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Jay Barlow

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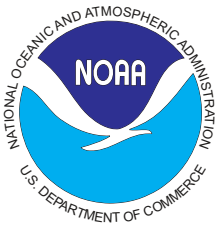

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CETACEAN ABUNDANCE IN THE CALIFORNIA CURRENT ESTIMATED FROM SHIP-BASED LINE-TRANSECT SURVEYS IN 1991-2014

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Jay Barlow

Marine Mammal and Turtle Division
Southwest Fisheries Science Center
National Marine Fisheries Service
National Oceanic & Atmospheric Administration
8901 La Jolla Shores Drive
La Jolla, California 92037

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Jay Barlow
NOAA Southwest Fisheries Science Center
8901 La Jolla Shores Dr., La Jolla CA 92037

ABSTRACT

The abundance of most cetaceans in the California Current Ecosystem along US West Coast is estimated from data collected on a 2014 ship-based survey and is re-estimated for six previous surveys from 1991 to 2008. Line-transect methods were used on all surveys, and analyses are based on a multiple-covariate line-transect approach with new Beaufort-specific estimates of trackline detection probability (*g(0)*). Estimates for 1991-2008 are higher than previously published estimates from those surveys due to the incorporation of these new, lower *g(0)* estimates. Warm temperate species were more abundant in 2014 than in previous years, likely due to movement in response to unusually warm oceanographic conditions during the survey. The 2014 estimated abundance for short-beaked common dolphins, a warm temperate species, is approximately twice the highest 1991-2008 estimate. The cold-temperate northern right whale dolphin was not seen in California waters, but its abundance is much higher than average in waters off Oregon and Washington in 2014. Short-beaked common dolphins, long-beaked common dolphins and striped dolphins were the most abundant small cetaceans with 2014 abundances of ~1,430,000, ~90,000 and ~90,400 (respectively). Fin whales and humpback whales were the most abundant large whales, with abundances of ~9,900 and ~3,100 (respectively). Although still rare compared to these species, sei whales are more common in the California Current than in previous years. Abundance is estimated for 20 cetacean species plus several categories of cetaceans that could not be identified to species. The 2014 estimates include pygmy killer whales (*Feresa attenuata*) for the first time, based on the first sighting of that tropical species in California waters.

INTRODUCTION

Abundance is a key descriptor of any animal population. For cetaceans in US waters, abundance estimates are used to assess whether humans have a detrimental effect on populations in cases where the absolute level of human-caused mortality can be assessed (Wade 1998). Trends in abundance are necessary to assess potential human perturbations to populations when direct mortality cannot be estimated (Taylor et al. 2007). Without some measure of abundance or relative abundance, it is difficult to assess the conservation status of any animal population.

The abundance of pelagic cetaceans in the California Current off the U.S. West Coast was previously estimated from summer and fall ship-based surveys in 1991, 1993, 1996, 2001, and 2005 (Barlow & Forney 2007) and in 2008 (Barlow 2010). Within this area, cetacean abundance was previously estimated for smaller geographic regions based on aerial surveys of California in winter 1991-92 (Forney & Barlow 1998) and year-round ship surveys of southern California in 2004-2013 (Campbell *et al.* 2015). In this report, we estimate abundance for most pelagic cetaceans along the U.S. West Coast from a survey conducted by the Southwest Fisheries Science Center (SWFSC) in the summer and fall of 2014. Abundance is estimated as the number of animals present within the study area at the times of the surveys and does not represent a closed population estimate. The 2014 California Current Cetacean and Ecosystem Survey (CalCurCEAS) used the same survey methods and survey design as the prior 1991-2008 SWFSC surveys. Similar analytical methods are used in analyses of the 2014 survey with the addition of new estimates of trackline detection probability based on a method developed by Barlow (2015) and the incorporation of a new scheme for choosing covariates in the detection function based on results presented by Barlow *et al.* (2011). Data from 1991-2008 surveys are re-analyzed with the new methods to provide more accurate estimates and to better maintain comparability with the new 2014 estimates.

The Marine Mammal Protection Act requires the calculation of potential biological removal (PBR) levels for all marine mammal stocks within US waters (GAMMS 2005). The estimation of PBR requires a minimum estimate of stock size that "provides reasonable assurance that the stock size is equal to or greater than the estimate". The guideline for assessing the status of marine mammal populations (GAMMS 2005) recommends that PBRs be calculated only from recent surveys (i.e. those conducted within 8 years). For most cetacean stocks along the US West Coast, minimum estimates of abundance should be calculated from the average of the 2008 and 2014 ship surveys. In this report we also calculate the average abundance from these two most recent surveys and present a minimum estimate of abundance, defined as the lower 20^{th} percentile of the abundance estimate (GAMMS 2005), for each species.

METHODS

Field Methods

A cetacean survey of the California Current was conducted in 2014 from 5 August to 9 December on the 52-m R/V *Ocean Starr* (previously the National Oceanic and Atmospheric Administration (NOAA) R/V *David Starr Jordan*) that was chartered by the SWFSC for this survey. The survey was conducted along pre-determined transect lines that systematically covered waters off California, Oregon and Washington from the coast to approximately 556 km (300 nmi) offshore. Planned transect lines (Fig. 1) are identical to the primary transect lines surveyed in 2005 (Barlow & Forney 2007) and are based on a systematic design with a randomly selected starting point. These transects are offset midway between the primary transect lines used on the 2001 and 2008 SWFSC surveys.

The same visual line-transect sampling methods were used in 2014 as had been used on previous SWFSC surveys in the California Current (Barlow & Forney 2007). In summary, experienced field technicians (henceforth called "observers") searched from the flying bridge deck (10 m above sea level) using two pedestal-mounted 25X binoculars from port and starboard observation stations while a third observer searched with unaided eyes (and, occasionally, 7X binoculars) from a center observation and data recording station. The survey was conducted in "closing mode" for most cetacean species; in this survey mode, the ship diverted from the transect line and approached groups of cetaceans that were seen within 5.5 km of the transect line so that the observers could better determine group size and species composition. The vessel was not diverted if group size and species composition could be estimated from the transect line. Group size and species composition were estimated by all observers who felt confident that they had seen the entire group. If a group could not be identified to species with certainty, observers recorded the next highest taxonomic level for that group. In many of those cases, observers also recorded their "best guess" of the most probable species based on characteristics they were able to observe as well as other factors such as species distributions and recently seen species.

Analytical Methods

Abundance is estimated for all cetacean species seen on the 1991-2014 California Current surveys except those whose very coastal habitat was not adequately covered by the survey transects: harbor porpoise (*Phocoena phocoena*), coastal bottlenose dolphins (*Tursiops truncatus*) and gray whales (*Eschrichtius robustus*) (see Table 1 for all other common and scientific species names). Similar analytical methods are used for abundance estimation as were used by Barlow & Forney (2007) for the 1991-2005 surveys. The study area was divided into the same four geographic regions as were used in the previous analysis (Figure 2, Table 2). Cetacean density (D, animals per km^2) is estimated for each species in region i as

$$D_i = \frac{n_i \cdot \hat{s}_i \cdot \hat{f}(0 \mid \bar{z}_i)}{2 \cdot L_i \cdot \hat{g}_i(0)} \qquad (1)$$

where L_i = the length of on-effort transect lines in region i;
s_i = the mean group size of the species in region i;
$g_i(0)$ = the sea-state weighted mean trackline detection probability of the species in region i;
$f(0|z_i)$ = the probability density function evaluated at zero perpendicular distance for the mean value of covariates z in region i; and
n_i = the number of groups of the species seen in region i.

Only the sightings (n) and survey effort (L) on planned large-scale transect lines (Fig. 1) are used to estimate abundance. Fine-scale survey effort in 1991 (circumnavigations of the Channel Islands, Barlow 1995), in 2005 (National Marine Sanctuaries, Forney 2007) and in 2014 (Bureau of Ocean Energy Management study areas) are not used for abundance estimation. However, all sightings made using standard search protocols are used to estimate $f(0)$. Transect lines and sightings are limited to Beaufort 0-5 wind

conditions for all species except *Kogia* spp. *Kogia* were only seen in Beaufort 0-3 conditions, so abundance is estimated for this genus using only transect lines and sightings in these more limited conditions. Abundance, *N*, for each species in the entire study area is estimated as the sum of the product of the cetacean density and the areas, A_i, in each of the four regions (Table 2):

$$N = \sum_{i=1}^{4} N_i = \sum_{i=1}^{4} D_i \cdot A_i \qquad (2).$$

Equations (1) and (2) were applied for each survey year and for all years pooled.

As in previous analyses, data from the entire time series (in this case, 1991-2014) and all regions are pooled to parameterize multiple-covariate models (Marques and Buckland 2003) that describe the relative probabilities of detecting cetaceans groups as functions of their distance from the transect line and a variety of other factors that affect the likelihood that a group will be seen. Relative to previous analyses, truncation distances (Table 1) are increased to increase the sample size use in estimating encounter rates and thereby reduce the variance in estimating density and abundance. Truncation distances are increased from 2 to 3 km for Dall's porpoises and from 4 km to 5.5 km for delphinids and large cetaceans but are kept at 4 km for small whales. Detection probabilities from all models within 2 AIC_c units of the best-fit model are averaged, weighted by their AIC_c values.

In past analyses of Dall's porpoise abundance (Barlow & Forney 2007), survey conditions were limited to Beaufort 2 or better to avoid bias that could be caused by movement of the animals in reaction to the vessel prior to being seen. Often Dall's porpoises are not seen in rough seas until they start swimming rapidly towards the vessel to bow-ride. The new approach to estimating *g(0)* used in this paper should correct for this bias because reactive movement affects apparent density in different sea states which is the basis for Beaufort-specific *g(0)* estimates. To evaluate whether this approach is effective, we also estimate Dall's porpoise abundance for Beaufort 0-2 and Beaufort 0-3 conditions (in addition to the Beaufort 0-5 conditions used for all other species).

Multiple covariate line-transect models are fit using the function *ddf.r* in the R package Distance v.0.9.4 with a half-normal key function and no adjustment terms. The scheme used for choosing the covariates is based on the results of a meta-analysis of 32 SWFSC surveys (Barlow *et al.* 2011). In this analysis of a much larger set of survey data, the authors found that including survey-specific covariates did not improve the fit of a detection probability model to empirical distributions of perpendicular detection distances when other important covariates (e.g. Beaufort sea state, swell height, visibility, survey vessel and group size) were included in the model. This result justifies the pooling of data from multiple surveys to increase sample size, to better estimate the truly important covariates, and, thereby, to improve precision in density and abundance estimates. They found that the choice of appropriate covariates varied among groups of species with different sighting characteristics (such as large whales which are typically detected by seeing their large blows and small delphinids that are typically detected from the splashes). They found, however, that distributions of perpendicular sighting distances

differed among individual species within these species groups and that the inclusion of a species-specific covariate improved the detection model for most species groups.

The same six species groups (Table 1) are used in the current analysis as were used by Barlow *et al.* (2011). The multiple covariate models include *Species* as a categorical covariate to explain species-specific differences within most species group. Additional covariates are added in a step-wise approach based on the covariate that contributed the greatest reduction in AIC_c at each step. Covariates are added until no further improvement is seen in AIC_c. Potential covariates include those that were found to be important in the previous analyses (Barlow *et al.* 2011): Beaufort state (*Beauf*), swell height in feet from trough to crest (*SwellHght*), visibility or the maximum estimated distance in nautical miles at which observers could see a dolphin (*Vis*, truncated at 6 nmi or roughly the distance to the horizon), the mean estimate of group size (*GroupSize* and its natural logarithm *lnGroupSize*), and the survey vessel used (*Ship*). *SwellHght* is correlated with *Beauf* (Pearson's R = 0.41), so swell height is re-expressed as the swell anomaly (*SwellAnom*) or the deviation from the expected swell height for a given sea state (Barlow *et al.* 2011). For species with fewer than 25 sightings, the multiple co-variate models were limited to *Beauf* and *Species*, to improve the stability of bootstrap estimates. Estimates of *f(0)* are expressed as the Effective half-Strip Widths in km (ESW = $1/f(0)$).

Multiple observers typically made independent group size estimates. Calibration factors are used to correct for individual biases in estimating group sizes for all species (Gerrodette & Forcada 2005, Barlow & Forney 2007). Direct calibration coefficients (based on group sizes counted from aerial photographs) are available for many SWFSC observers from survey data collected in the eastern tropical Pacific (Gerrodette *et al.* 2002), including six of the observers on the 2014 survey. Aerial photographic estimates of group size are not available for the California Current surveys; however, indirect calibration factors are estimated for most of the remaining observers using a method (Barlow *et al.* 1998, Barlow & Forney 2007) that compares their estimates of group size to the calibrated estimates of the other observers. If neither direct nor indirect calibration coefficients were available for an observer, a generic correction of 0.860 (Gerrodette & Forcada 2005) is applied to correct for the average tendency for observers to underestimate group size. The size estimate for each group was calculated as the geometric mean of the individual calibrated estimates weighted by each observer's variance in estimating group size (Barlow *et al.* 1998). Mean group size in a region (s_i in Eq. 1) is estimated as a simple average of the size estimates for each group.

The trackline detection probability, *g(0)*, is estimated as the average of the Beaufort-specific *g(0)* values for a given species and geographic region weighted by the length of survey effort at each Beaufort state. Beaufort- and species-specific *g(0)* values are taken from Barlow (2015) and are based on a new approach to estimating *g(0)* that uses changes in apparent density in different Beaufort states to infer changes in *g(0)* relative to the best survey conditions (Beaufort 0). These values are considerably lower than previous estimates that were based on a conditionally independent observer who recorded sightings missed by other observers (Barlow 1995). The estimates of *g(0)* for

sperm whales (Moore and Barlow 2014), small beaked whales and dwarf and pygmy sperm whales (Moore and Barlow 2013; Barlow 2015) also incorporate a correction for availability bias because some of these long-diving animals will be missed even in the best survey conditions if they are directly under the transect line.

If a group of cetaceans could not be identified to species but observers specified a "probable" species, that group is assigned to the probable species. As in previous analyses (Barlow & Forney 2007), the observers' expert opinions are believed to be more reliable for abundance estimation than prorating unidentified groups to a species category. If no "probable" species is specified, the abundance of unidentified cetaceans is estimated for the lowest specified taxonomic level (e.g., "unidentified delphinoid" or "unidentified rorqual", see Table 1).

The precision of abundance and density is estimated using a nonparametric bootstrap with segments of survey effort as the bootstrap unit. Consecutive survey segments are combined into segments of ~150 km length (roughly one survey day). Survey segments (and associated sightings) are sampled with replacement within each region and year, matching the actual number of segments sampled within that region. For species with fewer than 25 sightings, bootstrap group sizes are sampled from all years and regions. Line-transect models are fit to these sighting data replicating the same step-wise model fitting framework with model averaging. Values of $g(0)$ for each bootstrap sample are estimated with a parametric bootstrap by drawing from a logit-transformed normal distribution with the mean and standard error of the $g(0)$ estimate. The bootstrap sample size is 100, and standard errors of effective strip width ($1/f(0)$), density, and abundance are estimated as the standard deviation of their respective bootstrap estimates.

RESULTS

The 2014 survey covered ~9,330 km of the planned transects (Fig. 1) in Beaufort states of 0-5. Approximately 11% of all survey in 2014 was in calm (Beaufort 0-2) conditions, which falls within the range of 10-25% observed during previous surveys (Table 2). The survey effort in Beaufort 0-5 is geographically well distributed in 2014 (Fig. 2), and all four strata received approximately uniform survey coverage. Survey effort in calm conditions is much more patchily distributed (Fig. 2).

The geographic distribution of sightings appears to be shifted northward for many delphinid species (Fig. 3, Appendix) relative to previous surveys (Barlow & Forney 2007; Barlow 2010). Typically, few short-beaked common dolphins or striped dolphins are seen north of 40° N, but in 2014 both species were commonly seen as far north as 44° N. Northern right whale dolphins were not seen at all off California and few Pacific white-sided dolphins were seen off central and southern California. Pygmy killer whales (normally a tropical species) were seen for the first time off California during the 2014 survey, and another tropical species, the false killer whale, was photographed by whale watching vessels in southern California that year. The distribution of common large whales (fin, sperm, blue & humpback) was not remarkably different from previous years,

but more groups of sei whales were seen in 2014 than in all previous SWFSC surveys combined.

New group size calibration coefficients were estimated for four observers using the indirect calibration method. These new calibration coefficients (0.907, 0.874, 0.923, and 0.961, respectively for observer numbers 80, 86, 234, and 280) were less than one, indicating that they tended to under-estimated the true group size. However, their degree of under-estimation was less than that found by Gerrodette & Forcada (2005) who estimated an average coefficient of 0.86 for directly calibrated observers.

The covariates selected in fitting our line-transect models of perpendicular sighting distance (Table 2) are similar to the covariates selected in a similar approach by Barlow *et al.* (2011). In addition to *Species*, which was included for all species groups, the commonly selected covariates for all species were some measure of group size (*LnTotGS* or *TotGS*), Beaufort state, ship and visibility. Swell height anomaly was also included in most models, but was added last or nearly last by the stepwise fitting algorithm. However, the signs of the coefficients were not always consistent among groups. In the best-fit models, the sign of the visibility term was always positive, the sign of the group size terms was usually positive, and the sign of the Beaufort and swell height terms were usually negative, which is expected if sighting distances increase with visibility and group size and decrease with higher Beaufort states (higher wind speed) and swell heights. Large whales are an exception for which the Beaufort coefficient is slightly positive, and Dall's porpoise are an exception for which the group size coefficients were negative. The coefficients for the ship effect term were completely inconsistent among species groups, with different ships having greater sighting distances for some species and lower distances for others.

For most species, mean estimates of effective strip width (ESW) ($1/f(0)$) varied little among years and among species within a species group (Table 4). The coefficients of variation associated with estimates of ESW (Table 4, Appendix) are small compared with the overall coefficient of variation in estimating abundance, which indicates that uncertainty in estimating this component of abundance is not contributing much to the overall uncertainty in abundance estimates. ESWs are consistently greatest for killer whales and sperm whales. ESWs for humpback whales are consistently greater than for fin and blue whales. Unidentified large whales and unidentified rorquals also have large ESWs, probably because distant sightings are less likely to be identified. The lowest estimates of ESW are for Dall's porpoise, *Kogia* spp. and small beaked whales, although a direct comparison of these species to others is not valid given the different choices in truncation distance.

For most species, trackline detection probabilities ($g(0)$) and mean group sizes did not vary much among years (Tables 5 & 6, respectively), but $g(0)$ did vary tremendously among different species. Trackline detection probabilities were generally much lower than those used in previous publications (Barlow & Forney 2007), especially for baleen whales. Long-beaked common dolphins consistently formed the largest groups in all years, followed closely by short-beaked common dolphins. Unlike those two species,

Pacific white-sided dolphins and northern right whale dolphins group sizes where highly variable among years.

The new abundance estimates are stratified by region, pooled over all years 1991-2014 (Table 7) and stratified by year (1996-2012), pooled over all regions (Table 8). For comparison to previous results, the year-specific abundance estimates are presented for the three California strata pooled (Table 9) and for the Oregon/Washington stratum (Table 10). Although sample sizes are typically too small for meaningful estimates, more detailed stratifications by year and region are given in the Appendix. Pooled 2008 and 2014 abundance estimates and minimum abundance for estimating PBR are given in Table 11.

Dall's porpoise abundance is also estimated for Beaufort 0-2 and Beaufort 0-3 conditions (Appendix). The mean (and standard deviation) of annual estimates of Dall's porpoise abundance in the three California strata (1991-2014) are 20,959 (15,980), 18,372 (10,523), and 17,961 (8,588) for Beaufort 0-2, 0-3, and 0-5 conditions (respectively). For the Oregon/Washington stratum (1996-2014) the comparable abundances are 19,345 (19,835), 16,226 (9,558), and 18,300 (8,254). The average abundances do not vary much with the Beaufort conditions used in making the estimates, but precision is much better when a wider range of conditions (and therefore a greater number of sightings) is included.

DISCUSSION

Distribution

The northward shift in the distribution of many species seen during the 2014 survey may be related to the particularly warm waters (the "warm blob") in the eastern North Pacific that year (Bond *et al.* 2015). The 2014 abundance of short-beaked common dolphins, a warm temperate species, is much higher than any previous year in the study area (Table 8), and the estimate for the Oregon/Washington stratum (Table 10) was approximately 5 times the average abundance there (Table 7). The 2014 abundance of striped dolphins in the California strata is also the highest of any survey year, and many more were seen off Oregon than ever before. The abundance of long-beaked common dolphins, another warm temperate species, is high in 2014, but this was not higher than the 2008 estimate. In general, warm temperate delphinids appear to have shifted northward with additional animals (likely from Mexico) moving into California waters and with some animals from California moving into Oregon and Washington waters.

The abundance of cold temperate species was not uniformly low, as might be expected given the warm water in the California Current. Dall's porpoise and Pacific white-sided dolphin abundance in 2014 is fairly typical of their abundance in the previous three surveys (2001-2008, Table 8) and the abundance of northern right whale dolphins is higher in 2014 than previous years. However, these three cold-temperate species all showed distributional shifts to the north (Fig. 3). All of the sightings of northern right

whale dolphins were in the Oregon/Washington stratum, and sightings of the other two species were very low in southern and central California in 2014.

The increase in sei whale sightings in 2014 is not clearly related to a northward shift caused by warm waters. Across the North Pacific, sei whales typically feed in summer and fall in cold temperate waters between 35° and 60° N (Miyashita *et al.* 1995). Although some of the increase in sei whale abundance may be attributed to population recovery from whaling, the observed increase may also represent a distributional shift from pelagic waters in the North Pacific to more coastal waters in the California Current. The higher abundance of northern right whale dolphins in 2014 might also be attributable to offshore/inshore movement. The northward shift of blue whales into waters off Oregon and Washington (Barlow 2010) appears to be continuing, and the highest estimate of abundance in that region is in 2014.

Abundance

The abundances in this report are estimates of the number of animals present within the defined study area at the time of the survey. These are not closed population estimates for any species. This point is emphasized by the observed year-to-year changes in abundance that are caused by apparent shifts in distribution into and out of this study area. In addition to year-to-year variability, the large baleen whales (blue, fin, sei and humpback whales) undergo seasonal migrations from feeding areas in the California Current to more tropical breeding areas. These southward migrations begin prior to the end of the surveys in most years, and therefore survey-based methods only estimate the average number of migrating whales that are present during the survey period. Seasonal north/south shifts in distribution have also been reported for Pacific white-sided dolphins (Forney & Barlow 1998) and common dolphins (Dohl *et al.* 1986; Forney & Barlow 1998).

Re-estimated abundances for the 1991-2008 surveys are systematically higher than previously published estimates. This is the result of using new, lower estimates of *g(0)* from Barlow (2015) (Table 5). These Beaufort-specific *g(0)* values provide a more complete accounting for missed trackline animals, and the new estimates for these years should therefore be less biased than the previous estimates. Comparing the 2008 estimates in Table 7 to the 2008 estimates in Barlow (2010), the average abundance increased by ~50% for delphinids, by ~100% for large baleen whales, by ~100% for small whales (*Ziphius* spp., *Mesoplodon* spp., *Kogia* spp. and minke whales), and by ~15% for Dall's porpoises. The fractional increases actually varied considerably within these broad categories. Values of *g(0)* decrease much more rapidly with Beaufort state for fin whales than for humpback whales, likely due to their longer dive times. Consequently, fin whale abundance changed more than humpback whale abundance when these new methods are applied. The changes in estimates of Dall's porpoise abundance are small because prior estimates were based only on Beaufort 0-2 conditions and therefore did not include a large bias due to missed animals in rough seas.

Other analytical changes have resulted in other changes to the 1991-2008 abundances relative to previous published estimates, but those changes are not expected to be systematically higher or lower. Greater truncation distances are used for most species. A greater range of allowable Beaufort conditions is used for small whales and Dall's porpoises. A different scheme for choosing covariates is used in estimating effective strip widths based on Barlow (2010). As a result of these changes, the number of sightings used for abundance estimation (Table 6), the mean effective strip widths (Table 4), and the distances surveyed (Table 2) are different from those given in previous publications (Barlow & Forney 2007; Barlow 2010). Mean group sizes also changed as a result of including more groups within the truncation distance.

By far, the most abundant small cetacean in the study area in all years is the short-beaked common dolphin. The second most abundant species was the long-beaked common dolphin in some years and the striped dolphin in other years. The most abundant large whale in 1996-2014 is, by a large margin, the fin whale.

Although abundances are generally higher due to the new *g(0)* estimates, the year 2014 has especially high estimates for several species. The 2014 abundance of short-beaked common dolphins is more than twice the highest estimate for that species from 1996 to 2008 (Table 8). This much higher abundance appears due more to an increase in the number of sightings than an increase in group size (Table 6). The 2014 estimates for striped dolphins, northern right whale dolphins, Baird's beaked whales, sei whales, fin whales, and humpback whales are also the highest abundances for those species (Table 8). For most of these species the increase is also due to a greater number of sightings, with near-average group sizes (Table 6); however, for northern right whale dolphins the group size was approximately twice the long-term average and the number of groups seen was lower than average. These higher estimates in 2014 cannot be explained by new methods because the new methods were applied to all years.

The estimate of sperm whales abundance in 2014 (1,083) is roughly half the trend-based estimates of abundance given in Moore and Barlow (2014). The trend-based approach to estimating current abundance uses data from a longer time series that includes the higher abundance seen in 2005 and 2008. The coefficients of variation for single-year estimates of sperm whale abundance are large, illustrating the difficulty of estimating abundance from a single survey year and the advantage of using data from many years. The precision of abundance estimates for most species can be improved by using this trend-based approach.

Estimates of Dall's porpoise abundance did not change much as a result of applying the new *g(0)* estimates because previous estimates were only based on sightings and surveys in calm seas (Beaufort 0-2). One benefit of using the new *g(0)* values for Dall's porpoise is the ability to use data collected in rougher seas. Only about 11% of survey effort in 2014 occurred in calm conditions (Table 2), and the distribution of survey effort in calm seas is very patchy compared to the overall grid of survey effort. The new *g(0)* method not only corrects for potential biases associated with missed animals in rough seas, it also corrects for biases caused by reactive movement in response

to the ship (Barlow 2015). The standard deviations of annual estimates of Dall's porpoise abundance are reduced by a factor of 2 when this larger sample of Beaufort 0-5 data is used to estimate their abundance.

Trends

Although it is tempting to interpret changes in abundance estimates as long term trends, either due to population growth or movement, the analyses used here are not suitable for directly using the estimates and measures of precision for quantitative trend analyses. Effective strip widths and trackline detection probabilities are estimated for pooled years which introduces covariance in the abundance estimates. Bayesian methods have been developed and applied to these data to specifically analyze trends in abundance while accounting for these structural covariances. These trend analyses methods have been applied to fin whales, Cuvier's beaked whales, *Mesopodon* beaked whales, Baird's beaked whales, and sperm whales (Moore and Barlow 2011; Moore and Barlow 2013; Moore and Barlow 2014). Long-term trends in blue whale populations are better based on capture/recapture abundance estimate because the fraction of the population in the California Current study area has declined over time (Calambokidis *et al.* 2009; Calambokidis and Barlow 2013). Humpback whale abundance and trends are more precisely estimated using capture-recapture methods as well (Calambokidis and Barlow 2013).

The pattern of increasing fin whale and humpback whale abundance found by Moore and Barlow (2011) and Calambokidis and Barlow (2013) appears consistent with the highest-yet abundances of those species in 2014. Moore and Barlow (2013) found a decline in the abundance of Cuvier's and *Mesoplodon* beaked whale abundance from 1991-2008. The 2014 estimate of Cuvier's beaked whales in the California strata is still lower than the 1991 and 1993 estimates (Table 9), but the pattern seen in the entire study area from 1996 to 2014 (Table 8) may indicate a change in that downward trend. A revised Bayesian trend analysis incorporating this new survey year may be appropriate for beaked whales. From the 1970s to the early 1990s, short-beaked common dolphins were reported to be increasing in abundance off California (Forney & Barlow 1998) and decreasing in abundance off Baja California (Anganuzzi & Buckland 1994), and the increase off California appears to be continuing in the current data. Campbell *et al.* (2015) did not find any net increase in common dolphins in southern California from 2004 to 2013. Given the nearly monotonic increase in abundance of short-beaked common dolphins from 1991 to 2014 in our data, a trend analysis for that species might also be informative. Campbell *et al.* (2015) found a statistically significant, roughly 5-fold reduction in the density of Pacific white-sided dolphins in southern California from 2004 to 2013, which mirrors our roughly 3-fold reduction in abundance estimates from 2005 to 2014 in the pooled California strata (Table 9). However, in our longer time series, Pacific white-sided dolphin abundance in California was also very low in 1991 and 1993.

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LITERATURE CITED

Angunuzzi, A. A. and S. T. Buckland. 1994. Relative abundance of dolphins associated with tuna in the eastern Pacific Ocean: Analysis of 1992 data. Report International Whaling Commission. 44:361-366.

Barlow, J. 1995. The abundance of cetaceans in California waters: Part I: Ship surveys in summer and fall of 1991. Fishery Bulletin 93:1-14.

Barlow, J. 2010. Cetacean abundance in the California Current estimated from a 2008 ship-based line-transect survey. NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-456. 20pp.

Barlow, J. 2015. Inferring trackline detection probabilities, *g(0)*, for cetaceans from apparent densities in different survey conditions. Marine Mammal Science 31(3):923-943.

Barlow, J., L. T. Ballance, and K. A. Forney. 2011. Effective strip widths for ship-based line-transect surveys of cetaceans. NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-484. 28pp.

Barlow, J. and K. A. Forney. 2007. Abundance and population density of cetaceans in the California Current ecosystem. Fishery Bulletin 105:509-526.

Barlow, J. T. Gerrodette, and W. Perryman. 1998. Calibrating group size estimates for cetaceans seen on ship surveys. Admin. Rept. LJ-98-11 available from Southwest Fisheries Science Center, 8901 La Jolla Shores Dr., La Jolla, CA 92037. 39pp.

Bond, N. A., M. F. Cronin, H. Freeland, and N. Mantua. 2015. Causes and impacts of the 2014 warm anomaly in the NE Pacific. Geophys. Res. Lett., 42, 3414–3420. doi: 10.1002/2015GL063306.

Calambokidis, J. and J. Barlow. 2013. Updated abundance estimates of blue and humpback whales off the US west coast incorporating photo-identifications from 2010 and 2011. Document PSRG-2013-13 presented to the Pacific Scientific Review Group, April 2013. 7 p.

Calambokidis, J., J. Barlow, J. K. B. Ford, T. E. Chandler, and A. B. Douglas. 2009. Insights into the population structure of blue whales in the Eastern North Pacific from recent sightings and photographic identification. Marine Mammal Science

Campbell, G. S., L. Thomas, K. Whitaker, A. B. Douglas, J. Calambokidis, and J. A. Hildebrand. 2015. Inter-annual and seasonal trends in cetacean distribution, density and abundance off southern California. Deep-Sea Research II. Topical Studies in Oceanography112: 143-157.

Dohl, T. P., M. L. Bonnell, and R. G. Ford. 1986. Distribution and abundance of common dolphin, *Delphinus delphis*, in the Southern California Bight: A quantitative assessment based on aerial transect data. Fishery Bulletin 84:333-343.

Forney, K.A. 2007. Preliminary estimates of cetacean abundance along the U. S. West Coast and within four National Marine Sanctuaries. NOAA Technical Memorandum NOAA-NMFS-SWFSC-TM-406. 27pp.

Forney, K.A. and J. Barlow. 1998 Seasonal patterns in the abundance and distribution of California cetaceans, 1991-92. Marine Mammal Science 14(3):460-489.

GAMMS 2005. Guidelines for preparing stock assessment reports pursuant to section 117 of the Marine Mammal Protection Act. Available from *www.**nmfs.noaa.gov**/pr/pdfs/sars/gamms2005.pdf.*

Gerrodette, T., and J. Forcada. 2005. Non-recovery of two spotted and spinner dolphin populations in the eastern tropical Pacific Ocean. Marine Ecology Progress Series 291:1-21.

Gerrodette, T., W. Perryman and J. Barlow. 2002. Calibrating group size estimates of dolphins in the eastern tropical Pacific Ocean. Administrative Report LJ-02-08, available from Southwest Fisheries Science Center, P.O. Box 271, La Jolla, CA 92038. 73pp.

Marques, F. C. and S. T. Buckland. 2003. Incorporating covariates into standard line transect analysis. Biometrics 59:924-935.

Miyashita, T., H. Kato, and T. Kasuya (Eds.). 1995. Worldwide map of cetacean distribution based on Japanese sighting data. Volume 1. National Research Institute of Far Seas Fisheries, Shizuoka, Japan. 140pp.

Moore, J. E. and J. Barlow. 2011. Bayesian hierarchical estimation of fin whale abundance trends from a 1991-2008 time series of line-transect surveys in the California Current. Journal Applied Ecology 48:1195-1205.

