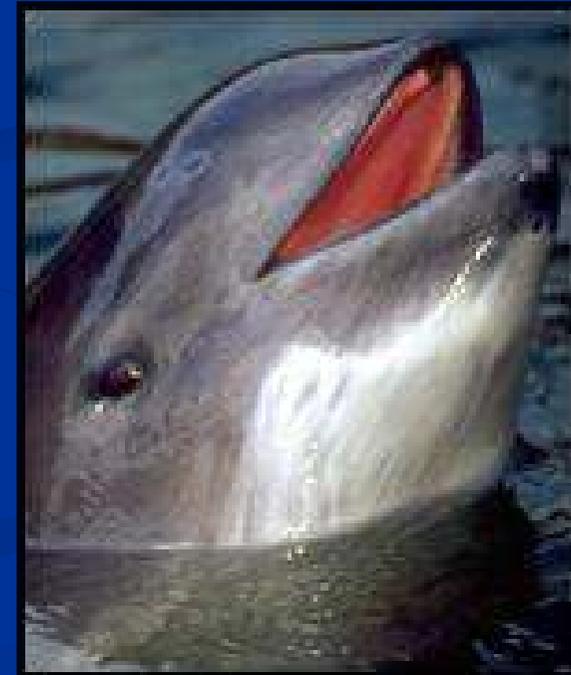


Causes of Death in Harbour Porpoises (*Phocoena phocoena*) Stranded in Scottish Coastal Waters 1992-2007

Mark Dagleish	Moredun Research Institute
Geoff Foster	SAC Inverness
Fiona Howie	SAC Edinburgh
Bob Reid	SAC Inverness
Jill Sales	BIOSS University of Edinburgh
Tony Patterson	SAC Inverness
Harry Ross	SAC Inverness
Jason Barley	SAC Inverness



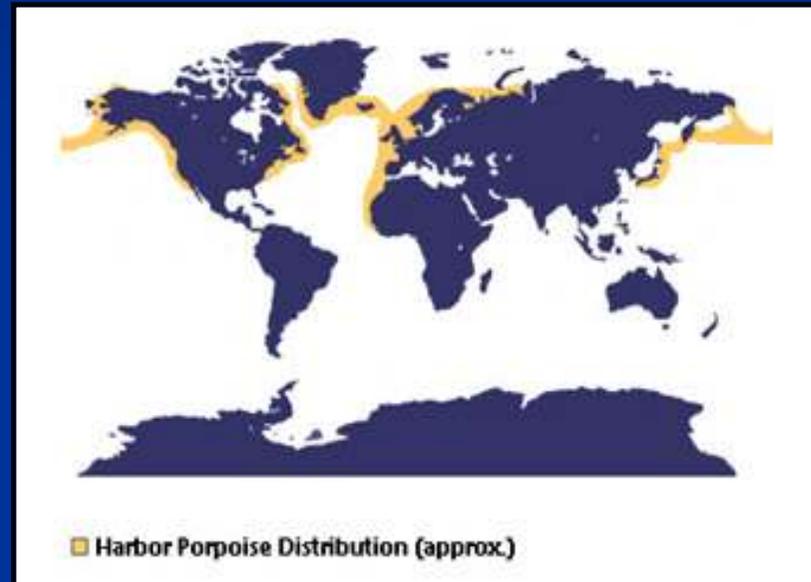
Harbour porpoises

- UK smallest cetacean
- Appearance
- Behaviour
- Reproduction
- Nutrition
- Status and Conservation.



Harbour porpoises

- Range
- Habitat
- Distribution.



