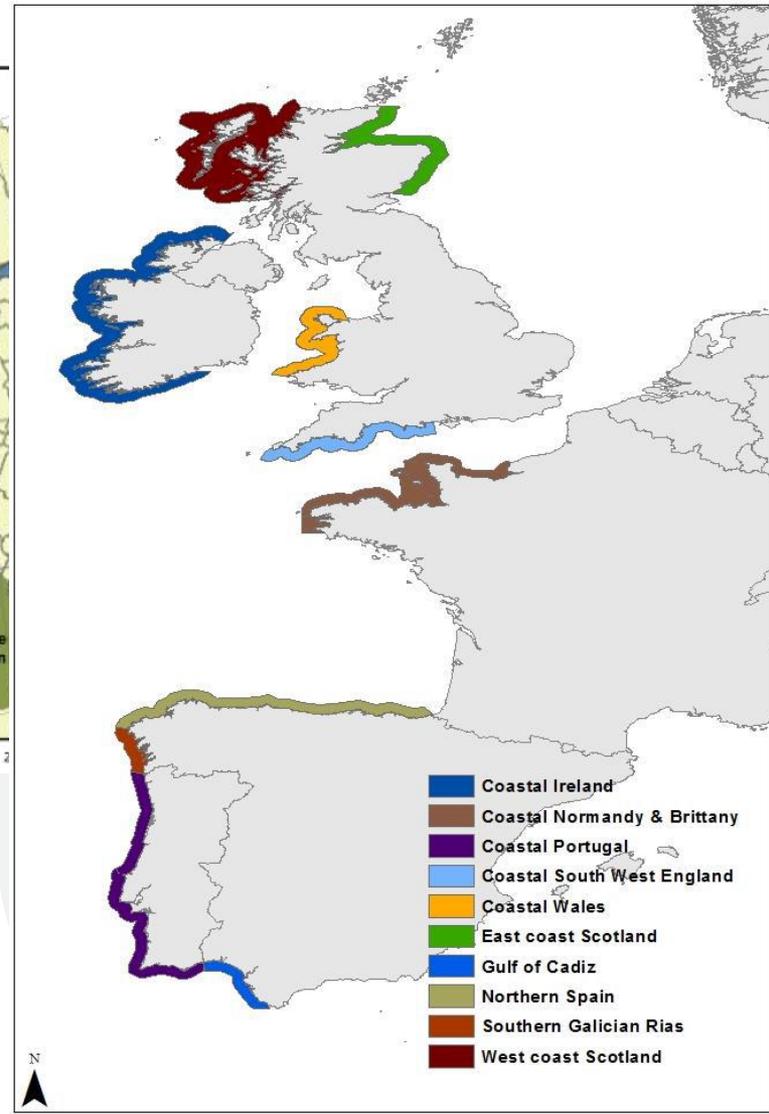
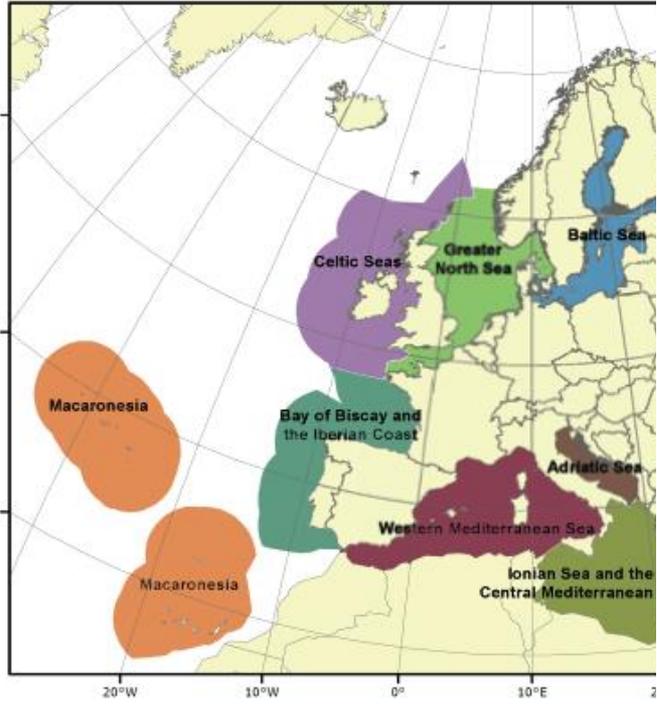
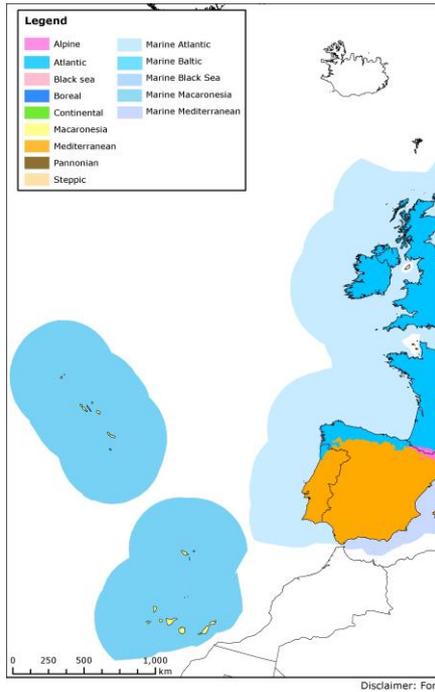


Coordinated Monitoring and Coherent Assessment of Population Status: Northern Europe

Kelly Macleod, Senior Marine Species Advisor, JNCC

(With thanks to Peter Evans!)

Assessment and reporting in 'European Seas'

