

# 2016 State of Our Watersheds Report

## Dungeness – Morse Watersheds



*To ensure continued economic growth, promote long-term community vitality and protect sensitive resources and assets, it is essential that we incorporate climate change preparedness into our planning efforts and operations.*

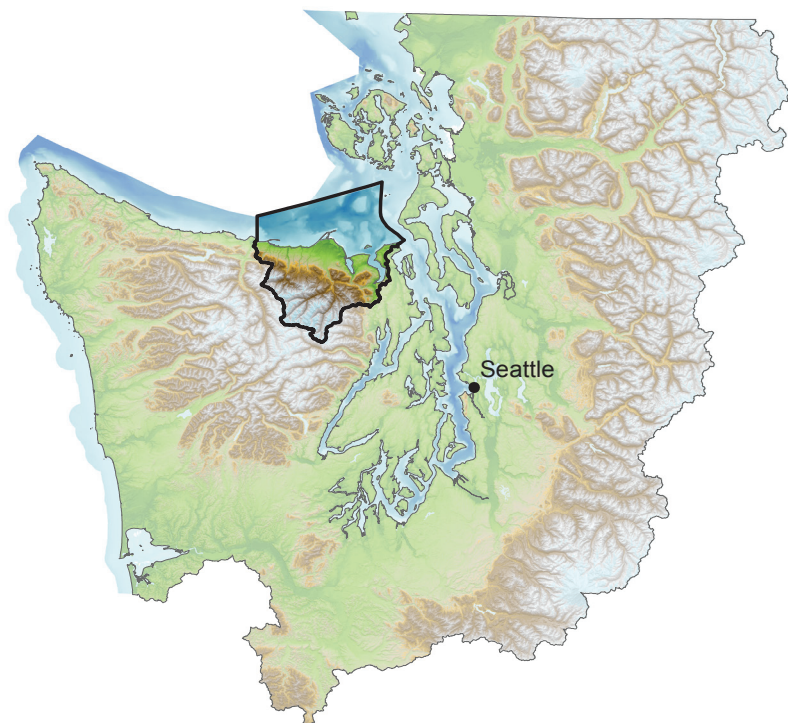
– **W. RON ALLEN**  
**JAMESTOWN S'KLALLAM TRIBE**



## Jamestown S'Klallam Tribe

The Jamestown S'Klallam Tribe is part of the Klallam Band of Indians that have resided throughout the Strait of Juan de Fuca, Hood Canal and Port Gamble Bay for generations.

Headwaters of the Dungeness basin are in federal lands (Forest Service and National Park) and much of the watershed has remained forested. Commercial forestry is the predominant land use in the upper watershed. The remaining area is a mix of agricultural, rural residential and urban development. This report will focus on portions of the Dungeness Basin and surrounding marine waters, which is only a portion of the area that the Jamestown S'Klallam Tribe works in and manages.



# Degradation of Dungeness Basin

The Jamestown S’Klallam Tribe’s Focus Area is located in the northeast corner of the Olympic Peninsula and includes portions of WRIAs 17 and 18. These watersheds drain into the Strait of Juan de Fuca and include the Dungeness River, which once supported impressive runs of spring Chinook, summer pink and fall pink salmon.<sup>1</sup> A century of river water withdrawals, riparian forest harvest, and filling and development in the floodplain have made the Dungeness River watershed a ghost of what it used to be.<sup>2</sup> This is the home watershed for the Jamestown S’Klallam Tribe, for which healthy habitat and salmon runs are both culturally and economically vital. Although a large portion of the Focus Area is contained within Olympic National Park and the U.S. Forest Service wilderness area, many of the habitats are heavily impacted by land use, water extractions, infrastructure and other habitat alterations, especially along shorelines and critical environmental areas.

Technical analysis has identified the significant habitat limiting factors for decline of the region’s salmonid populations as:

- Estuarine habitat loss and degradation;
- Loss of channel complexity from loss and recruitment of large woody debris;
- Low/impaired instream flows;
- Floodplain and shoreline modifications;
- Sediment aggradation; and
- Loss of littoral drift.<sup>3</sup>



Washington Department of Ecology Coastal Atlas, 2006

A marina environment is a type of armored shoreline in Sequim Bay.

## Recovery Plan Includes Protecting Habitat and Fish

The overall salmon recovery strategy for the region seeks to maintain habitat integrity to protect and strengthen wild stocks while restoring habitat for the formerly productive but currently weak wild stocks.

Specific salmon recovery goals and prioritized actions are identified in the North Olympic Peninsula Lead Entity (NOPLE) for Salmon strategy and workplans. NOPLE is the umbrella organization that brings representatives from most of the different stakeholder groups together to coordinate salmon recovery efforts across the North Olympic Peninsula. NOPLE has established priorities for both watershed and nearshore processes to recover ecological function. Priority work is related to hydrologic regime, sediment supply, lower river hydrodynamics, water quality, canopy cover, floodplain restoration and nutrient input.

The identified goals for the NOPLE Recovery Strategy are:

- Achieve fish stocks that are robust to changing conditions, self-sustaining over the long term and capable of supporting harvests (ceremonial, subsistence, recreational and commercial).
- Implement the salmon recovery plans to protect and restore fish habitat.
- Restore and maintain ecosystem function; and
- Integrate efforts toward larger salmon recovery and restoration goal in the entire Puget Sound.<sup>4</sup>



Jamestown S’Klallam Tribe

A box culvert on Siebert Creek under Highway 101 near Sequim.



# Recovery Efforts Lagging

At the 10-year mark of the Puget Sound Salmon Recovery Plan, a review of key environmental indicators for the Dungeness basin planning area shows that 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. 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 (e.g., Siebert Creek culvert replacement, Dungeness River floodplain restoration) contribute to the slow pace of progress.

