SCANS-III http://synergy.st-andrews.ac.uk/scans3/

Aim:

Robust large-scale estimates of cetacean abundance in the North Sea & adjacent waters

Background:

- third survey in a series of decadal surveys SCANS (1994) & SCANS-II/CODA (2005/2007).
- data needed to inform governments (Favourable Conservation Status under the Habitats Directive, Good Environmental Status (GES) under the Marine Strategy Framework Directive (MSFD)).

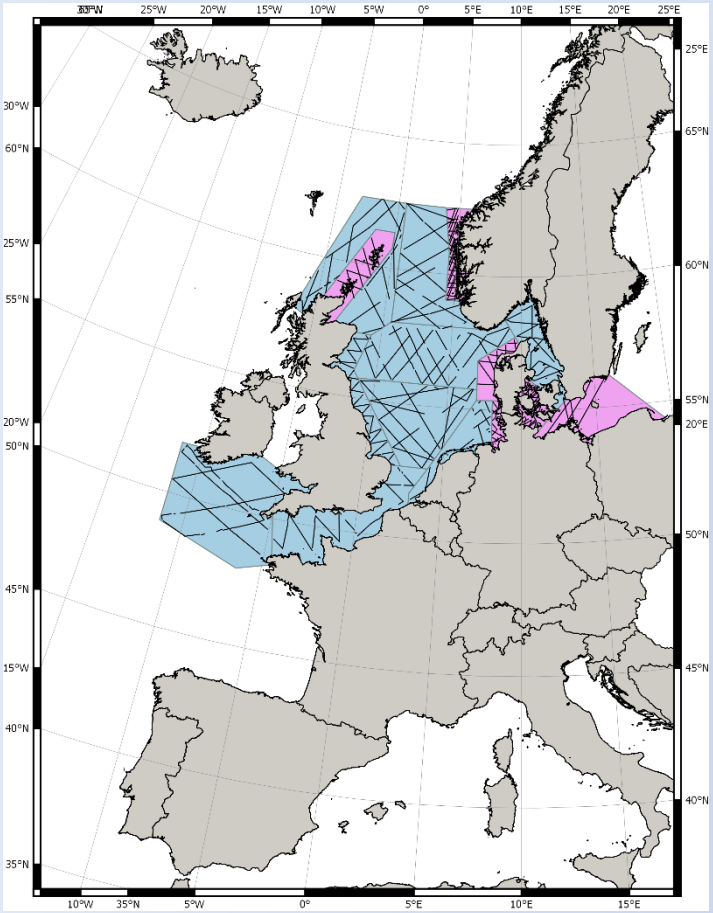
Project funding:

governments of Denmark, France, Germany, the Netherlands, Norway, Portugal, Spain, Sweden and the UK.

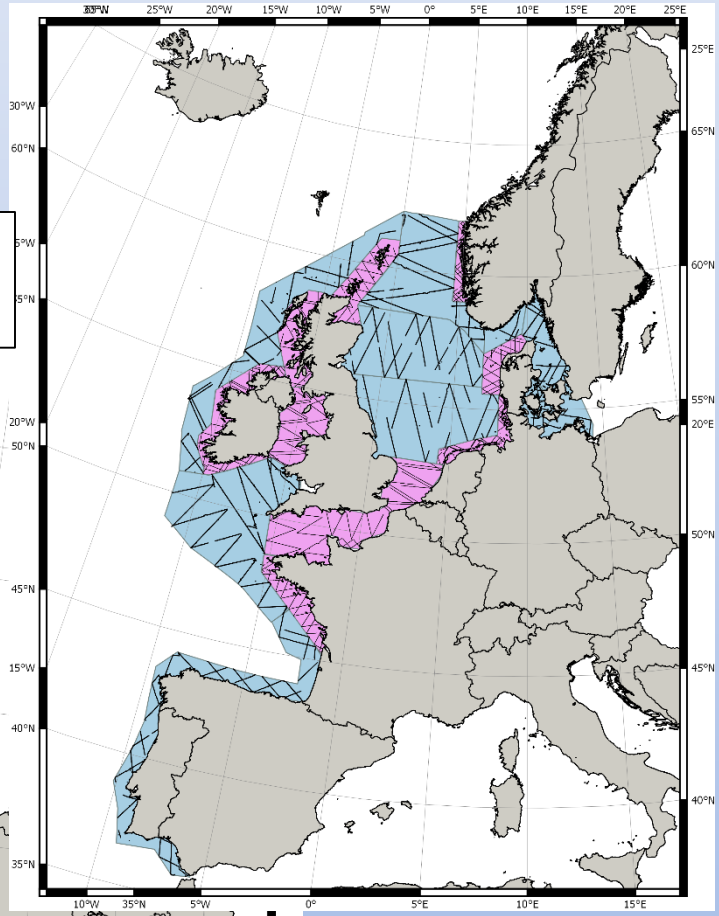
Data collection:

7 airplanes & 3 vessels

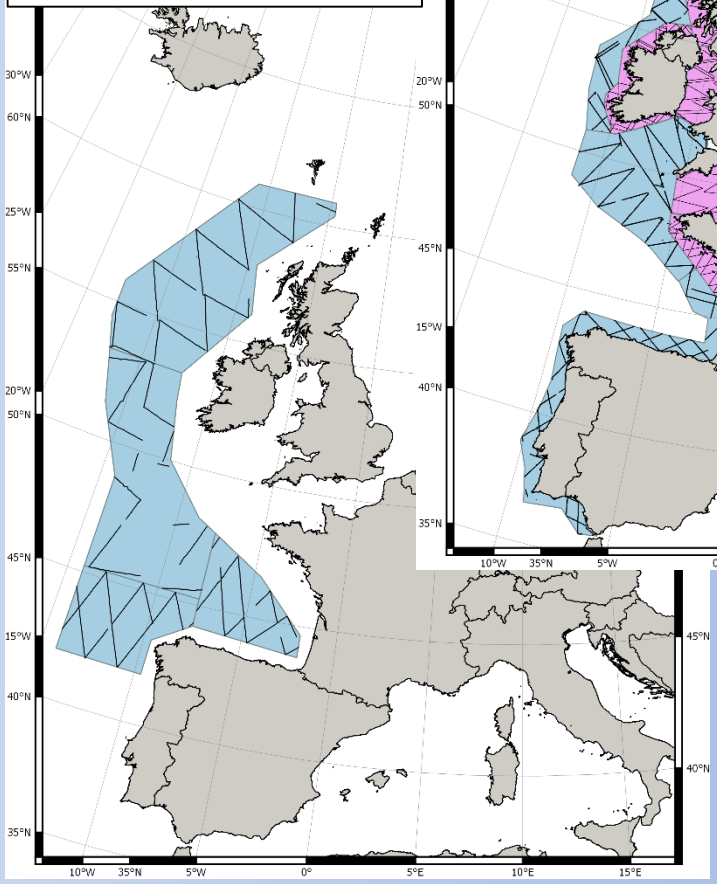
SCANS (1994)
3 ships & 2 aircraft



SCANS-II (2005)
7 ships & 3 aircraft

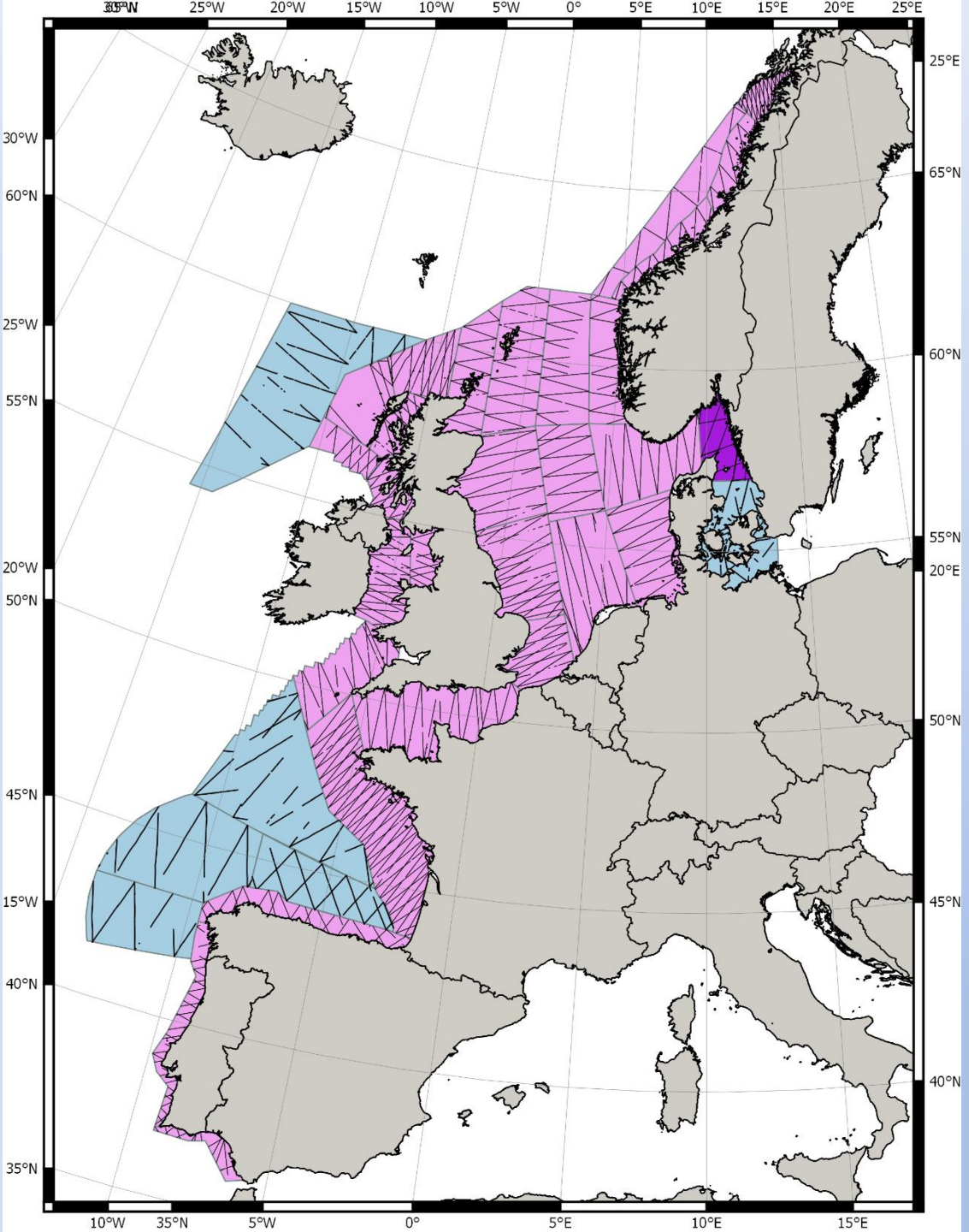


CODA (2005/2007)
5 ships

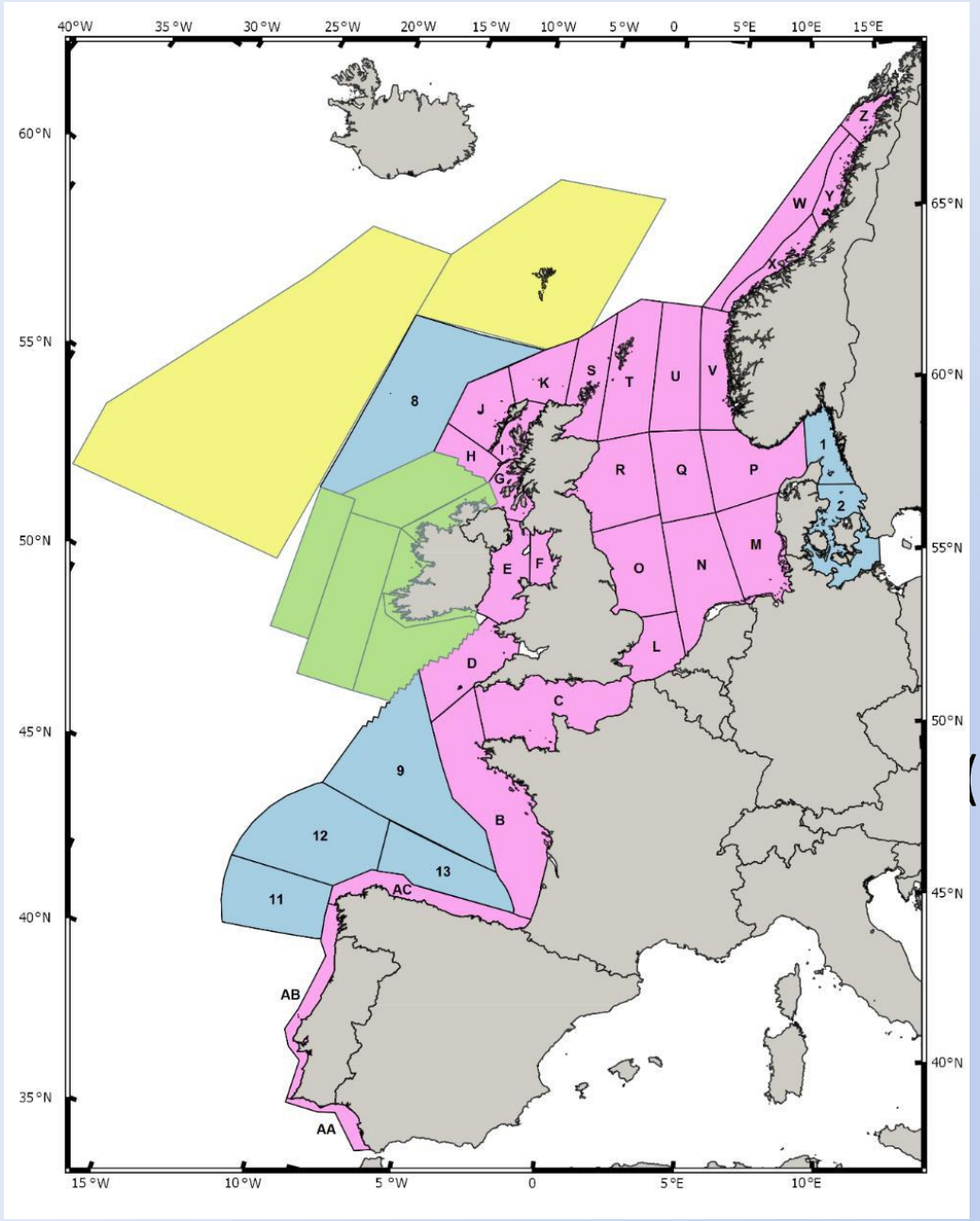


