



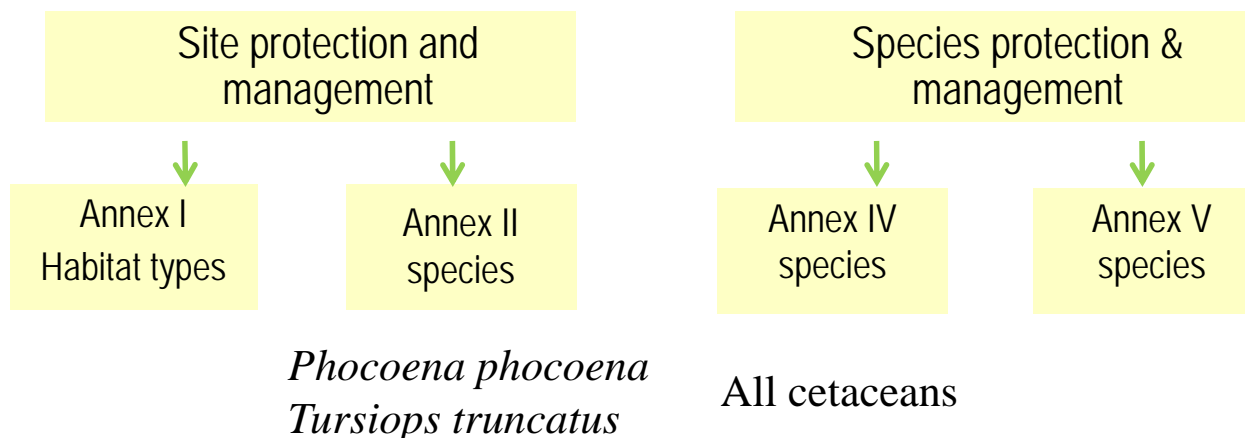
THE HABITATS DIRECTIVE AND ITS ROLE IN CETACEAN CONSERVATION

Peter G.H. Evans

Sea Watch Foundation & School of Ocean Sciences, Bangor University

The Habitats Directive

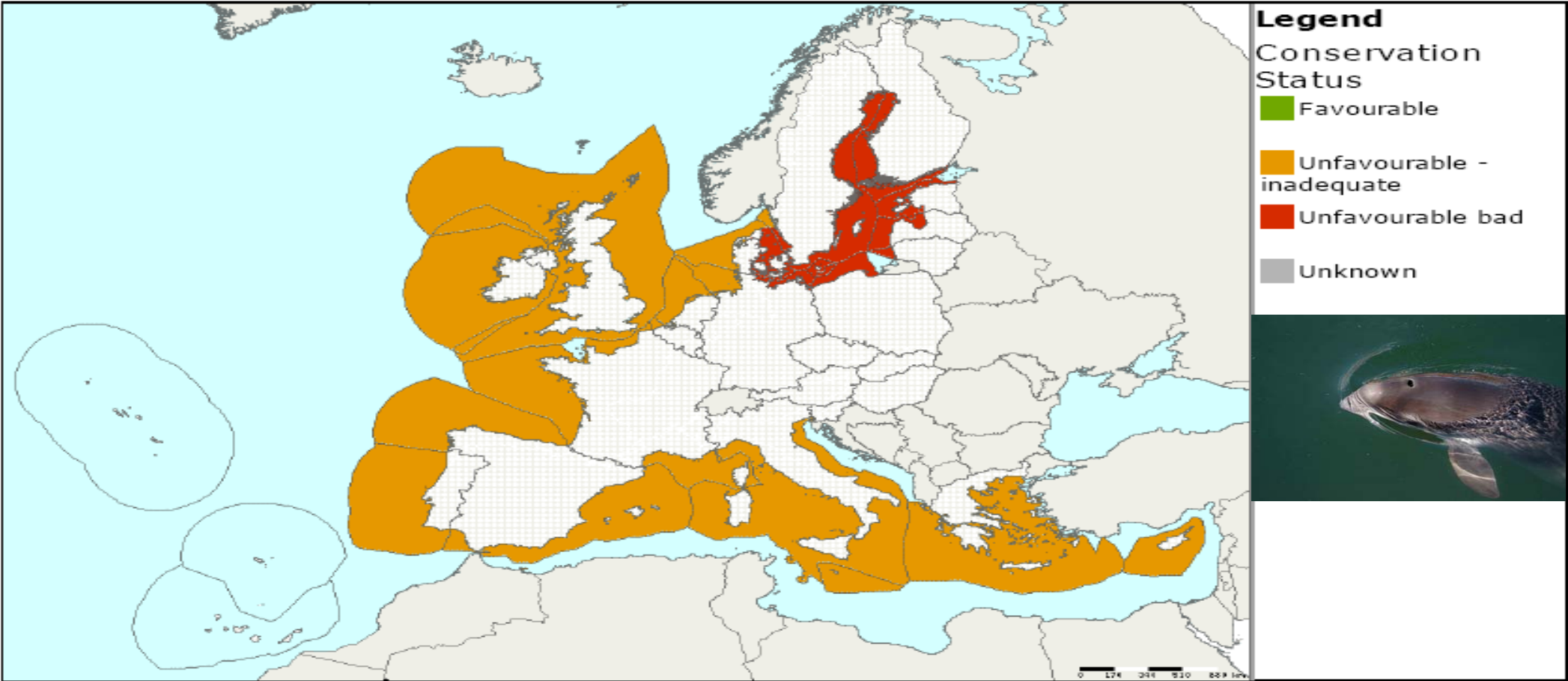
- ❖ EU law providing common framework for the conservation and sustainable use of biodiversity to fulfil CBD commitments
- ❖ Overall objective is to ensure that these species and habitat types are maintained at, or restored to, a “*favourable conservation status*”
- ❖ A strong instrument for integration of biodiversity requirements into other EU policy areas, including fisheries



Species name:**Phocoena phocoena**
Annex: **II, IV**

Species group: **Mammals**
Regions: **ATL MATL MBAL MMAC MMED**

**Assessments of conservation status at the European level
(all biogeographical regions - EU25)**



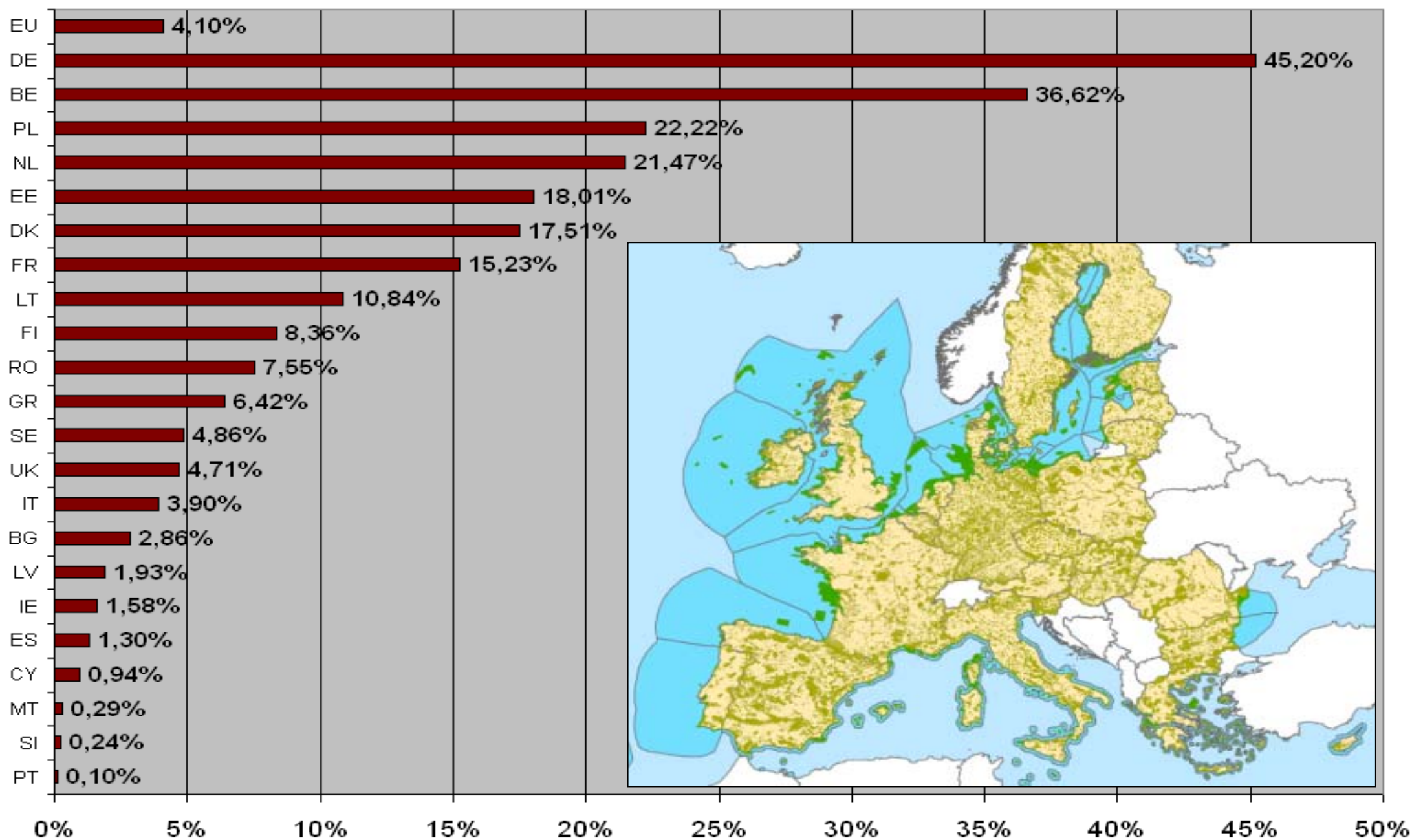
| MS | Region | Conservation status assessment | | | | | Population size & unit | Population Trend |
|------|--------|--------------------------------|------------|---------|------------------|---------|------------------------|------------------|
| | | Range | Population | Habitat | Future prospects | Overall | | |
| EU25 | MBAL | | | | | | > 934 grids | |
| EU25 | MMED | | | | | | 59 grids | |
| EU25 | MATL | | | | | | | |

Key principles of Natura 2000

- ❖ Conservation of species & habitats across entire natural range in EU - irrespective of political boundaries
- ❖ Site selection is exclusively scientific
- ❖ Sites have strong legal protection
- ❖ Not a system of nature reserves – management in collaboration with stakeholders
- ❖ Promotes sustainable development : new activities or development affecting N2000 are not automatically excluded



% of national seas covered by Natura 2000: January 2011



Source: *European Commission*



Site selection for Harbour Porpoise

Species is listed for 197 Natura 2000 sites, of which 83 are category D

Ongoing debate about whether sites can be selected having regard to Article HD 4:

'for aquatic species which range over wide areas, such sites will be proposed only where there is a clearly identifiable area representing the physical and biological factors essential to their life and reproduction'

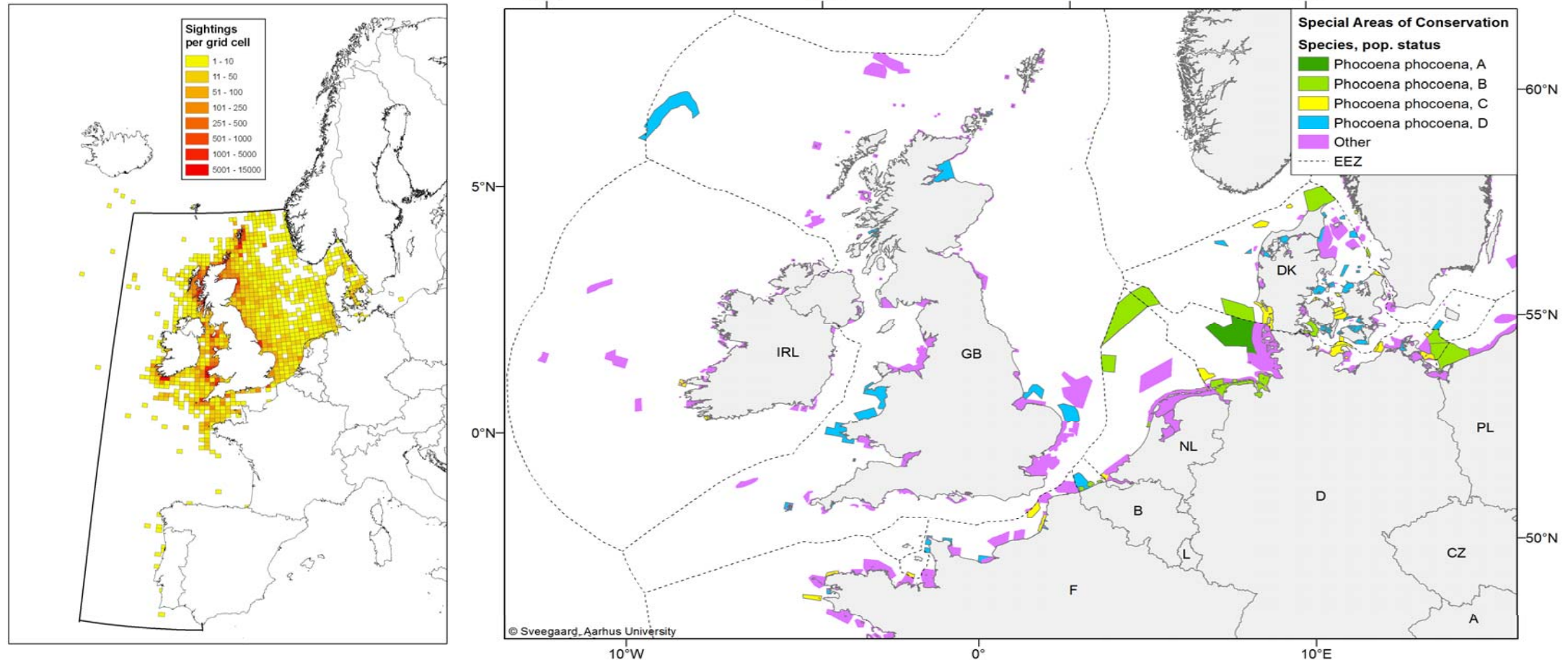
Ad hoc expert meeting, convened by the Commission on 14 December 2000, concluded that:

“it is possible to identify areas representing crucial factors for the life cycle of this species. These areas would be identifiable on the basis of:

- ❖ The continuous or regular presence of the species (although subject to seasonal variations);
- ❖ good population density (in relation to neighbouring areas);
- ❖ high ratio of young to adults during certain periods of the year;
- ❖ other biological elements characteristic of these areas, such as very developed social and sexual life.”



DESIGNATED SACs CONTAINING HARBOUR PORPOISE (2010) COMPARED WITH DISTRIBUTION OF SIGHTINGS (1990-2010)



(Source: Evans & Baines, 2012; S. Sveegaard *pers. comm.*)

Reconciling Natura 2000 protection with economic activities

- Natura 2000 sites are not exclusion areas for economic activities
- Development proposal assessed on case by case basis
- COM guidance for key sectors
- Key issues:
 - Value of strategic planning
 - Appropriate assessment of plans/projects according to Article 6 of the Habitats Directive; mitigation; alternatives; compensation
 - Positive contribution of sectors to biodiversity



Future Management of Natura 2000

- SCI \Rightarrow SAC
- Conservation Objectives
- Conservation Measures
- Management Plans
- Legal, statutory or contractual arrangements
- Full stakeholder engagement
- New Biogeographical Seminars



The Marine Strategy Framework Directive (MSFD) constitutes the environmental pillar of the EU's Integrated Maritime Policy

The Directive establishes a framework within which:

- Member States shall take the necessary measures to achieve or maintain good environmental status (GES) in the marine environment by the year 2020
- The Directive provides a structure and a timeline, with details developed within a common implementation strategy.

