

2016 State of Our Watersheds Report

Skagit River Basin



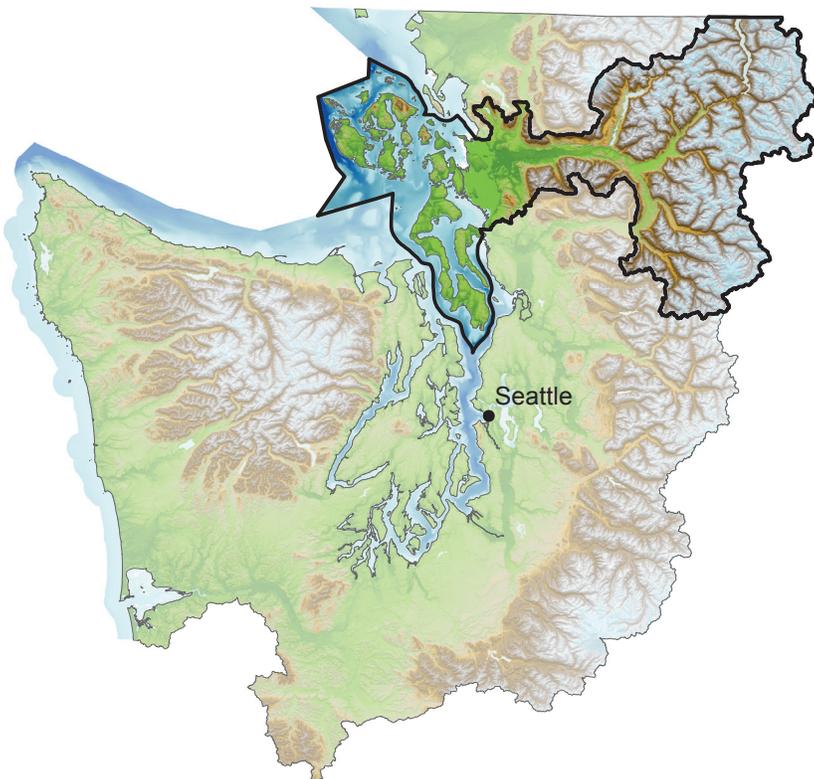
It's hard to tell our fishermen that they can't fish. If we didn't truly believe we could rebuild these salmon runs, we wouldn't be working as hard as we do. It's difficult to recover weak stocks without recovering their habitat at the same time. We are doing a lot of habitat work, as much as we can. We are also monitoring these projects for their benefits to salmon.

**– LORRAINE LOOMIS,
FISHERIES MANAGER,
SWINOMISH TRIBE**



Swinomish Indian Tribal Community

The Swinomish Indian Tribal Community is made up of Coast Salish people descended from groups and bands originating from the Skagit and Samish river valleys, coastal areas surrounding nearby bays and waters, and numerous islands including San Juan, Whidbey and Camano islands. The Swinomish reservation on the southeastern end of Fidalgo Island is surrounded by 27 miles of saltwater shoreline. It is bounded on the west by Skagit Bay, the east by Swinomish Channel and the north by Padilla Bay. The reservation is about 15 square miles in size and includes 7,450 acres of upland and approximately 2,900 acres of tidelands.



Recovery Plan Seeks to Restore and Protect

The Skagit River remains one of the more pristine watersheds within Puget Sound.

The upper portion of the watershed is primarily under control of the federal government, located within the Mount Baker-Snoqualmie National Forest. Portions of the watershed are in federal wilderness and national parks. The middle section of the watershed is largely held as forestland, either in state or private ownership. The delta reaches are predominantly held in agricultural land.

Human land use over the last 150 years has resulted in the degradation of salmon habitat due to forestry and agricultural practices that constitute the primary land uses within the watershed.

Current limiting factors identified by the Skagit Recovery Plan include:

- Seeding levels,
- Degraded riparian zones,
- Poaching,
- Current hydroelectric operations,
- Sedimentation and mass wasting,
- Flooding,
- High water temperature,
- Hydromodification,
- Water withdrawals,
- Loss of delta habitat and connectivity,
- Loss of pocket estuaries and connectivity, and
- Illegal habitat degradation.¹

The habitat recovery strategy pursued for the Skagit River sought to protect and restore the system from a process-based and landscape scale. It was recognized that successful recovery depends on the ability to produce an overall gain in the factors that support viable populations. Key strategies and actions focused on habitat protection and restoration.



Kari Neumeier, NWIFC

The Swinomish Tribe integrated a canoe landing channel into an estuary restoration project along the Swinomish Channel.

The protection strategy focused on:

- Streamflows,
- Basin hydrology,
- Water and sediment quality and sediment transport,
- Stream channel complexity,
- Riparian areas and wetlands,
- Tidal delta area and nearshore, and
- Fish passage and access.

The restoration strategy focuses on fish production and weighs restoration actions by the degree to which they restore landscape conditions in the basin and thus contribute to long-term recovery.

Restoration efforts are focused on spawning areas, rearing in freshwater, tidal delta and nearshore habitat.

Tidal and Nearshore Habitat Restoration Prioritized

In 2010, the Skagit Watershed Council updated its restoration actions to provide a more strategic focus to restoration and recovery efforts.

Three guiding principles were adopted:

1. Restore processes that form and sustain salmon habitats.
2. Protect functioning processes and habitats from degradation.
3. Focus protection and restoration on the most biologically important areas.

Adoption of these principles also prioritized restoration to three areas:

1. Estuary and riverine tidal habitat;
2. Shallow nearshore habitat, including pocket estuaries; and
3. Sediment and hydrology impaired watersheds.²

Implementation of the Skagit Chinook Recovery Plan³ is lagging behind the pace originally anticipated during plan development in 2006. Restoration work has progressed with numerous capital projects focused on restoring fish habitat and passage.

However, WRIAs 3&4 have faced significant funding shortages for restoration projects, limiting implementation progress. Progress also has lagged on implementing the regulatory and incentive programs to protect and restore salmonid habitat and habitat-forming processes.

Numerous shoreline management plans within WRIAs 3&4 are

still in the process of being updated and action on regulatory gaps such as agriculture buffers and FEMA's Flood Insurance Program still need to occur. A major element of the 2006 Skagit Chinook Recovery Plan relies on revisions to state and national environmental regulatory programs, which have proven difficult to adjust to address the needs of the salmon resources in the Northwest.⁴

Swinomish environmental director Todd Mitchell observes a self-regulating tide gate installed as part of a tideland restoration.



Kari Neumeier, NWIFC

Recovery Efforts Show Improvement But Still Lagging in Key Indicators

At the 10-year mark of the Puget Sound Salmon Recovery Plan, a review of key environmental indicators for the Skagit basin reveals mixed results in progress toward the recovery plan's goals and objectives. Priority issues continue to be degradation of water quantity and quality, degradation of floodplain and riparian processes, degradation of marine shoreline habitat conditions, and habitat blocked to fish access. There has been progress in two indicators: water wells and restoration. With the water wells indicator,

improvement came after the Tribe took the state of Washington to court to stop the over-allocation of the Skagit groundwater supply. In general, there is a shortage of staff at all levels (e.g., federal, state, tribal, county) needed to address the issues and implement actions to restore and protect habitat, and to monitor and enforce compliance of existing regulations. In addition, funding shortfalls for large-scale projects contribute to the slow pace of progress.

