



Effects of varying resighting effort on estimation of survival for the Dundas population

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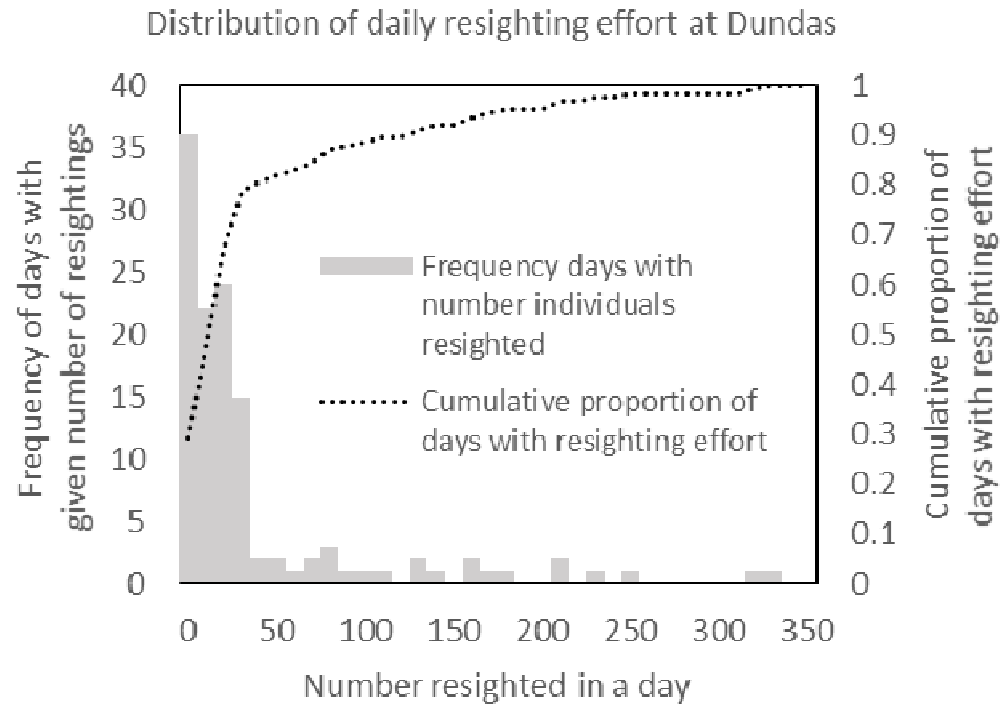
Dundas resighting effort & survival

- Dundas is the largest breeding population, though low resighting effort of marked individuals relative to Sandy Bay
- DOC requested an exploratory analysis to assess effects of extending the tag resighting period on estimation of survival
- We used MR observations to estimate annual resighting effort and survival-at-age given historical effort

Method

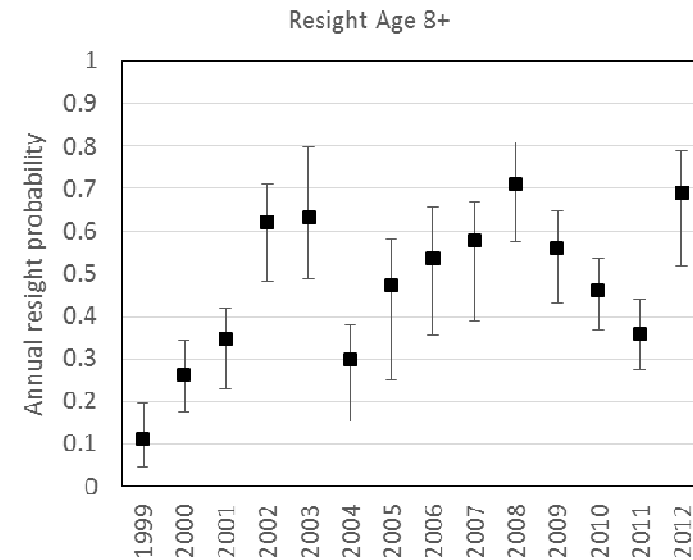
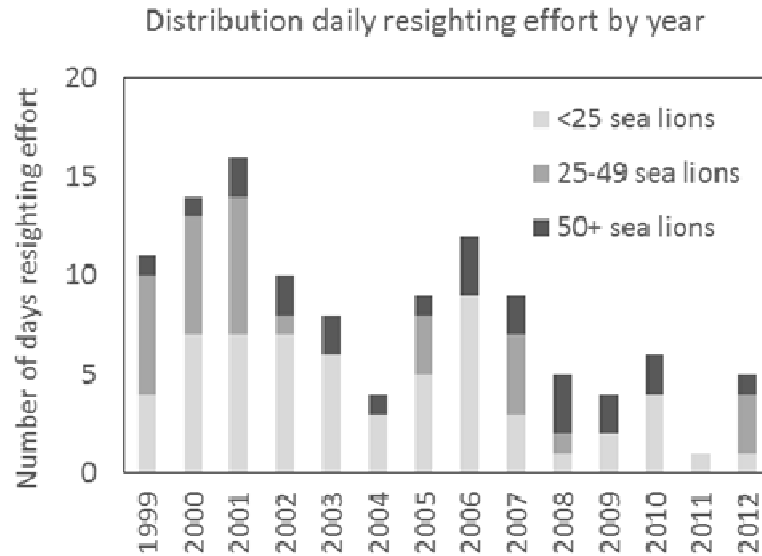
- SeaBird used to generate MCMC estimates ($n = 250$) of annual resighting probability and survival
- Observations of NZSLs flipper-tagged (1990-1992 and 1998-2011) and resighted at Dundas (1999-2012).
- Same basic model configuration to model run 7a (Roberts et al., 2013), with some differences:
 - No partitioning based on breeding status or estimation of pupping rates
 - Resighting effort at ages 6 and 7 was year-invariant
- Resighting effort estimates then compared with days resighting effort in each year
- Variability in model estimates compared with Sandy Bay model (model run 7a, Roberts et al., 2013)