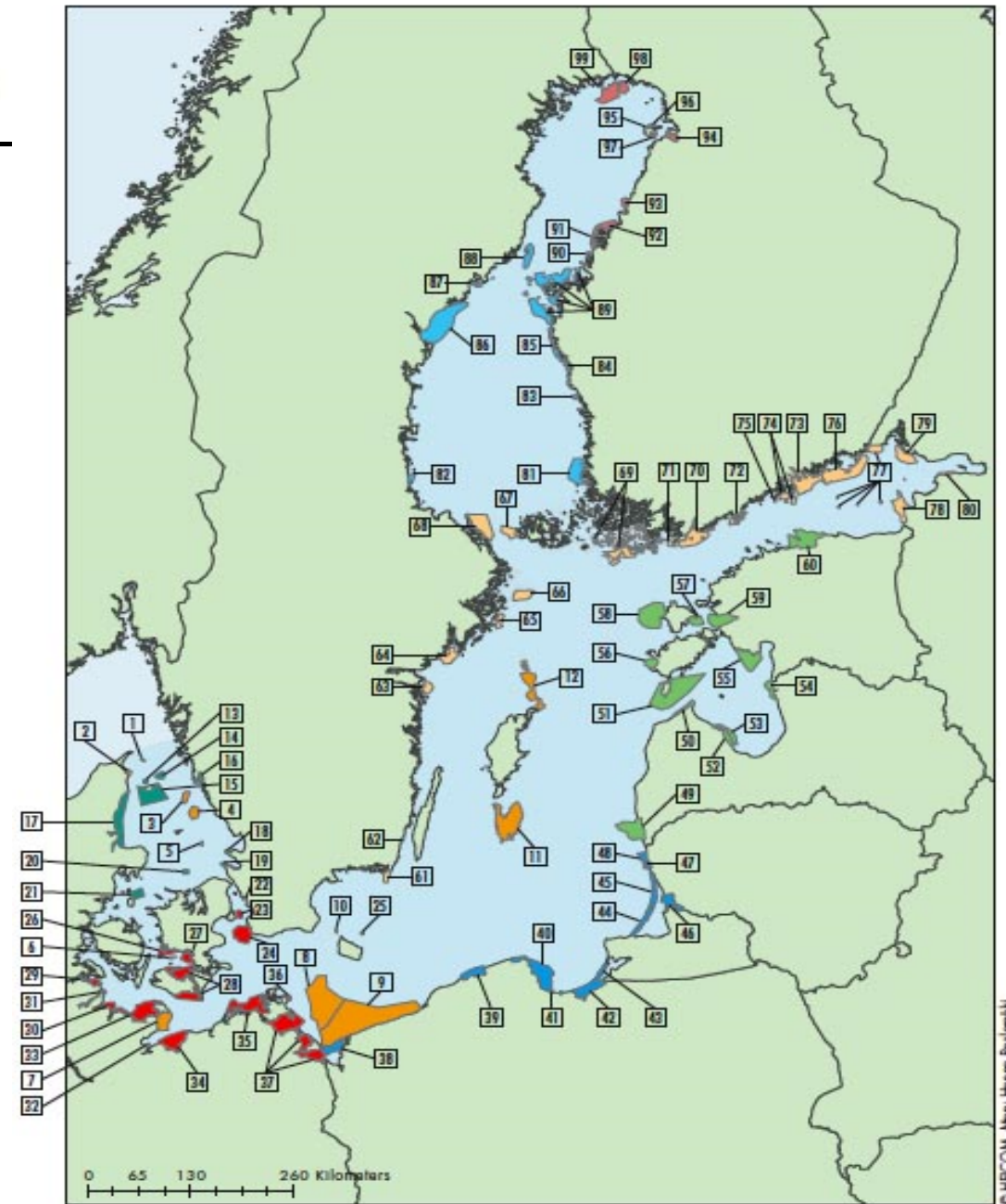
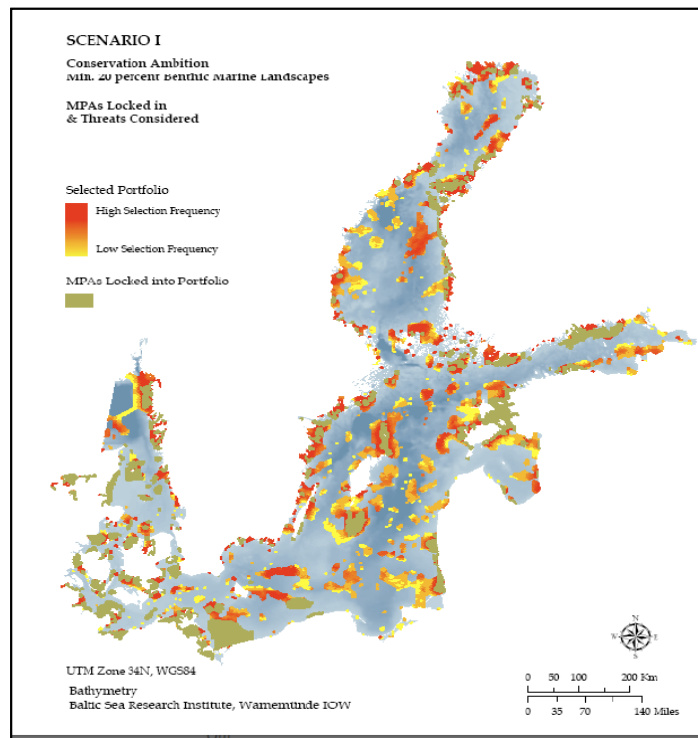




Helsinki Commission

Baltic Marine Environment Protection Commission

- 90 Baltic Sea Protected Areas designated
- Goal is for 20% of all benthic marine landscapes, 60% of all grey seal haul-out sites, & 100% of all cold water coral sites



HUMAN ACTIVITIES IN NORTHERN EUROPE KNOWN TO AFFECT SMALL CETACEANS

| Human Activity | Northern East Atlantic | Central East Atlantic | Bay of Biscay | N. North Sea | Inner Danish Waters | Baltic Sea | S. North Sea | English Channel | Irish Sea |
|----------------------|------------------------|-----------------------|---------------|--------------|---------------------|------------|--------------|-----------------|-----------|
| Hunting | + | - | - | - | - | - | - | - | - |
| Fisheries – direct | +++ | ++ | +++ | ++ | ++ | ++ | +++ | + | + |
| Fisheries - indirect | ++ | ++ | ++ | +++ | ++ | +++ | ++ | + | + |
| Pollution | + | + | ++ | ++ | ++ | +++ | +++ | ++ | ++ |
| Climate change | ++ | ++ | ++ | ++ | ++ | ++ | +++ | ++ | ++ |
| Ship traffic | + | +++ | ++ | ++ | +++ | +++ | +++ | +++ | ++ |
| Pile driving | + | + | + | ++ | ++ | ++ | +++ | ++ | +++ |
| Seismic exploration | ++ | ++ | + | ++ | - | + | ++ | + | ++ |
| Military sonar | ++ | ++ | + | ++ | - | - | - | ++ | + |
| Recreational | + | + | + | + | +++ | +++ | +++ | +++ | +++ |
| Habitat change | + | + | + | ++ | + | + | ++ | ++ | ++ |

Red = high; Orange = medium; Yellow = low; Green = no activity

(Source: Evans, 2011: ASCOBANS AC18/Doc 6-05)

THE BYCATCH PROBLEM

Bottom set gill nets & tangle nets

- Harbour porpoise

Pelagic trawls

- Common and striped dolphins

Driftnets

- Harbour porpoise

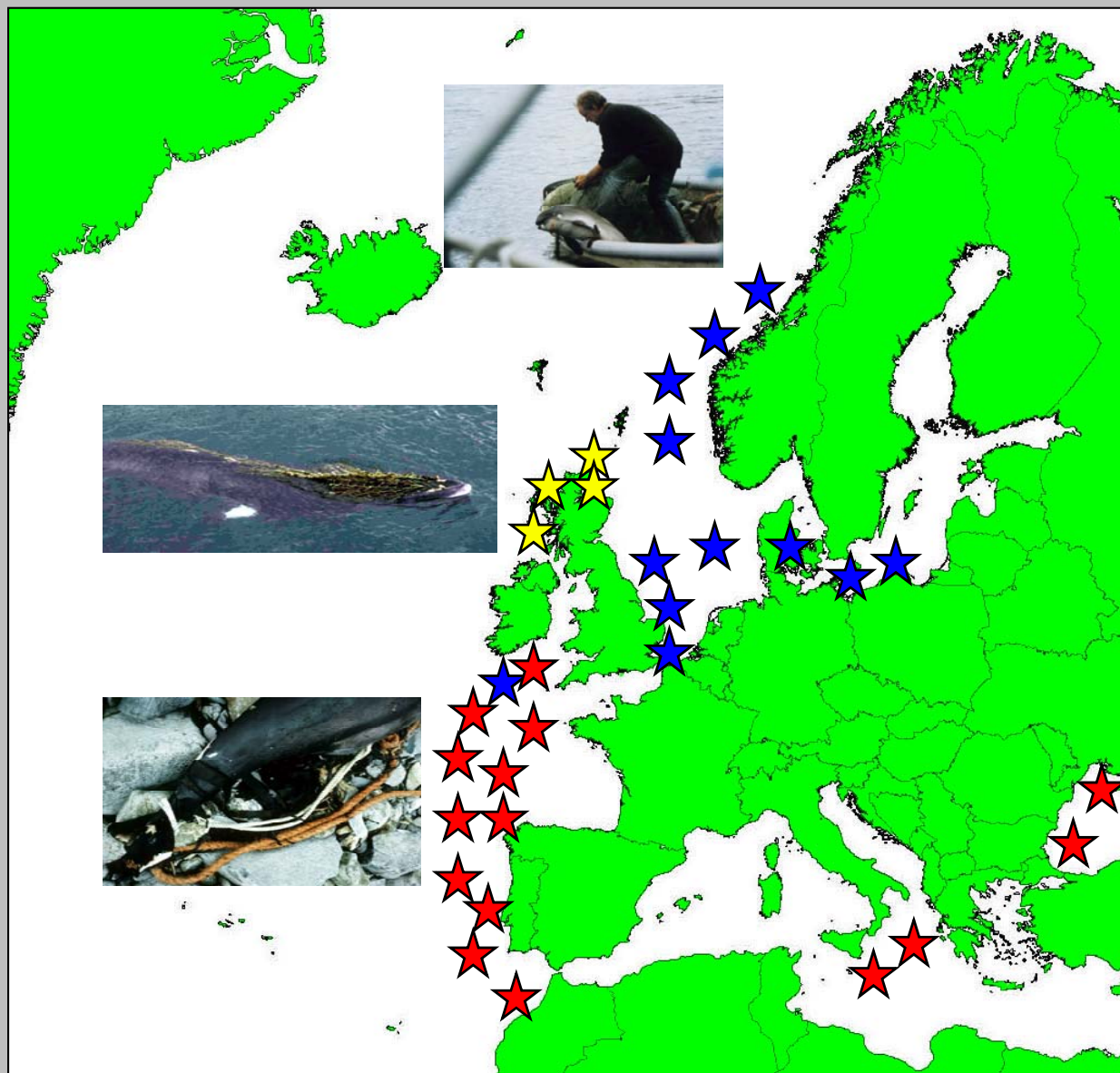
Creel lines, ghost netting

- Minke & humpback whales

★ Harbour Porpoise

★ Common or Striped Dolphin

★ Minke & Humpback Whale





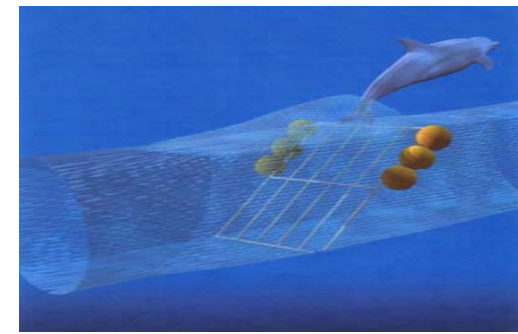
By-catches and new CFP

- **New proposed CFP Regulation**: Under Union Measures: Article 14: "Technical measures frameworks to ensure the protection of marine biological resources and the reduction of the impact of fishing activities on fish stocks and on marine ecosystems shall be established. Technical measures frameworks shall:...(c) **reduce catches of unwanted marine organisms;**"
- **New proposed European Marine & Fisheries Fund (EMFF)**: Under "Sustainable development of fisheries": Article 36 Limiting the impact of fishing on the marine environment: "1. In order to reduce the impact of fishing on the marine environment, foster the elimination of discards and facilitate the transition to exploitation of living marine biological resources that restores and maintains populations of harvested species above levels which can produce the MSY, the EMFF may support investments in equipment: (a) improving size selectivity or species selectivity of fishing gear; (b) **reducing unwanted catches of commercial stocks or other by-catches....**"





MITIGATION MEASURES



- **Acoustic Deterrent Devices (ADDs)** - Pingers in gillnet fisheries (812/2004: wreck net & tangle net fisheries; potential interactive ADDs in pelagic trawls)

Problems: operational failure, durability, cost, practicality, health & safety issues, enforcement, some success (DDD02 & CETASAVR) with species other than porpoise, habituation vs habitat exclusion, not mandatory for small vessel (12m or less) fisheries

- **Excluder Devices** - Separation grids (rigid grids, rope & tunnel barriers, guiding panels, escape panels) in pair trawl fisheries

Problems: most devices ineffective (20% reduction at best), positioning is critical, catch reductions, handling difficulties in big pelagic trawls

- **Other Possibilities** - 1) Gear Modification: Changes in net type, acoustically reflective nets, floating head ropes 2) Effort Management: Fishery Closures, “No Take” zones, Quotas

DEFINITIONS FOR BIOSENSITIVITY WEIGHTINGS

| Factor | Sensitivity Weighting |
|--|---|
| Female age at sexual maturity (using maximum values) | 2 = ≥ 10 yrs 1 = 6-9 yrs 0 = 5 yrs or less |
| Length of breeding cycle | 2 = ≥ 5 yrs 1 = 2-4 yrs 0 = 1-2 yrs |
| Typical life span | 2 = ≥ 50 yrs 1 = 26-49 yrs 0 = 25 yrs or less |
| Estimated size of Management Unit | 5 = 500 or less 4 = 501-1000 3 = 1001-10,000 2 = 10,001-50,000 1 = 50,001-100,000 0 = $\geq 100,000$ |
| Proportional importance of the MU in relation to the regional population size (taken as equivalent to the ASCOBANS Agreement Area) | 5 = 81-100% 4 = 61-80% 3 = 41-60% 2 = 21-40% 1 = 11-20% 0 = 10% or less |
| Proportional importance of the regional (ASCOBANS area) population globally | 2 = $> 50\%$ 1 = 25-50% 0 = $< 25\%$ |
| Ecological niche width (based upon geographic range, number of habitats in which it occurs, and range of sea surface temperatures occupied) | 2 = Narrow 1 = Moderate 0 = Wide |

(Source:
Evans & Baines, 2012)

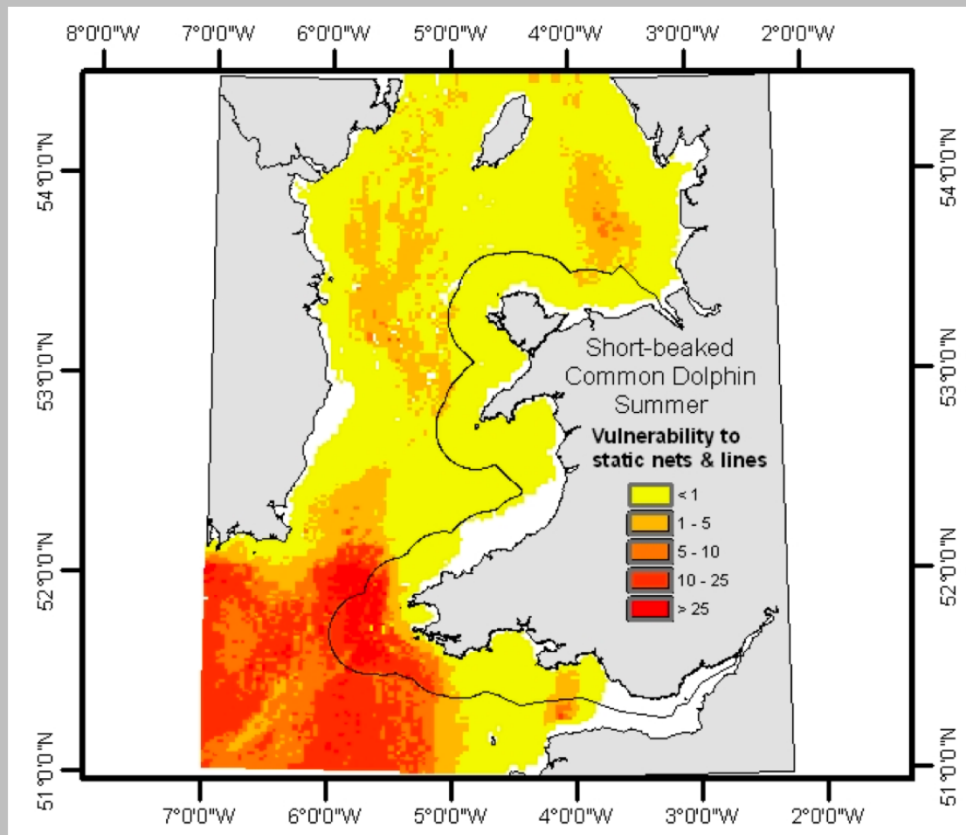
WEIGHTINGS FOR BIOLOGICAL SENSITIVITY & BY-CATCH VULNERABILITY COMBINED, BY FISHERIES ACTIVITY

| Fisheries Activity | Species | | | | | |
|---|----------------|-----------|------------|-------------|-----------|-----------|
| | GRS | HP | BND | SBCD | RD | MW |
| 1) Beam trawls & scallop dredges | 8 | 5 | 12 | 7 | 9 | 9 |
| 2) Rockhopper trawls | 8 | 5 | 12 | 7 | 9 | 9 |
| 3) Oyster/Mussel dredging & prospecting | 8 | 5 | 12 | 7 | 9 | 9 |
| 4) Demersal trawls | 8 | 9 | 16 | 11 | 9 | 9 |
| 5) Light demersal trawls & seines | 8 | 9 | 16 | 11 | 9 | 9 |
| 6) Hydraulic section dredges | 8 | 9 | 6 | 7 | 9 | 9 |
| 7) Pelagic trawls, nets & lines | 12 | 9 | 16 | 16 | 13 | 13 |
| 8) Static gear: nets & long lines | 12 | 14 | 16 | 16 | 13 | 13 |
| 9) Static gear: pots & traps | 17 | 5 | 6 | 7 | 9 | 18 |
| 10) Rod and line hand-fishing | n/a | n/a | n/a | n/a | n/a | n/a |
| 11) Casual hand gathering | n/a | n/a | n/a | n/a | n/a | n/a |
| 12) Professional hand gathering | n/a | n/a | n/a | n/a | n/a | n/a |
| 13) Aquaculture: trestles, ground lays, traps | 12 | 5 | 12 | 7 | 9 | 13 |
| 14) Aquaculture: cages, rope cultivation | 12 | 5 | 12 | 7 | 9 | 13 |

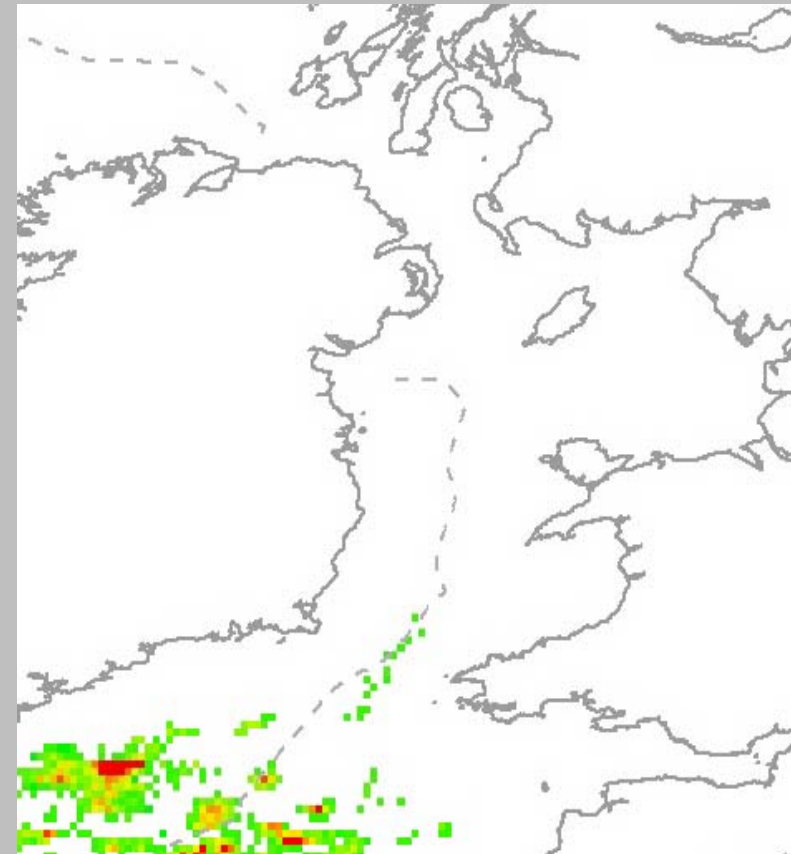
(Source: Evans & Baines, 2012)

