



Preliminary Report on New Zealand Sea Lion Disease Research Auckland Islands 2017-18

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Components of the 17/18 field season



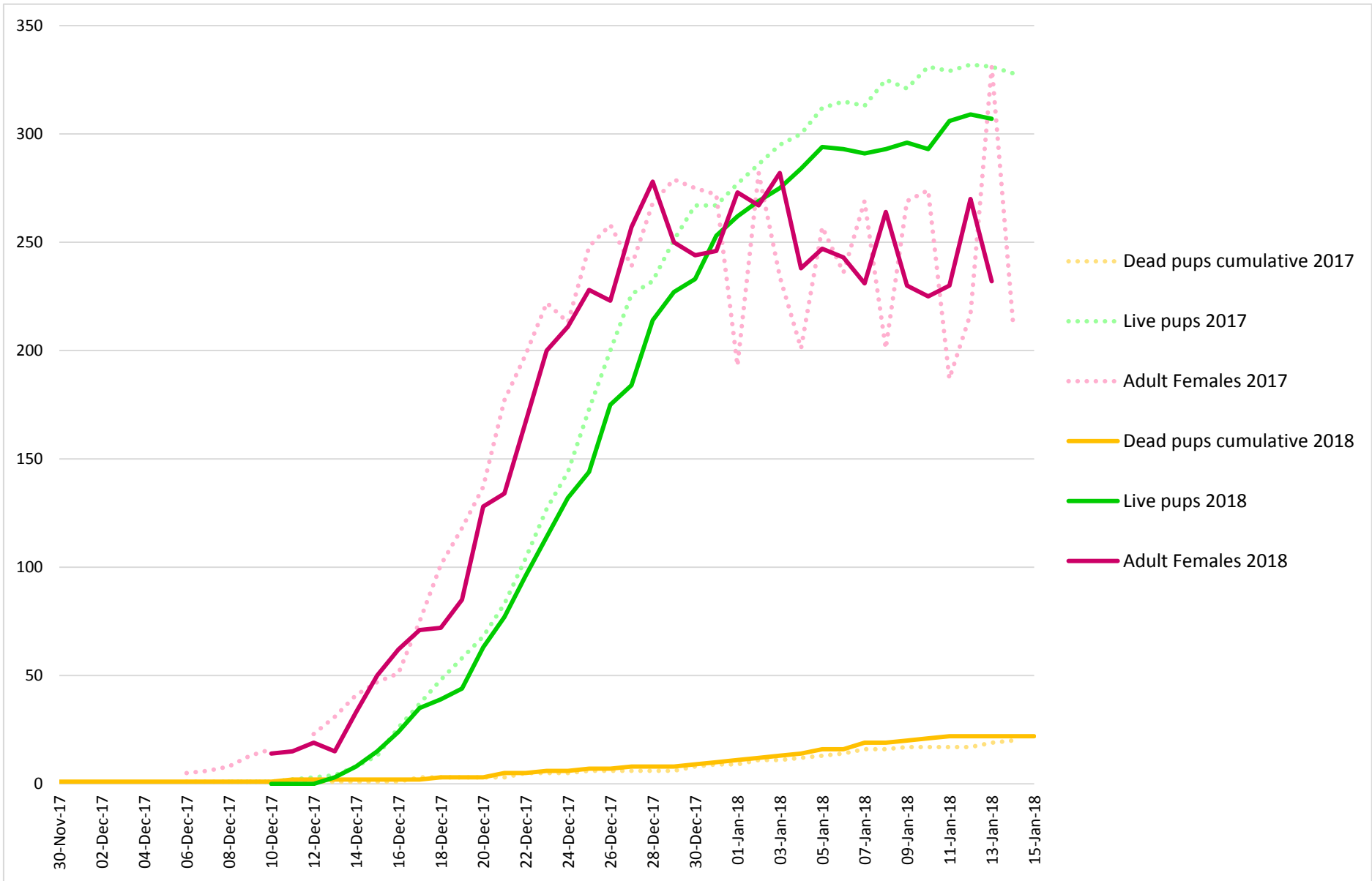
- Monitoring of pupping to determine pup birthdate and maternal ID
- Permanent individual identification of Sandy Bay pups
- Ivermectin treatment trial to investigate hookworm carriage as risk factor for mortality
- Necropsy of dead pups to designate cause of death
- Case control study to investigate risk factors for pup mortality and *K. pneumoniae* infection
- Prospective cohort study to investigate morbidity and pup response to disease