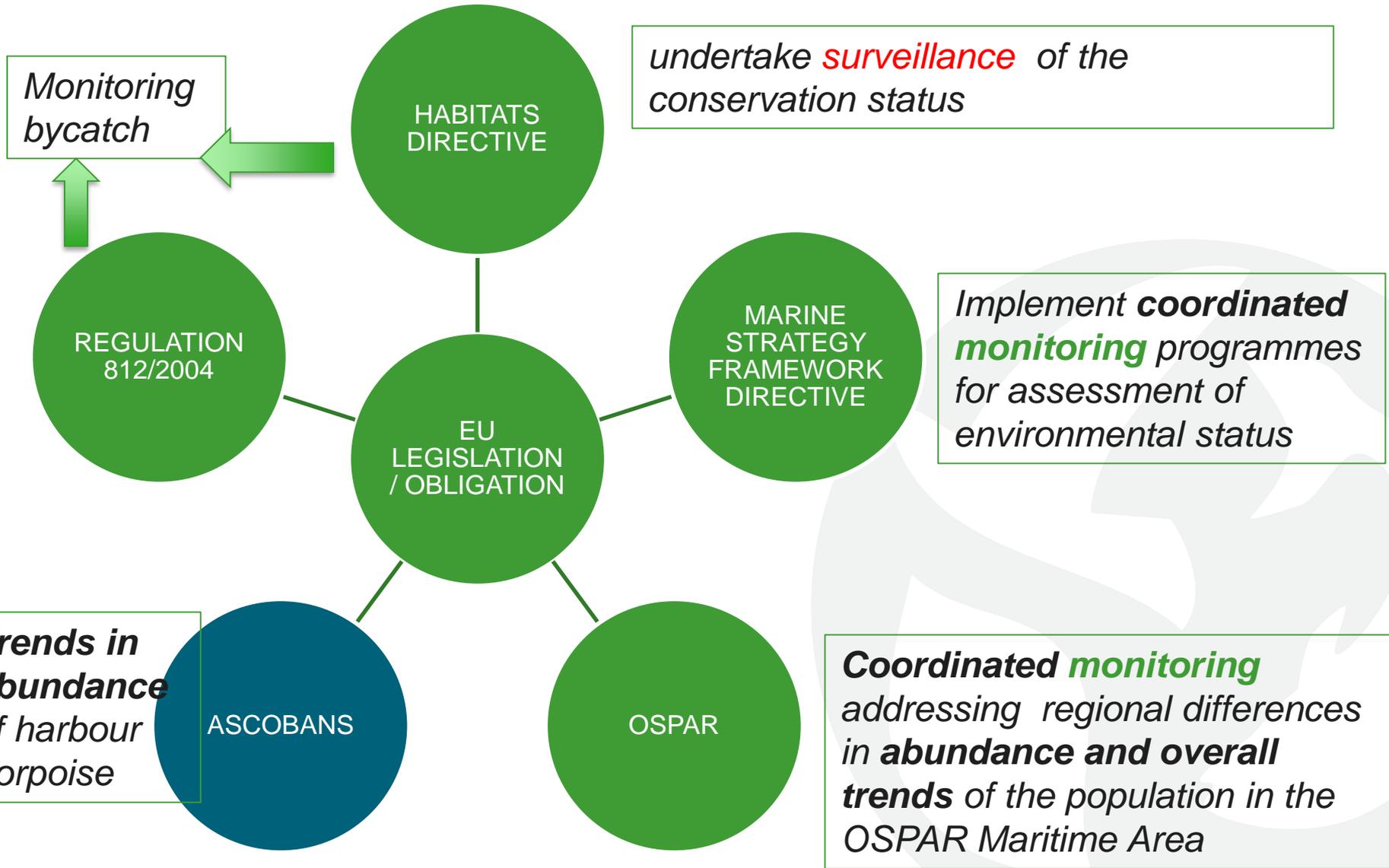


MONITORING

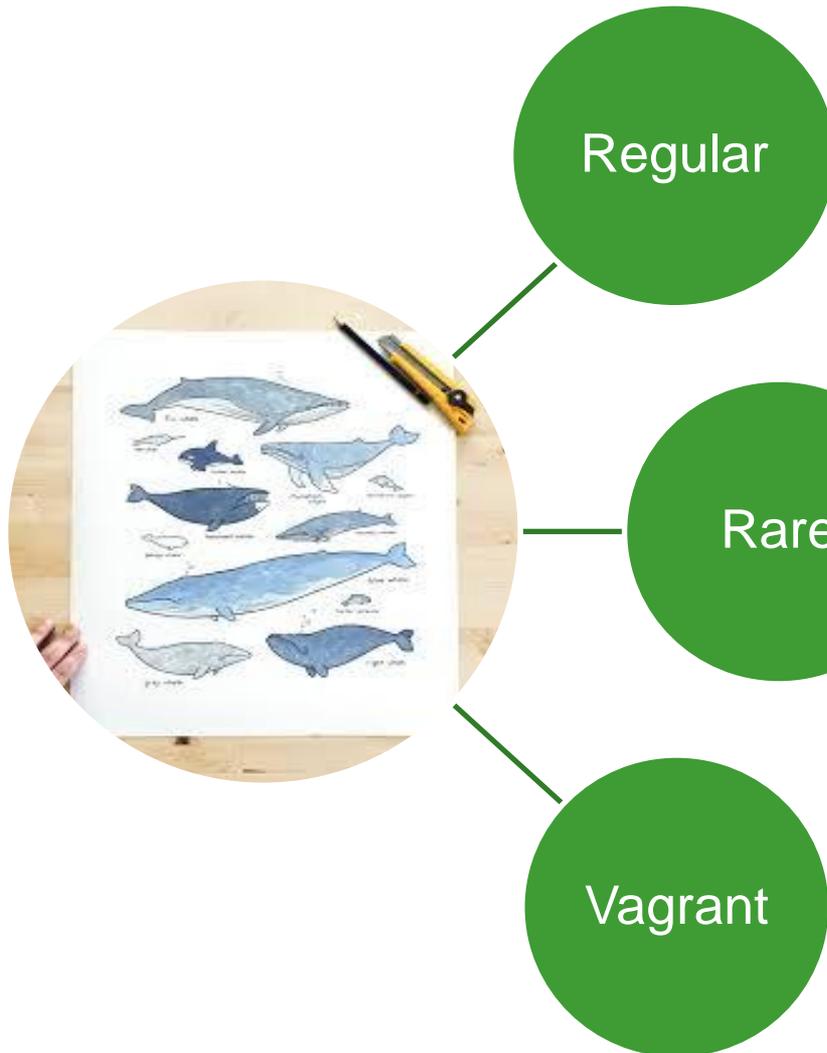


‘ observe and check the progress or quality of something (e.g. population abundance) over a period of time to ensure conservation objectives are being met’

Requirements to monitor?



