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ECOLOGY OF THE SHORT-BEAKED COMMON DOLPHIN (*Delphinus delphis*) OFF SOUTHERN SPAIN

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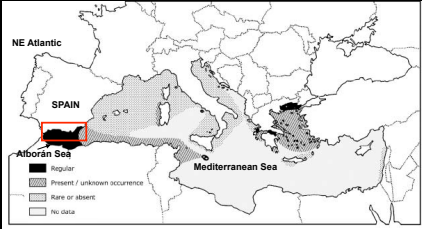
CREPAD - Spanish Space Agency (satellite images)

IFAW (Logger software)

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European Union LIFE-Nature

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Conservation issues

- Common dolphin is believed to have declined in the Mediterranean
- ACCOBAMS has developed a Conservation Plan
- Effective conservation depends on our understanding of the ecology
- The Alborán Sea is its most important remaining habitat – constitutes a vital source of information
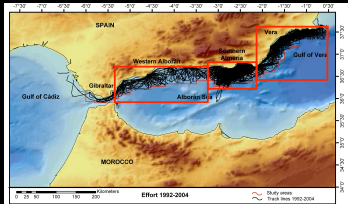
Source: Bearzi *et al.* 2003

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Methods

- Line transect data (1992 – 2004)
- Data on environmental variables

Study area:	19,189 sq km
Effort:	37,385 km
Sightings:	738 groups

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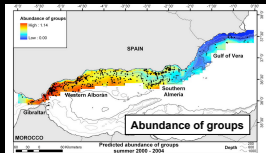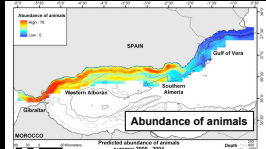### Methods

- Distribution and abundance:

Spatial modelling (GAMs) was used using 'extrinsic' (environmental) variables
(e.g. depth, slope, sea surface temperature, chlorophyll concentration, distance from coast, distance from the shelf edge)

Two steps were used: - modelling abundance of groups
(probability of detection combined with spatial analysis)
- modelling group sizes
- abundance of animals

- Differences were examined among:

a) Sub-areas
- Western Alborán
- Southern Almería
- Gulf of Vera

b) Groups of years

c) Seasons
- summer: June to September
- winter: October to May

d) 'Intrinsic' variables
- behaviour
- presence of calves
- interspecies agregations

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Results: abundance

- Total abundance:
19,429 animals (density = 1.01 animals/km2)
95%CI = 15,277 - 22,804
CV = 0.11 – 0.18

- Geographical differences:
W. Alborán = 1.55 animals/km2
Almería = 0.97 animals/km2
G. of Vera = 0.14 animals/km2

- Bimodal distribution pattern

Abundance of groups

Group size

Abundance of animals

Results: abundance

- Seasonal differences:
  - Summer = 7,148 animals (0.69 animals/km², 95%CI = 5,820 – 7,875)
  - Winter = 2,429 animals (0.23 animals/km2, 95%CI = 1,628 – 3,951)
- Change in distribution pattern