Background

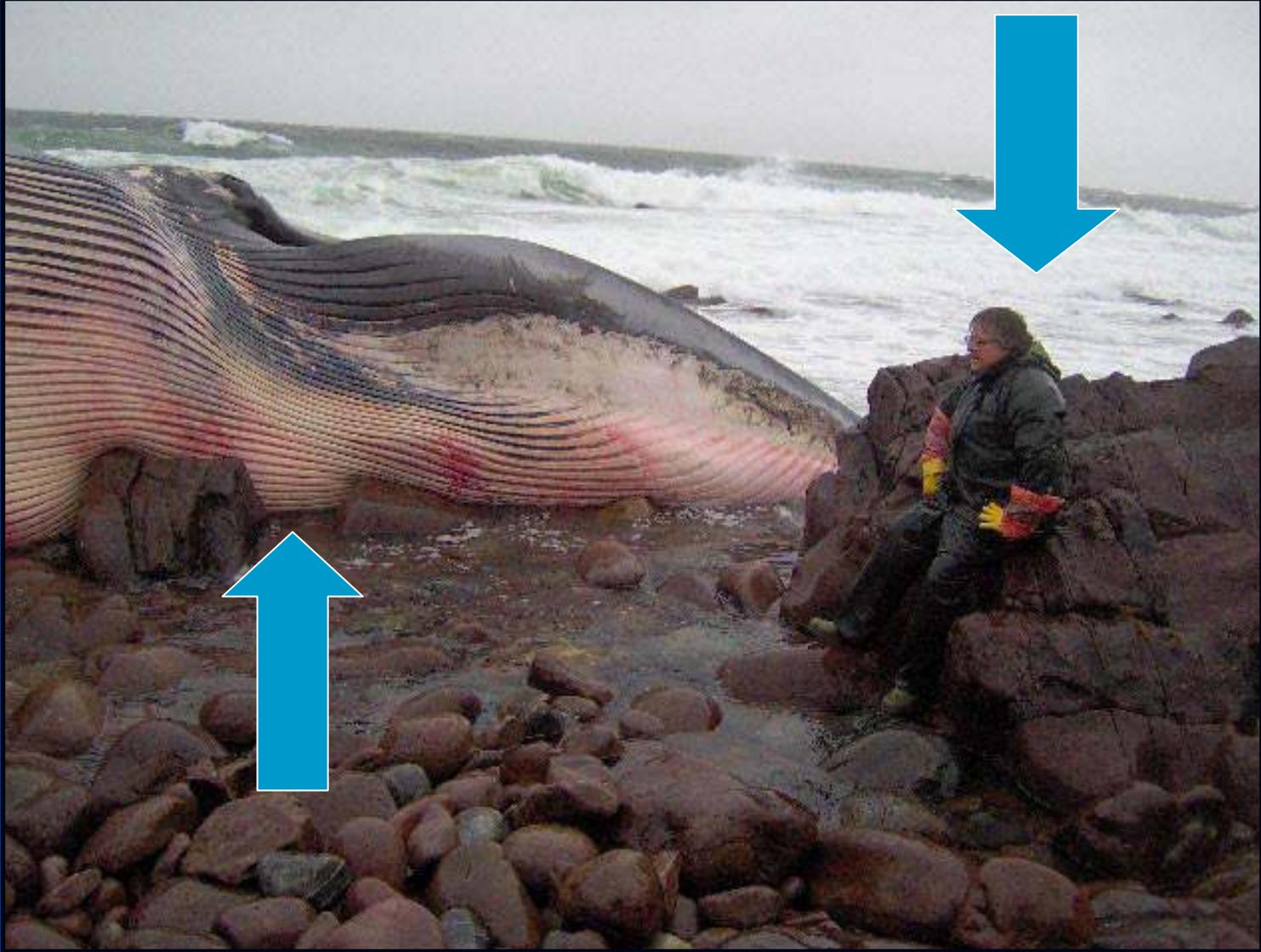
- Sea mammals stranded on Scottish coast
- Primarily cetaceans but occasionally pinnipeds
- Part of the DEFRA funded UK strandings project
- Scottish Government funding for last 2 years.



Mechanics

- Stranded animals are reported to SAC, Inverness
- Transported to VIC Inverness
-gross post-mortem examination
- Agreed European-wide protocol – measurements, weights, tissue samples *etc.*
- Bacteriology
- Histopathology.





Dataset

- 1992 – 2007 inclusive
- n = 605 harbour porpoises stranded on Scottish coast
- primary cause of death ascribed to one of 10 categories.



Primary Classification of Causes of Death

1. Physical trauma	252 (41.7)
2. Pneumonia	79 (13.1)
3. Starvation/hypothermia	54 (8.9)
4. Parasitism	39 (6.4)
5. Neonatal death	38 (6.3)
6. Pregnancy related	12 (2.0)
7. Meningo/encephalitis	5 (0.8)
8. Neoplasia	3 (0.5)
9. Miscellaneous	34 (5.6)
10. Not Established	89 (14.7).