COMMON DOLPHIN VULNERABILITY TO STATIC NETS IN RELATION TO GILL NET EFFORT FROM VMS

Common dolphin vulnerability



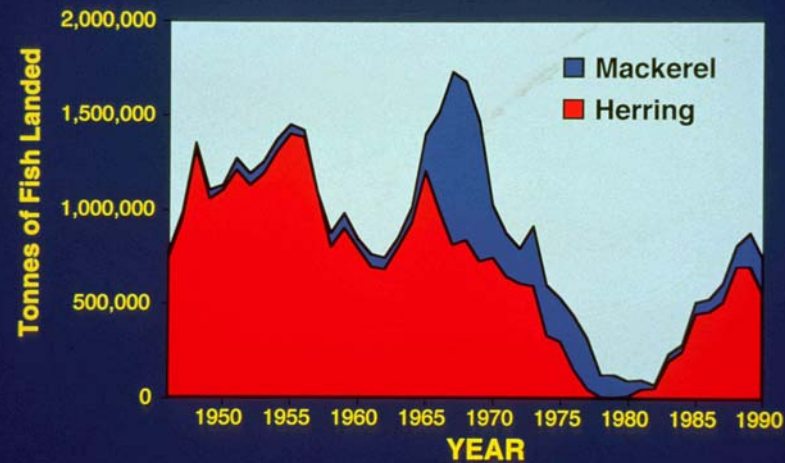
Gill nets



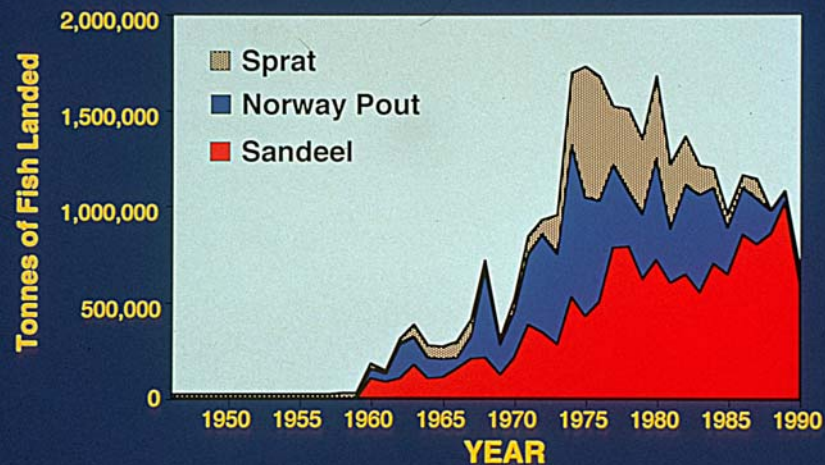
(Source: Lee *et al.*, 2010; Evans & Baines, 2012)

Resource depletion

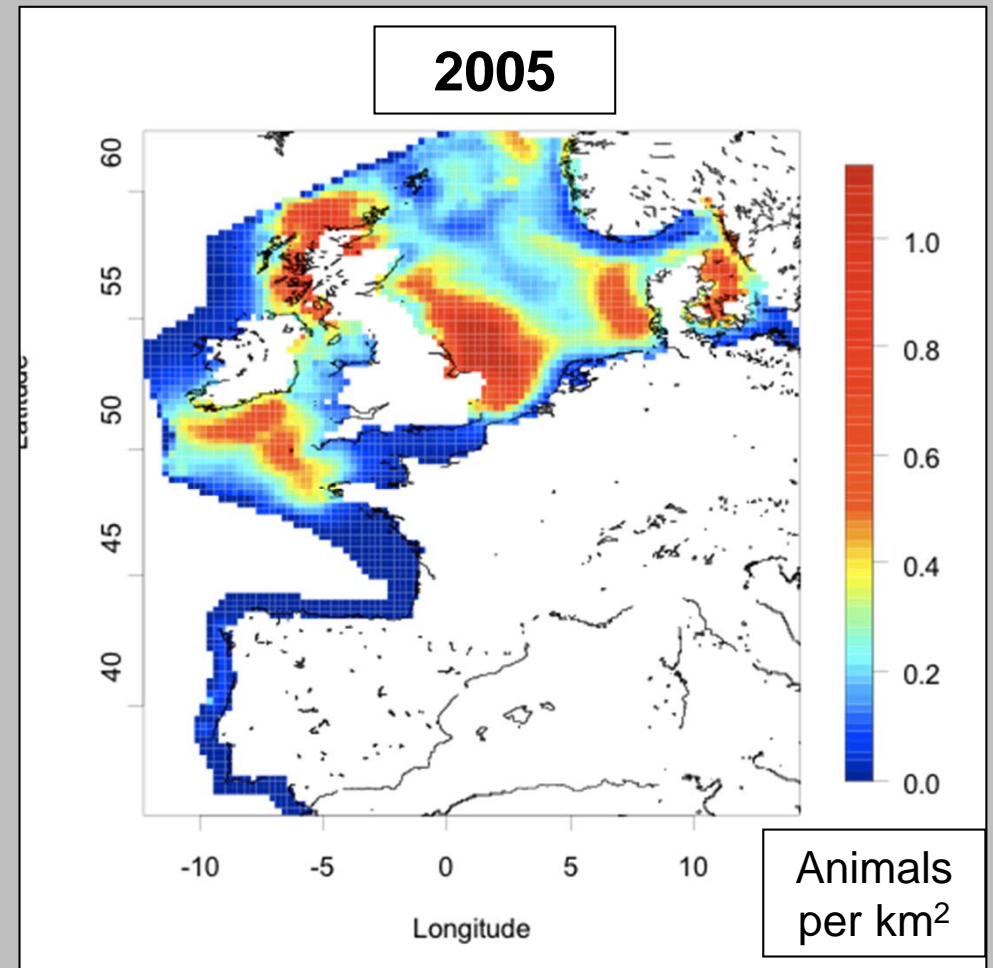
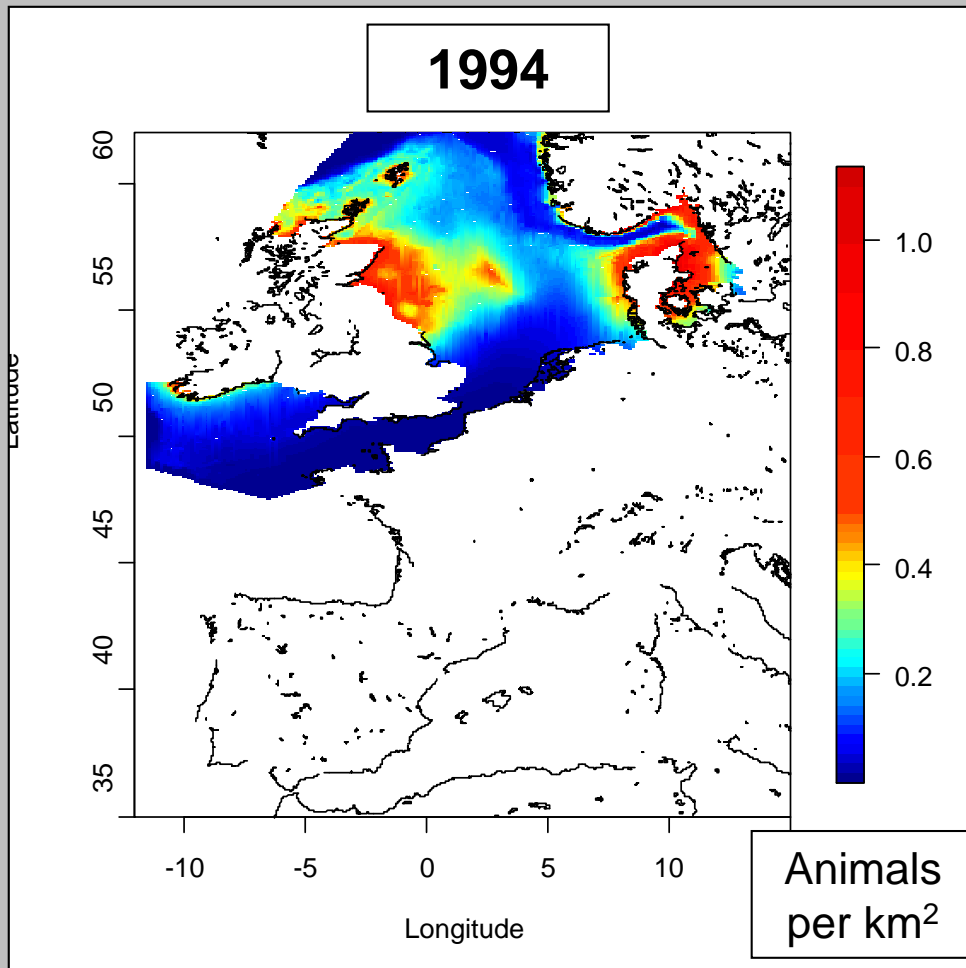
Annual Landings of Principal Pelagic Fish Species from the North Sea, 1946-1990



Annual Landings of Principal Industrial Fish Species from the North Sea, 1946-1990

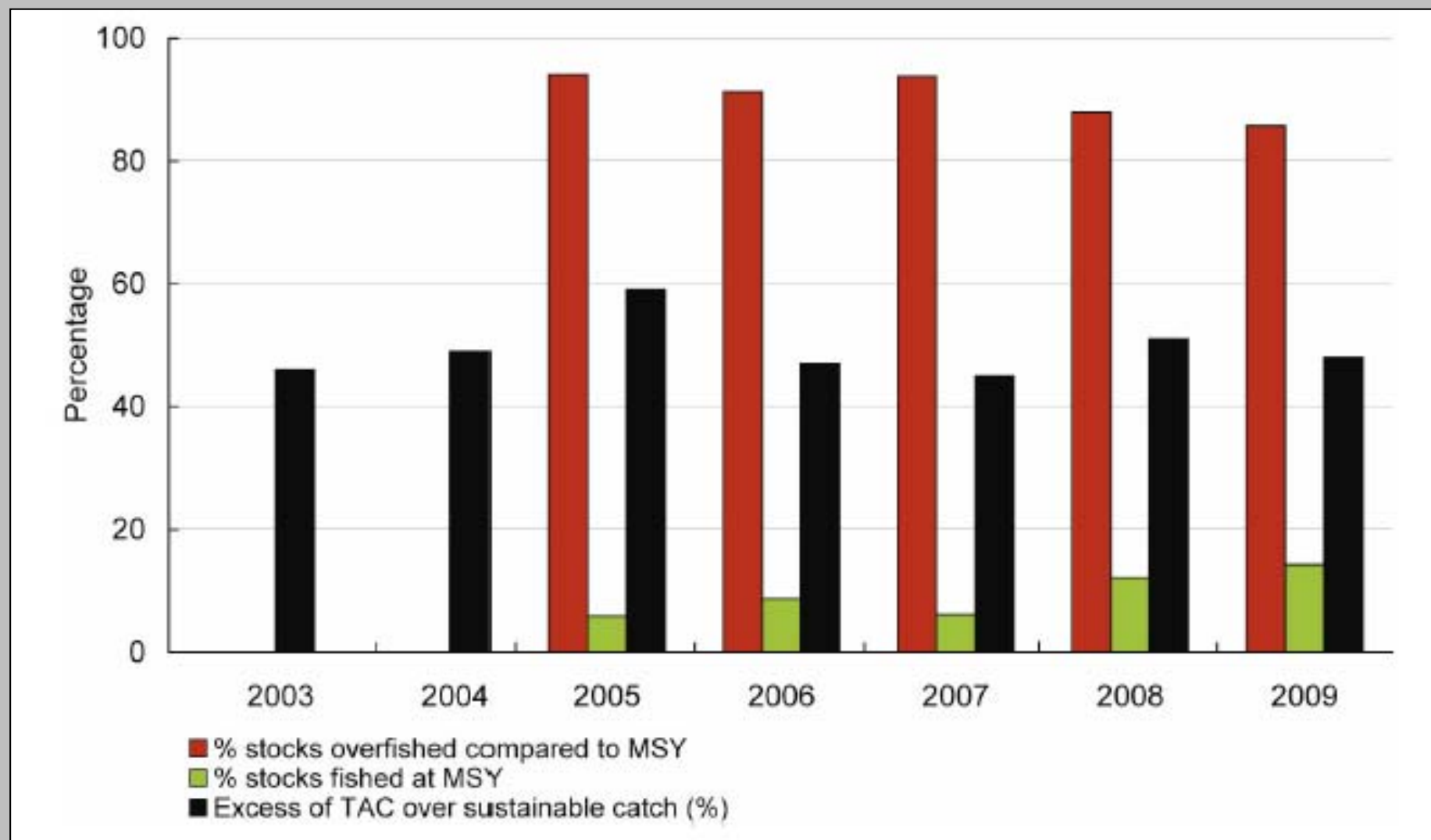


CHANGES IN HARBOUR PORPOISE DENSITY, 1994 vs 2005



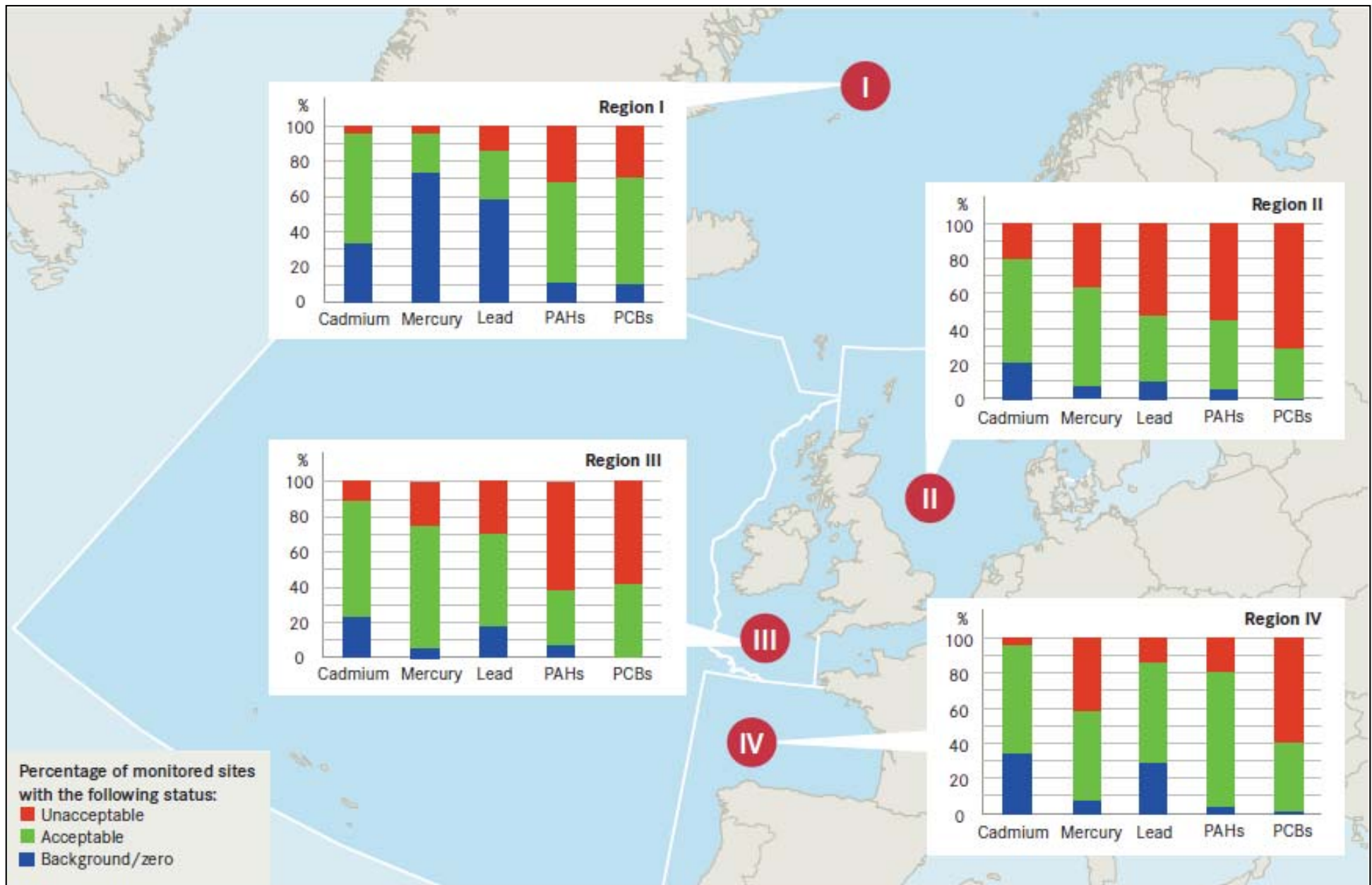
(Source: SCANS & SCANS II Surveys)

