# Movement Patterns and Habitat Use of Juvenile Sablefish in Southeast Alaska

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# Introduction

Sablefish (*Anoplopoma fimbria*)

- Per pound, one of the highest valued groundfish species
- Range from Bering Sea to Baja Peninsula; two populations
- Declining trend in relative abundance since 1988
- Abundant age-1 indicative of strong year class

# Problem Statement

Little known about early life history stages and use of nearshore environments:

I. Spawning occurs offshore in Feb-March and larvae drift to nearshore at end of summer

II. Settle in bays for one to two years

III. Return to deeper waters; typically recruit at age-4

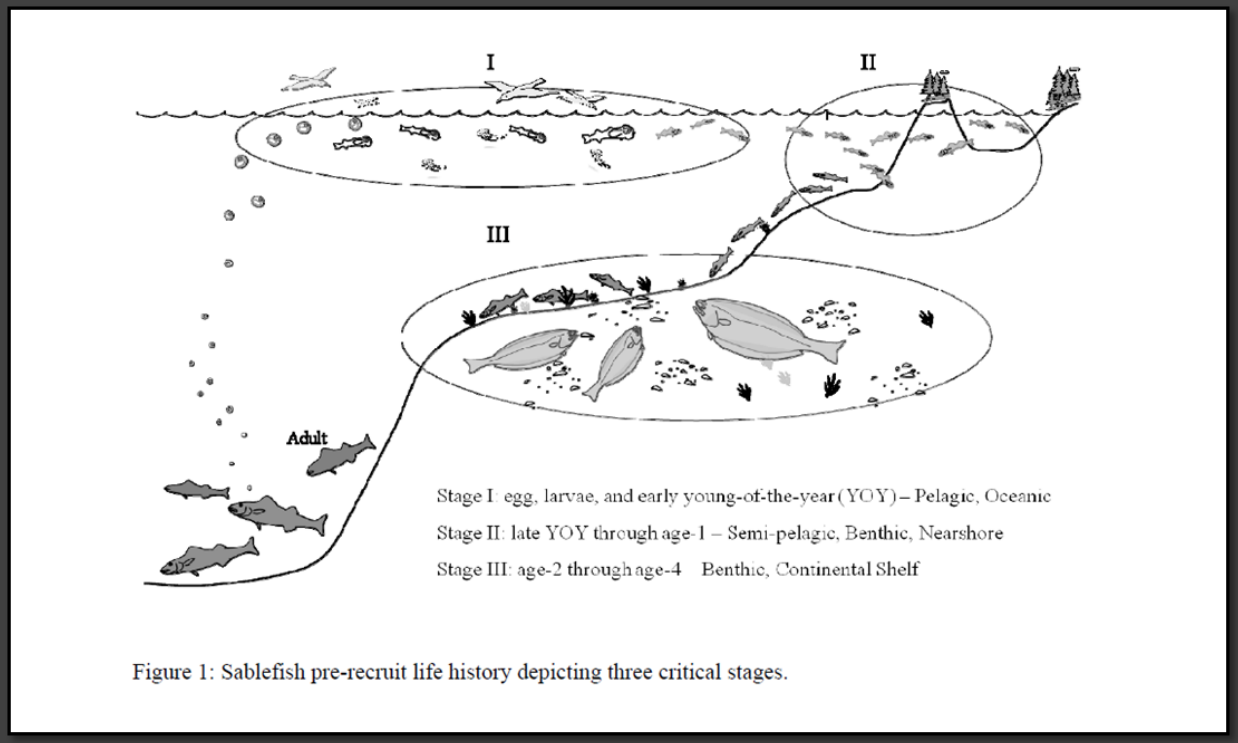


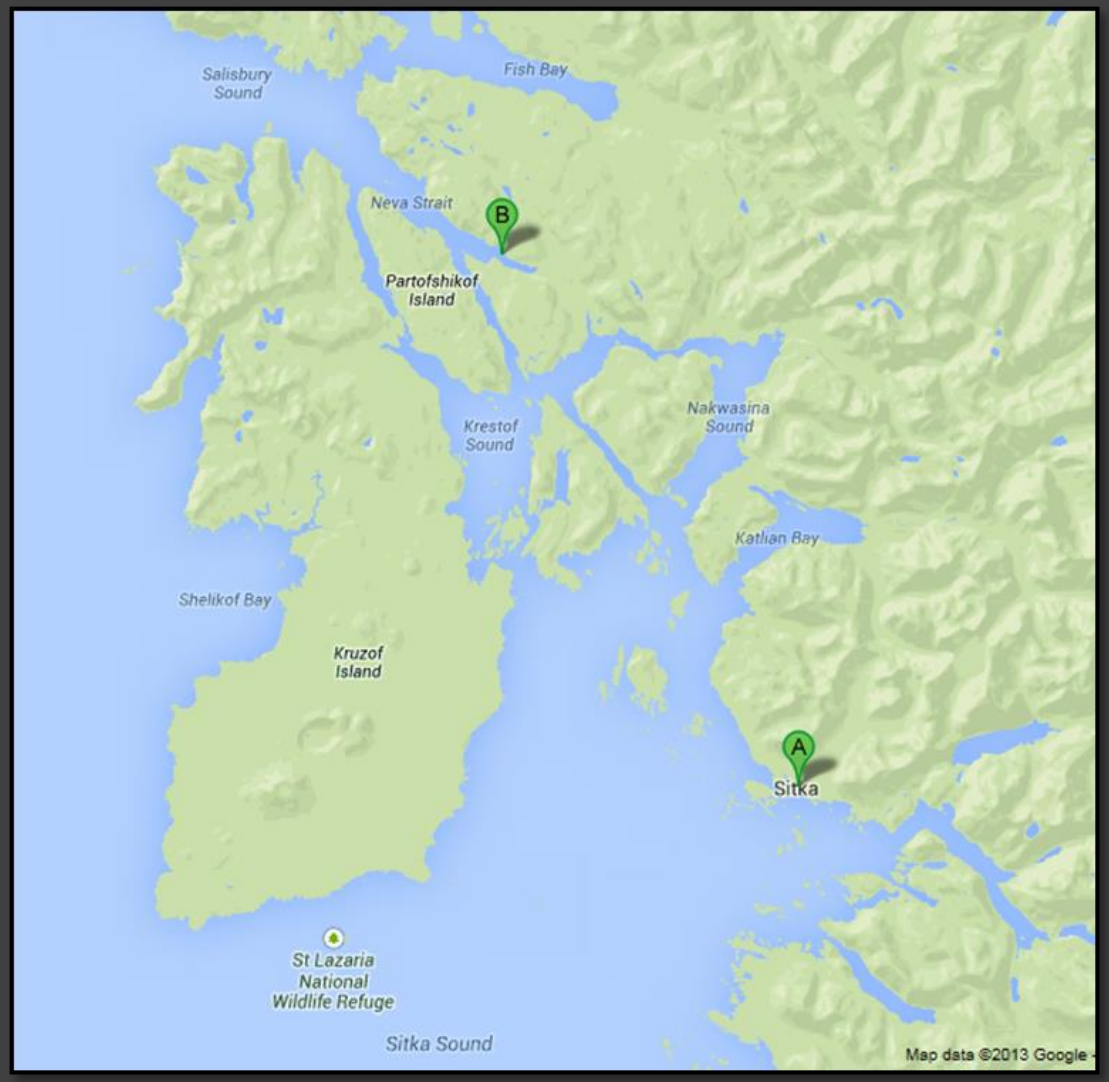

Figure 1: Sablefish pre-recruit life history depicting three critical stages.

(MESAPS 2010)

# Study Region

St. John Baptist Bay (SJBB)

- 20 miles north of Sitka
- Only consistent site where juvenile sablefish abundant
- No significant differences compared to other bays



# Goals

Use acoustic telemetry to gather continuous record of movements and habitat use:

1. Improve knowledge of early life history
2. Gain better understanding of importance of nursery grounds and habitat use
3. Provide important baseline data on fine-scale movements of juvenile sablefish in SJBB

