

## Recent increases in survival of western Steller sea lions in Alaska and implications for recovery

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**Supplement.** Tables S1 and S2 provide information that was used in the fitting of the Leslie matrix models used to estimate changes in natality over time. Table S1 contains the regional population growth rates estimated from time series of non-pup counts while Table S2 contains age- and sex-specific survival of Steller sea lions in the combined central and eastern Gulf of Alaska regions. These regions were combined for the Leslie model because the distribution of sightings of branded animals indicated considerable movement of juveniles from the central to the eastern Gulf region (Fritz et al. 2013). Figure S1 contains the sighting probabilities by sex, region and year for all Steller sea lions branded as part of this study

Table S1. Regional Steller sea lion population growth rates, 2000–2012. Annual rates of change ( $\pm 95\%$  credible interval) in counts of non-pups (Fritz et al. 2013, Johnson & Fritz 2014)

Region	Population growth rate (% yr <sup>-1</sup> )
Eastern Gulf of Alaska	4.51 (1.63 to 7.58)
Central Gulf of Alaska	0.87 (–0.34 to 2.18)
Combined eastern-central Gulf of Alaska	2.40 (0.92 to 3.86)
Eastern Aleutian Islands	2.39 (0.92 to 3.94)

Table S2. Age- and sex-specific estimates of survival ( $\Phi$ ) and standard error (SE) of branded western Steller sea lions in the combined eastern-central Gulf regions in Alaska. Average  $\Phi$  was estimated for Ages 4+ yr

Age (yr)	Females		Males	
	$\Phi$	SE	$\Phi$	SE
1	0.719	0.031	0.733	0.036
2	0.786	0.041	0.664	0.044
3	0.826	0.037	0.773	0.045
4–10	0.941	0.009	0.883	0.014

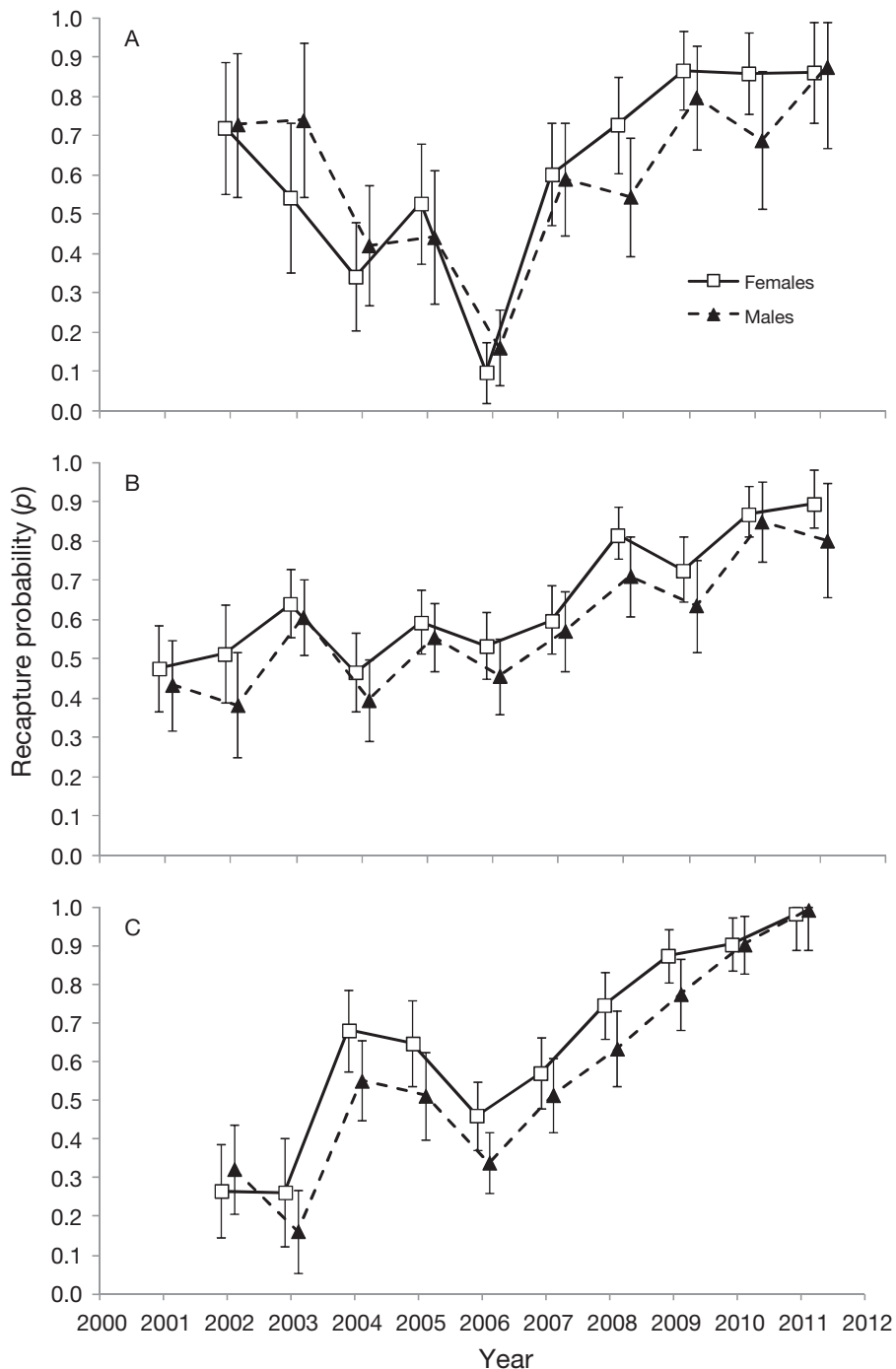


Fig. S1. Recapture probability ( $p \pm 2SE$ ) by year of female and male Steller sea lions branded as pups in the eastern Gulf of Alaska (A), central Gulf of Alaska (B), and the eastern Aleutian Islands (C). Legend in A applies to B and C. Female and male data are plotted at  $\pm 0.1$  yr from integer year for display purposes

#### LITERATURE CITED

- Fritz L, Sweeney KS, Johnson DS, Lynn M, Gilpatrick J (2013) Aerial, ship, and land-based surveys of Steller sea lions (*Eumetopias jubatus*) in Alaska, June and July 2008-2012. US Department of Commerce, NOAA Tech Memo NMFS-AFSC-251
- Johnson DS, Fritz LW (2014) agTrend—A Bayesian approach for estimating trends of aggregated abundance. *Methods Ecol Evol*, doi: 10.1111/2041-210X.12231