

# ISLAND COUNTY'S BULL KELP PROJECT:

## Year 3 Update

Linda Rhodes  
Island County Marine Resources Committee



MRC meeting  
2 January 2018

# ACKNOWLEDGMENTS!

## VOLUNTEERS

### 2015

Vernon Brisley  
Lenny Corin  
Leal Dickson  
Linda Kast  
Don Meehan  
Debra Paros

### 2016

Barbara Bennett  
Vernon Brisley  
Barbara Brock  
Paulette Brunner  
Debra Paros  
Gregg Ridder

### 2017

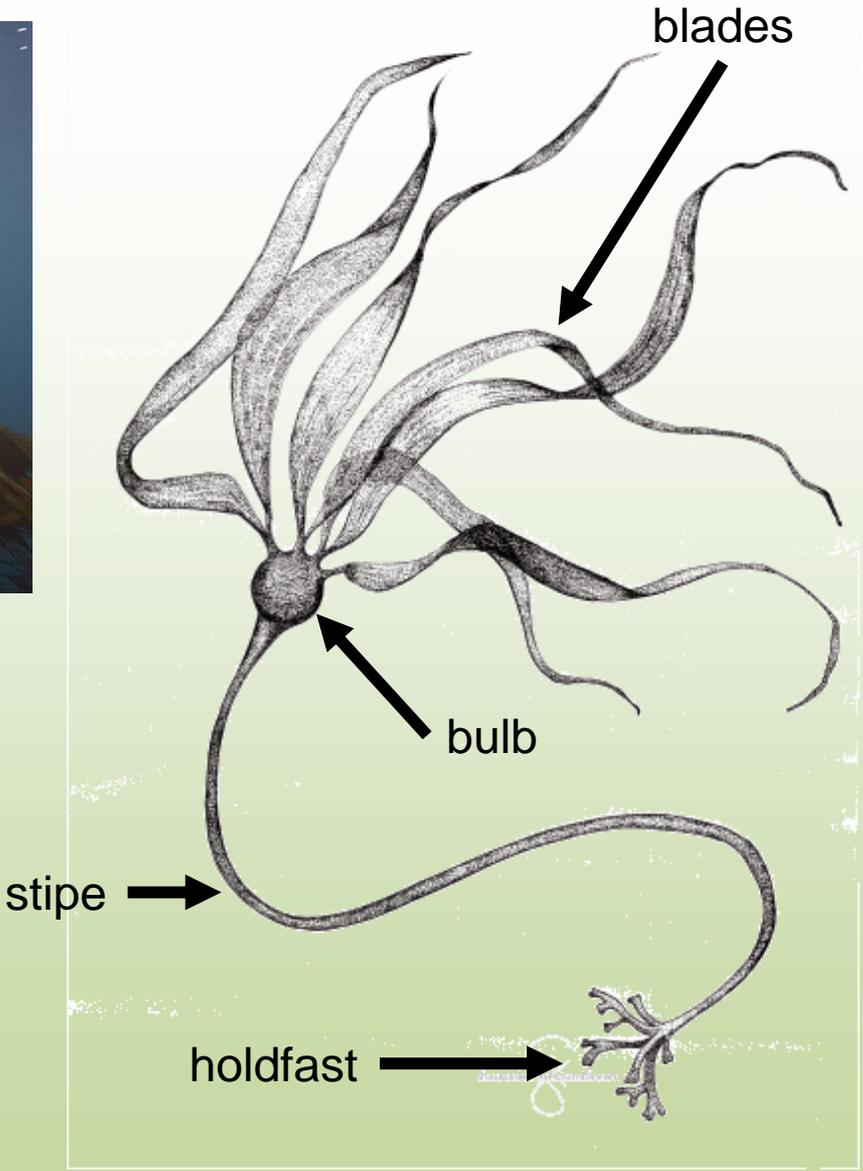
Vernon Brisley  
Barbara Brock  
Paulette Brunner  
Debra Paros  
Gregg Ridder

## EQUIPMENT & FUNDING

NW Straits Commission  
NW Straits Foundation



<http://www.montereybayaquarium.org/-/m/images/animal-guide/plants/bull-kelp.jpg?bc=white&h=565&mh=738&mw=1312&w=1000&usecustomfunctions=1&cropx=0&copy=56>



# WHY BULL KELP?



## STRUCTURAL HABITAT

- Shelter for invertebrates, juvenile fish, adult fish
- Critical Habitat under the GMA & Shoreline Master Programs