# Objectives

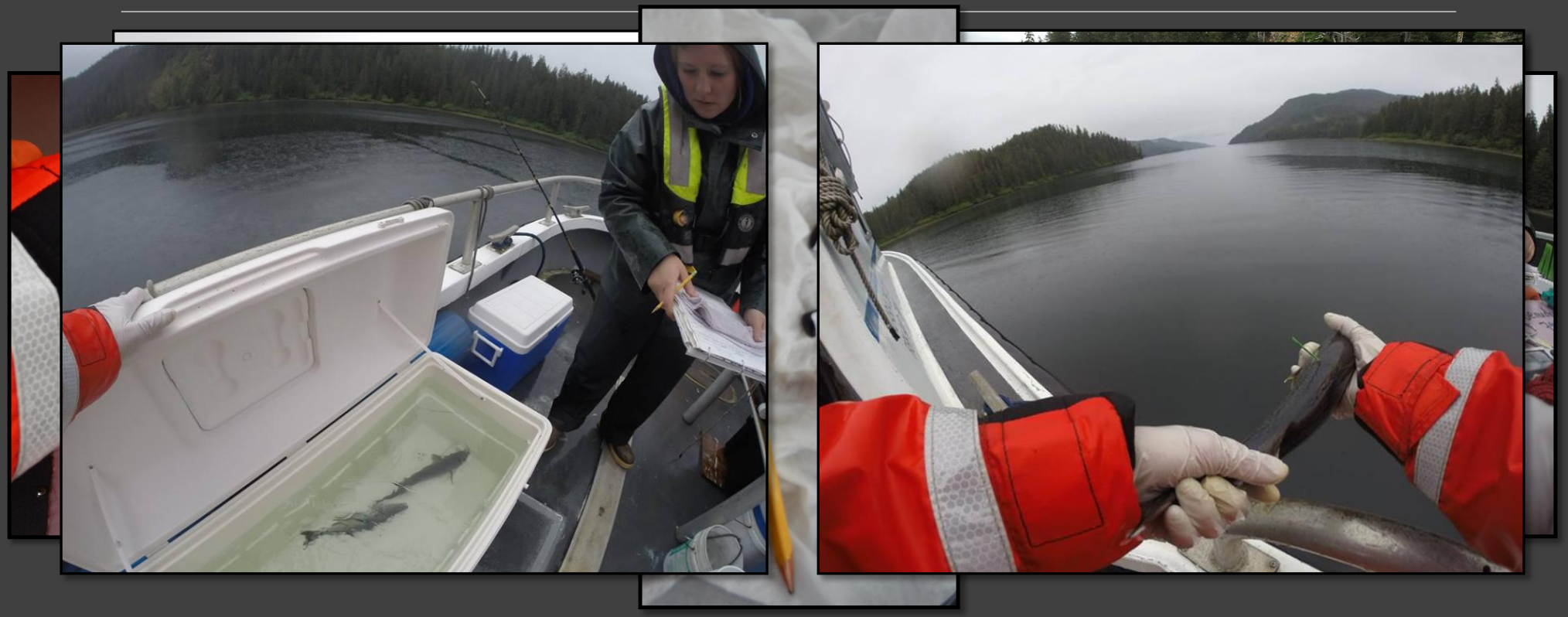
1. Describe coarse-scale spatial distribution (patterns of space use) and variation
   - How long do they stay in the bay?
   - Where are they in the bay?
   - What are they doing?
2. Evaluate relationships between movement patterns and ecological factors

# Fieldwork

June 2015 and 2016

- Deployed array of 8 receivers
- Tagged 20 age-1 fish each year
- Mobile tracking surveys every 7-10 days

