**Supporting information**

**S1 Equations**

**Formulas for the mean stratified estimator**

For trip by a vessel in stratum let be the bycatch of seabirds in numbers.

An estimator for mean bycatch per trip across all vessels in is then

 (1.1)

where is the total number of trips in area. An estimator for the total bycatch in

 (1.2)

with variance

 (1.3)

where is the total number of trips in by all vessels.

**General linear mixed effect model**

In a general notion, seabird bycatch (Y) on trip *j* at vessel *i* was modelled according to:

) = and

where and βs represent coefficients under estimation, x1-xn represent candidate variables as described in Table 3, is the random vessel-specific intercept (assumed to be independent and identically distributed as ), and is the random residual variation.