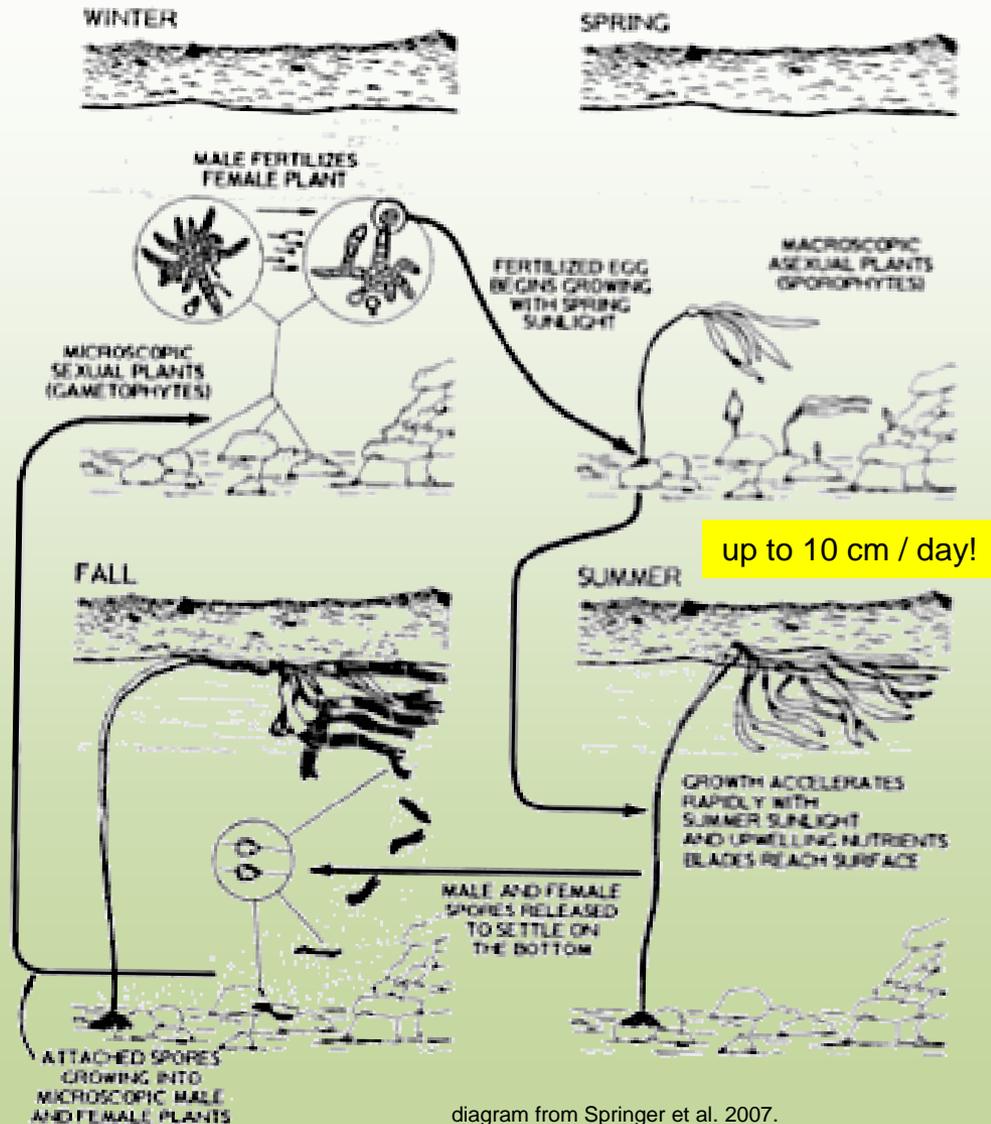
## FOOD WEB

- Grazing by invertebrates
- Biomass export to other habitats

## WATER QUALITY

- uptake of inorganic nutrients
- uptake of  $\text{CO}_2$  & production of  $\text{O}_2$

# LIFE CYCLE



- Annual plant
- Can overwinter for a 2<sup>nd</sup> year
- Microscopic sexual phase
- Macroscopic asexual phase



diagram from Springer et al. 2007.  
[http://www.lenfestocean.org/~media/legacy/lenfest/pdfs/springer\\_underlying\\_report\\_0.pdf?la=en](http://www.lenfestocean.org/~media/legacy/lenfest/pdfs/springer_underlying_report_0.pdf?la=en)

