



Western Washington University
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Salish Sea Ecosystem Conference

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Comparison of Bull Kelp coverage survey methods over time in the San Juan Archipelago

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Woodard, Todd and Palmer-McGee, Casey, "Comparison of Bull Kelp coverage survey methods over time in the San Juan Archipelago" (2018). *Salish Sea Ecosystem Conference*. 486.
<https://cedar.wvu.edu/ssec/2018ssec/allsessions/486>

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Kelp Monitoring In Samish Traditional Territory

The background of the slide features a large, stylized, and semi-transparent image of a traditional Samish Indian Totem Pole. The pole is circular and contains several distinct figures, including a bear at the top, a human figure in the middle, and a fish at the bottom. The colors are muted, blending with the dark blue background.

Comparison of Bull Kelp coverage survey methods over time in the San Juan Archipelago

Todd Woodard, Director of Natural Resources
Samish Indian Nation
Lengtíxw tse Schténgexqen Á7leng
House of Watching Over All the Territory

Samish Indian Nation Traditional Territory



Samish Tradition

- S7a'mesh - "The Giving People"
- A people with hundreds of generations of history
- A deep connection to the Salish Sea and its abundant natural resources
- Rich in chela'ngen (culture) with traditions that continue to this day
- "When the Tide is Out, the Table is Set"
- 7 Generation thinking



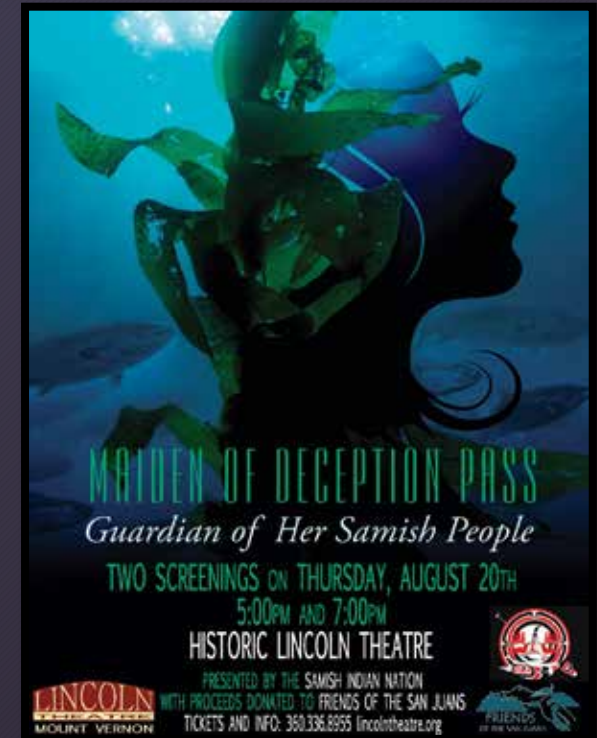
Importance of Bull Kelp to the Ecosystem and to the Culture



- Becoming integral part of the Rockfish Recovery Plan
- Among the most productive ecosystems in the world
- Provides nursery and forage habitat for a wide range of species
- Slows currents and provides wave attenuation



- Used to wrap salmon in for traditional cooking
- Bulbs used to store/transport eulachon oil
- Bulbs used to make rattles
- Featured in Samish Traditional Stories



2004-2006 Baseline Survey-Friends of the San Juans

- Image classification of San Juan County based on low tide color infrared aerial photography used to conduct an automated pixel scale classification.
- Friends of the San Juans added 10 foot buffer around the pixel classification to smooth out the lines and account for subsurface kelp not detected in the image classification

2004-2006 Baseline Map



Samish 2017-Digitizing Kelp

- Amazing 2016 imagery-no image classification needed
- Hand digitized areas of kelp-Student volunteer help
- Elected not to add 10 foot buffer due to clarity of photo