STATUS OF FISH STOCKS IN NORTHERN EUROPE



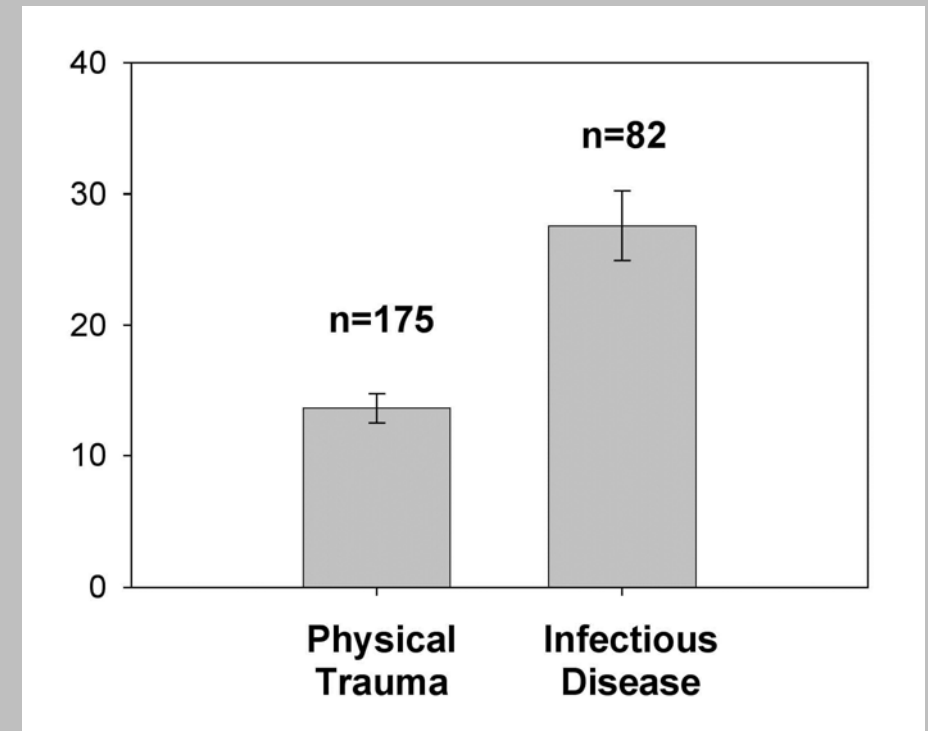
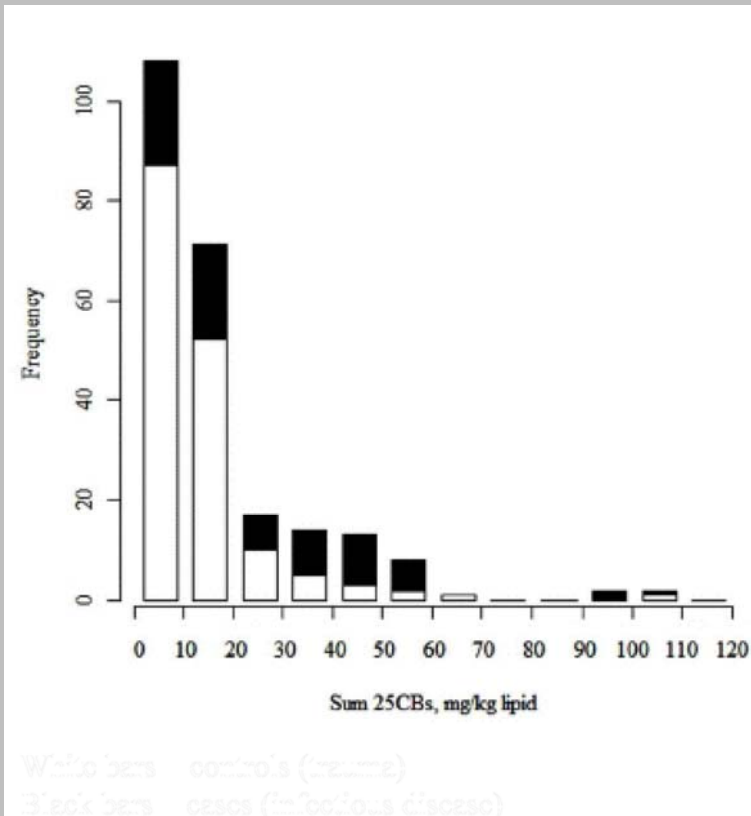
(Source: ICES, 2010)

CHEMICAL CONTAMINANTS IN NORTHERN EUROPE



(Source: OSPAR Quality Status Review, 2010)

PCBs & the incidence of infectious disease in UK harbour porpoise (1990-2001)



17mg/kg total CH level = threshold for toxicity

(Source: Jepson *et al.* (2006) *Cetacean Strandings Investigation and Co-ordination in the UK 2000-04*. Final report to Defra. 79pp. <http://www.defra.gov.uk/wildlifecountryside/resprog/findings/index.htm>)

HUMAN USES OF THE SEA

75-135 dB
100 Hz-20 kHz

**Pleasure/
Whale-watching
Boats**

85-170 dB
50 Hz-1 kHz

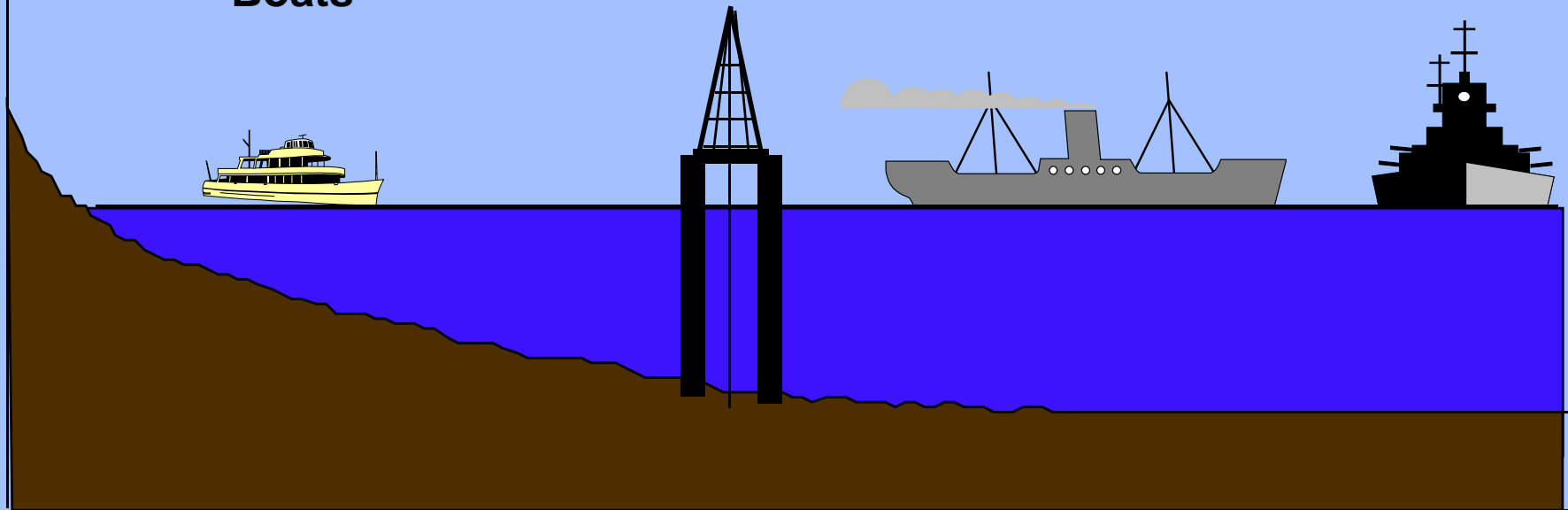
**Oil Platform
Drilling**

160-230 dB
20-900 Hz

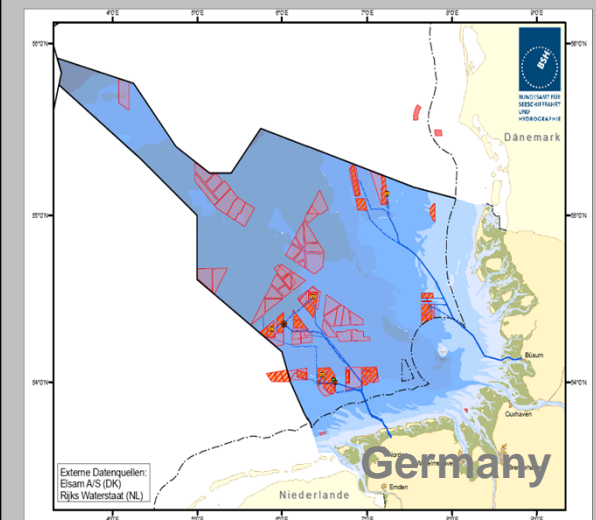
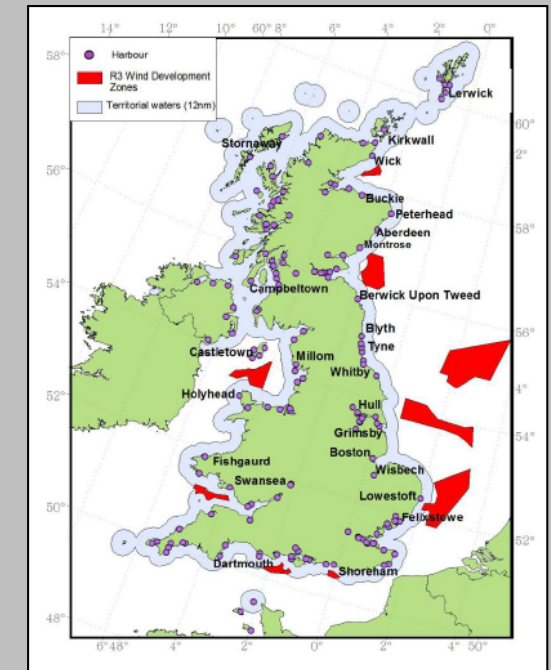
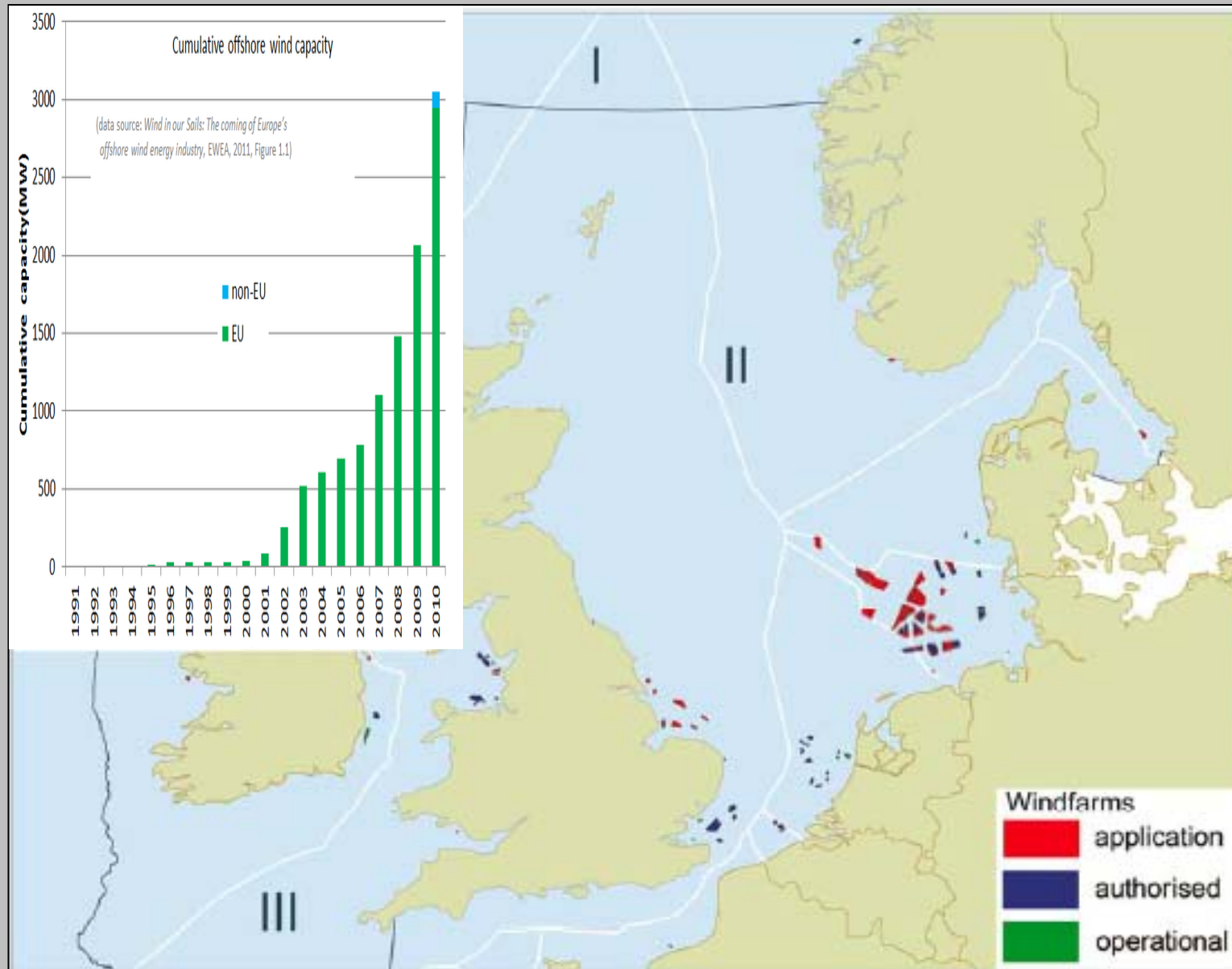
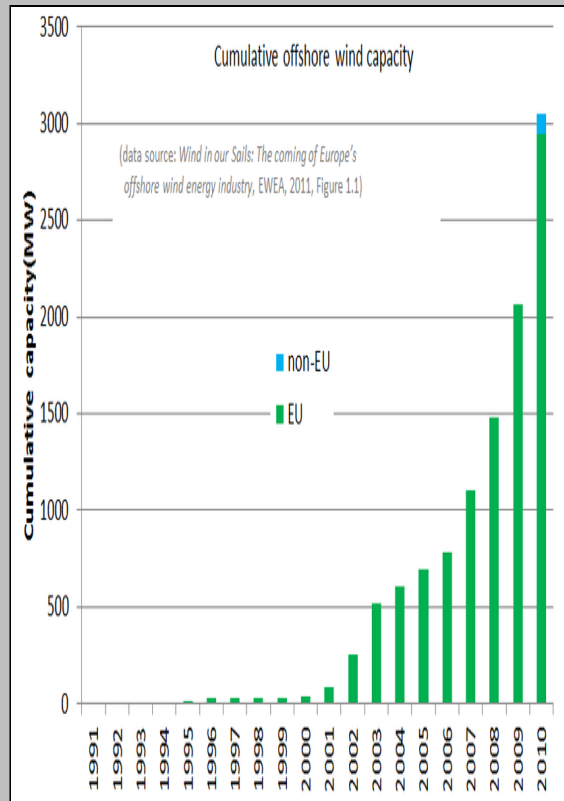
**Merchant Ships
Seismic Surveys**

210-230 dB
450 Hz-8 kHz

**Military
Ships**



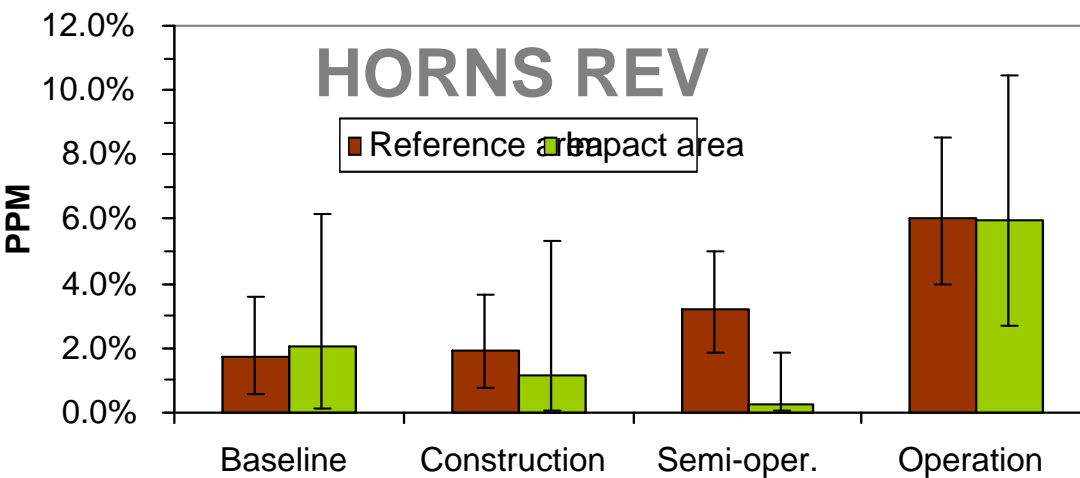
WIND FARM DEVELOPMENTS IN NORTHERN EUROPE



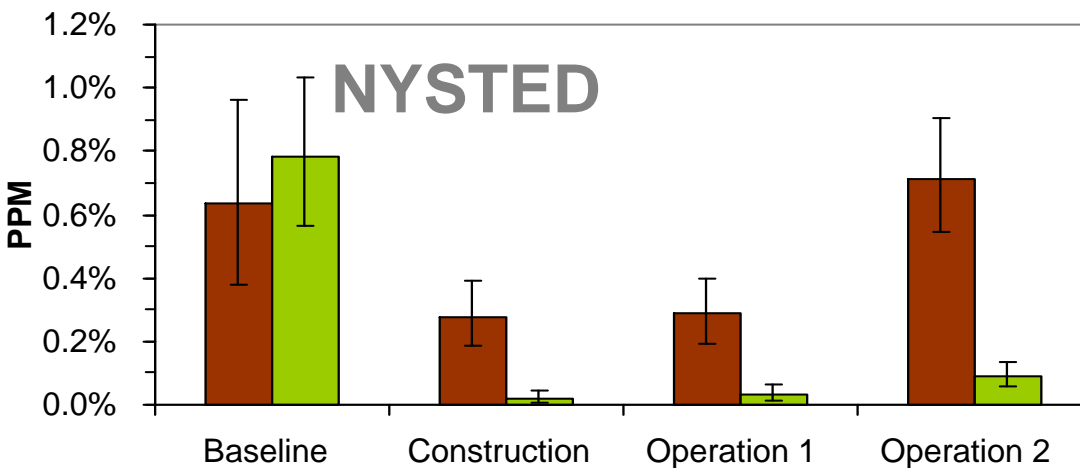
(Source: OSPAR Quality Status Review, 2010; Crown Estate, 2010)

HORNS REV

Reference area Impact area

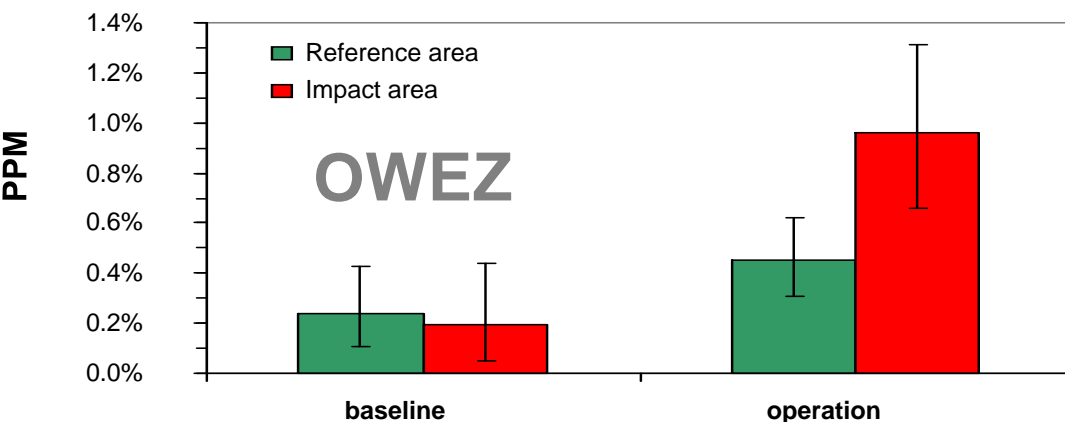


NYSTED



OWEZ

Reference area Impact area



(Courtesy of J. Teilmann)