photo from  
<http://blogs.evergreen.edu/bullkelp/files/2012/12/Sorus-Day.jpg>

# FACTORS AFFECTING DISTRIBUTION

## Light

photoperiod x intensity

## Disease

*Streblonema*, parasitic alga

## Temperature

3 – 17°C

## Competition

algae, epiphytes



## Nutrients

$\text{NO}_3$ ,  $\text{NH}_4$ ,  $\text{PO}_4$

## Herbivores

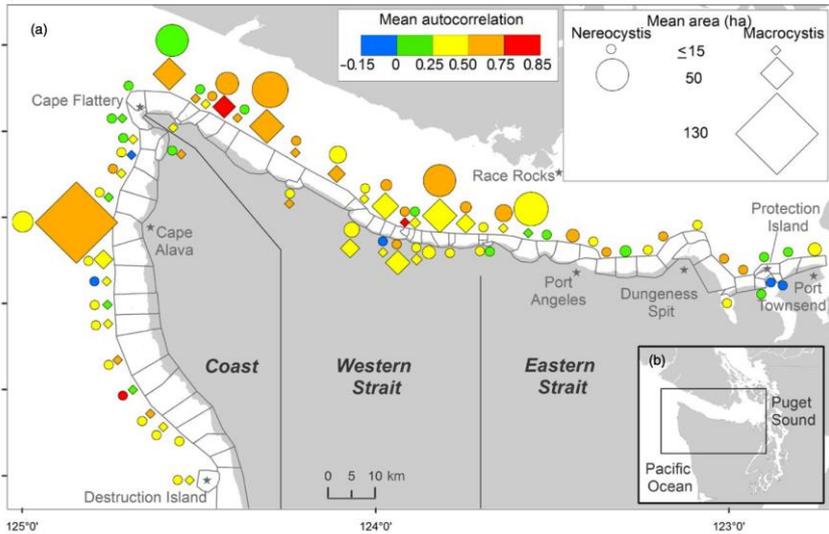
urchins, mollusks, crustaceans

## Wave action

dissolved gases, disruption

# WASHINGTON

WA Dept. of Natural Resources



## The dynamics of Kelp Forests in the Northeast Pacific Ocean and the relationship with environmental drivers

Pfister et al. 2017. J.Ecology 2017: 1-14

## NW Straits Commission

**Northwest Straits Commission**  
partners in marine conservation

ABOUT US | OUR WORK | GET INVOLVED | RESOURCE LIBRARY

**KELP PROTECTION AND RECOVERY**

Lucas Hart  
Marine Program Manager  
hmart@nwstraits.org  
360-385-1153

**KELP PROTECTION AND RECOVERY**

**OVERVIEW**  
The large brown algae commonly known as 'kelp' provide habitat to a variety of species in Puget Sound, and are considered critical habitat warranting protection. Kelp, like eelgrass, provides food, shade, and other valuable ecosystem services. Conspecific declines in the abundance of bull kelp (*Nereocystis luetkeana*), the most common canopy-forming species in Puget Sound, have been observed in many areas. The cause is likely a number of factors, including stormwater impacts, sedimentation, and competitive interactions. Little information on abundance, or changes over time, is available in the Northwest Straits region. And much remains unknown about the understory kelp species.

## Island County Marine Resources Comm.

**ISLAND COUNTY MARINE RESOURCES COMMITTEE**

HOME | PROJECTS | MEETINGS & EVENTS | RESOURCES | ABOUT US

**BULL KELP MONITORING**

**BULL KELP MONITORING**  
Marine Species & Habitats | Marine Species

Floating bull kelp (*Nereocystis luetkeana*) is important habitat for marine invertebrates, such as pinto abalone, and marine fishes, including forage fish and the endangered rockfish bocaccio (*Sebastes paucispinus*). However, the distribution and area of bull kelp beds in Puget Sound is not regularly monitored, so changes in abundance of this critical habitat would be poorly documented.

# 2017 MRC Boat-based Survey

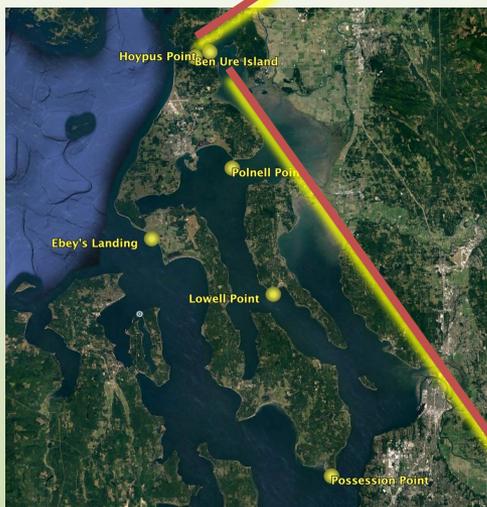
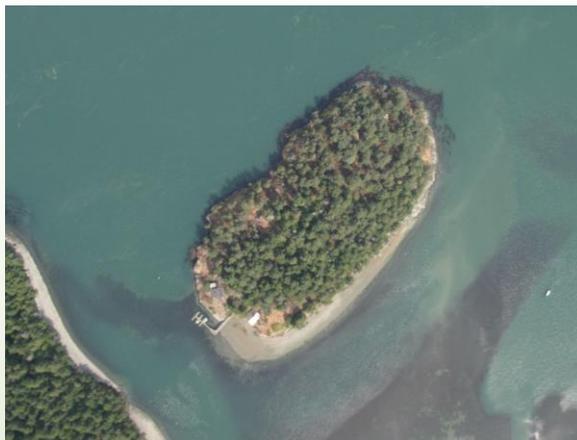