Review of the trend for these key environmental indicators since the 2012 State of Our Watersheds Report shows improvement for some indicators and a steady loss for others in habitat status:

Tribal Indicator	Status	Trend Since SOW 2012 Report
Water Quality	In 2011, over 51% of riparian acreage along fish-bearing streams within the 2008 Lower Skagit Temperature TMDL watersheds were non-forested and impaired. Since 2006, the streams were more impaired and less forested.	Declining
Water Wells	Since October 2013, Skagit County has not issued building permits that rely on permit-exempt wells as their sole water source, unless adequately mitigated for. This has resulted in no new unmitigated exempt well development in Skagit County since that date. There have been between 30 and 40 replacement wells allowed in the basin since that time.	Improving
Shoreline Modifications/Forage Fish Impacts	At present, about 55% of Skagit County's soft shorelines are already hardened by bulkheads or levees. To add further concern, nearly 1 mile of shoreline has been armored in Skagit County since 2005.	Declining
San Juan Island Shoreline Modifications	In the San Juan Islands, over 25 miles of marine shoreline are already either modified or armored. To make matters more critical, between 2005 and 2014, 5,676 feet of new marine shoreline armoring was added in San Juan County, the fifth highest county total in Puget Sound, and 11% of all permitted marine shoreline armoring completed in Puget Sound during that time period.	Declining
Stream Blockages - Culverts	From 2010-2014, the number of barrier culverts increased from 497 to 580, a 17% increase. For every culvert repaired in the Skagit watershed, over 3 new barrier culverts were identified. An additional 107 barrier culverts were surveyed in the Skagit River watershed and only 24 barrier culverts were repaired, resulting in a net increase of 83 additional barrier culverts.	Declining
Forest Roads	Completed 80% of road and 86% of culvert repair or abandonment on private and state-owned forest roads in the Skagit Watershed.	Improving
Riparian Buffers	From 2006 to 2011, there has been no change in the status of the Skagit delta riparian areas. Over 80% of riparian areas in the Skagit delta were cleared of trees or impaired. Over 90% of that impaired area was found in agriculturally zoned lands. From 2006 to 2013, Skagit delta agricultural drainages continued to have the worst overall water quality in the Skagit River watershed.	Declining
Restoration	Through 2015, 6 pocket estuaries have been restored, totaling 33.6 acres. Total smolt production projections show a potential increase of over 48,000 smolts, 33% of Chinook recovery target. The change since the 2012 report reflects the completion of Turner Bay and Dugualla Heights restoration projects. 12% of the 2005 Skagit Chinook Recovery Plan's habitat restoration goal for the estuary has been met. At present, estuary restoration is on track to realize the Recovery Plan's habitat goal in 50 years.	Improving
	About 12% of the 2005 Skagit Chinook Recovery Plan's habitat restoration goals for the estuary have been met. At present, estuary restoration is on track to realize the recovery plan's habitat goal in 50 years. Skagit Intensively Monitored Watershed (IMW) investigators have found decreases in juvenile Chinook densities where restoration has increased habitat capacity.	

The Tribe continues to work toward the protection and restoration of healthy and functional nearshore, estuarine and river habitat, restoring those areas that are degraded, and conducting research to understand the organisms and the habitats they occupy.

Looking Ahead

Population growth and associated development within Skagit County will continue to pose challenges to salmon conservation and recovery efforts. Current trends indicate that land-use regulation reform is required and continued funding of habitat restoration activities is necessary in order to achieve the agreed-upon recovery goals.

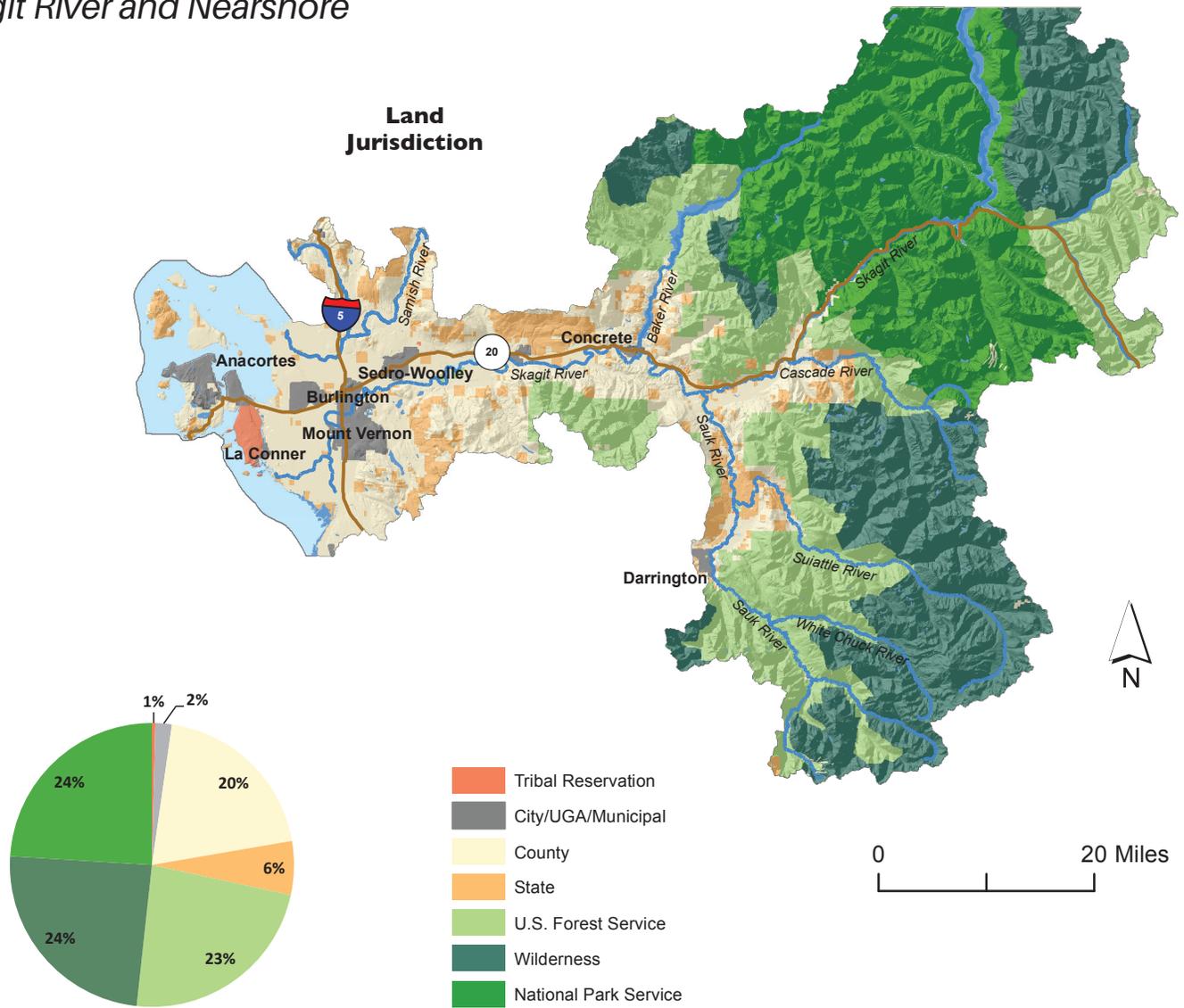
Restoration and protection work within the Skagit River watershed has not kept pace with the goals of the Recovery Plan. Up-

grading the regulatory framework that serves to protect salmon habitat must occur if the underlying assumption to all the recovery goals is to be realized: that existing habitat will be protected from loss.

The current state and federal regulatory framework clearly has not provided adequate protection of the instream flow, water quality and riparian habitat within the basin and nearshore areas.

Swinomish Indian Tribal Community

Skagit River and Nearshore



With a 3,100-square-mile watershed, the Skagit River is the largest in the Puget Sound and the third largest on the West Coast of the continental United States. It provides 30% of Puget Sound’s freshwater input. The Skagit River originates in British Columbia, and flows south into Washington state before continuing westward through Skagit County and into the sound. The upper half of the watershed is primarily within the National Forest and the North Cascades National Park, and the lower half mainly comprises private forest, agriculture, rural residential and urban residential lands. The Baker River, Sauk River and the Cascade River all flow within the Skagit River watershed.

The Swinomish Indian Tribe lived in the

Skagit and Samish River valleys and in the coastal areas surrounding Skagit, Padilla, and Fidalgo Bays since time immemorial. They are Coast Salish people, and their culture has centered around abundant saltwater resources like salmon, shellfish and marine mammals, as well as upland resources, like cedar, berries and wild game. Their homeland remains on Fidalgo Island, where they are surrounded by 27 miles of saltwater shoreline.

Since European settlement, land use in the watershed has been dominated by natural resources. The foothills and mountains have been mainly used for wood products, mining and outdoor recreation. The river valleys, the delta and the coastal areas have been used for agriculture, industry,

commerce, and residential development. Population is projected to increase to an estimated 162,000 people by 2040.¹

The Skagit River is home to all six species of Pacific salmon, including steelhead. It has the healthiest and largest runs of wild Chinook and pink salmon in Puget Sound.²

The last 150 years of human land use has resulted in declines in Chinook productivity, yet the Skagit River watershed remains one of the healthiest in Puget Sound. The Skagit Chinook Recovery Plan provides a strategy for both protection and targeted restoration.³ It will take federal, tribal, state and local leadership to provide a consistent yet adaptive plan to control the future impacts of land use in the watershed.

