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Appendices

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Table S1: Blue whale sightings data sources

Source	Time Range	Data Collection
NOAA Southwest Fisheries Science Center Surveys	1991-2008	Systematic
California Cooperative Oceanic Fisheries Investigations (CalCOFI) Surveys	2009-2015	Systematic
NOAA National Marine Fisheries Service Surveys	2008-2009, 2014	Systematic

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Spotter Pro	2013-2018	Mixed
Whale Alert	2014-2018	Opportunistic
Channel Island National Marine Sanctuary Aerial Monitoring and Spatial Analysis Program (CINM SAMSAP) Surveys	1997-2008	Systematic
Channel Islands Naturalist Corps	2015	Opportunistic
Point Blue Surveys	1999-2018	Systematic

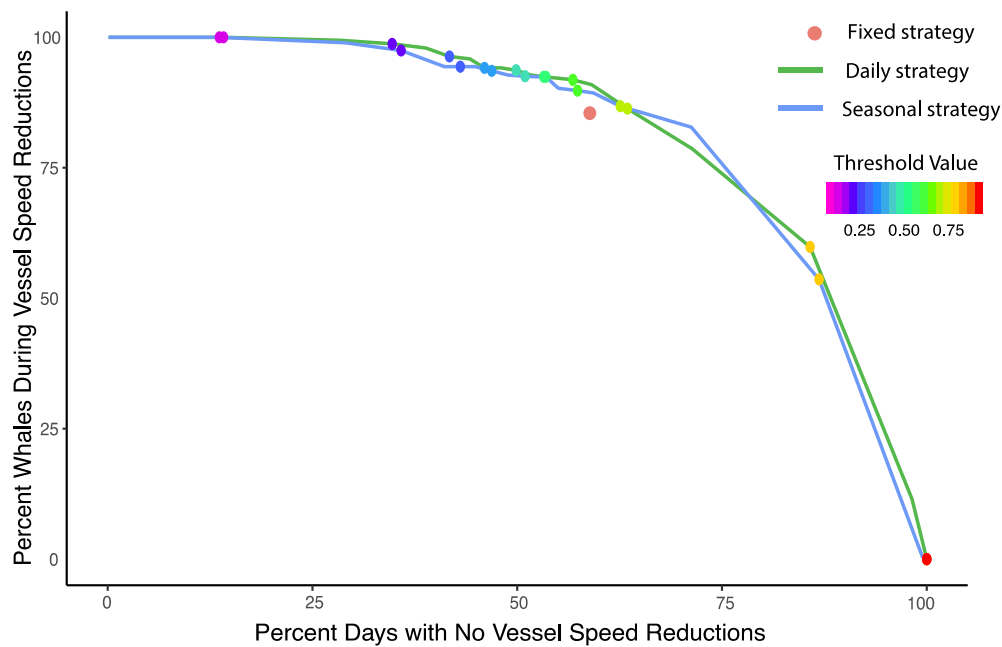


Figure S1: Comparison of the tradeoff over the study period (2002-2018) between the percentage of days with unrestricted vessel speeds (x-axis) and the percentage of blue whales expected to be protected from greater than 10 knot shipping speeds (y-axis) for simulated seasonal (blue) and daily (green) dynamic ocean management strategies. Percentage of