**Marine-  
influence**

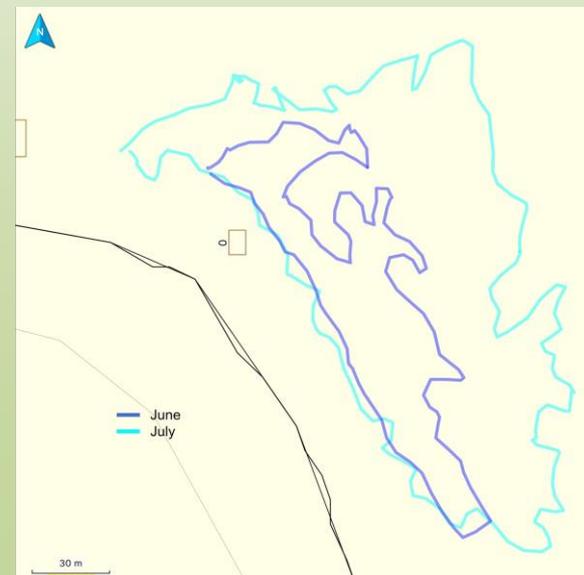
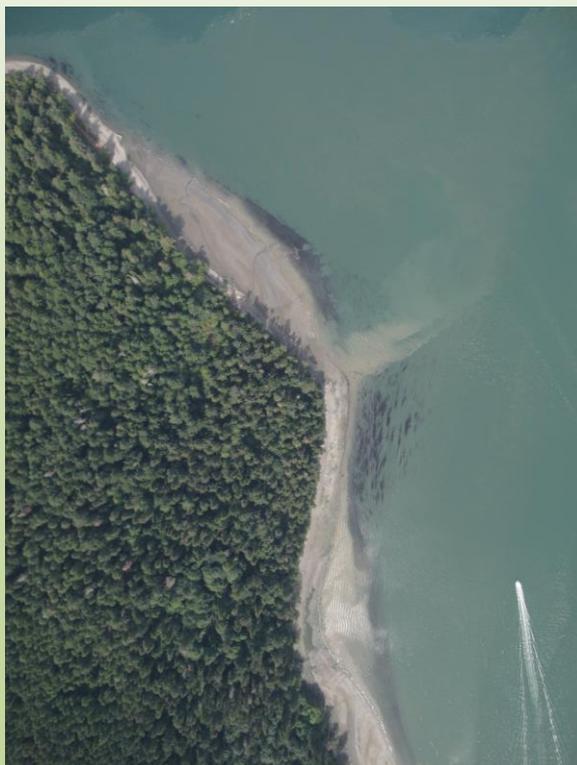
**River-  
influence**

# 2017 MRC Boat-based Survey

**Ben Ure Island**

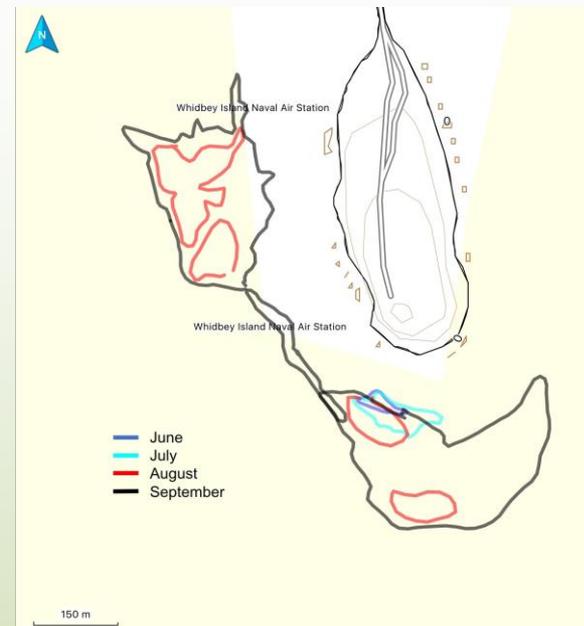
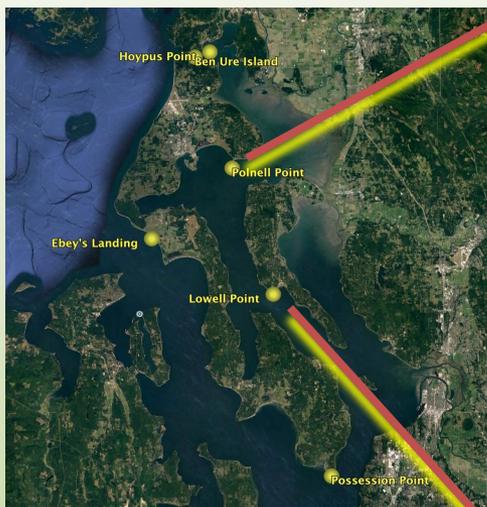


