Use of PVA to assess the potential for long term impacts from piling noise on marine mammal populations

A case study from the Scottish east coast

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WIND
MARINE
BIOMASS

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INTRODUCTION

NATURAL POWER: TWO DECADES OF UNIQUE INDUSTRY EXPERIENCE

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INTRODUCTION

CASE STUDY: INCH CAPE OFFSHORE LIMITED (ICOL)

- Owned by Repsol Nuevas Energías UK Limited (51%) and EDP Renewables UK Limited (EDPR 49%)
- Established to develop, finance, construct, operate, maintain and decommission the Inch Cape Offshore Wind Farm
- Extensive programme of engineering and environmental works to support consent applications to the Scottish Government
- Considered a diverse range of environmental factors ranging from human uses of the site such as commercial fishing interests, to biological interests such as marine mammals

MARINE MAMMAL PVA

INTRODUCTION

- Offshore wind and marine mammals
- Construction phase (pile driving)
- Potential effects:
  - Lethal effects and physical injury
  - Auditory injury
  - Displacement
- EIA – population level assessment
- HRA – requires assessment against a designated site's conservation objectives 'in the long term'

MARINE MAMMAL PVA

CASE STUDY: INCH CAPE

- ~20km east of Angus coastline
- ~1,000MW
- Up to 213 turbines

Inch Cape Offshore Ltd

New Energy for Scotland

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HARBOUR SEAL FRAMEWORK

Assess spatial distribution of piling noise

Assess spatial distribution of marine mammals

Integrate to assess numbers of animals which have potential to be impacted

Proportion of reference population

Population level impacts (PVA)

MORAY
OFFSHORE RENEWABLES

			ctable s)
Hi population)			
Medium (10-20% of population)	Minor		
Low (<10% of population)	Negligib		

Keywords:
EU habitats directive
Appropriate assessment
Population consequences
Disturbance
Offshore wind farm
Marine mammal

120

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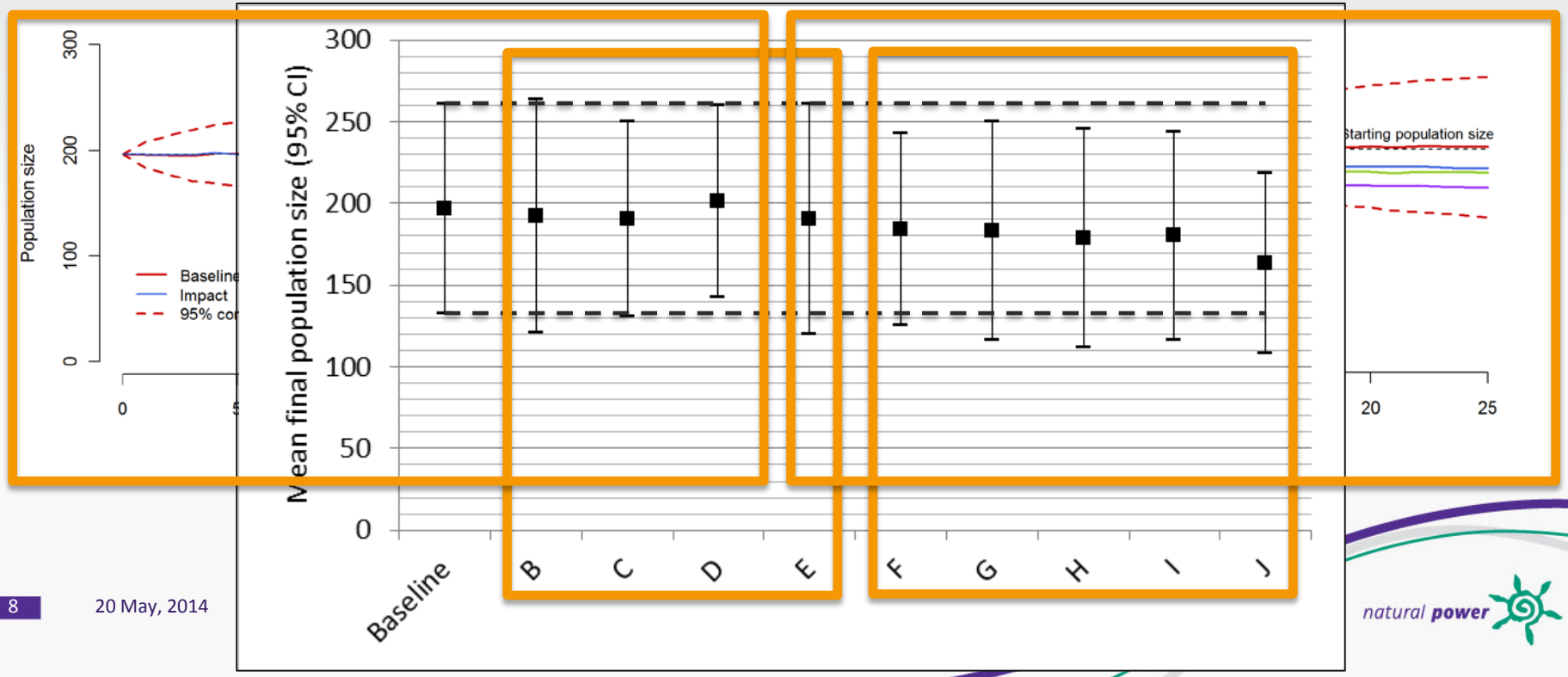
PVA