SCANS III effort

(blue vessel, pink & purple aerial)



Study area



Pink:

Aerial survey (2016)

Blue:

Boat survey (2016)

Green:

OBSERVE

(Irish survey 2015, 2016 & 2017)

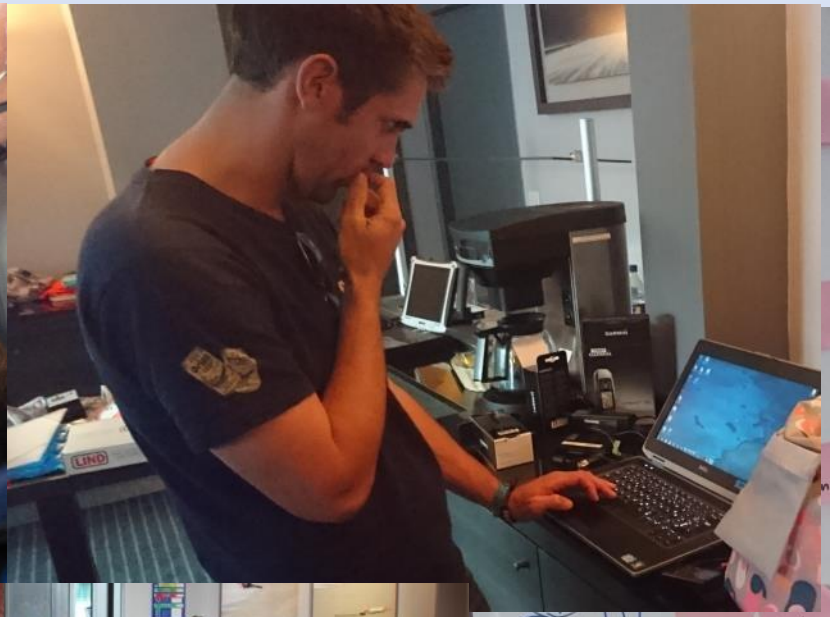
Yellow:

North Atlantic Sightings Survey

(2015)