**Hoypus Point**



# 2017 MRC Boat-based Survey

## Polnell Point

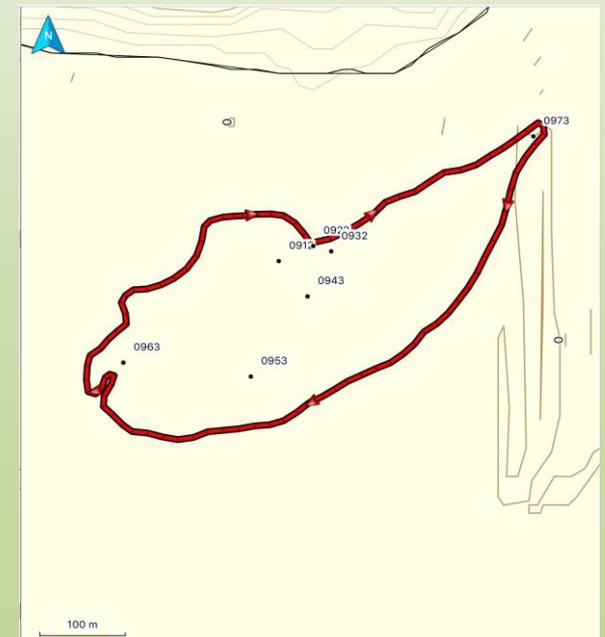
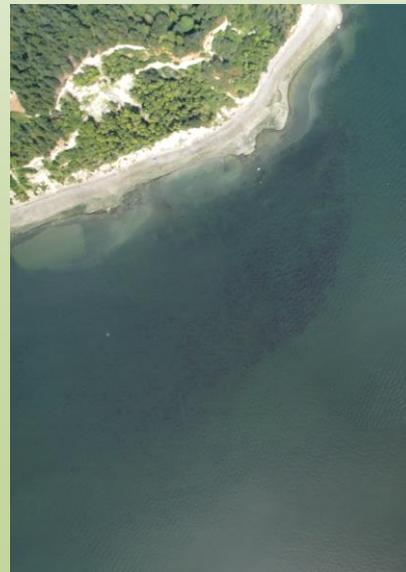
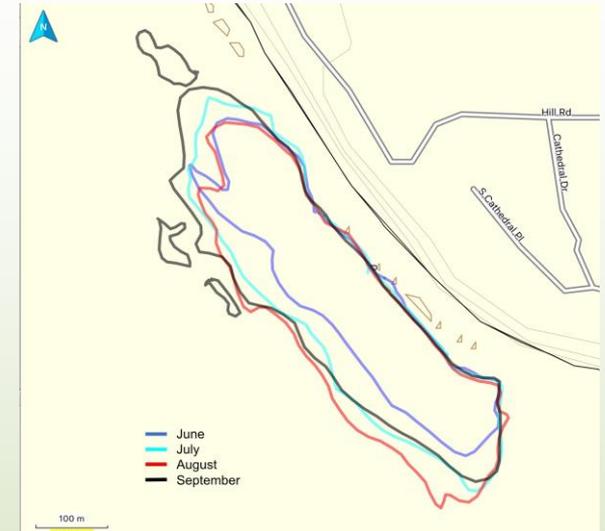
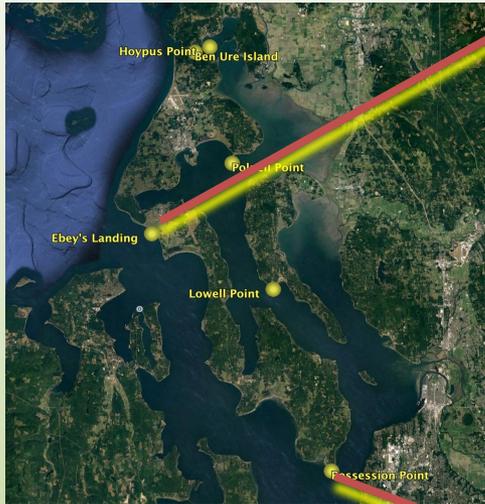