Danish North Sea - No significant effects

- High abundance - c. 1 animal/km²
- Only significant effect during semi-construction
- Reference area not affected

(Tougaard *et al.*, 2006a)

Danish Baltic Sea - Negative long term effects

- Low abundance - c. 0.1 animal/km²
- Strong effect of construction
- Reference area (10+ km away) also affected
- Effect in wind farm persists for >10 years

(Carstensen *et al.*, 2006; Tougaard *et al.*, 2006b; Teilmann & Carstensen, 2012)

Dutch North Sea - Positive effects at operation

- Low abundance - c. 0.1 animal/km²
- No monitoring of construction
- More animals in wind farm area
- Reference area affected positively

(Scheidat *et al.*, 2010)

Mitigation Measures to Reduce Impacts of Noise

- **Near-field operational measures:**
 - ramp up (soft-start)
 - near-field exposures (safety zone, bubble curtains)
- **Habitat-based management**
 - exclusion areas
 - siting measures
- **Technology-based noise control**
 - ship quieting (propeller cavitation, hull design, on-board machinery, operational modifications)
 - vibroseis (electromagnetic vibration rather than impulsive sound)
- **Cumulative noise management**
 - habitat sensitivity mapping
 - marine spatial planning

EXAMPLES OF INJURIES TO CETACEANS IN NORTHERN EUROPE

- 21 species, particularly fin, minke & sperm whales



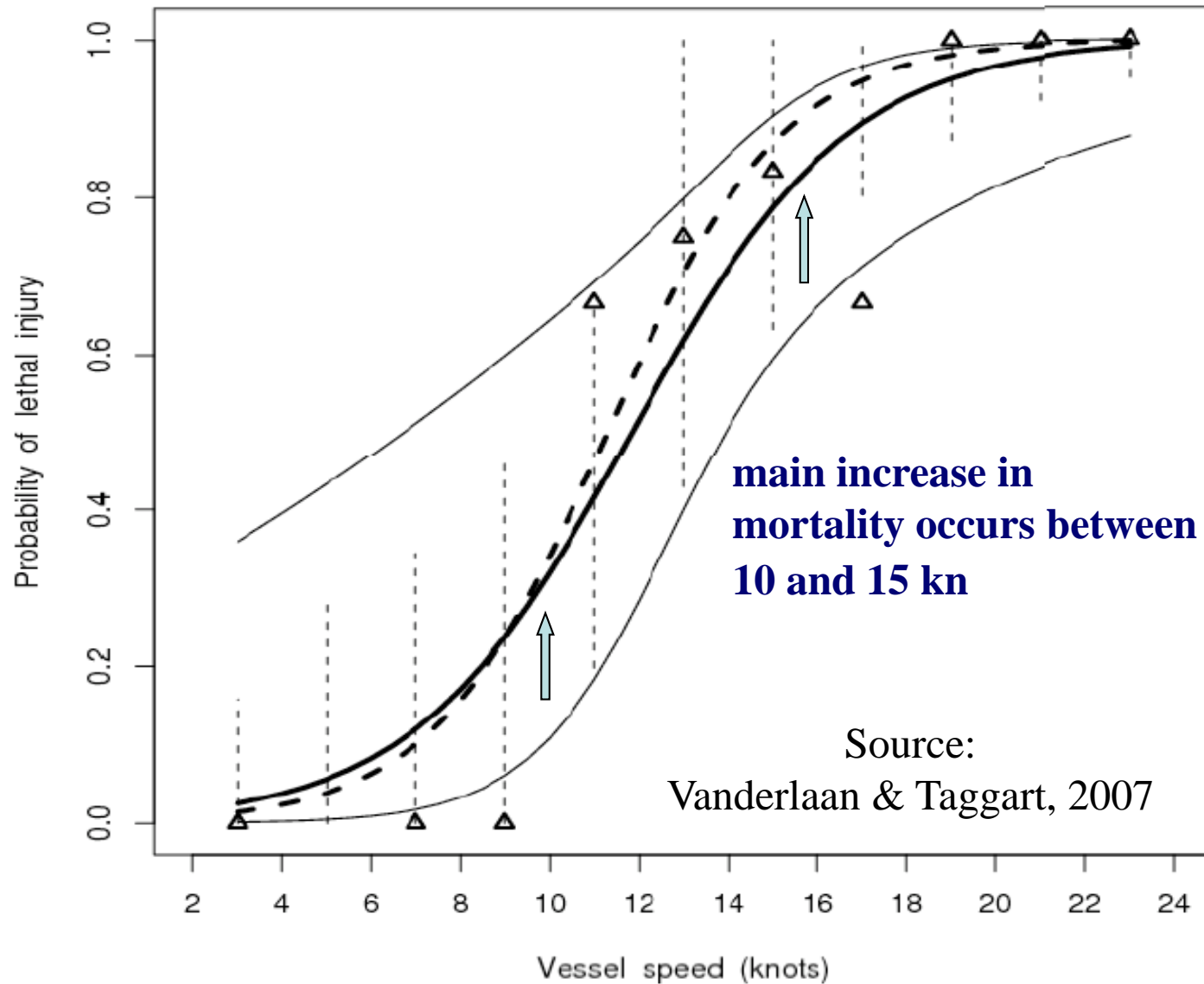
Physical trauma cases

- 12-20% large whales
- 4-6% dolphins
- 4% porpoises

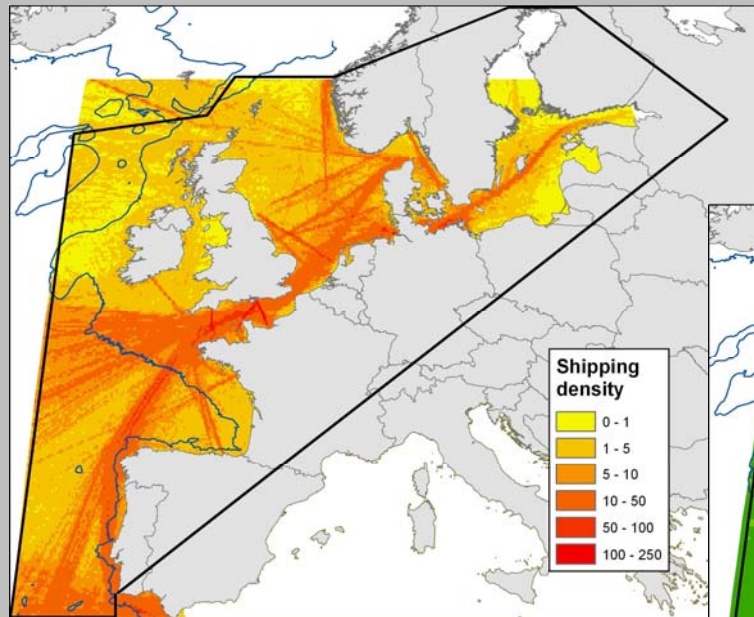


(Source: Evans & Baines, 2011; CSIP unpublished data)

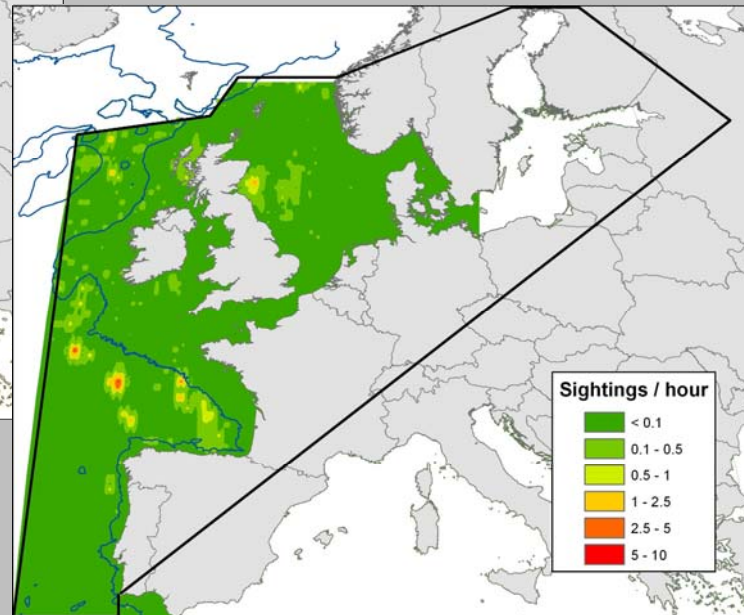
PROBABILITY OF A LETHAL STRIKE AT DIFFERENT VESSEL SPEEDS



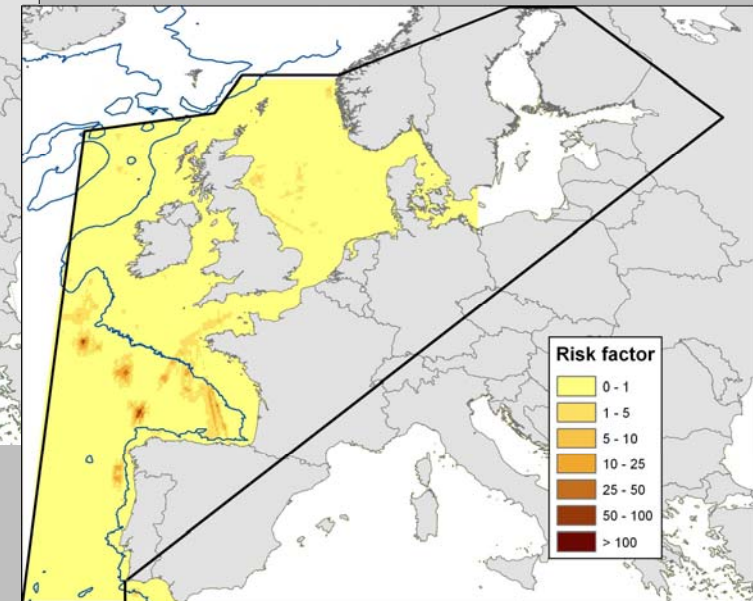
SHIPPING ACTIVITY & COLLISION RISK IN THE ASCOBANS AREA



a) Shipping Density



b) Whale Density



c) Collision Risk

(Source: Evans & Baines, 2010)

Effects of Recreational Activities on Cetaceans

Short-term

- avoidance
- increased dive times
- increased swim speeds
- changes in vocal behaviour
- changes in social cohesion
- disruption of social groups

Long-term

- reduced birth rates
- declines in abundance
- movement out of the affected area
- disruption of association patterns



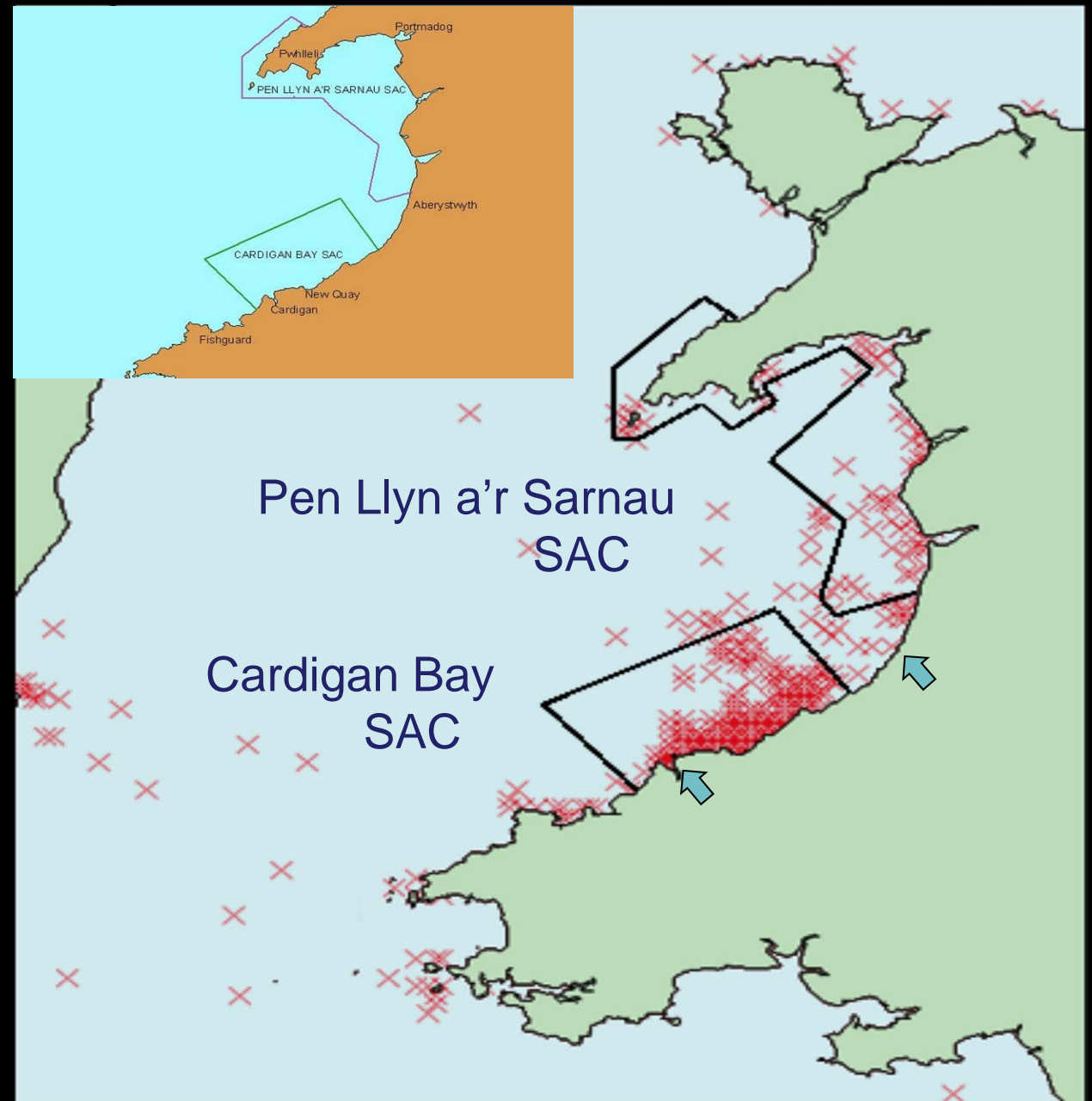
(Source: Nowacek *et al.*, 2001; Bejder and Samuels, 2003; Hastie *et al.*, 2003; Foote *et al.*, 2004; Bejder *et al.*, 2006a, b; Lusseau, 2006; Lusseau *et al.*, 2009)

THE BOTTLENOSE DOLPHINS OF CARDIGAN BAY

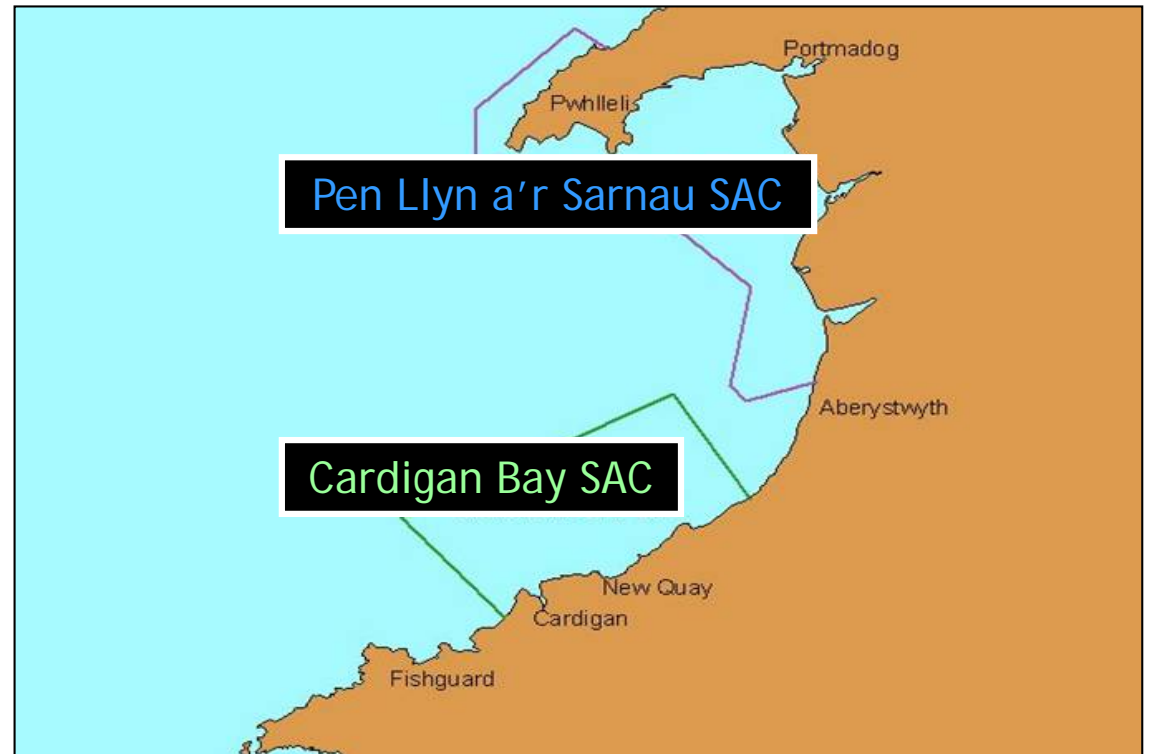
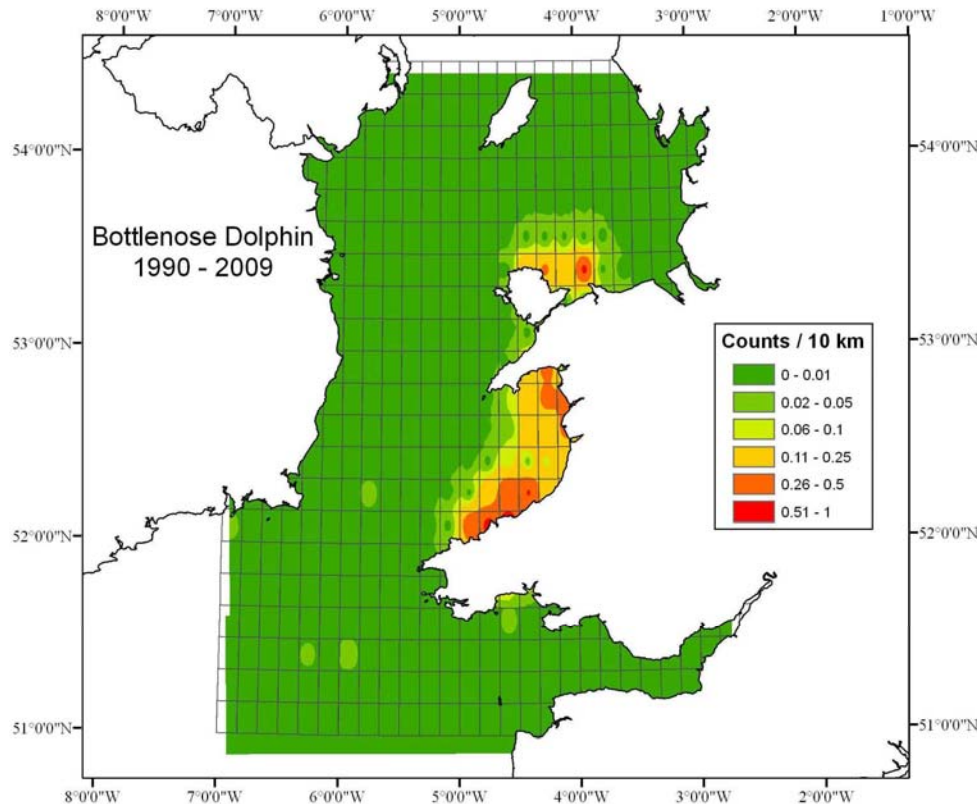