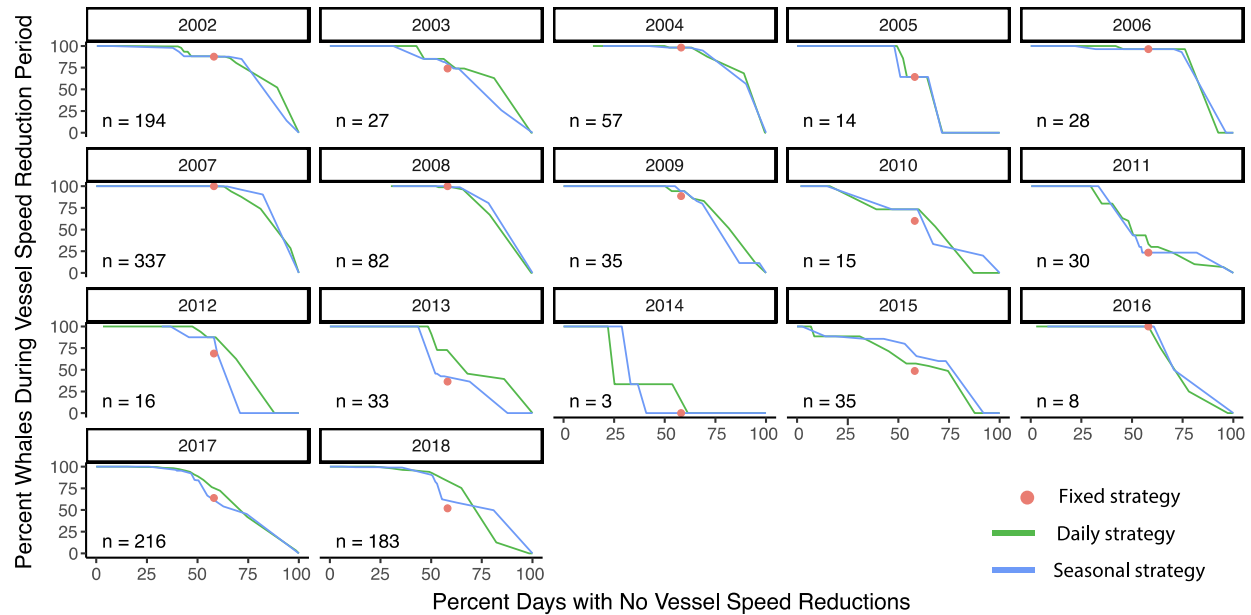
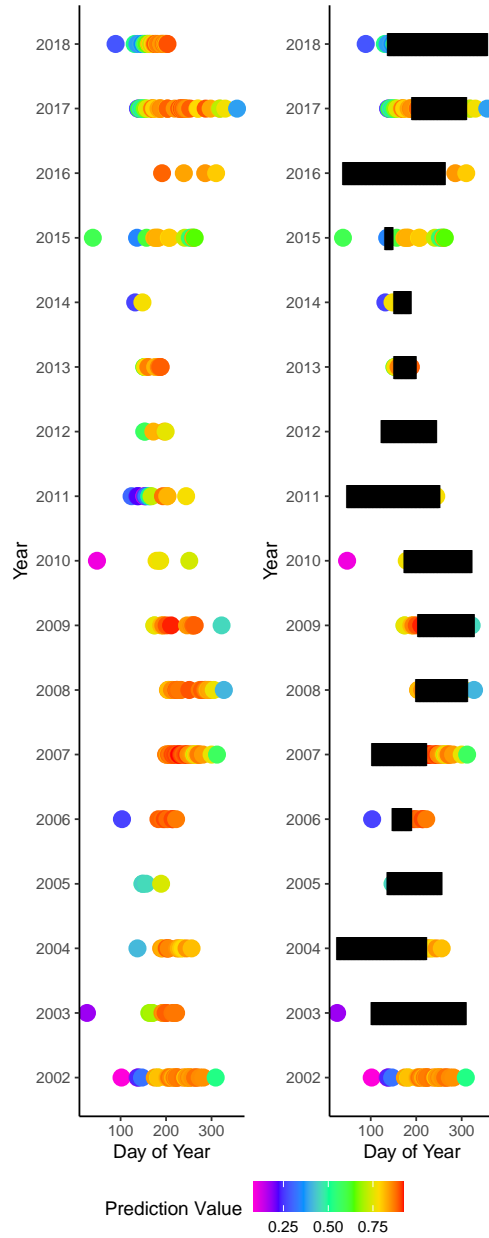


Figure S2. Interannual variability in the tradeoff between the percentage of days with unrestricted vessel speeds (x-axis) and the percentage of blue whales expected to be protected from greater than 10 knot shipping speeds (y-axis) for simulated seasonal (blue) and daily (green) dynamic ocean management strategies. The pink dot in each panel indicates simulated performance of the July through November strategy. The sample size for blue whales sighted that year within the shipping lane to evaluate the strategies is listed on the corresponding sub-plot.



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Figure S3. (Left) Distribution of blue whale sightings within the Traffic Separation Scheme by day of year from 2002-2018. Colors represent the predicted habitat suitability value within the shipping lane on a 0-1 scale from the blue whale distribution model. (Right) Days of the year where a vessel speed reduction period was implemented (vertical black line) based on the date range of blue whale sightings in the previous year. This strategy performed slightly better than the fixed strategy in percentage of unrestricted vessel speed days (65% compared to 58%), but

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611 *performed substantially worse than the fixed strategy in percentage of whales sighted during the*
612 *speed reduction period (56% compared to 78%).*