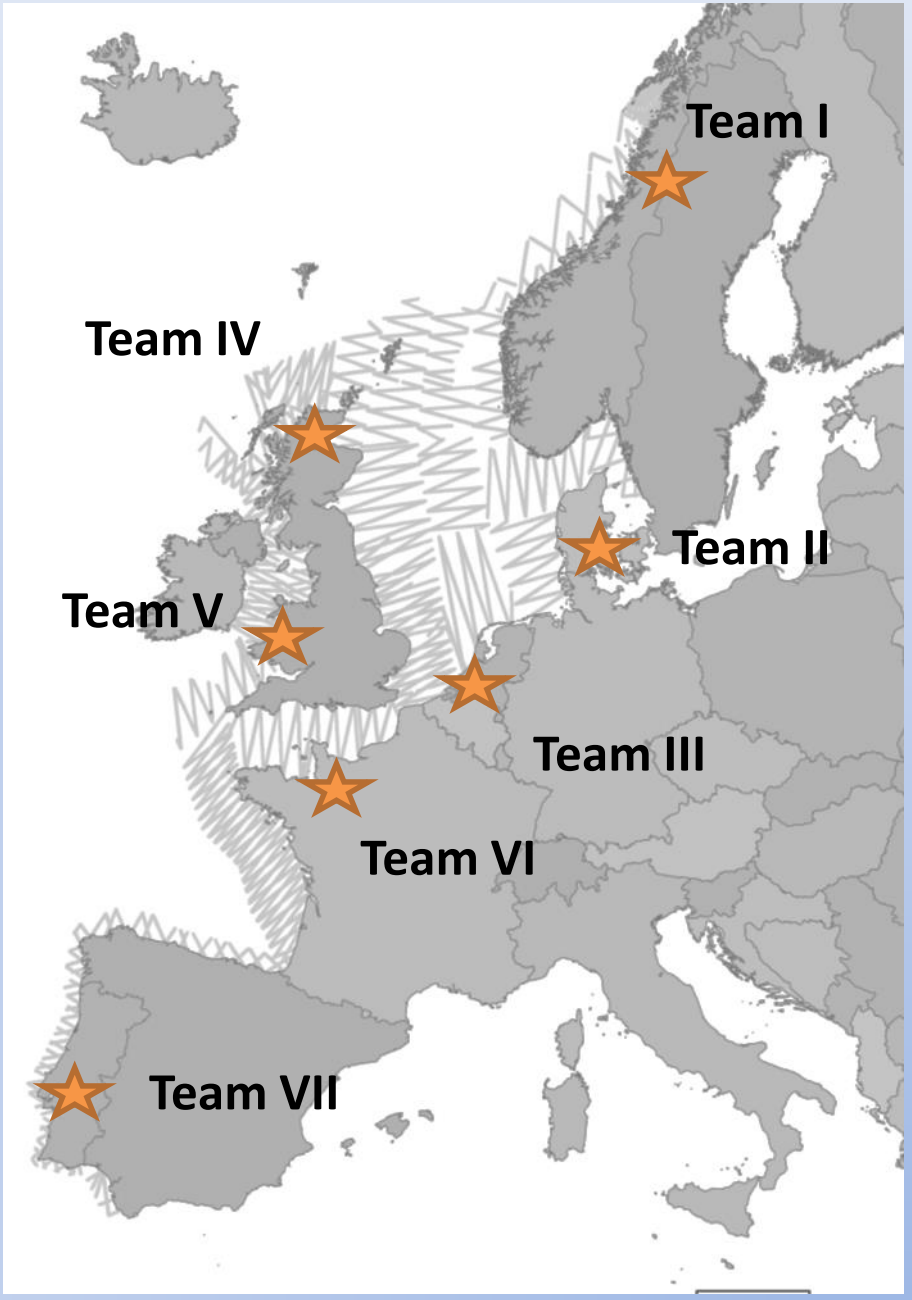
Data collection

SCANS III – Aerial survey preparations



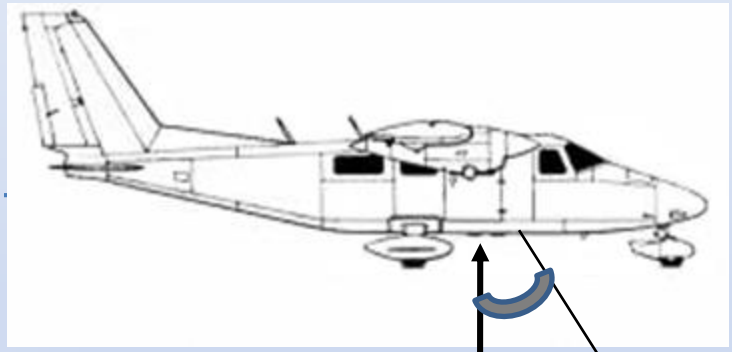
Aerial surveys SCANSIII - July 2017

- 7 airplanes with 8 teams á 3 observers
- 54337 km “on effort”
- 1674 sightings of 2281 porpoises
- Average group size 1.36