Criteria for SAC site selection for Bottlenose Dolphins

- Criteria were areas where sightings of the species were concentrated
- Based upon vessel surveys largely in coastal waters between Cardigan and Aberystwyth
- Cardigan Bay proposed as cSAC for bottlenose dolphins in 1996, and designated in 2004
- 1^o feature for Pen Llyn a'r Sarnau SAC initially its reefs & estuaries



BOTTLENOSE DOLPHIN DISTRIBUTION IN THE IRISH SEA



- locally distributed, mainly coastal, particularly in summer; more widely distributed in winter

- main summer concentrations are in Cardigan Bay (av. group size = 2-4.5), & in winter in North Wales (av. group size = 7-35)

Source: Baines & Evans (2012) *Atlas of Marine Mammals of Wales*

SAC Conservation Objectives

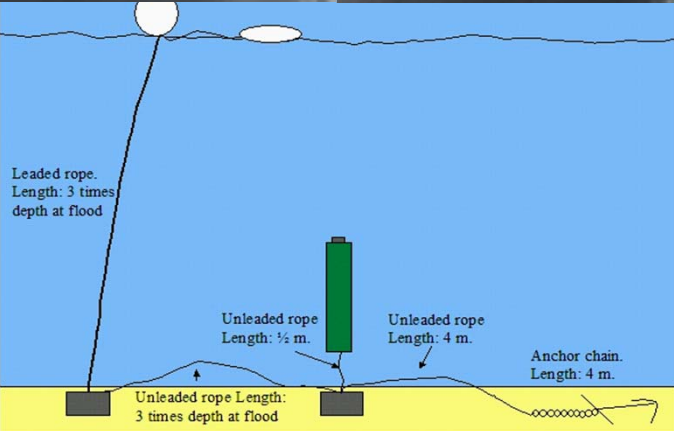
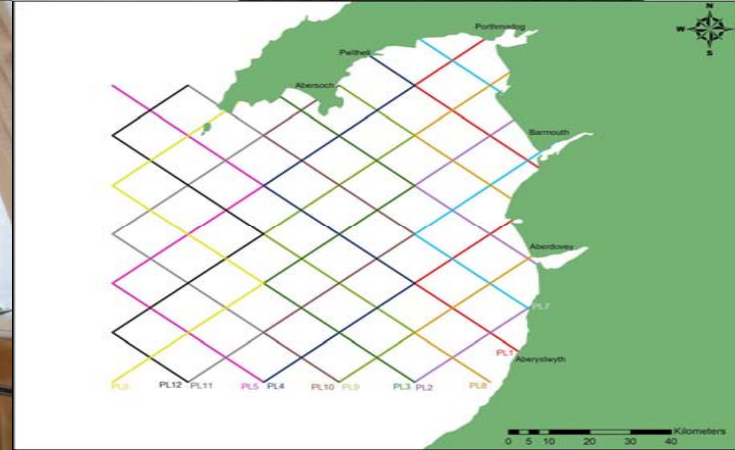
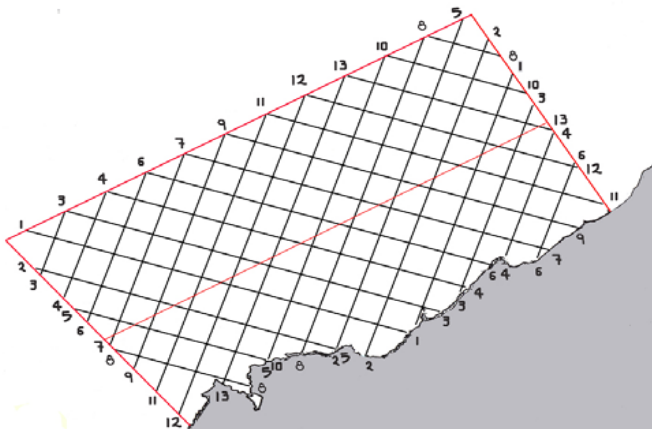
To maintain (or restore) the habitat and species features, as a whole, at (or to) Favourable Conservation Status within the site

For species, e.g. harbour porpoise, bottlenose dolphin:

- **Population Dynamics**
 - Population Size
 - Reproductive Success
 - Population Structure
 - Physiological Health
- **Range**
- **Habitat**
 - Distribution and Extent
 - Structure, Function and Quality
- **Management of Activities and Operations**

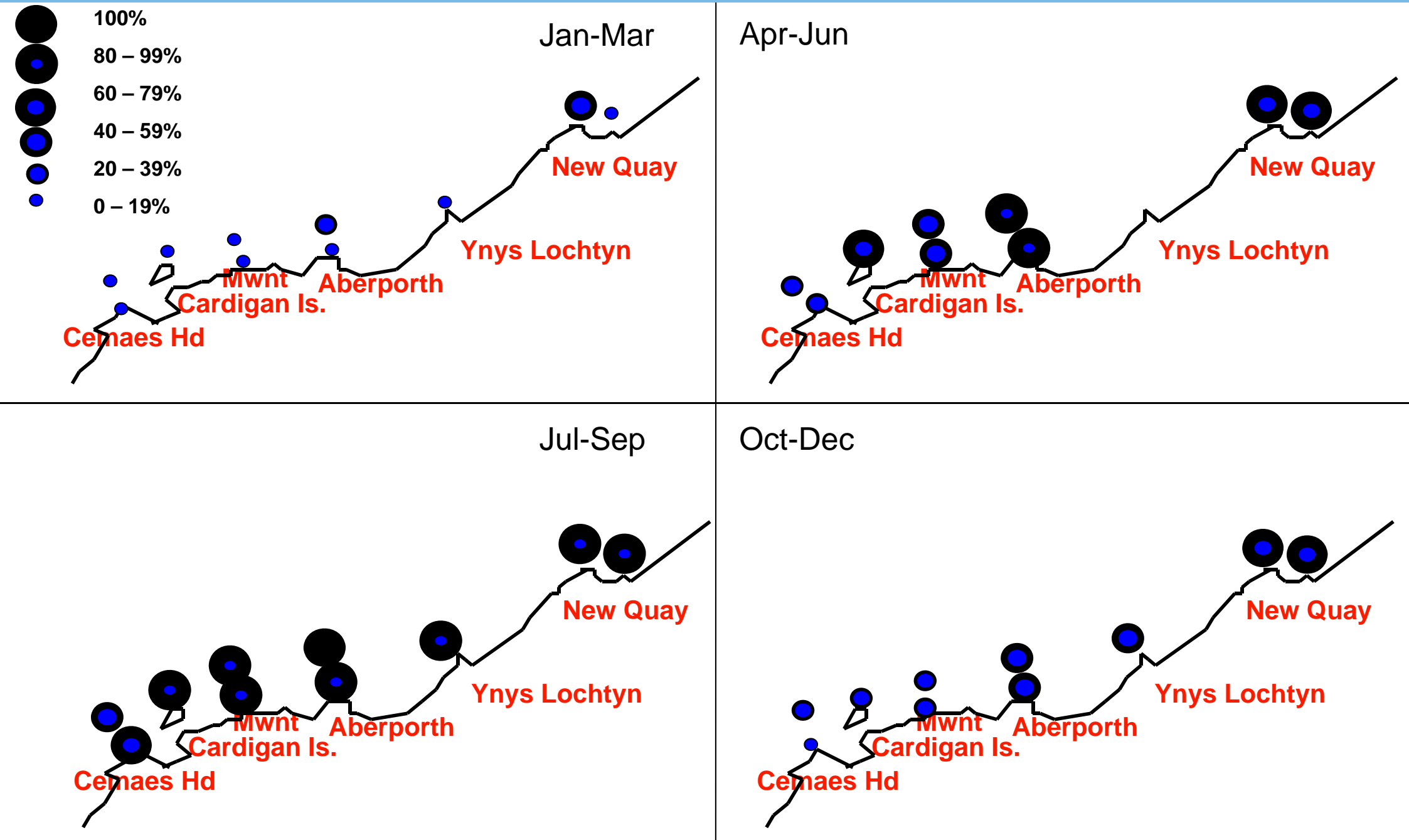


Monitoring Methods: *Line-transects, Photo-ID, Land watches, Passive Acoustic Monitoring*



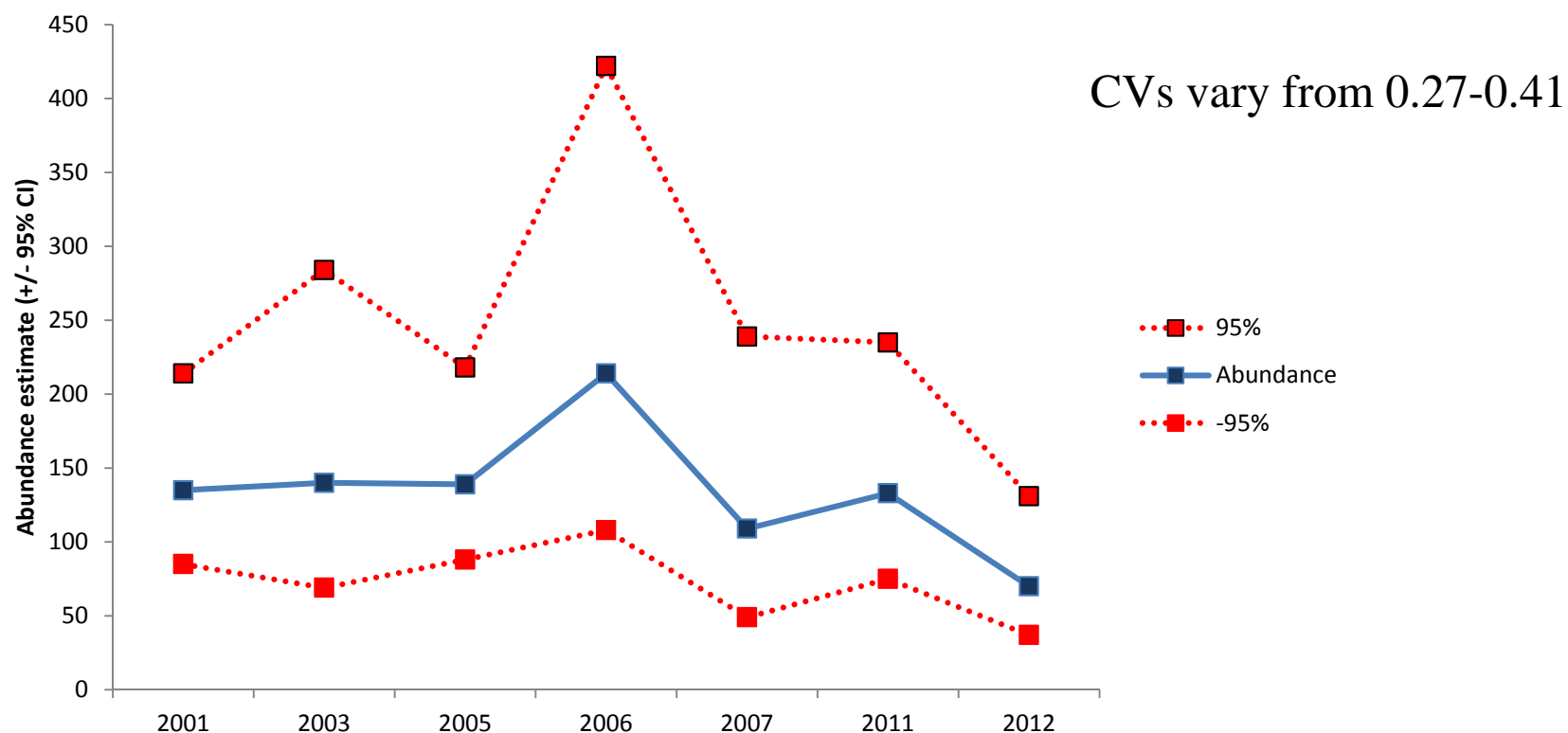
Seasonal Distribution of BND

Percentage of detection positive days of days logged





Line-transect surveys in Cardigan Bay SAC



Source: Veneruso & Evans, 2012; Feingold & Evans, 2013

Welsh Bottlenose Dolphin Photo-ID Catalogue, 2012

sea watch
FOUNDATION



PHOTO-IDENTIFICATION - the catalogue

248 marked
(105 well and 143 slightly)



132 right
(no nicks)



131 left
(no nicks)