Data Sources: USFWS 2014,⁴ SSHIAP 2004,⁵ WADNR 2014a,⁶ WADNR 2014b,⁷ WADOT 2012,⁸ WADOT 2013,⁹ WAECY 2011a,¹⁰ WAECY 2013d¹¹

Shoreline Management Plan Leaves Shorelines Vulnerable to Future Bulkheads and Levees

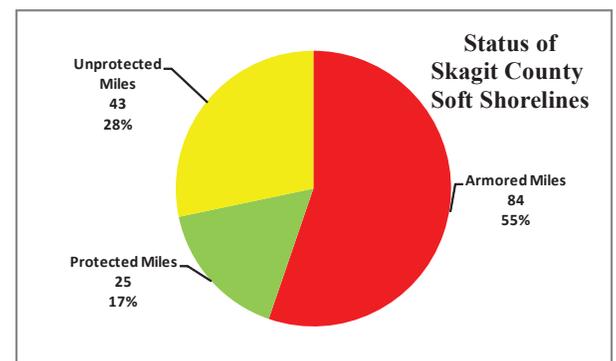
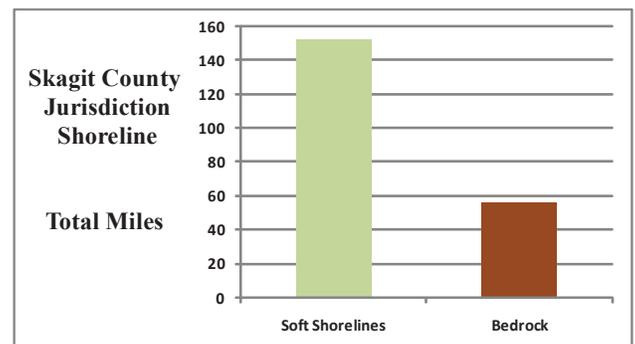
Based on the current Skagit County shoreline management plan, the soft shorelines of the nearshore could be 83% armored under a full build-out scenario. At present, approximately 55% of soft Skagit County shorelines (excluding bedrock areas that have no need for armoring) have bulkheads or levees.¹ In addition to shorelines already armored or modified, current Skagit County zoning would allow 28% of soft shoreline to be bulkheaded under the residential exemption in the Shoreline regulations. This would mean a total of over 83% of all of the soft shoreline in Skagit County's jurisdiction could be armored behind bulkheads and/or levees if the county is fully developed. To add further concern, nearly 1 mile of shoreline has been armored in Skagit County since 2005.²

Skagit County jurisdiction of bedrock, soft and artificially hardened marine shoreline



Washington state and Skagit County shoreline codes both allow an exemption from getting a shoreline substantial development permit to build bulkheads that protect single family residences. State law also states that “Local shoreline master programs shall include policies and regulations designed to achieve no net loss...and that exempt development in the aggregate will not cause a net loss of ecological functions of the shore- line.”³ In Skagit County this exemption is allowed for all Skagit shoreline designations except for Aquatic or Natural, (it is prohibited in Aquatic and is conditional in Natural). When considering the exemption for single-family residences and how it is implemented outside Natural designations in Skagit County, a full build-out scenario would make “no net loss” of ecological functions of the shoreline unattainable.⁴

Skagit County zoning designation of armored and unmodified soft shoreline.

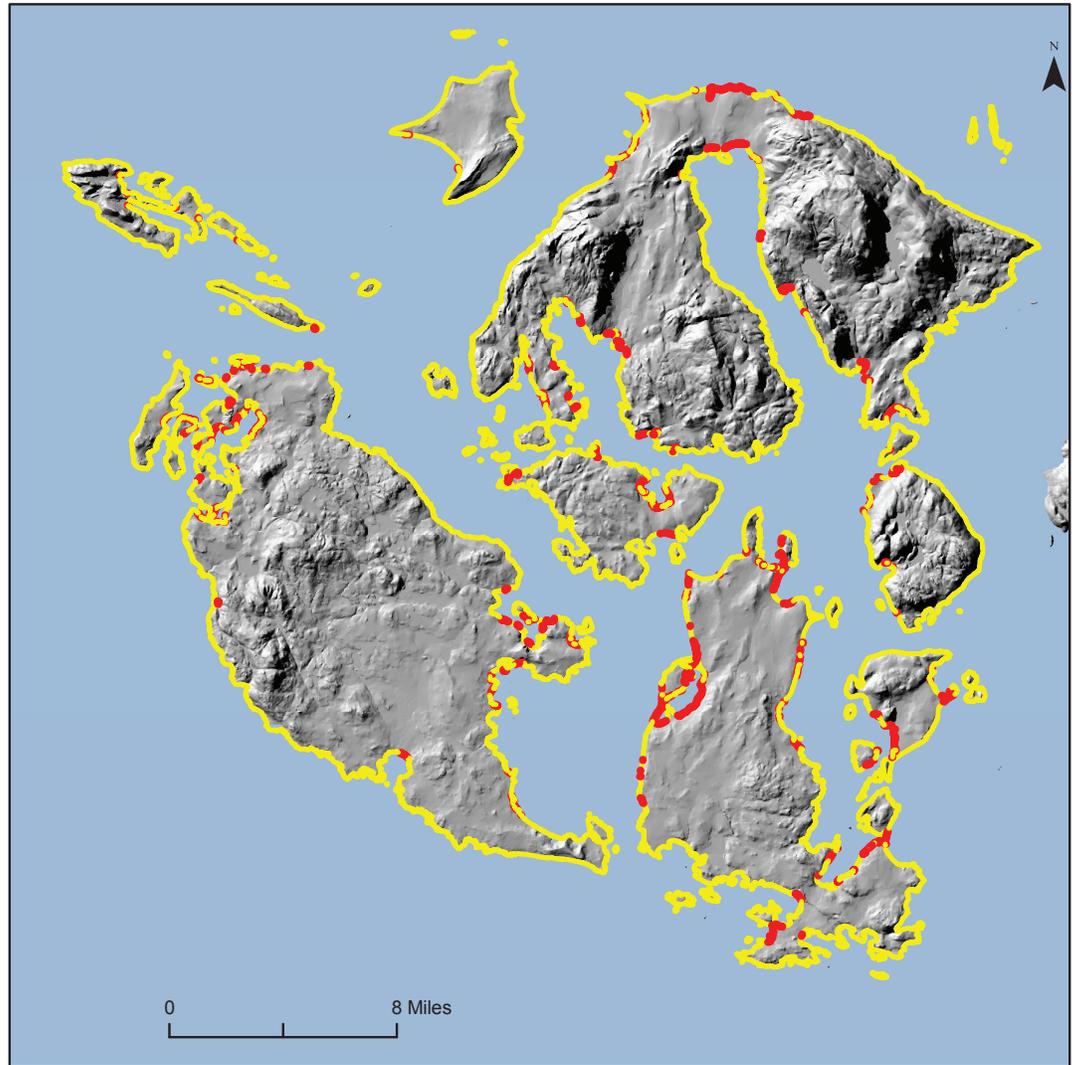


Data Sources: PSNERP 2008,⁵ SSHIAP 2004,⁶ WADNR 2014a,⁷ WADNR 2014b,⁸ WADOT 2013,⁹ WAECY 2011a,¹⁰ WAECY 2013a¹¹

Shoreline Armoring Increases Threats to Forage Fish Habitat Critical to Ecology of San Juan County

In the San Juan Islands, over 25 miles of marine shoreline are already either modified or armored.¹ To make matters more critical, between 2005 and 2014, 5,676 feet of new marine shoreline armoring was added in San Juan County, the fifth highest county total in Puget Sound, and 11% of all permitted marine shoreline armoring completed in Puget Sound during that time period.² A separate analysis, a 2014 report from Friends of the San Juans that compared San Juan County shoreline armoring permits from 1972 to 1992 with shoreline armoring permits from 1992 to 2009, found that current regulatory protection policies starting in 1993 have not reduced rates or armoring, but that exemptions allowing for new shoreline armoring and repair of existing shoreline armoring have actually increased since 1993.³

In the San Juan County Marine Stewardship Area Plan, shoreline modification was identified as a top threat to the county's marine ecosystem.⁴ The cumulative impact of human modifications to the shoreline may be far-reaching in terms of both habitat and existing human activities, particularly in the face of anticipated increases in the rate of sea level rise and storm-induced erosion. Forage fish are especially vulnerable to shoreline armoring, as armoring interrupts erosion, distribution and accretion of their spawning sediments.⁵ These impacts to forage fish are felt directly by federally listed Puget Sound Chinook salmon that feed on forage fish. Considering the critical ecological role forage fish have in Puget Sound Chinook salmon ecology, no more armoring can be allowed where it might impact their habitat, and every opportunity to remove impactful armoring must be taken.