Moore, J. E. and J. Barlow. 2013. Declining abundance of beaked whales (family Ziphiidae) in the California Current large marine ecosystem. PlosOne.

Moore, J. E. and J. Barlow. 2014. Improved abundance and trend estimates for sperm whales in the eastern North Pacific from Bayesian hierarchical modeling. Endangered Species Research 25:141–150.

Taylor, B. L., Martinez, M., Gerrodette, T., Barlow, J., and Hrovat, Y. N. 2007. Lessons from monitoring trends in abundance of marine mammals. Marine Mammal Science 23:157-175.

Wade, P. R. 1998. Calculating limits to the allowable human-caused mortality of cetaceans and pinnipeds. Marine Mammal Science 14(1):1-37.

Table 1. Species groups, common names and scientific name. Species and higher taxonomic categories were pooled into these groups for estimating line-transect detection probabilities as functions of perpendicular sighting distance and other covariates.

Species group	Common name	Scientific name(s)	Truncation Distance (km)
Small delphinids			5.5
	Short-beaked common dolphin	*Delphinus delphis*	
	Long-beaked common dolphin	*Delphinus capensis*	
	Unclassified common dolphin	*Delphinus* spp.	
	Striped dolphin	*Stenella coeruleoalba*	
	Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	
	Northern right whale dolphin	*Lissodelphis borealis*	
	Unidentified delphinoid		
Large delphinids			5.5
	Bottlenose dolphin	*Tursiops truncatus*	
	Risso's dolphin	*Grampus griseus*	
	Pygmy killer whale	*Feresa attenuata*	
	Short-finned pilot whale	*Globicephala macrorhynchus*	
Porpoises			3.0
	Dall's porpoise	*Phocoenoides dalli*	
Large odontocetes			5.5
	Baird's beaked whale	*Berardius bairdii*	
	Killer whale	*Orcinus orca*	
	Sperm whale	*Physeter macrocephalus*	
Small whales			4.0
	Mesoplodon spp	*Mesoplodon* spp.	
	Cuvier's beaked whale	*Ziphius cavirostris*	
	Unidentified ziphiid whale	*Mesoplodon* or *Z. cavirostris*	
	Kogia spp.	*Kogia breviceps* or *Kogia sima*	
	Minke whale	*Balaenoptera acutorostrata*	
	Unidentified small whale		
Large whales			5.5
	Bryde's whale	*Balaenoptera edeni*	
	Sei whale	*Balaenoptera borealis*	
	Sei/Bryde's whale	*B. edeni* or *B. borealis*	
	Sei/Bryde's/fin whale	*B. borealis, B. edeni or B. physalus*	
	Fin whale	*Balaenoptera physalus*	
	Blue whale	*Balaenoptera musculus*	
	Humpback whale	*Megaptera novaeangliae*	
	Unidentified rorqual		
	Unidentified large whale		

Table 2. Survey effort (km) stratified by year and geographic region. The percentage of survey effort in calm conditions (Beaufort 0-2) is given for each year and region. The size (km^2) of each survey region is also given

	Region					
Year	Southern California	Central California	Northern California	Oregon & Washington	Total Effort	Percent Calm
1991	4,041	2,968	3,018	-	10,027	25%
1993	2,543	1,523	2,085	-	6,152	19%
1996	3,994	3,057	3,287	4,338	14,676	13%
2001	2,455	1,608	2,376	3,098	9,538	10%
2005	2,838	2,386	2,665	2,951	10,840	10%
2008	3,035	2,895	2,396	3,238	11,563	11%
2014	2,780	1,841	1,998	2,708	9,327	11%
Total	21,687	16,277	17,826	16,333	72,123	14%
Percent Calm	12%	14%	19%	10%	14%	
Study Area	318,541	242,959	258,070	322,237	1,141,807	

Table 3. Covariates selected for the best-fit line-transect models for each of the species groups used for the abundance estimates. Line-transect models were fit to data from 1991 to 2014. The species covariate (*Species*) allowed variation in the scale factor of the detection function for different species within a species group and was included in all models. Other covariates were added (in the given order) if they improved model fit (measured by AIC_c). Potential covariates included total group size (*TotGS*), the natural logarithm of total group size (*LnTotGS*), Beaufort state (*Beauf*), survey vessel (*Ship*), visibility (*Vis*), and swell anomaly (*SwellAnom*). Covariates in parentheses were only included in some of the averaged models that were within two AIC_c units of the best-fit model.

Species group	Covariates in Final Line-transect Models
Small delphinids	*Species + LnTotGS + Beauf + Vis + (Ship + TotGS + SwellAnom)*
Large delphinids	*Species + TotGS + (Vis + LnTotGS + Beauf + SwellAnom)*
Large odontocetes	*Species + (LnTotGS + Beauf + SwellAnom)*
Dall's porpoise	*Species + Beauf + LnTotGS + Ship + Vis + (SwellAnom + TotGS)*
Small whales	*Species + Beauf +(LnTotGS + TotGS + SwellAnom + Vis)*
Large whales	*Species + Ship + Vis + (Beauf + SwellAnom + LnTotGS + TotGS)*

Table 4. Mean effective strip widths (ESW = 1/*f(0)* km) and coefficients of variation (CVs) for each species and year in the four geographic regions (pooled). ESWs and CVs are missing (NA) in years without sightings of that species.

	1991		1993		1996		2001		2005		2008		2014		Mean
Species	ESW	CV	ESW	CV	ESW	CV	ESW	CV	ESW	CV	ESW	CV	ESW	CV	ESW
Short-beaked common dolphin	3.03	0.08	3.27	0.09	2.90	0.08	2.55	0.10	2.91	0.08	2.85	0.08	2.67	0.08	2.88
Long-beaked common dolphin	3.57	0.15	2.66	0.21	3.45	0.17	2.48	0.20	3.66	0.17	3.65	0.36	4.22	0.11	3.39
Unidentified common dolphin	2.78	0.23	2.66	0.23	2.77	0.16	2.04	0.18	4.17	0.14	4.07	0.12	3.42	0.19	3.13
Striped dolphin	3.63	0.07	3.87	0.09	3.48	0.12	3.46	0.12	3.26	0.08	3.44	0.09	3.32	0.09	3.49
Pacific white-sided dolphin	2.65	0.18	1.66	0.23	3.05	0.11	2.00	0.19	2.72	0.16	2.49	0.19	1.85	0.21	2.35
Northern right whale dolphin	3.61	0.12	2.55	0.20	3.28	0.12	2.33	0.14	3.33	0.12	2.83	0.16	2.31	0.23	2.89
Bottle-nose dolphin	2.79	0.17	3.11	0.20	2.60	0.20	2.42	0.24	2.33	0.30	2.39	0.37	3.14	0.28	2.68
Risso's dolphin	2.64	0.16	2.69	0.16	2.69	0.15	2.46	0.15	2.54	0.17	2.29	0.19	2.30	0.18	2.52
Pygmy killer whale	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.36	0.18	2.36
Short-finned pilot whale	NA	NA	3.45	0.37	3.49	0.31	NA	NA	3.49	0.34	3.33	0.39	3.66	0.32	3.48
Killer whale	5.32	0.18	5.40	0.13	5.30	0.12	5.39	0.10	5.22	0.12	5.38	0.06	5.19	0.16	5.31
Dall's porpoise	1.36	0.09	1.05	0.08	1.27	0.07	1.40	0.10	1.29	0.07	1.42	0.10	1.25	0.10	1.29
Mesoplodon spp.	1.96	0.21	1.99	0.18	1.68	0.20	NA	NA	1.58	0.29	1.05	0.28	2.01	0.22	1.71
Cuvier's beaked whale	1.84	0.24	1.53	0.26	1.59	0.23	1.62	0.32	1.65	0.21	1.69	0.29	1.38	0.28	1.61
Baird's beaked whale	2.14	0.38	3.99	0.35	2.03	0.49	1.75	0.56	2.85	0.35	2.69	0.39	2.99	0.36	2.63
Kogia spp	2.55	0.22	2.40	0.20	2.77	0.21	NA	NA	NA	NA	2.32	0.21	NA	NA	2.51
Sperm whale	4.98	0.12	5.16	0.07	4.91	0.12	4.85	0.13	4.70	0.14	4.42	0.15	4.51	0.13	4.79
Minke whale	2.78	0.26	NA	NA	2.08	0.31	2.31	0.35	2.49	0.33	1.33	0.55	2.11	0.39	2.18
Bryde's whale	2.81	0.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.81
Sei whale	NA	NA	3.14	0.23	2.91	0.26	3.31	0.19	3.09	0.19	4.11	0.15	3.22	0.19	3.30
Sei/Bryde's whale	2.90	0.23	2.76	0.20	NA	NA	NA	NA	NA	NA	NA	NA	2.83	0.21	2.83
Sei/Bryde's/fin whale	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.12	0.27	2.12
Fin whale	3.28	0.08	3.31	0.08	2.97	0.06	3.07	0.06	2.91	0.07	3.84	0.10	2.92	0.06	3.19
Blue whale	3.14	0.08	3.09	0.07	2.78	0.06	2.83	0.08	2.69	0.08	3.55	0.11	2.81	0.06	2.98
Humpback whale	3.80	0.10	3.80	0.08	3.48	0.09	3.75	0.09	3.79	0.08	4.33	0.07	3.53	0.09	3.78
Unidentified dolphin	2.64	0.12	2.69	0.23	3.01	0.12	2.90	0.18	2.99	0.14	NA	NA	3.19	0.21	2.90
Unidentified beaked whale	NA	NA	2.40	0.19	2.40	0.17	1.40	0.26	2.02	0.20	1.68	0.25	1.67	0.23	1.93
Unidentified small whale	2.37	0.22	1.49	0.34	1.93	0.27	1.78	0.26	1.91	0.37	1.15	0.47	1.20	0.30	1.69
Unidentified rorqual	4.09	0.13	4.57	0.08	4.26	0.10	4.35	0.09	4.02	0.09	4.72	0.06	4.19	0.10	4.31
Unidentified large whale	4.60	0.13	4.68	0.12	4.40	0.16	4.55	0.14	4.39	0.16	4.97	0.08	4.44	0.17	4.58

Table 5. Mean trackline detection probabilities (*g(0)*) and coefficients of variation for each species and year pooled across all four geographic regions. Values are missing (NA) in years without sightings of that species.

	1991		1993		1996		2001		2005		2008		2014		Mean
Species	g(0)	CV	g(0)	CV	g(0)	CV	g(0)	CV	g(0)	CV	g(0)	CV	g(0)	CV	g(0)
Short-beaked common dolphin	0.62	0.16	0.65	0.14	0.60	0.11	0.54	0.13	0.58	0.13	0.56	0.15	0.58	0.13	0.59
Long-beaked common dolphin	0.61	0.18	0.58	0.22	0.59	0.17	0.51	0.19	0.60	0.23	0.56	0.18	0.65	0.20	0.59
Unidentified common dolphin	0.62	0.17	0.63	0.21	0.60	0.15	0.51	0.21	0.60	0.21	0.55	0.22	0.65	0.24	0.59
Striped dolphin	0.45	0.12	0.49	0.12	0.41	0.12	0.34	0.15	0.40	0.13	0.38	0.11	0.42	0.11	0.41
Pacific white-sided dolphin	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Northern right whale dolphin	0.58	0.10	0.63	0.10	0.56	0.10	0.53	0.10	0.52	0.10	0.54	0.11	0.53	0.17	0.56
Bottle-nose dolphin	0.34	0.36	0.35	0.22	0.31	0.21	0.27	0.30	0.33	0.27	0.29	0.27	0.34	0.28	0.32
Risso's dolphin	0.71	0.08	0.76	0.10	0.66	0.08	0.62	0.11	0.70	0.08	0.65	0.11	0.69	0.10	0.69
Pygmy killer whale	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.41	0.31	0.41
Short-finned pilot whale	NA	NA	0.81	0.08	0.67	0.14	NA	NA	0.73	0.10	0.68	0.15	0.75	0.12	0.73
Killer whale	0.75	0.20	0.81	0.22	0.70	0.24	0.69	0.30	0.70	0.21	0.67	0.31	0.69	0.33	0.72
Dall's porpoise	0.45	0.54	0.45	0.51	0.36	0.37	0.34	0.43	0.35	0.34	0.32	0.38	0.32	0.44	0.37
Mesoplodon spp.	0.15	0.61	0.17	0.52	0.14	0.32	NA	NA	0.13	0.54	0.11	0.64	0.14	0.65	0.14
Cuvier's beaked whale	0.18	0.51	0.18	0.39	0.16	0.41	0.14	0.54	0.14	0.42	0.15	0.35	0.16	0.29	0.16
Baird's beaked whale	0.16	0.53	0.17	0.58	0.13	0.43	0.13	0.79	0.12	0.39	0.12	0.52	0.13	0.59	0.14
Kogia spp	0.05	1.02	0.03	1.60	0.02	1.92	NA	NA	NA	NA	0.03	0.33	NA	NA	0.03
Sperm whale	0.60	0.28	0.63	0.23	0.60	0.19	0.58	0.16	0.60	0.21	0.58	0.22	0.58	0.24	0.60
Minke whale	0.16	0.64	NA	NA	0.13	0.64	0.13	0.60	0.12	1.00	0.12	0.80	0.13	0.91	0.13
Bryde's whale	0.48	0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.48
Sei whale	NA	NA	0.53	0.16	0.48	0.17	0.47	0.22	0.44	0.23	0.44	0.18	0.44	0.15	0.47
Sei/Bryde's whale	0.47	0.19	0.50	0.15	NA	NA	NA	NA	NA	NA	NA	NA	0.44	0.19	0.47
Sei/Bryde's/fin whale	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.42	0.16	0.42
Fin whale	0.41	0.23	0.44	0.18	0.39	0.18	0.38	0.20	0.37	0.17	0.37	0.16	0.36	0.19	0.39
Blue whale	0.61	0.22	0.61	0.21	0.59	0.24	0.58	0.20	0.59	0.20	0.57	0.22	0.59	0.18	0.59
Humpback whale	0.75	0.19	0.77	0.20	0.74	0.24	0.73	0.20	0.73	0.21	0.73	0.22	0.72	0.28	0.74
Unidentified dolphin	0.55	0.13	0.52	0.16	0.51	0.11	0.48	0.15	0.50	0.13	NA	NA	0.51	0.16	0.51
Unidentified beaked whale	NA	NA	0.17	0.61	0.15	0.49	0.14	0.60	0.14	0.43	0.14	0.47	0.14	0.38	0.15
Unidentified small whale	0.12	0.50	0.13	0.52	0.11	0.52	0.10	0.66	0.09	1.05	0.11	0.50	0.10	0.88	0.11
Unidentified rorqual	0.52	0.18	0.53	0.19	0.51	0.19	0.49	0.16	0.49	0.14	0.48	0.17	0.48	0.16	0.50
Unidentified large whale	0.54	0.18	0.51	0.25	0.51	0.16	0.50	0.18	0.51	0.16	0.50	0.18	0.51	0.21	0.51

Table 6. Number of sightings (*n*) and mean group size (*s*) for each species and year in the four geographic regions (pooled). Only on-effort sightings within the truncation distance and on systematic transect lines are included. Group sizes are missing (NA) in years without sightings of that species.

	1991		1993		1996		2001		2005		2008		2014		Pooled Years	
Species	# Sightings	Group Size	# Sightings	Group Size	# Sightings	Group Size	# Sightings	Group Size	# Sightings	Group Size	# Sightings	Group Size	# Sightings	Group Size	# Sightings	Group Size
Short-beaked common dolphin	124	122.5	106	172.1	110	185.0	69	170.2	86	249.4	121	178.1	181	190.6	797	179.4
Long-beaked common dolphin	5	265.2	1	321.7	6	560.7	2	332.8	6	101.7	8	556.9	9	482.0	37	407.6
Unidentified common dolphin	8	27.6	3	15.1	10	13.3	1	10.6	7	134.3	6	100.9	4	131.8	39	63.6
Striped dolphin	24	61.2	16	42.7	15	20.1	6	84.0	23	67.7	19	12.9	47	46.5	150	46.3
Pacific white-sided dolphin	11	27.7	10	12.8	32	146.2	17	33.0	10	101.7	19	83.2	22	30.8	121	73.9
Northern right whale dolphin	15	18.1	8	17.8	18	77.6	25	16.1	6	263.0	13	33.6	7	160.5	92	58.2
Bottle-nose dolphin	16	11.2	4	26.1	8	4.3	9	18.7	6	15.2	2	8.2	3	15.4	48	13.3
Risso's dolphin	28	20.8	17	19.4	27	29.8	27	18.3	14	22.7	6	22.0	13	16.9	132	21.8
Pygmy killer whale	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	1	27.0	1	27.0
Short-finned pilot whale	0	NA	4	14.6	2	42.7	0	NA	1	31.6	1	49.2	1	36.7	9	29.0
Killer whale	5	5.2	2	8.5	7	6.4	8	6.9	7	5.9	5	9.7	3	5.8	37	6.8
Dall's porpoise	87	4.2	13	4.7	173	4.0	74	3.0	70	5.3	65	4.3	36	4.0	518	4.1
Mesoplodon spp.	6	1.7	7	2.0	14	1.6	0	NA	3	3.4	1	1.0	7	1.7	38	1.8
Cuvier's beaked whale	18	2.4	12	1.9	9	1.5	5	2.0	3	2.3	10	1.5	6	1.9	63	1.9
Baird's beaked whale	2	4.2	4	18.9	5	4.8	2	3.7	4	10.1	5	8.4	5	10.5	27	9.3
Kogia spp	2	1.3	3	1.0	1	1.0	0	NA	0	NA	1	1.9	0	NA	7	1.2
Sperm whale	13	5.9	13	8.6	13	6.0	11	9.0	21	8.9	13	4.6	13	3.9	97	6.8
Minke whale	4	1.1	0	NA	10	1.0	4	1.1	5	1.5	2	1.0	3	1.0	28	1.1
Bryde's whale	1	2.1	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	1	2.1
Sei whale	0	NA	2	1.1	2	2.7	1	1.0	3	1.2	3	3.6	14	1.4	25	1.7
Sei/Bryde's whale	2	1.0	3	1.0	0	NA	0	NA	0	NA	0	NA	2	1.0	7	1.0
Sei/Bryde's/fin whale	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	9	1.1	9	1.1
Fin whale	24	2.1	31	2.0	73	1.9	32	2.8	82	2.1	76	2.8	96	1.7	414	2.1
Blue whale	57	2.2	43	1.7	81	1.5	13	1.9	25	1.7	19	1.8	23	1.7	261	1.8
Humpback whale	9	4.3	17	1.7	59	1.9	24	2.3	50	1.7	44	2.1	61	2.1	264	2.0
Unidentified dolphin	12	3.4	5	58.5	19	16.2	5	5.7	13	38.5	0	NA	7	21.7	61	21.7
Unidentified beaked whale	0	NA	3	1.3	3	1.0	2	1.0	4	2.0	4	1.9	8	1.4	24	1.5
Unidentified small whale	8	1.2	5	1.4	7	1.3	4	1.0	2	2.9	2	1.0	5	1.0	33	1.3
Unidentified rorqual	3	1.4	2	1.9	24	1.5	5	1.0	19	1.2	19	1.4	42	1.3	114	1.3
Unidentified large whale	11	1.4	1	1.0	10	1.7	4	1.0	12	1.3	7	1.2	3	1.0	48	1.3

Table 7. Total abundances and coefficients of variation (CVs) estimated for each species in the four geographic strata pooled over all available survey years within each stratum (1991-2014 for the three California strata, 1996-2014 for the Oregon/Washington stratum). CVs are missing (NA) in years without sightings of that species.

	Southern California		Central California		Northern California		Oregon/Washington		Total	
Species	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV
Short-beaked common dolphin	278,305	0.24	208,816	0.26	115,081	0.32	22,300	0.48	624,503	0.15
Long-beaked common dolphin	35,518	0.38	16,814	0.95	0	NA	0	NA	52,331	0.39
Unidentified common dolphin	8,084	0.48	1,041	0.54	27	1.06	0	NA	9,152	0.43
Striped dolphin	21,384	0.24	6,914	0.34	5,857	0.53	2,478	0.94	36,632	0.18
Pacific white-sided dolphin	1,939	0.54	9,823	0.73	5,568	0.46	13,112	0.28	30,441	0.27
Northern right whale dolphin	851	0.48	10,638	0.52	2,266	0.43	14,962	0.47	28,717	0.30
Bottle-nose dolphin	4,977	0.47	356	0.78	253	0.88	0	NA	5,585	0.42
Risso's dolphin	4,172	0.29	4,048	0.33	1,110	0.38	3,796	0.51	13,126	0.22
Pygmy killer whale	229	1.11	0	NA	0	NA	0	NA	229	1.11
Short-finned pilot whale	400	0.74	182	0.94	144	0.84	80	1.12	807	0.47
Killer whale	42	0.93	100	1.24	131	1.12	297	1.27	570	0.76
Dall's porpoise	800	0.95	3,929	1.12	14,288	1.41	18,785	0.94	37,802	0.80
Mesoplodon spp.	691	0.59	473	0.86	655	0.77	381	0.68	2,200	0.35
Cuvier's beaked whale	1,019	0.57	1,184	0.71	534	0.71	908	0.53	3,645	0.35
Baird's beaked whale	565	0.71	1,055	0.90	877	0.82	3,449	0.61	5,946	0.46
Kogia spp	505	1.21	1,590	0.61	242	1.43	524	1.40	2,862	0.53
Sperm whale	538	0.77	226	0.67	705	0.59	296	0.97	1,766	0.43
Minke whale	216	1.60	198	1.20	88	1.32	418	1.05	920	0.80
Bryde's whale	0	NA	12	1.05	0	NA	0	NA	12	1.05
Sei whale	0	NA	26	0.85	82	0.52	130	0.48	238	0.36
Sei/Bryde's whale	17	0.73	17	0.76	5	1.15	0	NA	40	0.52
Sei/Bryde's/fin whale	22	0.83	33	0.81	23	0.76	0	NA	78	0.54
Fin whale	919	0.46	2,156	0.29	1,282	0.43	1,346	0.33	5,704	0.18
Blue whale	966	0.79	636	0.82	260	0.89	92	0.66	1,955	0.50
Humpback whale	59	0.75	730	0.66	153	0.76	681	0.69	1,623	0.43
Unidentified dolphin	3,988	0.43	1,635	0.56	619	0.37	204	0.63	6,446	0.30
Unidentified beaked whale	246	0.60	290	0.81	215	0.58	298	0.74	1,049	0.36
Unidentified small whale	523	0.71	358	0.72	373	0.66	477	0.79	1,731	0.39
Unidentified rorqual	92	0.45	193	0.39	128	0.47	142	0.61	555	0.27
Unidentified large whale	72	0.44	58	0.65	44	0.47	39	0.71	213	0.30

Table 8. Total abundances and coefficients of variation for each species and year in all four regions pooled. Estimates and CVs are missing (NA) in years without sightings of that species. The OR/WA region was not surveyed in 1991 or 1993, so estimates do not include those years.

	1996		2001		2005		2008		2014	
Species	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV
Short-beaked common dolphin	465,341	0.24	558,002	0.36	693,117	0.25	658,901	0.24	1,427,576	0.25
Long-beaked common dolphin	70,558	0.75	34,280	1.14	15,516	0.98	114,031	0.88	89,998	0.58
Unidentified common dolphin	3,211	0.50	666	0.96	21,014	0.94	14,091	0.74	13,518	1.13
Striped dolphin	8,614	0.51	28,773	0.63	61,107	0.46	9,436	0.32	90,433	0.24
Pacific white-sided dolphin	58,438	0.58	16,259	0.49	17,896	0.56	29,863	0.37	24,077	0.45
Northern right whale dolphin	28,790	0.44	17,695	0.34	41,981	0.66	12,916	0.49	54,604	0.81
Bottle-nose dolphin	1,693	0.56	16,902	1.04	6,471	0.63	1,223	0.86	3,027	0.78
Risso's dolphin	16,565	0.51	19,370	0.38	9,196	0.45	4,509	0.56	8,903	0.36
Pygmy killer whale	0	NA	0	NA	0	NA	0	NA	1,580	1.06
Short-finned pilot whale	1,388	0.87	0	NA	700	1.21	909	1.32	770	1.24
Killer whale	461	0.87	835	0.93	583	1.01	672	1.48	305	1.32
Dall's porpoise	57,265	0.71	27,885	0.57	45,752	0.75	30,172	0.61	21,976	0.72
Mesoplodon spp.	4,046	0.51	0	NA	2,703	0.79	466	1.61	2,590	0.65
Cuvier's beaked whale	2,086	0.51	2,675	0.66	1,618	0.68	2,990	0.62	3,775	0.68
Baird's beaked whale	2,895	0.89	1,735	1.56	6,192	1.01	5,394	0.83	7,960	0.93
Kogia spp	1,856	1.54	0	NA	0	NA	4,111	1.12	0	NA
Sperm whale	1,014	0.57	2,080	0.72	3,368	0.52	1,143	0.97	1,242	0.66
Minke whale	1,432	1.05	957	0.96	1,355	1.64	594	1.32	682	0.98
Bryde's whale	0	NA	0	NA	0	NA	0	NA	0	NA
Sei whale	150	0.78	48	1.43	136	0.96	311	0.76	864	0.40
Sei/Bryde's whale	0	NA	0	NA	0	NA	0	NA	106	0.79
Sei/Bryde's/fin whale	0	NA	0	NA	0	NA	0	NA	695	0.60
Fin whale	4,795	0.31	5,101	0.65	8,247	0.34	7,302	0.27	9,892	0.38
Blue whale	2,936	0.47	972	0.45	1,466	0.45	878	0.51	1,496	0.44
Humpback whale	1,742	0.53	1,295	0.59	1,623	0.52	1,313	0.60	3,064	0.82
Unidentified dolphin	7,662	0.37	1,158	0.58	18,109	0.56	0	NA	4,843	0.59
Unidentified beaked whale	337	0.70	533	0.98	1,704	0.78	1,627	0.61	3,136	0.54
Unidentified small whale	1,806	0.72	1,486	0.70	1,728	1.31	755	1.05	2,701	0.74
Unidentified rorqual	645	0.45	145	0.53	619	0.23	603	0.45	1,677	0.44
Unidentified large whale	291	0.56	99	0.55	365	0.49	167	0.45	81	0.65

Table 9. Total abundances and coefficients of variation (CVs) for each species and year in the three California regions. CVs are missing (NA) in years without sightings of that species.

	1991		1993		1996		2001		2005		2008		2014	
Species	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV
Short-beaked common dolphin	323,707	0.27	598,436	0.29	459,096	0.25	557,685	0.36	678,989	0.25	658,812	0.24	1,319,419	0.26
Long-beaked common dolphin	23,991	1.00	13,154	1.10	70,558	0.75	34,280	1.14	15,516	0.98	114,031	0.88	89,998	0.58
Unidentified common dolphin	5,191	0.47	1,987	0.87	3,211	0.50	666	0.96	21,014	0.94	14,091	0.74	13,518	1.13
Striped dolphin	35,724	0.49	28,574	0.46	8,524	0.51	28,773	0.63	61,107	0.46	9,436	0.32	77,262	0.27
Pacific white-sided dolphin	4,734	0.46	4,820	0.40	51,542	0.66	9,793	0.63	9,339	1.00	7,191	0.58	3,366	0.61
Northern right whale dolphin	5,039	0.55	6,245	0.55	23,850	0.52	10,764	0.50	31,432	0.87	4,720	0.69	0	NA
Bottle-nose dolphin	7,612	0.60	6,194	0.62	1,693	0.57	16,902	1.04	6,471	0.63	1,223	0.86	3,027	0.78
Risso's dolphin	12,354	0.32	11,418	0.39	8,120	0.57	12,727	0.54	8,564	0.46	4,509	0.56	8,473	0.37
Pygmy killer whale	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	1,580	1.06
Short-finned pilot whale	0	NA	1,349	0.79	1,085	1.25	0	NA	700	1.21	909	1.32	770	1.24
Killer whale	270	0.76	240	1.63	282	1.14	324	1.28	274	1.32	219	1.13	286	1.37
Dall's porpoise	25,469	1.14	8,706	1.34	29,758	1.04	16,345	0.70	19,368	0.78	20,399	0.72	5,682	1.01
Mesoplodon spp.	1,395	0.67	2,823	0.64	3,661	0.53	0	NA	1,311	1.31	466	1.61	2,309	0.68
Cuvier's beaked whale	5,412	0.57	5,545	0.67	1,076	0.53	1,614	0.75	940	0.91	1,708	0.69	3,343	0.72
Baird's beaked whale	982	1.06	8,208	0.88	1,673	1.08	0	NA	1,099	1.13	2,574	1.05	1,646	1.25
Kogia spp	1,760	0.97	8,546	0.91	0	NA	0	NA	0	NA	4,111	1.12	0	NA
Sperm whale	1,011	0.78	2,214	0.93	606	0.70	1,997	0.75	2,550	0.58	1,081	1.02	1,217	0.68
Minke whale	407	0.97	0	NA	455	0.89	558	1.23	1,355	1.64	594	1.32	174	1.83
Bryde's whale	63	0.95	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA
Sei whale	0	NA	78	0.82	150	0.78	48	1.43	42	1.20	143	1.03	397	0.52
Sei/Bryde's whale	57	1.10	161	0.60	0	NA	0	NA	0	NA	0	NA	106	0.79
Sei/Bryde's/fin whale	0	NA	0	NA	0	NA	0	NA	0	NA	0	NA	695	0.60
Fin whale	1,556	0.62	3,131	0.46	4,415	0.33	4,533	0.68	7,247	0.38	5,367	0.34	6,433	0.44
Blue whale	2,569	0.47	2,641	0.73	2,936	0.47	877	0.51	1,326	0.50	801	0.55	1,276	0.50
Humpback whale	568	0.75	703	0.52	1,714	0.53	897	0.75	896	0.49	953	0.75	585	1.08
Unidentified dolphin	1,139	0.40	15,189	0.77	7,207	0.37	1,047	0.62	17,936	0.57	0	NA	4,752	0.61
Unidentified beaked whale	0	NA	615	0.85	337	0.70	0	NA	1,220	0.94	1,379	0.72	2,819	0.59
Unidentified small whale	1,335	0.56	2,372	0.82	1,450	0.82	1,083	0.75	1,728	1.31	393	1.38	1,040	1.23
Unidentified rorqual	90	0.69	110	0.84	610	0.47	98	0.72	451	0.31	497	0.52	1,235	0.49
Unidentified large whale	257	0.47	26	0.96	275	0.61	76	0.62	242	0.53	147	0.49	53	0.71

Table 10. Abundances and coefficients of variation for each species and year in the OR/WA region. CVs are missing (NA) in years without sightings of that species. The OR/WA region was not surveyed in 1991 or 1993, so estimates are not presented for those years.

	1996		2001		2005		2008		2014	
Species	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV	Abundance	CV
Short-beaked common dolphin	6,245	1.19	318	1.07	14,128	1.12	88	0.98	108,157	0.64
Long-beaked common dolphin	0	NA	0	NA	0	NA	0	NA	0	NA
Unidentified common dolphin	0	NA	0	NA	0	NA	0	NA	0	NA
Striped dolphin	90	0.98	0	NA	0	NA	0	NA	13,171	0.91
Pacific white-sided dolphin	6,896	0.66	6,466	0.73	8,557	0.61	22,672	0.44	20,711	0.49
Northern right whale dolphin	4,940	0.62	6,931	0.37	10,549	0.98	8,195	0.59	54,604	0.81
Bottle-nose dolphin	0	NA	0	NA	0	NA	0	NA	0	NA
Risso's dolphin	8,446	0.81	6,642	0.50	633	1.19	0	NA	430	0.99
Pygmy killer whale	0	NA	0	NA	0	NA	0	NA	0	NA
Short-finned pilot whale	304	1.25	0	NA	0	NA	0	NA	0	NA
Killer whale	179	1.02	511	1.36	308	1.55	453	2.05	19	2.05
Dall's porpoise	27,507	0.79	11,540	0.89	26,384	1.10	9,773	1.18	16,294	0.92
Mesoplodon spp.	385	1.10	0	NA	1,392	0.78	0	NA	281	1.43
Cuvier's beaked whale	1,010	0.92	1,061	1.14	678	0.99	1,282	0.97	432	1.37
Baird's beaked whale	1,222	1.46	1,735	1.56	5,093	1.15	2,820	1.03	6,314	1.07
Kogia spp	1,856	1.54	0	NA	0	NA	0	NA	0	NA
Sperm whale	408	0.92	82	1.12	818	1.04	62	1.23	25	1.06
Minke whale	977	1.44	399	1.65	0	NA	0	NA	507	1.08
Bryde's whale	0	NA	0	NA	0	NA	0	NA	0	NA
Sei whale	0	NA	0	NA	95	1.21	169	0.96	468	0.61
Sei/Bryde's whale	0	NA	0	NA	0	NA	0	NA	0	NA
Sei/Bryde's/fin whale	0	NA	0	NA	0	NA	0	NA	0	NA
Fin whale	381	0.53	567	0.79	1,000	0.55	1,935	0.52	3,458	0.79
Blue whale	0	NA	95	1.11	140	1.06	77	0.81	221	0.97
Humpback whale	28	1.20	398	0.67	727	0.92	360	0.98	2,480	0.96
Unidentified dolphin	455	0.97	111	1.02	172	1.32	0	NA	91	1.14
Unidentified beaked whale	0	NA	533	0.98	484	1.25	248	1.03	317	1.27
Unidentified small whale	356	1.15	403	1.53	0	NA	362	1.29	1,661	0.84
Unidentified rorqual	35	0.73	47	0.60	168	0.44	106	0.75	442	1.15
Unidentified large whale	16	1.32	23	1.08	122	0.79	20	1.22	28	1.25

Table 11. Geometric mean of the 2008 and 2014 abundance estimates and minimum abundance estimated as the lower 20th percentile of that mean (GAMMS 2005).