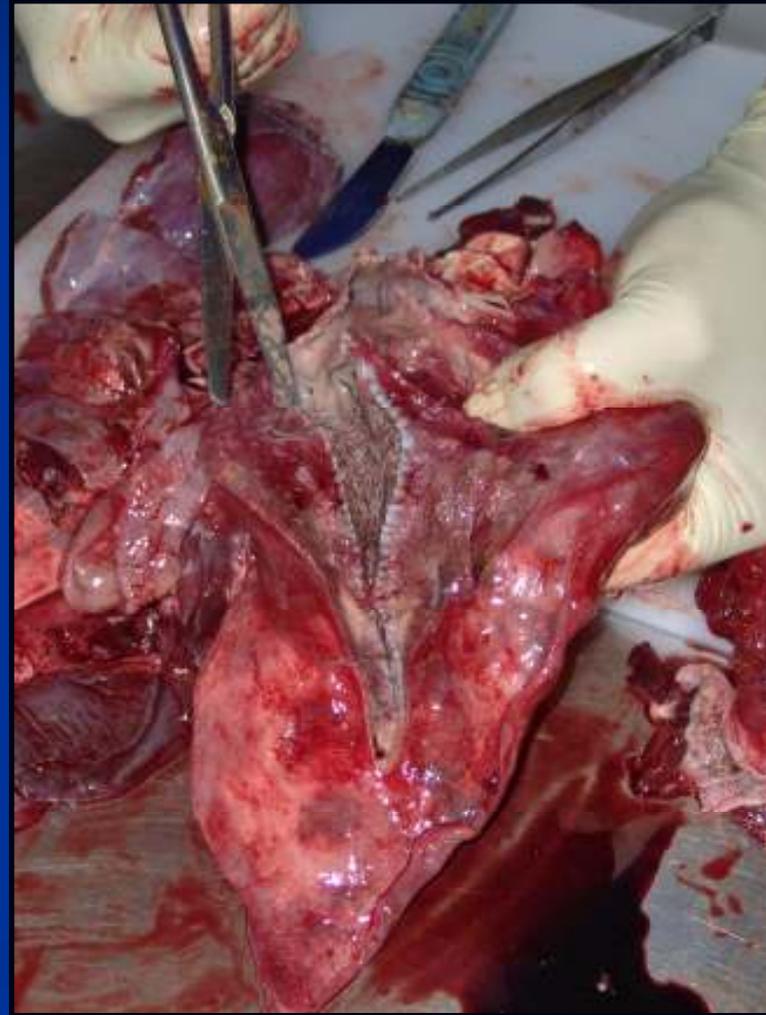
Secondary Classification of Causes of Death (Physical Trauma n = 252)

1.	BND kill	180 (29.8)
2.	Bycatch	37 (6.1)
3.	? Bycatch	22 (3.6)
4.	Boat strike	1 (0.2)
5.	Other/unknown	12 (2.0).



Secondary Classification of Causes of Death (Pneumonia n = 79)

1. Parasitic 64 (10.6)
2. Bacterial 8 (1.3)
3. Fungal 2 (0.3)
4. Other 5 (0.8).



Secondary Classification of Causes of Death (Neonatal death n = 38)

1. Abortion (pre-term) 1 (0.2)
2. Stillbirth 6 (1.0)
3. Drowning 4 (0.7)
4. Starvation 3 (0.5)
5. Unknown 24 (4.0).



Secondary Classification of Causes of Death (Miscellaneous n = 34)

1. Bacterial	19 (3.1)
2. Orchitis/epididymitis	2 (0.3)
3. Polycystic liver	1 (0.2)
4. Pyelonephritis	1 (0.2)
5. Uterine rupture	1 (0.2)
6. Vertebral osteomyelitis	1 (0.2)
7. Peritonitis	1 (0.2)
8. Interstitial nephritis	1 (0.2).