Review of the status of these key environmental indicators since the 2012 State of Our Watersheds Report shows a steady loss in habitat status:

Tribal Indicator	Status	Trend Since SOW 2012 Report
Stream Blockage – Culverts	There is concern that a high ranking project (Siebert Creek Hwy 101 Fish Passage Restoration) to remove an undersized culvert blocking 33 miles of fish habitat is not getting attention or being completed.	Unknown
Marine Shoreline Modifications/Forage Fish Impacts	Only 63% of marine shorelines remain in a natural condition. Since reported in 2012, modified and armored marine shoreline has increased by 1%. 52% of the marine shoreline documented as sand lance, surf smelt and herring habitat has been negatively impacted and impacts have increased by 1% since reported in 2012. Herring stocks remain in critical status in Discovery Bay.	Declining
Forestland Cover	From 2006-2011, the number of sub-watersheds having a moderate, poor or severely damaged forest cover has increased by 3%. 65 of 99 sub-watersheds had an overall loss of forest cover.	Declining
Impervious Surface	From 2006-2011, there was a 1% increase in impervious surface. 9% of the sub-watersheds had increases of 2-4%, primarily in UGAs. 12 subwatersheds have 12-40% impervious surface area or seriously degrading watershed health.	Declining
Climate Change	Climate change is affecting tribal natural resources and infrastructure. JKST has developed a vulnerability assessment and adaptation plan to prepare for climate change.	Unknown

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

As the Tribe looks ahead, the issues and indicators discussed in this report will remain as priorities needing attention and monitoring. The Tribe continues to work on issues pertaining to armoring along all marine shorelines and particularly its effects on herring and forage fish habitat. Other priority issues include the decrease in forest cover and the increase of impervious surface in important habitat areas.

The Jamestown S’Klallam Tribe is on the forefront of addressing tribal vulnerabilities and initiating preparation for climate change. As one of the first tribes in western Washington to complete a climate adaptation plan and vulnerability assessment, they have identified and prioritized areas where the changing climate conditions (i.e., changing precipitation patterns, sea level rise, ocean acidification) will leave their resources, infrastructure, economy and health most vulnerable.<sup>5</sup> Sea level rise models designed for their Focus Area show potential damage and vulnerability to critical beaches, tribal infrastructure, main roads and emergency services. Additional impacts to the Tribe include increased occurrence of shellfish poisoning associated with harmful algal blooms (which warmer conditions may favor) and potentially diminished health and wellness of Tribal members.

One of the main problems in the Dungeness watershed, both for fish and humans, is low streamflows, especially in late summer when the highest demand for irrigation water coincides with peak Chinook spawning. The Tribe has worked for many years with the irrigation community, as well as the Clallam Conservation District and Washington Department of Ecology, to reduce the impacts of irrigation by implementation of water conservation projects and other improved irrigation system efficiencies. Over the past 15 years, the irrigators have reduced their withdrawal by over 45% with the development and implementation of the Water Conservation Plan.<sup>6</sup> Progress has been made, but Dungeness flows are still inadequate for sustaining ESA-listed salmon species. Currently an agreement between the Water Users Association and Washington Department of Ecology (September 2012) details allowed water uses and mitigation activity for irrigation. The agreement binds the irrigators to withdraw no more than 50% of the river flow, while always leaving at least 60 cfs; and to reduce their adjudicated certificates to 93.5 cfs. The Tribe is hopeful that the irrigators will commit to further reductions in irrigation diversions.

In spite of outward appearances, the Sequim/Dungeness watershed is still degraded. Hydrological modifications of the Dungeness River, including a 3-mile-long Army Corps of Engineers levee and five private levees, have caused such significant aggradation in the lower river that flooding is a constant threat. The Jamestown Tribe is working with the Army Corps of Engineers through a tribal Treaty Rights at Risk forum about this very serious



PNPTC

Forest cover at Fort Warden State Park.

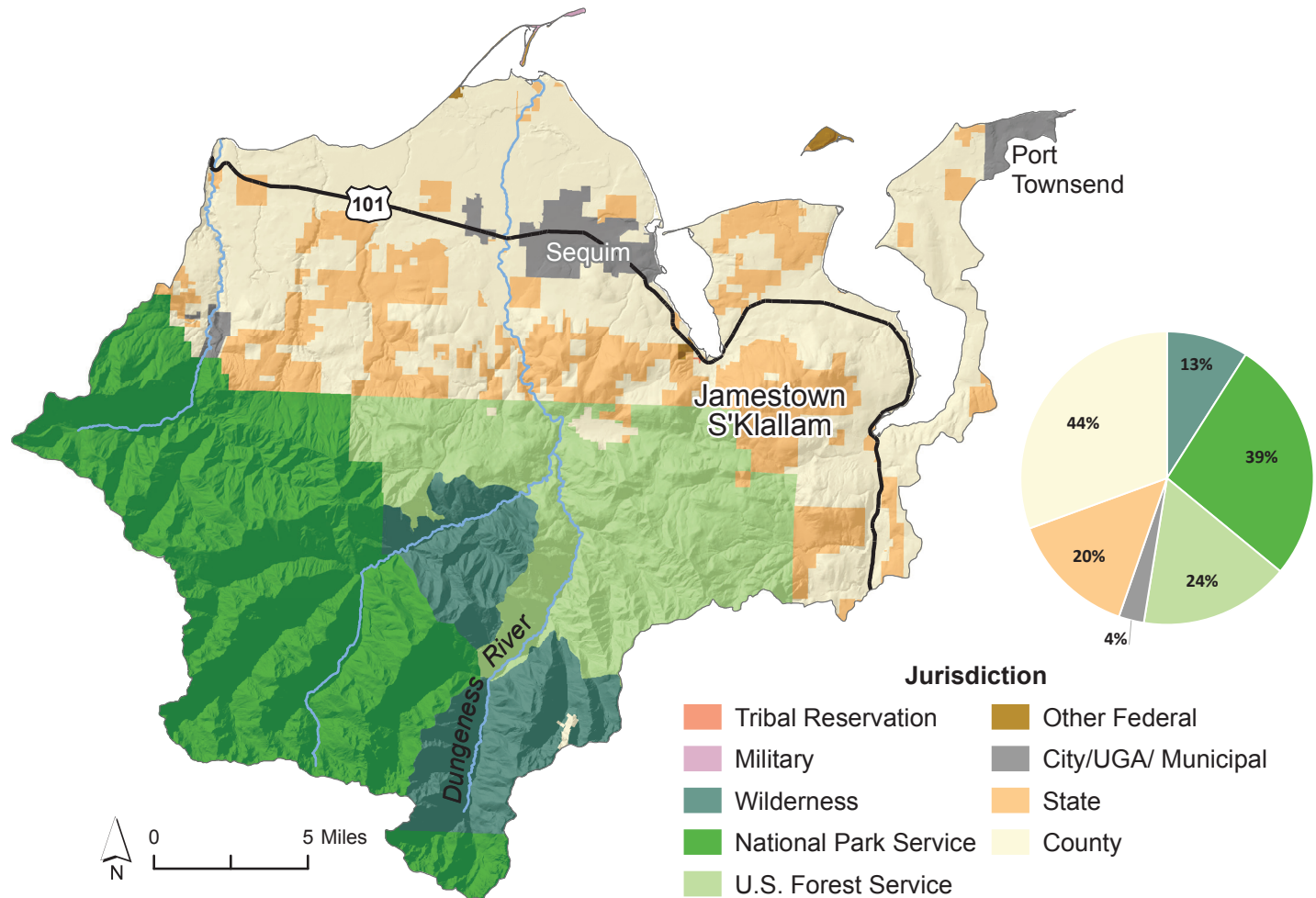
concern. The Tribe is hoping to gain continued funding to include floodplain restoration. Funding from the Puget Sound Acquisition and Restoration Fund and the Floodplains by Design initiative has been allocated for restoration efforts in the lower Dungeness River floodplain to restore and improve nearshore, estuary and floodplain conditions, while reducing downstream flood risk. The project funded in 2015 includes plans for levee setbacks and habitat restoration to reconnect 112 acres of floodplain that is expected to be completed within the next five years. The Jamestown Tribe will continue to lead efforts to plan and implement additional habitat restoration on the river.