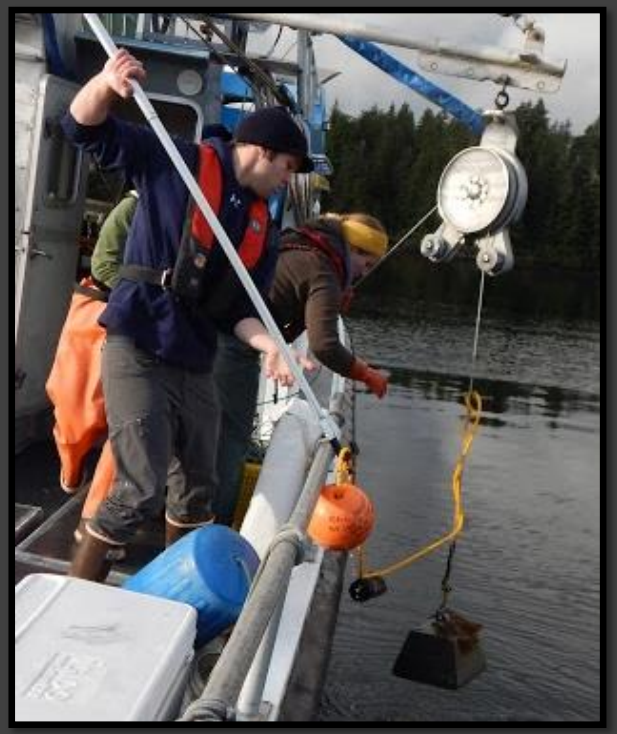
# Tagging

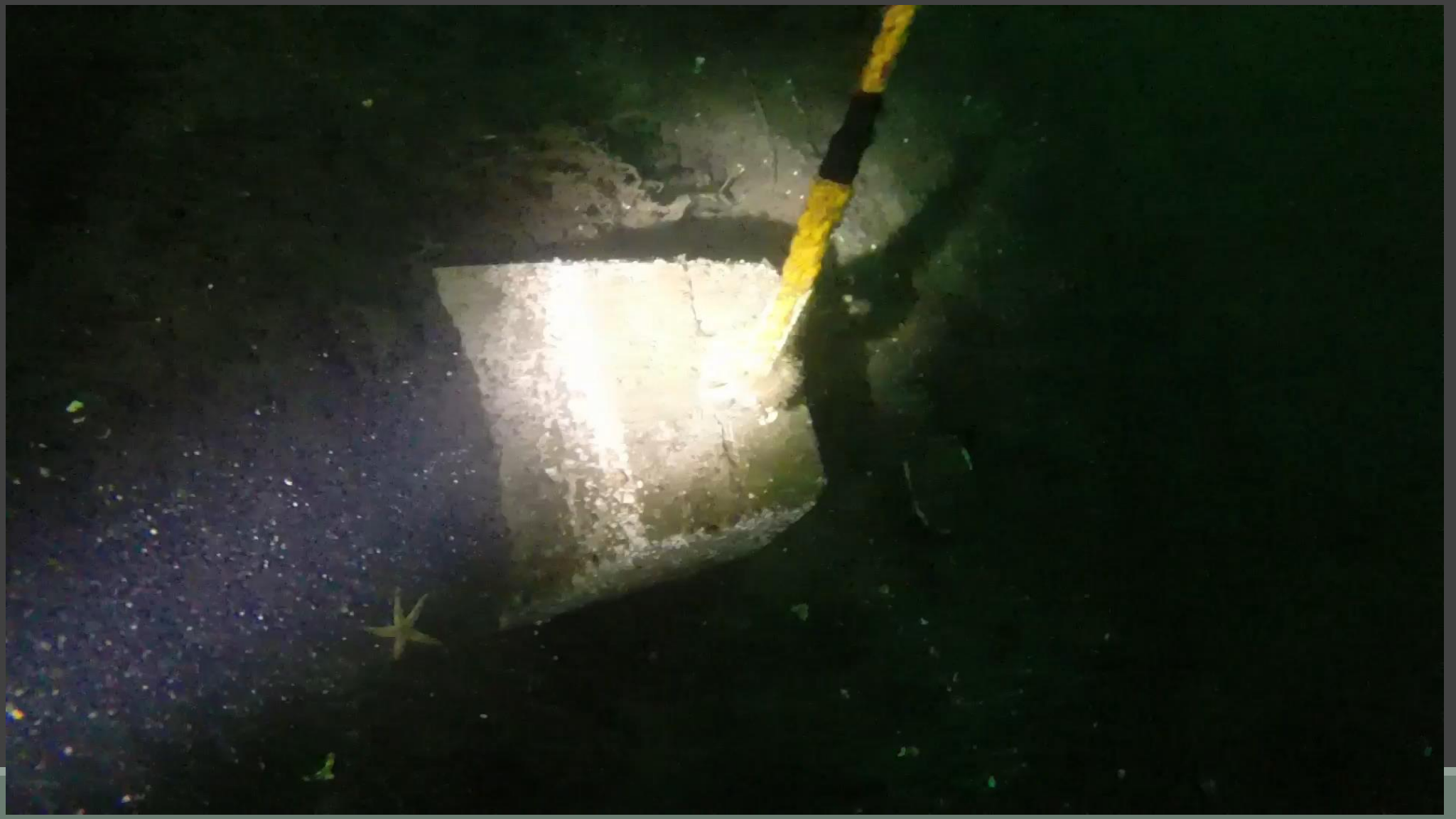


# Fieldwork

Fall 2015 and 2016

- Retrieved receivers and downloaded data