2017 Hand Delineated Kelp Map



Adding Traditional Ecological Knowledge

- Tribal Fishermen with a lifetime of experience produce a hand drawn chart
- Two individuals with nearly 100 years of combined Traditional Ecological Knowledge of the waters around the San Juan Archipelago

TEK Map



Different Methods Pose Certain Levels of Uncertainty



- Sea state and shadows can obscure kelp
- Different delineators can have different interpretations

- Flights may not have been taken at the same tide/time of year

- Elected not to add the 10foot buffer as we felt we were more accurately depicting the bed without it

Results Map

- Hand delineation was just completed the week of March 19th
- The following is very preliminary analysis and comparisons




A Closer Look 1-Stuart Island

- 2004-'06-
101.04 acres of kelp
- 2017-
51.62 acres of kelp
- 49.42 acre LOSS
- Approximately a 49%
loss in 10 years



 2007 Only (loss)

 2017 Only (gain)

 Both 2007 and 2017
(maintained)

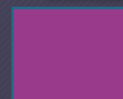
A Closer Look 2-Patos Island

- 2004-'06-
15.86 acres of Kelp
- 2017-
3.6 acres of kelp
- 12.26 acre LOSS
- Approximately a
77.3% loss in 10
years

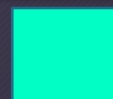


A Closer Look 3- Lopez Island

- 2004-'06-
222.29 acres of kelp
- 2017-
138.96 acres of kelp
- 83.33 acre LOSS
- Approximately a
37.5% loss in 10
years



2007 Only (loss)



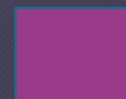
2017 Only (gain)



Both 2007 and 2017
(maintained)

A Closer Look 4- San Juan Island

- 2004-'06-
236.82 acres of kelp
(all of San Juan Is.)
- 2017-
208.08 acres of kelp
(all of San Juan Is.)
- 28.74 acre Loss
- Approximately a
12.14% Loss in 10
years



2007 Only (loss)



2017 Only (gain)



Both 2007 and 2017
(maintained)

Overall Comparisons

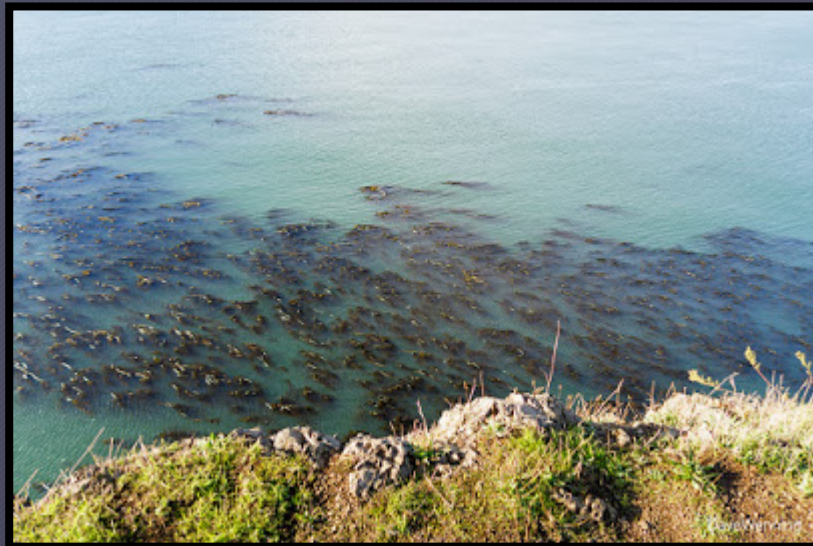
- Details San Juan Archipelago wide
- 2004-'06- 845.56 acres of kelp
- 2017- 539.62 acres of kelp
- 305.83 acre LOSS
- Approximately a 36.17% loss overall

- Local Stories may be far more compelling though




Next Steps

- Repeatable Methods going forward
- Ground truthing and more discussion on best way to compare data
- Identification of potential Restoration sites
- Measurements such as bed width etc?



Questions?



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