## Lowell Point



# 2017 MRC Boat-based Survey

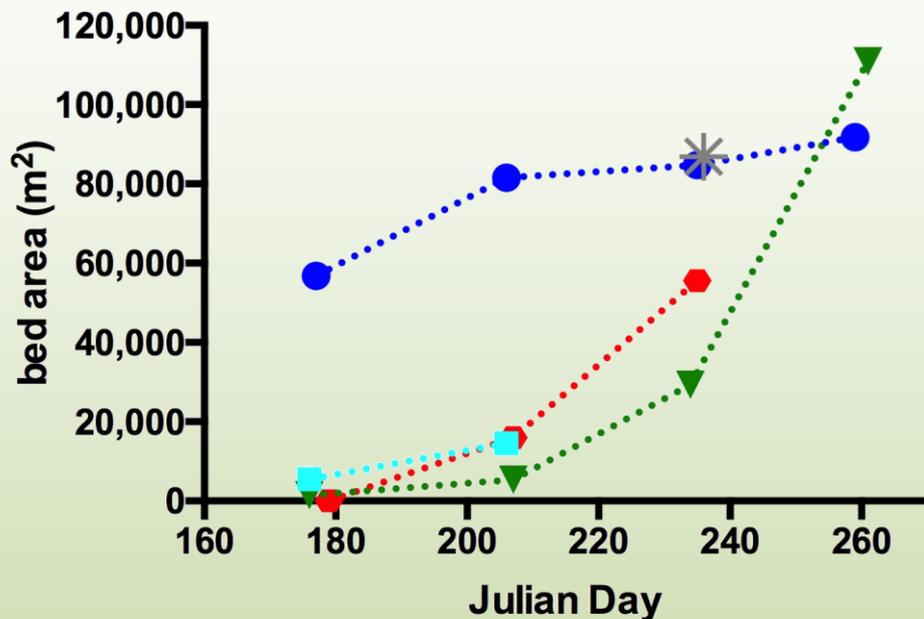
## Ebey's Landing



## Possession Point

# 2017 MRC Boat-based Survey

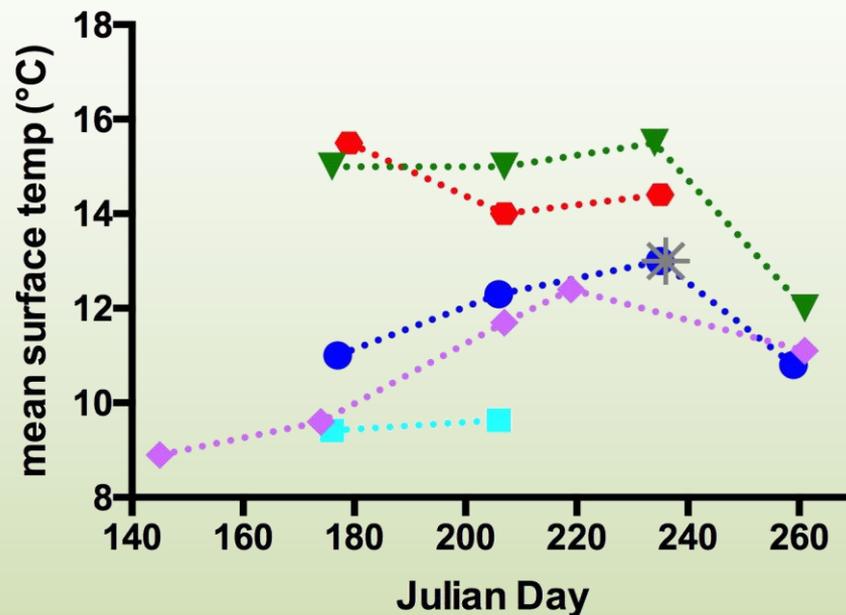
## 2017 Bed Areas



- Ebey's Landing
- Hoypus Point
- ▼ Polnell Point
- ◆ Lowell Point
- \* Possession Point

Difference in monthly growth dynamics

## 2017 Surface Temperatures

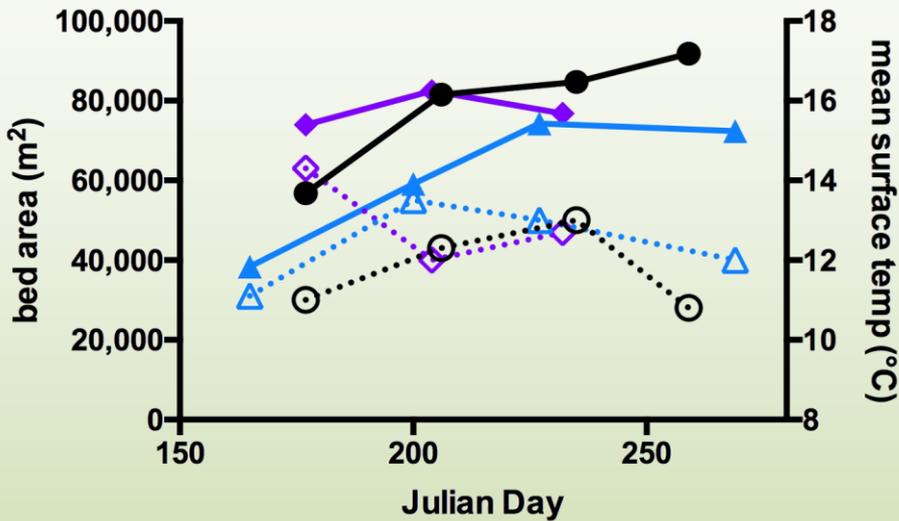


- Ebey's Landing
- Hoypus 2017
- ◆ Ben Ure 2017
- ◆ Lowell Point
- ▼ Polnell Point
- \* Possession Point