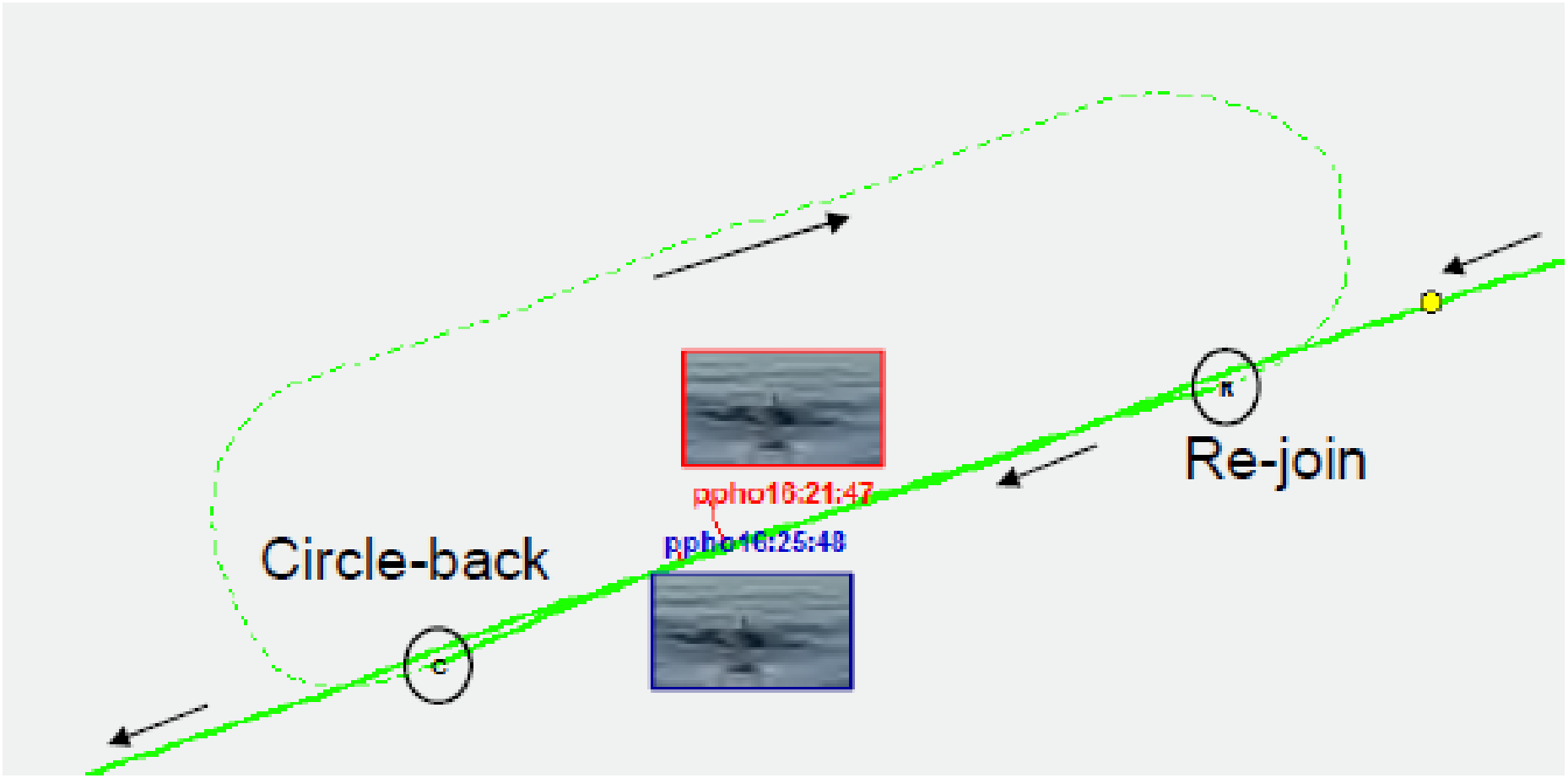
Two engine
High-winged
Bubble windows

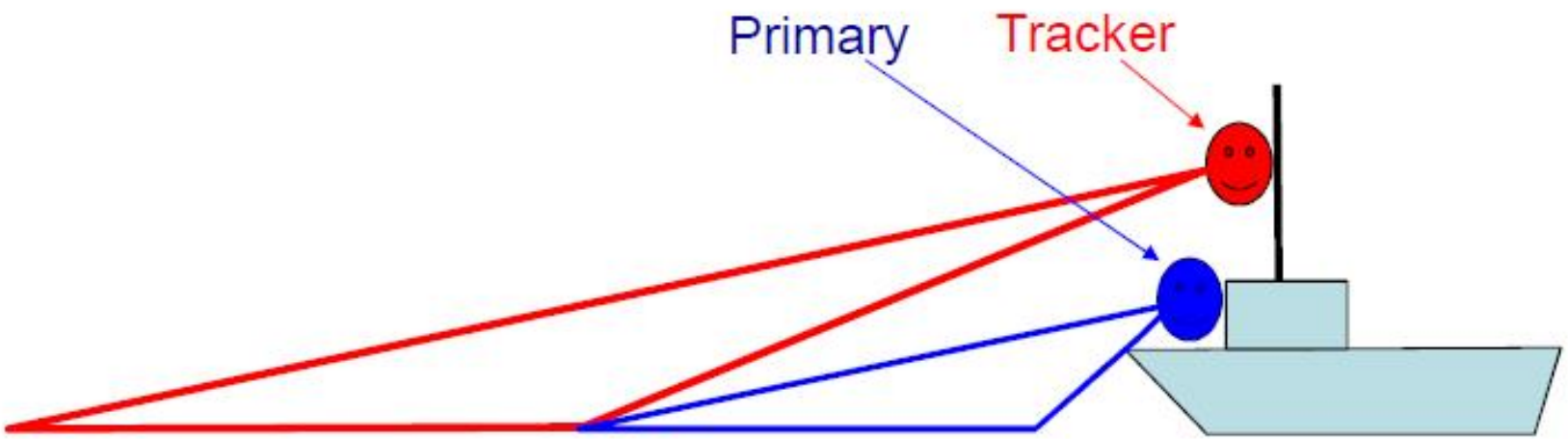
Line transect
Distance sampling
g(0) estimates