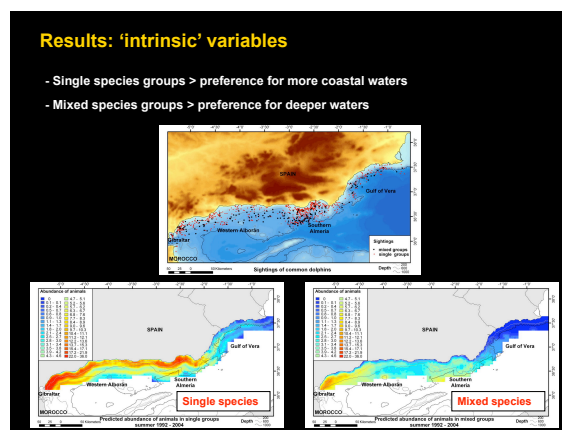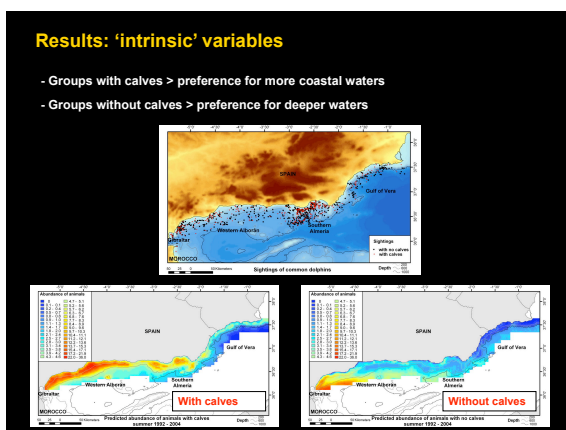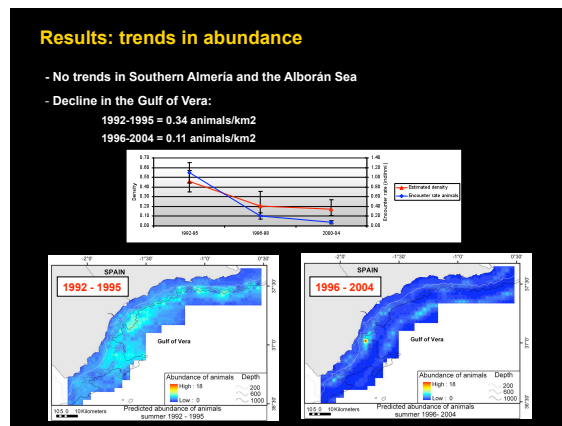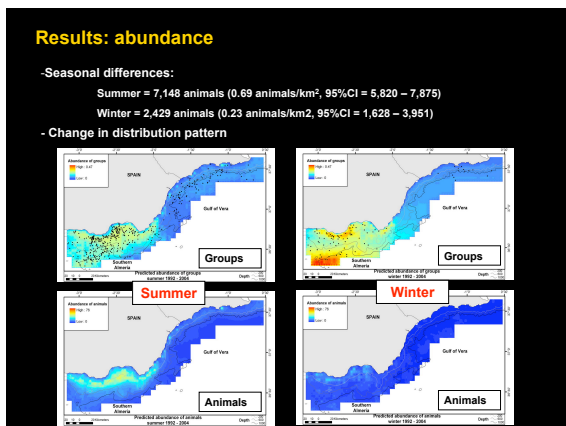**Results: trends in abundance**

- No trends in Southern Almería and the Alborán Sea
- Decline in the Gulf of Vera:
  - 1992-1995 = 0.34 animals/km2
  - 1996-2004 = 0.11 animals/km2

Results: 'intrinsic' variables

- Groups with calves > preference for more coastal waters
- Groups without calves > preference for deeper waters

Results: 'intrinsic' variables

- Single species groups > preference for more coastal waters
- Mixed species groups > preference for deeper waters

Results: 'intrinsic' variables

- Groups feeding > preference for more coastal waters
- Groups socialising > bimodal pattern
- Groups traveling > general pattern

Results: 'intrinsic' variables

- Single species socialising groups > preference for more coastal waters
- Mixed species socialising groups > preference for deeper waters

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Conclusions

1. Estimated abundance fairly stable in the northern Alborán Sea since 1992

   - In contrast with the decline in the rest of the Mediterranean

   - Despite reported by-catch rate Moroccan driftnets in southern Alborán Sea (aprox. 1,500 per year)

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Conclusions

2. There is a significant drop in density in the Gulf of Vera since 1996

   - Exponential growth of aquaculture since mid 1990s

   - Catches of round sardinella (*Sardinella aurita*) to feed the fish have also increased exponentially

   - This may have led to a reduction in prey availability

   - It could also be due to similar reasons as for the rest of the Mediterranean

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Conclusions

3. Shelf edge areas, especially off Malaga and Almería, are preferred habitats, particularly when feeding and with calves

   - This is also the area with the strongest impact from human activities

   - This kind of information could lead to specific management measures for those areas

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Conclusions

4. Introducing 'intrinsic' factors leads to a clearer picture of habitat use

   - Improves our understanding of the ecology of the species

   - Should also lead to more effective conservation

   - Outcomes are easy for administrators