Distribution of resighting effort



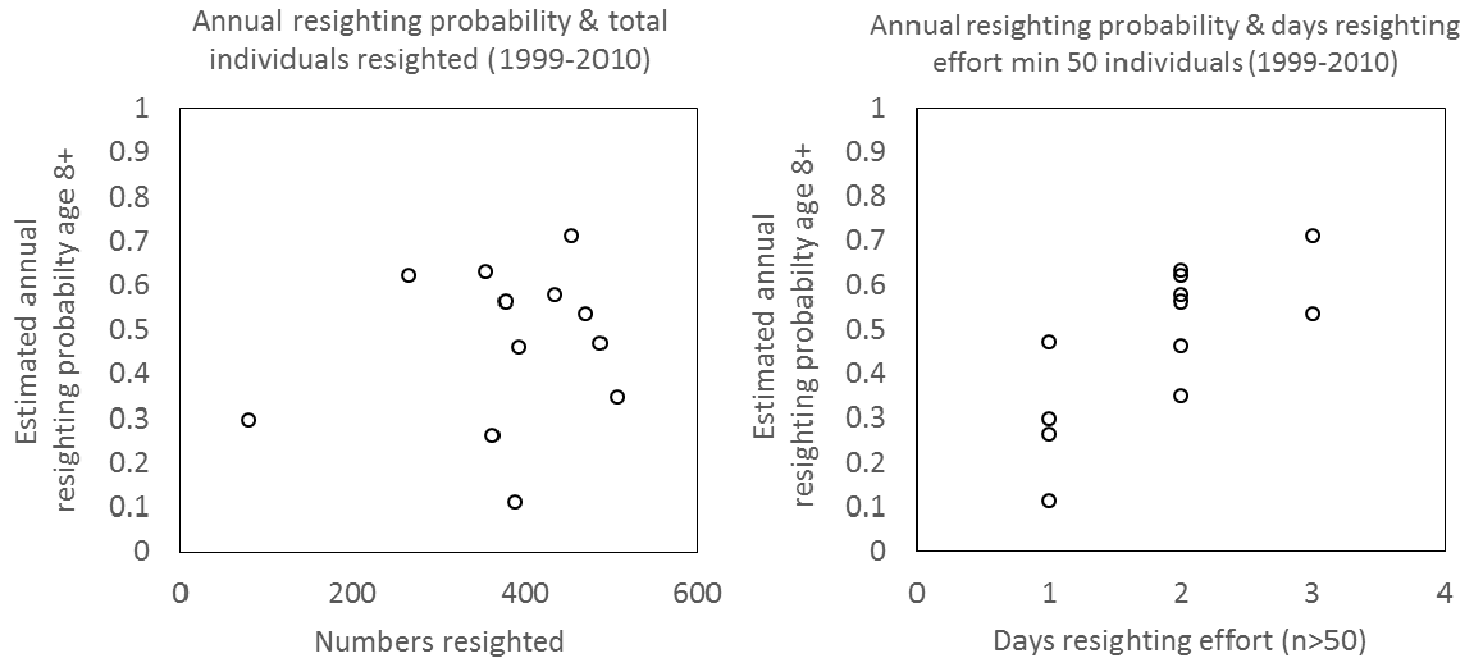
- 123 days with resighting effort (1 to 333 individuals seen)
- Fewer than 50 observed in 80% of days
- Days with 50+ individuals resighted account for 67% of all resightings