35 cetacean species in Northern Europe

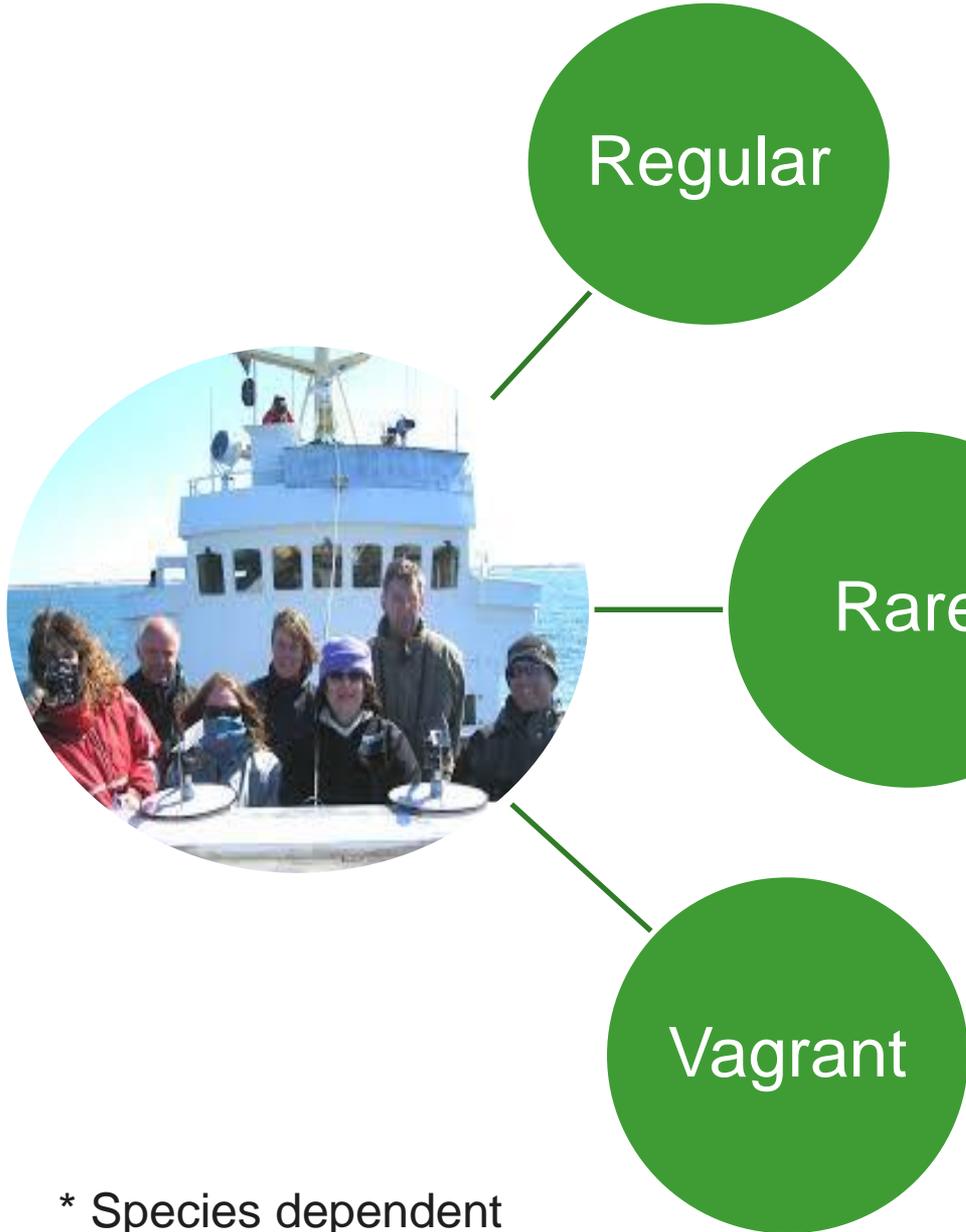


- Harbour porpoise, common dolphin, white beaked dolphin, minke whale, long-finned pilot whale

- Sightings uncommon
- Blue whale, Sei whale, True's beaked whale

- Outside the normal range
- Beluga, Narwhal, Fraser's dolphin

Population distribution



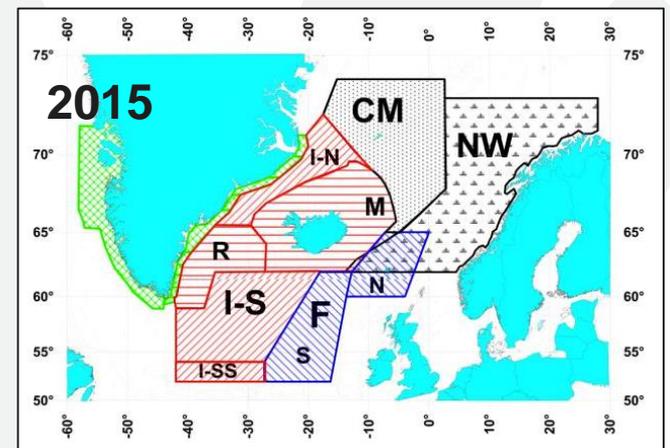
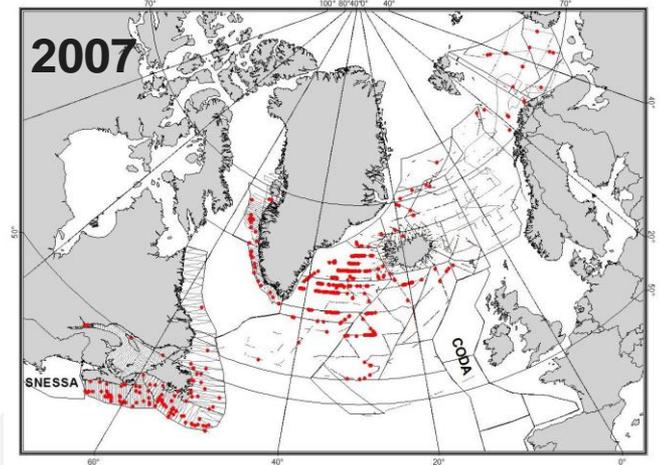
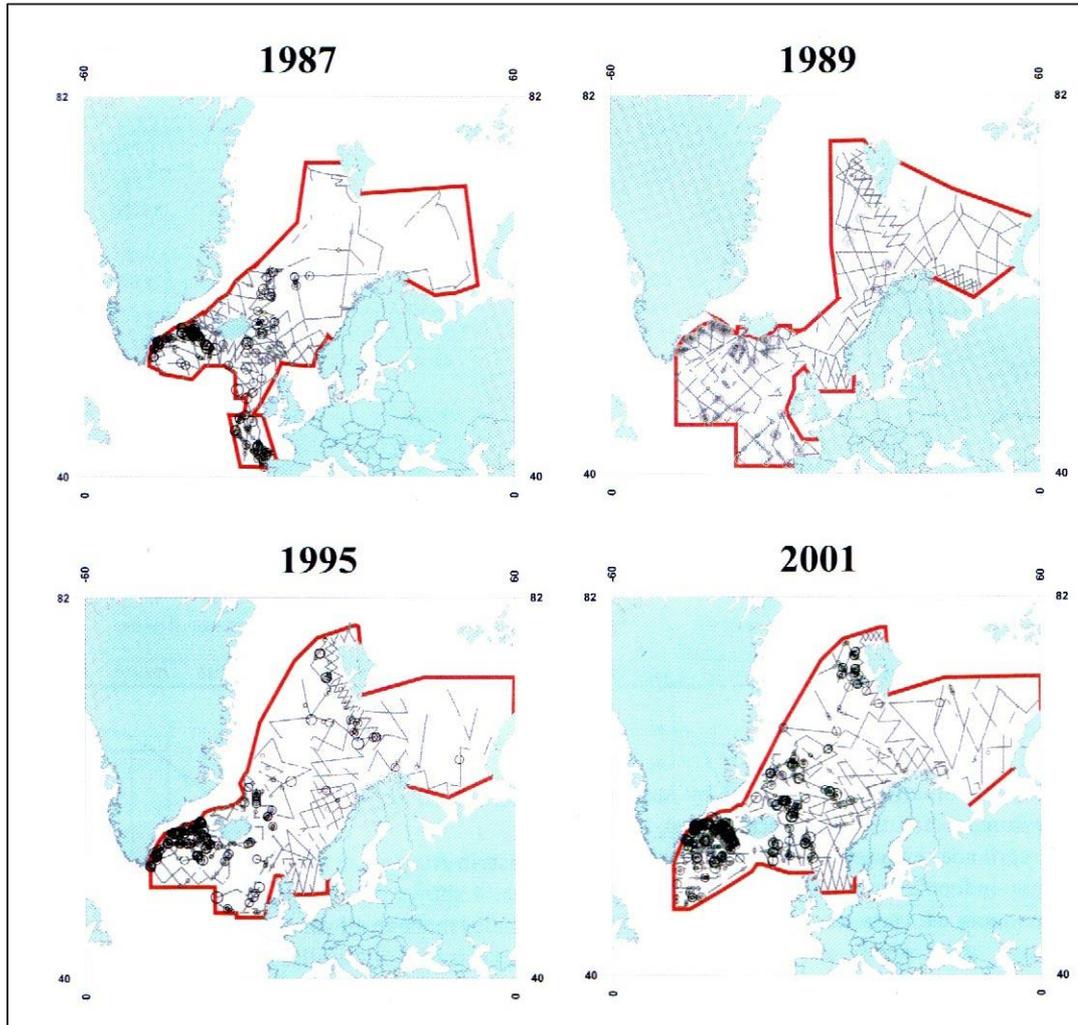
- Widely or locally distributed:
 - LT abundance survey
 - Photo-ID *
 - Passive acoustics*