Species	2008 Estimates		2014 Estimates		Mean Abundance 2008-2014		Minimum Abundance
	N	CV	N	CV	N	CV	Nmin
Short-beaked common dolphin	658,901	0.24	1,427,576	0.25	969,861	0.17	839,325
Long-beaked common dolphin	114,031	0.88	89,998	0.58	101,305	0.49	68,432
Unidentified common dolphin	14,091	0.74	13,518	1.13	13,802	0.61	8,592
Striped dolphin	9,436	0.32	90,433	0.24	29,211	0.20	24,782
Pacific white-sided dolphin	29,863	0.37	24,077	0.45	26,814	0.28	21,195
Northern right whale dolphin	12,916	0.49	54,604	0.81	26,556	0.44	18,608
Bottlenose dolphin	1,223	0.86	3,027	0.78	1,924	0.54	1,255
Risso's dolphin	4,509	0.56	8,903	0.36	6,336	0.32	4,871
Pygmy killer whale	0	NA	1,580	1.06	1,580	1.06	761
Short-finned pilot whale	909	1.32	770	1.24	836	0.79	466
Killer whale	672	1.48	305	1.32	452	0.85	244
Dall's porpoise	30,172	0.61	21,976	0.72	25,750	0.45	17,954
Mesoplodon spp.	466	1.61	2,590	0.65	1,099	0.71	642
Cuvier's beaked whale	2,990	0.62	3,775	0.68	3,359	0.44	2,356
Baird's beaked whale	5,394	0.83	7,960	0.93	6,552	0.58	4,171
Kogia spp	4,111	1.12	0	NA	4,111	1.12	1,924
Sperm whale	1,143	0.97	1,242	0.66	1,191	0.54	778
Minke whale	594	1.32	682	0.98	636	0.72	369
Bryde's whale	0	NA	0	NA	0	NA	0
Sei whale	311	0.76	864	0.40	519	0.40	374
Sei/Bryde's whale	0	NA	106	0.79	106	0.79	59
Sei/Bryde's/fin whale	0	NA	695	0.60	695	0.60	436
Fin whale	7,302	0.27	9,892	0.38	8,499	0.23	7,011
Blue whale	878	0.51	1,496	0.44	1,146	0.33	875
Humpback whale	1,313	0.60	3,064	0.82	2,006	0.48	1,371
Unidentified dolphin	0	NA	4,843	0.59	4,843	0.59	3,057
Unidentified beaked whale	1,627	0.61	3,136	0.54	2,259	0.39	1,640
Unidentified small whale	755	1.05	2,701	0.74	1,428	0.59	904
Unidentified rorqual	603	0.45	1,677	0.44	1,006	0.31	780
Unidentified large whale	167	0.45	81	0.65	117	0.38	86

Figure 1. Planned transect lines for the 2014 California Current Cetacean and Ecosystem Assessment Survey (CalCurCEAS).

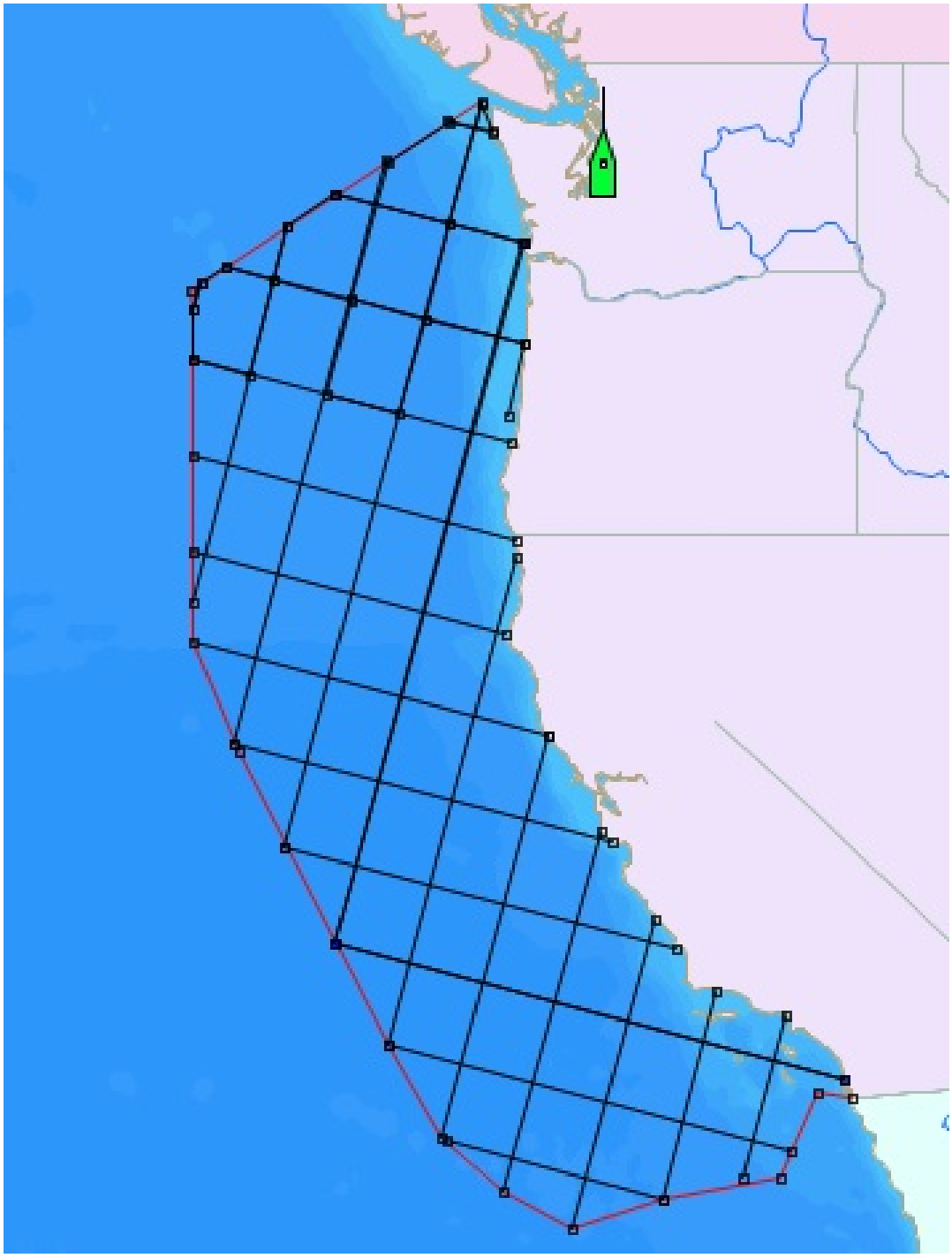


Figure 2. Transect lines completed during the 2014 survey in calm (Beaufort states 0-2), moderate (Beaufort 3) and rough (Beaufort 4-5) survey conditions. Bold black lines indicate the boundaries of the four regional strata (from North to South): Oregon & Washington, Northern California, Central California, and Southern California. Transect lines that were not part of the regular survey grid (Figure 1) were not used in estimating the transect length for line-transect abundance estimates and sightings made on those lines were only used in estimating the line-transect detection probabilities.

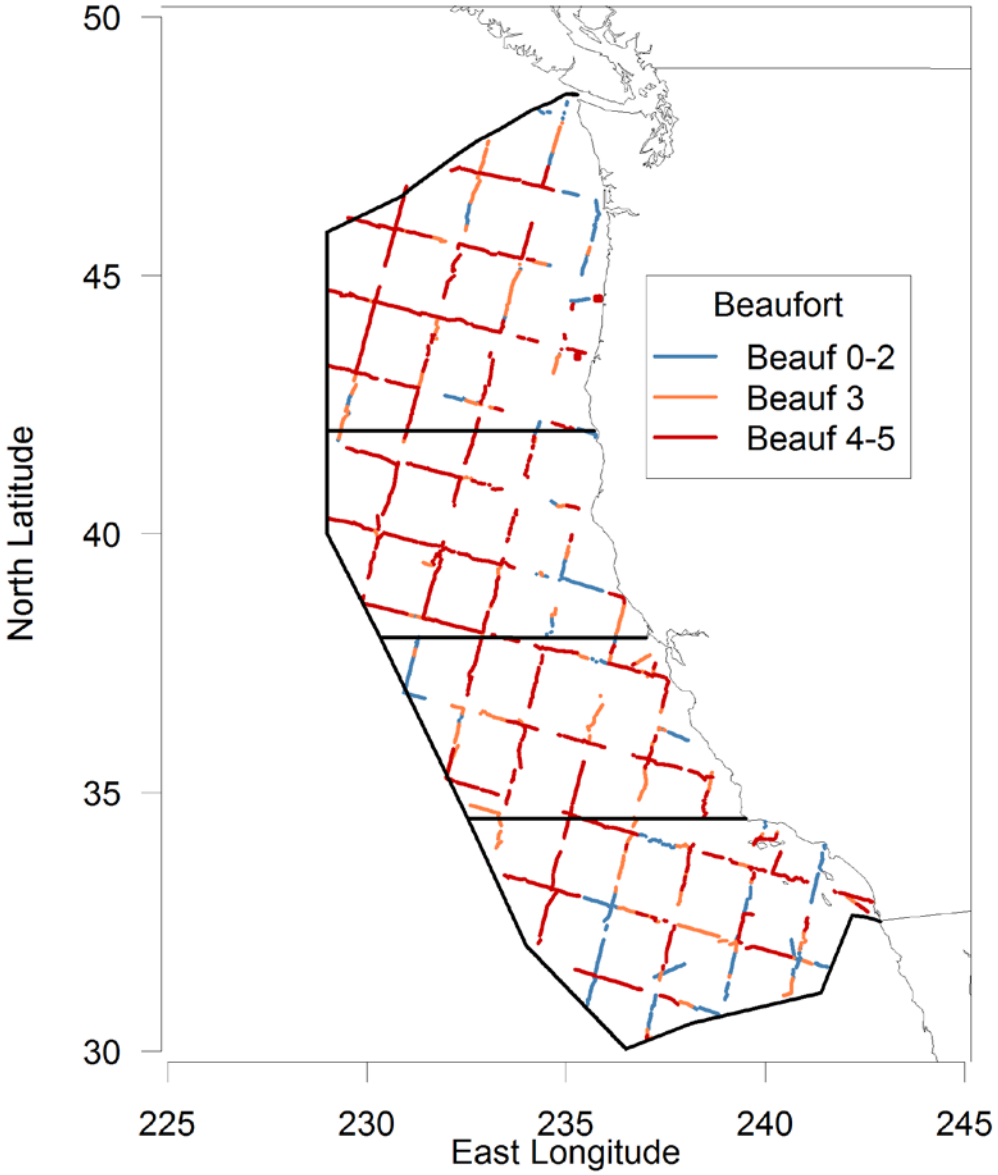
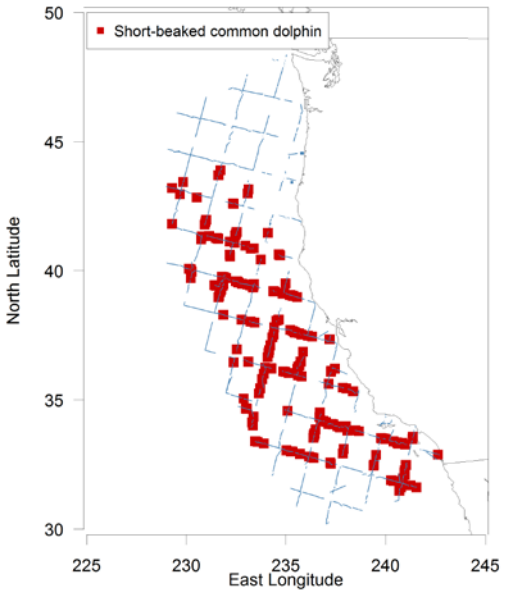
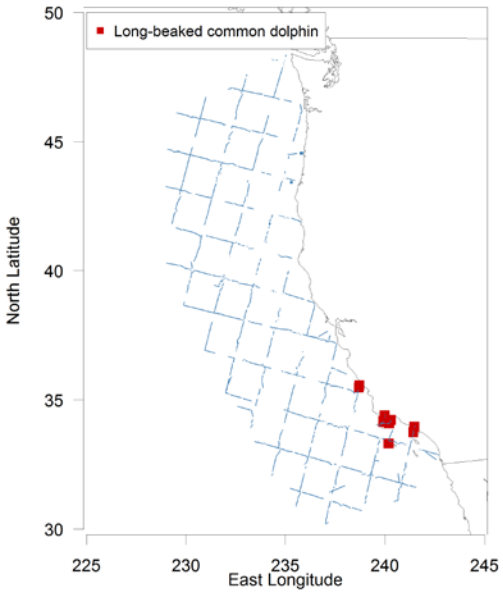
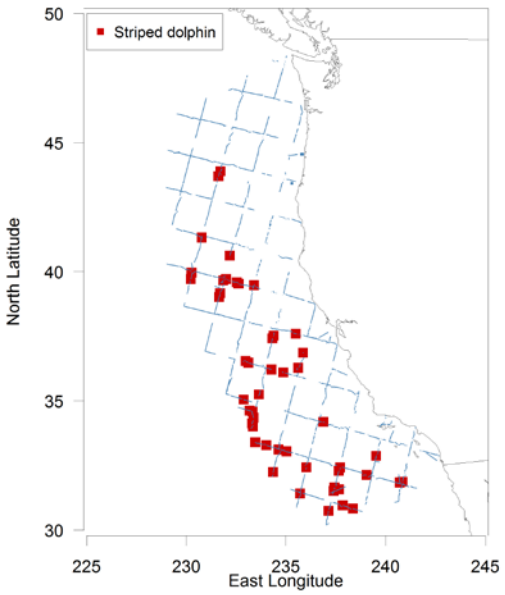


Figure 3. Locations of sightings in 2014 for selected species (see figure legends) including off-effort sightings that are not used for abundance estimation. Light blue lines indicate surveyed transect lines.







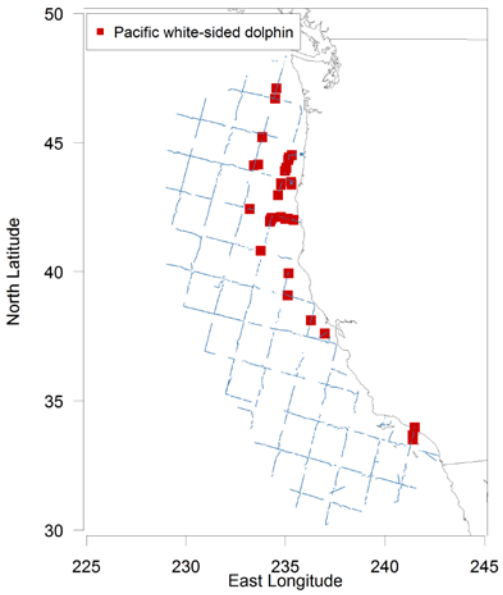


Figure 3. (cont.)

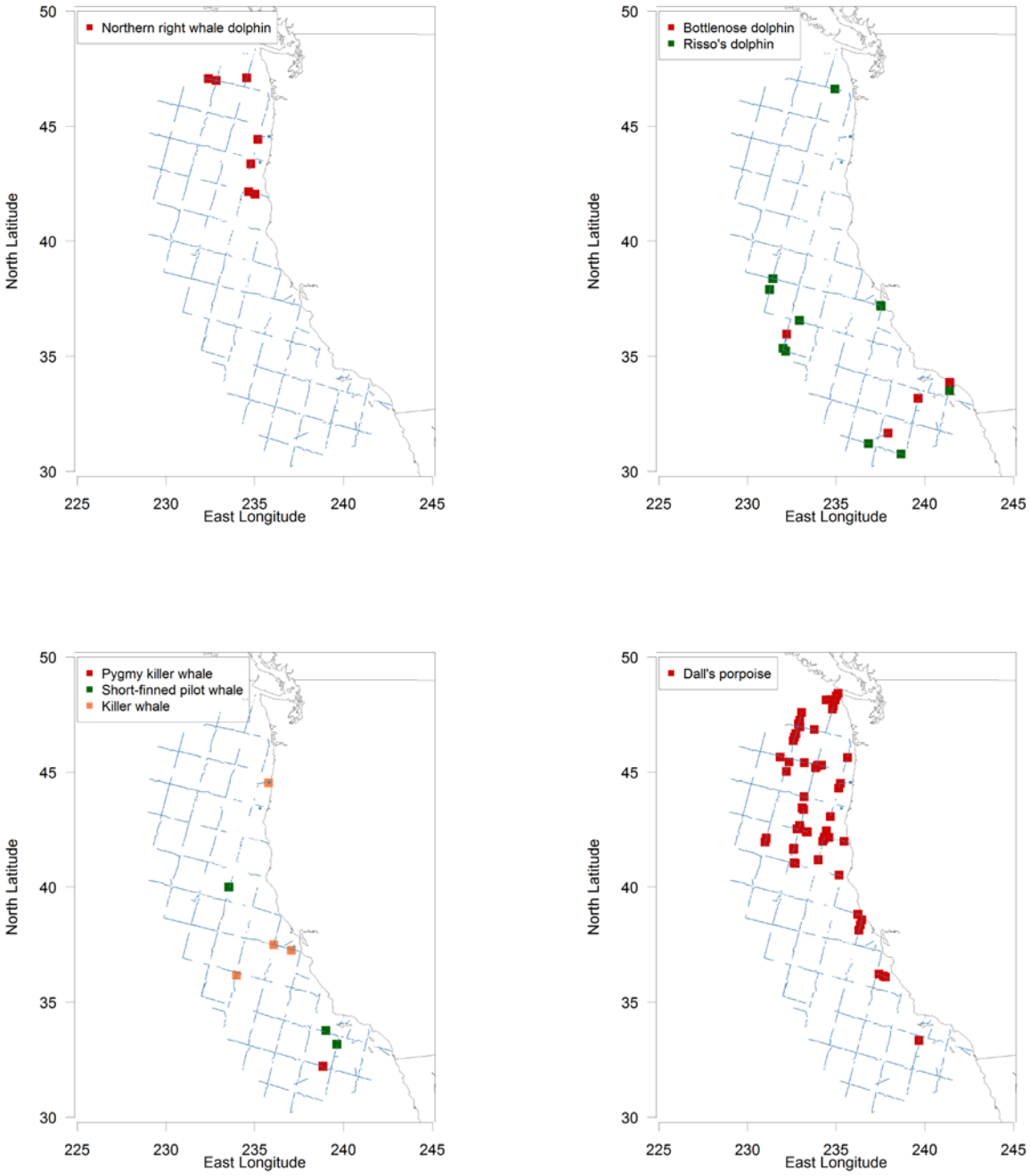
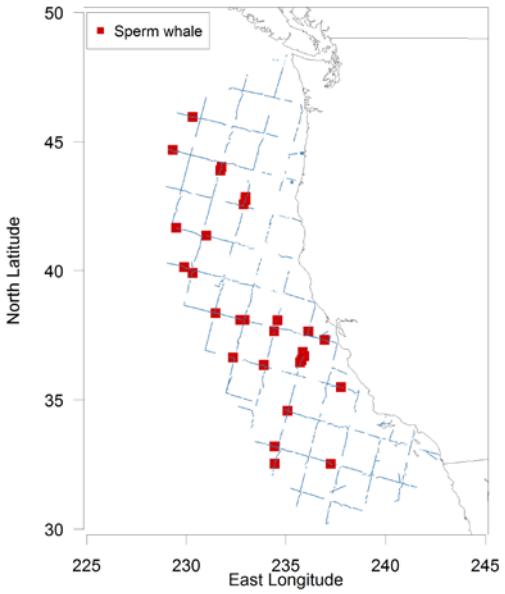
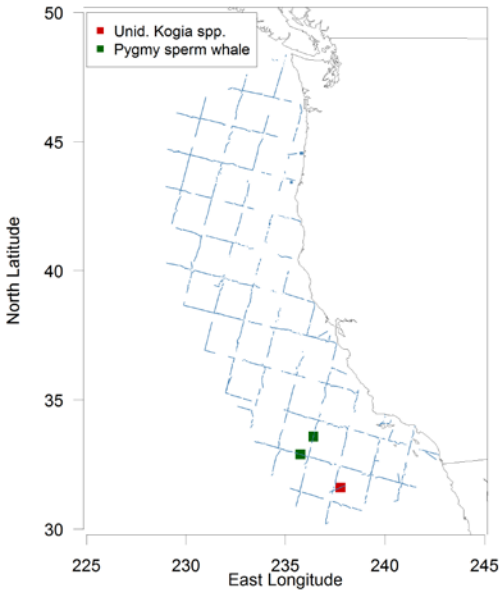
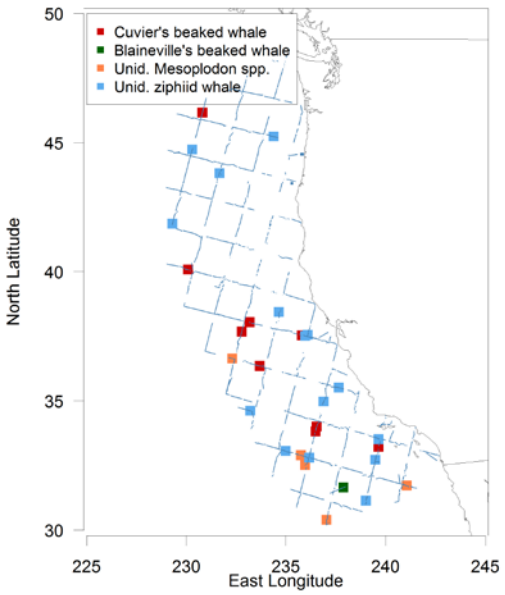


Figure 3. (cont.)







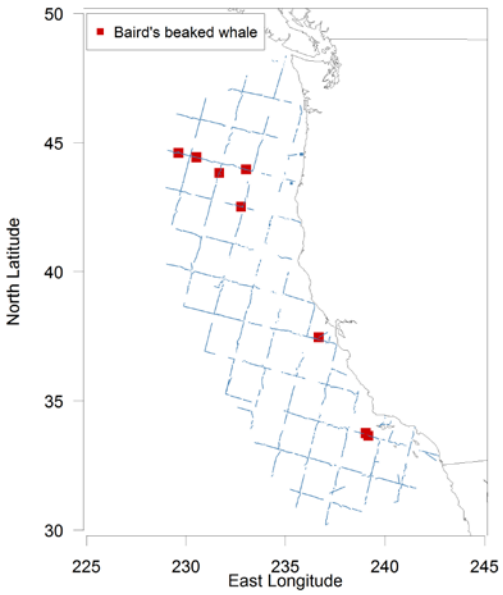


Figure 3. (cont.)

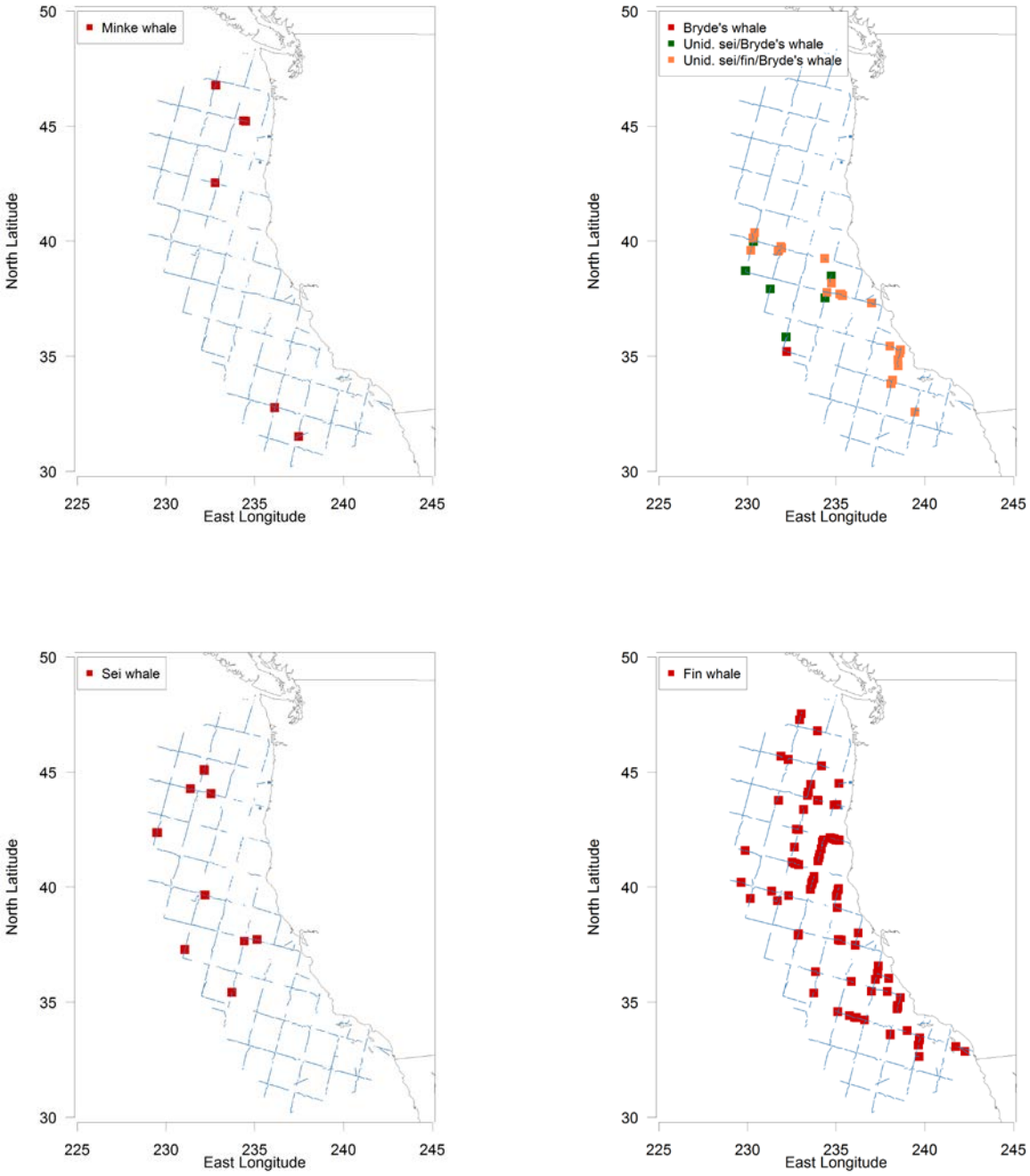
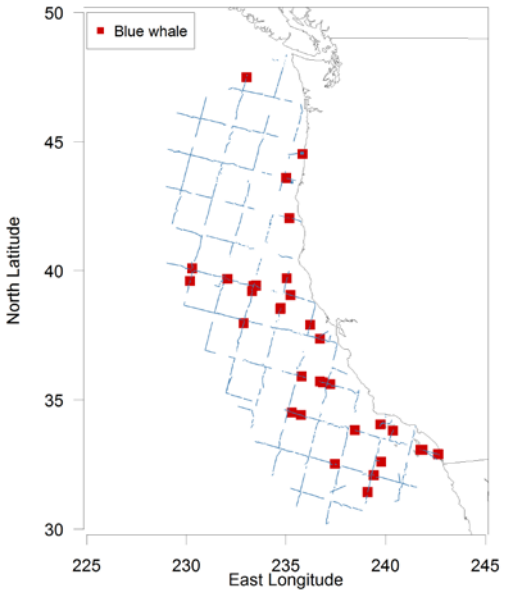
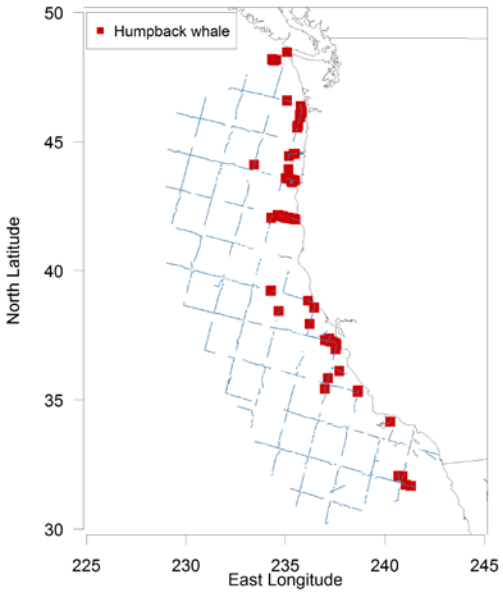


Figure 3. (cont.)





Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Short-beaked common dolphin (SWFSC species code 017).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Short-beaked common dolphin	Pooled	SoCal	21,687	388	168.8	2.96	0.58	873.7	278,305	0.24	0.08	0.11	0.05	0.20
Short-beaked common dolphin	Pooled	CentrlCA	16,277	262	182.7	2.88	0.59	859.5	208,816	0.26	0.12	0.11	0.07	0.19
Short-beaked common dolphin	Pooled	NoCal	17,826	134	193.8	2.66	0.61	445.9	115,081	0.32	0.17	0.12	0.08	0.19
Short-beaked common dolphin	Pooled	ORWA	16,346	13	286.2	2.90	0.57	69.2	22,300	0.48	0.32	0.35	0.13	0.19
Short-beaked common dolphin	Pooled	TOTALS	72,136	797	179.4	2.88	0.59	546.9	624,503	0.15	0.07	0.06	0.05	0.12
Short-beaked common dolphin	1991	SoCal	4,041	88	113.3	3.10	0.61	650.4	207,191	0.35	0.18	0.19	0.09	0.21
Short-beaked common dolphin	1991	CentrlCA	2,968	33	127	3	0.6	406.8	98,837	0.32	0.24	0.33	0.12	0.19
Short-beaked common dolphin	1991	NoCal	3,018	3	340.2	3.58	0.69	68.5	17,679	0.93	0.55	0.84	0.17	0.18
Short-beaked common dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Short-beaked common dolphin	1991	TOTALS	10,027	124	122.5	3.03	0.62	283.5	323,707	0.27	0.16	0.16	0.08	0.16
Short-beaked common dolphin	1993	SoCal	2,543	34	272.6	3.45	0.58	915.8	291,730	0.47	0.34	0.31	0.12	0.21
Short-beaked common dolphin	1993	CentrlCA	1,523	61	109.8	3.10	0.68	1045.4	253,990	0.37	0.21	0.14	0.11	0.21
Short-beaked common dolphin	1993	NoCal	2,085	11	206.5	3.67	0.73	204.3	52,716	0.93	0.43	0.66	0.09	0.25
Short-beaked common dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Short-beaked common dolphin	1993	TOTALS	6,152	106	172.1	3.27	0.65	524.1	598,436	0.29	0.19	0.21	0.09	0.14
Short-beaked common dolphin	1996	SoCal	3,994	46	158.0	2.86	0.57	561.4	178,813	0.33	0.21	0.16	0.10	0.19
Short-beaked common dolphin	1996	CentrlCA	3,057	46	215.1	3.07	0.61	859.4	208,809	0.49	0.35	0.23	0.09	0.22
Short-beaked common dolphin	1996	NoCal	3,287	17	174.2	2.61	0.62	277.0	71,474	0.44	0.30	0.26	0.12	0.18
Short-beaked common dolphin	1996	ORWA	4,338	1	221.8	2.36	0.56	19.4	6,245	1.19	1.09	0.00	0.12	0.21
Short-beaked common dolphin	1996	TOTALS	14,676	110	185.0	2.90	0.60	407.5	465,341	0.24	0.17	0.13	0.08	0.11
Short-beaked common dolphin	2001	SoCal	2,455	39	221.3	2.68	0.51	1295.5	412,663	0.46	0.27	0.36	0.10	0.19
Short-beaked common dolphin	2001	CentrlCA	1,608	18	113.9	2.64	0.61	398.8	96,881	0.46	0.37	0.26	0.21	0.21
Short-beaked common dolphin	2001	NoCal	2,376	11	96.4	2.08	0.58	186.5	48,140	1.02	0.60	0.61	0.20	0.18
Short-beaked common dolphin	2001	ORWA	3,098	1	3.5	1.04	0.55	1.0	318	1.07	0.95	0.00	0.13	0.17
Short-beaked common dolphin	2001	TOTALS	9,538	69	170.2	2.55	0.54	488.7	558,002	0.36	0.22	0.26	0.10	0.13
Short-beaked common dolphin	2005	SoCal	2,838	46	237.5	3.02	0.60	1059.7	337,553	0.38	0.26	0.18	0.10	0.21
Short-beaked common dolphin	2005	CentrlCA	2,386	23	231.9	2.33	0.50	961.6	233,619	0.31	0.20	0.19	0.11	0.16
Short-beaked common dolphin	2005	NoCal	2,665	16	293.9	3.42	0.62	417.8	107,816	0.49	0.41	0.27	0.12	0.21
Short-beaked common dolphin	2005	ORWA	2,951	1	489.7	3.27	0.58	43.8	14,128	1.12	1.07	0.00	0.08	0.19
Short-beaked common dolphin	2005	TOTALS	10,840	86	249.4	2.91	0.58	607.0	693,117	0.25	0.20	0.12	0.08	0.13
Short-beaked common dolphin	2008	SoCal	3,035	65	140.4	2.85	0.55	951.4	303,057	0.32	0.19	0.15	0.09	0.22
Short-beaked common dolphin	2008	CentrlCA	2,895	43	220.4	2.93	0.59	954.7	231,962	0.41	0.31	0.28	0.12	0.22
Short-beaked common dolphin	2008	NoCal	2,396	12	245.1	2.41	0.53	479.7	123,793	0.62	0.33	0.39	0.16	0.22
Short-beaked common dolphin	2008	ORWA	3,238	1	4.9	4.75	0.58	0.3	88	0.98	0.94	0.00	0.05	0.21
Short-beaked common dolphin	2008	TOTALS	11,563	121	178.1	2.85	0.56	577.1	658,901	0.24	0.17	0.15	0.08	0.15
Short-beaked common dolphin	2014	SoCal	2,780	70	147.0	2.84	0.65	997.6	317,776	0.50	0.23	0.33	0.09	0.25
Short-beaked common dolphin	2014	CentrlCA	1,841	38	268.6	2.75	0.58	1749.6	425,074	0.41	0.28	0.25	0.12	0.19
Short-beaked common dolphin	2014	NoCal	1,998	64	171.9	2.41	0.51	2234.2	576,569	0.39	0.21	0.12	0.10	0.19
Short-beaked common dolphin	2014	ORWA	2,708	9	333.4	2.92	0.56	335.6	108,157	0.64	0.43	0.46	0.16	0.23
Short-beaked common dolphin	2014	TOTALS	9,327	181	190.6	2.67	0.58	1250.3	1,427,576	0.25	0.15	0.13	0.08	0.13
Short-beaked common dolphin	1991	California	10,027	124	193.6	3.16	0.64	1125.7	323,707	0.27	0.16	0.48	0.09	0.12
Short-beaked common dolphin	1993	California	6,152	106	196.3	3.41	0.66	2165.5	598,436	0.29	0.19	0.30	0.08	0.13
Short-beaked common dolphin	1996	California	10,338	109	182.4	2.84	0.60	1697.7	459,096	0.25	0.17	0.13	0.08	0.11
Short-beaked common dolphin	2001	California	6,440	68	143.9	2.46	0.56	1880.8	557,685	0.36	0.21	0.24	0.12	0.12
Short-beaked common dolphin	2005	California	7,889	85	254.4	2.92	0.57	2439.0	678,989	0.25	0.19	0.13	0.08	0.11
Short-beaked common dolphin	2008	California	8,325	120	202.0	2.73	0.56	2385.8	658,812	0.24	0.17	0.19	0.09	0.13
Short-beaked common dolphin	2014	California	6,619	172	195.8	2.67	0.58	4981.3	1,319,419	0.26	0.14	0.15	0.08	0.12

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Long-beaked common dolphin (SWFSC species code 016).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Long-beaked common dolphin	Pooled	SoCal	21,687	32	324.7	3.68	0.58	111.5	35,518	0.38	0.32	0.22	0.14	0.19
Long-beaked common dolphin	Pooled	CentrlCA	16,277	5	937.8	3.50	0.59	69.2	16,814	0.95	0.78	0.47	0.16	0.22
Long-beaked common dolphin	Pooled	NoCal	17,826	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	Pooled	TOTALS	72,136	37	407.6	3.66	0.58	45.8	52,331	0.39	0.29	0.23	0.13	0.17
Long-beaked common dolphin	1991	SoCal	4,041	5	265.2	3.57	0.61	75.3	23,991	1.00	0.78	0.57	0.15	0.18
Long-beaked common dolphin	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Long-beaked common dolphin	1991	TOTALS	10,027	5	265.2	3.57	0.61	21.0	23,991	1.00	0.73	0.57	0.15	0.18
Long-beaked common dolphin	1993	SoCal	2,543	1	321.7	2.66	0.58	41.3	13,154	1.10	1.13	0.00	0.21	0.22
Long-beaked common dolphin	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Long-beaked common dolphin	1993	TOTALS	6,152	1	321.7	2.66	0.58	11.5	13,154	1.10	1.15	0.00	0.21	0.22
Long-beaked common dolphin	1996	SoCal	3,994	3	659.8	2.89	0.57	151.3	48,209	0.94	0.67	0.68	0.18	0.19
Long-beaked common dolphin	1996	CentrlCA	3,057	3	461.6	4.01	0.61	92.0	22,348	1.13	1.06	0.00	0.13	0.21
Long-beaked common dolphin	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	1996	TOTALS	14,676	6	560.7	3.45	0.59	61.8	70,558	0.75	0.68	0.52	0.17	0.17
Long-beaked common dolphin	2001	SoCal	2,455	2	332.8	2.48	0.51	107.6	34,280	1.14	1.16	0.00	0.20	0.19
Long-beaked common dolphin	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2001	TOTALS	9,538	2	332.8	2.48	0.51	30.0	34,280	1.14	1.15	0.00	0.20	0.19
Long-beaked common dolphin	2005	SoCal	2,838	6	101.7	3.66	0.60	48.7	15,516	0.98	0.91	0.00	0.17	0.23
Long-beaked common dolphin	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2005	TOTALS	10,840	6	101.7	3.66	0.60	13.6	15,516	0.98	0.88	0.00	0.17	0.23
Long-beaked common dolphin	2008	SoCal	3,035	6	191.9	3.96	0.55	86.5	27,565	1.08	0.94	0.61	0.48	0.19
Long-beaked common dolphin	2008	CentrlCA	2,895	2	1652.1	2.74	0.59	355.9	86,466	1.12	1.07	0.00	0.17	0.20
Long-beaked common dolphin	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2008	TOTALS	11,563	8	556.9	3.65	0.56	99.9	114,031	0.88	0.76	0.82	0.36	0.18
Long-beaked common dolphin	2014	SoCal	2,780	9	482.0	4.22	0.65	282.5	89,998	0.58	0.58	0.02	0.11	0.20
Long-beaked common dolphin	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Long-beaked common dolphin	2014	TOTALS	9,327	9	482.0	4.22	0.65	78.8	89,998	0.58	0.55	0.02	0.11	0.20
Long-beaked common dolphin	1991	California	10,027	5	265.2	3.57	0.61	75.3	23,991	1.00	0.73	0.57	0.15	0.18
Long-beaked common dolphin	1993	California	6,152	1	321.7	2.66	0.58	41.3	13,154	1.10	1.15	0.00	0.21	0.22
Long-beaked common dolphin	1996	California	10,338	6	560.7	3.45	0.59	243.3	70,558	0.75	0.67	0.56	0.17	0.16
Long-beaked common dolphin	2001	California	6,440	2	332.8	2.48	0.51	107.6	34,280	1.14	1.15	0.00	0.20	0.19
Long-beaked common dolphin	2005	California	7,889	6	101.7	3.66	0.60	48.7	15,516	0.98	0.89	0.00	0.17	0.23
Long-beaked common dolphin	2008	California	8,325	8	922.0	3.35	0.57	442.4	114,031	0.88	0.76	0.70	0.37	0.17
Long-beaked common dolphin	2014	California	6,619	9	482.0	4.22	0.65	282.5	89,998	0.58	0.57	0.02	0.11	0.20

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Unidentified common dolphin (SWFSC species code 005).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Unidentified common dolphin	Pooled	SoCal	21,687	27	83.6	3.51	0.58	25.4	8,084	0.48	0.29	0.29	0.11	0.19
Unidentified common dolphin	Pooled	CentrlCA	16,277	11	19.8	2.63	0.59	4.3	1,041	0.54	0.38	0.40	0.19	0.19
Unidentified common dolphin	Pooled	NoCal	17,826	1	8.0	3.46	0.61	0.1	27	1.06	1.10	0.00	0.13	0.16
Unidentified common dolphin	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	Pooled	TOTALS	72,136	39	63.6	3.26	0.59	8.0	9,152	0.43	0.24	0.27	0.11	0.14
Unidentified common dolphin	1991	SoCal	4,041	3	25.5	2.81	0.61	5.5	1,756	0.81	0.55	0.81	0.40	0.20
Unidentified common dolphin	1991	CentrlCA	2,968	5	29	3	0.6	14.1	3,434	0.61	0.54	0.57	0.37	0.20
Unidentified common dolphin	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified common dolphin	1991	TOTALS	10,027	8	27.6	2.78	0.62	4.5	5,191	0.47	0.39	0.41	0.23	0.17
Unidentified common dolphin	1993	SoCal	2,543	2	18.6	2.26	0.58	5.6	1,791	0.93	0.69	0.61	0.20	0.23
Unidentified common dolphin	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	1993	NoCal	2,085	1	8.0	3.46	0.73	0.8	197	1.21	1.05	0.00	0.13	0.21
Unidentified common dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified common dolphin	1993	TOTALS	6,152	3	15.1	2.66	0.63	1.7	1,987	0.87	0.60	0.61	0.23	0.21
Unidentified common dolphin	1996	SoCal	3,994	4	14.6	3.14	0.57	4.1	1,309	0.71	0.61	0.34	0.23	0.19
Unidentified common dolphin	1996	CentrlCA	3,057	6	12.4	2.52	0.61	7.8	1,901	0.68	0.49	0.27	0.21	0.21
Unidentified common dolphin	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	1996	TOTALS	14,676	10	13.3	2.77	0.60	2.8	3,211	0.50	0.39	0.20	0.16	0.15
Unidentified common dolphin	2001	SoCal	2,455	1	10.6	2.04	0.51	2.1	666	0.96	0.85	0.00	0.18	0.21
Unidentified common dolphin	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2001	TOTALS	9,538	1	10.6	2.04	0.51	0.6	666	0.96	0.86	0.00	0.18	0.21
Unidentified common dolphin	2005	SoCal	2,838	7	134.3	4.17	0.60	66.0	21,014	0.94	0.80	0.61	0.14	0.21
Unidentified common dolphin	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2005	TOTALS	10,840	7	134.3	4.17	0.60	18.4	21,014	0.94	0.80	0.61	0.14	0.21
Unidentified common dolphin	2008	SoCal	3,035	6	100.9	4.07	0.55	44.2	14,091	0.74	0.87	0.60	0.12	0.22
Unidentified common dolphin	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2008	TOTALS	11,563	6	100.9	4.07	0.55	12.3	14,091	0.74	0.84	0.60	0.12	0.22
Unidentified common dolphin	2014	SoCal	2,780	4	131.8	3.42	0.65	42.4	13,518	1.13	0.63	0.72	0.19	0.24
Unidentified common dolphin	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified common dolphin	2014	TOTALS	9,327	4	131.8	3.42	0.65	11.8	13,518	1.13	0.62	0.72	0.19	0.24
Unidentified common dolphin	1991	California	10,027	8	27.2	2.79	0.62	19.6	5,191	0.47	0.39	0.47	0.27	0.15
Unidentified common dolphin	1993	California	6,152	3	13.3	2.86	0.65	6.4	1,987	0.87	0.60	0.61	0.21	0.20
Unidentified common dolphin	1996	California	10,338	10	13.5	2.83	0.59	11.9	3,211	0.50	0.39	0.22	0.17	0.14
Unidentified common dolphin	2001	California	6,440	1	10.6	2.04	0.51	2.1	666	0.96	0.86	0.00	0.18	0.21
Unidentified common dolphin	2005	California	7,889	7	134.3	4.17	0.60	66.0	21,014	0.94	0.81	0.61	0.14	0.21
Unidentified common dolphin	2008	California	8,325	6	100.9	4.07	0.55	44.2	14,091	0.74	0.84	0.60	0.12	0.22
Unidentified common dolphin	2014	California	6,619	4	131.8	3.42	0.65	42.4	13,518	1.13	0.62	0.72	0.19	0.24

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Striped dolphin (SWFSC species code 013).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Striped dolphin	Pooled	SoCal	21,687	69	59.0	3.46	0.40	67.1	21,384	0.24	0.15	0.14	0.07	0.16
Striped dolphin	Pooled	CentrlCA	16,277	46	30.4	3.62	0.42	28.5	6,914	0.34	0.17	0.26	0.07	0.14
Striped dolphin	Pooled	NoCal	17,826	32	35.8	3.21	0.44	22.7	5,857	0.53	0.23	0.38	0.08	0.15
Striped dolphin	Pooled	ORWA	16,346	3	109.0	3.34	0.39	7.7	2,478	0.94	0.56	0.74	0.21	0.16
Striped dolphin	Pooled	TOTALS	72,136	150	46.3	3.45	0.42	32.1	36,632	0.18	0.11	0.12	0.05	0.09
Striped dolphin	1991	SoCal	4,041	13	94.6	3.73	0.44	93.1	29,648	0.60	0.40	0.28	0.10	0.17
Striped dolphin	1991	CentrlCA	2,968	10	20	3	0.4	22.2	5,390	0.57	0.34	0.37	0.08	0.18
Striped dolphin	1991	NoCal	3,018	1	36.4	4.32	0.52	2.7	686	1.05	0.98	0.00	0.07	0.16
Striped dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Striped dolphin	1991	TOTALS	10,027	24	61.2	3.63	0.45	31.3	35,724	0.50	0.25	0.29	0.07	0.12
Striped dolphin	1993	SoCal	2,543	5	59.1	3.25	0.39	45.4	14,453	0.80	0.38	0.93	0.17	0.19
Striped dolphin	1993	CentrlCA	1,523	6	53.9	4.10	0.51	51.0	12,387	0.57	0.51	0.42	0.21	0.18
Striped dolphin	1993	NoCal	2,085	5	13.0	4.21	0.55	6.7	1,734	0.58	0.43	0.39	0.07	0.15
Striped dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Striped dolphin	1993	TOTALS	6,152	16	42.7	3.87	0.49	25.0	28,574	0.47	0.28	0.40	0.09	0.12
Striped dolphin	1996	SoCal	3,994	8	29.7	3.40	0.39	22.6	7,187	0.57	0.45	0.23	0.13	0.16
Striped dolphin	1996	CentrlCA	3,057	3	16.3	4.74	0.43	3.9	947	1.24	1.10	0.00	0.04	0.18
Striped dolphin	1996	NoCal	3,287	3	4.2	2.81	0.46	1.5	389	0.71	0.60	0.31	0.20	0.16
Striped dolphin	1996	ORWA	4,338	1	2.2	2.36	0.39	0.3	90	0.98	0.98	0.00	0.12	0.15
Striped dolphin	1996	TOTALS	14,676	15	20.1	3.48	0.41	7.5	8,614	0.51	0.37	0.27	0.12	0.12
Striped dolphin	2001	SoCal	2,455	5	91.7	3.42	0.33	83.5	26,596	0.67	0.42	0.39	0.14	0.16
Striped dolphin	2001	CentrlCA	1,608	1	45.4	3.66	0.43	9.0	2,177	0.98	0.89	0.00	0.08	0.19
Striped dolphin	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Striped dolphin	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Striped dolphin	2001	TOTALS	9,538	6	84.0	3.46	0.34	25.2	28,773	0.63	0.41	0.38	0.12	0.15
Striped dolphin	2005	SoCal	2,838	10	46.5	3.08	0.41	64.3	20,477	0.71	0.36	0.58	0.12	0.17
Striped dolphin	2005	CentrlCA	2,386	6	61.2	3.39	0.32	71.9	17,478	0.83	0.39	0.87	0.18	0.28
Striped dolphin	2005	NoCal	2,665	7	103.4	3.41	0.44	89.7	23,152	0.82	0.41	0.58	0.11	0.16
Striped dolphin	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Striped dolphin	2005	TOTALS	10,840	23	67.7	3.26	0.40	53.5	61,107	0.46	0.23	0.39	0.08	0.13
Striped dolphin	2008	SoCal	3,035	6	13.9	3.67	0.37	10.0	3,195	0.57	0.35	0.33	0.08	0.16
Striped dolphin	2008	CentrlCA	2,895	8	11.1	3.53	0.41	10.5	2,547	0.33	0.30	0.15	0.15	0.19
Striped dolphin	2008	NoCal	2,396	5	14.5	3.03	0.35	14.3	3,694	0.55	0.44	0.20	0.12	0.20
Striped dolphin	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Striped dolphin	2008	TOTALS	11,563	19	12.9	3.44	0.38	8.3	9,436	0.32	0.22	0.12	0.09	0.11
Striped dolphin	2014	SoCal	2,780	22	59.1	3.50	0.48	140.4	44,717	0.36	0.27	0.13	0.13	0.19
Striped dolphin	2014	CentrlCA	1,841	12	27.1	3.44	0.39	65.6	15,932	0.47	0.30	0.26	0.10	0.16
Striped dolphin	2014	NoCal	1,998	11	21.4	2.71	0.34	64.4	16,613	0.58	0.52	0.47	0.10	0.18
Striped dolphin	2014	ORWA	2,708	2	162.4	3.83	0.38	40.9	13,171	0.91	0.72	0.54	0.14	0.19
Striped dolphin	2014	TOTALS	9,327	47	46.5	3.32	0.42	79.2	90,433	0.24	0.19	0.18	0.09	0.11
Striped dolphin	1991	California	10,027	24	50.4	3.83	0.47	117.9	35,724	0.49	0.25	0.21	0.08	0.10
Striped dolphin	1993	California	6,152	16	42.0	3.85	0.48	103.1	28,574	0.46	0.29	0.43	0.09	0.10
Striped dolphin	1996	California	10,338	14	16.8	3.65	0.43	28.0	8,524	0.51	0.37	0.25	0.13	0.12
Striped dolphin	2001	California	6,440	6	68.5	3.54	0.38	92.5	28,773	0.63	0.40	0.39	0.11	0.15
Striped dolphin	2005	California	7,889	23	70.4	3.29	0.39	225.9	61,107	0.46	0.23	0.42	0.10	0.12
Striped dolphin	2008	California	8,325	19	13.2	3.41	0.38	34.8	9,436	0.32	0.21	0.14	0.09	0.10
Striped dolphin	2014	California	6,619	45	35.9	3.22	0.40	270.3	77,262	0.27	0.18	0.14	0.08	0.10

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Pacific white-sided dolphin (SWFSC species code 022).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Pacific white-sided dolphin	Pooled	SoCal	21,687	22	32.5	2.71	1.00	6.1	1,939	0.54	0.42	0.30	0.16	0.00
Pacific white-sided dolphin	Pooled	CentrlCA	16,277	25	140.8	2.67	1.00	40.4	9,823	0.73	0.27	0.64	0.13	0.00
Pacific white-sided dolphin	Pooled	NoCal	17,826	27	67.4	2.37	1.00	21.6	5,568	0.46	0.27	0.47	0.15	0.00
Pacific white-sided dolphin	Pooled	ORWA	16,346	47	61.5	2.17	1.00	40.7	13,112	0.28	0.23	0.25	0.16	0.00
Pacific white-sided dolphin	Pooled	TOTALS	72,136	121	73.9	2.42	1.00	26.7	30,441	0.27	0.15	0.31	0.11	0.00
Pacific white-sided dolphin	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Pacific white-sided dolphin	1991	CentrlCA	2,968	8	23	2	1.0	13.9	3,374	0.49	0.41	0.38	0.29	0.00
Pacific white-sided dolphin	1991	NoCal	3,018	3	40.6	3.83	1.00	5.3	1,360	0.94	0.85	0.02	0.15	0.00
Pacific white-sided dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pacific white-sided dolphin	1991	TOTALS	10,027	11	27.7	2.65	1.00	4.1	4,734	0.46	0.41	0.22	0.18	0.00
Pacific white-sided dolphin	1993	SoCal	2,543	1	4.5	1.29	1.00	0.7	219	0.93	0.97	0.00	0.14	0.00
Pacific white-sided dolphin	1993	CentrlCA	1,523	1	9.9	2.09	1.00	1.6	377	1.00	1.00	0.00	0.13	0.00
Pacific white-sided dolphin	1993	NoCal	2,085	8	14.1	1.66	1.00	16.4	4,224	0.44	0.46	0.29	0.27	0.00
Pacific white-sided dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pacific white-sided dolphin	1993	TOTALS	6,152	10	12.8	1.66	1.00	4.2	4,820	0.40	0.41	0.26	0.23	0.00
Pacific white-sided dolphin	1996	SoCal	3,994	9	49.7	3.13	1.00	17.9	5,702	1.01	1.03	0.00	0.13	0.00
Pacific white-sided dolphin	1996	CentrlCA	3,057	10	301.6	3.28	1.00	150.4	36,542	0.88	0.54	0.61	0.18	0.00
Pacific white-sided dolphin	1996	NoCal	3,287	6	123.9	3.14	1.00	36.0	9,298	0.69	0.40	0.60	0.20	0.00
Pacific white-sided dolphin	1996	ORWA	4,338	7	67.4	2.54	1.00	21.4	6,896	0.66	0.53	0.33	0.23	0.00
Pacific white-sided dolphin	1996	TOTALS	14,676	32	146.2	3.05	1.00	51.2	58,438	0.58	0.34	0.50	0.11	0.00
Pacific white-sided dolphin	2001	SoCal	2,455	5	23.1	2.50	1.00	9.4	2,998	0.95	0.84	0.25	0.11	0.00
Pacific white-sided dolphin	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Pacific white-sided dolphin	2001	NoCal	2,376	5	44.0	1.76	1.00	26.3	6,795	0.81	0.69	0.06	0.42	0.00
Pacific white-sided dolphin	2001	ORWA	3,098	7	32.3	1.82	1.00	20.1	6,466	0.73	0.47	0.94	0.33	0.00
Pacific white-sided dolphin	2001	TOTALS	9,538	17	33.0	2.00	1.00	14.2	16,259	0.49	0.37	0.35	0.19	0.00
Pacific white-sided dolphin	2005	SoCal	2,838	1	10.2	1.99	1.00	0.9	288	1.08	1.06	0.00	0.16	0.00
Pacific white-sided dolphin	2005	CentrlCA	2,386	2	15.1	3.14	1.00	2.0	489	1.01	1.01	0.00	0.05	0.00
Pacific white-sided dolphin	2005	NoCal	2,665	1	564.6	3.19	1.00	33.2	8,562	1.12	1.11	0.00	0.11	0.00
Pacific white-sided dolphin	2005	ORWA	2,951	6	68.6	2.63	1.00	26.6	8,557	0.61	0.59	0.48	0.22	0.00
Pacific white-sided dolphin	2005	TOTALS	10,840	10	101.7	2.72	1.00	15.7	17,896	0.56	0.45	0.62	0.16	0.00
Pacific white-sided dolphin	2008	SoCal	3,035	3	17.3	2.14	1.00	4.0	1,273	0.73	0.51	0.60	0.35	0.00
Pacific white-sided dolphin	2008	CentrlCA	2,895	4	70.5	2.00	1.00	24.4	5,918	0.70	0.64	0.28	0.25	0.00
Pacific white-sided dolphin	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Pacific white-sided dolphin	2008	ORWA	3,238	12	104.0	2.74	1.00	70.4	22,672	0.44	0.32	0.37	0.21	0.00
Pacific white-sided dolphin	2008	TOTALS	11,563	19	83.2	2.49	1.00	26.2	29,863	0.37	0.26	0.32	0.19	0.00
Pacific white-sided dolphin	2014	SoCal	2,780	3	28.9	3.11	1.00	5.0	1,596	0.98	0.95	0.00	0.14	0.00
Pacific white-sided dolphin	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Pacific white-sided dolphin	2014	NoCal	1,998	4	14.3	2.08	1.00	6.9	1,770	0.72	0.64	0.04	0.21	0.00
Pacific white-sided dolphin	2014	ORWA	2,708	15	35.6	1.53	1.00	64.3	20,711	0.49	0.56	0.45	0.22	0.00
Pacific white-sided dolphin	2014	TOTALS	9,327	22	30.8	1.85	1.00	21.1	24,077	0.45	0.43	0.28	0.21	0.00
Pacific white-sided dolphin	1991	California	10,027	11	31.7	3.02	1.00	19.2	4,734	0.46	0.41	0.17	0.18	0.00
Pacific white-sided dolphin	1993	California	6,152	10	9.5	1.68	1.00	18.6	4,820	0.40	0.41	0.29	0.20	0.00
Pacific white-sided dolphin	1996	California	10,338	25	158.4	3.18	1.00	204.3	51,542	0.66	0.43	0.48	0.12	0.00
Pacific white-sided dolphin	2001	California	6,440	10	33.6	2.13	1.00	35.7	9,793	0.63	0.55	0.20	0.21	0.00
Pacific white-sided dolphin	2005	California	7,889	4	196.6	2.77	1.00	36.1	9,339	1.00	0.61	0.84	0.17	0.00
Pacific white-sided dolphin	2008	California	8,325	7	43.9	2.07	1.00	28.4	7,191	0.58	0.39	0.39	0.24	0.00
Pacific white-sided dolphin	2014	California	6,619	7	21.6	2.60	1.00	11.9	3,366	0.61	0.55	0.21	0.22	0.00

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Northern right whale dolphin (SWFSC species code 027).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Northern right whale dolphin	Pooled	SoCal	21,687	14	14.1	3.12	0.54	2.7	851	0.48	0.58	0.34	0.16	0.14
Northern right whale dolphin	Pooled	CentrlCA	16,277	23	111.7	3.25	0.55	43.8	10,638	0.52	0.25	0.47	0.11	0.12
Northern right whale dolphin	Pooled	NoCal	17,826	22	22.5	2.77	0.57	8.8	2,266	0.43	0.38	0.32	0.13	0.15
Northern right whale dolphin	Pooled	ORWA	16,346	33	63.4	2.58	0.53	46.4	14,962	0.47	0.21	0.41	0.11	0.14
Northern right whale dolphin	Pooled	TOTALS	72,136	92	58.2	2.88	0.55	25.2	28,717	0.30	0.16	0.29	0.07	0.07
Northern right whale dolphin	1991	SoCal	4,041	10	10.8	3.56	0.57	6.6	2,102	0.77	0.76	0.17	0.17	0.13
Northern right whale dolphin	1991	CentrlCA	2,968	2	9	4	0.6	1.4	342	0.81	0.78	0.09	0.13	0.15
Northern right whale dolphin	1991	NoCal	3,018	3	48.8	3.84	0.63	10.1	2,595	0.74	0.55	0.65	0.12	0.13
Northern right whale dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Northern right whale dolphin	1991	TOTALS	10,027	15	18.1	3.61	0.58	4.4	5,039	0.55	0.59	0.57	0.12	0.10
Northern right whale dolphin	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Northern right whale dolphin	1993	CentrlCA	1,523	4	20.6	2.95	0.62	14.8	3,588	0.80	0.41	0.61	0.19	0.15
Northern right whale dolphin	1993	NoCal	2,085	4	15.0	2.16	0.65	10.3	2,656	0.69	0.55	0.23	0.34	0.16
Northern right whale dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Northern right whale dolphin	1993	TOTALS	6,152	8	17.8	2.55	0.63	5.5	6,245	0.55	0.37	0.36	0.20	0.10
Northern right whale dolphin	1996	SoCal	3,994	1	50.1	3.14	0.53	3.7	1,194	0.94	0.89	0.00	0.11	0.13
Northern right whale dolphin	1996	CentrlCA	3,057	9	123.7	3.65	0.57	88.0	21,389	0.54	0.40	0.66	0.15	0.14
Northern right whale dolphin	1996	NoCal	3,287	3	24.2	3.90	0.58	4.9	1,267	0.62	0.49	0.56	0.17	0.14
Northern right whale dolphin	1996	ORWA	4,338	5	32.1	2.28	0.53	15.3	4,940	0.62	0.38	0.62	0.22	0.14
Northern right whale dolphin	1996	TOTALS	14,676	18	77.6	3.28	0.56	25.2	28,790	0.44	0.26	0.45	0.12	0.10
Northern right whale dolphin	2001	SoCal	2,455	1	4.7	0.96	0.49	2.0	651	1.15	0.96	0.00	0.29	0.15
Northern right whale dolphin	2001	CentrlCA	1,608	2	20.3	3.00	0.56	7.5	1,811	0.80	0.68	0.49	0.27	0.16
Northern right whale dolphin	2001	NoCal	2,376	11	19.2	2.55	0.54	32.2	8,302	0.62	0.64	0.55	0.19	0.16
Northern right whale dolphin	2001	ORWA	3,098	11	13.4	2.10	0.53	21.5	6,931	0.37	0.34	0.22	0.21	0.13
Northern right whale dolphin	2001	TOTALS	9,538	25	16.1	2.33	0.53	15.5	17,695	0.34	0.36	0.19	0.14	0.10
Northern right whale dolphin	2005	SoCal	2,838	1	17.8	1.63	0.56	3.5	1,100	0.89	0.96	0.00	0.14	0.14
Northern right whale dolphin	2005	CentrlCA	2,386	2	607.0	4.21	0.48	124.8	30,332	0.90	0.90	0.00	0.06	0.12
Northern right whale dolphin	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Northern right whale dolphin	2005	ORWA	2,951	3	115.3	3.32	0.54	32.7	10,549	0.98	0.60	0.87	0.12	0.14
Northern right whale dolphin	2005	TOTALS	10,840	6	263.0	3.33	0.52	36.8	41,981	0.66	0.44	0.54	0.12	0.10
Northern right whale dolphin	2008	SoCal	3,035	1	16.8	2.42	0.52	2.2	698	1.17	1.09	0.00	0.17	0.14
Northern right whale dolphin	2008	CentrlCA	2,895	4	25.5	2.16	0.55	14.9	3,616	0.86	0.54	0.54	0.14	0.15
Northern right whale dolphin	2008	NoCal	2,396	1	4.1	1.08	0.50	1.6	406	1.04	0.97	0.00	0.22	0.15
Northern right whale dolphin	2008	ORWA	3,238	7	44.9	3.51	0.54	25.4	8,195	0.59	0.38	0.52	0.15	0.18
Northern right whale dolphin	2008	TOTALS	11,563	13	33.6	2.83	0.54	11.3	12,916	0.49	0.30	0.36	0.16	0.11
Northern right whale dolphin	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Northern right whale dolphin	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Northern right whale dolphin	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Northern right whale dolphin	2014	ORWA	2,708	7	160.5	2.31	0.53	169.5	54,604	0.81	0.56	0.68	0.23	0.17
Northern right whale dolphin	2014	TOTALS	9,327	7	160.5	2.31	0.53	47.8	54,604	0.81	0.58	0.68	0.23	0.17
Northern right whale dolphin	1991	California	10,027	15	22.7	3.64	0.59	18.1	5,039	0.55	0.59	0.54	0.12	0.09
Northern right whale dolphin	1993	California	6,152	8	17.8	2.55	0.63	25.1	6,245	0.55	0.37	0.39	0.21	0.10
Northern right whale dolphin	1996	California	10,338	13	66.0	3.56	0.56	96.7	23,850	0.52	0.32	0.52	0.10	0.09
Northern right whale dolphin	2001	California	6,440	14	14.7	2.17	0.53	41.7	10,764	0.50	0.54	0.36	0.22	0.09
Northern right whale dolphin	2005	California	7,889	3	312.4	2.92	0.52	128.3	31,432	0.87	0.71	0.68	0.31	0.12
Northern right whale dolphin	2008	California	8,325	6	15.5	1.89	0.52	18.6	4,720	0.69	0.44	0.49	0.18	0.12
Northern right whale dolphin	2014	California	6,619	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Common bottlenose dolphin (SWFSC species code 018).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Bottlenose dolphin	Pooled	SoCal	21,687	39	14.5	2.64	0.32	15.6	4,977	0.47	0.28	0.17	0.13	0.27
Bottlenose dolphin	Pooled	CentrlCA	16,277	6	7.5	2.88	0.33	1.5	356	0.78	0.43	0.52	0.22	0.35
Bottlenose dolphin	Pooled	NoCal	17,826	3	10.0	2.52	0.34	1.0	253	0.88	0.59	0.44	0.20	0.34
Bottlenose dolphin	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	Pooled	TOTALS	72,136	48	13.3	2.66	0.32	4.9	5,585	0.42	0.24	0.15	0.12	0.22
Bottlenose dolphin	1991	SoCal	4,041	13	12.8	2.73	0.34	22.3	7,110	0.64	0.43	0.38	0.20	0.41
Bottlenose dolphin	1991	CentrlCA	2,968	2	5	3	0.3	1.5	371	1.11	0.95	0.00	0.21	0.29
Bottlenose dolphin	1991	NoCal	3,018	1	3.3	2.74	0.40	0.5	130	1.10	0.95	0.00	0.16	0.34
Bottlenose dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottlenose dolphin	1991	TOTALS	10,027	16	11.2	2.79	0.34	6.7	7,612	0.60	0.36	0.35	0.17	0.36
Bottlenose dolphin	1993	SoCal	2,543	2	47.5	3.43	0.31	17.4	5,536	0.69	0.64	0.18	0.18	0.28
Bottlenose dolphin	1993	CentrlCA	1,523	1	2.1	3.42	0.39	0.5	125	1.16	0.92	0.00	0.21	0.29
Bottlenose dolphin	1993	NoCal	2,085	1	7.4	2.14	0.40	2.1	533	1.63	0.93	0.00	0.35	0.29
Bottlenose dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bottlenose dolphin	1993	TOTALS	6,152	4	26.1	3.11	0.35	5.4	6,194	0.62	0.48	0.49	0.20	0.22
Bottlenose dolphin	1996	SoCal	3,994	6	4.8	2.68	0.31	4.4	1,397	0.63	0.58	0.39	0.23	0.24
Bottlenose dolphin	1996	CentrlCA	3,057	2	3.0	2.36	0.33	1.2	296	0.71	0.62	0.47	0.39	0.30
Bottlenose dolphin	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	1996	TOTALS	14,676	8	4.3	2.60	0.31	1.5	1,693	0.56	0.49	0.32	0.20	0.21
Bottlenose dolphin	2001	SoCal	2,455	9	18.7	2.42	0.27	53.1	16,902	1.04	0.84	0.15	0.24	0.30
Bottlenose dolphin	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2001	TOTALS	9,538	9	18.7	2.42	0.27	14.8	16,902	1.04	0.84	0.15	0.24	0.30
Bottlenose dolphin	2005	SoCal	2,838	5	14.4	2.26	0.33	17.1	5,443	0.72	0.54	0.35	0.35	0.30
Bottlenose dolphin	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2005	NoCal	2,665	1	19.2	2.68	0.34	4.0	1,029	1.16	1.11	0.00	0.19	0.29
Bottlenose dolphin	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2005	TOTALS	10,840	6	15.2	2.33	0.33	5.7	6,471	0.63	0.50	0.29	0.30	0.27
Bottlenose dolphin	2008	SoCal	3,035	2	8.2	2.39	0.29	3.8	1,223	0.86	0.65	0.33	0.37	0.27
Bottlenose dolphin	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2008	TOTALS	11,563	2	8.2	2.39	0.29	1.1	1,223	0.86	0.59	0.33	0.37	0.27
Bottlenose dolphin	2014	SoCal	2,780	2	9.6	3.36	0.36	2.9	920	1.01	0.69	0.45	0.36	0.32
Bottlenose dolphin	2014	CentrlCA	1,841	1	26.9	2.70	0.31	8.7	2,107	0.99	0.86	0.00	0.19	0.24
Bottlenose dolphin	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Bottlenose dolphin	2014	TOTALS	9,327	3	15.4	3.14	0.34	2.7	3,027	0.78	0.54	0.34	0.28	0.28
Bottlenose dolphin	1991	California	10,027	16	7.1	2.89	0.36	24.4	7,612	0.60	0.36	0.41	0.17	0.32
Bottlenose dolphin	1993	California	6,152	4	19.0	3.00	0.37	20.0	6,194	0.62	0.48	0.47	0.18	0.21
Bottlenose dolphin	1996	California	10,338	8	3.9	2.52	0.32	5.6	1,693	0.57	0.49	0.33	0.24	0.21
Bottlenose dolphin	2001	California	6,440	9	18.7	2.42	0.27	53.1	16,902	1.04	0.85	0.15	0.24	0.30
Bottlenose dolphin	2005	California	7,889	6	16.8	2.47	0.33	21.1	6,471	0.63	0.50	0.26	0.29	0.26
Bottlenose dolphin	2008	California	8,325	2	8.2	2.39	0.29	3.8	1,223	0.86	0.60	0.33	0.37	0.27
Bottlenose dolphin	2014	California	6,619	3	18.3	3.03	0.33	11.6	3,027	0.78	0.52	0.30	0.28	0.28