Actual v model estimated resighting effort



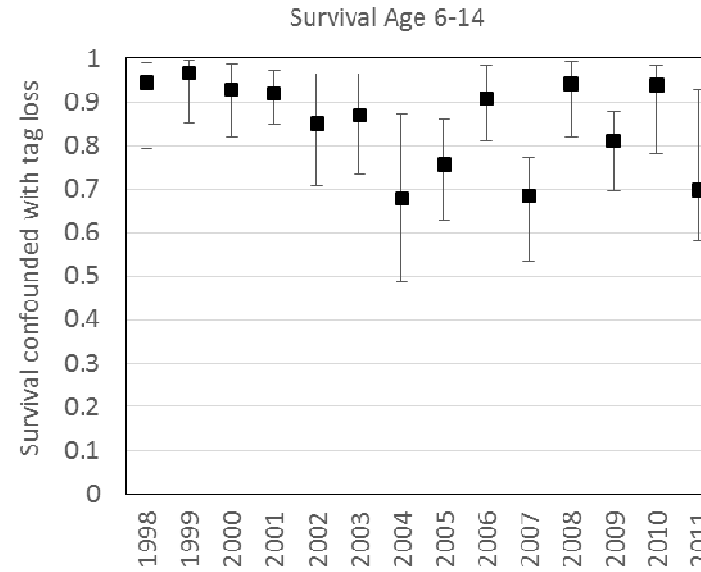
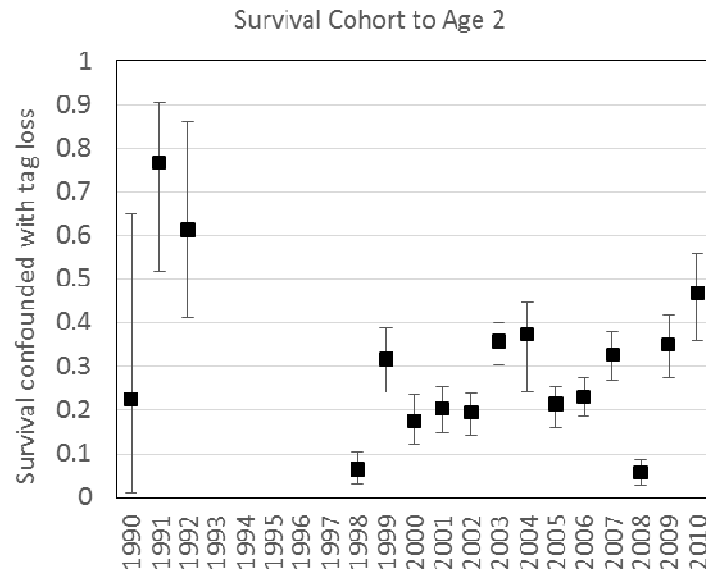
- Variation in resighting effort by year
- Median annual resighting probability estimates ranged from 0.11 to 0.71 for age 8+ individuals with a mean annual CV of 0.17

Actual v model estimated resighting effort



- Poor agreement with annual number of individuals resighted
- Much better agreement with days resighting effort with min. 50 resightings:
 - 0.11-0.47 for years with 1 day
 - 0.35-0.63 for years with 2 days
 - 0.54-0.71 for years with 3 days

SeaBird survival estimates Dundas



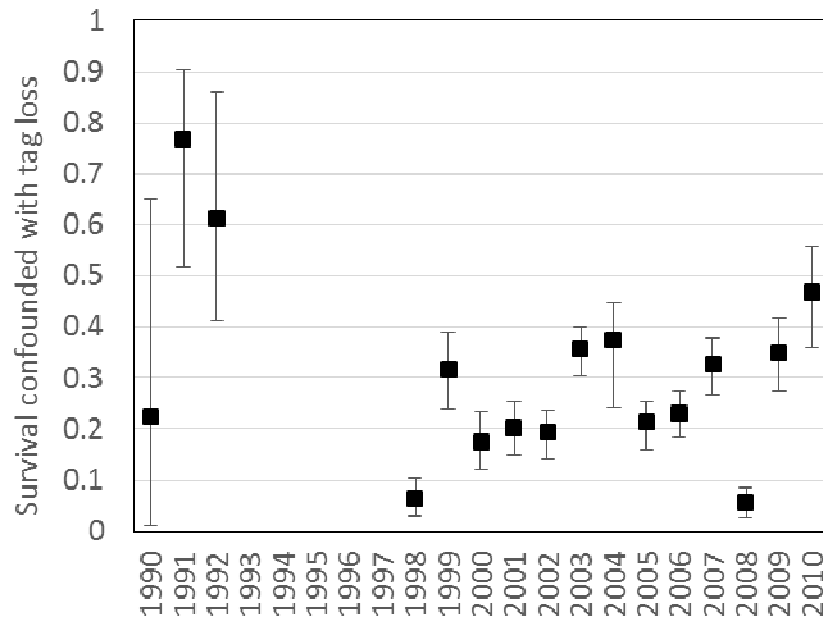
- CV of survival estimates for Dundas not much greater than for Sandy Bay:
 - Dundas CV = 0.18 & 0.08 for Surv age 0-2 and 6-14, respectively
 - Sandy Bay CV = 0.16 & 0.05