- Widely distributed:
 - LT relative abundance survey

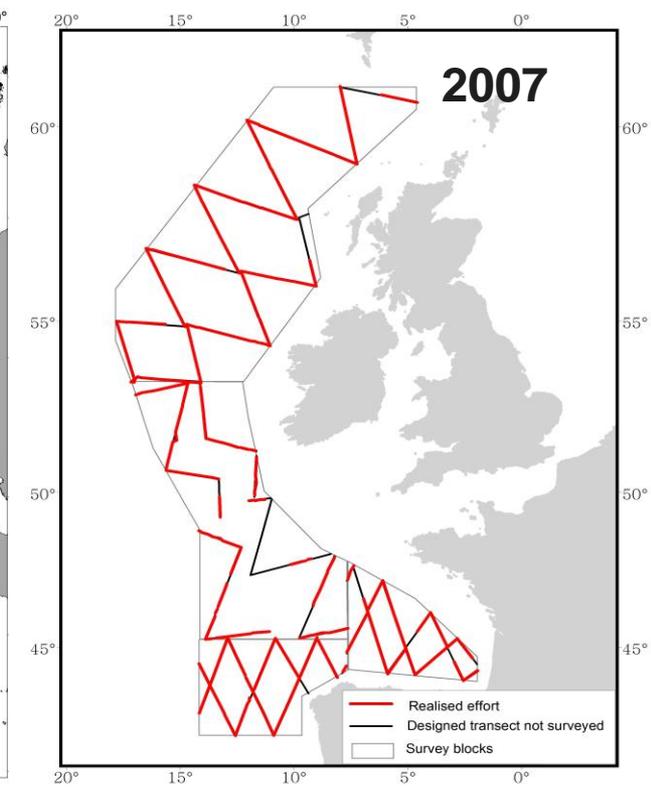
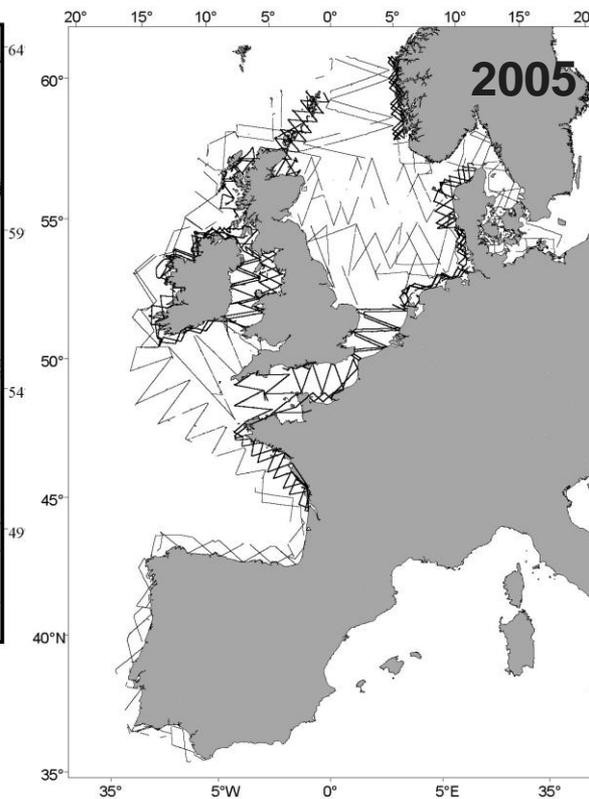
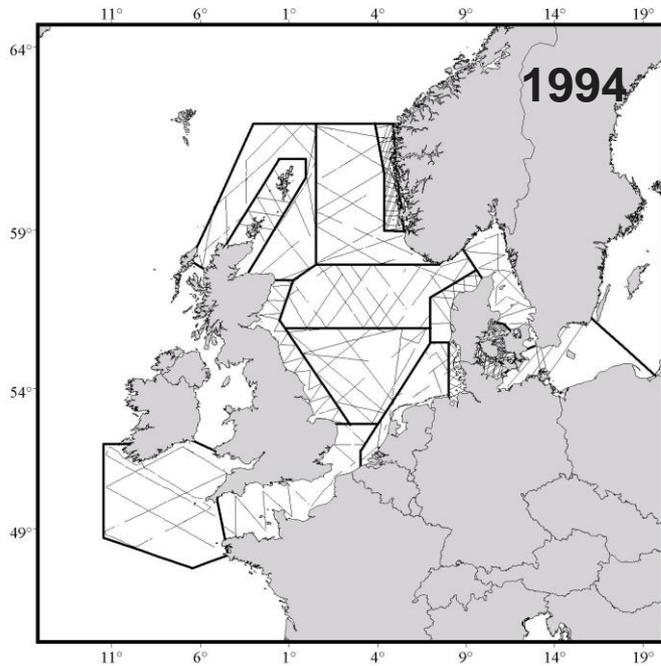
- Opportunistic records:
 - Strandings
 - sightings