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Risso's dolphin (SWFSC species code 021).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Risso's dolphin	Pooled	SoCal	21,687	58	15.8	2.38	0.68	13.1	4,172	0.29	0.22	0.11	0.11	0.11
Risso's dolphin	Pooled	CentrlCA	16,277	35	28.4	2.66	0.69	16.7	4,048	0.33	0.25	0.17	0.14	0.12
Risso's dolphin	Pooled	NoCal	17,826	15	18.8	2.61	0.70	4.3	1,110	0.38	0.31	0.17	0.14	0.10
Risso's dolphin	Pooled	ORWA	16,346	25	28.2	2.79	0.66	11.8	3,796	0.51	0.29	0.37	0.15	0.12
Risso's dolphin	Pooled	TOTALS	72,136	133	21.8	2.56	0.68	11.5	13,126	0.22	0.12	0.12	0.11	0.07
Risso's dolphin	1991	SoCal	4,041	14	16.0	2.53	0.69	15.9	5,057	0.51	0.38	0.21	0.21	0.12
Risso's dolphin	1991	CentrlCA	2,968	9	28	3	0.7	21.0	5,096	0.53	0.40	0.25	0.20	0.13
Risso's dolphin	1991	NoCal	3,018	5	20.7	2.59	0.78	8.5	2,200	0.67	0.62	0.14	0.18	0.09
Risso's dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Risso's dolphin	1991	TOTALS	10,027	28	20.8	2.64	0.71	10.8	12,354	0.32	0.23	0.15	0.16	0.08
Risso's dolphin	1993	SoCal	2,543	6	7.5	2.32	0.68	5.6	1,791	0.42	0.37	0.11	0.18	0.15
Risso's dolphin	1993	CentrlCA	1,523	8	29.2	2.73	0.80	35.0	8,513	0.49	0.46	0.56	0.22	0.12
Risso's dolphin	1993	NoCal	2,085	3	16.8	3.34	0.84	4.3	1,114	0.66	0.54	0.54	0.35	0.11
Risso's dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Risso's dolphin	1993	TOTALS	6,152	17	19.4	2.69	0.76	10.0	11,418	0.39	0.30	0.35	0.16	0.10
Risso's dolphin	1996	SoCal	3,994	10	13.5	2.13	0.65	12.1	3,861	0.70	0.55	0.21	0.14	0.12
Risso's dolphin	1996	CentrlCA	3,057	5	44.7	2.92	0.72	17.5	4,259	0.83	0.59	0.45	0.19	0.14
Risso's dolphin	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Risso's dolphin	1996	ORWA	4,338	12	37.1	3.06	0.64	26.2	8,446	0.81	0.38	0.59	0.21	0.12
Risso's dolphin	1996	TOTALS	14,676	27	29.8	2.69	0.66	14.5	16,565	0.51	0.26	0.37	0.15	0.08
Risso's dolphin	2001	SoCal	2,455	14	13.5	2.21	0.59	29.4	9,361	0.71	0.68	0.07	0.16	0.16
Risso's dolphin	2001	CentrlCA	1,608	3	29.6	2.88	0.69	13.9	3,366	0.62	0.55	0.36	0.22	0.13
Risso's dolphin	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Risso's dolphin	2001	ORWA	3,098	10	21.8	2.67	0.64	20.6	6,642	0.50	0.52	0.19	0.19	0.12
Risso's dolphin	2001	TOTALS	9,538	27	18.3	2.46	0.62	17.0	19,370	0.38	0.37	0.16	0.15	0.11
Risso's dolphin	2005	SoCal	2,838	6	27.8	2.80	0.72	14.5	4,626	0.65	0.36	0.33	0.24	0.13
Risso's dolphin	2005	CentrlCA	2,386	1	46.0	3.39	0.58	4.9	1,191	1.15	1.11	0.00	0.26	0.11
Risso's dolphin	2005	NoCal	2,665	6	14.4	2.18	0.70	10.6	2,746	0.45	0.46	0.28	0.19	0.11
Risso's dolphin	2005	ORWA	2,951	1	18.2	2.32	0.68	2.0	633	1.19	1.10	0.00	0.26	0.14
Risso's dolphin	2005	TOTALS	10,840	14	22.7	2.54	0.70	8.1	9,196	0.45	0.30	0.24	0.17	0.08
Risso's dolphin	2008	SoCal	3,035	5	22.6	2.36	0.65	12.2	3,891	0.66	0.46	0.41	0.23	0.12
Risso's dolphin	2008	CentrlCA	2,895	1	19.0	1.96	0.66	2.5	618	1.13	1.14	0.00	0.20	0.15
Risso's dolphin	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Risso's dolphin	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Risso's dolphin	2008	TOTALS	11,563	6	22.0	2.29	0.65	3.9	4,509	0.56	0.41	0.37	0.19	0.11
Risso's dolphin	2014	SoCal	2,780	3	15.2	2.70	0.76	4.0	1,275	0.81	0.63	0.34	0.30	0.12
Risso's dolphin	2014	CentrlCA	1,841	8	15.6	2.11	0.68	23.6	5,725	0.40	0.51	0.49	0.22	0.15
Risso's dolphin	2014	NoCal	1,998	1	41.9	3.16	0.58	5.7	1,473	1.10	0.96	0.00	0.30	0.17
Risso's dolphin	2014	ORWA	2,708	1	8.2	1.71	0.66	1.3	430	0.99	0.94	0.00	0.25	0.14
Risso's dolphin	2014	TOTALS	9,327	13	16.9	2.30	0.69	7.8	8,903	0.36	0.36	0.33	0.18	0.10
Risso's dolphin	1991	California	10,027	28	21.7	2.66	0.73	45.4	12,354	0.32	0.23	0.14	0.16	0.07
Risso's dolphin	1993	California	6,152	17	17.8	2.80	0.77	45.0	11,418	0.39	0.30	0.37	0.19	0.09
Risso's dolphin	1996	California	10,338	15	29.1	2.52	0.69	29.6	8,120	0.57	0.41	0.38	0.13	0.08
Risso's dolphin	2001	California	6,440	17	21.5	2.55	0.64	43.2	12,727	0.54	0.57	0.29	0.17	0.12
Risso's dolphin	2005	California	7,889	13	29.4	2.79	0.67	30.1	8,564	0.46	0.30	0.25	0.20	0.09
Risso's dolphin	2008	California	8,325	6	20.8	2.16	0.65	14.8	4,509	0.56	0.41	0.34	0.19	0.11
Risso's dolphin	2014	California	6,619	12	24.2	2.66	0.67	33.3	8,473	0.37	0.37	0.30	0.22	0.10

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Pygmy killer whale (SWFSC species code 032).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)	Bootstrap Mean Abundance	Bootstrap SE Abundance
Pygmy killer whale	Pooled	SoCal	21,687	1	27.0	2.36	0.37	0.7	229	1.11	0.90	0.50	0.18	0.26	150	167
Pygmy killer whale	Pooled	CentrlCA	16,277	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	Pooled	NoCal	17,826	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	Pooled	TOTALS	72,136	1	27.0	2.36	0.37	0.2	229	1.11	0.90	0.50	0.18	0.26	150	167
Pygmy killer whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pygmy killer whale	1991	TOTALS	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pygmy killer whale	1993	TOTALS	6,152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1996	TOTALS	14,676	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2001	TOTALS	9,538	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2005	TOTALS	10,840	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2008	TOTALS	11,563	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2014	SoCal	2,780	1	27.0	2.36	0.41	5.0	1,580	1.06	0.88	0.47	0.18	0.31	1086	1154
Pygmy killer whale	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2014	TOTALS	9,327	1	27.0	2.36	0.41	1.4	1,580	1.06	0.91	0.47	0.18	0.31	1086	1154
Pygmy killer whale	1991	California	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1993	California	6,152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	1996	California	10,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2005	California	7,889	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2008	California	8,325	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Pygmy killer whale	2014	California	6,619	1	27.0	2.36	0.41	5.0	1,580	1.06	0.91	0.47	0.18	0.31	1086	1154

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Short-finned pilot whale (SWFSC species code 036).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Short-finned pilot whale	Pooled	SoCal	21,687	3	45.2	3.60	0.69	1.3	400	0.74	0.62	0.40	0.32	0.12
Short-finned pilot whale	Pooled	CentrlCA	16,277	2	29.4	3.41	0.71	0.8	182	0.94	0.66	0.50	0.37	0.14
Short-finned pilot whale	Pooled	NoCal	17,826	3	16.3	3.44	0.71	0.6	144	0.84	0.60	0.38	0.37	0.12
Short-finned pilot whale	Pooled	ORWA	16,346	1	18.2	3.33	0.67	0.2	80	1.12	0.98	0.67	0.31	0.14
Short-finned pilot whale	Pooled	TOTALS	72,136	9	29.0	3.47	0.70	0.7	807	0.47	0.35	0.25	0.36	0.08
Short-finned pilot whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Short-finned pilot whale	1991	TOTALS	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1993	CentrlCA	1,523	1	9.6	3.49	0.79	1.1	278	1.42	1.14	0.50	0.33	0.11
Short-finned pilot whale	1993	NoCal	2,085	3	16.3	3.44	0.82	4.2	1,071	0.86	0.58	0.44	0.37	0.09
Short-finned pilot whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Short-finned pilot whale	1993	TOTALS	6,152	4	14.6	3.45	0.81	1.2	1,349	0.79	0.56	0.39	0.37	0.08
Short-finned pilot whale	1996	SoCal	3,994	1	67.2	3.66	0.68	3.4	1,085	1.25	1.04	0.54	0.28	0.18
Short-finned pilot whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1996	ORWA	4,338	1	18.2	3.33	0.67	0.9	304	1.25	1.01	0.62	0.31	0.14
Short-finned pilot whale	1996	TOTALS	14,676	2	42.7	3.49	0.67	1.2	1,388	0.87	0.71	0.53	0.31	0.14
Short-finned pilot whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2001	TOTALS	9,538	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2005	SoCal	2,838	1	31.6	3.49	0.73	2.2	700	1.21	0.93	0.57	0.34	0.10
Short-finned pilot whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2005	TOTALS	10,840	1	31.6	3.49	0.73	0.6	700	1.21	1.00	0.57	0.34	0.10
Short-finned pilot whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2008	CentrlCA	2,895	1	49.2	3.33	0.68	3.7	909	1.32	0.89	0.51	0.39	0.15
Short-finned pilot whale	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2008	TOTALS	11,563	1	49.2	3.33	0.68	0.8	909	1.32	0.86	0.51	0.39	0.15
Short-finned pilot whale	2014	SoCal	2,780	1	36.7	3.66	0.75	2.4	770	1.24	0.91	0.53	0.32	0.12
Short-finned pilot whale	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2014	TOTALS	9,327	1	36.7	3.66	0.75	0.7	770	1.24	0.88	0.53	0.32	0.12
Short-finned pilot whale	1991	California	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	1993	California	6,152	4	12.9	3.47	0.80	5.3	1,349	0.79	0.56	0.40	0.37	0.08
Short-finned pilot whale	1996	California	10,338	1	67.2	3.66	0.68	3.4	1,085	1.25	1.06	0.54	0.28	0.18
Short-finned pilot whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Short-finned pilot whale	2005	California	7,889	1	31.6	3.49	0.73	2.2	700	1.21	0.99	0.57	0.34	0.10
Short-finned pilot whale	2008	California	8,325	1	49.2	3.33	0.68	3.7	909	1.32	0.86	0.51	0.39	0.15
Short-finned pilot whale	2014	California	6,619	1	36.7	3.66	0.75	2.4	770	1.24	0.86	0.53	0.32	0.12

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Killer whale (SWFSC species code 037).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Killer whale	Pooled	SoCal	21,687	5	4.2	5.22	0.70	0.1	42	0.93	0.49	0.24	0.15	0.31
Killer whale	Pooled	CentrlCA	16,277	9	5.6	5.30	0.71	0.4	100	1.24	0.36	0.19	0.12	0.34
Killer whale	Pooled	NoCal	17,826	10	7.0	5.38	0.72	0.5	131	1.12	0.30	0.14	0.10	0.43
Killer whale	Pooled	ORWA	16,346	13	8.4	5.31	0.68	0.9	297	1.27	0.25	0.22	0.10	0.40
Killer whale	Pooled	TOTALS	72,136	37	6.8	5.31	0.70	0.5	570	0.76	0.18	0.12	0.10	0.24
Killer whale	1991	SoCal	4,041	1	3.0	5.25	0.72	0.1	31	2.17	0.91	0.00	0.29	0.36
Killer whale	1991	CentrlCA	2,968	2	5	5	0.7	0.4	99	1.31	0.71	0.40	0.20	0.29
Killer whale	1991	NoCal	3,018	2	7.0	5.40	0.79	0.5	140	0.84	0.63	0.08	0.09	0.27
Killer whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Killer whale	1991	TOTALS	10,027	5	5.2	5.32	0.75	0.2	270	0.98	0.40	0.19	0.18	0.20
Killer whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Killer whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Killer whale	1993	NoCal	2,085	2	8.5	5.40	0.81	0.9	240	1.63	0.65	0.24	0.13	0.22
Killer whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Killer whale	1993	TOTALS	6,152	2	8.5	5.40	0.81	0.2	240	1.63	0.65	0.24	0.13	0.22
Killer whale	1996	SoCal	3,994	1	5.2	5.36	0.68	0.2	56	2.31	1.10	0.00	0.17	0.39
Killer whale	1996	CentrlCA	3,057	2	5.8	5.09	0.73	0.5	124	1.65	0.72	0.67	0.16	0.32
Killer whale	1996	NoCal	3,287	1	10.2	5.43	0.73	0.4	101	1.85	1.00	0.00	0.07	0.37
Killer whale	1996	ORWA	4,338	3	5.9	5.38	0.68	0.6	179	1.02	0.51	0.04	0.13	0.39
Killer whale	1996	TOTALS	14,676	7	6.4	5.30	0.70	0.4	461	0.87	0.41	0.19	0.12	0.24
Killer whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Killer whale	2001	CentrlCA	1,608	2	4.9	5.36	0.72	0.8	190	1.91	0.77	0.01	0.07	0.39
Killer whale	2001	NoCal	2,376	2	4.6	5.35	0.69	0.5	135	1.70	0.59	0.48	0.11	0.34
Killer whale	2001	ORWA	3,098	4	9.1	5.42	0.68	1.6	511	1.36	0.50	0.16	0.11	0.44
Killer whale	2001	TOTALS	9,538	8	6.9	5.39	0.69	0.7	835	0.93	0.35	0.20	0.10	0.30
Killer whale	2005	SoCal	2,838	1	1.0	4.73	0.73	0.1	16	1.41	1.01	0.00	0.14	0.33
Killer whale	2005	CentrlCA	2,386	1	3.7	5.38	0.65	0.2	54	1.62	1.06	0.00	0.17	0.37
Killer whale	2005	NoCal	2,665	2	8.2	5.42	0.72	0.8	204	1.67	0.73	0.20	0.10	0.35
Killer whale	2005	ORWA	2,951	3	6.8	5.20	0.70	1.0	308	1.55	0.55	0.45	0.12	0.39
Killer whale	2005	TOTALS	10,840	7	5.9	5.22	0.70	0.5	583	1.01	0.36	0.30	0.12	0.21
Killer whale	2008	SoCal	3,035	2	5.8	5.37	0.67	0.5	170	1.44	0.79	0.12	0.06	0.37
Killer whale	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Killer whale	2008	NoCal	2,396	1	3.1	5.27	0.65	0.2	49	1.97	1.05	0.00	0.12	0.48
Killer whale	2008	ORWA	3,238	2	17.0	5.44	0.68	1.4	453	2.05	0.71	0.42	0.05	0.42
Killer whale	2008	TOTALS	11,563	5	9.7	5.38	0.67	0.6	672	1.48	0.44	0.48	0.06	0.31
Killer whale	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Killer whale	2014	CentrlCA	1,841	2	8.3	5.41	0.70	1.2	286	1.37	0.93	0.00	0.05	0.34
Killer whale	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Killer whale	2014	ORWA	2,708	1	1.0	4.74	0.67	0.1	19	2.05	1.00	0.00	0.39	0.42
Killer whale	2014	TOTALS	9,327	3	5.8	5.19	0.69	0.3	305	1.32	0.70	0.45	0.16	0.33
Killer whale	1991	California	10,027	5	4.9	5.31	0.75	1.0	270	0.76	0.40	0.19	0.17	0.20
Killer whale	1993	California	6,152	2	8.5	5.40	0.81	0.9	240	1.63	0.65	0.24	0.13	0.22
Killer whale	1996	California	10,338	4	7.1	5.29	0.71	1.1	282	1.14	0.54	0.35	0.11	0.23
Killer whale	2001	California	6,440	4	4.7	5.35	0.71	1.3	324	1.28	0.50	0.25	0.09	0.27
Killer whale	2005	California	7,889	4	4.3	5.18	0.70	1.1	274	1.32	0.49	0.36	0.12	0.24
Killer whale	2008	California	8,325	3	4.5	5.32	0.66	0.7	219	1.13	0.64	0.19	0.09	0.35
Killer whale	2014	California	6,619	2	8.3	5.41	0.70	1.2	286	1.37	0.89	0.00	0.05	0.34

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Dall's porpoise (SWFSC species code 044) in Beaufort 0-2 conditions.

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Dall's porpoise	Pooled	SoCal	3,557	6	2.3	1.84	0.71	1.5	467	1.43	1.06	0.00	0.08	0.31
Dall's porpoise	Pooled	CentrlCA	2,608	33	4.6	1.44	0.72	27.8	6,759	1.08	0.36	0.21	0.08	0.35
Dall's porpoise	Pooled	NoCal	3,621	149	3.5	1.53	0.71	67.6	17,441	1.06	0.24	0.07	0.06	0.38
Dall's porpoise	Pooled	ORWA	2,183	94	3.5	1.58	0.71	66.6	21,453	1.05	0.46	0.08	0.08	0.36
Dall's porpoise	Pooled	TOTALS	11,969	282	3.6	1.54	0.71	40.4	46,120	0.63	0.19	0.05	0.06	0.25
Dall's porpoise	1991	SoCal	742	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1991	CentrlCA	624	10	3	2	0.7	20.6	4,993	1.48	0.67	0.20	0.10	0.32
Dall's porpoise	1991	NoCal	931	53	3.7	1.43	0.71	104.8	27,047	0.86	0.28	0.10	0.10	0.30
Dall's porpoise	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dall's porpoise	1991	TOTALS	2,296	63	3.6	1.44	0.71	28.1	32,041	0.73	0.31	0.07	0.09	0.27
Dall's porpoise	1993	SoCal	372	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1993	CentrlCA	395	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1993	NoCal	619	1	1.0	1.54	0.72	0.7	189	1.18	0.86	0.00	0.11	0.34
Dall's porpoise	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dall's porpoise	1993	TOTALS	1,386	1	1.0	1.54	0.72	0.2	189	1.18	0.91	0.00	0.11	0.34
Dall's porpoise	1996	SoCal	425	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1996	CentrlCA	461	15	4.8	1.38	0.75	75.9	18,444	1.27	0.51	0.04	0.11	0.39
Dall's porpoise	1996	NoCal	672	43	3.3	1.45	0.73	99.2	25,609	1.32	0.64	0.13	0.08	0.34
Dall's porpoise	1996	ORWA	532	51	3.7	1.46	0.76	161.9	52,158	1.60	0.84	0.04	0.10	0.36
Dall's porpoise	1996	TOTALS	2,089	109	3.7	1.44	0.75	84.3	96,211	0.95	0.45	0.06	0.08	0.27
Dall's porpoise	2001	SoCal	131	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2001	CentrlCA	365	4	2.3	1.26	0.67	15.0	3,637	1.36	0.78	0.00	0.12	0.44
Dall's porpoise	2001	NoCal	357	23	2.3	1.76	0.67	61.8	15,940	1.34	0.83	0.15	0.09	0.43
Dall's porpoise	2001	ORWA	381	14	2.8	1.84	0.73	38.6	12,425	1.35	0.59	0.10	0.10	0.37
Dall's porpoise	2001	TOTALS	1,233	41	2.4	1.74	0.69	28.0	32,001	0.83	0.35	0.07	0.09	0.31
Dall's porpoise	2005	SoCal	548	6	2.3	1.84	0.67	10.1	3,211	1.26	1.02	0.00	0.08	0.27
Dall's porpoise	2005	CentrlCA	36	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2005	NoCal	574	14	5.7	1.48	0.67	69.6	17,969	1.40	0.37	0.38	0.13	0.39
Dall's porpoise	2005	ORWA	420	16	4.1	1.62	0.67	71.3	22,973	1.34	0.42	0.19	0.13	0.48
Dall's porpoise	2005	TOTALS	1,579	36	4.4	1.60	0.67	38.7	44,152	1.10	0.30	0.16	0.11	0.28
Dall's porpoise	2008	SoCal	531	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2008	CentrlCA	550	4	10.2	1.72	0.70	30.6	7,436	1.55	0.91	0.52	0.13	0.36
Dall's porpoise	2008	NoCal	254	14	3.8	1.75	0.73	81.2	20,960	1.13	0.41	0.06	0.11	0.35
Dall's porpoise	2008	ORWA	507	5	3.3	1.53	0.70	15.1	4,867	1.16	0.71	0.37	0.13	0.35
Dall's porpoise	2008	TOTALS	1,842	23	4.8	1.70	0.72	29.1	33,263	0.86	0.48	0.31	0.09	0.25
Dall's porpoise	2014	SoCal	809	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2014	CentrlCA	179	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2014	NoCal	214	1	2.9	1.93	0.71	5.0	1,278	1.62	1.20	0.00	0.08	0.45
Dall's porpoise	2014	ORWA	341	7	1.7	1.91	0.68	13.3	4,300	1.41	0.51	0.17	0.12	0.39
Dall's porpoise	2014	TOTALS	1,543	8	1.8	1.92	0.68	4.9	5,578	1.18	0.60	0.17	0.11	0.39
Dall's porpoise	1991	California	2,296	63	3.3	1.47	0.73	125.4	32,041	0.73	0.31	0.11	0.09	0.22
Dall's porpoise	1993	California	1,386	1	1.0	1.54	0.72	0.7	189	1.18	0.91	0.00	0.11	0.34
Dall's porpoise	1996	California	1,557	58	4.0	1.41	0.74	175.1	44,053	0.90	0.51	0.08	0.09	0.27
Dall's porpoise	2001	California	853	27	2.3	1.51	0.67	76.7	19,576	1.12	0.53	0.09	0.11	0.38
Dall's porpoise	2005	California	1,158	20	4.0	1.66	0.67	79.7	21,180	1.27	0.41	0.41	0.11	0.28
Dall's porpoise	2008	California	1,335	18	7.0	1.74	0.72	111.8	28,396	0.98	0.57	0.40	0.11	0.25
Dall's porpoise	2014	California	1,202	1	2.9	1.93	0.71	5.0	1,278	1.62	1.14	0.00	0.08	0.45

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Dall's porpoise (SWFSC species code 044) in Beaufort 0-3 conditions.

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Dall's porpoise	Pooled	SoCal	7,979	6	2.3	1.71	0.57	0.9	278	1.83	0.97	0.00	0.07	0.54
Dall's porpoise	Pooled	CentrlCA	6,166	39	4.4	1.42	0.58	16.7	4,059	1.09	0.29	0.21	0.08	0.48
Dall's porpoise	Pooled	NoCal	7,145	206	3.8	1.40	0.62	63.6	16,410	1.21	0.22	0.09	0.06	0.50
Dall's porpoise	Pooled	ORWA	5,478	129	3.9	1.49	0.57	54.4	17,544	0.91	0.26	0.08	0.05	0.46
Dall's porpoise	Pooled	TOTALS	26,767	380	3.9	1.44	0.60	33.5	38,292	0.73	0.16	0.05	0.05	0.32
Dall's porpoise	1991	SoCal	1,430	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1991	CentrlCA	1,252	11	3	1	0.6	14.0	3,398	1.23	0.63	0.19	0.13	0.42
Dall's porpoise	1991	NoCal	1,709	69	4.2	1.30	0.62	105.8	27,316	1.31	0.27	0.17	0.09	0.47
Dall's porpoise	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dall's porpoise	1991	TOTALS	4,391	80	4.0	1.32	0.62	26.9	30,714	1.20	0.32	0.14	0.09	0.42
Dall's porpoise	1993	SoCal	956	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1993	CentrlCA	926	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1993	NoCal	1,279	9	4.9	1.03	0.65	25.9	6,693	1.49	0.49	0.34	0.14	0.44
Dall's porpoise	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dall's porpoise	1993	TOTALS	3,161	9	4.9	1.03	0.65	5.9	6,693	1.49	0.46	0.34	0.14	0.44
Dall's porpoise	1996	SoCal	1,433	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1996	CentrlCA	1,271	17	4.5	1.40	0.57	37.8	9,185	1.09	0.51	0.22	0.12	0.50
Dall's porpoise	1996	NoCal	1,389	59	3.4	1.32	0.63	87.4	22,560	1.36	0.61	0.15	0.09	0.41
Dall's porpoise	1996	ORWA	1,542	60	3.8	1.40	0.57	91.6	29,515	1.35	0.56	0.10	0.09	0.50
Dall's porpoise	1996	TOTALS	5,634	136	3.7	1.36	0.60	53.7	61,259	0.81	0.37	0.07	0.07	0.30
Dall's porpoise	2001	SoCal	546	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2001	CentrlCA	686	4	2.3	1.27	0.59	8.9	2,162	1.56	0.77	0.00	0.13	0.51
Dall's porpoise	2001	NoCal	612	27	2.5	1.63	0.65	51.6	13,314	1.45	0.76	0.44	0.13	0.42
Dall's porpoise	2001	ORWA	933	18	3.0	1.65	0.56	31.7	10,214	0.96	0.56	0.16	0.12	0.51
Dall's porpoise	2001	TOTALS	2,776	49	2.7	1.61	0.61	22.5	25,689	1.06	0.44	0.15	0.08	0.33
Dall's porpoise	2005	SoCal	1,132	6	2.3	1.71	0.54	6.5	2,065	1.53	0.99	0.00	0.07	0.53
Dall's porpoise	2005	CentrlCA	485	2	5.3	1.21	0.46	19.5	4,744	1.12	0.58	0.08	0.11	0.56
Dall's porpoise	2005	NoCal	1,130	20	5.3	1.49	0.59	53.4	13,772	1.40	0.38	0.25	0.08	0.48
Dall's porpoise	2005	ORWA	1,078	23	5.3	1.50	0.53	71.3	22,972	1.29	0.36	0.16	0.10	0.50
Dall's porpoise	2005	TOTALS	3,825	51	4.9	1.51	0.55	38.1	43,553	0.80	0.27	0.13	0.07	0.32
Dall's porpoise	2008	SoCal	1,062	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2008	CentrlCA	879	5	8.5	1.76	0.65	21.2	5,156	2.13	0.68	0.51	0.12	0.47
Dall's porpoise	2008	NoCal	571	17	3.6	1.78	0.58	52.0	13,415	1.11	0.44	0.07	0.11	0.48
Dall's porpoise	2008	ORWA	976	12	3.5	1.54	0.64	22.0	7,104	1.58	0.57	0.12	0.11	0.42
Dall's porpoise	2008	TOTALS	3,489	34	4.3	1.69	0.61	22.5	25,675	0.90	0.35	0.24	0.09	0.29
Dall's porpoise	2014	SoCal	1,420	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2014	CentrlCA	667	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2014	NoCal	455	5	2.8	1.44	0.57	18.7	4,825	1.42	0.62	0.05	0.15	0.44
Dall's porpoise	2014	ORWA	939	15	3.9	1.56	0.56	35.2	11,327	1.22	0.52	0.40	0.12	0.46
Dall's porpoise	2014	TOTALS	3,481	20	3.6	1.53	0.56	14.1	16,152	0.92	0.46	0.29	0.09	0.37
Dall's porpoise	1991	California	4,391	80	3.5	1.35	0.63	119.8	30,714	1.20	0.32	0.12	0.10	0.30
Dall's porpoise	1993	California	3,161	9	4.9	1.03	0.65	25.9	6,693	1.49	0.46	0.34	0.14	0.44
Dall's porpoise	1996	California	4,092	76	4.0	1.36	0.60	125.2	31,745	0.98	0.52	0.13	0.09	0.30
Dall's porpoise	2001	California	1,843	31	2.4	1.45	0.62	60.5	15,475	1.26	0.69	0.28	0.11	0.31
Dall's porpoise	2005	California	2,747	28	4.3	1.47	0.53	79.4	20,581	1.01	0.37	0.16	0.08	0.31
Dall's porpoise	2008	California	2,512	22	6.1	1.77	0.62	73.2	18,571	1.08	0.44	0.39	0.10	0.34
Dall's porpoise	2014	California	2,542	5	2.8	1.44	0.57	18.7	4,825	1.42	0.68	0.05	0.15	0.44

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Dall's porpoise (SWFSC species code 044) in Beaufort 0-5 conditions.