Summary

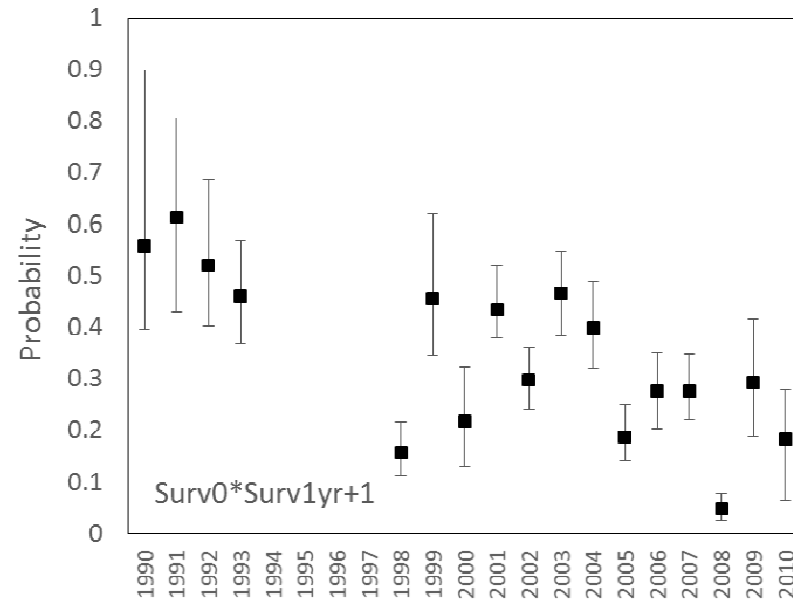
- Highly variable resighting effort by day and year
- Assessment indicates that 3 days of resighting effort would lead to resighting >50% breeding age individuals each year
- Probably an even greater proportion of those nursing a pup
- CV of survival estimates only slightly higher than Sandy Bay despite much lower resighting effort
- Note that Dundas model not put through the same validation checks as the Sandy Bay model

Pup/yearling survival estimates

Dundas

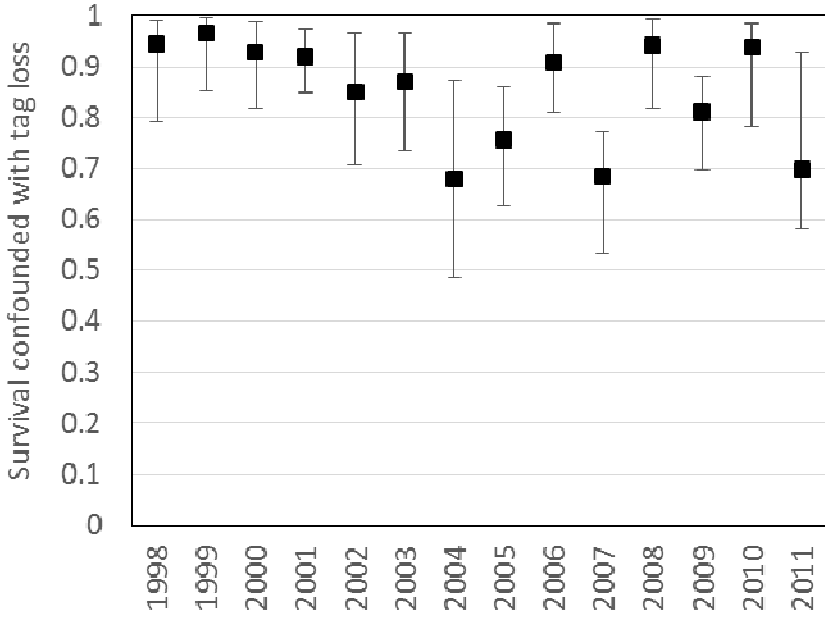


Sandy Bay



Age 6-14 survival estimates

Dundas



Sandy Bay