* Species dependent

NASS & T-NASS SURVEYS



SCANS & CODA



Hammond *et al.*, 2002, 2013; CODA, 2009

Power to detect trends

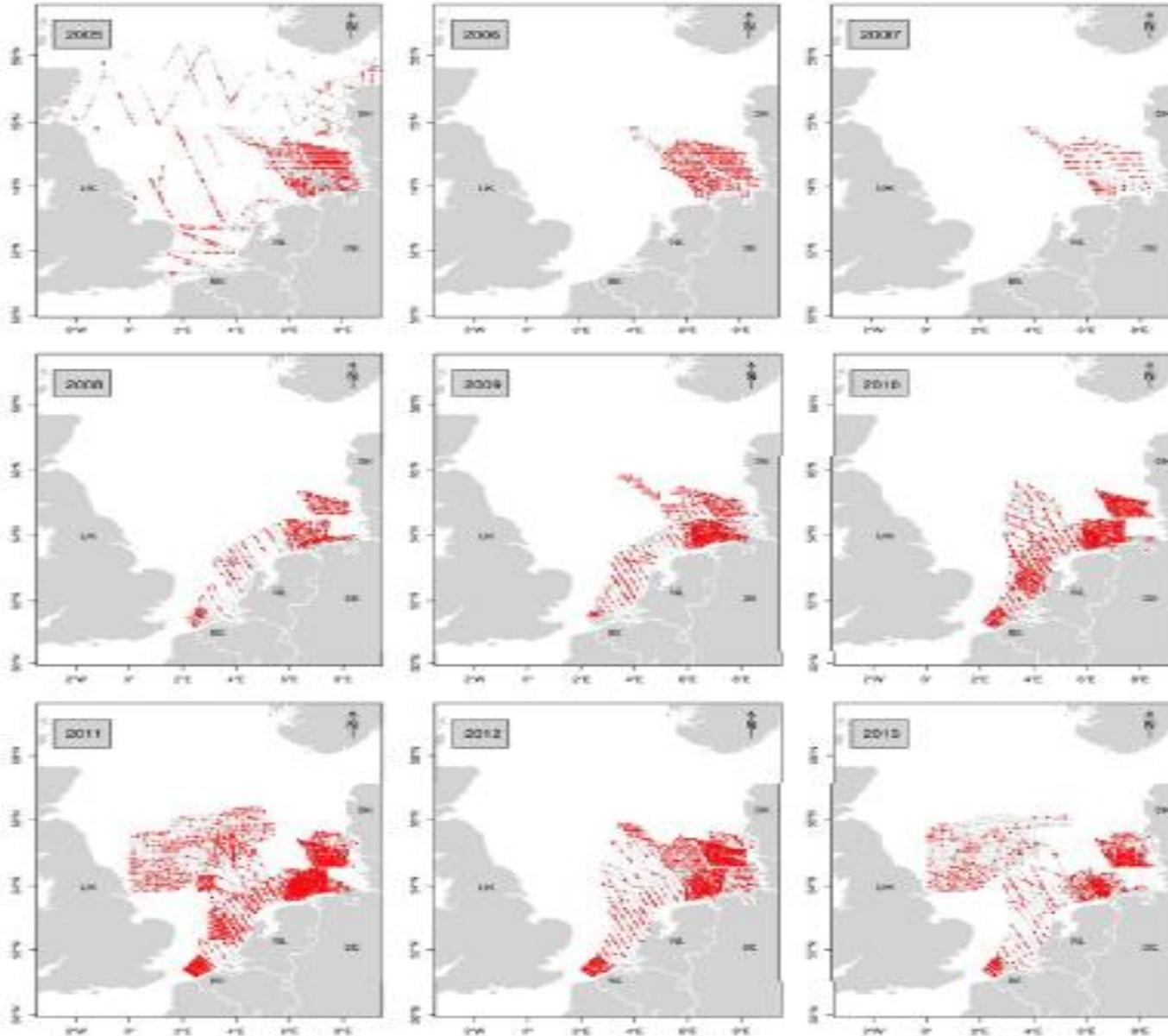
Frequency of survey increased to every 3rd year, then power to detect a 30% decline over 3 generations improves

Monitoring activity	Species	CV of measured estimate of abundance	Power (%) to detect trends in abundance	
			$\alpha = 0.05$	$\alpha = 0.2$
SUANS (ships and aircraft)	Harbour porpoise	0.14	20	57
	White-beaked dolphin	0.3	12	36
Harbour porpoise	Minke whale	0.24	16	43
	Harbour porpoise	0.197	13	42
SCANS-II (ships and aircraft)	Short-beaked common dolphin	0.234	16	44
	0.14	0.69	69	91
	White-beaked dolphin	0.303	12	36
	Minke whale	0.347	10	32
Common dolphin	Bottlenose dolphin (likely offshore)	0.492	8	28
	Bottlenose dolphin (likely offshore)	0.25	15	42
CODA (ships)	Minke whale	0.24	47	75
	Common dolphin	0.38	9	30
	Minke whale	0.99	6	22
	Pilot whale	0.34	14	38
	Sperm whale	0.34	14	38