Difference in early season surface temperatures

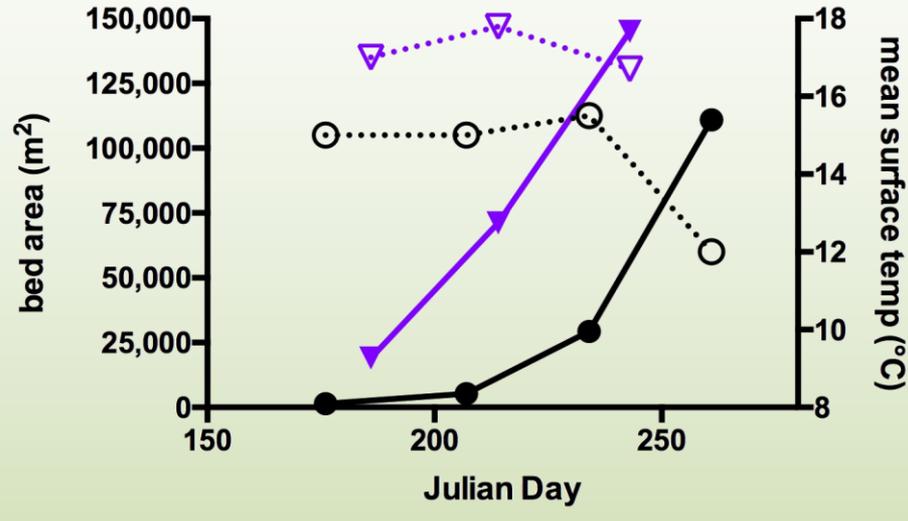
# 2017 MRC Boat-based Survey

## Ebey's Landing



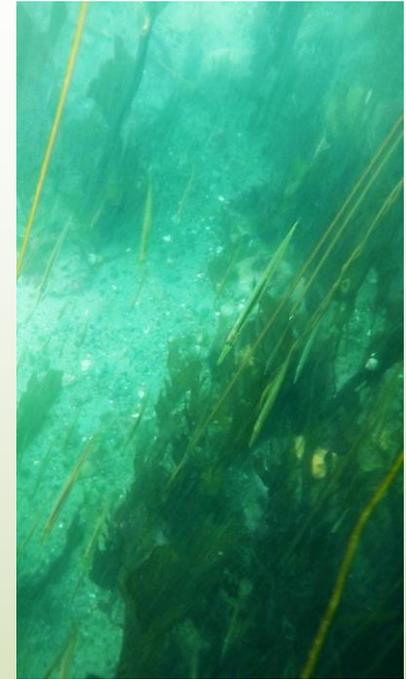
Areas larger in 2016 & 2017  
 Temperatures similar all years

## Polnell Point



Areas larger in 2016  
 Temperatures higher in 2016  
 Similar growth patterns

# Anecdotal Biological Observations

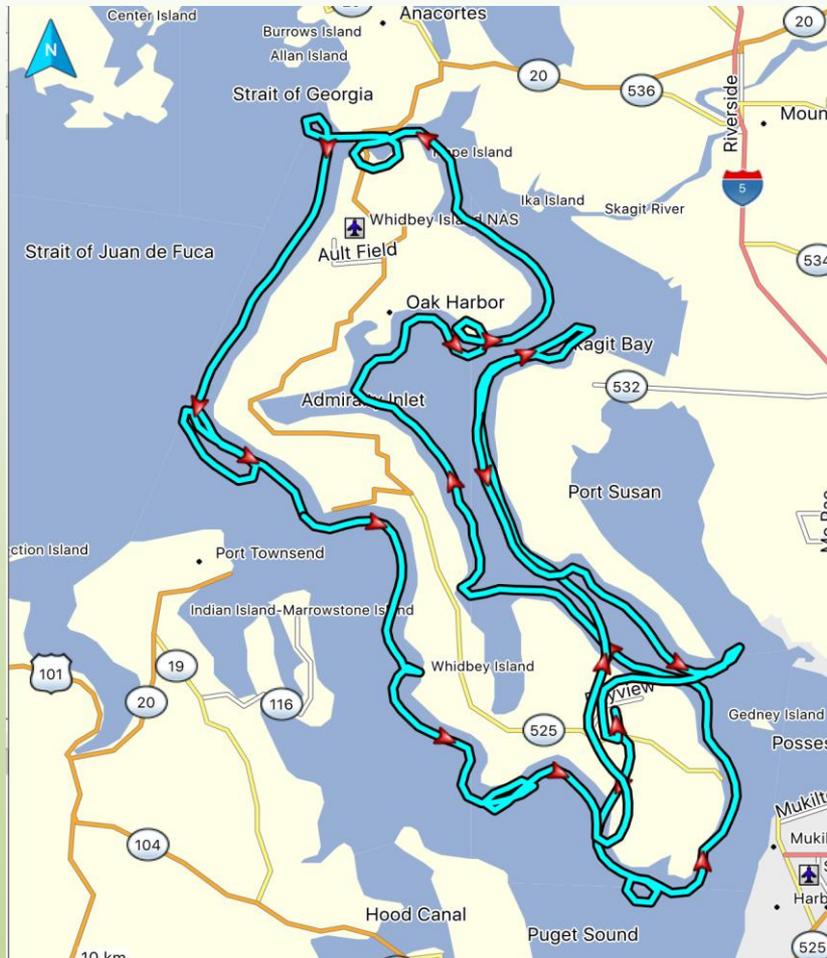


# New in 2017! Aerial Imaging for Kelp

(Gregg Ridder & Vernon Brisley)



