# Galápagos Islands Sperm Whales (*Physeter macrocephalus*) Clan Assignments
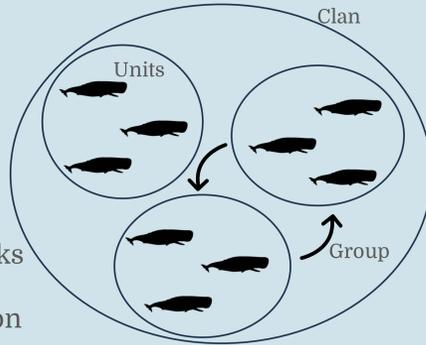
Madison Sliwa

Supervised by: Hal Whitehead and Ana Eguiguren

**DALHOUSIE UNIVERSITY**

**WDC{ WHALE AND DOLPHIN CONSERVATION**

## Background



Codas:
- Patterned clicks
- Used for communication

Vocal clans:
- Culturally distinct
- Have different codas
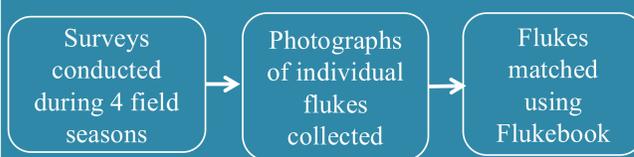- Life-long membership

The cultural turnover:
- Occurred from 1985 – 2003
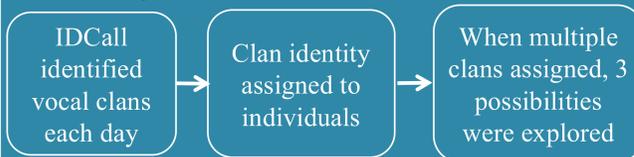- Saw two clans be replaced by two other clans

## Research Objectives

1. Evaluate the validity of acoustic-based clan assignments.

2. Investigate whether the assumption that individuals of the same clan are sighted together is still maintained within these new sets of whales.

## Methods

### Data Collection and Photoidentification

Surveys conducted during 4 field seasons → Photographs of individual flukes collected → Flukes matched using Flukebook

### Data Analysis

IDCall identified vocal clans each day → Clan identity assigned to individuals → When multiple clans assigned, 3 possibilities were explored

### Possible Sources of Error

1. A photo-identification error.

2. The individual was male.

3. There was a large time difference between sighting and coda recordings.

## Preliminary Results

Table 1. Summary of the total percentage of individuals with conflicts.

| Total Individuals Sighted on More than One Day | Total Individuals with Conflict | Total Percentage with Conflict |
|---|---|---|
| 298 | 66 | 22.15% |

Table 2. Summary of individuals sighted on less than and more than one day and their clan assignments.

| Clan | Palindrome | Short | Four Plus | Slow Increasing |
|---|---|---|---|---|
| Palindrome | 99 | 46 | 0 | 0 |
| Short | | 65 | 12 | 8 |
| Four Plus | | | 12 | 0 |
| Slow Increasing | | | | 54 |

① Is the Photo-Identification Correct?



Figure 1. An example of a correct photoidentification match.

Figure 2. An example of an incorrect photoidentification match.

Photoidentification error

▽

19.46% with conflict

② Could the Individual be Male?

**13 males** (2013,2014)    **11 females** (2013,2014)

Not a female

▽

15.10% with conflict

③ Was the Individual Seen within the Time the Clan was Heard?



208 mins
Clan 2

14 mins
Clan 4

85 mins
Clan 4

## Key Takeaways

1. Short clan:
   - Has the most conflicting individuals assigned.
   - Is the only clan with errors with all other clans sighted.
   - Codas can overpower other clans.

2. The total individuals with conflict changes with the outcomes of error source checking:
   - 8 individuals were incorrectly identified.
   - 13 individuals were identified as male.

3. Odd clan assignments generally had greater time differences between photoidentifications and coda recordings.

## Next Steps

1. Assign sex to individuals sighted in 2022 and 2023.

2. Investigate the posterior probabilities of corresponding clan assignments.

## Acknowledgements

## References