Within the past 10 years, there has been a proliferation of commercial development and associated increase of impervious surfaces, leading to greater amounts of stormwater runoff. Stormwater runoff impacts fresh and marine waters and is a contributing factor to shellfish harvest area downgrades and salmon fatalities in local streams. Shellfish beds in both Dungeness and Sequim bays are closed to harvest due to either bacterial pollution or toxins associated with algal blooms. Urban and residential growth in the watershed relies almost entirely on groundwater sources that are hydraulically linked with the Dungeness River. Except for the city of Sequim, the entire watershed is served by individual or community septic systems, many of which are likely contributors to marine bacterial pollution.<sup>7</sup> The Tribe will continue to monitor and address impacts to water quality and shellfish.

Habitat is declining despite the assessment of the Puget Sound Chinook Recovery Plan that protecting existing habitat is the most important action needed.<sup>8</sup> Conditions in the Dungeness River floodplain that are harmful to both fish and humans have been described in the Dungeness Flood Control Plan (1990), Dungeness Comprehensive Flood Hazard Management Plan (2009) and several salmon recovery documents. A focused message is needed to foster community will and political support to protect remaining high-quality habitat.



# Jamestown S’Klallam Tribe



The Focus Area for the Jamestown S’Klallam Tribe report is in the north-east corner of the Olympic Peninsula and includes portions of WRIA 17 (Quilcene-Snow) and WRIA 18 (Dungeness-Elwha) in the rain shadow of the Olympic Mountains. Its watersheds drain north to the Strait of Juan de Fuca and Admiralty Inlet. These watersheds include the Dungeness River, whose headwaters are located in the Olympic National Park and U.S. Forest Service wilderness areas, as well as several smaller independent drainages.

The topography and precipitation patterns vary dramatically within the Focus Area, from high mountain ridges with 240 inches of annual precipitation to lowland valleys with only 15 inches of annual precipitation. Geologic features in the landscape were created from a combination of

seismic uplift, glaciation and fluvial processes. These past and current forces have had important consequences for the evolution of coastal shoreline features, stream drainages and headwater wetlands, many of which provide important spawning and rearing habitats in the nearshore for many forage fish and salmonid species, including the ESA-threatened Hood Canal/Eastern Strait summer chum and the Puget Sound Chinook.

Many streams in the Focus Area have natural periods of low flows and may go dry during the summer months when precipitation is sparse. This renders streams particularly vulnerable to human impacts, such as riparian vegetation removal and water extractions. While these streams may not flow year-round, they still provide important spawning habitat for fish popula-

tions, including coho and fall chum.

The Klallam were the first human inhabitants in the Eastern Strait region where they had villages and fishing camps along the shorelines and near the mouths of major streams, enjoying the benefits of the plentiful fish and shellfish resources. After the signing of the Point No Point Treaty of 1855, the S’Klallam tribes ceded their lands to the U.S. government and several Indian Reservations were established. Euro-Americans had begun settlements around sawmills in the region to continue logging the old-growth timber that dominated the landscape and farming the floodplains of the lower Dungeness River. Today the region is largely rural and forested; however, Jefferson and Clallam counties, along with the local cities Port Townsend and Sequim, are rapidly developing.

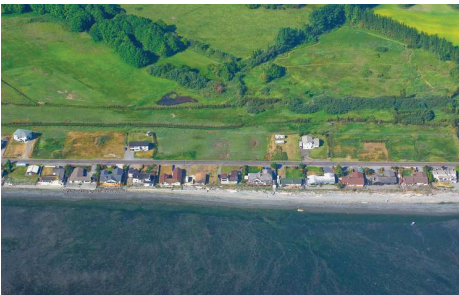
# Nearshore Habitat Loss in the Strait of Juan de Fuca from Morse Creek to Port Townsend

Since reported in 2012,<sup>1</sup> modified and armored marine shoreline has increased by 1% in the Jamestown S'Klallam Tribe's focus area. The Jamestown S'Klallam Tribe relies on healthy habitats for fish and shellfish to sustain their way of life and they are working toward restoring and preserving natural shoreline in this region.

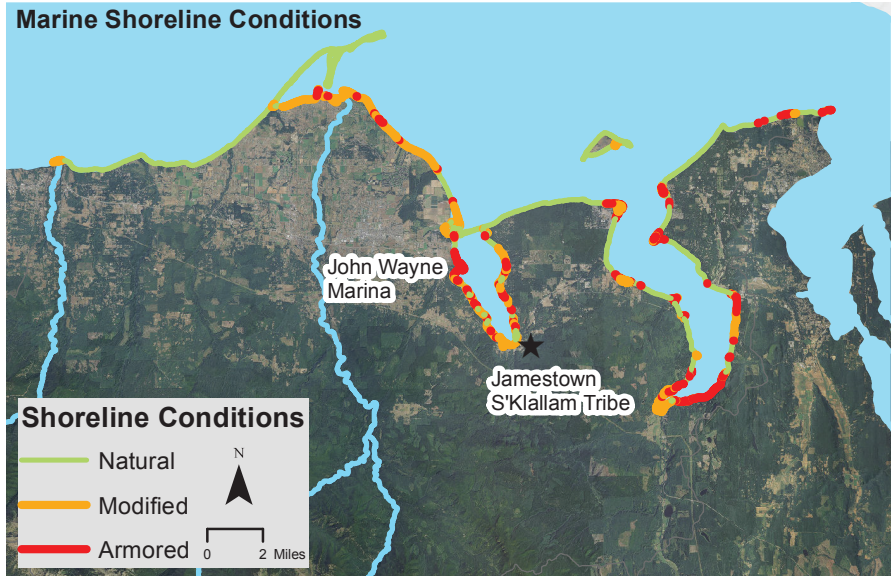
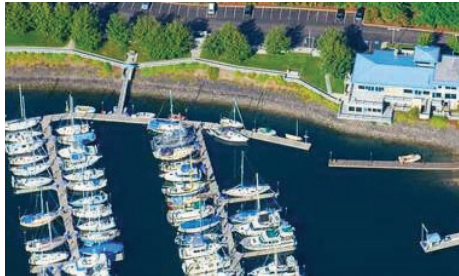
## A. Natural Shoreline