More than 25 miles of shoreline are armored or modified in San Juan County.⁶

San Juan County Shoreline

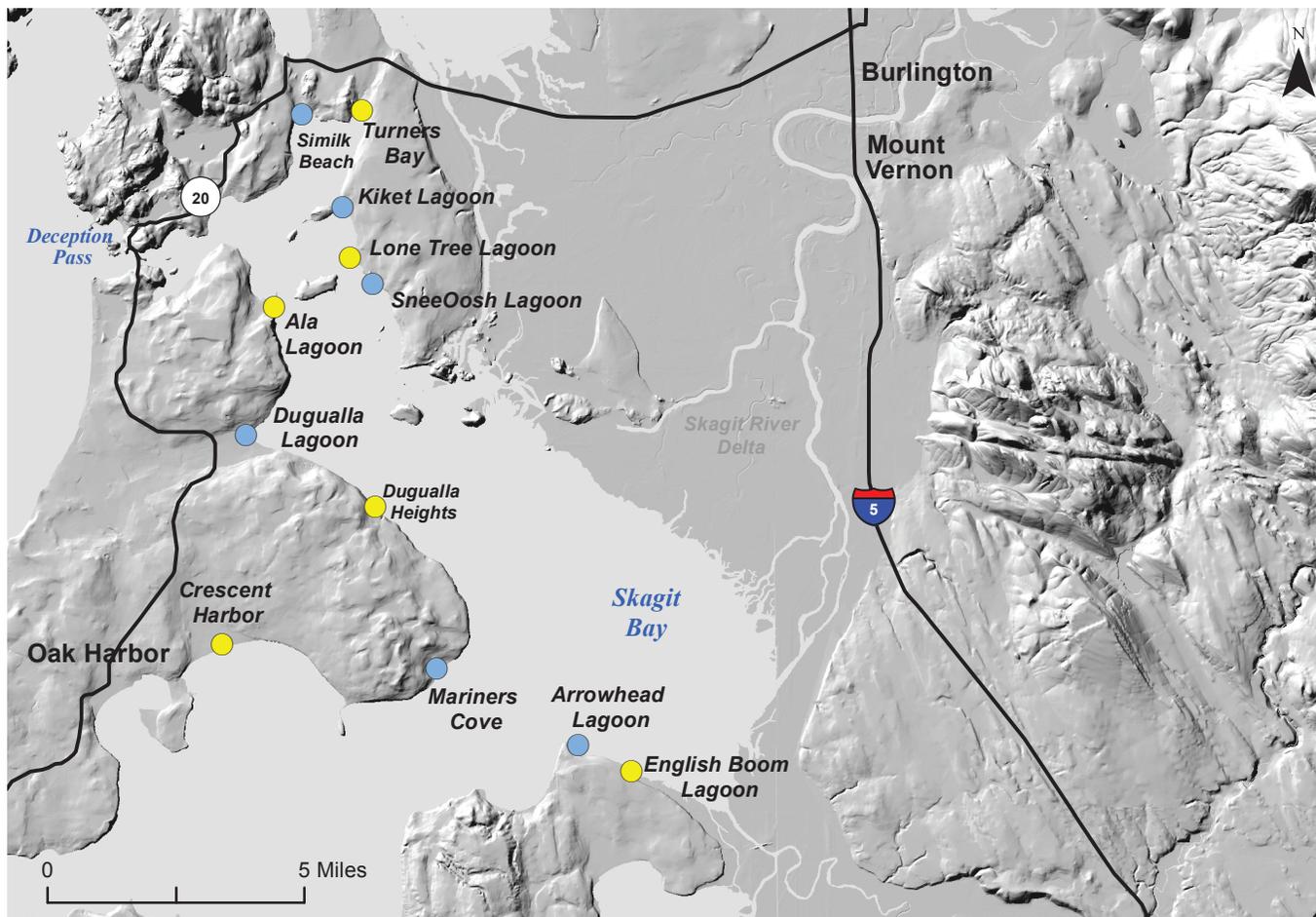
- Armored or Modified
- Not Armored or Modified

Data Sources: PSNERP 2008,⁷ SSHIAP 2004,⁸ WAEYC 2013b⁹

Whidbey Basin Pocket Estuaries

Restoration Underway and Initial Targets Have Been Met

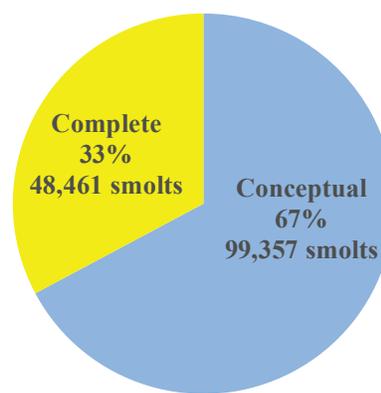
The Skagit Chinook Recovery Plan prioritized the restoration of 12 pocket estuaries totaling 76.8 acres of usable habitat area, all of which is within a day's swimming distance for Skagit River juvenile Chinook. Through 2015, pocket estuary restoration has been completed at six sites totaling 33.6 acres. These restored pocket estuaries are estimated to increase Chinook smolt production by over 48,000 smolts. The change in status since the 2012 State of Our Watersheds Report reflects Turner Bay and Dugualla Heights both going from active restoration projects to completed restoration projects.^{1,2}



There are 12 prioritized pocket estuary restoration projects in the Whidbey basin, six of which have been completed and six of which are conceptual.

For the Whidbey basin, modeling and field surveys have led researchers to conclude that over two-thirds of historic pocket estuaries have been completely lost to juvenile salmon use, and the remaining one-third has been reduced in size by approximately 50%. This suggests an approximately 80% net reduction in pocket estuary area. The 12

pocket estuaries within a day's swimming time of the Skagit River delta have experienced an 86% net reduction.³ Restoration of these sites are expected to result in the production of over 147,000 additional smolts. Over 63% of the increased production, or over 93,000 smolts will come from the completed restoration of the Dugualla Lagoon project.⁴

