recovery Plan	Riparian	Riparian		Chinook	Steelhead	Conceptual		Grant apps for construction	Site Planning	\$175,000	2017	SFEG	\$175,000	\$0	PSAR
Restoration	Downey Creek Crossing	Expanding Suiattle River road crossing at Downey Cr to minimize impacts to 3 ac alluvial fan.	2	1	Skagit Chinook Recovery Plan	Instream	Instream	3 acres of alluvial fan	Suiattle Spring Chinook	Bull Trout	Active; funded 2011	Permitting	Construction			2015	SRSC/USFS	\$983,000	\$478,000	SRFB, PSAR
Restoration	Suiattle Riprap Removal	Removal of riprap to improve edge habitat	2	1	Skagit Chinook Recovery Plan	Instream	Instream	900 feet	Chinook		Active; funded 2011	Design, permitting	Construction	Construction	\$0	2014	SRSC/USFS	\$292,675	\$43,091	SRFB, PSAR
TOTAL FLOODPLAIN TIER 2													\$0	\$1,520,000				\$4,744,107	\$873,637	
<b>Sediment &amp; Hydrology Impaired Watersheds (restoration actions in spawning habitat) (Tier 3)</b>																				
Restoration	Illabot Creek Road decommissioning	NEPA permitting for closing 14 mi of USFS rd to protect intact habitat in Illabot Ck. NEPA completed in early 2012. Schedule for decommissioning not known.	3		Skagit Chinook Recovery Plan	Uplands	Sediment Reduction		Chinook	Steelhead	Completed					2012	SCD/USFS	\$190,000		PSAR
Restoration	Lower Cascade Roads	Deconstruction of 1.1 miles of forest road in the Boulder Creek drainage	3	4	Skagit Chinook Recovery Plan	Uplands	Sediment Reduction	1.1 miles	Chinook	Steelhead	Conceptual			\$50,000	Construction	2014	SCL	\$50,000	\$7,500	SRFB
Restoration	Sauk Roads	Sediment reduction work on remaining 25/50 miles of USFS roads in Sauk Prairie and Dan Ck areas identified in recovery plan	3	4	Skagit Chinook Recovery Plan	Uplands	Sediment Reduction	25 miles of roads	Chinook	Steelhead	Conceptual		Grant apps for construction	Data Collection	\$300,000	2015	SRSC/USFS	\$300,000	\$45,000	SRFB
Restoration	Upper Sauk Erosion Control	Reduction of road sediment from USFS road in upper Sauk R.	3	4	Skagit Chinook Recovery Plan	Uplands	Sediment Reduction	7 Miles	Chinook	Steelhead	Conceptual			\$400,000	Construction	2015	SRSC/USFS	\$400,000	\$60,000	SRFB
TOTAL IMPAIRED WATERSHEDS (T3)													\$0	\$750,000	\$0			\$940,000	\$112,500	
<b>Hatchery Capital Projects</b>																				
<b>Harvest Capital Projects</b>																				
<b>Hydropower Capital Projects</b>																				
<b>TOTAL CAPITAL PROJECTS AND PROGRAMS</b>												\$3,315,603	\$7,040,000	\$300,000	\$82,495,383	\$10,063,391				
<b>KEY FOR</b>																				
<b>Habitat Capital Projects</b>					<b>Restoration Type &amp; Performance</b>															
*Amount of LE SRFB/PSAR funds					1 - Degraded floodplain and in-river channel structure															
Added in 2012					2 - Degraded nearshore and estuarine conditions and loss of associated habitat															
Removed from 2012 list for reasons described					3 - Riparian area degradation and loss of in-river large woody debris															
In progress phased implementation and funding					4 - Excessive sediments in spawning gravels															
Proposed for funding within next 3 years					5 - Degraded water quality and temperature															
					6 - Impaired instream flows															
					7 - Barriers to fish passage															
					1 - Instream habitat projects (stream miles treated)															
					W - Wetland habitat projects (acres created/treated)															
					E - Estuarine habitat projects (acres created and treated)															
					L - Land acquisition projects (acres/ miles acquired for protection and/or restoration)															
					R - Riparian habitat projects (stream miles/acres treated)															
					U - Upland habitat projects (acres treated)															
					P - Fish passage projects (barriers removed/stream miles opened/fish screens installed)															
					M - Marine shoreline projects (miles/acres) (pocket estuaries and shorelines outside of natal delta areas and tributaries to Puget Sound)															
					F - Floodplain reconnection projects (miles/acres)															
<b>NON-CAPITAL PROGRAMS</b>																				
<b>Outreach &amp; Education</b>																				
<b>Habitat protection</b>																				

Project Information and How it relates to the Recovery Plan												Project Planning						Project Cost and Sponsor						
Project Type	Plan Category	Project Name	Brief Project Description	Priority tier of project	Limiting Factors	Document Ref for limiting factors	HWS Habitat Type	HWS Activity Type	Project Performance	Primary Species Benefiting	Secondary Species Benefiting	Current Project Status	2012 Activity to be funded	2012 Estimated Cost	2013 Activity to be funded	2013 Estimated Cost	2014 Activity to be funded	2014 Estimated Cost	Likely End Date	Likely Sponsor	Total cost of project	Local share or other funding	Source of funds (PSAR, SRFB, other)	
Harvest Management support																								
Stock Monitoring Support																								
Instream Flow protection																								
Future Habitat Project Development																								
Assessments																								
Planning		Sediment Impaired Watersheds	Update of 10+ year old assessment of Skagit River sub-basins following road sediment reduction work and new road inventories									Conceptual				\$120,000	Data Collection		2014		\$120,000	\$120,000		