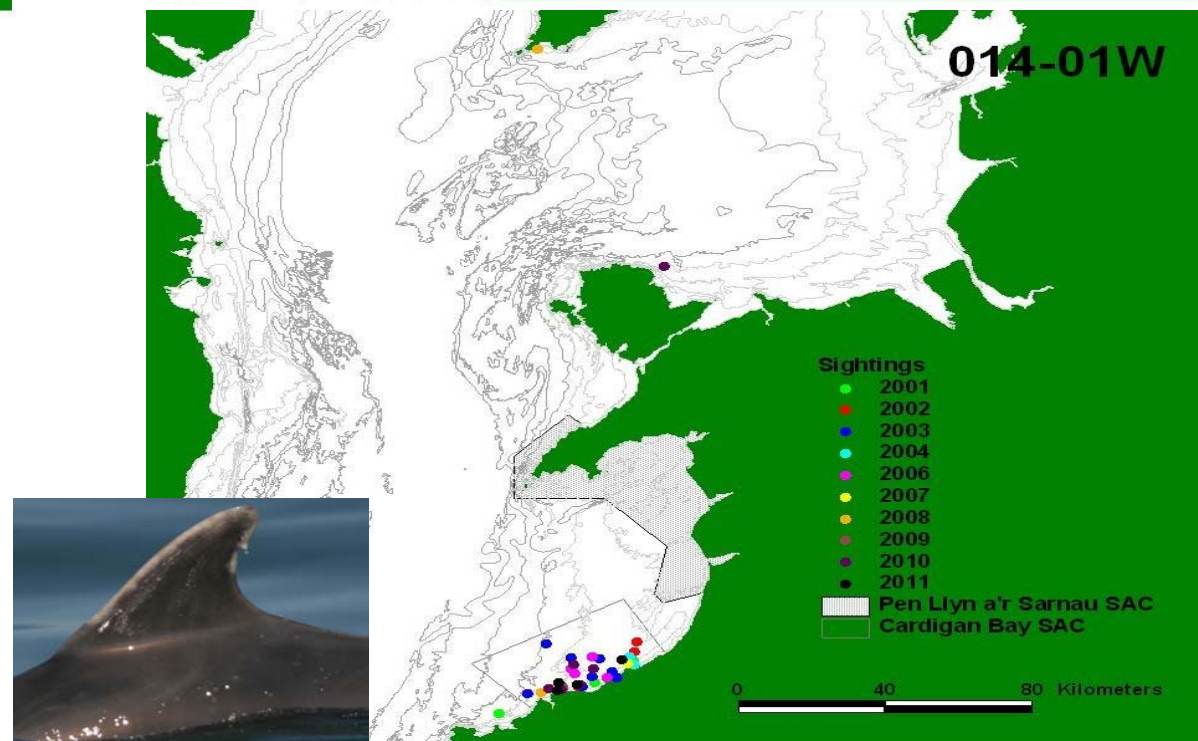
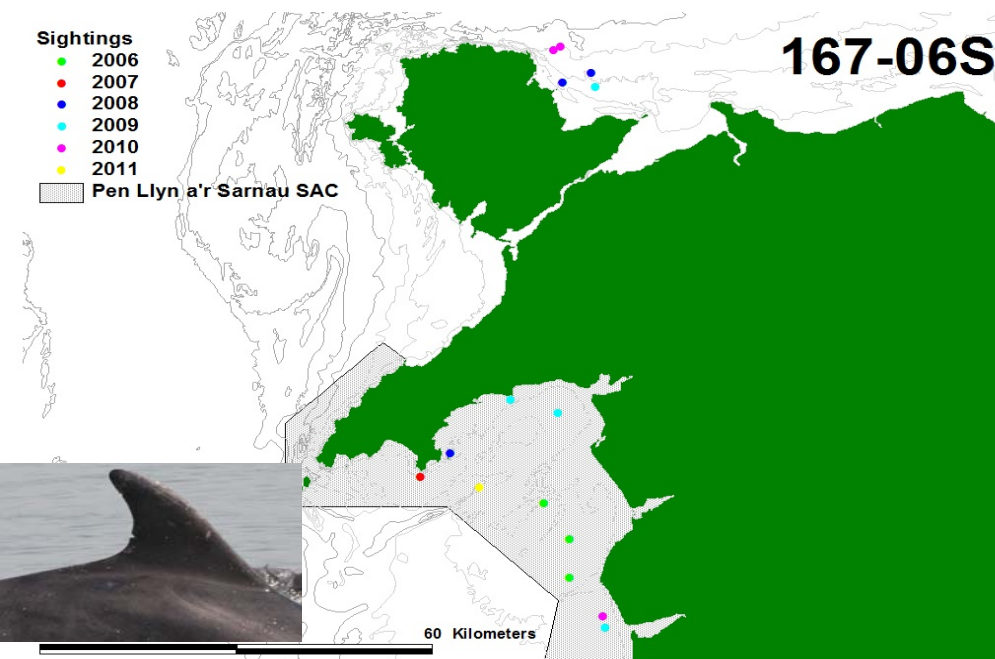
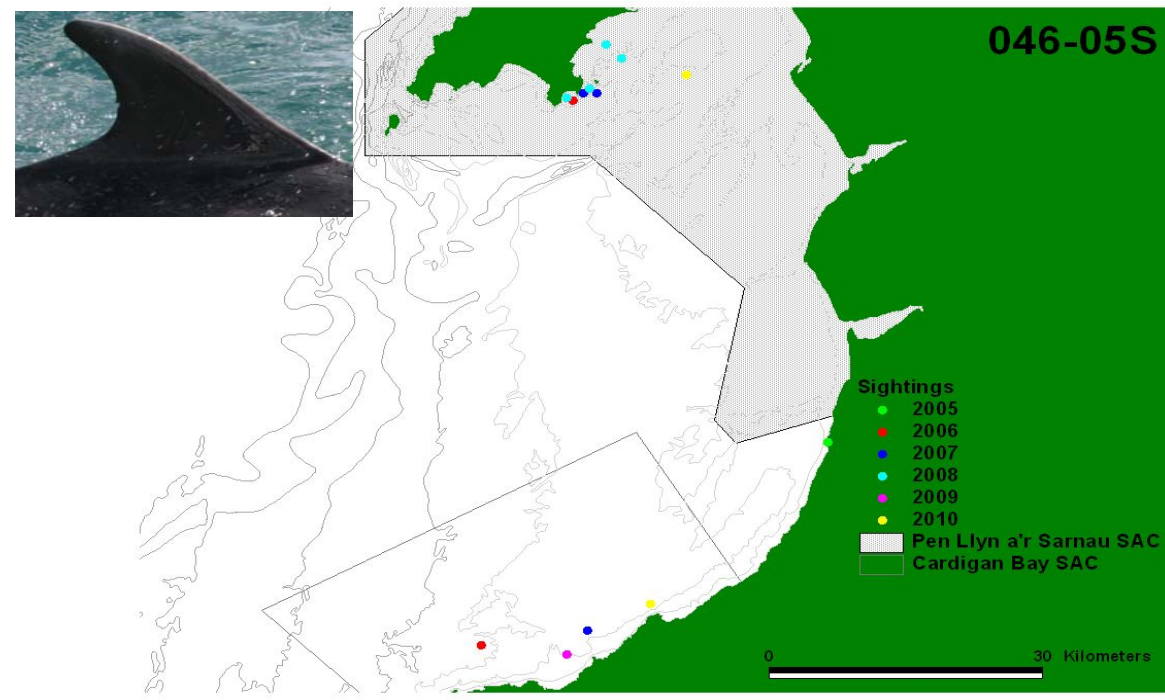
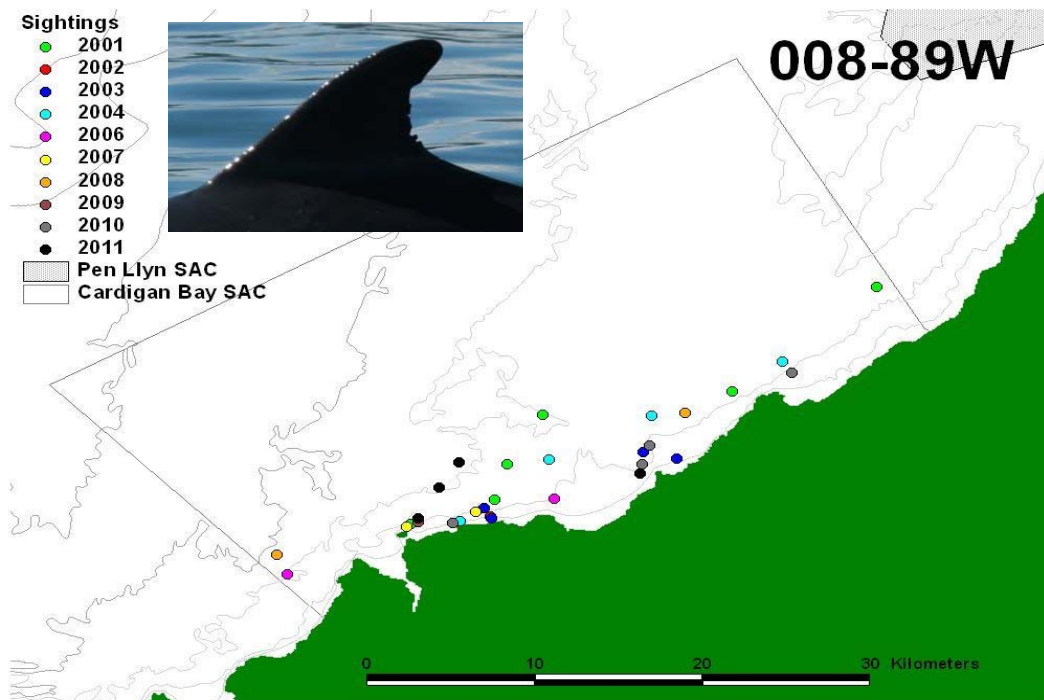
At least 380 dolphins in the catalogue

Use of Photo-ID

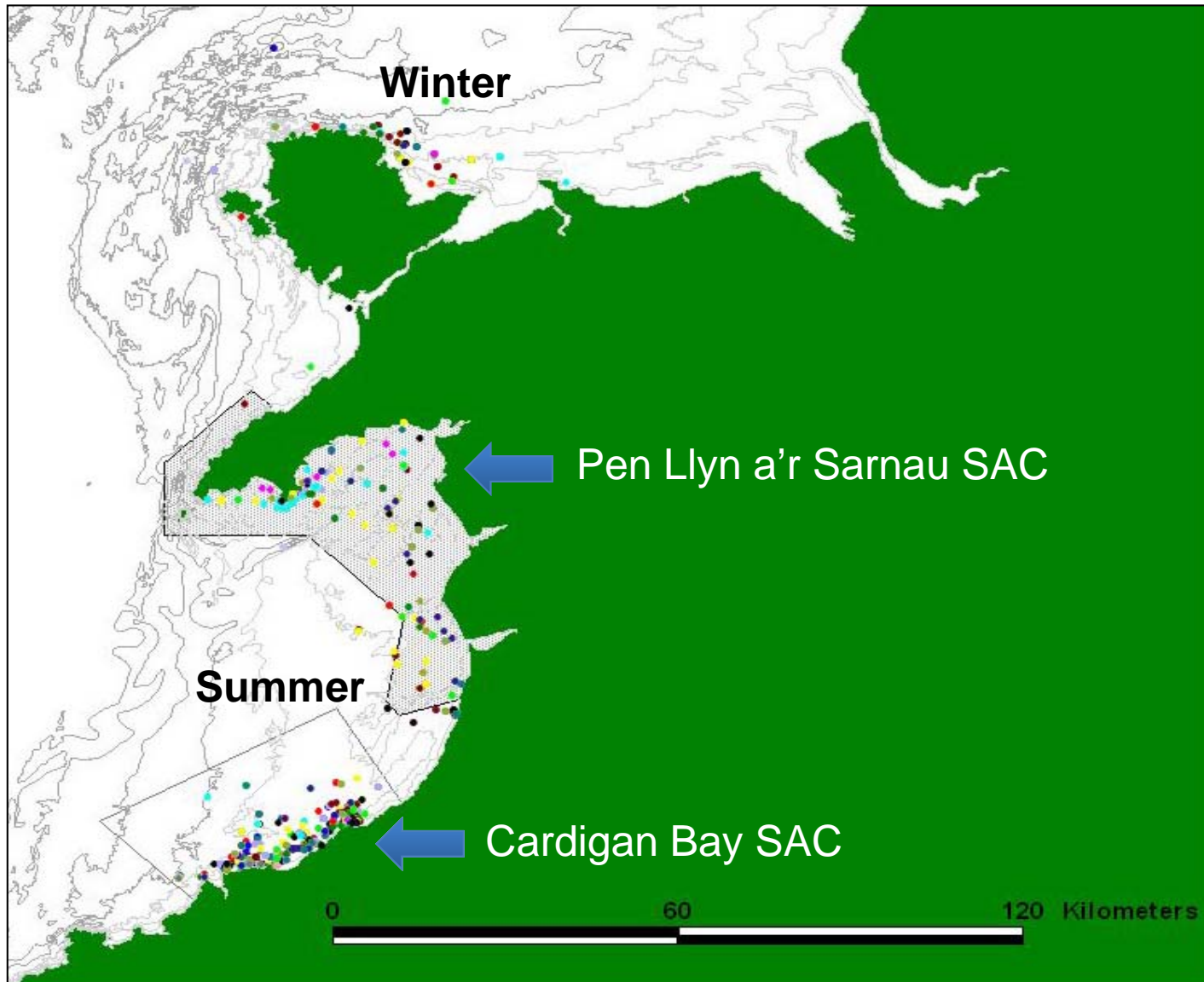


a non-invasive, non-destructive method used to:

1. estimate abundance
2. assess population trends
3. define habitat use and site fidelity
4. define migration patterns and ranges
5. define social structures
6. study life history (birth & death rates)



THE CHALLENGE OF AREA-BASED PROTECTION



Bottlenose Dolphin Photo-ID in Wales

- 64% (141/221) of individuals recorded in both Cardigan Bay SAC and unprotected areas in North Wales
- 78% (172/221) of individuals recorded in one or both SACs also occurred in North Wales
- 15% (33/221) of individuals recorded only in Cardigan Bay SAC

(Source: Veneruso & Evans, 2012; Feingold & Evans, 2013)



Human Activities in Cardigan Bay

- Potting
- Scallop Dredging
- Sailing
- Water Sports
- Dolphin Watching

Recreational and commercial boating code of conduct in Cardigan Bay SAC

Development and promotion of Codes by Ceredigion County Council

Monitoring study “Local Council Dolphin Watch”

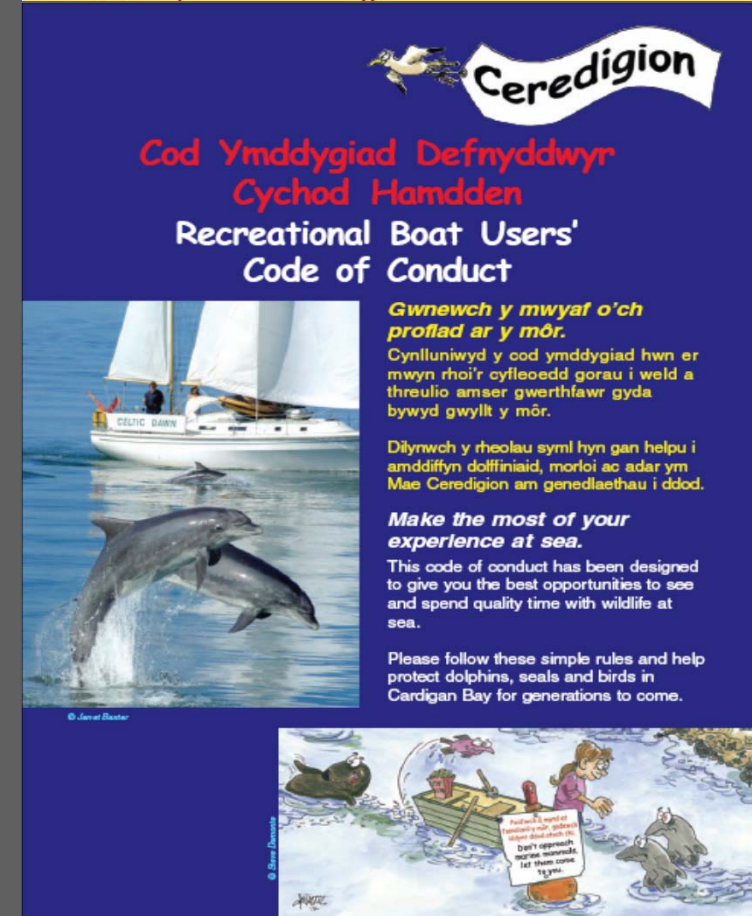
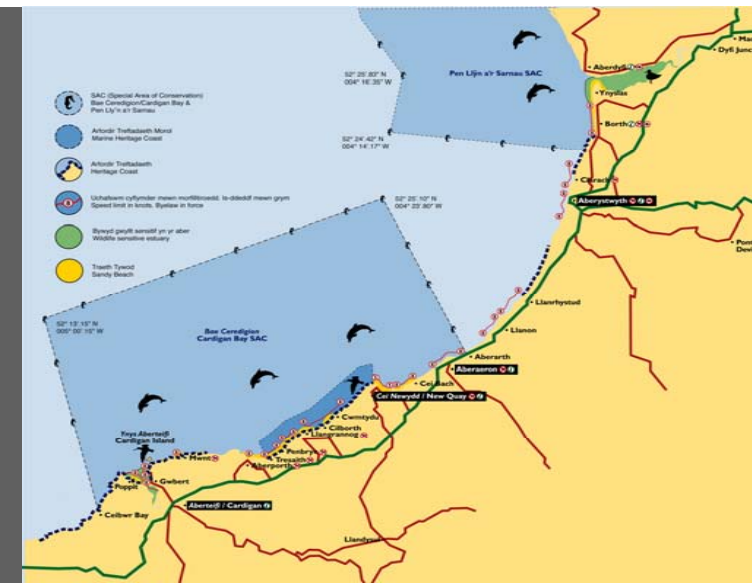
Opening of Information Centre for boat users in New Quay

8-knot speed restriction zone
200m from headland since 2001

Accreditation scheme (WiSe)

Compliance:
90% recreational
vessels

98% commercial
vessels



Legislative back up

Code is voluntary

Byelaws for speed restriction, withdraw mooring and launching permits

Deliberate and **reckless** disturbance of protected species is an offence under:

Wildlife and Countryside Act (1981) and the
Countryside Rights of Way (CROW) Act (2000)



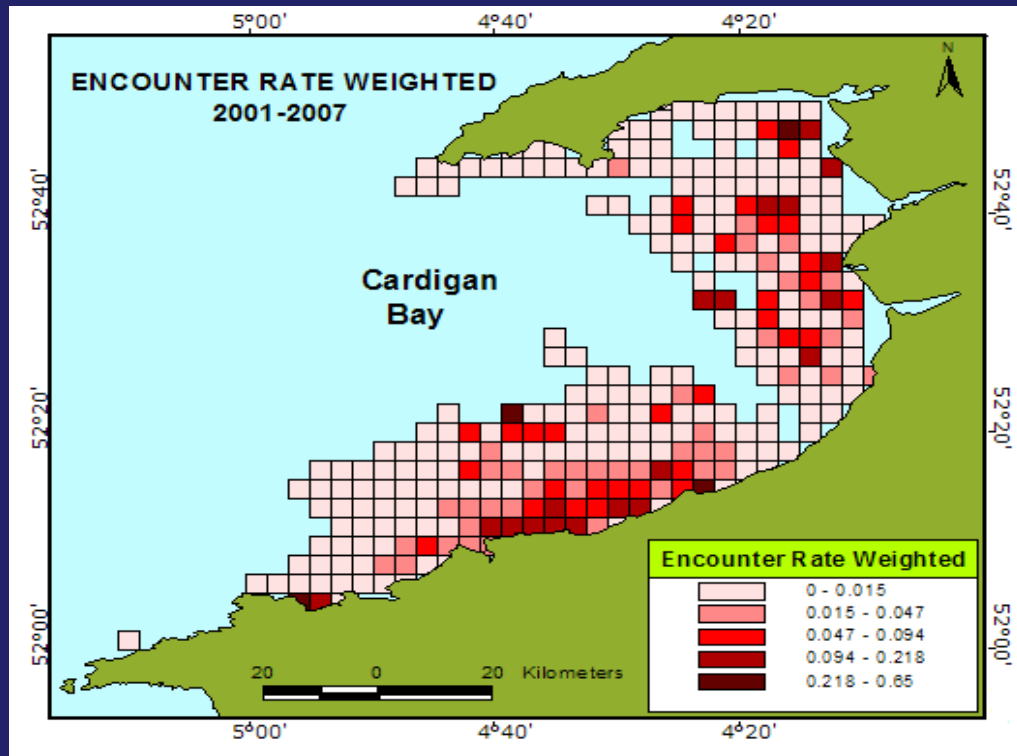
CCW define carrying capacity for commercial recreational boat operators

- Will the **precautionary principle** stand up if queried?