Regional monitoring



JNCC
Nature Conservation Committee

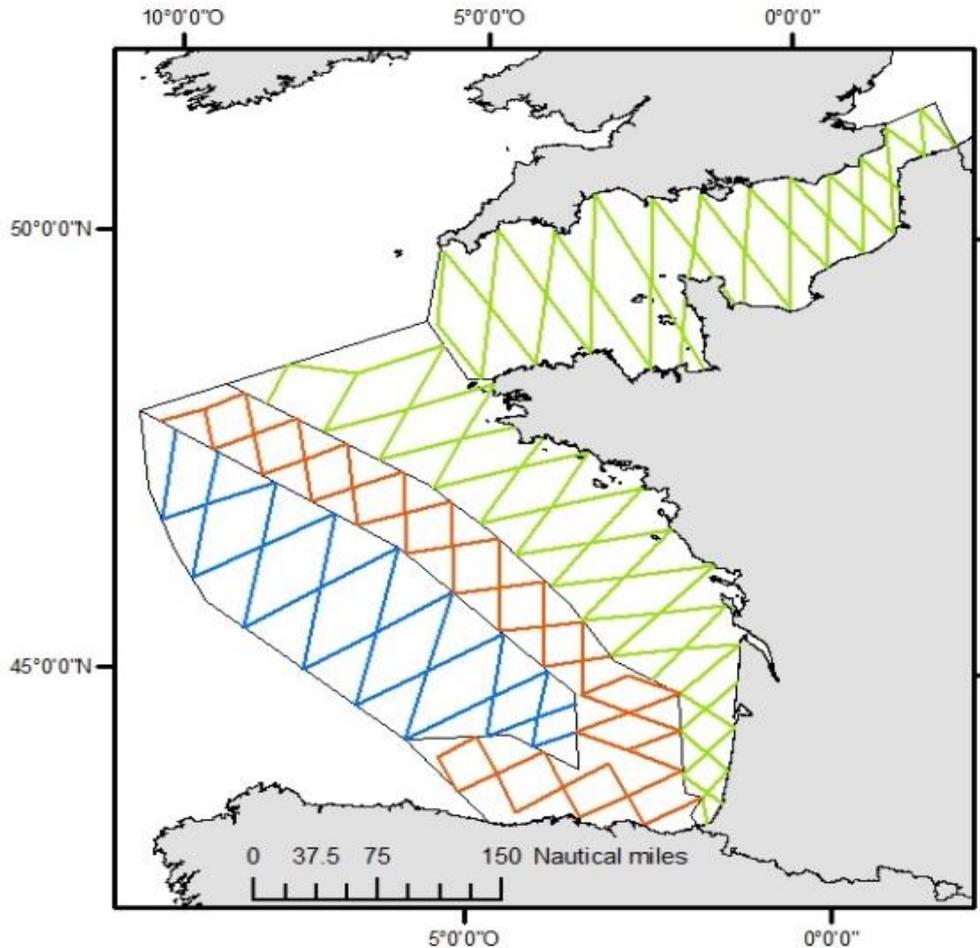


Gilles *et al.*, in press

Subproject of
DEPONS

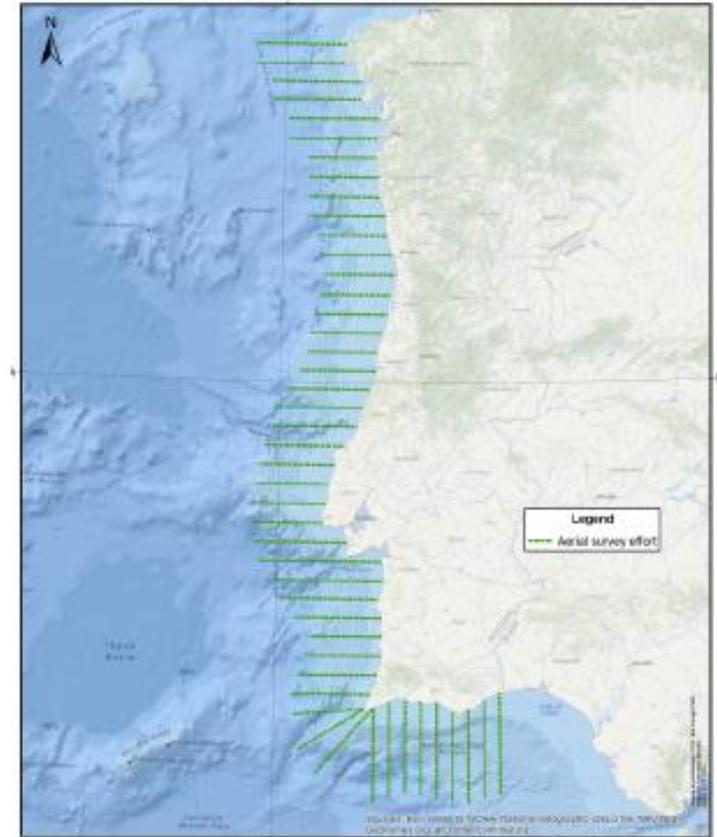
National monitoring

FRANCE



SAMM: 1 winter and 1 summer aerial surveys 2011-12

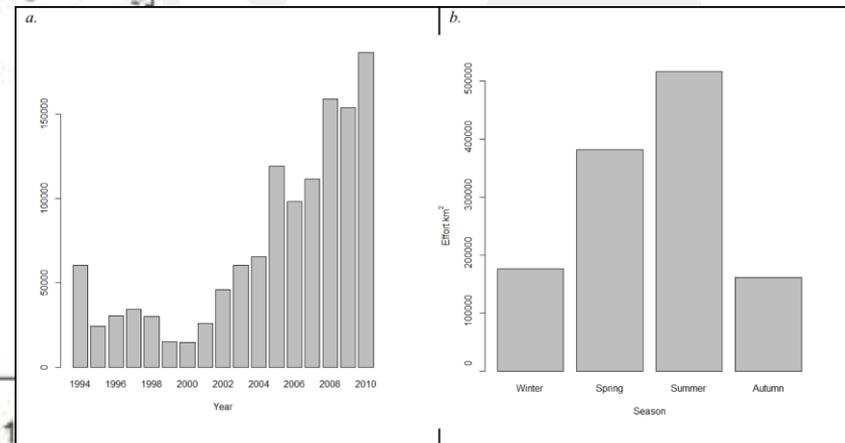
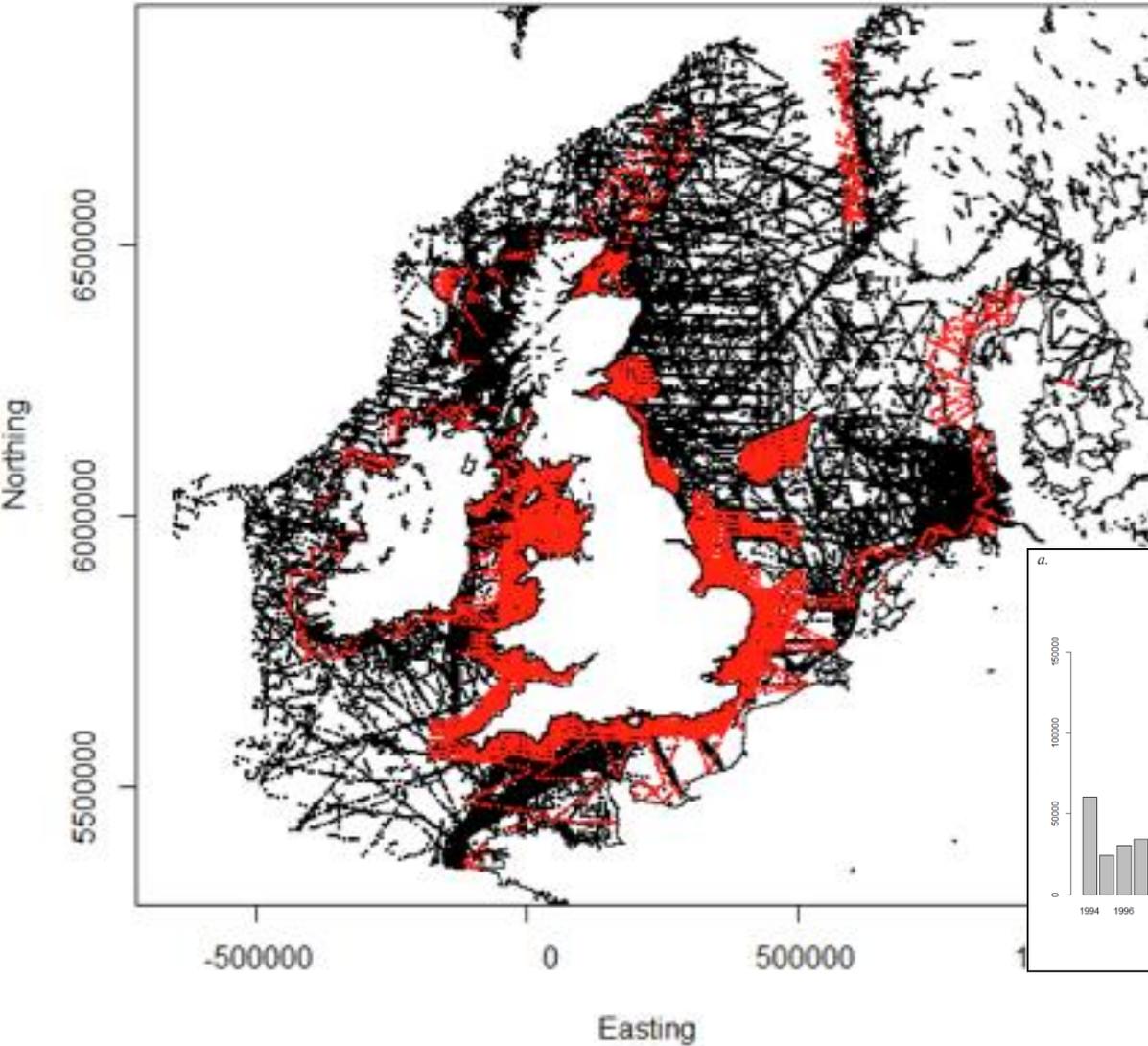
PORTUGAL