Planning		Middle Skagit Project Development	Assessment completed July 2011. Assessment, identify restoration actions, develop reach-specific plans	1								Completed								2011	SWC	\$196,000	\$30,000	Skagit Co., SCL
Planning		Skagit Delta Hydraulic Model	Placeholder for extending FVCOM 3D hydraulic modeling across the entire geomorphic delta of the Skagit River to evaluate synergy between proposed projects and their effects on geomorphic evolution across the delta, especially in relation to flood dynamics.									Conceptual				\$350,000	Data Collection & Analysis		2015	FFF	\$350,000	\$50,000		
Planning		Riprap inventory	Update 1998 inventory of hydromodifications; middle Skagit update completed in early 2010 as part of Middle Skagit project development grant									Conceptual				?	Data Collection		2014		\$50,000	\$0		
		Floodplain Productivity Assessment	Found first on 2007 list; no description or progress so moving out beyond 2015																					
		<b>TOTAL ASSESSMENTS</b>														\$0	\$470,000		\$0			\$716,000	\$200,000	
Watershed Plan Implementation and Coordination																								
		Lead entity base grant (2011-2013)														\$80,000	\$80,000		Ongoing		\$160,000			
		Lead entity capacity (PSAR) (2011-2013)														\$171,315	\$171,315		Ongoing		\$342,630			
		NEP														\$45,345					\$45,345			
		<b>TOTAL WATERSHED IMPL &amp; COORD</b>														\$296,660	\$251,315				\$547,975			
14 Research																								
14.3 Freshwater Rearing																								
Research		Yearling Chinook Research	Study of life stages, habitats, capacity and survival of Skagit yearling Chinook		data gap	14.3.1 Skagit Chinook Recovery Plan				Chinook		Active	Data collection & results						2012	Phase 1 SRSC, USIT, SCL, Phase 2 UW, SCL				
																					\$0	\$0		
14.4 Tidal Delta Rearing																								
Research		Impacts of Global Warming on delta habitats	Part of plan action 14.4.1; being addressed by Skagit Climate Science Consortium		data gap	14.4.1 Skagit Chinook Recovery Plan				Chinook		Active	Implementation	\$400,000					Ongoing	SCSC	\$400,000			
Research		Impacts of Beaver Activity in the Tidal Delta	Plan action 14.4.2; study published February 2012		data gap	Skagit Chinook Recovery Plan				Chinook		Completed					\$590,000							
Research		SRT Evaluation	Initial study of fish-friendly tidegates funded in 2010 and completed in Jan. 2012. Additional work anticipated		data gap	14.4.3 Skagit Chinook Recovery Plan				Chinook		Initial report completed		?		?			?		NOAA	\$144,000		
Research		Update delta juvenile Chinook capacity model	Update of empirical model used to estimate juvenile Chinook habitat capacity in the Skagit delta		data gap	App D, Skagit Chinook Recovery Plan				Chinook		Proposed		\$20,000	Analysis & report		\$0		2014	IMW (SRSC, NOAA, WDFW) & SCL				
Research		Salmon habitat and agriculture research	No update available on progress on this topic at this time.		data gap					Chinook		Proposed										\$0		
14.5 Nearshore Rearing																								
Research		Origin of Juvenile Chinook in WRIA 6 Nearshore	Study completed. Part of Plan actions 14.5.1 and 14.5.2		data gap	Skagit Chinook Recovery Plan				Chinook		Completed							?	SRSC	\$261,884			
Research		WRIA2 Habitat Based Assessment of Juvenile Salmon	Study completed. Part of Plan actions 14.5.1 and 14.5.2		data gap	Skagit Chinook Recovery Plan				Chinook		Completed							?	SRSC	\$821,006			
Research		Forage Fish Ecology	Forage fish use of nearshore habitats were studied as part of plan action 14.5.2 for the San Juan Islands. Three species of forage fish (herring, smelt, and sand lance) were associated with different geomorphic shoreline types in this study.		data gap	14.5.6 Skagit Chinook Recovery Plan				Chinook		Completed												
Research		Fry migrant Chinook use of non-natal small coastal streams	New research on small coastal streams from results found in pocket estuary study; non-natal use of small coastal streams by fry migrant Chinook.		data gap	Result of 14.5.1 in Skagit Chinook Recovery Plan				Chinook		Active	Data collection	?					?	Tulalip, SRSC, NWIFC, Whidbey Watershed Stewards				
Research		Hatchery/Wild Fish Interactions	Part of plan action 14.5.3. NOAA and SRSC have collected the necessary data for this study, but do not currently have funding to complete it at this time		data gap	Skagit Chinook Recovery Plan				Chinook		Active	Analysis and final report	Needs funding				\$0	2013	NOAA, SRSC		\$0		
Research		Forage Fish abundance & survival in armored shorelines	Spawning and egg survival aspects of forage fish ecology being studied as part of a shoreline armoring research project. Forage fish egg abundance and survival related to armored and natural beaches will be studied along with many other nearshore biota and processes.		data gap	Result of 14.5.6 in Skagit Chinook Recovery Plan				Chinook		Active	Data design and collection	?					?	SRSC, UW, Swinomish, Tulalip, and NOAA				
Research		Chinook Life Histories & Marine Survival	Was part of plan actions 14.5.9, 15.5 and 15.6. Continue use of otolith data to determine marine survival of various life history types of Skagit Chinook. Needs funding		data gap	14.5.9 Skagit Chinook Recovery Plan				Chinook		Active			Implementation	\$100,000		\$590,000	2012					