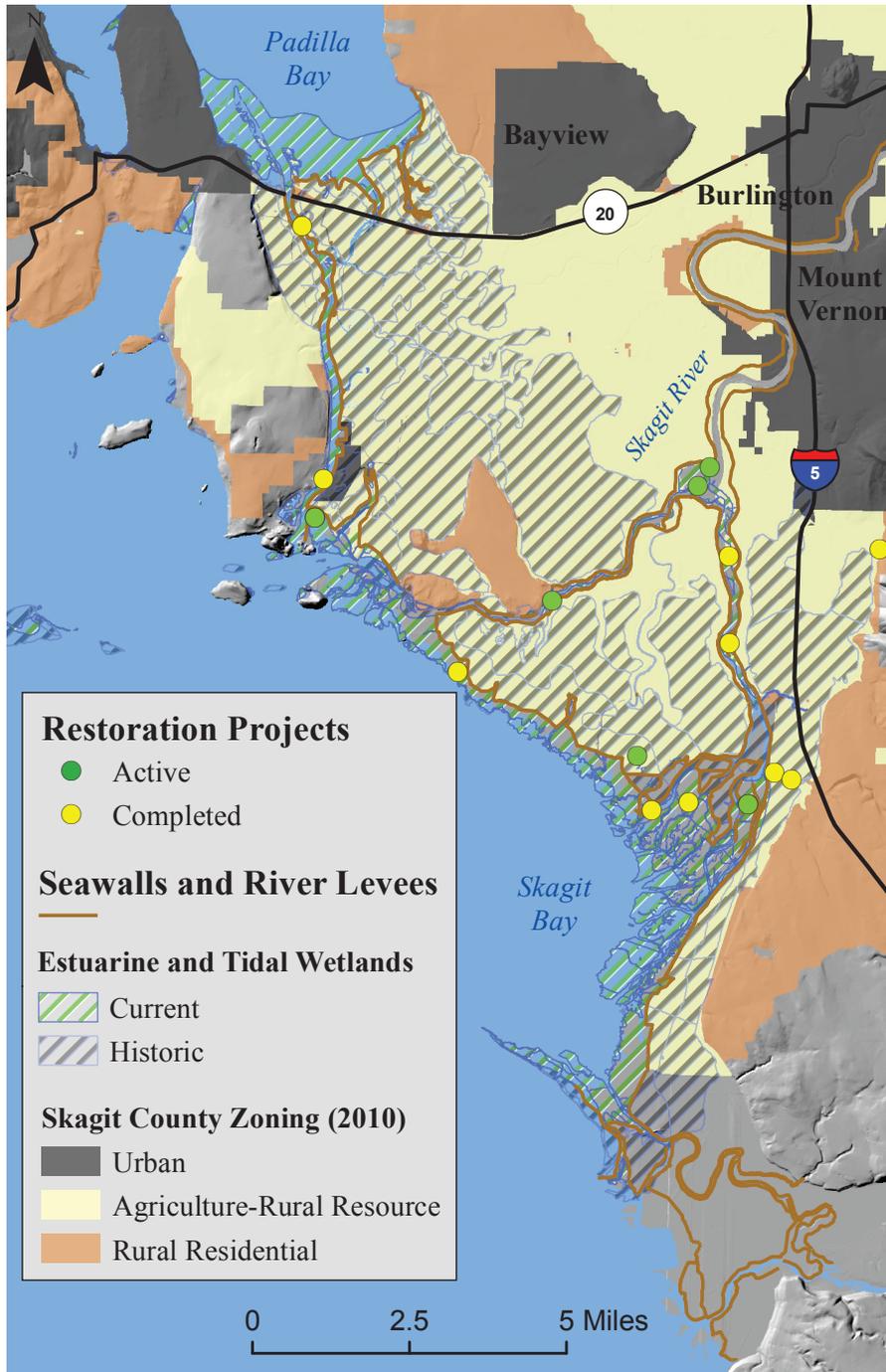


Whidbey basin pocket estuary restoration has resulted in the additional production of an estimated 48,641 Chinook smolts.

Data Sources: HWS 2015,⁵ SSHIAP 2004,⁶ SRSC & WDFW 2005,⁷ SRSC & WDFW 2012,⁸ WADOT 2012⁹

Skagit Estuary Restoration on Track to Meet 50-year Chinook Recovery Goals

About 12% of the 2005 Skagit Chinook Recovery Plan’s habitat restoration goals for the estuary have been met.¹ At present, estuary restoration is on track to realize the Recovery Plan’s habitat goal in 50 years.² Skagit Intensively Monitored Watershed (IMW) investigators have found decreases in juvenile Chinook densities where restoration has increased habitat capacity.³



Over 70% of historic estuarine and tidal wetlands in the Skagit delta fall on lands that are currently zoned in agriculture,^{6,7} a complicating factor for future estuary and tidal wetland restoration opportunities.⁸

Diking, dredging, filling, clearing and developing the Skagit delta over the last 150 years has reduced tidal wetland area from 28,375 acres to 7,705 acres.⁴ This has resulted in an estimated 88% loss of juvenile Chinook rearing habitat in the delta, leading to an overpopulation of existing habitat.

Since the 2012 State of the Watershed Report, the Fisher Slough tidal marsh restoration was completed, a series of small marsh sites along the Swinomish Channel were created by the removal of dredge spoils, and tidal inundation at WDFW’s Milltown Island in the South Fork was expanded. Additionally, there is progress on three tidal delta projects on WDFW land (Fir Island Farms, Cottonwood Island and Deepwater Slough Phase 2).⁵

Based on current restoration status, the 50-year habitat restoration goal is reachable. However, many of the remaining identified delta restoration projects involve privately owned agricultural land, which will make keeping pace with the 50-year restoration target very difficult.



Skagit River Delta

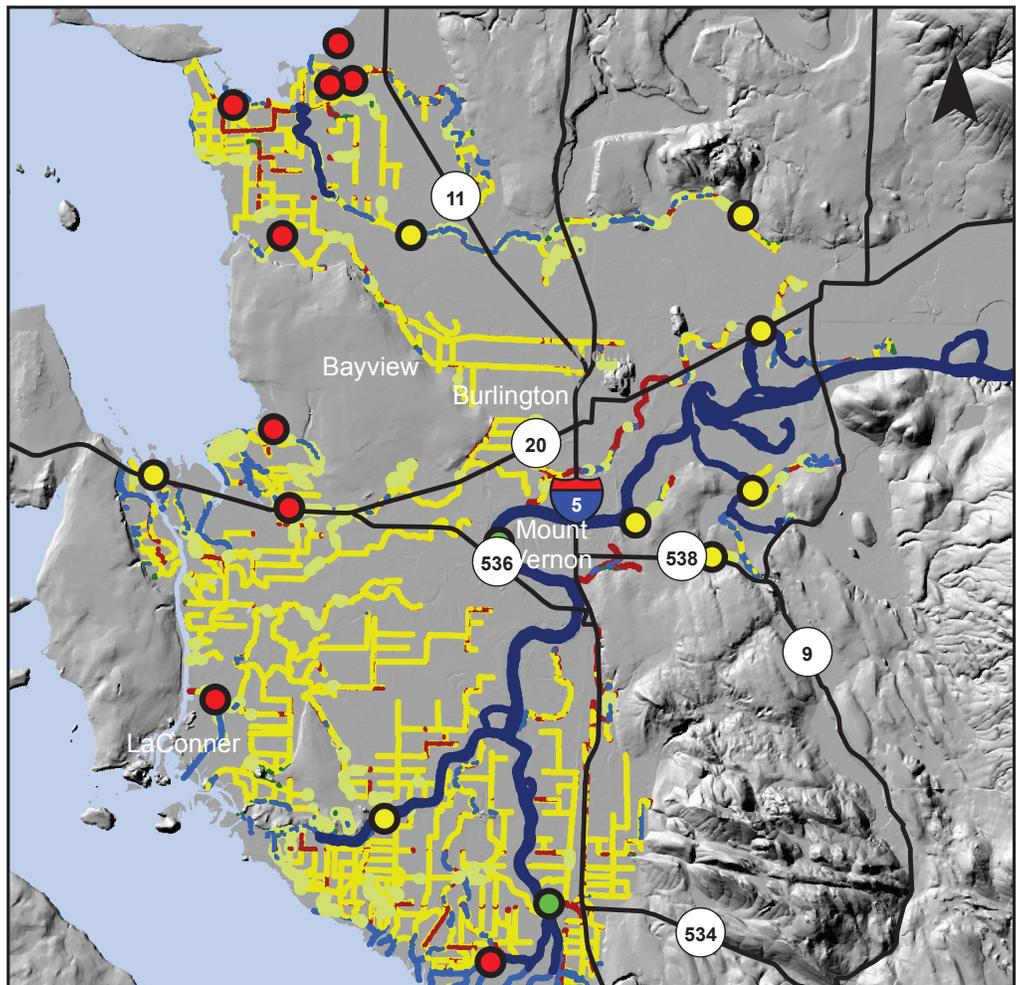
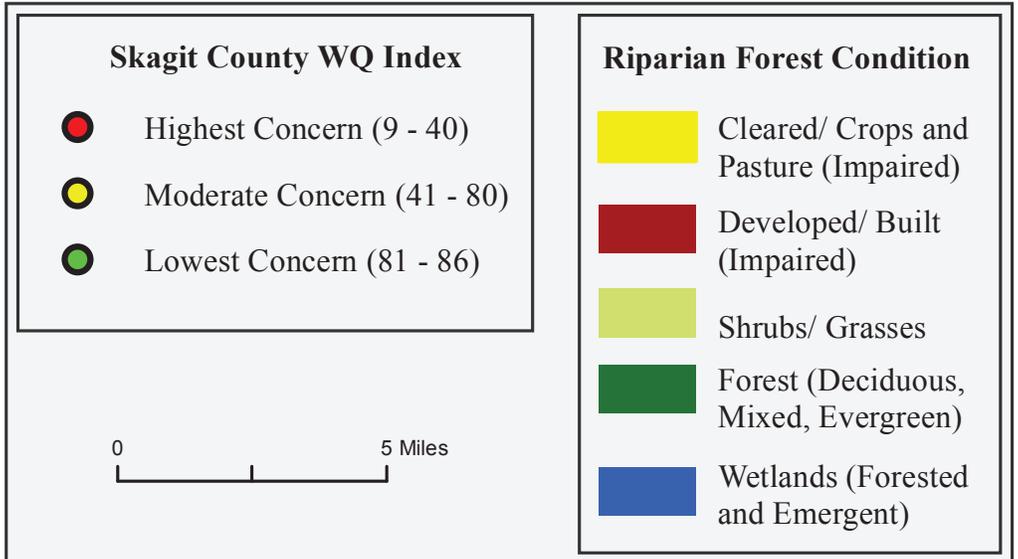
Washington Recreation and Conservation Office