## B. Modified Shoreline



## C. Armored Shoreline

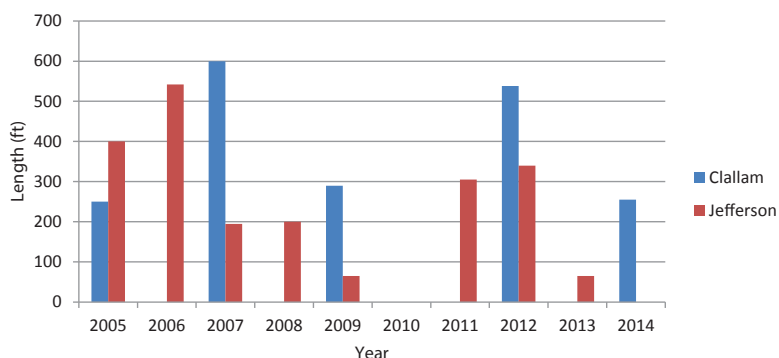


Data Sources: Carman et al. 2015,<sup>8</sup> NAIP 2011,<sup>9</sup> PSNERP 2008,<sup>10</sup> SSHIAP 2012<sup>11</sup>

The Strait of Juan de Fuca contains a rich array of marine habitats that support diverse populations of fish, marine mammals, and other wildlife. The impacts of bulkheads, docks, and other forms of armoring can reduce or eliminate productive beaches and shallow water habitats through filling or by alteration of sediment sources or sediment transport along the nearshore.<sup>2</sup> Furthermore, shoreline armoring associated with a single-family residence, which is exempt under local Shoreline Master Plans, has substantially increased.<sup>3</sup> However, the nearshore coastline adjacent to the Jamestown S'Klallam reservation is largely forested and undeveloped, which is notable compared to the area near the northwestern shore of Sequim Bay (Photo C). This area by Washington Harbor has had a long history of occupancy by the Jamestown S'Klallam Tribe up until the time of non-Indian settlement.<sup>4</sup>

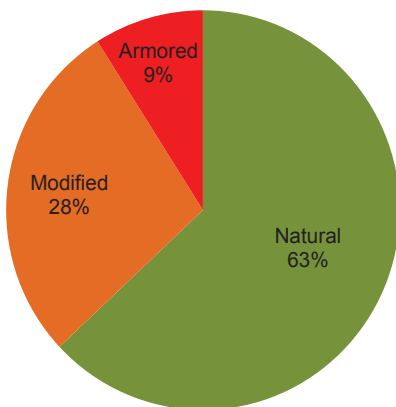
Today habitat function has been lost as a marina, dock, fill, parking lot and launch ramp have severely impacted the shoreline natural processes.<sup>5</sup> The marsh habitat partially isolated by road fill to the south of the marina can likely support juvenile salmon and is of interest for restoration. Shoreline alterations such as jetties and rock walls disrupt the flow of sediment on beaches. Docks and bulkheads cover beaches and reduce the productivity of plants and fish in these areas.<sup>6</sup> The Jamestown S'Klallam Tribe relies on these healthy habitats to sustain their way of life, including fishing and shellfishing, and the Tribe is working toward preserving and restoring habitat in this region. Habitat alteration has been identified in the Action Agenda as a threat and a priority for action in the Puget Sound and Strait of Juan de Fuca.<sup>7</sup>

**Figure 2: New Shoreline Armoring Permits by County**



There is an unknown amount of unpermitted armoring that is not included in this graph.

**Figure 1: Calculated Shoreline Conditions**



As of 2012, data collected on shoreline conditions in this focus area shows that 63% is natural, 28% is modified and 9% is armored (Figure 1). New shoreline armoring was permitted in Clallam and Jefferson counties from 2005 through 2014 (Figure 2).

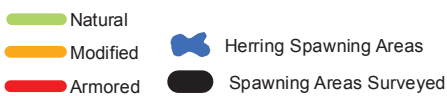


# Spawning Conditions for Sand Lance, Surf Smelt and Herring Are Threatened

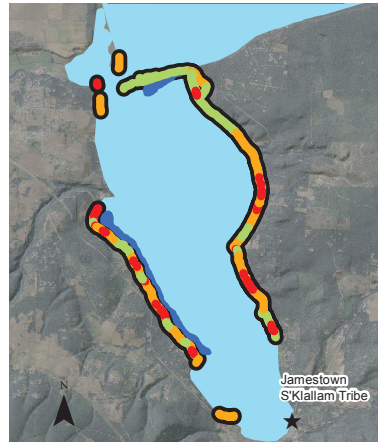
In the Jamestown S'Klallam Tribe's Area of Concern, 52% of the shoreline documented as sand lance, surf smelt and herring habitat has been negatively impacted. Since reported in 2012,<sup>1</sup> modified and armored shoreline has increased by 1%. Armoring and modification interrupts the movement of sand and sediment along the shoreline and could negatively affect spawning habitat. Herring stocks remain in critical status in Discovery Bay.