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Dall's porpoise	Pooled	SoCal	21,687	13	3.8	1.30	0.35	2.5	800	0.95	0.48	0.22	0.19	0.53
Dall's porpoise	Pooled	CentrlCA	16,277	57	4.2	1.25	0.36	16.2	3,929	1.12	0.21	0.14	0.07	0.61
Dall's porpoise	Pooled	NoCal	17,826	250	4.0	1.34	0.38	55.4	14,288	1.41	0.22	0.07	0.06	0.54
Dall's porpoise	Pooled	ORWA	16,346	199	4.2	1.31	0.34	58.3	18,785	0.94	0.23	0.06	0.05	0.57
Dall's porpoise	Pooled	TOTALS	72,136	519	4.1	1.32	0.36	33.1	37,802	0.80	0.14	0.04	0.05	0.39
Dall's porpoise	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1991	CentrlCA	2,968	11	3	1	0.4	9.0	2,191	1.40	0.66	0.16	0.10	0.56
Dall's porpoise	1991	NoCal	3,018	76	4.4	1.33	0.46	90.2	23,277	1.21	0.30	0.16	0.10	0.61
Dall's porpoise	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dall's porpoise	1991	TOTALS	10,027	87	4.2	1.36	0.45	22.3	25,469	1.14	0.30	0.13	0.09	0.54
Dall's porpoise	1993	SoCal	2,543	2	7.5	0.90	0.34	9.5	3,031	1.57	0.89	0.00	0.11	0.64
Dall's porpoise	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1993	NoCal	2,085	11	4.2	1.08	0.47	22.0	5,675	1.96	0.50	0.28	0.08	0.55
Dall's porpoise	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dall's porpoise	1993	TOTALS	6,152	13	4.7	1.05	0.45	7.6	8,706	1.33	0.41	0.22	0.08	0.51
Dall's porpoise	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	1996	CentrlCA	3,057	20	4.4	1.20	0.38	32.2	7,822	1.22	0.47	0.25	0.12	0.60
Dall's porpoise	1996	NoCal	3,287	72	3.9	1.28	0.39	85.0	21,935	1.36	0.57	0.09	0.09	0.60
Dall's porpoise	1996	ORWA	4,338	81	3.9	1.28	0.33	85.4	27,507	0.79	0.47	0.06	0.11	0.57
Dall's porpoise	1996	TOTALS	14,676	173	4.0	1.27	0.36	50.2	57,265	0.71	0.35	0.05	0.07	0.37
Dall's porpoise	2001	SoCal	2,455	4	4.4	0.86	0.28	14.9	4,760	1.08	0.65	0.16	0.10	0.53
Dall's porpoise	2001	CentrlCA	1,608	6	2.2	1.29	0.37	8.6	2,098	1.10	0.54	0.03	0.11	0.58
Dall's porpoise	2001	NoCal	2,376	33	2.7	1.46	0.35	36.8	9,486	1.00	0.66	0.33	0.14	0.65
Dall's porpoise	2001	ORWA	3,098	31	3.3	1.41	0.33	35.8	11,540	0.89	0.40	0.17	0.13	0.58
Dall's porpoise	2001	TOTALS	9,538	74	3.0	1.40	0.34	24.4	27,885	0.57	0.34	0.13	0.10	0.43
Dall's porpoise	2005	SoCal	2,838	6	2.3	1.75	0.36	3.7	1,193	2.04	0.90	0.01	0.08	0.52
Dall's porpoise	2005	CentrlCA	2,386	9	4.5	0.91	0.28	33.0	8,013	1.27	0.51	0.06	0.17	0.58
Dall's porpoise	2005	NoCal	2,665	21	5.3	1.39	0.38	39.4	10,162	0.98	0.46	0.22	0.10	0.56
Dall's porpoise	2005	ORWA	2,951	34	6.1	1.25	0.34	81.9	26,384	1.10	0.30	0.17	0.08	0.52
Dall's porpoise	2005	TOTALS	10,840	70	5.3	1.29	0.35	40.1	45,752	0.75	0.22	0.12	0.07	0.34
Dall's porpoise	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2008	CentrlCA	2,895	11	6.0	1.37	0.35	23.6	5,723	1.44	0.40	0.36	0.14	0.58
Dall's porpoise	2008	NoCal	2,396	29	4.1	1.47	0.29	56.9	14,676	0.74	0.42	0.10	0.13	0.57
Dall's porpoise	2008	ORWA	3,238	25	3.7	1.39	0.34	30.3	9,773	1.18	0.37	0.07	0.12	0.60
Dall's porpoise	2008	TOTALS	11,563	65	4.3	1.42	0.32	26.4	30,172	0.61	0.24	0.10	0.10	0.38
Dall's porpoise	2014	SoCal	2,780	1	3.3	1.16	0.41	1.3	401	1.62	1.12	0.00	0.10	0.52
Dall's porpoise	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Dall's porpoise	2014	NoCal	1,998	8	3.7	1.25	0.28	20.5	5,281	1.12	0.50	0.15	0.16	0.50
Dall's porpoise	2014	ORWA	2,708	27	4.1	1.25	0.33	50.6	16,294	0.92	0.42	0.13	0.10	0.58
Dall's porpoise	2014	TOTALS	9,327	36	4.0	1.25	0.32	19.2	21,976	0.72	0.34	0.10	0.10	0.44
Dall's porpoise	1991	California	10,027	87	3.6	1.42	0.42	99.2	25,469	1.14	0.30	0.12	0.09	0.45
Dall's porpoise	1993	California	6,152	13	5.8	0.99	0.41	31.5	8,706	1.34	0.42	0.21	0.10	0.49
Dall's porpoise	1996	California	10,338	92	4.1	1.24	0.38	117.2	29,758	1.04	0.48	0.16	0.09	0.41
Dall's porpoise	2001	California	6,440	43	3.1	1.20	0.33	60.3	16,345	0.70	0.54	0.14	0.09	0.38
Dall's porpoise	2005	California	7,889	36	4.0	1.35	0.34	76.1	19,368	0.78	0.33	0.13	0.08	0.35
Dall's porpoise	2008	California	8,325	40	5.0	1.42	0.32	80.4	20,399	0.72	0.34	0.22	0.12	0.38
Dall's porpoise	2014	California	6,619	9	3.5	1.21	0.35	21.7	5,682	1.01	0.48	0.12	0.13	0.40

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Mesoplodon sp. (SWFSC species codes 51 & 59).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Mesoplodon spp.	Pooled	SoCal	21,687	11	1.9	1.77	0.13	2.2	691	0.59	0.35	0.12	0.23	0.37
Mesoplodon spp.	Pooled	CentrlCA	16,277	11	1.6	1.99	0.14	1.9	473	0.86	0.35	0.18	0.18	0.39
Mesoplodon spp.	Pooled	NoCal	17,826	11	1.9	1.62	0.14	2.5	655	0.77	0.37	0.28	0.17	0.81
Mesoplodon spp.	Pooled	ORWA	16,346	5	1.9	1.96	0.13	1.2	381	0.68	0.44	0.23	0.24	0.36
Mesoplodon spp.	Pooled	TOTALS	72,136	38	1.8	1.82	0.13	1.9	2,200	0.35	0.19	0.09	0.15	0.34
Mesoplodon spp.	1991	SoCal	4,041	3	1.9	1.93	0.14	2.5	804	0.73	0.57	0.22	0.29	0.89
Mesoplodon spp.	1991	CentrlCA	2,968	2	2	2	0.2	2.0	486	1.34	0.78	0.31	0.41	0.81
Mesoplodon spp.	1991	NoCal	3,018	1	1.0	2.31	0.18	0.4	106	1.24	0.99	0.00	0.16	0.60
Mesoplodon spp.	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mesoplodon spp.	1991	TOTALS	10,027	6	1.7	1.96	0.15	1.2	1,395	0.67	0.45	0.19	0.21	0.61
Mesoplodon spp.	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	1993	CentrlCA	1,523	3	1.4	2.27	0.17	3.7	887	0.75	0.68	0.33	0.17	0.64
Mesoplodon spp.	1993	NoCal	2,085	4	2.4	1.78	0.17	7.5	1,936	0.93	0.62	0.29	0.30	0.73
Mesoplodon spp.	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mesoplodon spp.	1993	TOTALS	6,152	7	2.0	1.99	0.17	2.5	2,823	0.64	0.44	0.27	0.18	0.52
Mesoplodon spp.	1996	SoCal	3,994	4	1.9	1.35	0.12	5.7	1,814	0.85	0.59	0.26	0.33	0.48
Mesoplodon spp.	1996	CentrlCA	3,057	4	1.6	1.85	0.14	4.2	1,025	0.96	0.46	0.40	0.33	0.60
Mesoplodon spp.	1996	NoCal	3,287	4	1.3	1.54	0.15	3.2	823	0.84	0.70	0.24	0.24	0.70
Mesoplodon spp.	1996	ORWA	4,338	2	1.5	2.26	0.13	1.2	385	1.10	0.72	0.28	0.27	0.41
Mesoplodon spp.	1996	TOTALS	14,676	14	1.6	1.68	0.14	3.5	4,046	0.51	0.29	0.16	0.20	0.32
Mesoplodon spp.	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2001	TOTALS	9,538	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2005	NoCal	2,665	1	4.7	1.21	0.14	5.1	1,311	1.31	0.99	0.00	0.31	0.77
Mesoplodon spp.	2005	ORWA	2,951	2	2.8	1.77	0.12	4.3	1,392	0.78	0.67	0.14	0.29	0.40
Mesoplodon spp.	2005	TOTALS	10,840	3	3.4	1.58	0.13	2.4	2,703	0.79	0.59	0.18	0.29	0.54
Mesoplodon spp.	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2008	NoCal	2,396	1	1.0	1.05	0.11	1.8	466	1.61	1.02	0.00	0.28	0.64
Mesoplodon spp.	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2008	TOTALS	11,563	1	1.0	1.05	0.11	0.4	466	1.61	1.06	0.00	0.28	0.64
Mesoplodon spp.	2014	SoCal	2,780	4	2.0	2.07	0.15	4.7	1,495	0.84	0.52	0.20	0.25	0.87
Mesoplodon spp.	2014	CentrlCA	1,841	2	1.5	2.01	0.12	3.3	814	0.95	0.68	0.26	0.25	0.73
Mesoplodon spp.	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2014	ORWA	2,708	1	1.0	1.75	0.12	0.9	281	1.43	0.99	0.00	0.26	0.49
Mesoplodon spp.	2014	TOTALS	9,327	7	1.7	2.01	0.14	2.3	2,590	0.65	0.40	0.18	0.22	0.65
Mesoplodon spp.	1991	California	10,027	6	1.5	2.02	0.16	4.9	1,395	0.67	0.45	0.21	0.20	0.51
Mesoplodon spp.	1993	California	6,152	7	1.9	2.03	0.17	11.2	2,823	0.64	0.44	0.25	0.18	0.50
Mesoplodon spp.	1996	California	10,338	12	1.6	1.58	0.14	13.1	3,661	0.53	0.33	0.20	0.24	0.37
Mesoplodon spp.	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Mesoplodon spp.	2005	California	7,889	1	4.7	1.21	0.14	5.1	1,311	1.31	0.94	0.00	0.31	0.77
Mesoplodon spp.	2008	California	8,325	1	1.0	1.05	0.11	1.8	466	1.61	1.06	0.00	0.28	0.64
Mesoplodon spp.	2014	California	6,619	6	1.8	2.04	0.14	8.0	2,309	0.68	0.45	0.18	0.22	0.74

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Cuvier's beaked whale (SWFSC species code 061).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Cuvier's beaked whale	Pooled	SoCal	21,687	19	1.9	1.66	0.16	3.2	1,019	0.57	0.23	0.08	0.20	0.50
Cuvier's beaked whale	Pooled	CentrlCA	16,277	21	2.2	1.81	0.16	4.9	1,184	0.71	0.29	0.11	0.19	0.49
Cuvier's beaked whale	Pooled	NoCal	17,826	12	1.7	1.62	0.17	2.1	534	0.71	0.27	0.21	0.25	0.43
Cuvier's beaked whale	Pooled	ORWA	16,346	11	1.7	1.36	0.15	2.8	908	0.53	0.29	0.13	0.18	0.46
Cuvier's beaked whale	Pooled	TOTALS	72,136	63	1.9	1.65	0.16	3.2	3,645	0.35	0.15	0.07	0.18	0.24
Cuvier's beaked whale	1991	SoCal	4,041	6	2.2	1.51	0.17	6.4	2,023	0.74	0.46	0.09	0.30	0.77
Cuvier's beaked whale	1991	CentrlCA	2,968	10	2	2	0.2	11.3	2,753	0.92	0.55	0.22	0.26	0.66
Cuvier's beaked whale	1991	NoCal	3,018	2	2.6	1.76	0.20	2.5	636	0.90	0.69	0.50	0.42	0.65
Cuvier's beaked whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cuvier's beaked whale	1991	TOTALS	10,027	18	2.4	1.84	0.18	4.7	5,412	0.57	0.37	0.11	0.24	0.51
Cuvier's beaked whale	1993	SoCal	2,543	5	1.8	1.49	0.15	7.8	2,479	0.76	0.35	0.29	0.27	0.53
Cuvier's beaked whale	1993	CentrlCA	1,523	1	2.3	0.91	0.20	4.2	1,022	1.26	0.91	0.00	0.37	0.75
Cuvier's beaked whale	1993	NoCal	2,085	6	1.8	1.66	0.20	7.9	2,043	1.21	0.33	0.27	0.33	0.59
Cuvier's beaked whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cuvier's beaked whale	1993	TOTALS	6,152	12	1.9	1.53	0.18	4.9	5,545	0.67	0.22	0.18	0.26	0.39
Cuvier's beaked whale	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Cuvier's beaked whale	1996	CentrlCA	3,057	4	1.6	1.92	0.17	3.2	776	0.67	0.45	0.19	0.22	0.56
Cuvier's beaked whale	1996	NoCal	3,287	2	1.0	1.49	0.18	1.2	300	1.05	0.65	0.00	0.34	0.68
Cuvier's beaked whale	1996	ORWA	4,338	3	1.7	1.23	0.15	3.1	1,010	0.92	0.49	0.37	0.25	0.61
Cuvier's beaked whale	1996	TOTALS	14,676	9	1.5	1.59	0.16	1.8	2,086	0.51	0.25	0.18	0.23	0.41
Cuvier's beaked whale	2001	SoCal	2,455	3	1.9	1.76	0.13	5.1	1,614	0.75	0.59	0.30	0.42	0.55
Cuvier's beaked whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Cuvier's beaked whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Cuvier's beaked whale	2001	ORWA	3,098	2	2.2	1.41	0.15	3.3	1,061	1.14	0.58	0.04	0.22	0.67
Cuvier's beaked whale	2001	TOTALS	9,538	5	2.0	1.62	0.14	2.3	2,675	0.66	0.40	0.15	0.32	0.54
Cuvier's beaked whale	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Cuvier's beaked whale	2005	CentrlCA	2,386	2	2.3	1.87	0.13	3.9	940	0.91	0.67	0.42	0.21	0.58
Cuvier's beaked whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Cuvier's beaked whale	2005	ORWA	2,951	1	2.3	1.20	0.15	2.1	678	0.99	0.84	0.00	0.20	0.46
Cuvier's beaked whale	2005	TOTALS	10,840	3	2.3	1.65	0.14	1.4	1,618	0.68	0.52	0.28	0.21	0.42
Cuvier's beaked whale	2008	SoCal	3,035	3	1.7	1.98	0.14	3.0	952	1.06	0.56	0.22	0.27	0.56
Cuvier's beaked whale	2008	CentrlCA	2,895	2	1.5	1.44	0.16	2.2	531	0.97	0.68	0.23	0.32	0.49
Cuvier's beaked whale	2008	NoCal	2,396	1	1.0	1.76	0.14	0.9	225	1.37	1.04	0.00	0.33	0.53
Cuvier's beaked whale	2008	ORWA	3,238	4	1.6	1.58	0.15	4.0	1,282	0.97	0.44	0.20	0.34	0.68
Cuvier's beaked whale	2008	TOTALS	11,563	10	1.5	1.69	0.15	2.6	2,990	0.62	0.30	0.13	0.29	0.35
Cuvier's beaked whale	2014	SoCal	2,780	2	1.5	1.88	0.18	1.6	499	1.35	0.80	0.24	0.23	0.64
Cuvier's beaked whale	2014	CentrlCA	1,841	2	3.4	1.17	0.15	10.1	2,459	0.93	0.55	0.32	0.21	0.49
Cuvier's beaked whale	2014	NoCal	1,998	1	1.0	1.24	0.14	1.5	384	1.28	1.01	0.00	0.25	0.44
Cuvier's beaked whale	2014	ORWA	2,708	1	1.0	0.93	0.15	1.3	432	1.37	0.97	0.00	0.31	0.41
Cuvier's beaked whale	2014	TOTALS	9,327	6	1.9	1.38	0.16	3.3	3,775	0.68	0.39	0.27	0.28	0.29
Cuvier's beaked whale	1991	California	10,027	18	2.4	1.77	0.18	20.1	5,412	0.57	0.37	0.18	0.25	0.41
Cuvier's beaked whale	1993	California	6,152	12	2.0	1.36	0.18	19.9	5,545	0.67	0.22	0.17	0.27	0.37
Cuvier's beaked whale	1996	California	10,338	6	1.3	1.70	0.17	4.4	1,076	0.53	0.35	0.14	0.25	0.41
Cuvier's beaked whale	2001	California	6,440	3	1.9	1.76	0.13	5.1	1,614	0.75	0.61	0.30	0.42	0.55
Cuvier's beaked whale	2005	California	7,889	2	2.3	1.87	0.13	3.9	940	0.91	0.68	0.42	0.21	0.58
Cuvier's beaked whale	2008	California	8,325	6	1.4	1.73	0.15	6.0	1,708	0.69	0.36	0.17	0.29	0.39
Cuvier's beaked whale	2014	California	6,619	5	1.9	1.43	0.16	13.2	3,343	0.72	0.44	0.28	0.24	0.31

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Baird's beaked whale (SWFSC species code 063).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Baird's beaked whale	Pooled	SoCal	21,687	3	10.1	3.09	0.13	1.8	565	0.71	0.57	0.34	0.30	0.37
Baird's beaked whale	Pooled	CentrlCA	16,277	5	12.9	3.36	0.14	4.3	1,055	0.90	0.56	0.32	0.30	0.40
Baird's beaked whale	Pooled	NoCal	17,826	5	9.2	2.63	0.14	3.4	877	0.82	0.43	0.49	0.39	0.59
Baird's beaked whale	Pooled	ORWA	16,346	14	7.8	2.46	0.13	10.7	3,449	0.61	0.26	0.22	0.27	0.38
Baird's beaked whale	Pooled	TOTALS	72,136	27	9.3	2.73	0.13	5.2	5,946	0.46	0.20	0.17	0.26	0.25
Baird's beaked whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	1991	CentrlCA	2,968	1	3	2	0.2	2.0	480	1.46	1.05	0.00	0.41	0.79
Baird's beaked whale	1991	NoCal	3,018	1	4.9	2.38	0.18	1.9	502	1.02	0.72	0.00	0.36	0.61
Baird's beaked whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Baird's beaked whale	1991	TOTALS	10,027	2	4.2	2.14	0.16	0.9	982	1.06	0.67	0.12	0.38	0.53
Baird's beaked whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	1993	CentrlCA	1,523	3	16.9	3.87	0.17	25.3	6,138	1.12	0.71	0.23	0.30	0.62
Baird's beaked whale	1993	NoCal	2,085	1	25.0	4.34	0.17	8.0	2,070	1.32	0.93	0.00	0.49	0.73
Baird's beaked whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Baird's beaked whale	1993	TOTALS	6,152	4	18.9	3.99	0.17	7.2	8,208	0.88	0.62	0.17	0.35	0.58
Baird's beaked whale	1996	SoCal	3,994	1	7.1	2.74	0.12	2.6	831	1.53	1.04	0.00	0.49	0.36
Baird's beaked whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	1996	NoCal	3,287	1	11.3	3.41	0.15	3.3	842	1.36	0.92	0.00	0.42	0.72
Baird's beaked whale	1996	ORWA	4,338	3	1.9	1.33	0.13	3.8	1,222	1.46	0.57	0.01	0.72	0.54
Baird's beaked whale	1996	TOTALS	14,676	5	4.8	2.03	0.13	2.5	2,895	0.89	0.44	0.42	0.49	0.43
Baird's beaked whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2001	ORWA	3,098	2	3.7	1.75	0.13	5.4	1,735	1.56	0.67	0.51	0.56	0.79
Baird's beaked whale	2001	TOTALS	9,538	2	3.7	1.75	0.13	1.5	1,735	1.56	0.68	0.51	0.56	0.79
Baird's beaked whale	2005	SoCal	2,838	1	6.4	2.60	0.13	3.4	1,099	1.13	1.00	0.00	0.26	0.38
Baird's beaked whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2005	ORWA	2,951	3	11.3	2.93	0.12	15.8	5,093	1.15	0.77	0.23	0.36	0.44
Baird's beaked whale	2005	TOTALS	10,840	4	10.1	2.85	0.12	5.4	6,192	1.01	0.60	0.25	0.35	0.39
Baird's beaked whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2008	CentrlCA	2,895	1	10.3	3.27	0.14	4.0	966	1.41	1.13	0.00	0.35	0.55
Baird's beaked whale	2008	NoCal	2,396	2	2.5	1.52	0.11	6.2	1,608	1.49	1.01	0.00	0.58	0.52
Baird's beaked whale	2008	ORWA	3,238	2	13.4	3.58	0.13	8.8	2,820	1.03	0.71	0.24	0.32	0.75
Baird's beaked whale	2008	TOTALS	11,563	5	8.4	2.69	0.12	4.7	5,394	0.83	0.55	0.31	0.39	0.52
Baird's beaked whale	2014	SoCal	2,780	1	16.9	3.92	0.15	5.2	1,646	1.25	1.06	0.00	0.25	0.68
Baird's beaked whale	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2014	ORWA	2,708	4	8.9	2.75	0.12	19.6	6,314	1.07	0.49	0.37	0.39	0.66
Baird's beaked whale	2014	TOTALS	9,327	5	10.5	2.99	0.13	7.0	7,960	0.93	0.47	0.28	0.36	0.59
Baird's beaked whale	1991	California	10,027	2	4.2	2.14	0.16	3.9	982	1.06	0.67	0.11	0.38	0.53
Baird's beaked whale	1993	California	6,152	4	21.0	4.11	0.17	33.3	8,208	0.88	0.62	0.16	0.36	0.55
Baird's beaked whale	1996	California	10,338	2	9.2	3.07	0.14	5.9	1,673	1.08	0.75	0.16	0.43	0.63
Baird's beaked whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Baird's beaked whale	2005	California	7,889	1	6.4	2.60	0.13	3.4	1,099	1.13	1.00	0.00	0.26	0.38
Baird's beaked whale	2008	California	8,325	3	6.4	2.39	0.12	10.2	2,574	1.05	0.73	0.43	0.44	0.51
Baird's beaked whale	2014	California	6,619	1	16.9	3.92	0.15	5.2	1,646	1.25	1.04	0.00	0.25	0.68

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Kogia spp. (SWFSC species codes 047 & 080) in Beaufort 0-3 conditions.

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Kogia spp	Pooled	SoCal	7,979	1	1.0	2.09	0.02	1.6	505	1.21	0.94	0.34	0.28	1.90
Kogia spp	Pooled	CentrlCA	6,166	4	1.4	2.49	0.03	6.5	1,590	0.61	0.53	0.20	0.17	1.74
Kogia spp	Pooled	NoCal	7,145	1	1.0	2.55	0.03	0.9	242	1.43	1.10	0.34	0.25	1.13
Kogia spp	Pooled	ORWA	5,478	1	1.0	2.77	0.02	1.6	524	1.40	1.04	0.28	0.21	2.13
Kogia spp	Pooled	TOTALS	26,767	7	1.2	2.48	0.03	2.5	2,862	0.53	0.40	0.15	0.16	1.07
Kogia spp	1991	SoCal	1,430	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	1991	CentrlCA	1,252	2	1	3	0.1	7.2	1,760	0.97	0.73	0.28	0.22	1.02
Kogia spp	1991	NoCal	1,709	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kogia spp	1991	TOTALS	4,391	2	1.3	2.55	0.05	1.5	1,760	0.97	0.74	0.28	0.22	1.02
Kogia spp	1993	SoCal	956	1	1.0	2.09	0.01	17.4	5,546	1.40	0.98	0.33	0.28	1.76
Kogia spp	1993	CentrlCA	926	1	1.0	2.55	0.03	7.5	1,813	1.17	0.94	0.33	0.20	1.51
Kogia spp	1993	NoCal	1,279	1	1.0	2.55	0.03	4.6	1,187	1.15	1.09	0.33	0.25	0.38
Kogia spp	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kogia spp	1993	TOTALS	3,161	3	1.0	2.40	0.03	7.5	8,546	0.91	0.58	0.24	0.20	1.60
Kogia spp	1996	SoCal	1,433	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	1996	CentrlCA	1,271	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	1996	NoCal	1,389	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	1996	ORWA	1,542	1	1.0	2.77	0.02	5.8	1,856	1.54	1.06	0.27	0.21	1.92
Kogia spp	1996	TOTALS	5,634	1	1.0	2.77	0.02	1.6	1,856	1.54	1.04	0.27	0.21	1.92
Kogia spp	2001	SoCal	546	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2001	CentrlCA	686	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2001	NoCal	612	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2001	ORWA	933	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2001	TOTALS	2,776	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2005	SoCal	1,132	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2005	CentrlCA	485	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2005	NoCal	1,130	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2005	ORWA	1,078	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2005	TOTALS	3,825	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2008	SoCal	1,062	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2008	CentrlCA	879	1	1.9	2.32	0.03	16.9	4,111	1.12	1.01	0.31	0.21	0.33
Kogia spp	2008	NoCal	571	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2008	ORWA	976	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2008	TOTALS	3,489	1	1.9	2.32	0.03	3.6	4,111	1.12	0.94	0.31	0.21	0.33
Kogia spp	2014	SoCal	1,420	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2014	CentrlCA	667	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2014	NoCal	455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2014	ORWA	939	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2014	TOTALS	3,481	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	1991	California	4,391	2	1.3	2.55	0.05	7.2	1,760	0.97	0.74	0.28	0.22	1.02
Kogia spp	1993	California	3,161	3	1.0	2.40	0.03	29.5	8,546	0.91	0.58	0.24	0.20	1.53
Kogia spp	1996	California	4,092	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2001	California	1,843	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2005	California	2,747	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Kogia spp	2008	California	2,512	1	1.9	2.32	0.03	16.9	4,111	1.12	0.94	0.31	0.21	0.33
Kogia spp	2014	California	2,542	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Sperm whale (SWFSC species code 046).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Sperm whale	Pooled	SoCal	21,687	24	8.9	4.93	0.59	1.7	538	0.77	0.26	0.28	0.11	0.38
Sperm whale	Pooled	CentrlCA	16,277	21	4.1	4.72	0.60	0.9	226	0.67	0.33	0.26	0.11	0.28
Sperm whale	Pooled	NoCal	17,826	38	7.4	4.79	0.60	2.7	705	0.59	0.23	0.25	0.12	0.34
Sperm whale	Pooled	ORWA	16,346	14	5.8	4.58	0.59	0.9	296	0.97	0.30	0.46	0.14	0.34
Sperm whale	Pooled	TOTALS	72,136	97	6.8	4.78	0.60	1.5	1,766	0.43	0.14	0.17	0.11	0.19
Sperm whale	1991	SoCal	4,041	11	5.5	4.93	0.60	2.5	800	0.97	0.53	0.47	0.13	0.32
Sperm whale	1991	CentrlCA	2,968	2	8	5	0.6	0.9	212	1.00	0.74	0.43	0.08	0.34
Sperm whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sperm whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sperm whale	1991	TOTALS	10,027	13	5.9	4.98	0.60	0.9	1,011	0.78	0.47	0.34	0.12	0.28
Sperm whale	1993	SoCal	2,543	1	3.2	5.04	0.59	0.2	67	1.20	1.11	0.00	0.08	0.34
Sperm whale	1993	CentrlCA	1,523	4	4.2	5.11	0.64	1.7	411	1.24	1.05	0.00	0.05	0.24
Sperm whale	1993	NoCal	2,085	8	11.5	5.19	0.63	6.7	1,736	1.16	0.70	0.46	0.11	0.31
Sperm whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sperm whale	1993	TOTALS	6,152	13	8.6	5.16	0.63	1.9	2,214	0.94	0.46	0.43	0.07	0.23
Sperm whale	1996	SoCal	3,994	3	5.7	4.76	0.59	0.8	243	1.24	0.63	0.72	0.16	0.33
Sperm whale	1996	CentrlCA	3,057	3	6.1	4.88	0.60	1.0	247	1.12	0.65	0.49	0.12	0.32
Sperm whale	1996	NoCal	3,287	3	2.9	4.74	0.61	0.4	116	1.24	0.89	0.00	0.16	0.28
Sperm whale	1996	ORWA	4,338	4	8.4	5.19	0.59	1.3	408	0.92	0.68	0.44	0.09	0.33
Sperm whale	1996	TOTALS	14,676	13	6.0	4.91	0.60	0.9	1,014	0.57	0.36	0.31	0.12	0.19
Sperm whale	2001	SoCal	2,455	4	18.9	5.38	0.57	5.1	1,612	0.88	0.46	0.29	0.11	0.37
Sperm whale	2001	CentrlCA	1,608	1	1.2	4.39	0.60	0.1	34	1.08	0.86	0.00	0.12	0.29
Sperm whale	2001	NoCal	2,376	4	4.4	4.56	0.59	1.4	351	1.10	0.40	0.80	0.17	0.31
Sperm whale	2001	ORWA	3,098	2	2.2	4.58	0.59	0.3	82	1.12	0.65	0.37	0.16	0.33
Sperm whale	2001	TOTALS	9,538	11	9.0	4.85	0.58	1.8	2,080	0.72	0.27	0.37	0.13	0.16
Sperm whale	2005	SoCal	2,838	3	5.1	4.56	0.60	1.0	315	1.02	0.57	0.82	0.16	0.32
Sperm whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sperm whale	2005	NoCal	2,665	14	9.5	4.80	0.60	8.7	2,235	0.64	0.26	0.35	0.14	0.29
Sperm whale	2005	ORWA	2,951	4	9.8	4.44	0.59	2.5	818	1.04	0.44	0.83	0.19	0.32
Sperm whale	2005	TOTALS	10,840	21	8.9	4.70	0.60	2.9	3,368	0.52	0.24	0.29	0.14	0.21
Sperm whale	2008	SoCal	3,035	2	21.1	4.80	0.58	2.5	796	1.39	0.77	0.67	0.13	0.37
Sperm whale	2008	CentrlCA	2,895	3	1.0	4.13	0.59	0.2	52	1.08	0.78	0.00	0.18	0.38
Sperm whale	2008	NoCal	2,396	5	2.3	4.63	0.57	0.9	234	0.96	0.55	0.37	0.16	0.39
Sperm whale	2008	ORWA	3,238	3	1.0	4.13	0.59	0.2	62	1.23	0.58	0.00	0.19	0.37
Sperm whale	2008	TOTALS	11,563	13	4.6	4.42	0.58	1.0	1,143	0.97	0.32	0.70	0.15	0.22
Sperm whale	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sperm whale	2014	CentrlCA	1,841	8	3.7	4.61	0.59	3.0	723	0.84	0.47	0.58	0.14	0.36
Sperm whale	2014	NoCal	1,998	4	4.8	4.43	0.57	1.9	495	1.19	0.45	0.76	0.15	0.33
Sperm whale	2014	ORWA	2,708	1	1.0	4.09	0.58	0.1	25	1.06	0.88	0.00	0.19	0.33
Sperm whale	2014	TOTALS	9,327	13	3.9	4.51	0.58	1.1	1,242	0.66	0.32	0.45	0.13	0.24
Sperm whale	1991	California	10,027	13	6.9	5.08	0.60	3.4	1,011	0.78	0.47	0.36	0.11	0.25
Sperm whale	1993	California	6,152	13	6.3	5.12	0.62	8.6	2,214	0.93	0.45	0.43	0.07	0.21
Sperm whale	1996	California	10,338	9	4.9	4.79	0.60	2.2	606	0.70	0.47	0.45	0.14	0.20
Sperm whale	2001	California	6,440	9	8.2	4.78	0.59	6.6	1,997	0.75	0.30	0.36	0.11	0.18
Sperm whale	2005	California	7,889	17	7.3	4.68	0.60	9.6	2,550	0.58	0.28	0.36	0.14	0.22
Sperm whale	2008	California	8,325	10	8.1	4.52	0.58	3.6	1,081	1.02	0.37	0.75	0.15	0.21
Sperm whale	2014	California	6,619	12	4.3	4.52	0.58	4.9	1,217	0.68	0.35	0.52	0.14	0.24