Data sources: Collins & Sheikh 2005,⁹ HWS 2015,¹⁰ Skagit Co. 2010,¹¹ SSHIAP 2004,¹² WAECY 2014a¹³

Riparian Forests Remain Impaired on Skagit Delta Agricultural Lands

Prior to 2006, over 80% of riparian areas in the Skagit Delta were cleared of trees or impaired and over 90% of that impaired area was found in agriculturally zoned lands.¹ In 2011, over 80% of riparian areas remained impaired and over 90% of those areas continued to be found on agriculturally zoned land.^{2,3} From 2006 to 2013, Skagit delta agricultural drainages continued to have the worst overall water quality in the Skagit River watershed.⁴

Agriculture remains the most productive industry in Skagit County economy. With almost \$300 million in production in 2014, reflecting a near \$45 million increase in production since 2010, and a near \$250 million increase in production since the 1970s.⁵ While exemptions from the State Shoreline Management Act, the State Growth Management Act, and the Skagit County Critical Area Ordinance, combined with the Skagit Delta Fish and Tide Gate Initiative, have eased the burden of environmental regulation on agriculture and helped grow the agricultural economy, it has had the opposite effect on the delta's other natural resources. Riparian forest in the delta remains 80% impaired,⁶ the delta's water quality is chronically poor,⁷ and the delta's habitat preferred by endangered Chinook salmon are around 15% of historic levels.⁸ Like agriculture, riparian forests, water quality, and salmon all need protection from the burdens they face, and environmental regulation is meant to provide some of that protection. Environmental regulation/protection should only be eased if evidence suggests it is not needed to protect forests, water and salmon. As it stands now, a more balanced approach towards regulating agricultural practices to provide more protection for the other resources in the delta still seems warranted.



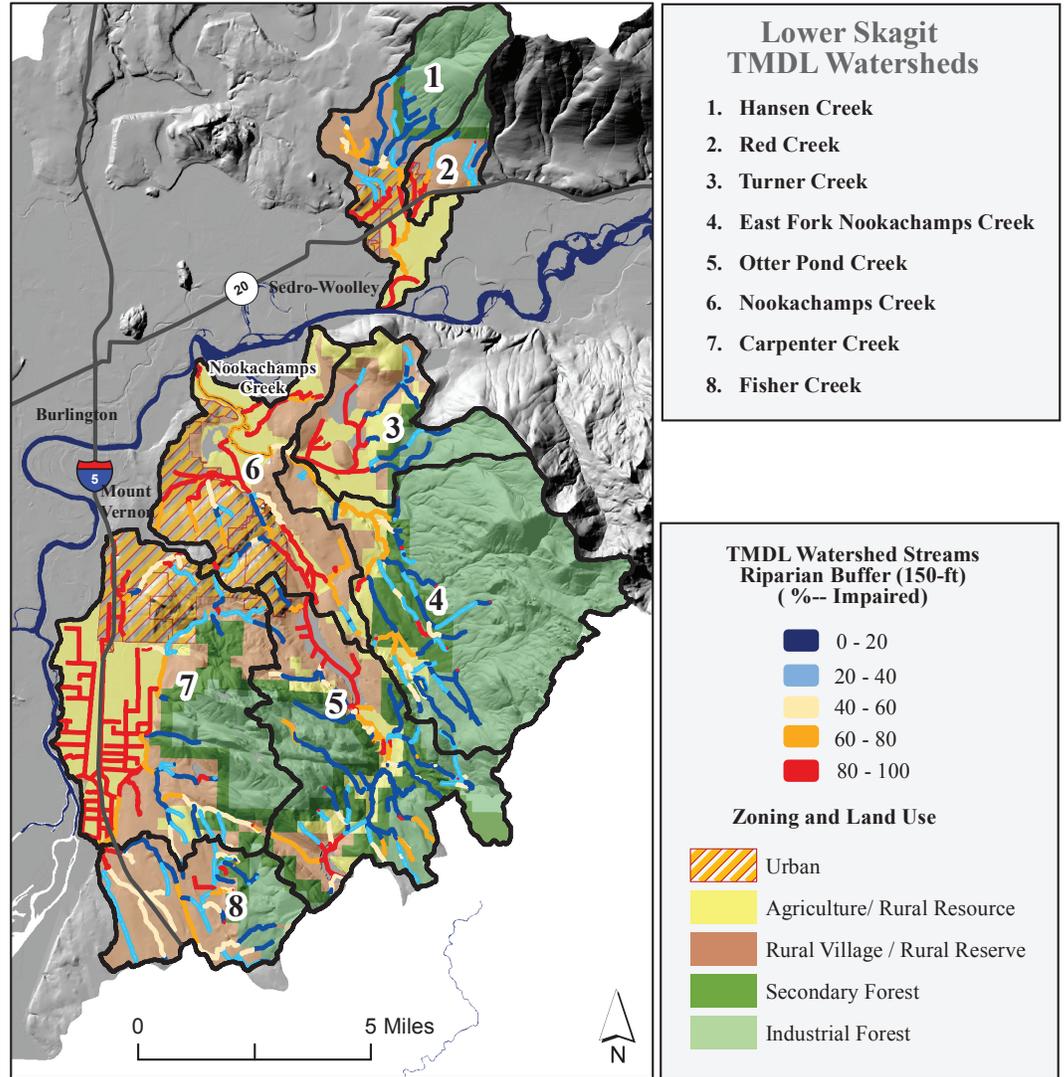
Data Sources: Skagit Co. 2006-2013,⁹ SSHIAP 2004,¹⁰ SSHIAP 2010,¹¹ WADOT 2012,¹² WAECY 2011b¹³

Lower Skagit Watersheds Not Meeting Stream Temperature TMDL Recommendations

In 2011, over 51% of riparian acreage along fish-bearing streams within the 2008 Lower Skagit Temperature TMDL watersheds was non-forested and impaired.^{1,2} When compared to 2006 NOAA-CCAP forest cover dataset, riparian forests within the TMDL watersheds were more impaired and less forested.³ This suggests that the lower Skagit is failing to meet the primary management recommendation of the temperature TMDL: riparian reforestation.

High stream temperatures impact Chinook salmon at all life stages, especially during juvenile rearing.⁴ The Lower Skagit Temperature TMDL remains in place for eight tributaries in the lower Skagit watershed as they are out of state compliance with Washington state water quality standards. The Lower Skagit TMDL recommends restoration of riparian tree shading of streams as the primary mechanism for lowering stream temperatures into compliance.

The state's TMDL plan for reducing stream temperature is voluntary and includes a combination of financial incentives, outreach and technical training, and communication.⁵ It is expected that with these measures in place, streams will be in temperature compliance by 2080.⁶ The present trend suggests that streams will not be compliance by 2080.



Land-use practices in the Lower Skagit Temperature TMDL watersheds continue to impair riparian condition.

Zoning Category	Riparian Acres (150ft-buffer)	2006 Impaired Riparian Acres (Non-forested in 150-ft buffer)	2011 Impaired Riparian Acres (Non-forested in 150-ft buffer)	Riparian Buffer Percent Impaired (Non-forested)	Riparian Impairment Trend 2006-2011
Urban	881	564	571	65%	More Impaired
Agriculture/ Rural Resource	2,555	1,928	1,946	76%	More Impaired
Rural Residential	1,944	848	850	44%	More Impaired
Secondary Forest	1,028	210	219	21%	More Impaired
Industrial Forest	847	127	127	15%	No Change

In the lower Skagit TMDL watersheds, riparian forests continued to become more impaired between 2006 and 2011.