MARPRO
Aerial survey effort

MARPRO Surveys, Autumn 2010-14

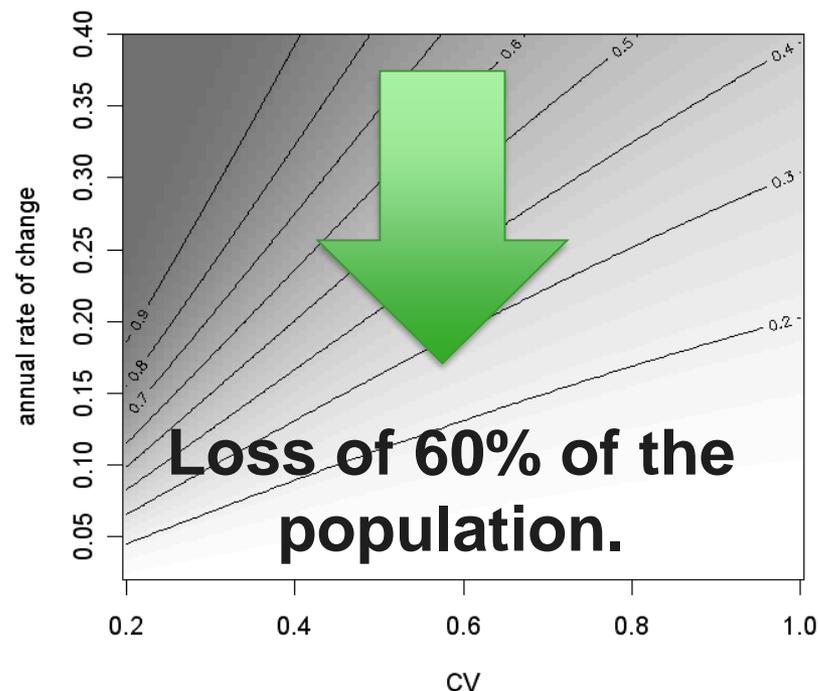
Joint Cetacean Protocol



Population trends

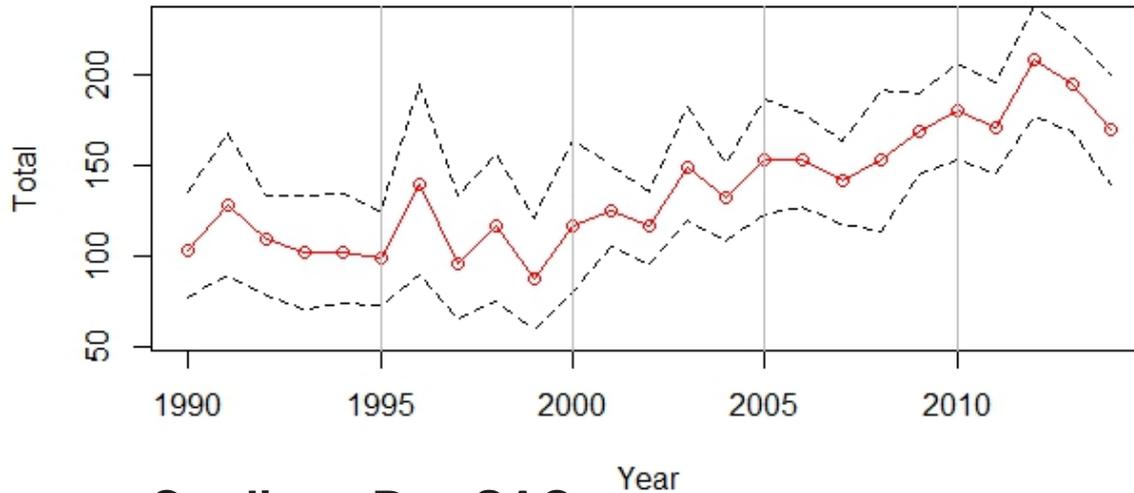
- Preliminary work: ‘.....targets such as having high power to detect a 1% annual decline in abundance or range over a 6 year reporting period are not remotely feasible (Thomas, 2009)’

Annual survey, 6 years, CV = 0.2, 80% power (0.15 annual rate decline)