Forage fishes, such as sand lance and surf smelt, spawn on upper intertidal beaches made of sand and gravel. These fish are small schooling fishes that are important prey for larger predatory fish and wildlife in the marine food web.<sup>2</sup> Sand lance is recognized as being one of the key elements of a juvenile chinook's nearshore diet.<sup>3</sup> In the Strait of Juan de Fuca, the bays have been altered in various ways by human activities, to the detriment of these species. Studies show that development on shorelines negatively affects their spawning sites.<sup>4</sup> This could be one of the main factors contributing to their continued decline. Maintaining abundant herring, surf smelt and sand lance in Puget Sound is a conservation imperative, but current county regulations do not consider cumulative or off-site impacts of armoring the shoreline and do not address likely future conditions such as climate change.<sup>5,6</sup>

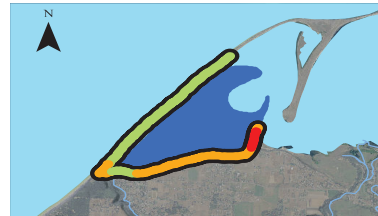
## Shoreline Conditions Surveyed for Forage Fish and Herring



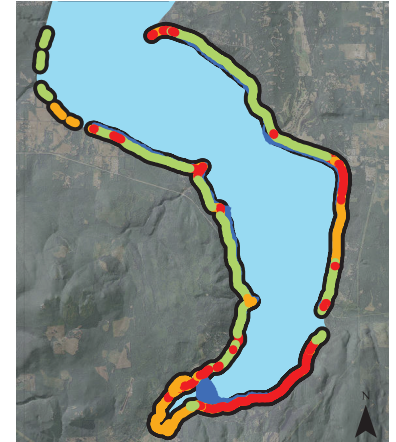
Sequim Bay Habitat Conditions



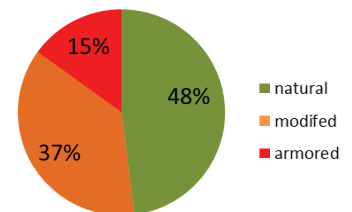
Dungeness Bay Habitat Conditions



Discovery Bay Habitat Conditions



**Figure 1: Fish Habitat Shoreline Conditions**



Shoreline conditions in known forage fish spawning areas by percentage area. Of note, not all shorelines have been surveyed.



Surf Smelt



Herring



Sand Lance

Pacific herring are a valuable indicator of ecosystem health and they serve as an important bait fish for tribal fishermen. In Discovery Bay, Pacific herring status is critical (Figure 2), which is one step away from disappearance. In Sequim Bay, the status in recent years has fluctuated between moderately healthy and depressed. The estimated herring biomass in Discovery Bay and Sequim Bay combined continues to be low compared to the 1980s.<sup>7</sup>

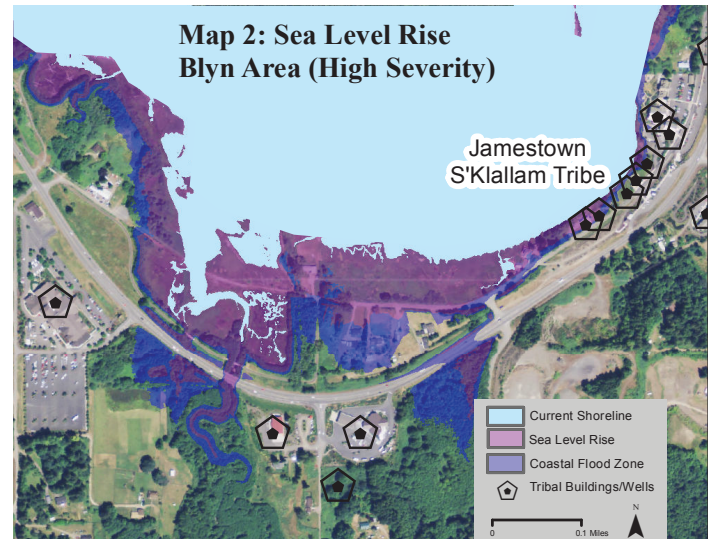
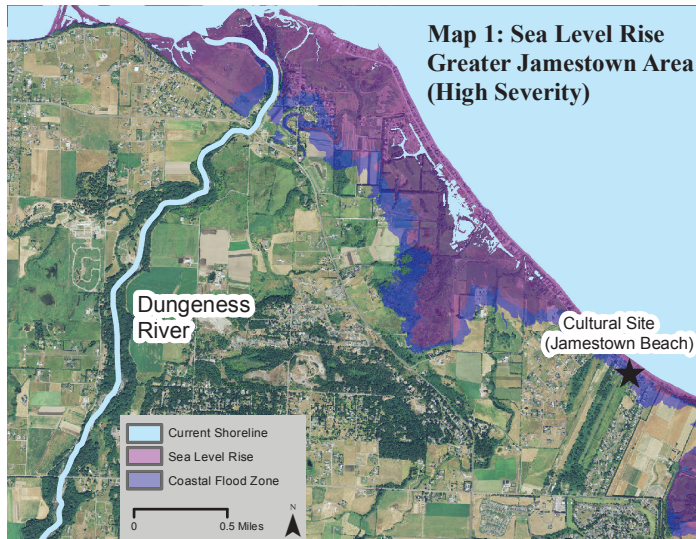
**Figure 2: WDFW Herring Status<sup>8</sup>**

Year	Discovery Bay	Sequim Bay
1994	Critical	unknown
1996	Depressed	Healthy
1998	Critical	Healthy
2000	Critical	Healthy
2002	Critical	Moderately Healthy
2004	Critical	Depressed
2006	Critical	Depressed
2008	Critical	Depressed
2010	Critical	Depressed
2012	Critical	Moderately Healthy

Data Sources: Carman et al. 2015,<sup>9</sup> NAIP 2011,<sup>10</sup> SSHIP 2004,<sup>11</sup> WDFW 2010<sup>12</sup>

# Vulnerability Assessment and Climate Change Adaptation Preparation

The Jamestown S'Klallam Tribe has prepared a climate adaptation plan to assess vulnerabilities and reduce negative impacts, if possible. Sea level rise models show potential damage and vulnerability to critical beaches, tribal infrastructure, main roads and emergency services.



The Jamestown S'Klallam Tribe is on the forefront of addressing tribal vulnerabilities and initiating preparation for climate change. As one of the first tribes in western Washington to complete a climate adaptation plan and vulnerability assessment, they have identified and prioritized areas where the changing climate conditions (i.e., changing precipitation patterns, sea level rise, ocean acidification) will leave their resources, infrastructure, economy and health most vulnerable.<sup>1</sup>