- PVA
  - Bottlenose dolphin – VORTEX
  - Harbour seal population model
- Assumptions
  - PTS onset was modelled as age-related mortality i.e. 'harvesting' of adult animals
  - Displacement was modelled to represent failure to successfully reproduce i.e. 'harvesting' of calves
- Baseline scenario – distribution of final population sizes after 25y

MARINE MAMMAL PVA

BOTTLENOSE DOLPHIN PVA

- Baseline scenario (population stable or very slightly increasing)
- Construction scenarios
  - Inch Cape (piling modelled 2016 and 2017)
  - Cumulative – Forth and Tay (piling modelled 2014-2018)
    – Forth and Tay and Moray Firth



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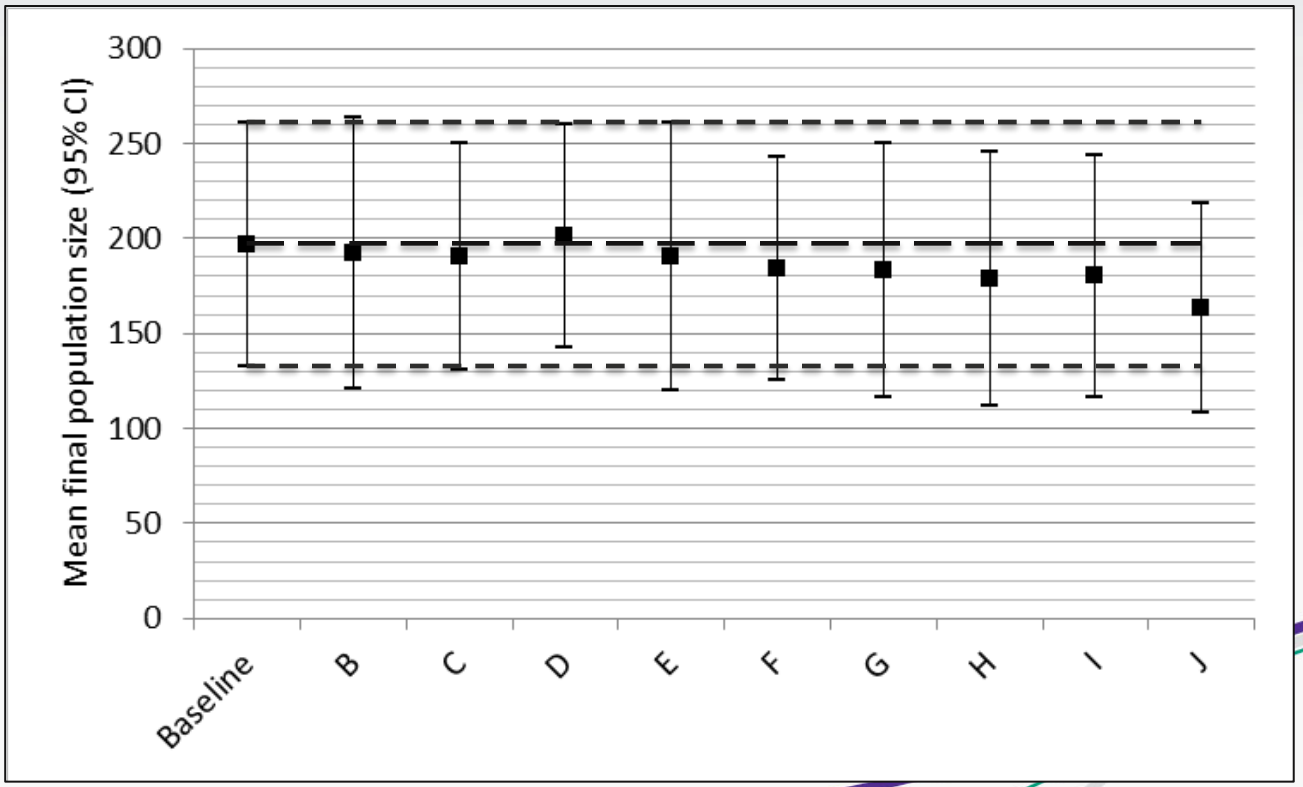
MARINE MAMMAL PVA