Data Sources: Skagit Co. 2010,⁷ SSHIAP 2004,⁸ WAECY 2011a,⁹ WAECY 2011b,¹⁰ WAECY 2014a¹¹

Skagit Basin Closed to Permit-Exempt Well Development

Since October 2013, Skagit County has not issued building permits that rely on permit-exempt wells as their sole water source, unless adequately mitigated for. This has resulted in no new unmitigated exempt well development in Skagit County since that date. There have been between 30 and 40 replacement wells allowed in the basin since that time.

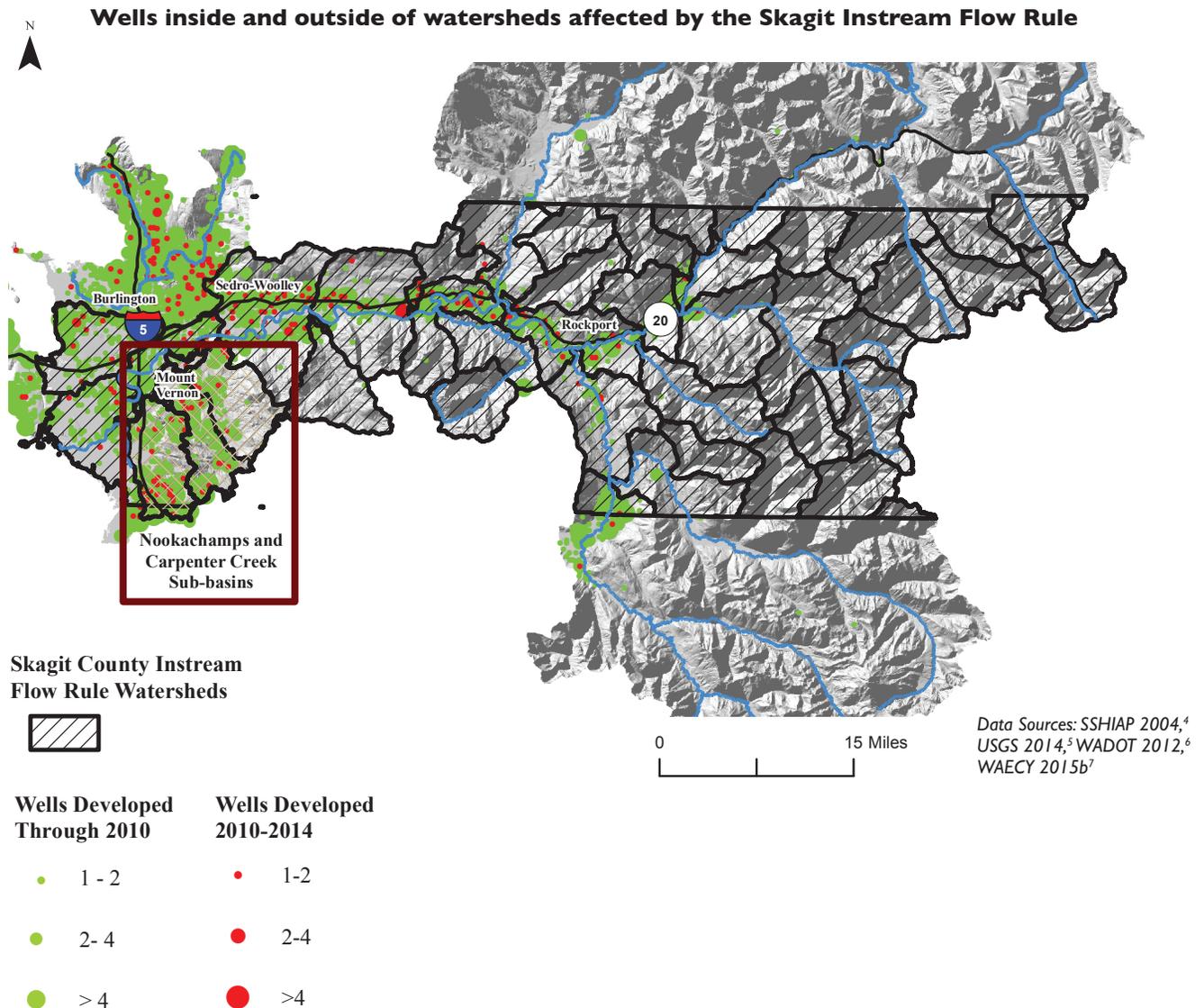
On October 3, 2013, the Washington Supreme Court overturned the 2006 Skagit Instream Flow Rule amendment that provided uninterrupted water supplies through a regulatory tool called water reservations, in its decision in *Swinomish Indian Tribal Community v. Department of Ecology*. The 2006 water reservations provided uninterrupted water supply for well users that started using water after the original rule was adopted in 2001. Ecology estimates that 475 homes and 8 businesses started using water between April 14, 2001 and October 3, 2013.¹

The Swinomish Tribe has agreed not to challenge Ecology’s decision not to interrupt water supply for those home and business owners, and has pledged to find sources of mitigation water for those users that rely on reservation water.² To date, no mitigation has been provided. This ruling applies to all sub-basins within the Skagit Instream Flow Rule, including the Nookachamps Creek and Carpenter Creek sub-basins.

Looking from the perspective of Skagit Chinook recovery, low flows in the Skagit River system continue to be a potential

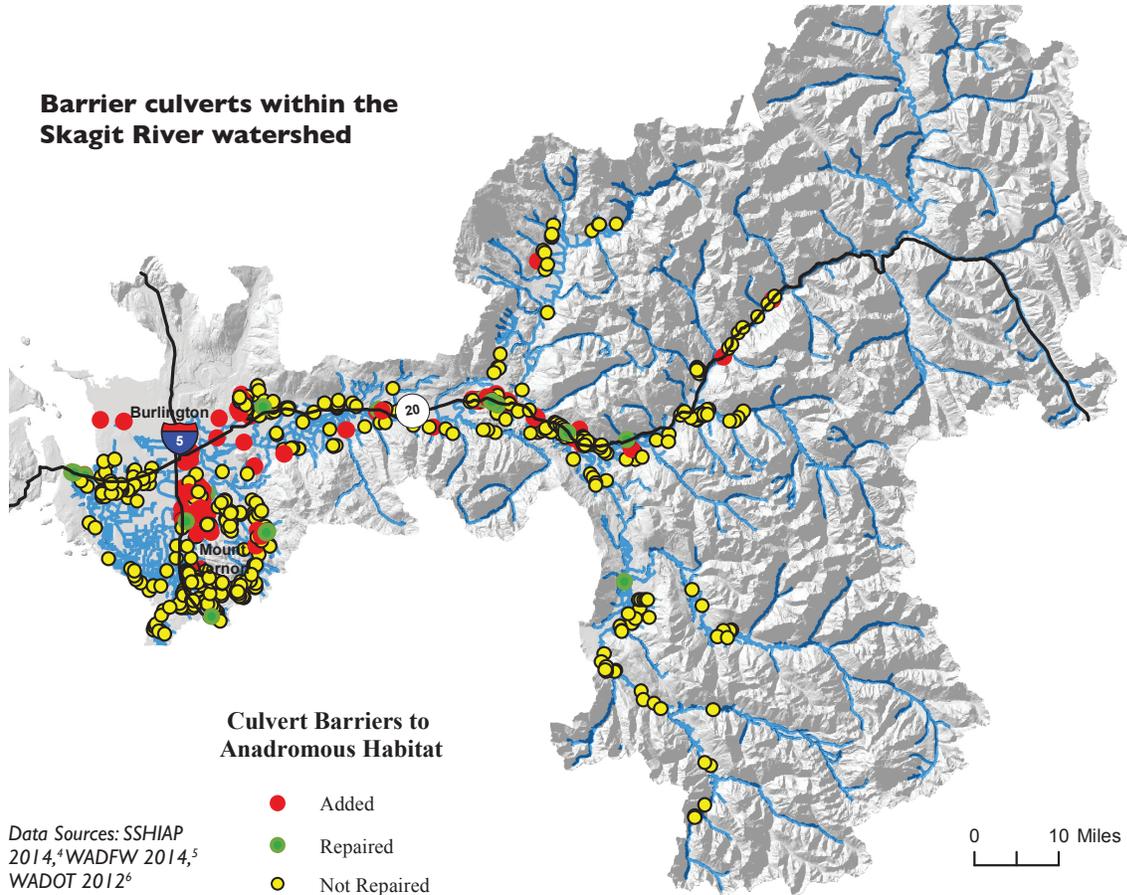
threat. However, the establishment of a legal restriction on permit-exempt well development in basins where streamflow reduction is having a direct impact on seasonal low flow is a significant step toward managing the factors of streamflow reduction that are within our control.

