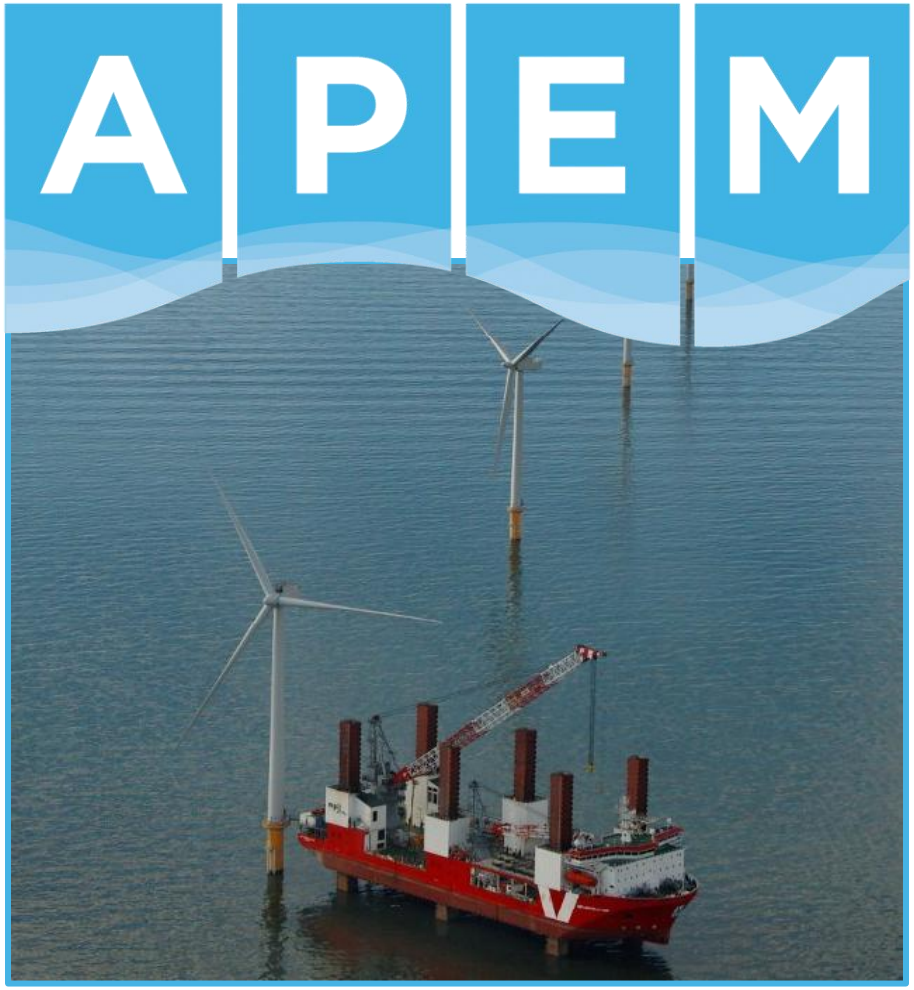


GPS-tagged birds help predict collision risk accurately

Laura Jervis *l.jervis@apemltd.co.uk*

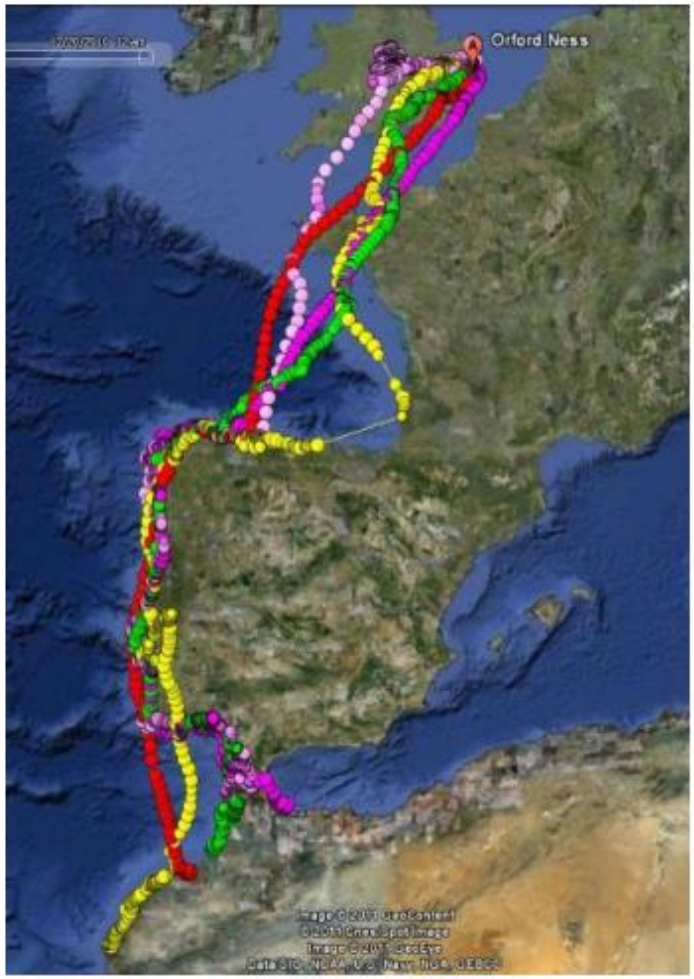
Who we are

- Europe's largest specialist aquatic science consultancy
- Currently 150 staff in 9 sites across UK
- Offices in Germany and USA
- Extensive renewables experience from survey to hearings
- 27 years old