# New in 2017! Aerial Imaging for Kelp



- Estimate amount of shoreline with associated bull kelp
- Identify potential beds for groundtruthing by boat
- Serve as baseline for future aerial surveys

# New in 2017! Aerial Imaging for Kelp

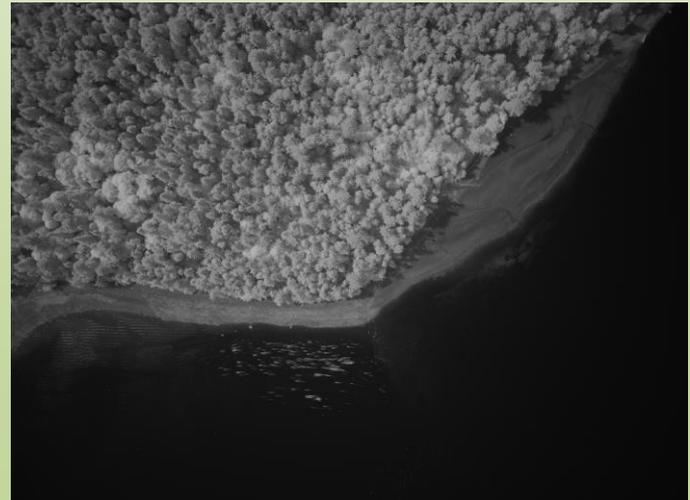
**Oblique**

**Orthogonal**

**Visible  
(RGB)**



**Infrared  
(NIR)**



# A Bust: Web-based Reporting

Island County 2017 Bull Kelp Location Survey  
Help identify where bull kelp is located along Island County's shoreline

Home About Contact



## HELP CAPTURE A 2017 "SNAPSHOT" OF BULL KELP LOCATIONS

May 7, 2017

In 2017, the project wants to capture a "snapshot" of bull kelp bed locations throughout Island County. With over 200 miles of shoreline in the County, your eyes from the beach or on the water are needed!

1. Confirm you know what bull kelp looks like by checking this page: "[Recognizing Bull Kelp](#)".
2. Review the simple data collection instructions on this page: "[Collecting Kelp Bed Data](#)". Observations can be made from the beach or from the water. The best (desired) data are GPS coordinates where a kelp bed begins and ends along the shoreline.
3. Report your observations on the short on-line reporting form: "[Bull Kelp Bed Location Report](#)".

We will publish a map in the fall showing the results of all the reports - & THANKS!

QUESTIONS RESPONSES 2

Section 1 of 2

### Bull Kelp Bed Location Report

We want to establish where bull kelp beds begin & end along Island County's shoreline.  
You can collect your observations from a boat or from the beach.  
The best navigation includes NAD 83 approximate (latitude & longitude) for the location.

Date of Observation \*

Month, day, year

Time of Observation \*

Time

How You Collected Data \*

from a boat

from the beach or shore

Other...

Kelp Bed Coordinates: Starting Latitude & Longitude (if no coordinates, enter 00.0000, 00.0000) \*

Short answer text

Kelp Bed Coordinates: Ending Latitude & Longitude (if no coordinates, enter 00.0000, 00.0000) \*

Short answer text

Short Description of Where You Collected Data (nearest landmark, e.g., park name, map feature)

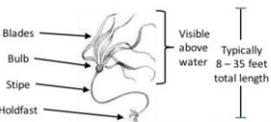
Short answer text

If you have observations or comments, please share them here.

Long answer text

- Article in Shore Stewards Newsletter (May-June 2017)
- Article in Sound Water Stewards Newsletter (June 2017)
- Advertised on MRC bull kelp project webpage

### RECOGNIZING BULL KELP



A bed from the water



Same bed from nearby bluff



And this is what it looks like on the beach.

### HOW TO COLLECT GPS COORDINATES

Coordinates can be collected from a boat or from land. Don't forget to record the time & date.

Starting coordinates:

- Position yourself & the end of the kelp bed in a perpendicular line to the shore (yes, this is subjective).
- Record these coordinates (latitude & longitude - any format).

Ending coordinates:

- Travel to the farthest end of the bed, & repeat the alignment for the starting coordinates.
- Record these coordinates (latitude & longitude - any format).



Starting coordinates

By land

Kelp bed

By boat

By land

Ending coordinates

By boat

**3 responses**

# 2017 Summary & 2018 Plans

- There are distinct differences in monthly bed growth between marine-influenced & river-influenced kelp beds.
- High water temperatures (&/or low salinity) may pose a future threat to beds river-influenced beds.
- In 2018, maintain boat-based surveys at current sites & to add at least 2 more sites (Camano Island, Possession Point)
- Groundtruth possible beds identified in aerial surveys
- Determine whether & how to conduct aerial surveys in the future

**THANK YOU!**