Since October 2013, all building permit applicants within the Skagit watershed instream flow rule area have been required to obtain Ecology’s approval of proposed water use prior to submitting a permit or subdivision application to Skagit County.³



More Anadromous Barrier Culverts Identified in the Skagit River Watershed Since 2010

In the Skagit River watershed between 2010 and 2014, an additional 107 barrier culverts were identified and only 24 barrier culverts were repaired. The net gain of 83 barrier culverts clearly indicates that we have yet to turn the corner on getting this issue addressed.



Data Sources: SSHIAP 2014,⁴ WADFW 2014,⁵ WADOT 2012⁶

Culvert Barriers to Anadromous Habitat

- Added
- Repaired
- Not Repaired

Through 2010, there were 497 culverts at least partially blocking anadromous migration in the Skagit River watershed, and through 2014 this number had increased to 580 culverts. The Skagit River Recovery Plan recommends governments be held accountable for repairing culverts under their jurisdiction. Currently in the Skagit watershed 52% of all barrier culverts are under government jurisdiction.¹ For culvert repair to be meaningful to the recovery of Chinook salmon, governments need to commit to an accelerated schedule of culvert repair.

Barrier Culverts on Anadromous Streams in the Skagit River Watershed						
Owner	Total Barrier Culverts in 2014	Barriers Surveyed Through 2010	Barrier culverts surveyed between 2010 and 2014	Barrier culverts repaired between 2010 and 2014	Change in Culvert Barriers (2010 - 2014)	Percent Change (2010 - 2014)
City	28	6	25	3	22	367%
County	162	153	15	6	9	6%
Drainage District	3	3	0	0	0	0%
Federal	28	26	2	0	2	8%
Other	1	1	0	0	0	0%
Port	1	1	0	0	0	0%
Private	261	216	53	8	45	21%
State	78	74	11	7	4	5%
Tribal	0	0	0	0	0	0%
Unknown	18	17	1	0	1	6%
Total	580	497	107	24	83	17%

As of 2014, an estimated 580 culverts remained barriers in the Skagit River watershed.²

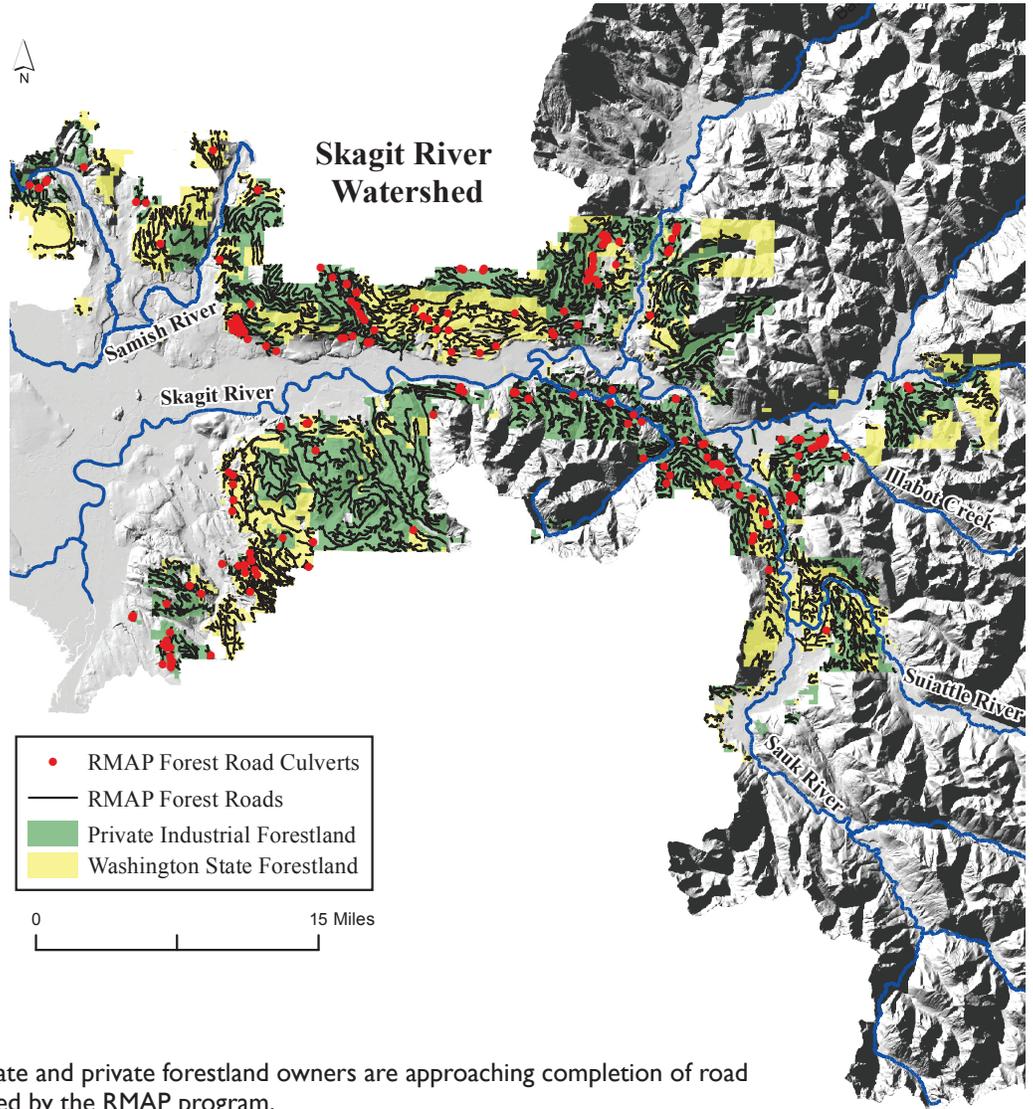
RMAPs Almost Complete in Skagit and Samish Watershed

The Washington State Forest Road Maintenance and Abandonment Plan (RMAP) has led to the repair or abandonment of 80% (1,331 miles out of 1,662 total miles) of private and state-owned forest roads in the Skagit River watershed.¹ Within the Sauk, Suiattle and Cascade watersheds of the Skagit, an estimated 69% (around 90 of 130 miles) of road have been either abandoned or repaired. RMAP has also resulted in the repair or removal of 179 of 209 culverts on private and state-owned forest roads within the Skagit, and 38 of 44 culverts within the Sauk, Suiattle, and Cascade watersheds. The majority of all remaining work is scheduled to be completed by 2021, as both Weyerhaeuser Corp. and Sierra Pacific are seeking a 2021 extension. Together they have over 300 miles of forest road that still needs to be brought up to RMAP standards or abandoned.

No alteration of the human landscape has a greater and more far-reaching effect on aquatic habitat than roads.² Over 1,600 miles of forest roads in the Skagit basin are on private industrial and state lands and fall under the RMAP mandate. It is expected that RMAP road repairs and abandonment will improve water quality in the upper Skagit and Samish River watersheds. Considering the role improved water quality plays in Chinook habitat, 80% of RMAP roads brought up to standard or abandoned is good news to salmon recovery in the Skagit and Samish river watersheds.

Data Sources: Mostovetsky 2015,³ Skagit Co. 2010,⁴ SSHIAP 2004,⁵ WADNR 2014a,⁶ WADNR 2014c,⁷ WAECY 2011a⁸

RMAP only applies to state and private forestland jurisdictions.



RMAP status shows that both the state and private forestland owners are approaching completion of road repairs and abandonment as mandated by the RMAP program.

2015 Samish and Skagit River watershed Road Maintenance and Abandonment Status (RMAP) from Annual Reports					
Jurisdiction	Total Miles of Forest Road	Completed Miles	Miles Remaining	Percent Complete	Planned Date for RMAP Completion
State Lands	574	543	31	95%	10/31/2016
Private Industrial Lands	1088	788	300	72%	10/31/2021
Jurisdiction	Total Number of Culverts	Repaired	Remaining to be Repaired	Percent Repaired	
State Lands	35	30	5	86%	
Private Industrial Lands	174	149	25	86%	

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