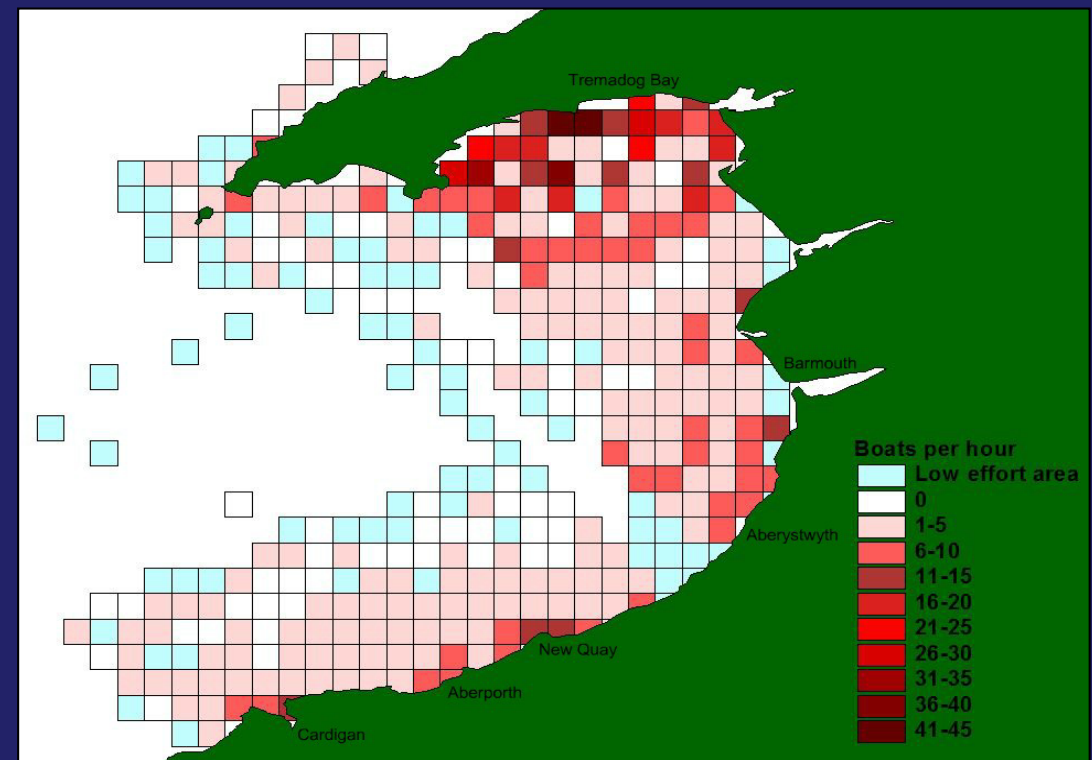
Dolphin Encounter Rates & Vessel Activity in Cardigan Bay



Dolphin Encounter Rates

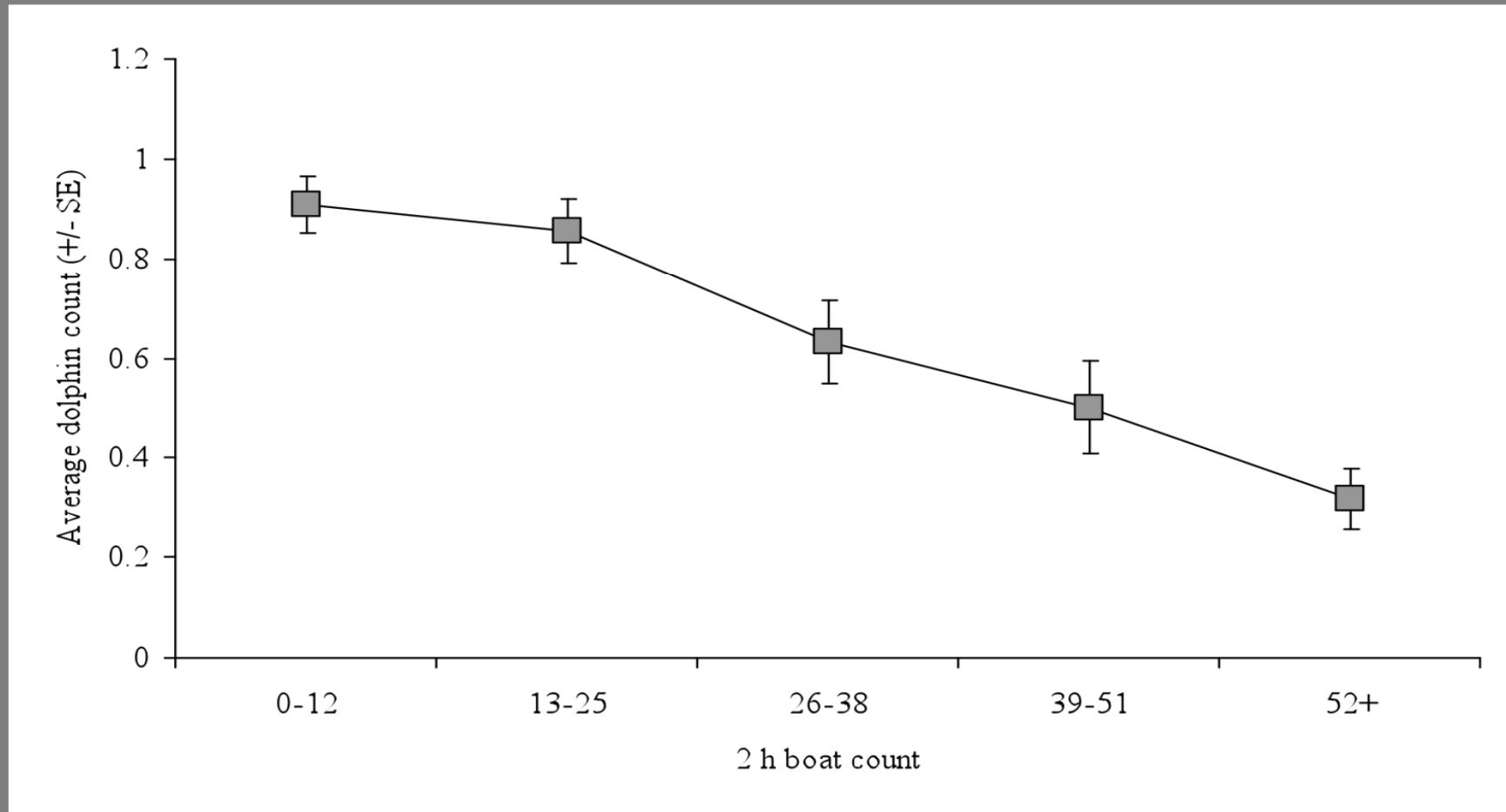


Vessel Encounter Rates



(Source: Pesante *et al.*, 2008; Lohrengel *et al.*, 2012)

The Relative Abundance of Bottlenose Dolphins at different levels of Boat Traffic at New Quay, Cardigan Bay SAC



(Source: Pierpoint *et al.*, 2009)

Fisheries

Locally : Potting for lobsters and crabs

- some netting
- some scallop dredging

View taken that local fishery fairly sustainable

Actions: Monitoring

- any change / increase should be assessed with a Project

Issues:

Economic, Lack of Information, Lack of Enforcement Legislation
remit of SFC only up to 6nm
M&FA not a RA, WAG review



Site management

Management is the responsibility of a large number of statutory bodies

=> **Competent Authorities (CA)**

Each CA must contribute to the management of the SAC in accordance with its statutory remit

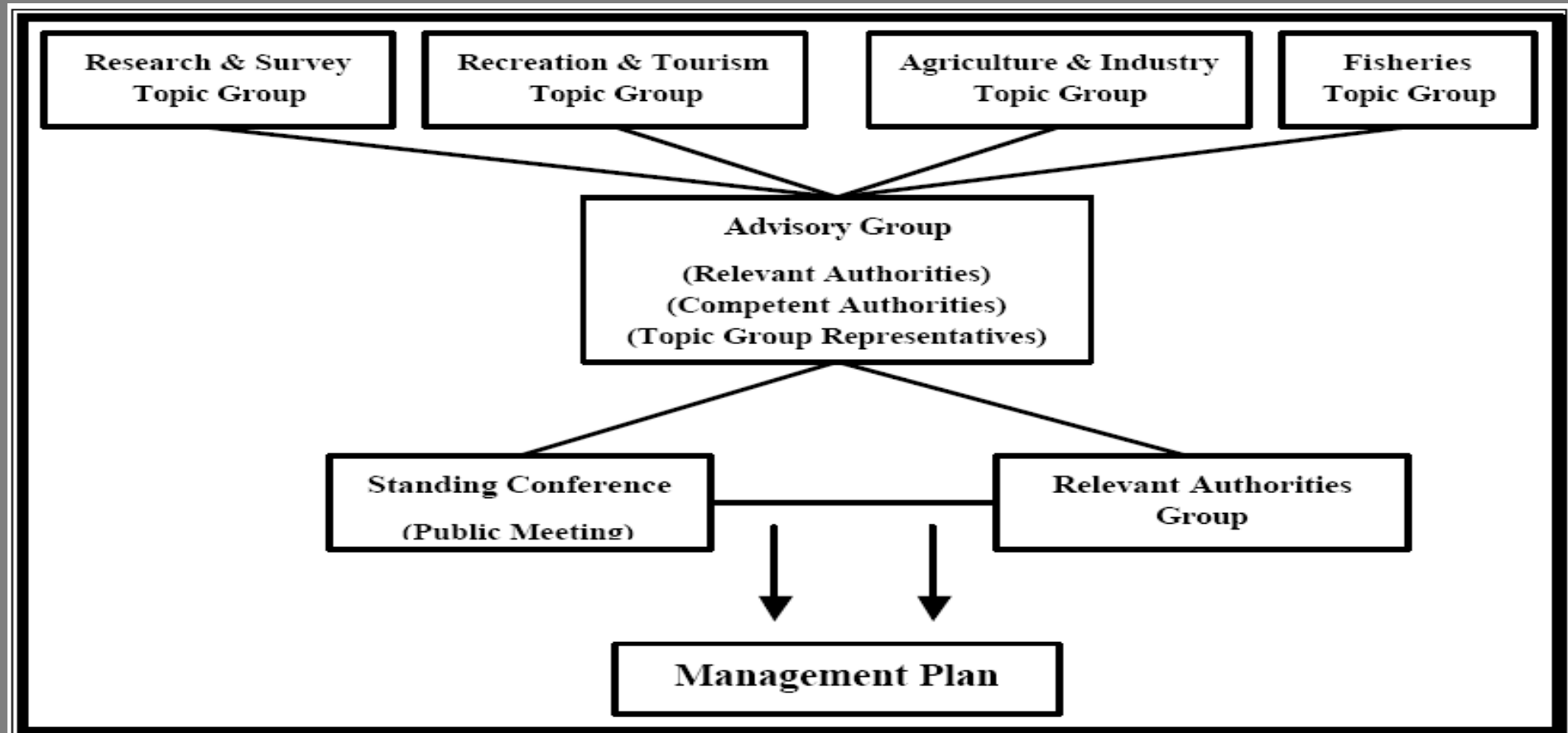
Certain CAs, termed **Relevant Authorities (RA)** are enabled to draw up a management scheme.

Nine members :

- **Ceredigion County Council**
- **Countryside Council for Wales**
- **Dwr Cymru Welsh Water**
- **Environment Agency Wales**
- **North Western & North Wales Sea Fisheries Committee**
- **Pembrokeshire Coast National Park Authority**
- **Pembrokeshire County Council**
- **South Wales Sea Fishery Committee**
- **Trinity House**



Liaison framework for the SAC



Management Plan 2001

“To maintain, within their natural variation, the distribution and abundance of the SAC’s bottlenose dolphin population”

- **Description of activity**
- **Current management**
- **143 Agreed actions**



- **Coastal Development & Defence**
- **Aggregate Extraction**
- **Navigational Dredging (including capital projects)**
- **Cables and Pipelines**
- **Electricity Generation**
- **Fossil fuels**
- **Nuclear**
- **Alternative (Offshore energy structures**
- **Effluent Disposal**
- **Land Runoff**
- **Historical Activities**
- **Commercial Boat Trip Operators**
- **Recreational Activities**
- **Swimming, snorkelling and diving**
- **Recreational vessels**
- **Commercial filming and photography**
- **Research Activities**
- **Military Activities**
- **Shipping**
- **Offshore Oil & Gas**
- **Marine Archaeology & Salvage**
- **Fishing**
- **Littering**
- **Non-Native Marine Species**
- **Climate Change**

Plans & projects

Consultation with Countryside Council for Wales

Significant Effect (alone or in combination with other projects) on
Favourable Conservation Status (FCS) of Features

Appropriate Assessment

No Adverse Effect



**Project can go
ahead**

Adverse Effect mitigated by adding
conditions



Adverse Effects
(Precautionary Principle)



**Project cannot go
ahead**

Exceptions

Imperative reasons of overriding public interest, including those of a social or economic nature which are sufficient to override the ecological importance of the designation

(Priority features): human health or safety considerations, or benefits of primary importance to the environment

Implementation

2003 Review:

83% Management Actions
in the Plan had been completed:

- **Amendments to the MOD Range Standing Orders** to minimise potential impact to marine mammals prior to a weapon firing trial
- **Improvement of Sewage Treatment Works** discharging within and adjacent to the SAC
- **Environment Agency Wales (EAW) Review of Consents**, 232 licences undergone Appropriate Assessment
- **Metal mining strategy, Environment Agency Wales**
- **Liaison with partners** to develop a strategic and sustainable framework for coastal development in Cardigan Bay (draft scoping study March 06)

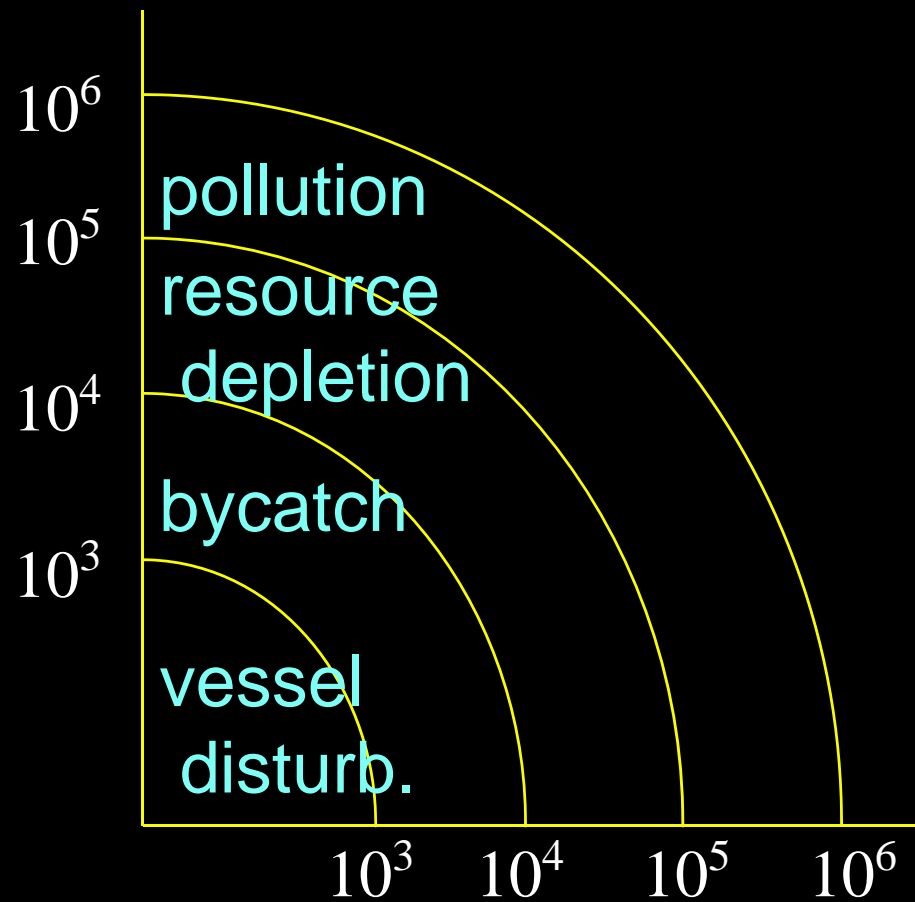


Education and Interpretation Strategy

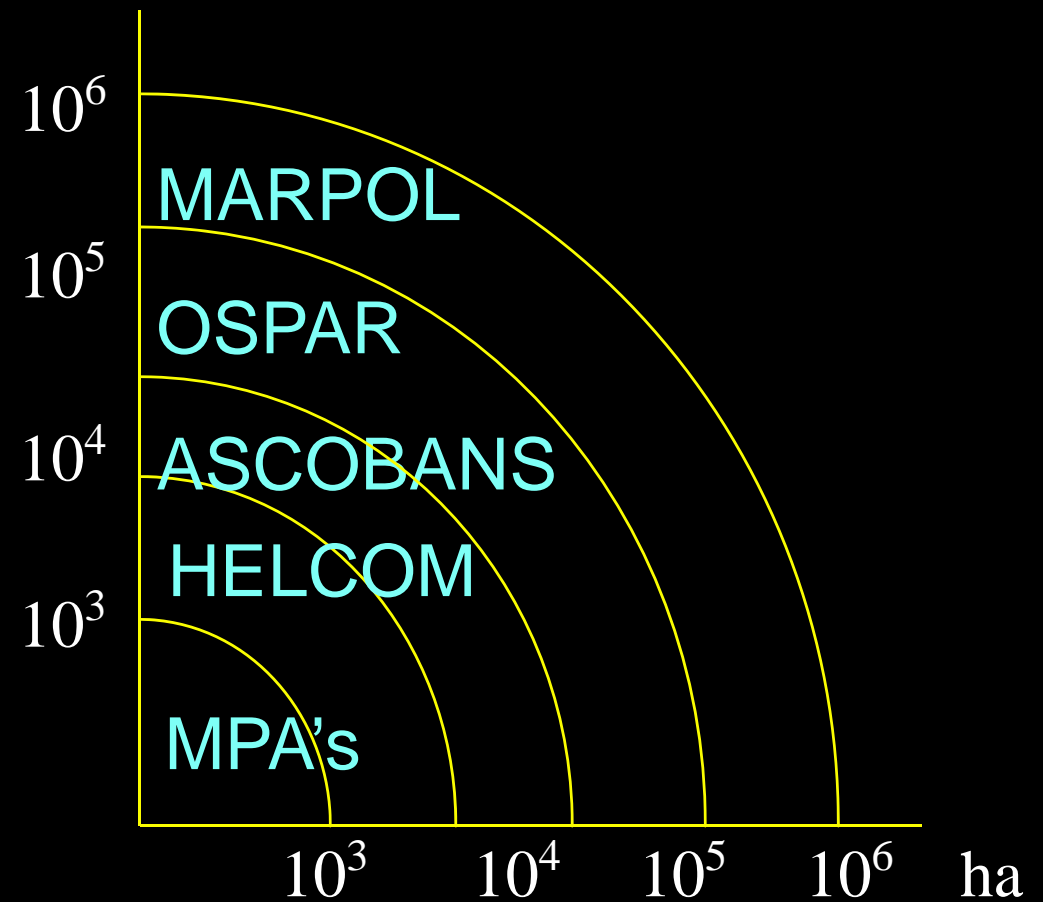
- website
- newsletters
- roadshows
- talks/slide shows
- careers day for teachers
- school packs
- Information Centre



THE SCOPE OF PROTECTIVE MEASURES IN LIMITING IMPACTS



IMPACTS



PROTECTIVE MEASURES

CONCLUDING REMARKS

- Spatial management needs to be evidence based. This requires adequate resources for survey & monitoring. Although expensive, it will enable management to be more cost effective in the long-term.
- The spatial scale of the mitigation measure should suit the scale of impact of the human activity that is being managed.
- Marine Protected Areas should be of appropriate size for the ecology of the species concerned if they are to be effective; areas of high usage should be identified, and their persistence monitored. Flexible management needs to be introduced where appropriate.
- Protected areas (and associated management measures) established for other taxa (particularly benthic species) will rarely be appropriate for cetaceans.
- Area-based management may not be the most effective approach to mitigate the impacts of some human activities.