Season Summary

- 9 December 2017 – 3 March 2018 at Sandy Bay, Enderby Island
- Collection of **1421** swabs (oral, rectal and other samples) from live NZ sea lion pups in 325 first captures, 96 control captures and 292 cohort captures
- 201 pups linked with their mother based on resighting, of which 182 had a mother with permanent identification
- 51 NZ sea lion necropsy examinations completed yielding **402** frozen samples



NZ sea lion counts – Sandy Bay 2017-18



First captures

- Weight, length and girth, full physical examination, oral and rectal swabs
- Temporary vinyl cap with identification number glued to the rump
- PIT tag inserted subcutaneously in the dorsal pelvic region
- Pups randomly allocated to ivermectin treatment or control groups

- **325 pups processed for first capture from 21 December 2017 to 22 January 2018**



Double tag scar, has microchip



Never been tagged, no microchip



Double tag scar, no microchip



Linking moms and pups through unique scar identification and resighting

Double tag scar, no microchip



Never been tagged, no microchip

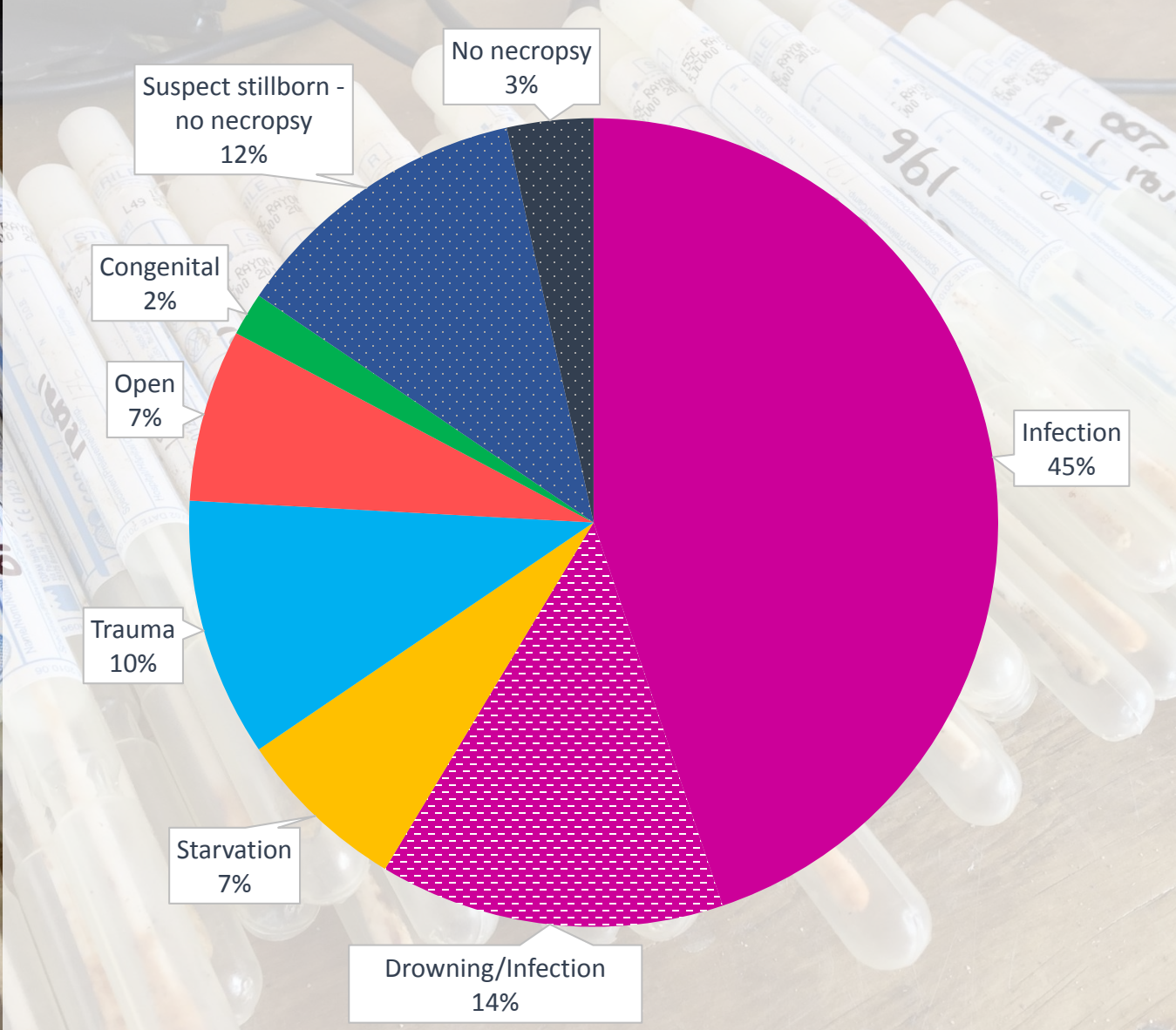


Pup mortality

- Total pup mortality between 9 December 2017 – 3 March 2018 was 58