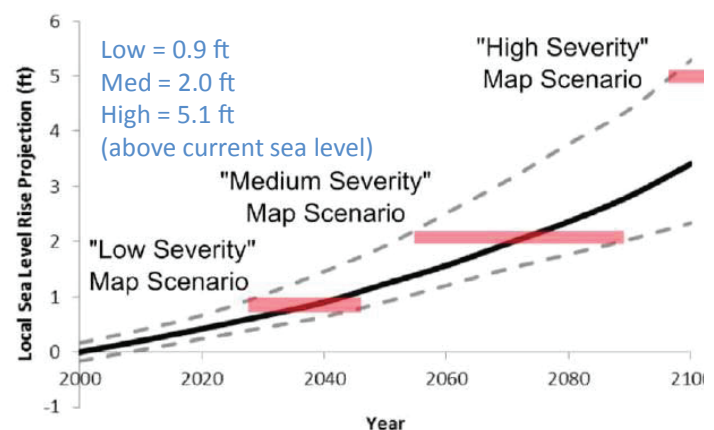
Climate vulnerability depends largely on climate exposure, sensitivity, and adaptive capacity.<sup>2</sup> Vulnerability rankings were determined through an interactive process with Tribal elders, citizens and government. For example, salmon provide the foundation for almost all aspects of tribal cultural life and also serve as economic and nutritional resources for the Tribe. Salmon will be impacted by the change in timing and amount of winter rains and flooding, scouring of egg redds (nests) during high flows, thermal stress

from higher water temperature and less water, and therefore habitat availability in the summer. Oysters and clams also are highly vulnerable under expected conditions and are a very high priority for the Tribe. Some of the potential impacts to shellfish include higher water temperatures and ocean acidification. Additional impacts to the Tribe include increased occurrence of shellfish poisoning associated with harmful algal blooms (which warmer conditions may favor), diminished health and wellness of Tribal citizens, economic loss, and flooding of tribal buildings, sacred historical places and infrastructure.<sup>3</sup> The maps above show flood conditions with a sea level rise model under the highest severity scenario (Figure 1).<sup>4</sup> They show the potential inundation of a vital water source, closed roads, an important cultural site at Jamestown Beach (Map 1) and buildings on the tribal campus in Blyn (Map 2) where flood risk is projected to increase by the end of the century.<sup>5</sup>



Ocean acidification (decrease in ocean pH) will cause waters to become "corrosive to shell-forming organisms such as oyster larvae, clams, mussels and crabs," posing some serious threats to the shellfish in the Strait of Juan de Fuca.<sup>7</sup> Pictured are the pteropod shells dissolving because of decreasing ocean pH.<sup>8</sup>

**Figure 1: Sea Level Rise Projections, Sequim Region**



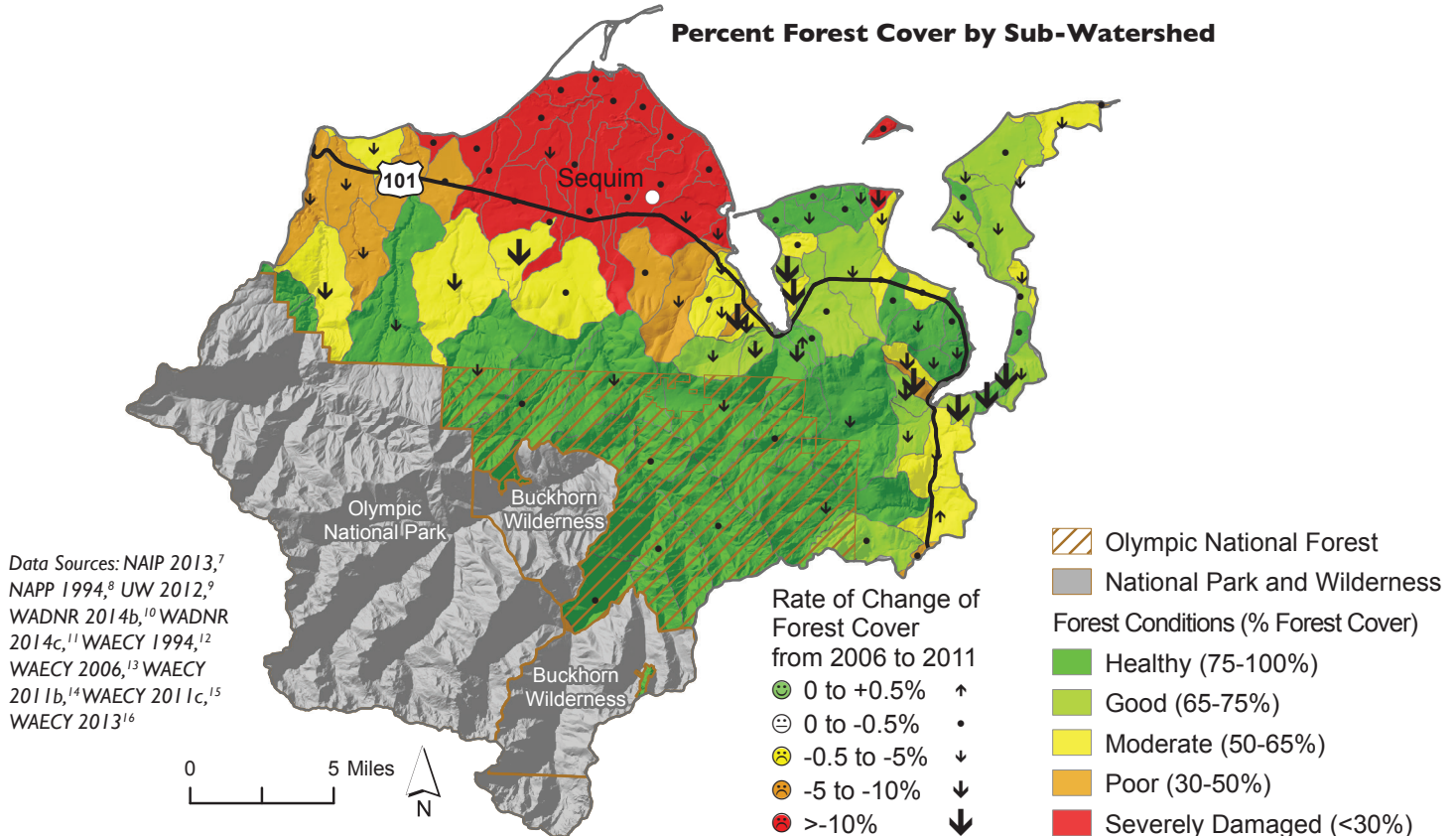
Graph of sea level rise scenarios. This figure was extracted from the Jamestown Climate Vulnerability Assessment and Adaptation Plan.<sup>9</sup>



# Forested Land Cover Critical for Watershed Health

Land with good to healthy amounts of forest cover is decreasing in the Focus Area outside Olympic National Park and Buckhorn Wilderness. Of the 99 sub-watersheds, those with moderate, poor or severely damaged amounts of forest cover increased from 50 sub-watersheds in 2006 to 53 sub-watersheds in 2011. Sixty-five sub-watersheds had an overall loss of forest cover from 2006 to 2011.