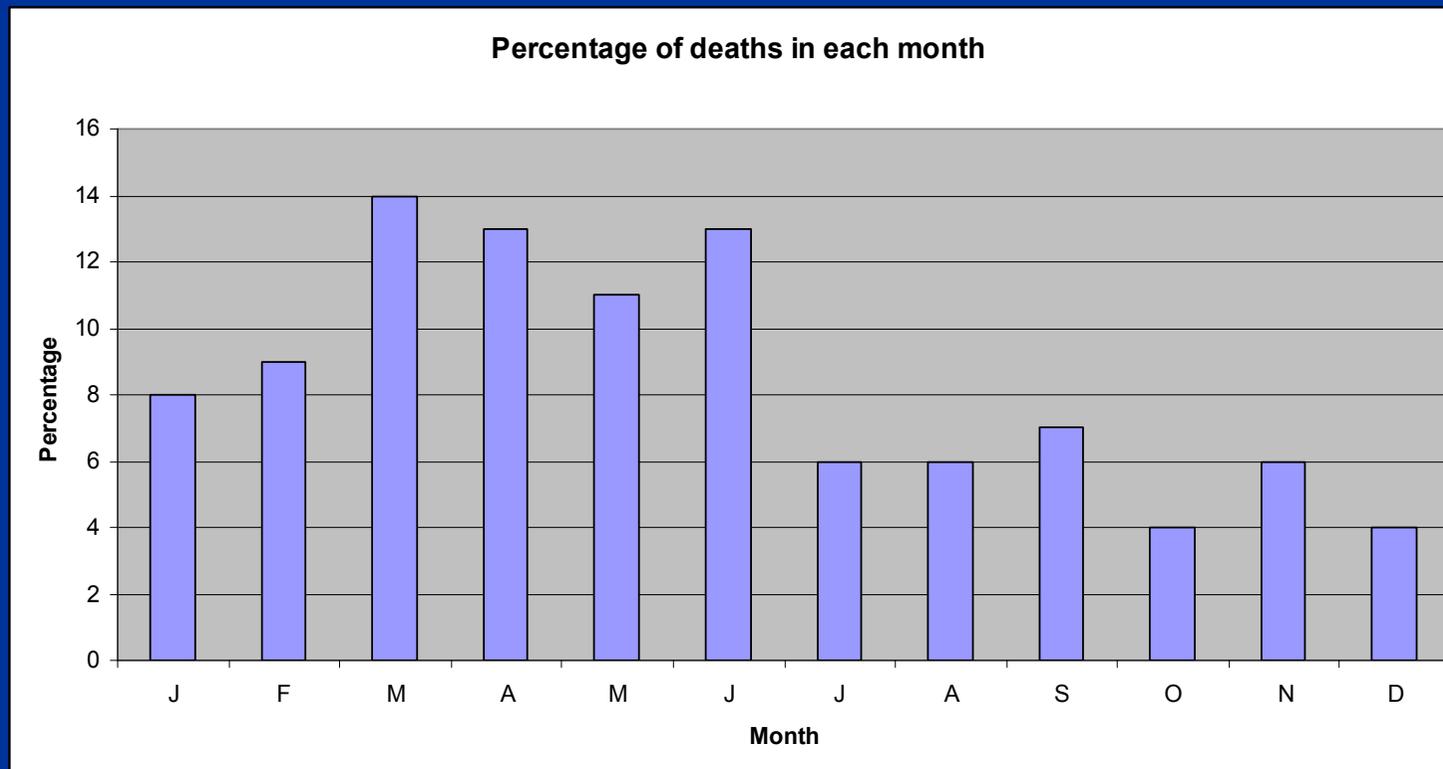
Geographical Location of Carcasses

- most carcasses found beached
- ~10% due to bycatch
- 70% found in five grid squares
- NJ (26%) & NH (15%)-Moray Firth
- NO (11%) & NT (8%)-Firths of Forth & Tay
- NS (10%)-Firth of Clyde.

HL	HM	HN	HO	HP	JL	JM
HQ	HR	HS	HT	HU	JQ	JR
HV	HW	HX	HY	HZ	JV	JW
NA	NB	NC	ND	NE	OA	OB
NF	NG	NH	NJ	NK	OF	OG
NL	NM	NN	NO	NP	OL	OM
NQ	NR	NS	NT	NU	OQ	OR

Time of Death

- Clear seasonal pattern to carcasses being reported
- More in Spring & early Summer.



Time of Death

Primary COD	Quarter				Total
	Q1	Q2	Q3	Q4	
Neonatal Death	0	33 (87)	5 (13)	0	38
Parasitism	17 (44)	10 (26)	7 (18)	5 (13)	39
Pneumonia	35 (44)	20 (25)	12 (15)	12 (15)	79
Pregnancy related	1 (8)	8 (67)	2 (17)	1 (8)	12
Starvation/hypothermia	25 (46)	19 (35)	5 (9)	5 (9)	54
Trauma	62 (25)	103 (41)	56 (22)	31 (12)	252
BND kills	37	83	39	20	

Length of Porpoises Killed by BND

Quarter	No. observed	Mean Length (cm)	s.d.
Q1	37	119.6	13.19
Q2	83	119.2	17.19
Q3	39	120.7	20.44
Q4	20	123.1	15.58

Conclusions

- 30% of all recorded Harbour porpoise deaths in Scotland are due to bottlenose dolphin attacks!
- Likelihood of being killed by a bottlenose dolphin is related to porpoise body length
- Several causes of death are influenced by season
- Pneumonia, especially verminous, is a notable cause of mortality.

**Any
questions?**



Photographer Ole Bang Nielsen