- Of these, 49 were able to be retrieved for necropsy
- The remaining 9 were all early season, probable stillbirth/periparturient death
- Sex ratio of dead pups that underwent necropsy was 24 male : 25 female
- All dead pups were born on Enderby Island except for three suspected Dundas Island-origin pups that were not tagged or microchipped



Provisional diagnosis based on gross necropsy



Pup mortality

- Eight dead pups found submerged or floating in pools and streams that should be escapable by healthy pups
- All pups had gross necropsy findings of drowning but also those consistent with *K. pneumoniae* infection
- Pups may have entered the water in attempt to quell a high fever and could not exit due to neurological or joint symptoms, resulting in drowning
- Confirmation of cause of death will be carried out with histopathology and microbiology analysis.





- 2 pups died two days apart in the same location, following collapse of a stream bank
- Cause of death was suffocation. Sand was found throughout the respiratory tract
- Perhaps a consequence of dry weather in early season drying out substrate

Case Control and Cohort Captures

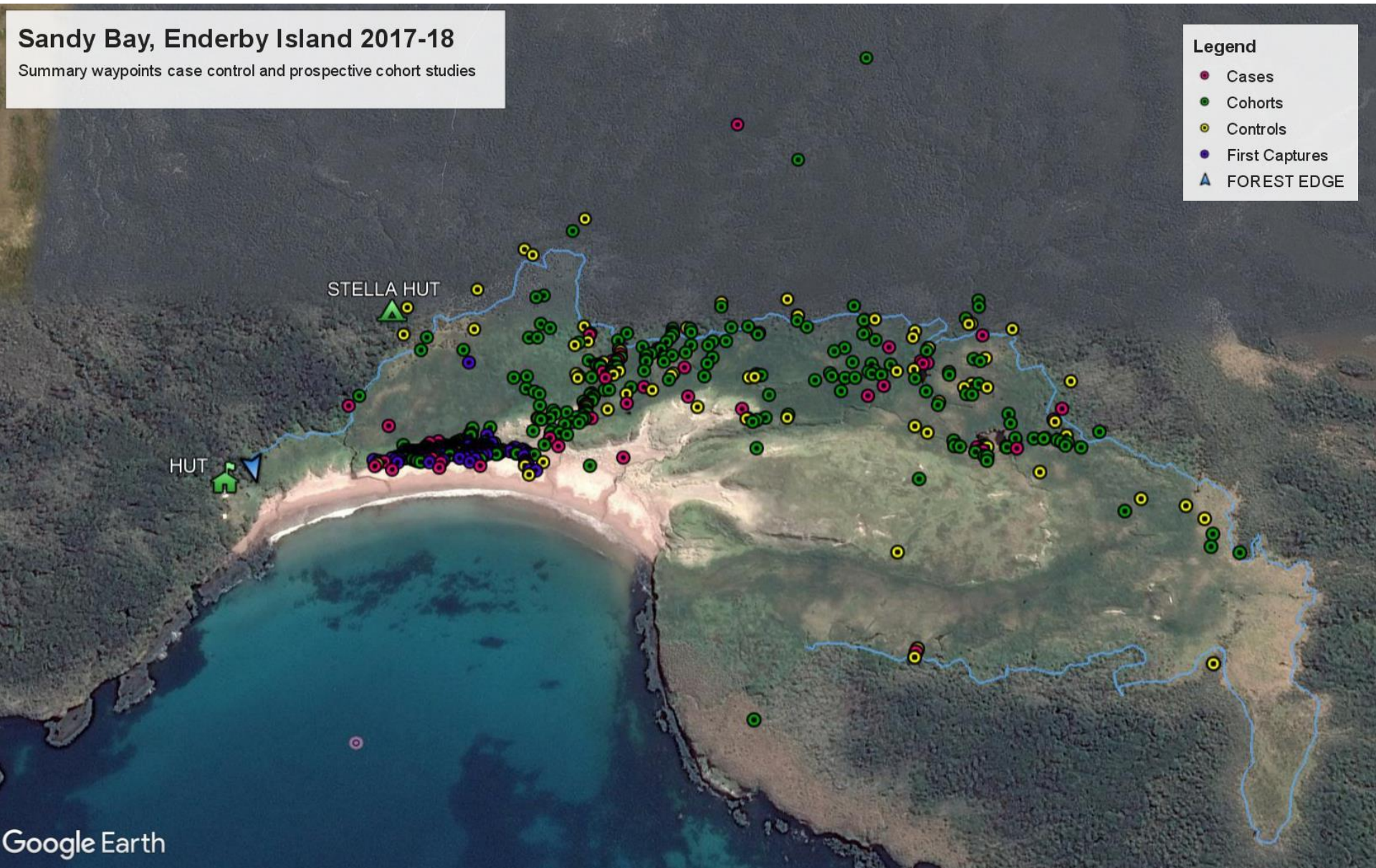
96 control captures and 292 cohort captures throughout the season