80 to 100 knots

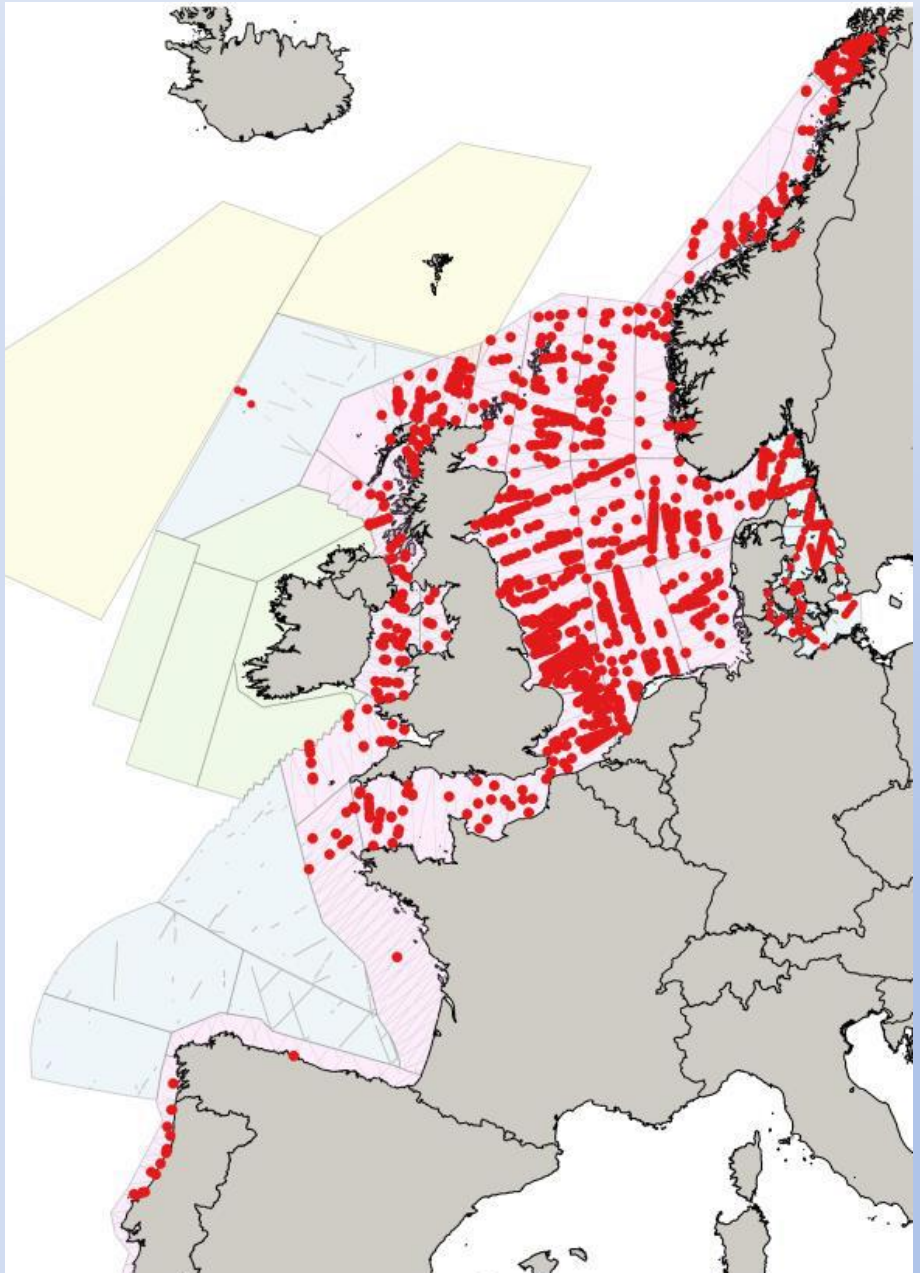
600ft
183m

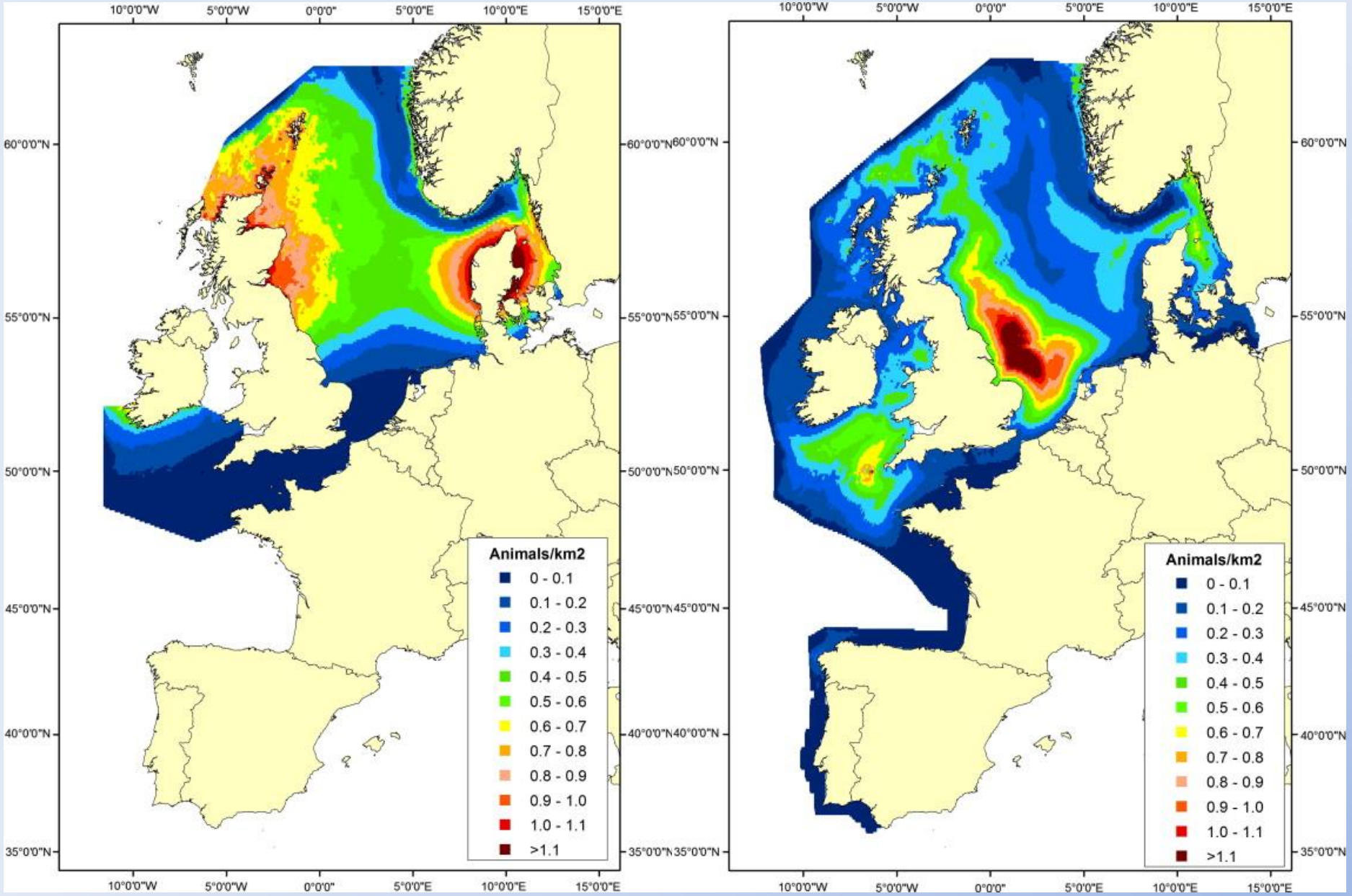

Re-join
R
ppho16:21:47
ppho16:25:48
Circle-back
C


Primary
Tracker