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Minke whale (SWFSC species code 071).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Minke whale	Pooled	SoCal	21687	6	1.4	2.29	0.12	0.7	216	1.60	0.73	0.17	0.36	0.92
Minke whale	Pooled	CentrlCA	16277	8	1.1	2.47	0.13	0.8	198	1.20	0.40	0.07	0.30	1.01
Minke whale	Pooled	NoCal	17826	4	1.1	2.44	0.14	0.3	88	1.32	0.47	0.04	0.31	0.90
Minke whale	Pooled	ORWA	16346	10	1.0	1.94	0.12	1.3	418	1.05	0.36	0.00	0.31	0.91
Minke whale	Pooled	TOTALS	72136	28	1.1	2.24	0.13	0.8	920	0.80	0.25	0.06	0.29	0.55
Minke whale	1991	SoCal	4041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1991	CentrlCA	2967.84	2	1	3	0.2	0.8	198	1.38	0.96	0.00	0.23	0.84
Minke whale	1991	NoCal	3018	2	1.1	2.57	0.18	0.8	209	1.47	0.67	0.06	0.27	0.77
Minke whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Minke whale	1991	TOTALS	10027	4	1.1	2.78	0.16	0.4	407	0.97	0.57	0.04	0.26	0.64
Minke whale	1993	SoCal	2543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1993	CentrlCA	1523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1993	NoCal	2085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Minke whale	1993	TOTALS	6152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1996	SoCal	3994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1996	CentrlCA	3057	2	1.0	2.58	0.13	1.0	232	1.14	0.65	0.00	0.32	0.91
Minke whale	1996	NoCal	3287	2	1.0	2.30	0.15	0.9	223	1.09	0.67	0.00	0.36	1.01
Minke whale	1996	ORWA	4338	6	1.0	1.84	0.12	3.0	977	1.44	0.51	0.00	0.37	0.92
Minke whale	1996	TOTALS	14676	10	1.0	2.08	0.13	1.3	1,432	1.05	0.36	0.00	0.31	0.64
Minke whale	2001	SoCal	2455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2001	CentrlCA	1608	2	1.3	2.52	0.13	2.3	558	1.23	0.65	0.15	0.31	0.88
Minke whale	2001	NoCal	2376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2001	ORWA	3098	2	1.0	2.10	0.12	1.2	399	1.65	0.81	0.00	0.51	0.70
Minke whale	2001	TOTALS	9538	4	1.1	2.31	0.13	0.8	957	0.96	0.53	0.12	0.35	0.60
Minke whale	2005	SoCal	2838	4	1.6	2.54	0.12	3.5	1,122	1.86	1.03	0.00	0.25	1.10
Minke whale	2005	CentrlCA	2386	1	1.0	2.26	0.10	1.0	233	1.98	1.12	0.00	0.36	0.96
Minke whale	2005	NoCal	2665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2005	ORWA	2951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2005	TOTALS	10840	5	1.5	2.49	0.12	1.2	1,355	1.64	0.89	0.17	0.33	1.00
Minke whale	2008	SoCal	3035	1	1.0	1.34	0.11	1.1	351	1.85	0.87	0.00	0.57	0.90
Minke whale	2008	CentrlCA	2895	1	1.0	1.32	0.13	1.0	243	1.92	1.08	0.00	0.50	1.02
Minke whale	2008	NoCal	2396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2008	ORWA	3238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2008	TOTALS	11563	2	1.0	1.33	0.12	0.5	594	1.32	0.73	0.00	0.55	0.80
Minke whale	2014	SoCal	2780	1	1.0	2.25	0.15	0.5	174	1.83	1.29	0.00	0.36	0.82
Minke whale	2014	CentrlCA	1841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2014	NoCal	1998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	2014	ORWA	2708	2	1.0	2.04	0.11	1.6	507	1.08	0.62	0.00	0.39	1.00
Minke whale	2014	TOTALS	9327	3	1.0	2.11	0.13	0.6	682	0.98	0.57	0.00	0.39	0.91
Minke whale	1991	California	10027	4	1.1	2.78	0.16	1.6	407	0.97	0.57	0.04	0.25	0.64
Minke whale	1993	California	6152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Minke whale	1996	California	10338	4	1.0	2.44	0.14	1.8	455	0.89	0.48	0.00	0.32	0.81
Minke whale	2001	California	6440	2	1.3	2.52	0.13	2.3	558	1.23	0.71	0.15	0.31	0.88
Minke whale	2005	California	7889	5	1.3	2.40	0.11	4.5	1,355	1.64	0.90	0.17	0.33	0.96
Minke whale	2008	California	8325	2	1.0	1.33	0.12	2.1	594	1.32	0.72	0.00	0.55	0.80
Minke whale	2014	California	6619	1	1.0	2.25	0.15	0.5	174	1.83	1.31	0.00	0.36	0.82

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Bryde's whale (SWFSC species code 072).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)	Bootstrap Mean Abundance	Bootstrap SE Abundance
Bryde's whale	Pooled	SoCal	21,687	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	Pooled	CentrlCA	16,277	1	2.1	2.81	0.47	0.0	12	1.05	0.91	0.32	0.22	0.21	8	9
Bryde's whale	Pooled	NoCal	17,826	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	Pooled	TOTALS	72,136	1	2.1	2.81	0.47	0.0	12	1.05	0.92	0.32	0.22	0.21	8	9
Bryde's whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1991	CentrlCA	2,968	1	2	3	0.5	0.3	63	0.95	0.86	0.33	0.22	0.18	45	42
Bryde's whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bryde's whale	1991	TOTALS	10,027	1	2.1	2.81	0.48	0.1	63	0.95	0.91	0.33	0.22	0.18	45	42
Bryde's whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bryde's whale	1993	TOTALS	6,152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1996	TOTALS	14,676	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2001	TOTALS	9,538	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2005	TOTALS	10,840	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2008	TOTALS	11,563	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2014	NoCal	1,998	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2014	TOTALS	9,327	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1991	California	10,027	1	2.1	2.81	0.48	0.3	63	0.95	0.91	0.33	0.22	0.18	45	42
Bryde's whale	1993	California	6,152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	1996	California	10,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2005	California	7,889	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2008	California	8,325	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Bryde's whale	2014	California	6,619	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Sei whale (SWFSC species code 073).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)	Bootstrap Mean Abundance	Bootstrap SE Abundance
Sei whale	Pooled	SoCal	21,687	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	Pooled	CentrlCA	16,277	5	1.0	3.10	0.47	0.1	26	0.85	0.53	0.00	0.21	0.22	29	25
Sei whale	Pooled	NoCal	17,826	9	1.9	3.22	0.48	0.3	82	0.52	0.36	0.19	0.21	0.19	85	44
Sei whale	Pooled	ORWA	16,346	11	1.8	3.42	0.45	0.4	130	0.48	0.39	0.23	0.17	0.17	129	62
Sei whale	Pooled	TOTALS	72,136	25	1.7	3.28	0.46	0.2	238	0.36	0.24	0.15	0.19	0.11	243	88
Sei whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sei whale	1991	TOTALS	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1993	NoCal	2,085	2	1.1	3.14	0.53	0.3	78	0.82	0.77	0.04	0.23	0.16	81	66
Sei whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sei whale	1993	TOTALS	6,152	2	1.1	3.14	0.53	0.1	78	0.82	0.70	0.04	0.23	0.16	81	66
Sei whale	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1996	NoCal	3,287	2	2.7	2.91	0.48	0.6	150	0.78	0.68	0.20	0.26	0.17	159	124
Sei whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1996	TOTALS	14,676	2	2.7	2.91	0.48	0.1	150	0.78	0.70	0.20	0.26	0.17	159	124
Sei whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2001	CentrlCA	1,608	1	1.0	3.31	0.47	0.2	48	1.43	1.32	0.00	0.19	0.22	52	74
Sei whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2001	TOTALS	9,538	1	1.0	3.31	0.47	0.0	48	1.43	1.10	0.00	0.19	0.22	52	74
Sei whale	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2005	CentrlCA	2,386	1	1.0	2.91	0.42	0.2	42	1.20	1.01	0.00	0.22	0.28	47	56
Sei whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2005	ORWA	2,951	2	1.3	3.17	0.45	0.3	95	1.21	0.92	0.00	0.18	0.22	109	132
Sei whale	2005	TOTALS	10,840	3	1.2	3.09	0.44	0.1	136	0.96	0.72	0.08	0.19	0.23	156	150
Sei whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2008	NoCal	2,396	1	4.6	4.11	0.42	0.6	143	1.03	1.02	0.00	0.15	0.19	139	144
Sei whale	2008	ORWA	3,238	2	3.2	4.11	0.45	0.5	169	0.96	0.76	0.51	0.16	0.20	183	175
Sei whale	2008	TOTALS	11,563	3	3.6	4.11	0.44	0.3	311	0.76	0.66	0.32	0.15	0.18	324	247
Sei whale	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	2014	CentrlCA	1,841	3	1.0	3.09	0.45	0.6	141	0.97	0.80	0.00	0.23	0.20	162	157
Sei whale	2014	NoCal	1,998	4	1.3	3.20	0.42	1.0	256	0.52	0.40	0.08	0.20	0.24	286	149
Sei whale	2014	ORWA	2,708	7	1.6	3.29	0.44	1.5	468	0.61	0.54	0.21	0.18	0.20	476	288
Sei whale	2014	TOTALS	9,327	14	1.4	3.22	0.44	0.8	864	0.40	0.34	0.14	0.19	0.15	925	370
Sei whale	1991	California	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA	0	0
Sei whale	1993	California	6,152	2	1.1	3.14	0.53	0.3	78	0.82	0.70	0.04	0.23	0.16	81	66
Sei whale	1996	California	10,338	2	2.7	2.91	0.48	0.6	150	0.78	0.69	0.20	0.26	0.17	159	124
Sei whale	2001	California	6,440	1	1.0	3.31	0.47	0.2	48	1.43	1.11	0.00	0.19	0.22	52	74
Sei whale	2005	California	7,889	1	1.0	2.91	0.42	0.2	42	1.20	1.05	0.00	0.22	0.28	47	56
Sei whale	2008	California	8,325	1	4.6	4.11	0.42	0.6	143	1.03	1.03	0.00	0.15	0.19	139	144
Sei whale	2014	California	6,619	7	1.2	3.14	0.44	1.6	397	0.52	0.43	0.07	0.21	0.18	448	233

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Sei or Bryde's whale (SWFSC species code 099).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Sei/Bryde's whale	Pooled	SoCal	21,687	3	1.0	2.88	0.46	0.1	17	0.73	0.68	0.00	0.21	0.21
Sei/Bryde's whale	Pooled	CentrlCA	16,277	3	1.0	2.76	0.47	0.1	17	0.76	0.54	0.00	0.21	0.20
Sei/Bryde's whale	Pooled	NoCal	17,826	1	1.0	2.83	0.48	0.0	5	1.15	0.95	0.00	0.23	0.21
Sei/Bryde's whale	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	Pooled	TOTALS	72,136	7	1.0	2.82	0.46	0.0	40	0.52	0.37	0.00	0.21	0.14
Sei/Bryde's whale	1991	SoCal	4,041	2	1.0	2.90	0.47	0.2	57	1.10	0.99	0.00	0.23	0.19
Sei/Bryde's whale	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sei/Bryde's whale	1991	TOTALS	10,027	2	1.0	2.90	0.47	0.1	57	1.10	0.98	0.00	0.23	0.19
Sei/Bryde's whale	1993	SoCal	2,543	1	1.0	2.83	0.45	0.2	49	1.01	1.06	0.00	0.17	0.21
Sei/Bryde's whale	1993	CentrlCA	1,523	2	1.0	2.73	0.52	0.5	112	0.76	0.61	0.00	0.22	0.17
Sei/Bryde's whale	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sei/Bryde's whale	1993	TOTALS	6,152	3	1.0	2.76	0.50	0.1	161	0.60	0.59	0.00	0.20	0.15
Sei/Bryde's whale	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	1996	TOTALS	14,676	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2001	TOTALS	9,538	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2005	TOTALS	10,840	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2008	TOTALS	11,563	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2014	CentrlCA	1,841	1	1.0	2.83	0.45	0.2	51	1.52	0.98	0.00	0.23	0.20
Sei/Bryde's whale	2014	NoCal	1,998	1	1.0	2.83	0.42	0.2	54	1.22	1.03	0.00	0.23	0.22
Sei/Bryde's whale	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2014	TOTALS	9,327	2	1.0	2.83	0.44	0.1	106	0.79	0.61	0.00	0.21	0.19
Sei/Bryde's whale	1991	California	10,027	2	1.0	2.90	0.47	0.2	57	1.10	0.98	0.00	0.23	0.19
Sei/Bryde's whale	1993	California	6,152	3	1.0	2.78	0.49	0.6	161	0.60	0.59	0.00	0.20	0.15
Sei/Bryde's whale	1996	California	10,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2005	California	7,889	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2008	California	8,325	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's whale	2014	California	6,619	2	1.0	2.83	0.44	0.4	106	0.79	0.60	0.00	0.21	0.19

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Sei, Bryde's or fin whale (SWFSC species code 199, only used in 2014).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Sei/Bryde's/fin whale	Pooled	SoCal	21,687	2	1.0	1.54	0.43	0.1	22	0.83	0.65	0.11	0.39	0.26
Sei/Bryde's/fin whale	Pooled	CentrlCA	16,277	4	1.1	2.13	0.44	0.1	33	0.81	0.59	0.07	0.30	0.23
Sei/Bryde's/fin whale	Pooled	NoCal	17,826	3	1.2	2.49	0.45	0.1	23	0.76	0.67	0.08	0.17	0.20
Sei/Bryde's/fin whale	Pooled	ORWA	16,346	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	Pooled	TOTALS	72,136	9	1.1	2.12	0.44	0.1	78	0.54	0.35	0.05	0.27	0.14
Sei/Bryde's/fin whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1991	TOTALS	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1993	SoCal	2,543	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1993	TOTALS	6,152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1996	SoCal	3,994	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1996	TOTALS	14,676	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2001	ORWA	3,098	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2001	TOTALS	9,538	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2005	SoCal	2,838	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2005	CentrlCA	2,386	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2005	TOTALS	10,840	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2008	TOTALS	11,563	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2014	SoCal	2,780	2	1.0	1.54	0.46	0.5	160	0.93	0.61	0.11	0.39	0.23
Sei/Bryde's/fin whale	2014	CentrlCA	1,841	4	1.1	2.13	0.43	1.3	304	0.92	0.57	0.08	0.30	0.25
Sei/Bryde's/fin whale	2014	NoCal	1,998	3	1.2	2.49	0.39	0.9	231	0.83	0.67	0.10	0.17	0.24
Sei/Bryde's/fin whale	2014	ORWA	2,708	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2014	TOTALS	9,327	9	1.1	2.12	0.42	0.6	695	0.60	0.34	0.06	0.27	0.16
Sei/Bryde's/fin whale	1991	California	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1993	California	6,152	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	1996	California	10,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2005	California	7,889	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2008	California	8,325	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Sei/Bryde's/fin whale	2014	California	6,619	9	1.1	2.05	0.43	2.6	695	0.60	0.34	0.07	0.27	0.14

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Fin whale (SWFSC species code 074).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Fin whale	Pooled	SoCal	21,687	63	2.4	3.23	0.38	2.9	919	0.46	0.26	0.21	0.06	0.28
Fin whale	Pooled	CentrlCA	16,277	154	2.3	3.15	0.39	8.9	2,156	0.29	0.17	0.07	0.05	0.26
Fin whale	Pooled	NoCal	17,826	112	2.0	3.10	0.40	5.0	1,282	0.43	0.19	0.09	0.06	0.26
Fin whale	Pooled	ORWA	16,346	85	1.9	3.20	0.37	4.2	1,346	0.33	0.21	0.10	0.07	0.27
Fin whale	Pooled	TOTALS	72,136	414	2.1	3.16	0.39	5.0	5,704	0.18	0.10	0.05	0.05	0.15
Fin whale	1991	SoCal	4,041	5	1.6	3.20	0.40	0.8	244	0.75	0.52	0.24	0.09	0.29
Fin whale	1991	CentrlCA	2,968	17	2	3	0.4	5.0	1,222	0.79	0.67	0.14	0.08	0.29
Fin whale	1991	NoCal	3,018	2	1.6	3.28	0.45	0.3	90	0.78	0.60	0.25	0.08	0.28
Fin whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fin whale	1991	TOTALS	10,027	24	2.1	3.28	0.41	1.4	1,556	0.61	0.46	0.13	0.08	0.23
Fin whale	1993	SoCal	2,543	4	1.3	3.35	0.38	0.8	264	0.65	0.46	0.28	0.09	0.30
Fin whale	1993	CentrlCA	1,523	21	2.1	3.33	0.45	9.9	2,410	0.57	0.45	0.10	0.08	0.25
Fin whale	1993	NoCal	2,085	6	1.8	3.24	0.46	1.8	458	0.70	0.63	0.20	0.08	0.25
Fin whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fin whale	1993	TOTALS	6,152	31	2.0	3.31	0.44	2.7	3,131	0.46	0.34	0.10	0.08	0.18
Fin whale	1996	SoCal	3,994	18	1.7	2.94	0.37	3.5	1,122	0.62	0.63	0.13	0.07	0.30
Fin whale	1996	CentrlCA	3,057	40	2.2	2.95	0.40	12.1	2,950	0.40	0.30	0.24	0.06	0.28
Fin whale	1996	NoCal	3,287	6	1.8	2.97	0.41	1.3	343	0.61	0.47	0.34	0.07	0.27
Fin whale	1996	ORWA	4,338	9	1.3	3.12	0.37	1.2	381	0.53	0.41	0.16	0.08	0.30
Fin whale	1996	TOTALS	14,676	73	1.9	2.97	0.39	4.2	4,795	0.31	0.26	0.14	0.06	0.18
Fin whale	2001	SoCal	2,455	1	28.1	2.82	0.33	6.1	1,937	1.35	0.87	0.00	0.12	0.36
Fin whale	2001	CentrlCA	1,608	6	3.3	3.08	0.40	5.1	1,234	0.95	0.68	0.18	0.08	0.31
Fin whale	2001	NoCal	2,376	15	1.9	3.06	0.38	5.3	1,362	0.75	0.43	0.26	0.07	0.31
Fin whale	2001	ORWA	3,098	10	1.3	3.10	0.37	1.8	567	0.79	0.58	0.29	0.07	0.26
Fin whale	2001	TOTALS	9,538	32	2.8	3.07	0.38	4.5	5,101	0.65	0.32	0.35	0.06	0.20
Fin whale	2005	SoCal	2,838	9	1.7	2.83	0.39	2.4	764	0.49	0.36	0.20	0.08	0.29
Fin whale	2005	CentrlCA	2,386	28	2.5	2.80	0.34	15.4	3,733	0.61	0.38	0.12	0.09	0.34
Fin whale	2005	NoCal	2,665	32	2.1	2.98	0.40	10.7	2,749	0.68	0.43	0.26	0.08	0.27
Fin whale	2005	ORWA	2,951	13	1.6	3.05	0.38	3.1	1,000	0.55	0.30	0.18	0.08	0.30
Fin whale	2005	TOTALS	10,840	82	2.1	2.91	0.37	7.2	8,247	0.34	0.23	0.10	0.07	0.17
Fin whale	2008	SoCal	3,035	18	3.2	3.83	0.36	6.9	2,186	0.54	0.46	0.29	0.11	0.28
Fin whale	2008	CentrlCA	2,895	22	2.8	3.82	0.38	7.2	1,753	0.53	0.32	0.17	0.11	0.29
Fin whale	2008	NoCal	2,396	15	2.4	3.88	0.34	5.5	1,428	0.61	0.40	0.10	0.10	0.34
Fin whale	2008	ORWA	3,238	21	2.7	3.86	0.38	6.0	1,935	0.52	0.24	0.24	0.10	0.29
Fin whale	2008	TOTALS	11,563	76	2.8	3.84	0.37	6.4	7,302	0.27	0.18	0.10	0.10	0.16
Fin whale	2014	SoCal	2,780	8	1.1	3.02	0.41	1.3	413	0.70	0.53	0.09	0.07	0.26
Fin whale	2014	CentrlCA	1,841	20	1.6	3.00	0.38	7.8	1,888	0.57	0.43	0.11	0.08	0.27
Fin whale	2014	NoCal	1,998	36	1.8	2.90	0.34	16.0	4,133	0.66	0.38	0.09	0.07	0.35
Fin whale	2014	ORWA	2,708	32	1.9	2.88	0.36	10.7	3,458	0.79	0.50	0.17	0.08	0.38
Fin whale	2014	TOTALS	9,327	96	1.7	2.92	0.36	8.7	9,892	0.38	0.25	0.07	0.06	0.19
Fin whale	1991	California	10,027	24	1.8	3.26	0.42	6.1	1,556	0.62	0.49	0.12	0.08	0.18
Fin whale	1993	California	6,152	31	1.8	3.30	0.43	12.5	3,131	0.46	0.34	0.10	0.08	0.15
Fin whale	1996	California	10,338	64	1.9	2.95	0.39	17.0	4,415	0.33	0.28	0.14	0.06	0.17
Fin whale	2001	California	6,440	22	11.1	2.98	0.37	16.4	4,533	0.68	0.37	0.47	0.07	0.20
Fin whale	2005	California	7,889	69	2.1	2.87	0.38	28.4	7,247	0.38	0.26	0.13	0.07	0.18
Fin whale	2008	California	8,325	55	2.8	3.84	0.36	19.6	5,367	0.34	0.24	0.12	0.10	0.19
Fin whale	2014	California	6,619	64	1.5	2.97	0.38	25.1	6,433	0.44	0.26	0.06	0.06	0.17

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Blue whale (SWFSC species code 075).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Blue whale	Pooled	SoCal	21,687	127	1.8	2.98	0.59	3.0	966	0.79	0.16	0.05	0.07	0.36
Blue whale	Pooled	CentrlCA	16,277	81	1.8	2.88	0.60	2.6	636	0.82	0.22	0.05	0.06	0.32
Blue whale	Pooled	NoCal	17,826	40	1.7	3.08	0.61	1.0	260	0.89	0.20	0.09	0.07	0.34
Blue whale	Pooled	ORWA	16,346	13	1.2	2.93	0.58	0.3	92	0.66	0.34	0.14	0.07	0.30
Blue whale	Pooled	TOTALS	72,136	261	1.8	2.96	0.59	1.7	1,955	0.50	0.11	0.03	0.06	0.21
Blue whale	1991	SoCal	4,041	39	2.2	3.10	0.60	5.7	1,804	0.62	0.24	0.10	0.08	0.30
Blue whale	1991	CentrlCA	2,968	15	2	3	0.6	2.8	680	0.66	0.48	0.12	0.10	0.36
Blue whale	1991	NoCal	3,018	3	1.4	3.29	0.65	0.3	85	0.70	0.56	0.24	0.14	0.26
Blue whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blue whale	1991	TOTALS	10,027	57	2.2	3.14	0.61	2.2	2,569	0.47	0.22	0.07	0.08	0.22
Blue whale	1993	SoCal	2,543	30	1.7	3.08	0.59	5.5	1,766	1.05	0.36	0.05	0.08	0.28
Blue whale	1993	CentrlCA	1,523	10	1.9	3.12	0.64	3.1	755	0.81	0.64	0.12	0.08	0.29
Blue whale	1993	NoCal	2,085	3	1.3	3.02	0.65	0.5	120	0.67	0.45	0.20	0.08	0.28
Blue whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Blue whale	1993	TOTALS	6,152	43	1.7	3.09	0.61	2.3	2,641	0.73	0.29	0.04	0.07	0.21
Blue whale	1996	SoCal	3,994	40	1.5	2.78	0.58	4.6	1,452	0.73	0.39	0.08	0.06	0.35
Blue whale	1996	CentrlCA	3,057	37	1.5	2.75	0.60	5.6	1,368	0.66	0.34	0.06	0.06	0.32
Blue whale	1996	NoCal	3,287	4	1.4	2.99	0.61	0.4	116	1.10	0.69	0.15	0.11	0.37
Blue whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Blue whale	1996	TOTALS	14,676	81	1.5	2.78	0.59	2.6	2,936	0.47	0.28	0.05	0.06	0.24
Blue whale	2001	SoCal	2,455	3	2.4	3.05	0.55	0.9	273	0.95	0.58	0.34	0.10	0.39
Blue whale	2001	CentrlCA	1,608	3	2.6	2.79	0.60	1.4	345	0.87	0.58	0.38	0.11	0.33
Blue whale	2001	NoCal	2,376	4	1.8	2.56	0.59	1.0	259	0.99	0.59	0.26	0.10	0.37
Blue whale	2001	ORWA	3,098	3	1.1	3.00	0.58	0.3	95	1.11	0.94	0.00	0.07	0.35
Blue whale	2001	TOTALS	9,538	13	1.9	2.83	0.58	0.9	972	0.45	0.31	0.21	0.08	0.20
Blue whale	2005	SoCal	2,838	3	3.2	2.48	0.60	1.1	365	1.03	0.59	0.26	0.13	0.33
Blue whale	2005	CentrlCA	2,386	9	1.9	2.55	0.56	2.5	602	0.66	0.49	0.20	0.12	0.34
Blue whale	2005	NoCal	2,665	9	1.5	2.93	0.60	1.4	358	0.77	0.53	0.16	0.14	0.31
Blue whale	2005	ORWA	2,951	4	1.0	2.65	0.59	0.4	140	1.06	0.43	0.00	0.11	0.38
Blue whale	2005	TOTALS	10,840	25	1.7	2.69	0.59	1.3	1,466	0.45	0.26	0.13	0.08	0.20
Blue whale	2008	SoCal	3,035	4	1.0	3.54	0.57	0.3	103	0.78	0.50	0.00	0.11	0.39
Blue whale	2008	CentrlCA	2,895	2	1.6	3.47	0.59	0.3	65	0.96	0.66	0.29	0.12	0.34
Blue whale	2008	NoCal	2,396	10	2.4	3.57	0.56	2.4	632	0.68	0.26	0.20	0.11	0.36
Blue whale	2008	ORWA	3,238	3	1.1	3.55	0.59	0.2	77	0.81	0.53	0.06	0.10	0.33
Blue whale	2008	TOTALS	11,563	19	1.8	3.55	0.57	0.8	878	0.51	0.21	0.14	0.11	0.22
Blue whale	2014	SoCal	2,780	8	1.8	2.88	0.62	1.5	463	0.78	0.45	0.16	0.07	0.30
Blue whale	2014	CentrlCA	1,841	5	2.1	2.77	0.59	1.7	416	0.90	0.70	0.30	0.08	0.32
Blue whale	2014	NoCal	1,998	7	1.4	2.83	0.56	1.5	397	0.89	0.66	0.12	0.08	0.35
Blue whale	2014	ORWA	2,708	3	1.9	2.62	0.58	0.7	221	0.97	0.79	0.32	0.09	0.35
Blue whale	2014	TOTALS	9,327	23	1.7	2.81	0.59	1.3	1,496	0.44	0.30	0.10	0.06	0.18
Blue whale	1991	California	10,027	57	1.9	3.20	0.62	8.8	2,569	0.47	0.22	0.08	0.09	0.17
Blue whale	1993	California	6,152	43	1.6	3.07	0.63	9.1	2,641	0.73	0.29	0.07	0.07	0.16
Blue whale	1996	California	10,338	81	1.5	2.84	0.60	10.6	2,936	0.47	0.28	0.06	0.06	0.21
Blue whale	2001	California	6,440	10	2.2	2.80	0.58	3.3	877	0.51	0.29	0.20	0.07	0.22
Blue whale	2005	California	7,889	21	2.2	2.65	0.59	5.0	1,326	0.50	0.31	0.17	0.09	0.20
Blue whale	2008	California	8,325	16	1.7	3.52	0.58	3.0	801	0.55	0.23	0.12	0.10	0.22
Blue whale	2014	California	6,619	20	1.7	2.83	0.59	4.7	1,276	0.50	0.34	0.13	0.06	0.18

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Humpback whale (SWFSC species code 076).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Humpback whale	Pooled	SoCal	21,687	13	1.8	3.98	0.73	0.2	59	0.75	0.28	0.14	0.06	0.32
Humpback whale	Pooled	CentrlCA	16,277	137	2.0	3.72	0.74	3.0	730	0.66	0.22	0.07	0.07	0.33
Humpback whale	Pooled	NoCal	17,826	22	2.6	3.61	0.74	0.6	153	0.76	0.36	0.33	0.08	0.26
Humpback whale	Pooled	ORWA	16,346	92	2.1	3.79	0.72	2.1	681	0.69	0.28	0.12	0.07	0.34
Humpback whale	Pooled	TOTALS	72,136	264	2.0	3.75	0.73	1.4	1,623	0.43	0.15	0.06	0.07	0.21
Humpback whale	1991	SoCal	4,041	3	1.7	4.00	0.74	0.2	69	1.19	0.68	0.11	0.07	0.29
Humpback whale	1991	CentrlCA	2,968	2	3	4	0.7	0.4	104	1.27	0.73	0.59	0.15	0.28
Humpback whale	1991	NoCal	3,018	4	6.7	3.79	0.77	1.5	395	1.01	0.58	0.42	0.10	0.25
Humpback whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Humpback whale	1991	TOTALS	10,027	9	4.3	3.80	0.75	0.5	568	0.75	0.38	0.43	0.10	0.19
Humpback whale	1993	SoCal	2,543	1	2.2	3.60	0.73	0.2	52	1.14	1.12	0.00	0.08	0.27
Humpback whale	1993	CentrlCA	1,523	11	1.5	3.82	0.77	1.9	460	0.70	0.56	0.07	0.08	0.26
Humpback whale	1993	NoCal	2,085	5	1.8	3.81	0.77	0.7	191	0.76	0.53	0.17	0.09	0.24
Humpback whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Humpback whale	1993	TOTALS	6,152	17	1.7	3.80	0.77	0.6	703	0.52	0.44	0.09	0.08	0.20
Humpback whale	1996	SoCal	3,994	1	1.7	3.00	0.72	0.1	31	1.35	1.01	0.00	0.09	0.33
Humpback whale	1996	CentrlCA	3,057	56	1.9	3.48	0.74	6.9	1,683	0.55	0.40	0.07	0.09	0.26
Humpback whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Humpback whale	1996	ORWA	4,338	2	1.0	3.66	0.72	0.1	28	1.20	0.66	0.00	0.09	0.23
Humpback whale	1996	TOTALS	14,676	59	1.9	3.48	0.74	1.5	1,742	0.53	0.40	0.07	0.09	0.24
Humpback whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Humpback whale	2001	CentrlCA	1,608	14	2.2	3.81	0.74	3.3	807	0.85	0.52	0.15	0.11	0.28
Humpback whale	2001	NoCal	2,376	2	2.0	3.23	0.73	0.3	90	1.90	0.94	0.00	0.13	0.38
Humpback whale	2001	ORWA	3,098	8	2.6	3.77	0.73	1.2	398	0.67	0.45	0.17	0.09	0.28
Humpback whale	2001	TOTALS	9,538	24	2.3	3.75	0.73	1.1	1,295	0.59	0.36	0.11	0.09	0.20
Humpback whale	2005	SoCal	2,838	2	2.3	4.11	0.74	0.3	83	1.09	0.62	0.45	0.11	0.27
Humpback whale	2005	CentrlCA	2,386	12	2.2	3.25	0.71	2.4	579	0.60	0.49	0.14	0.11	0.27
Humpback whale	2005	NoCal	2,665	8	1.6	3.48	0.74	0.9	233	0.91	0.82	0.14	0.09	0.27
Humpback whale	2005	ORWA	2,951	28	1.4	4.08	0.73	2.3	727	0.92	0.41	0.11	0.07	0.32
Humpback whale	2005	TOTALS	10,840	50	1.7	3.79	0.73	1.4	1,623	0.52	0.32	0.08	0.08	0.21
Humpback whale	2008	SoCal	3,035	4	2.0	4.39	0.72	0.4	130	0.72	0.51	0.24	0.08	0.31
Humpback whale	2008	CentrlCA	2,895	29	2.0	4.35	0.73	3.2	782	0.87	0.57	0.28	0.06	0.30
Humpback whale	2008	NoCal	2,396	1	2.0	3.76	0.71	0.2	40	1.31	1.22	0.00	0.10	0.32
Humpback whale	2008	ORWA	3,238	10	2.3	4.30	0.73	1.1	360	0.98	0.53	0.25	0.08	0.35
Humpback whale	2008	TOTALS	11,563	44	2.1	4.33	0.73	1.1	1,313	0.60	0.41	0.18	0.07	0.22
Humpback whale	2014	SoCal	2,780	2	1.0	3.68	0.75	0.1	42	1.02	0.78	0.00	0.08	0.28
Humpback whale	2014	CentrlCA	1,841	13	1.5	3.64	0.73	2.0	492	1.23	0.60	0.20	0.09	0.38
Humpback whale	2014	NoCal	1,998	2	1.0	3.54	0.70	0.2	52	1.00	0.64	0.00	0.12	0.35
Humpback whale	2014	ORWA	2,708	44	2.4	3.49	0.72	7.7	2,480	0.96	0.52	0.19	0.09	0.34
Humpback whale	2014	TOTALS	9,327	61	2.1	3.53	0.72	2.7	3,064	0.82	0.39	0.17	0.09	0.28
Humpback whale	1991	California	10,027	9	3.9	3.78	0.75	2.2	568	0.75	0.38	0.38	0.10	0.17
Humpback whale	1993	California	6,152	17	1.9	3.74	0.76	2.8	703	0.52	0.44	0.10	0.08	0.17
Humpback whale	1996	California	10,338	57	1.8	3.24	0.73	7.0	1,714	0.53	0.41	0.06	0.08	0.25
Humpback whale	2001	California	6,440	16	2.1	3.52	0.73	3.7	897	0.75	0.48	0.11	0.11	0.23
Humpback whale	2005	California	7,889	22	2.0	3.61	0.73	3.5	896	0.49	0.41	0.18	0.08	0.17
Humpback whale	2008	California	8,325	34	2.0	4.17	0.72	3.8	953	0.75	0.49	0.17	0.07	0.18
Humpback whale	2014	California	6,619	17	1.2	3.62	0.73	2.4	585	1.08	0.48	0.13	0.08	0.24