BOTTLENOSE DOLPHIN PVA

- Piling unlikely to have population level impacts – except 'J'?
  - Population remains viable
- Impacts for all scenarios (including 'J') are within the 95% CIs of the mean baseline projection
  - Unlikely to be able to detect potential change



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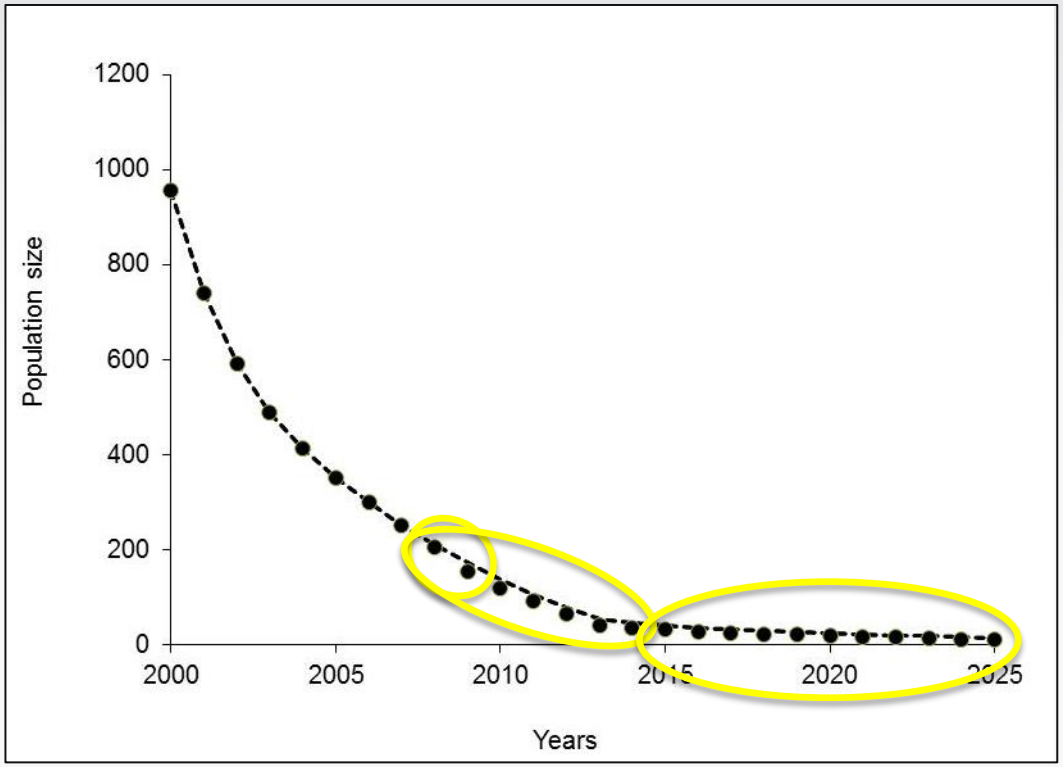
MARINE MAMMAL PVA