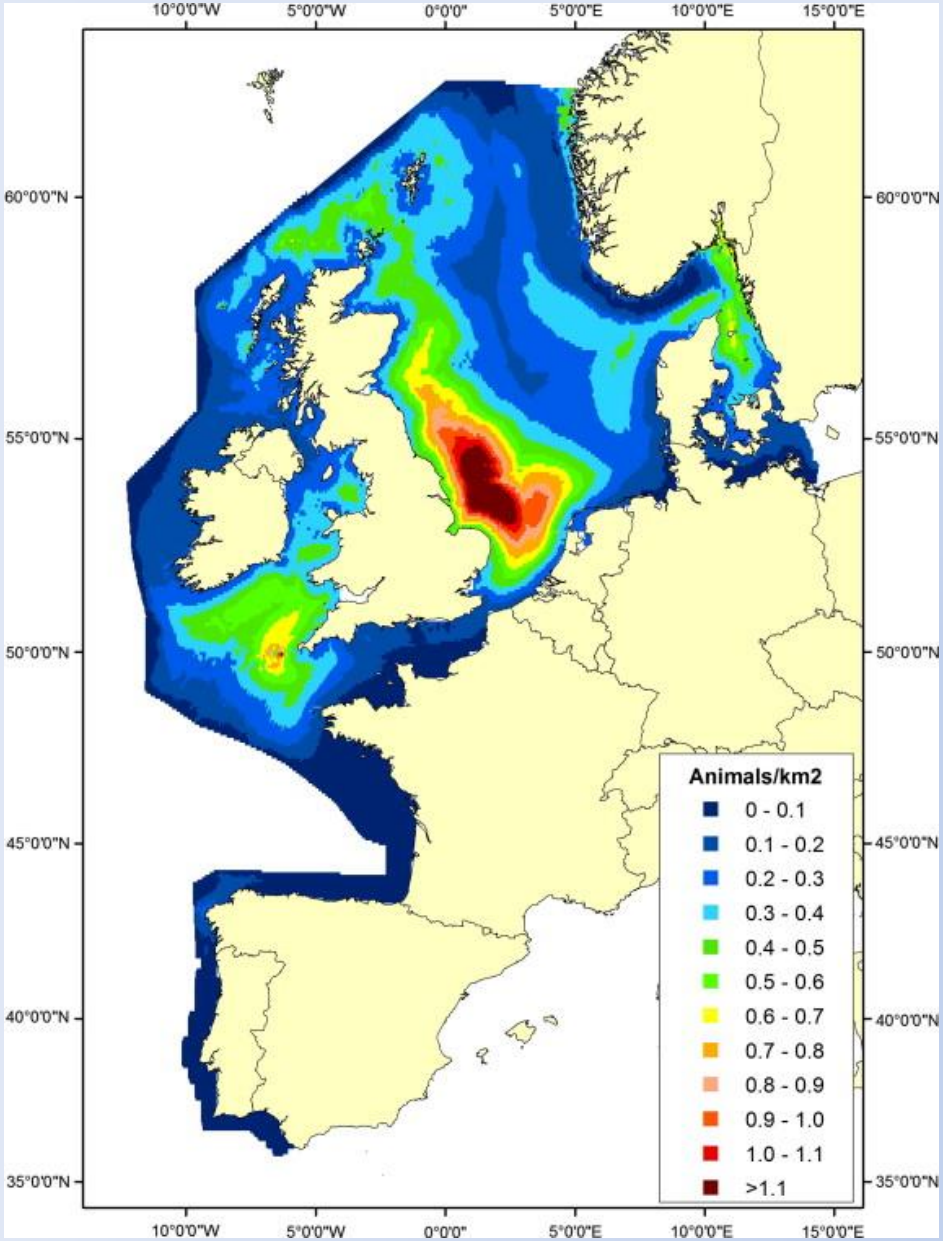
Distribution

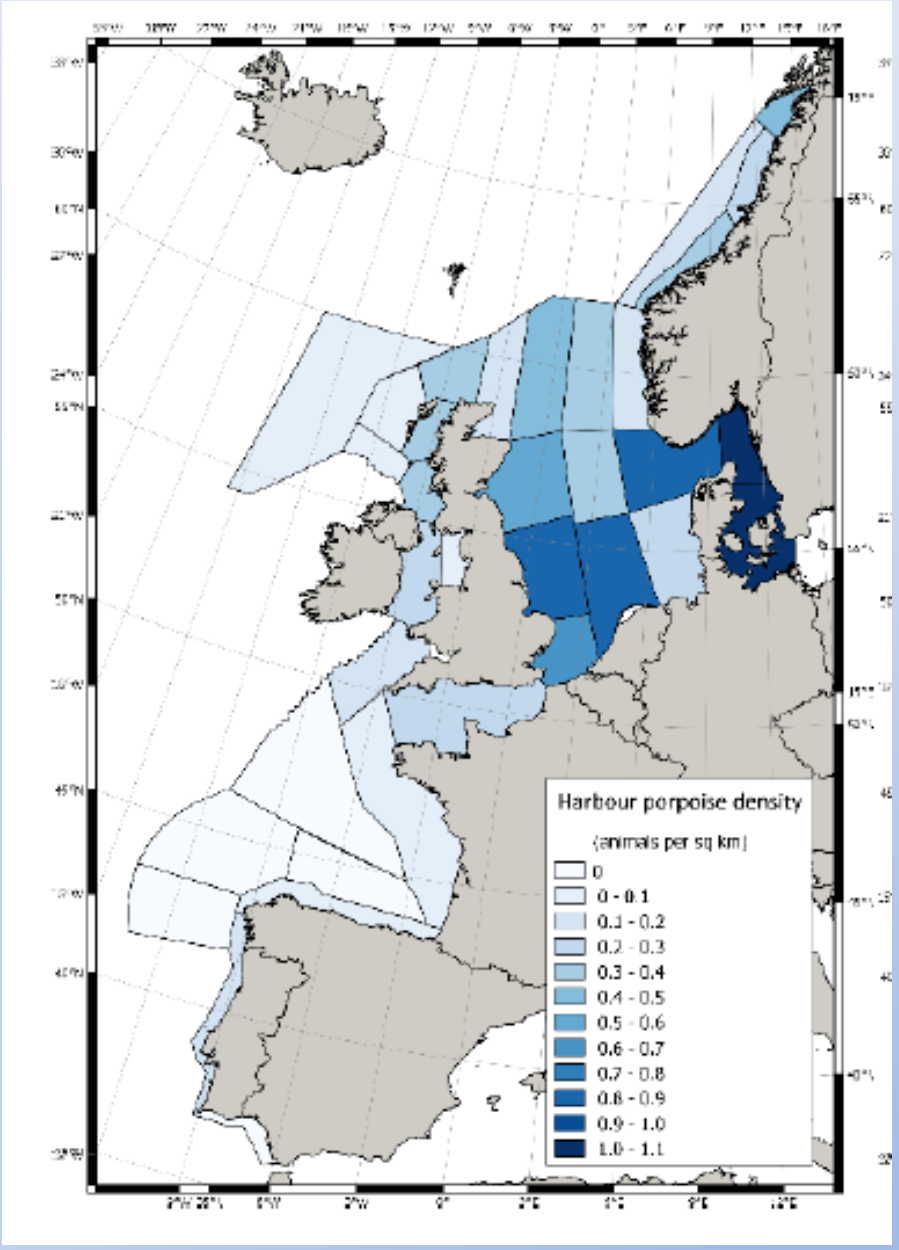
Harbour porpoise sightings
SCANSIII





Predictive spatial model for SCANS (1994) and SCANSII (2005).