**Percent Forest Cover by Sub-Watershed**

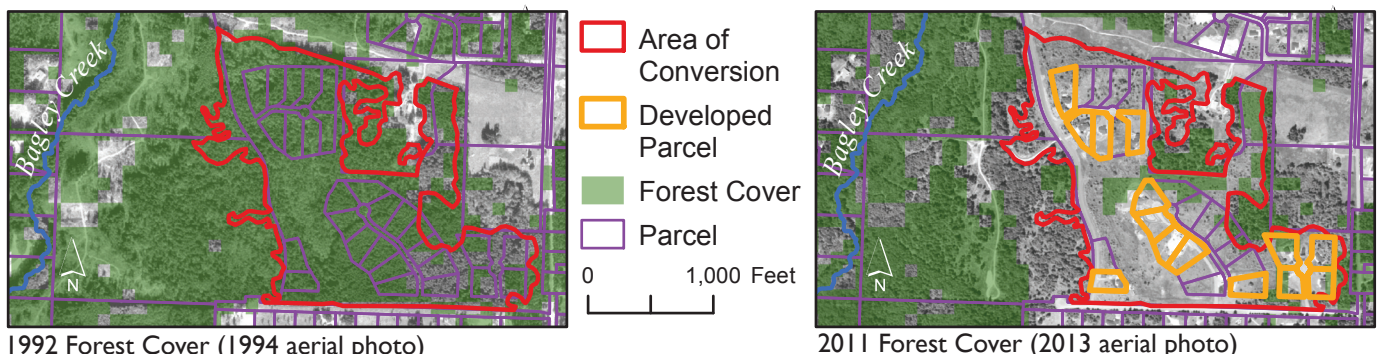


Forested land cover is a vital component of healthy stream ecosystems at both the watershed and riparian corridor scales.<sup>1</sup> The Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan states that the “removal and modification of native riparian forests increases water temperatures, reduces stability of floodplain landforms and reduces large woody debris recruitment to stream channels.”<sup>2</sup>

Loss of forest cover degrades aquatic ecosystems even when the level of impervious surface is low.<sup>3</sup> The threshold for minimal to severe stream degradation is 65% forest cover;<sup>4</sup> however, any level of disturbance has an impact on stream ecology.<sup>5</sup> Restoring forest cover through vegetation planting in riparian and adjacent areas is vital to salmon habitat restoration efforts in the Dungeness River.<sup>6</sup> While some forest cov-

er is regained through plantings in working forests, much more is lost as forestland is converted and developed. Outside of the Olympic National Park and Buckhorn Wilderness, forest cover decreased in 65 sub-watersheds, resulting in a loss of over 5% forest cover in 16 sub-watersheds and an overall loss of 2% (over 2,600 acres) of forest cover from 2006 to 2011.

## Land Conversions Result in Loss of Working Forests

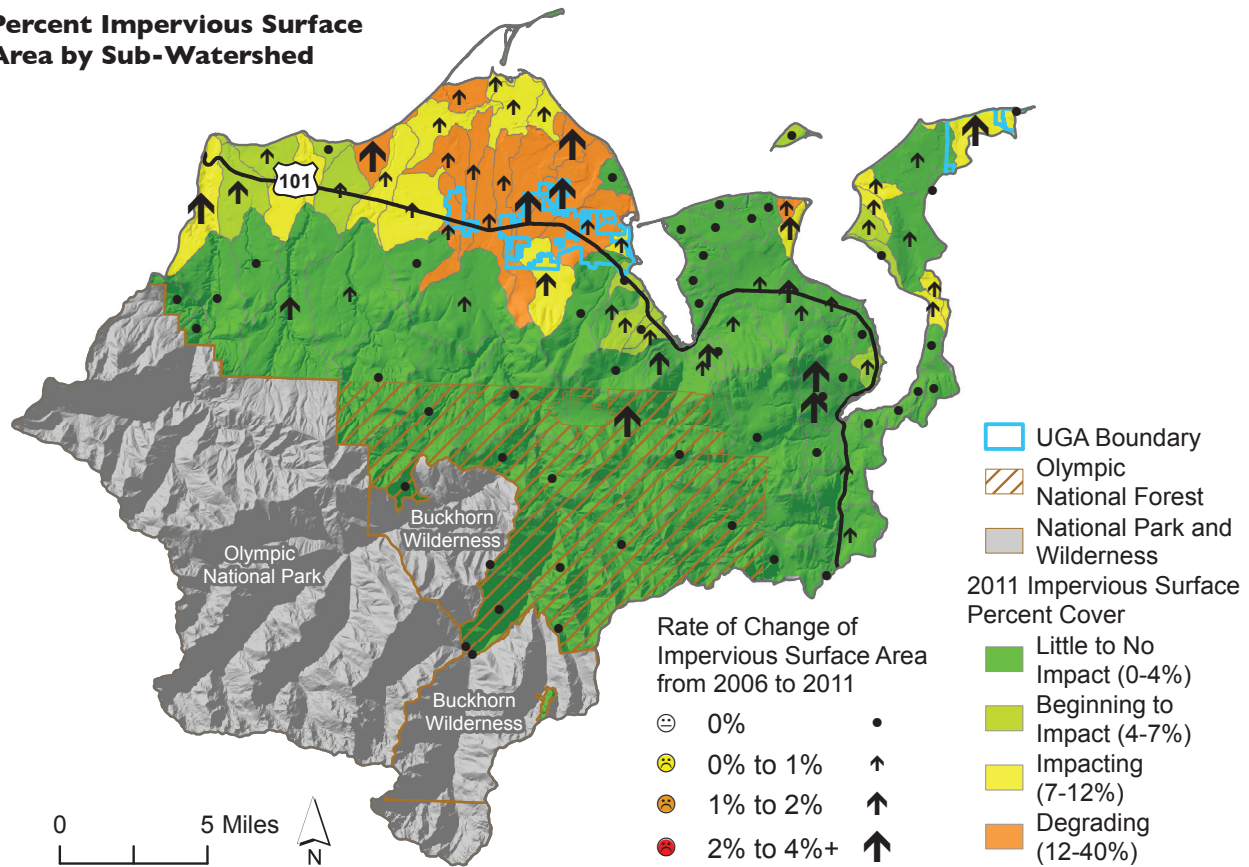


Seventy acres of forested land cover was removed by two permitted Forest Practice Application activities between 1999 and 2007 at this site near Bagley Creek. Fourteen new homes were built on the converted land between 2007 and 2014, with room for 14 additional homes.