HARBOUR SEAL PVA

- Baseline scenario (declining population)
- Adjusted baseline scenario (reduced adult mortality) (---)
- Construction scenario (•••)
  - Inch Cape (piling modelled 2008-2009)



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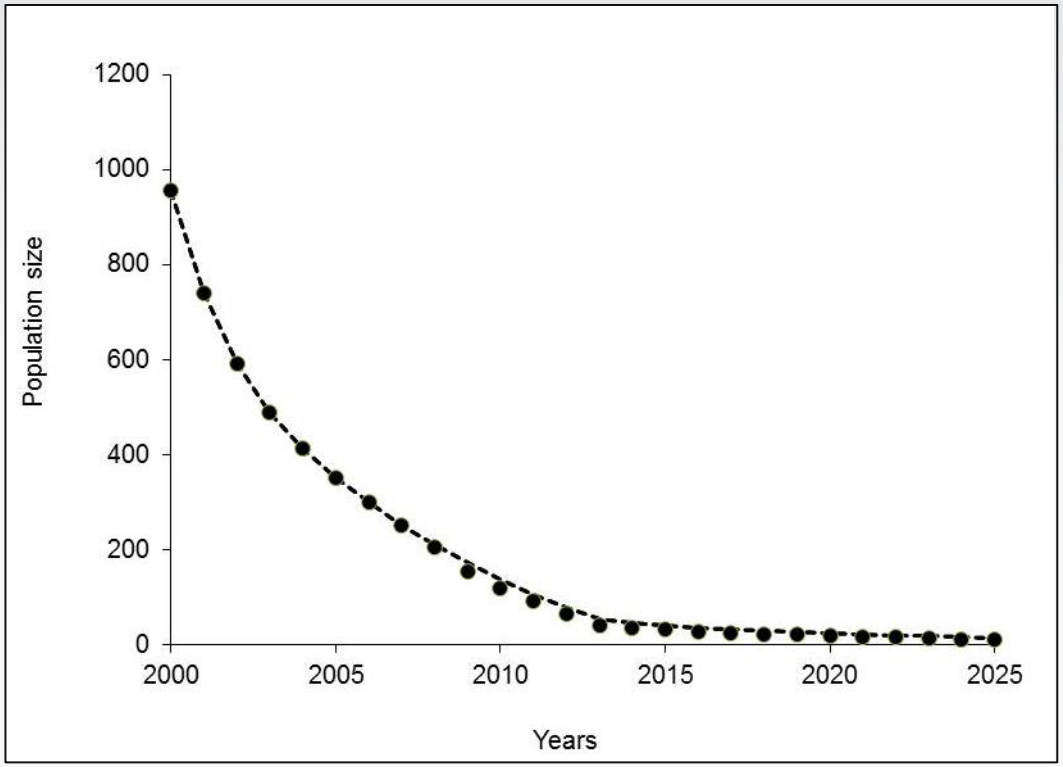
MARINE MAMMAL PVA

HARBOUR SEAL PVA

- East Coast Management Area harbour seal population is already not viable
- Unlikely to be able to measure any added loss that activities at the Forth and Tay developments may have



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MARINE MAMMAL PVA

CONCLUSIONS

	EIA		HRA
	Inch Cape	Cumulative	
Bottlenose dolphin 	Minor impact (medium term) and minor impact at the population level in the long term	Minor impact (medium term) and minor impact at the population level in the long term	No adverse effect on the site integrity of the Moray Firth SAC (qualifying interest feature: bottlenose dolphin), and site will continue to make an appropriate contribution to achieving favourable conservation status of bottlenose dolphin in the long term
Harbour seal 	Minor to moderate impact (medium term) but minor impact at the population level in the long term	Moderate impact (medium term) but minor impact at the population level in the long term	No adverse effect on the site integrity of the Firth of Tay and Eden Estuary SAC (qualifying interest feature: common seal)

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THANK YOU
FOR LISTENING

- Developer


- Co-authors

- Contributors to the impact assessment


any questions?