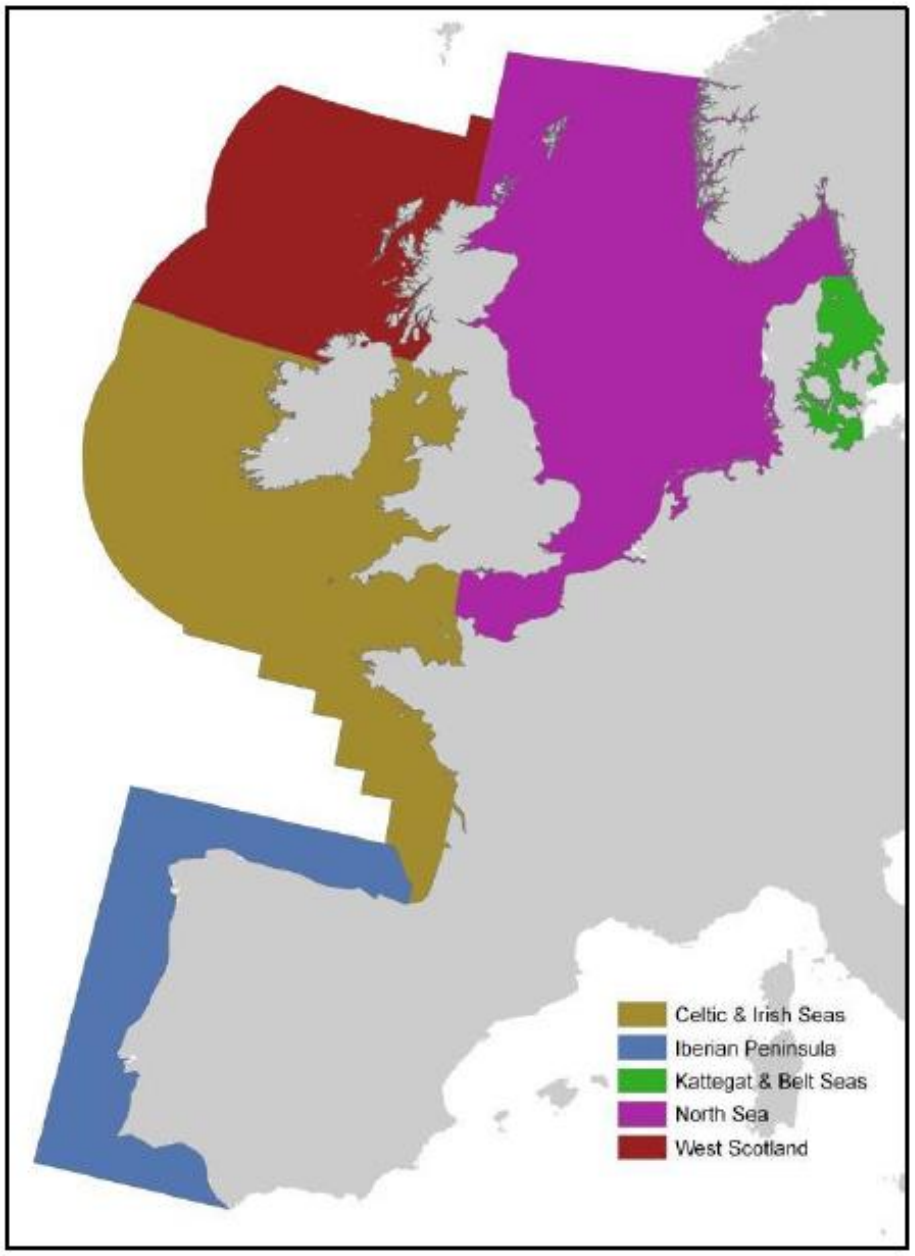


Predictive spatial model for SCANSII (2005) and porpoise density per area (2016).

Density and abundance

Estimates of total abundance and density (animals/km^2) in the whole SCANSIII area for all species

Species	Abundance	Density	CV	CL low	CL high
Harbour porpoise	466,569	0.381	0.154	345,306	630,417
Bottlenose dolphin	27,697	0.015	0.233	17,662	43,432
Risso's dolphin	13,584	0.008	0.441	5,943	31,047
White-beaked dolphin	36,287	0.020	0.290	18,694	61,869
White-sided dolphin	15,510	0.009	0.717	4,389	54,807
Common dolphin	467,673	0.261	0.264	281,129	777,998
Striped dolphin	372,340	0.208	0.329	198,583	698,134
Unid common or striped	158,167	0.088	0.188	109,689	228,069
Pilot whale	25,777	0.014	0.345	13,350	49,772
Beaked whales (all species)	11,394	0.006	0.503	4,494	28,888
Sperm whale	13,518	0.008	0.405	6,181	29,563
Minke whale	14,759	0.008	0.327	7,908	27,544
Fin whale	18,142	0.010	0.322	9,796	33,599



ICES Assessment units for harbour porpoises.

Table 33. Estimates of harbour porpoise abundance and density (animals/km^2) in ICES Assessment Units, and Norwegian coastal waters north of 62°N. CV is the coefficient of variation of abundance and density. CL low and CL high are the estimated lower and upper 95% confidence limits of abundance. All estimates are from aerial survey except for the Kattegat and Belt Seas AU, which is from ship survey block 2. Note that the sum of the estimates for the Celtic/Irish Seas and North Sea AUs (372,073) is slightly smaller than the sum of the contributing bocks (372,452); this is because block C spanned both AUs and was post-stratified in analysis.

Assessment Unit	Abundance	Density	CV	CL low	CL high
Celtic/Irish Seas (partial coverage only)	26,700	0.11	0.25	16,055	42,128
North Sea	345,373	0.52	0.18	246,526	495,752
West Scotland	24,370	0.21	0.23	15,074	37,858
Iberian peninsula	2,898	0.04	0.32	1,386	5,122
Kattegat and Belt Seas	42,324	1.04	0.30	23,368	76,658
Norwegian coastal waters	24,526	0.25	0.28	14,035	40,829

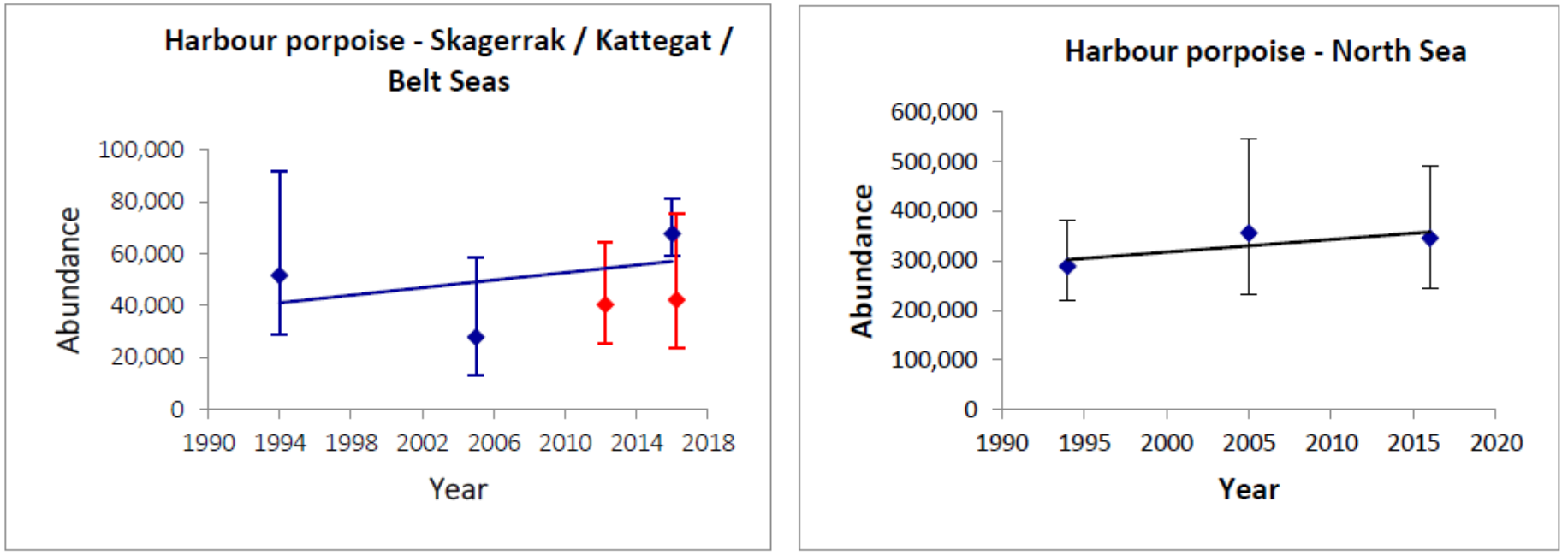


Figure 7. Trend lines fitted to time series of three or more abundance estimates. Top left: harbour porpoise in the Skagerrak/Kattegat/Belt Seas area (blue dots and line) – estimated rate of annual change = 1.24% (95%CI: -39; 67%), p = 0.81. Estimates for the Kattegat/Belt Seas population area (see Figure 6) shown as red dots. Top right: harbour porpoise in the North Sea – estimated rate of annual change = 0.8% (95%CI: -6.8; 9.0%), p = 0.18.