# Fieldwork



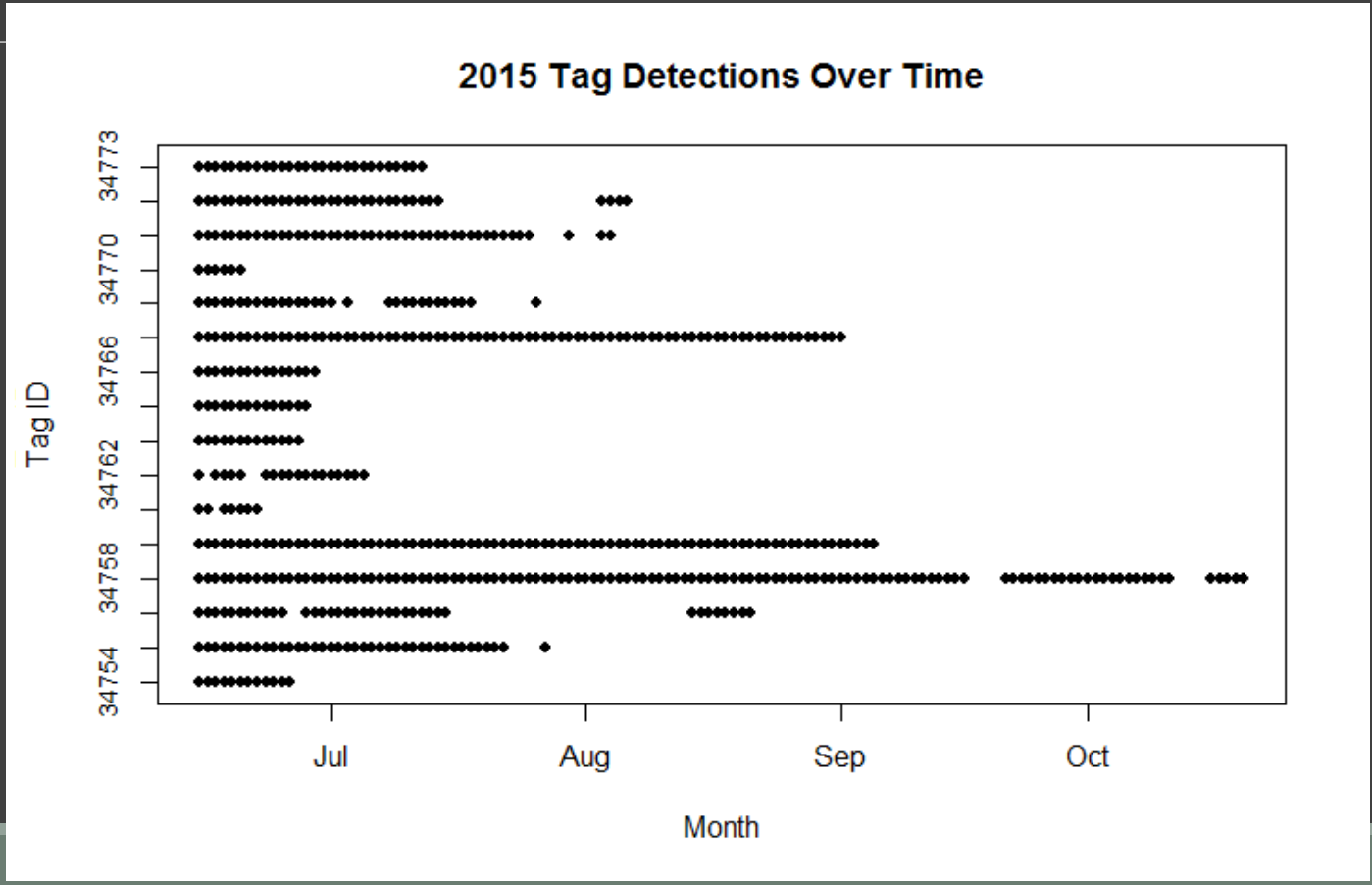

# #1 – How long are they in the bay?

2015:

36 days on average in bay (86% residence rate)

2016:

63 days on average in bay (84% residence rate)