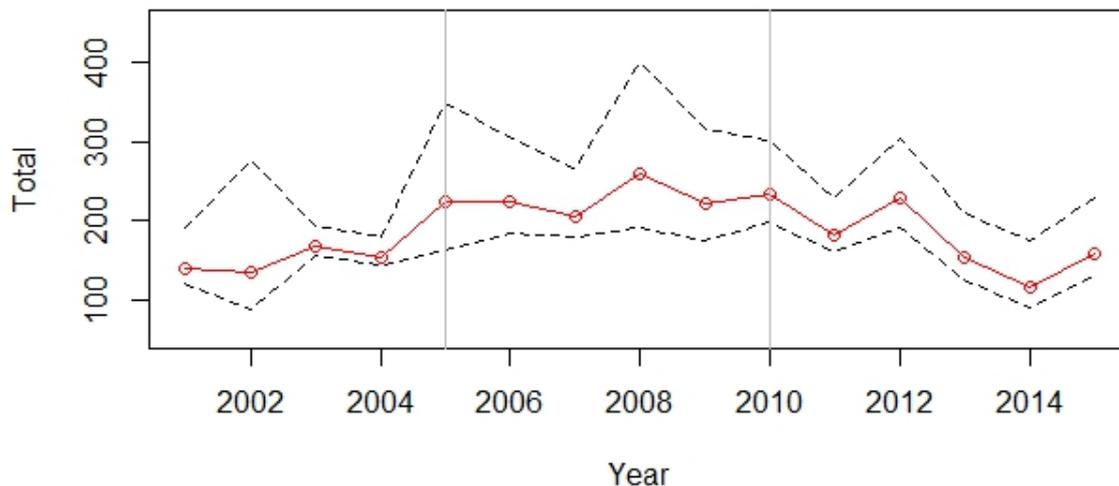


Coastal bottlenose dolphins

East Coast of Scotland

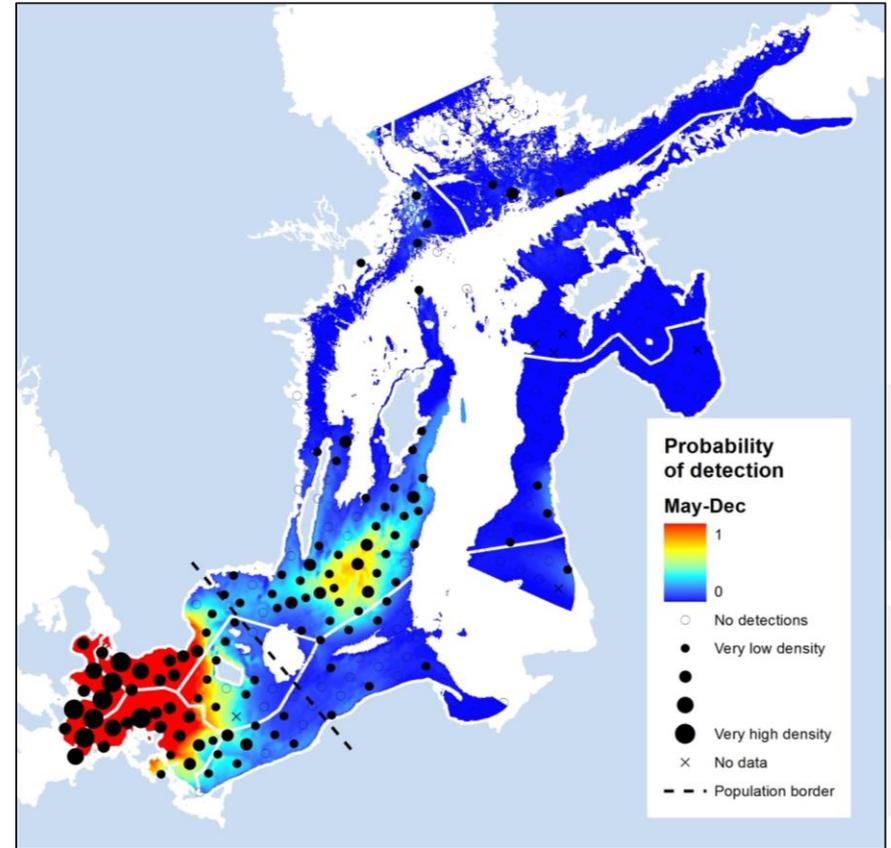
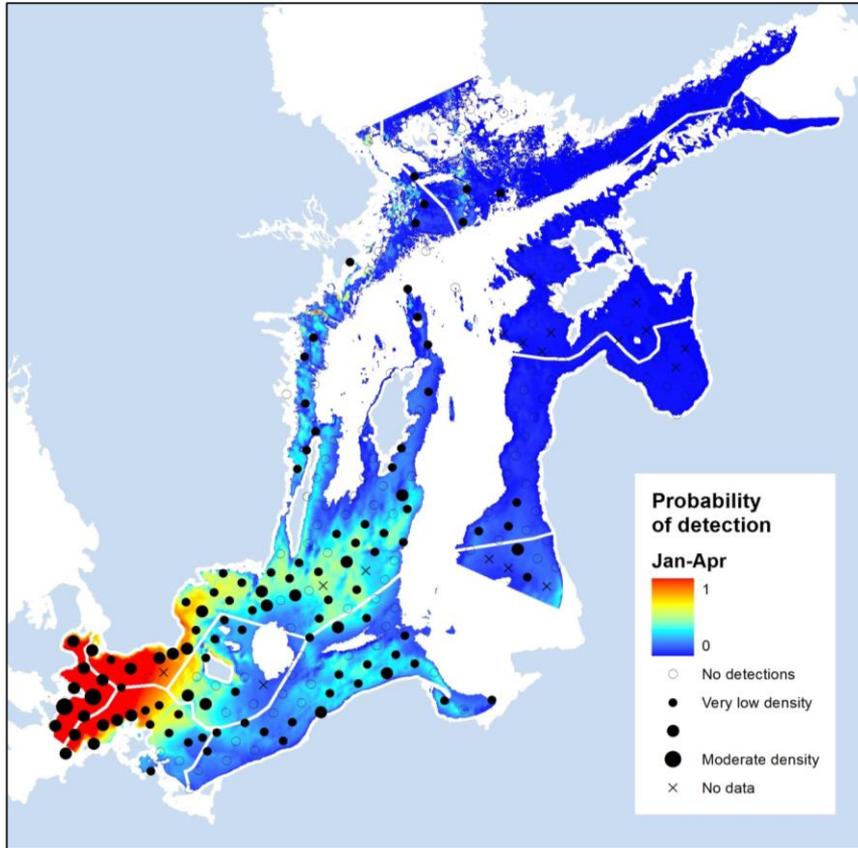


Cardigan Bay SAC



- Bottlenose dolphin populations monitored by photo-ID and mark-recapture
- Population estimates derived from at least 5 years of monitoring:
 - Sado Estuary (Portugal)
 - Moray Firth (Scotland)
 - Cardigan Bay (Wales)
 - Ile de Sein (France)
 - Shannon Estuary (Ireland)
 - Gulf of St Malo (France)

Passive acoustic methods



SAMBAH project, 2011-2013

Coherent assessment and coordinated monitoring?

- Requirements to monitor for MSFD should not exceed Habitats Directive
- OSPAR coordination (ICG-COBAM & Biodiversity Committee) BUT
- No clear mechanism to implement coordinated monitoring
- Assessments relying on ICES working groups
- Reporting 6 yearly BUT
- Very different templates MSFD v Habitats Directive
- Inappropriate temporal and spatial scales (monitoring and reporting)
- Gaps? Operational monitoring (changes take too long to detect; seasonality; effort into monitoring pressures)