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Unidentified delphinoid (SWFSC species code 077).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Unidentified dolphin	Pooled	SoCal	21,687	21	40.0	3.09	0.50	12.5	3,988	0.43	0.24	0.31	0.12	0.18
Unidentified dolphin	Pooled	CentrlCA	16,277	21	15.6	2.92	0.51	6.7	1,635	0.56	0.25	0.36	0.11	0.16
Unidentified dolphin	Pooled	NoCal	17,826	14	9.5	2.97	0.53	2.4	619	0.37	0.26	0.28	0.13	0.18
Unidentified dolphin	Pooled	ORWA	16,346	5	4.0	1.98	0.49	0.6	204	0.63	0.43	0.54	0.22	0.17
Unidentified dolphin	Pooled	TOTALS	72,136	61	21.7	2.92	0.51	5.6	6,446	0.30	0.14	0.23	0.10	0.09
Unidentified dolphin	1991	SoCal	4,041	1	8.1	3.97	0.52	0.5	154	1.07	1.04	0.00	0.07	0.19
Unidentified dolphin	1991	CentrlCA	2,968	7	3	3	0.5	2.8	680	0.53	0.41	0.24	0.11	0.19
Unidentified dolphin	1991	NoCal	3,018	4	2.3	2.18	0.58	1.2	305	0.58	0.40	0.23	0.15	0.18
Unidentified dolphin	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified dolphin	1991	TOTALS	10,027	12	3.4	2.64	0.55	1.0	1,139	0.40	0.29	0.19	0.12	0.13
Unidentified dolphin	1993	SoCal	2,543	4	71.3	2.40	0.50	47.1	15,005	0.78	0.48	0.73	0.26	0.16
Unidentified dolphin	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	1993	NoCal	2,085	1	7.0	3.88	0.61	0.7	184	1.13	1.04	0.00	0.09	0.16
Unidentified dolphin	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified dolphin	1993	TOTALS	6,152	5	58.5	2.69	0.52	13.3	15,189	0.77	0.45	0.72	0.23	0.16
Unidentified dolphin	1996	SoCal	3,994	4	37.8	3.43	0.49	11.3	3,594	0.64	0.58	0.08	0.20	0.16
Unidentified dolphin	1996	CentrlCA	3,057	10	11.7	3.04	0.52	12.0	2,910	0.46	0.33	0.36	0.14	0.19
Unidentified dolphin	1996	NoCal	3,287	3	8.6	2.71	0.54	2.7	702	0.77	0.69	0.55	0.40	0.18
Unidentified dolphin	1996	ORWA	4,338	2	7.3	2.44	0.49	1.4	455	0.97	0.83	0.44	0.17	0.16
Unidentified dolphin	1996	TOTALS	14,676	19	16.2	3.01	0.51	6.7	7,662	0.37	0.28	0.26	0.12	0.11
Unidentified dolphin	2001	SoCal	2,455	2	5.8	2.90	0.44	1.8	581	0.84	0.72	0.32	0.25	0.21
Unidentified dolphin	2001	CentrlCA	1,608	1	2.0	2.48	0.52	0.5	117	0.91	0.88	0.00	0.15	0.18
Unidentified dolphin	2001	NoCal	2,376	1	12.7	3.99	0.50	1.4	349	1.15	1.14	0.00	0.09	0.19
Unidentified dolphin	2001	ORWA	3,098	1	2.3	2.23	0.48	0.3	111	1.02	0.93	0.00	0.14	0.18
Unidentified dolphin	2001	TOTALS	9,538	5	5.7	2.90	0.48	1.0	1,158	0.58	0.45	0.38	0.18	0.15
Unidentified dolphin	2005	SoCal	2,838	6	43.5	2.85	0.52	31.2	9,947	0.87	0.39	0.79	0.18	0.20
Unidentified dolphin	2005	CentrlCA	2,386	3	61.8	3.20	0.44	27.4	6,654	0.83	0.66	0.14	0.16	0.17
Unidentified dolphin	2005	NoCal	2,665	3	17.2	3.56	0.53	5.2	1,335	0.74	0.59	0.58	0.18	0.21
Unidentified dolphin	2005	ORWA	2,951	1	2.3	1.47	0.50	0.5	172	1.32	1.18	0.00	0.21	0.17
Unidentified dolphin	2005	TOTALS	10,840	13	38.5	2.99	0.50	15.9	18,109	0.56	0.25	0.45	0.14	0.13
Unidentified dolphin	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2008	CentrlCA	2,895	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2008	ORWA	3,238	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2008	TOTALS	11,563	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2014	SoCal	2,780	4	31.0	3.70	0.55	10.9	3,483	0.78	0.48	0.66	0.21	0.19
Unidentified dolphin	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2014	NoCal	1,998	2	13.6	3.08	0.45	4.9	1,270	0.98	0.75	0.68	0.33	0.21
Unidentified dolphin	2014	ORWA	2,708	1	1.0	1.35	0.49	0.3	91	1.14	1.00	0.00	0.18	0.21
Unidentified dolphin	2014	TOTALS	9,327	7	21.7	3.19	0.51	4.2	4,843	0.59	0.34	0.56	0.21	0.16
Unidentified dolphin	1991	California	10,027	12	4.6	2.95	0.55	4.5	1,139	0.40	0.29	0.25	0.13	0.12
Unidentified dolphin	1993	California	6,152	5	39.2	3.14	0.55	47.8	15,189	0.77	0.45	0.77	0.23	0.16
Unidentified dolphin	1996	California	10,338	17	19.4	3.06	0.52	26.0	7,207	0.37	0.27	0.15	0.15	0.10
Unidentified dolphin	2001	California	6,440	4	6.8	3.12	0.49	3.7	1,047	0.62	0.51	0.39	0.19	0.16
Unidentified dolphin	2005	California	7,889	12	40.8	3.21	0.49	63.8	17,936	0.57	0.27	0.34	0.13	0.11
Unidentified dolphin	2008	California	8,325	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified dolphin	2014	California	6,619	6	22.3	3.39	0.50	15.9	4,752	0.61	0.38	0.57	0.20	0.17

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Unidentified beaked whale (SWFSC species code 049).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Unidentified beaked whale	Pooled	SoCal	21,687	6	1.6	2.00	0.14	0.8	246	0.60	0.34	0.17	0.20	0.41
Unidentified beaked whale	Pooled	CentrlCA	16,277	6	1.6	1.69	0.15	1.2	290	0.81	0.39	0.25	0.25	0.42
Unidentified beaked whale	Pooled	NoCal	17,826	7	1.5	2.25	0.16	0.8	215	0.58	0.32	0.24	0.16	0.68
Unidentified beaked whale	Pooled	ORWA	16,346	5	1.3	1.49	0.14	0.9	298	0.74	0.54	0.22	0.24	0.45
Unidentified beaked whale	Pooled	TOTALS	72,136	24	1.5	1.89	0.15	0.9	1,049	0.36	0.21	0.11	0.18	0.32
Unidentified beaked whale	1991	SoCal	4,041	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1991	CentrlCA	2,968	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified beaked whale	1991	TOTALS	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1993	SoCal	2,543	1	1.0	1.87	0.14	0.8	242	1.26	0.98	0.00	0.20	0.66
Unidentified beaked whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1993	NoCal	2,085	2	1.5	2.67	0.19	1.4	373	0.93	0.65	0.26	0.15	0.62
Unidentified beaked whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified beaked whale	1993	TOTALS	6,152	3	1.3	2.40	0.17	0.5	615	0.85	0.58	0.23	0.19	0.61
Unidentified beaked whale	1996	SoCal	3,994	1	1.0	2.41	0.14	0.4	120	1.26	0.92	0.00	0.15	0.59
Unidentified beaked whale	1996	CentrlCA	3,057	1	1.0	2.92	0.15	0.4	90	1.24	0.95	0.00	0.13	0.76
Unidentified beaked whale	1996	NoCal	3,287	1	1.0	1.87	0.17	0.5	127	1.24	0.99	0.00	0.18	0.68
Unidentified beaked whale	1996	ORWA	4,338	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1996	TOTALS	14,676	3	1.0	2.40	0.15	0.3	337	0.70	0.59	0.00	0.17	0.49
Unidentified beaked whale	2001	SoCal	2,455	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	2001	NoCal	2,376	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	2001	ORWA	3,098	2	1.0	1.40	0.14	1.7	533	0.98	0.85	0.00	0.26	0.60
Unidentified beaked whale	2001	TOTALS	9,538	2	1.0	1.40	0.14	0.5	533	0.98	0.87	0.00	0.26	0.60
Unidentified beaked whale	2005	SoCal	2,838	1	2.3	2.41	0.14	1.2	374	1.12	1.01	0.00	0.15	0.37
Unidentified beaked whale	2005	CentrlCA	2,386	1	2.3	1.40	0.12	3.0	717	1.46	1.13	0.00	0.23	0.74
Unidentified beaked whale	2005	NoCal	2,665	1	1.0	2.41	0.16	0.5	129	1.02	0.92	0.00	0.15	0.65
Unidentified beaked whale	2005	ORWA	2,951	1	2.3	1.87	0.14	1.5	484	1.25	1.05	0.00	0.20	0.44
Unidentified beaked whale	2005	TOTALS	10,840	4	2.0	2.02	0.14	1.5	1,704	0.78	0.51	0.17	0.20	0.43
Unidentified beaked whale	2008	SoCal	3,035	1	2.2	1.87	0.13	1.5	471	1.13	0.87	0.00	0.20	0.65
Unidentified beaked whale	2008	CentrlCA	2,895	1	1.0	1.04	0.15	1.1	273	1.52	1.05	0.00	0.33	0.63
Unidentified beaked whale	2008	NoCal	2,396	1	3.5	2.41	0.12	2.5	635	1.04	0.99	0.00	0.16	0.45
Unidentified beaked whale	2008	ORWA	3,238	1	1.0	1.40	0.14	0.8	248	1.03	0.96	0.00	0.27	0.73
Unidentified beaked whale	2008	TOTALS	11,563	4	1.9	1.68	0.14	1.4	1,627	0.61	0.49	0.31	0.25	0.47
Unidentified beaked whale	2014	SoCal	2,780	2	1.5	1.72	0.16	1.9	610	0.96	0.69	0.24	0.34	0.67
Unidentified beaked whale	2014	CentrlCA	1,841	3	1.8	1.59	0.14	6.8	1,662	0.88	0.52	0.36	0.30	0.70
Unidentified beaked whale	2014	NoCal	1,998	2	1.0	1.87	0.13	2.1	547	0.98	0.68	0.00	0.20	0.70
Unidentified beaked whale	2014	ORWA	2,708	1	1.0	1.40	0.13	1.0	317	1.27	1.09	0.00	0.27	0.72
Unidentified beaked whale	2014	TOTALS	9,327	8	1.4	1.67	0.14	2.7	3,136	0.54	0.37	0.20	0.23	0.38
Unidentified beaked whale	1991	California	10,027	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	1993	California	6,152	3	1.3	2.27	0.16	2.2	615	0.85	0.58	0.23	0.19	0.62
Unidentified beaked whale	1996	California	10,338	3	1.0	2.40	0.15	1.2	337	0.70	0.58	0.00	0.17	0.46
Unidentified beaked whale	2001	California	6,440	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified beaked whale	2005	California	7,889	3	1.9	2.07	0.14	4.6	1,220	0.94	0.56	0.22	0.21	0.48
Unidentified beaked whale	2008	California	8,325	3	2.2	1.77	0.13	5.1	1,379	0.72	0.59	0.28	0.24	0.53
Unidentified beaked whale	2014	California	6,619	7	1.4	1.73	0.14	10.9	2,819	0.59	0.37	0.21	0.24	0.43

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Unidentified small whale (SWFSC species code 078).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Unidentified small whale	Pooled	SoCal	21,687	10	1.7	2.26	0.10	1.6	523	0.71	0.33	0.18	0.21	0.41
Unidentified small whale	Pooled	CentrlCA	16,277	7	1.2	1.59	0.11	1.5	358	0.72	0.35	0.16	0.26	0.59
Unidentified small whale	Pooled	NoCal	17,826	9	1.1	1.72	0.12	1.4	373	0.66	0.36	0.13	0.29	0.50
Unidentified small whale	Pooled	ORWA	16,346	7	1.0	1.42	0.10	1.5	477	0.79	0.36	0.00	0.24	0.87
Unidentified small whale	Pooled	TOTALS	72,136	33	1.3	1.79	0.11	1.5	1,731	0.39	0.17	0.08	0.20	0.30
Unidentified small whale	1991	SoCal	4,041	4	1.0	2.70	0.11	1.6	513	0.87	0.60	0.00	0.18	0.77
Unidentified small whale	1991	CentrlCA	2,968	3	1	2	0.1	2.3	569	0.78	0.53	0.03	0.36	0.55
Unidentified small whale	1991	NoCal	3,018	1	2.3	2.75	0.14	1.0	253	1.87	1.17	0.00	0.15	0.49
Unidentified small whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified small whale	1991	TOTALS	10,027	8	1.2	2.37	0.12	1.2	1,335	0.56	0.39	0.15	0.22	0.50
Unidentified small whale	1993	SoCal	2,543	1	2.8	1.66	0.10	3.3	1,052	1.43	1.07	0.00	0.39	0.82
Unidentified small whale	1993	CentrlCA	1,523	1	1.0	1.76	0.14	1.3	325	1.46	1.13	0.00	0.24	0.92
Unidentified small whale	1993	NoCal	2,085	3	1.0	1.34	0.14	3.9	995	1.16	0.75	0.00	0.28	0.55
Unidentified small whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified small whale	1993	TOTALS	6,152	5	1.4	1.49	0.13	2.1	2,372	0.82	0.51	0.29	0.34	0.52
Unidentified small whale	1996	SoCal	3,994	3	1.8	1.90	0.10	3.5	1,116	1.08	0.56	0.21	0.29	0.56
Unidentified small whale	1996	CentrlCA	3,057	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	1996	NoCal	3,287	2	1.0	1.90	0.12	1.3	333	1.12	0.78	0.00	0.45	0.54
Unidentified small whale	1996	ORWA	4,338	2	1.0	2.02	0.10	1.1	356	1.15	0.73	0.00	0.29	1.02
Unidentified small whale	1996	TOTALS	14,676	7	1.3	1.93	0.11	1.6	1,806	0.72	0.40	0.17	0.27	0.52
Unidentified small whale	2001	SoCal	2,455	1	1.0	2.30	0.08	1.1	337	1.24	0.79	0.00	0.24	1.19
Unidentified small whale	2001	CentrlCA	1,608	1	1.0	1.32	0.11	2.1	513	1.17	0.93	0.00	0.27	0.98
Unidentified small whale	2001	NoCal	2,376	1	1.0	2.25	0.10	0.9	233	1.34	1.01	0.00	0.20	0.53
Unidentified small whale	2001	ORWA	3,098	1	1.0	1.26	0.10	1.2	403	1.53	1.02	0.00	0.45	1.13
Unidentified small whale	2001	TOTALS	9,538	4	1.0	1.78	0.10	1.3	1,486	0.70	0.39	0.00	0.26	0.66
Unidentified small whale	2005	SoCal	2,838	1	3.5	2.15	0.10	2.8	880	1.79	0.92	0.00	0.34	0.51
Unidentified small whale	2005	CentrlCA	2,386	1	2.3	1.66	0.08	3.5	848	1.48	1.01	0.00	0.34	1.37
Unidentified small whale	2005	NoCal	2,665	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	2005	ORWA	2,951	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	2005	TOTALS	10,840	2	2.9	1.91	0.09	1.5	1,728	1.31	0.66	0.15	0.37	1.05
Unidentified small whale	2008	SoCal	3,035	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	2008	CentrlCA	2,895	1	1.0	0.98	0.11	1.6	393	1.38	0.94	0.00	0.38	0.50
Unidentified small whale	2008	NoCal	2,396	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	2008	ORWA	3,238	1	1.0	1.32	0.10	1.1	362	1.29	0.95	0.00	0.42	0.75
Unidentified small whale	2008	TOTALS	11,563	2	1.0	1.15	0.11	0.7	755	1.05	0.70	0.00	0.47	0.50
Unidentified small whale	2014	SoCal	2,780	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified small whale	2014	NoCal	1,998	2	1.0	1.33	0.09	4.0	1,040	1.23	0.65	0.00	0.33	1.01
Unidentified small whale	2014	ORWA	2,708	3	1.0	1.11	0.10	5.2	1,661	0.84	0.53	0.00	0.38	0.92
Unidentified small whale	2014	TOTALS	9,327	5	1.0	1.20	0.10	2.4	2,701	0.74	0.38	0.00	0.30	0.88
Unidentified small whale	1991	California	10,027	8	1.4	2.42	0.13	4.9	1,335	0.56	0.39	0.18	0.21	0.39
Unidentified small whale	1993	California	6,152	5	1.6	1.59	0.13	8.5	2,372	0.82	0.51	0.30	0.33	0.52
Unidentified small whale	1996	California	10,338	5	1.4	1.90	0.11	4.8	1,450	0.82	0.46	0.20	0.32	0.44
Unidentified small whale	2001	California	6,440	3	1.0	1.96	0.10	4.1	1,083	0.75	0.45	0.00	0.25	0.66
Unidentified small whale	2005	California	7,889	2	2.9	1.91	0.09	6.3	1,728	1.31	0.67	0.15	0.37	1.05
Unidentified small whale	2008	California	8,325	1	1.0	0.98	0.11	1.6	393	1.38	0.98	0.00	0.38	0.50
Unidentified small whale	2014	California	6,619	2	1.0	1.33	0.09	4.0	1,040	1.23	0.64	0.00	0.33	1.01

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Unidentified rorqual (SWFSC species code 070).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Unidentified rorqual	Pooled	SoCal	21,687	19	1.5	4.50	0.50	0.3	92	0.45	0.39	0.13	0.08	0.24
Unidentified rorqual	Pooled	CentrlCA	16,277	42	1.3	4.22	0.51	0.8	193	0.39	0.24	0.10	0.09	0.24
Unidentified rorqual	Pooled	NoCal	17,826	30	1.3	4.31	0.52	0.5	128	0.47	0.20	0.10	0.09	0.24
Unidentified rorqual	Pooled	ORWA	16,346	23	1.3	4.14	0.49	0.4	142	0.61	0.42	0.09	0.09	0.27
Unidentified rorqual	Pooled	TOTALS	72,136	114	1.3	4.28	0.51	0.5	555	0.27	0.15	0.05	0.08	0.13
Unidentified rorqual	1991	SoCal	4,041	1	2.3	3.13	0.52	0.2	56	0.98	1.00	0.00	0.09	0.24
Unidentified rorqual	1991	CentrlCA	2,968	2	1	5	0.5	0.1	34	0.75	0.70	0.00	0.08	0.23
Unidentified rorqual	1991	NoCal	3,018	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified rorqual	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified rorqual	1991	TOTALS	10,027	3	1.4	4.09	0.52	0.1	90	0.69	0.59	0.26	0.13	0.18
Unidentified rorqual	1993	SoCal	2,543	1	2.3	4.52	0.50	0.2	64	1.30	1.06	0.00	0.09	0.25
Unidentified rorqual	1993	CentrlCA	1,523	1	1.5	4.61	0.56	0.2	46	1.11	1.09	0.00	0.08	0.17
Unidentified rorqual	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified rorqual	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified rorqual	1993	TOTALS	6,152	2	1.9	4.57	0.53	0.1	110	0.84	0.76	0.16	0.08	0.19
Unidentified rorqual	1996	SoCal	3,994	1	3.9	4.30	0.49	0.2	73	1.05	0.99	0.00	0.10	0.27
Unidentified rorqual	1996	CentrlCA	3,057	19	1.5	4.25	0.51	2.1	501	0.54	0.40	0.21	0.10	0.24
Unidentified rorqual	1996	NoCal	3,287	2	1.0	4.27	0.53	0.1	35	0.78	0.74	0.00	0.11	0.22
Unidentified rorqual	1996	ORWA	4,338	2	1.0	4.32	0.49	0.1	35	0.73	0.62	0.00	0.10	0.24
Unidentified rorqual	1996	TOTALS	14,676	24	1.5	4.26	0.51	0.6	645	0.45	0.35	0.17	0.10	0.19
Unidentified rorqual	2001	SoCal	2,455	1	1.0	4.12	0.46	0.1	34	1.07	1.08	0.00	0.11	0.28
Unidentified rorqual	2001	CentrlCA	1,608	1	1.0	4.47	0.52	0.1	33	1.32	1.22	0.00	0.10	0.24
Unidentified rorqual	2001	NoCal	2,376	1	1.2	4.27	0.50	0.1	31	1.06	0.96	0.00	0.12	0.24
Unidentified rorqual	2001	ORWA	3,098	2	1.0	4.45	0.49	0.1	47	0.60	0.60	0.00	0.10	0.22
Unidentified rorqual	2001	TOTALS	9,538	5	1.0	4.35	0.49	0.1	145	0.53	0.43	0.04	0.09	0.16
Unidentified rorqual	2005	SoCal	2,838	2	1.0	4.36	0.51	0.2	50	0.72	0.67	0.00	0.10	0.21
Unidentified rorqual	2005	CentrlCA	2,386	7	1.3	3.95	0.47	1.1	260	0.44	0.28	0.17	0.11	0.27
Unidentified rorqual	2005	NoCal	2,665	5	1.3	4.19	0.52	0.5	141	0.57	0.50	0.20	0.10	0.23
Unidentified rorqual	2005	ORWA	2,951	5	1.2	3.80	0.50	0.5	168	0.44	0.35	0.10	0.11	0.22
Unidentified rorqual	2005	TOTALS	10,840	19	1.2	4.02	0.49	0.5	619	0.23	0.22	0.08	0.09	0.14
Unidentified rorqual	2008	SoCal	3,035	9	1.4	4.82	0.48	0.9	287	0.80	0.69	0.20	0.06	0.25
Unidentified rorqual	2008	CentrlCA	2,895	2	1.3	4.44	0.50	0.2	49	1.07	0.97	0.00	0.06	0.24
Unidentified rorqual	2008	NoCal	2,396	5	1.3	4.72	0.47	0.6	161	0.56	0.37	0.19	0.07	0.27
Unidentified rorqual	2008	ORWA	3,238	3	1.6	4.64	0.50	0.3	106	0.75	0.64	0.19	0.10	0.25
Unidentified rorqual	2008	TOTALS	11,563	19	1.4	4.72	0.48	0.5	603	0.45	0.37	0.10	0.06	0.17
Unidentified rorqual	2014	SoCal	2,780	4	1.0	4.34	0.53	0.3	100	0.78	0.67	0.00	0.10	0.23
Unidentified rorqual	2014	CentrlCA	1,841	10	1.2	4.18	0.50	1.5	364	0.46	0.40	0.12	0.11	0.24
Unidentified rorqual	2014	NoCal	1,998	17	1.4	4.24	0.46	3.0	771	0.68	0.20	0.16	0.10	0.27
Unidentified rorqual	2014	ORWA	2,708	11	1.3	4.08	0.49	1.4	442	1.15	0.90	0.16	0.11	0.26
Unidentified rorqual	2014	TOTALS	9,327	42	1.3	4.19	0.48	1.5	1,677	0.44	0.26	0.09	0.10	0.16
Unidentified rorqual	1991	California	10,027	3	1.7	3.85	0.52	0.3	90	0.69	0.59	0.24	0.13	0.18
Unidentified rorqual	1993	California	6,152	2	1.9	4.57	0.53	0.4	110	0.84	0.76	0.16	0.08	0.19
Unidentified rorqual	1996	California	10,338	22	2.1	4.27	0.51	2.4	610	0.47	0.39	0.27	0.10	0.16
Unidentified rorqual	2001	California	6,440	3	1.1	4.29	0.49	0.4	98	0.72	0.62	0.06	0.10	0.22
Unidentified rorqual	2005	California	7,889	14	1.2	4.17	0.50	1.8	451	0.31	0.26	0.10	0.09	0.15
Unidentified rorqual	2008	California	8,325	16	1.3	4.66	0.48	1.7	497	0.52	0.44	0.12	0.06	0.17
Unidentified rorqual	2014	California	6,619	31	1.2	4.25	0.50	4.8	1,235	0.49	0.20	0.08	0.10	0.15

Appendix. Detailed information used to estimate density and abundance of the given species for all years pooled and for individual years stratified by Region.

Unidentified large whale (SWFSC species code 079).

Species	Year	Region	Transect Length (km)	# Sightings	Mean Group Size	Mean Effective Strip Width (km)	Mean g(0)	Density per 1000 km^2	Estimated Abundance	Coefficient Variation (Abundance & Density)	Bootstrap CV Encounter Rate	Bootstrap CV Group Size	Bootstrap CV ESW	Bootstrap CV g(0)
Unidentified large whale	Pooled	SoCal	21,687	17	1.3	4.53	0.51	0.2	72	0.44	0.26	0.12	0.14	0.26
Unidentified large whale	Pooled	CentrlCA	16,277	11	1.6	4.45	0.52	0.2	58	0.65	0.47	0.17	0.15	0.21
Unidentified large whale	Pooled	NoCal	17,826	12	1.2	4.61	0.53	0.2	44	0.47	0.30	0.17	0.13	0.23
Unidentified large whale	Pooled	ORWA	16,346	8	1.2	4.62	0.51	0.1	39	0.71	0.41	0.12	0.13	0.25
Unidentified large whale	Pooled	TOTALS	72,136	48	1.3	4.55	0.52	0.2	213	0.30	0.18	0.08	0.14	0.14
Unidentified large whale	1991	SoCal	4,041	7	1.5	4.56	0.53	0.5	171	0.49	0.39	0.24	0.13	0.24
Unidentified large whale	1991	CentrlCA	2,968	2	2	5	0.5	0.2	54	1.15	0.83	0.32	0.14	0.27
Unidentified large whale	1991	NoCal	3,018	2	1.0	4.68	0.57	0.1	32	0.87	0.72	0.00	0.13	0.23
Unidentified large whale	1991	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified large whale	1991	TOTALS	10,027	11	1.4	4.60	0.54	0.2	257	0.46	0.31	0.18	0.13	0.18
Unidentified large whale	1993	SoCal	2,543	1	1.0	4.68	0.51	0.1	26	0.96	0.92	0.00	0.12	0.25
Unidentified large whale	1993	CentrlCA	1,523	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified large whale	1993	NoCal	2,085	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified large whale	1993	ORWA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unidentified large whale	1993	TOTALS	6,152	1	1.0	4.68	0.51	0.0	26	0.96	0.93	0.00	0.12	0.25
Unidentified large whale	1996	SoCal	3,994	4	1.6	4.46	0.50	0.4	112	0.54	0.44	0.25	0.15	0.23
Unidentified large whale	1996	CentrlCA	3,057	5	1.9	4.31	0.53	0.7	163	0.93	0.78	0.27	0.16	0.24
Unidentified large whale	1996	NoCal	3,287	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified large whale	1996	ORWA	4,338	1	1.0	4.63	0.51	0.0	16	1.32	1.10	0.00	0.13	0.26
Unidentified large whale	1996	TOTALS	14,676	10	1.7	4.40	0.51	0.3	291	0.56	0.44	0.17	0.16	0.16
Unidentified large whale	2001	SoCal	2,455	1	1.0	4.58	0.47	0.1	30	1.04	0.94	0.00	0.15	0.28
Unidentified large whale	2001	CentrlCA	1,608	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified large whale	2001	NoCal	2,376	2	1.0	4.57	0.51	0.2	47	0.79	0.66	0.00	0.14	0.21
Unidentified large whale	2001	ORWA	3,098	1	1.0	4.49	0.51	0.1	23	1.08	1.05	0.00	0.14	0.26
Unidentified large whale	2001	TOTALS	9,538	4	1.0	4.55	0.50	0.1	99	0.55	0.48	0.00	0.14	0.18
Unidentified large whale	2005	SoCal	2,838	2	1.0	4.30	0.52	0.2	50	0.86	0.78	0.00	0.16	0.25
Unidentified large whale	2005	CentrlCA	2,386	2	1.0	4.06	0.48	0.2	52	0.71	0.65	0.00	0.21	0.28
Unidentified large whale	2005	NoCal	2,665	4	1.7	4.33	0.53	0.5	140	0.79	0.62	0.39	0.18	0.25
Unidentified large whale	2005	ORWA	2,951	4	1.3	4.65	0.51	0.4	122	0.79	0.57	0.18	0.12	0.26
Unidentified large whale	2005	TOTALS	10,840	12	1.3	4.39	0.51	0.3	365	0.49	0.34	0.18	0.16	0.16
Unidentified large whale	2008	SoCal	3,035	1	1.0	4.90	0.49	0.1	22	1.02	0.92	0.00	0.09	0.27
Unidentified large whale	2008	CentrlCA	2,895	2	1.7	4.99	0.51	0.2	54	0.91	0.74	0.31	0.08	0.25
Unidentified large whale	2008	NoCal	2,396	3	1.1	5.00	0.48	0.3	72	0.63	0.50	0.05	0.07	0.27
Unidentified large whale	2008	ORWA	3,238	1	1.0	4.92	0.51	0.1	20	1.22	1.13	0.00	0.09	0.28
Unidentified large whale	2008	TOTALS	11,563	7	1.2	4.97	0.50	0.1	167	0.45	0.37	0.14	0.08	0.18
Unidentified large whale	2014	SoCal	2,780	1	1.0	4.53	0.54	0.1	23	0.94	0.90	0.00	0.16	0.23
Unidentified large whale	2014	CentrlCA	1,841	0	NA	NA	NA	0.0	0	NA	NA	NA	NA	NA
Unidentified large whale	2014	NoCal	1,998	1	1.0	4.52	0.48	0.1	30	1.13	1.04	0.00	0.16	0.27
Unidentified large whale	2014	ORWA	2,708	1	1.0	4.28	0.50	0.1	28	1.25	1.08	0.00	0.20	0.27
Unidentified large whale	2014	TOTALS	9,327	3	1.0	4.44	0.51	0.1	81	0.65	0.58	0.00	0.17	0.21
Unidentified large whale	1991	California	10,027	11	1.4	4.64	0.54	0.9	257	0.47	0.32	0.18	0.13	0.17
Unidentified large whale	1993	California	6,152	1	1.0	4.68	0.51	0.1	26	0.96	0.93	0.00	0.12	0.25
Unidentified large whale	1996	California	10,338	9	1.7	4.38	0.51	1.0	275	0.61	0.50	0.19	0.17	0.17
Unidentified large whale	2001	California	6,440	3	1.0	4.58	0.49	0.3	76	0.62	0.52	0.00	0.14	0.20
Unidentified large whale	2005	California	7,889	8	1.2	4.23	0.51	0.9	242	0.53	0.40	0.24	0.19	0.16
Unidentified large whale	2008	California	8,325	6	1.2	4.96	0.50	0.6	147	0.49	0.40	0.18	0.08	0.17
Unidentified large whale	2014	California	6,619	2	1.0	4.52	0.51	0.2	53	0.71	0.66	0.00	0.16	0.22