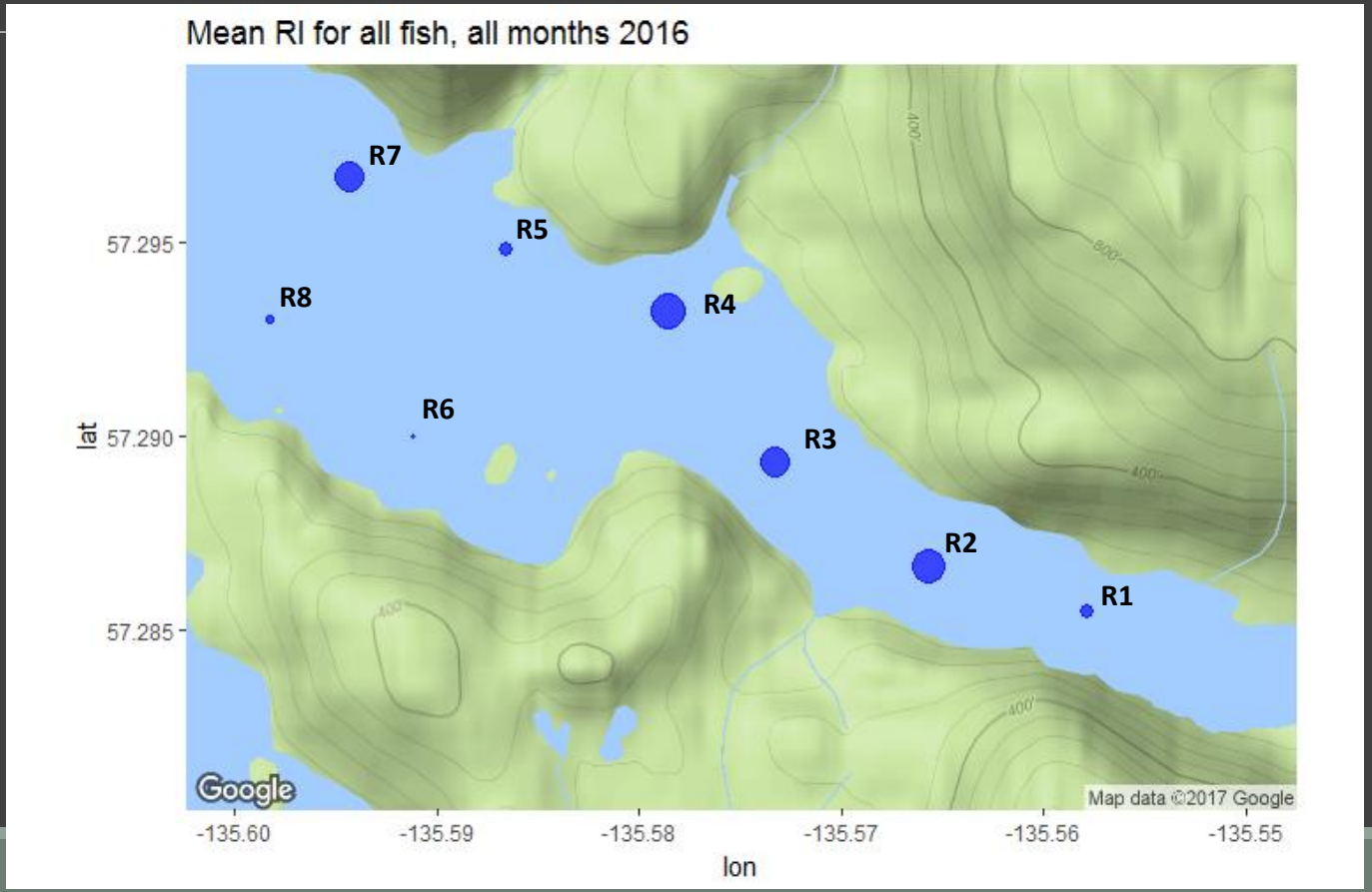
# #2 – Where are they in the bay?

2015:

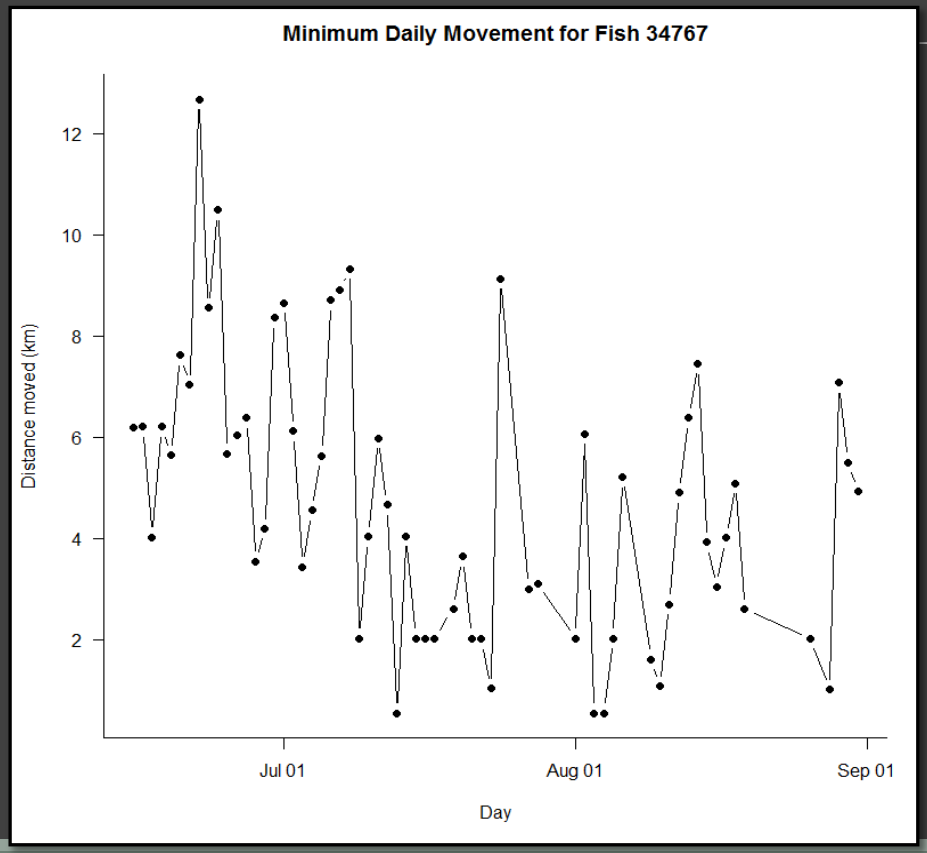
Receiver 3 had highest mean RI for all fish, all months

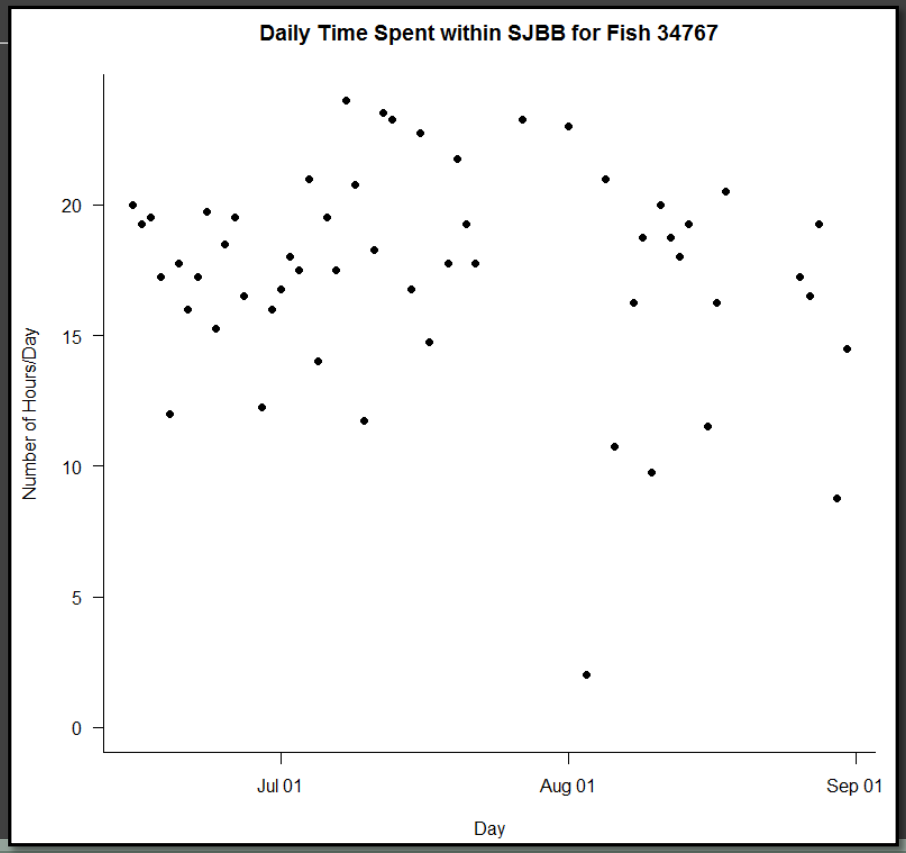
2016:

Receivers 2 and 4 had highest mean RI for all fish, all months



# #3 – What are they doing?



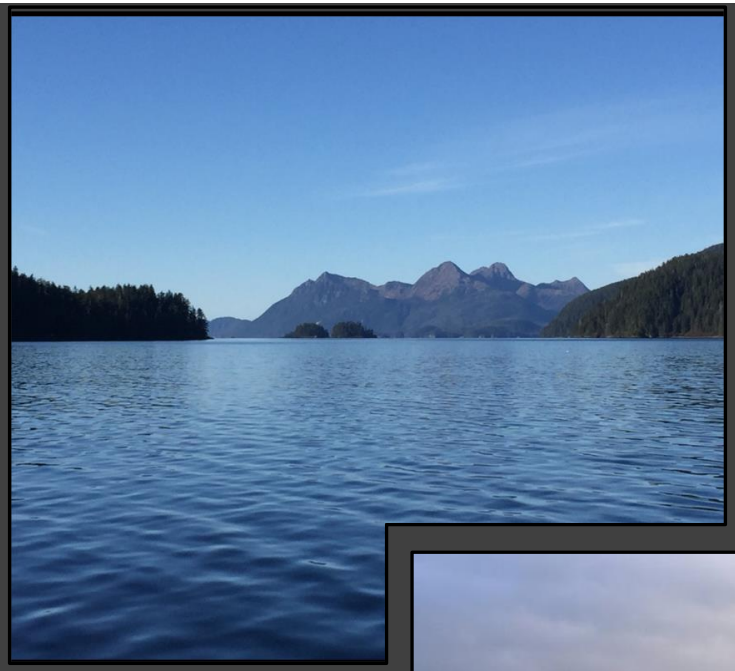
# Conclusions

Juvenile sablefish…

- High residence index
- Use certain areas of the bay more than others
- Move throughout the bay

Nearshore bays like SJBB are important habitats for the growth and survival of juvenile sablefish.

# June 2016 – Medvejie Hatchery



# Questions

# Data Processing

Raw data (over 2 million detections)

Set up 15-minute intervals,

most common location

Used binned data for analysis

| | Interval | 34754 | 34755 | 34757 | 34759 | 34761 |
|---|---|---|---|---|---|---|
| 1 | Range 1 | Middle Head | Middle Head | Head | Middle Mouth | Middle Mouth |
| 2 | Range 2 | Middle Head | Middle Head | Head | Middle Head | Middle Mouth |
| 3 | Range 3 | Middle Head | Middle Head | Head | Middle Mouth | Middle Mouth |
| 4 | Range 4 | Middle Mouth | Middle Head | Head | Middle Head | Middle Mouth |
| 5 | Range 5 | Middle Mouth | Middle Head | Head | Middle Head | Middle Mouth |
| 6 | Range 6 | Middle Head | Middle Head | Head | Middle Head | Middle Mouth |

| | Head | Middle Head | Middle Mouth | Mouth | Outside |
|---|---|---|---|---|---|
| [1,] | 5 | 7 | 3 | 0 | 0 |
| [2,] | 5 | 8 | 2 | 0 | 0 |
| [3,] | 5 | 4 | 6 | 0 | 0 |
| [4,] | 5 | 4 | 6 | 0 | 0 |
| [5,] | 5 | 4 | 6 | 0 | 0 |
| [6,] | 5 | 6 | 4 | 0 | 0 |

| Date | Time | Month | Hour | DateInts | TagID | Station.Name | Area.Bin | Latitude | Longitude | Interval |
|---|---|---|---|---|---|---|---|---|---|---|
| 2016-06-15 | 00:00:00 | 6 | 0 | 2016-06-15 | 43441 | 2 | Head | 57.2866333 | -135.565667 | 1 |
| 2016-06-15 | 00:00:00 | 6 | 0 | 2016-06-15 | 43442 | 3 | Middle Head | 57.2893333 | -135.5732667 | 1 |
| 2016-06-15 | 00:00:00 | 6 | 0 | 2016-06-15 | 43443 | 1 | Head | 57.28545 | -135.5578333 | 1 |
| 2016-06-15 | 00:00:00 | 6 | 0 | 2016-06-15 | 43444 | 1 | Head | 57.28545 | -135.5578333 | 1 |
| 2016-06-15 | 00:00:00 | 6 | 0 | 2016-06-15 | 43446 | 3 | Middle Head | 57.2893333 | -135.5732667 | 1 |
| 2016-06-15 | 00:00:00 | 6 | 0 | 2016-06-15 | 43447 | 3 | Middle Head | 57.2893333 | -135.5732667 | 1 |