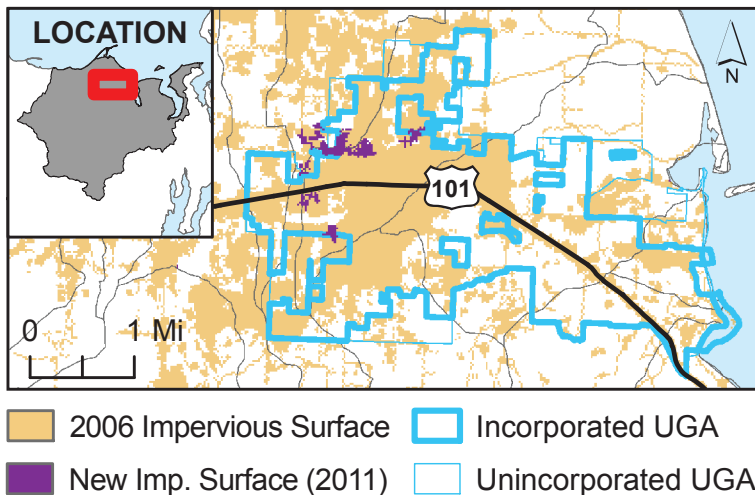
# Impervious Surface Negatively Impacts Water Quality

Impervious surface area increased by 1% across the Focus Area from 2006 to 2011. Nine of the 99 sub-watersheds within the Focus Area had increases of 2% to 4% impervious surface area, primarily in Urban Growth Areas (UGAs). Twelve sub-watersheds have degrading watershed health (12-40% impervious surface area).

**Percent Impervious Surface Area by Sub-Watershed**



**Impervious Surface Area in Sequim UGA**

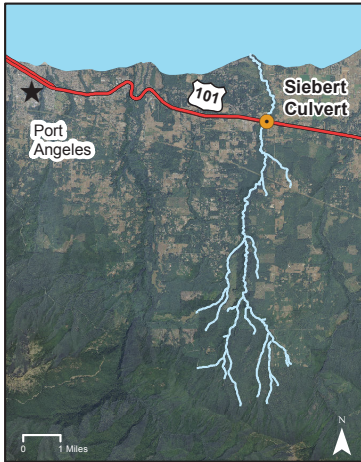


High population densities lead to large amounts of impervious surfaces, negatively impacting the local watersheds and resulting in loss of salmon habitat. The Sequim-Dungeness area is predominantly rural, but any level of human disturbance impacts watershed processes. Impervious surface area is well documented as a coarse measure of human impact on watershed scale hydrology and biology.<sup>1,2,3</sup> Impervious surface area causes increases in stream temperatures, decreases in stream biodiversity, and contributes to pollutants in stormwater runoff, which can contaminate local aquatic systems.<sup>4</sup> The Hood Canal and Strait of Juan de Fuca Summer Chum Recovery Plan describes thresholds of 10% impervious surface area in a watershed at which sensitive stream habitat elements are lost, while 25% to 30% impervious surface area results in poor water quality.<sup>5</sup> Watershed health is beginning to be impacted by impervious surface in 13 sub-watersheds within the Focus Area, is impacted already in 16, and degraded in 12. Each watershed has a different reaction to a given amount of impervious surface area: thresholds serve only to generalize the continuum of degradation that accrues as impervious surface area increases and forest cover is lost.<sup>6</sup> Impervious surface increased by only 1% between 2006 and 2011 in the Focus Area, however nine sub-watersheds had increases of 2-4%. Over two-thirds of the new areas of impervious surface occurred in UGAs – 55% in the Sequim UGA alone.



# Siebert Creek Culvert: A Fish-Passage Barrier

The Jamestown S'Klallam Tribe, as a co-manager of its shared natural resources with Washington state and steward of healthy fish habitat, is concerned about the timely removal of a fish passage barrier on State Highway 101. This barrier is a culvert that blocks over 33 miles of habitat of Siebert Creek, which provides home for ESA-listed steelhead and coho, and may provide habitat for fall chum and chinook.



Judge Boldt's 1974 ruling in *U.S. v. Washington* (the Boldt decision), upheld the tribal treaty right entitling the treaty tribes of Washington, including the Jamestown S'Klallam Tribe, to half of all harvestable salmon in their Usual and Accustomed treaty fishing areas.<sup>1</sup> More recently, in 2013 *U.S. et al v. State of Washington* (culvert case), the state was ordered to provide fish passage at culverts owned or managed by Washington State Department of Transportation.<sup>2</sup> As a result of this case, Washington state was ordered to fix fish-blocking culverts. Ranked as number 26 on the list, the Siebert Creek/Highway 101 culvert is scheduled for design and repair should funding become available.<sup>3</sup> For the Jamestown S'Klallam Tribe, the Siebert Creek estuary is characterized as prime salmonid habitat and is known as one of the best examples of a functioning, bar-bound estuary in the state of Washington.<sup>4</sup>

This nearshore habitat contains high-quality kelp and eelgrass and provides critical rearing and feeding areas for juvenile salmonids and a diverse assemblage of waterfowl. It also may provide foraging, refuge and rearing habitat for ESA-listed chum and chinook salmon juveniles from the Dungeness River during their seaward migration and is identified as foraging, migration and overwintering habitat for bull trout.<sup>5</sup> The stream historically had fall chum,<sup>6</sup> but currently has healthy habitat for winter steelhead and coho.<sup>7</sup> The Highway 101 box culvert hinders and prevents upstream movement of adults and is a barrier to juveniles going downstream during summer low flows. At times, vertical drops of several feet have been observed at this fishway outlet and the

downstream is devoid of pools.<sup>8</sup> Should this barrier be removed, there will be 34 miles of lineal habitat gained, 25 acres of spawning area gained, and 30 acres of rearing habitat gained.<sup>9</sup> In 2004, this culvert was recommended to be replaced with a bridge, supported by the WRIA 18 Watershed Plan, WDFW and the limiting factors analysis,<sup>10</sup> but has yet to be repaired. Although this culvert was initially anticipated to be replaced by 2020, the timeline has been shifted to a later date. Confounding factors indicate that cost and other obstacles will move the start date even later and possibly prevent the completion of this very important, but expensive project.

## A. Siebert Creek Estuary<sup>11</sup>



## B. Siebert Creek Culvert at Highway 101<sup>12</sup>



Jamestown S'Klallam Tribe (2)

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