Sandy Bay, Enderby Island 2017-18

Summary waypoints case control and prospective cohort studies

Legend

- Cases
- Cohorts
- Controls
- First Captures
- ▲ FOREST EDGE



FIRST CAPTURES

CASE CONTROL STUDY

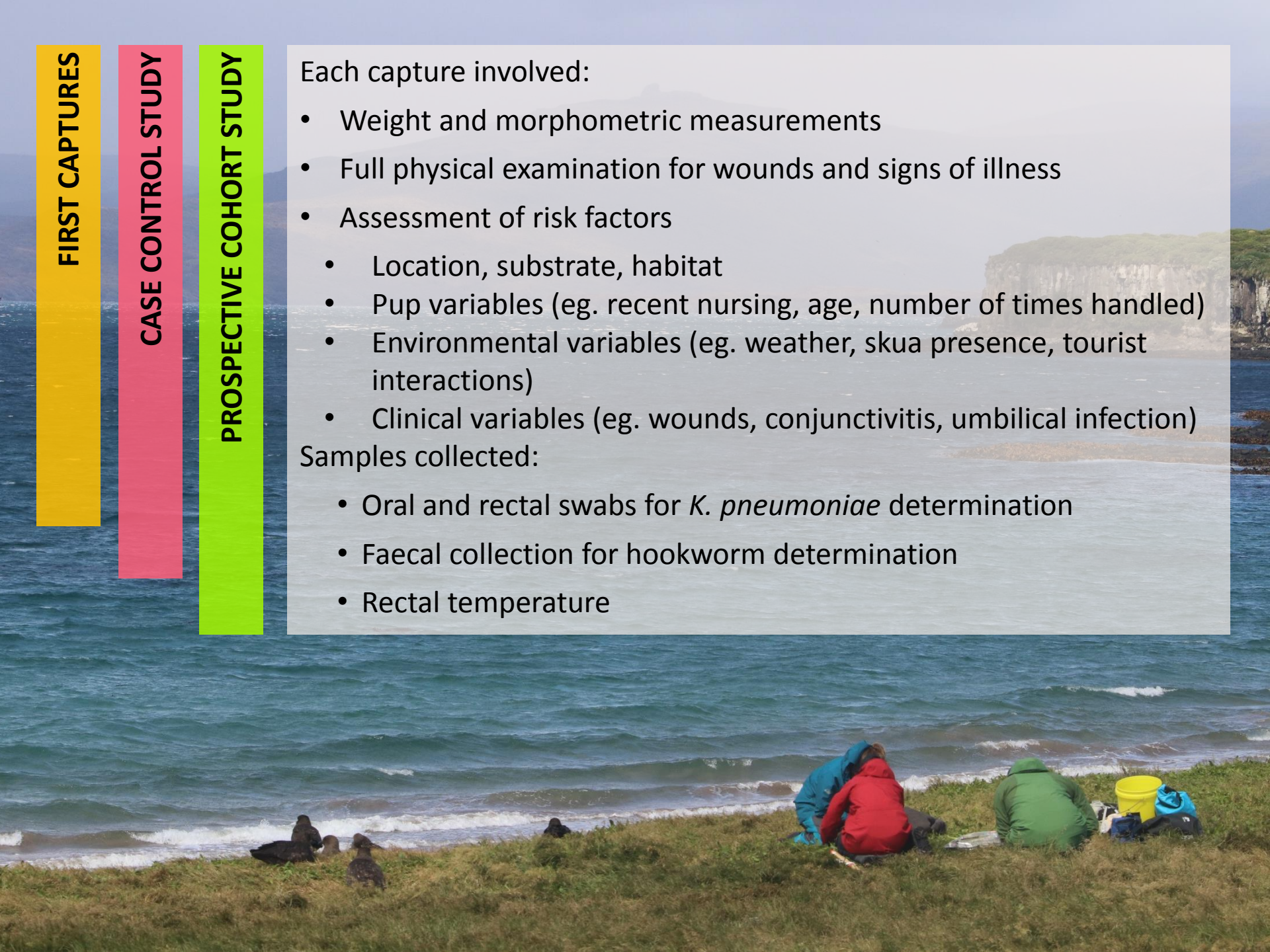
PROSPECTIVE COHORT STUDY

Each capture involved:

- Weight and morphometric measurements
- Full physical examination for wounds and signs of illness
- Assessment of risk factors
 - Location, substrate, habitat
 - Pup variables (eg. recent nursing, age, number of times handled)
 - Environmental variables (eg. weather, skua presence, tourist interactions)
 - Clinical variables (eg. wounds, conjunctivitis, umbilical infection)

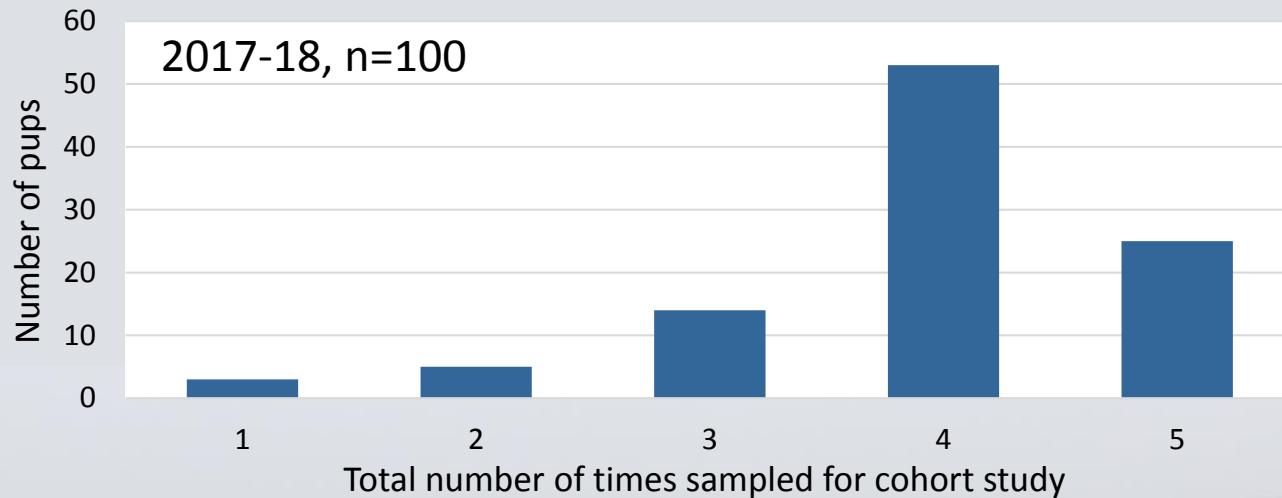
Samples collected:

- Oral and rectal swabs for *K. pneumoniae* determination
- Faecal collection for hookworm determination
- Rectal temperature



Prospective cohort study

- 100 pups were recruited to the study at first capture (twice the sample size of 2016-17)
- Same procedure of fortnightly sampling as 2016-17, except that blood was not collected
 - 52 were in the ivermectin treatment group, 48 were controls
 - 51 were male, 49 were female



This field season has generated a substantial number of samples from pups in addition to a large volume of risk factor data. Microbiology and histopathology labwork is ongoing



Results of lab analysis will feed back into risk factor data to determine the most important risk factors for pup mortality. Following this, options for mitigation can be assessed.

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