Project background

- Aerial digital surveys over 24 months of three wind farm areas
- Data from surveys underpinned Environmental Statement
- Estimated collisions with operational turbines

Special Protection Area seabird colony



The outward migrations of five Lesser Black-backed Gulls in 2010 (individuals in different colours)

Outward (red) and return (yellow) migration routes were sometimes very different

Source: http://www.bto.org/science/migration/tracking-studies

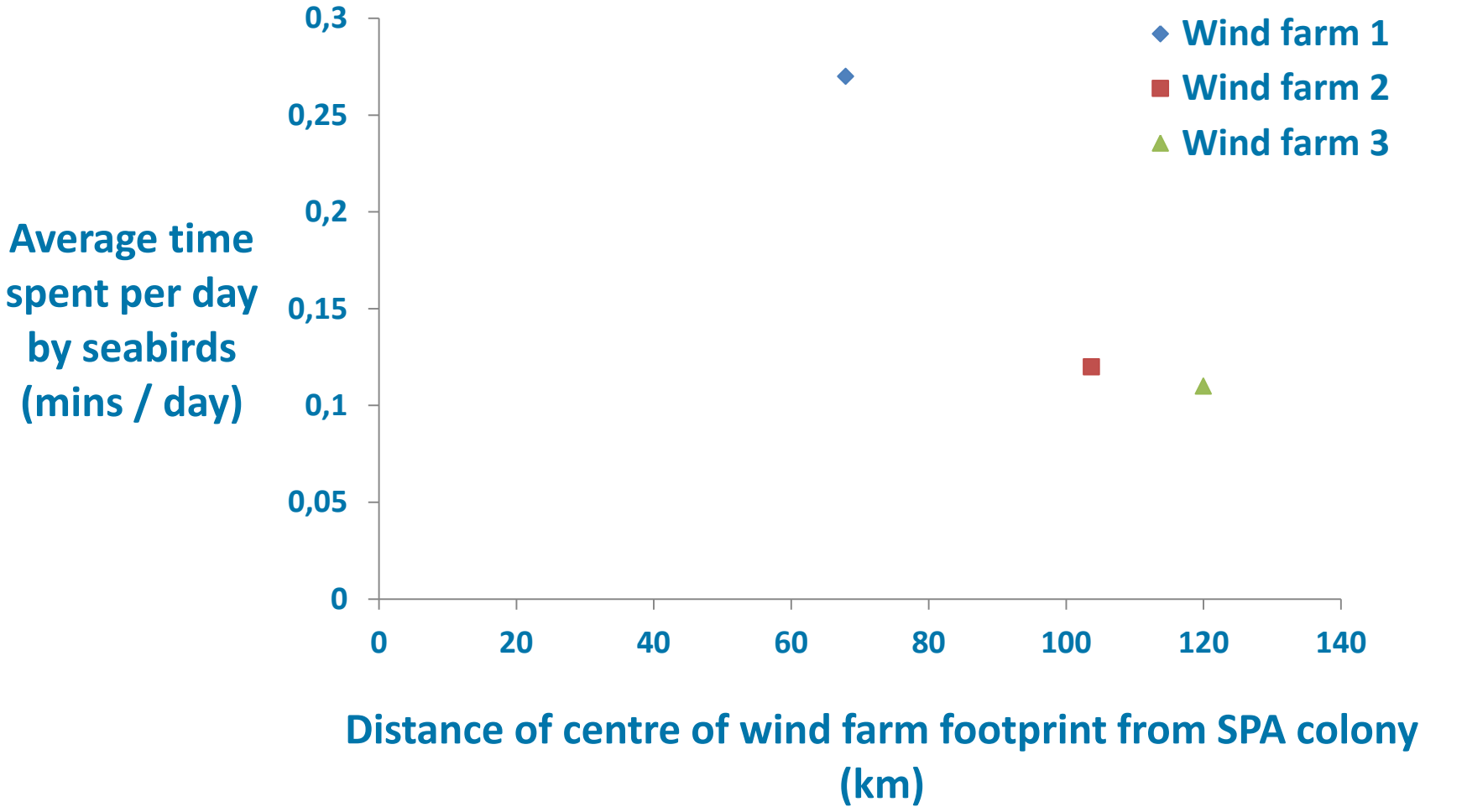
Special Protection Area seabird colony

- Analysis of collisions on an adjacent Special Protection Area (SPA) seabird population
- First we used percentage of regional population that is made up of the SPA population to estimate how many SPA birds were likely to be in proposed wind farm footprint
- Collisions estimated to be 31.5% or 14 adult seabirds attributable to SPA
- Estimate refined using two years of GPS-tagging data from an SPA colony of seabirds

Novel approach: minutes in wind farm

- Out of 24 tagged seabirds, 4 visited the proposed wind farm during breeding season
- The 4 seabirds averaged less than 2 minutes / week in the area
- Multiplying up this average time spent in area by colony size gave an estimate of the number of colony bird days spent in area
- Overall percentage attributable to the SPA colony was 1.5 % or 0.7 adult collisions
- Daylight hours during breeding season taken into account
- Extended breeding season gave 1.3 % or 0.8 adult collisions

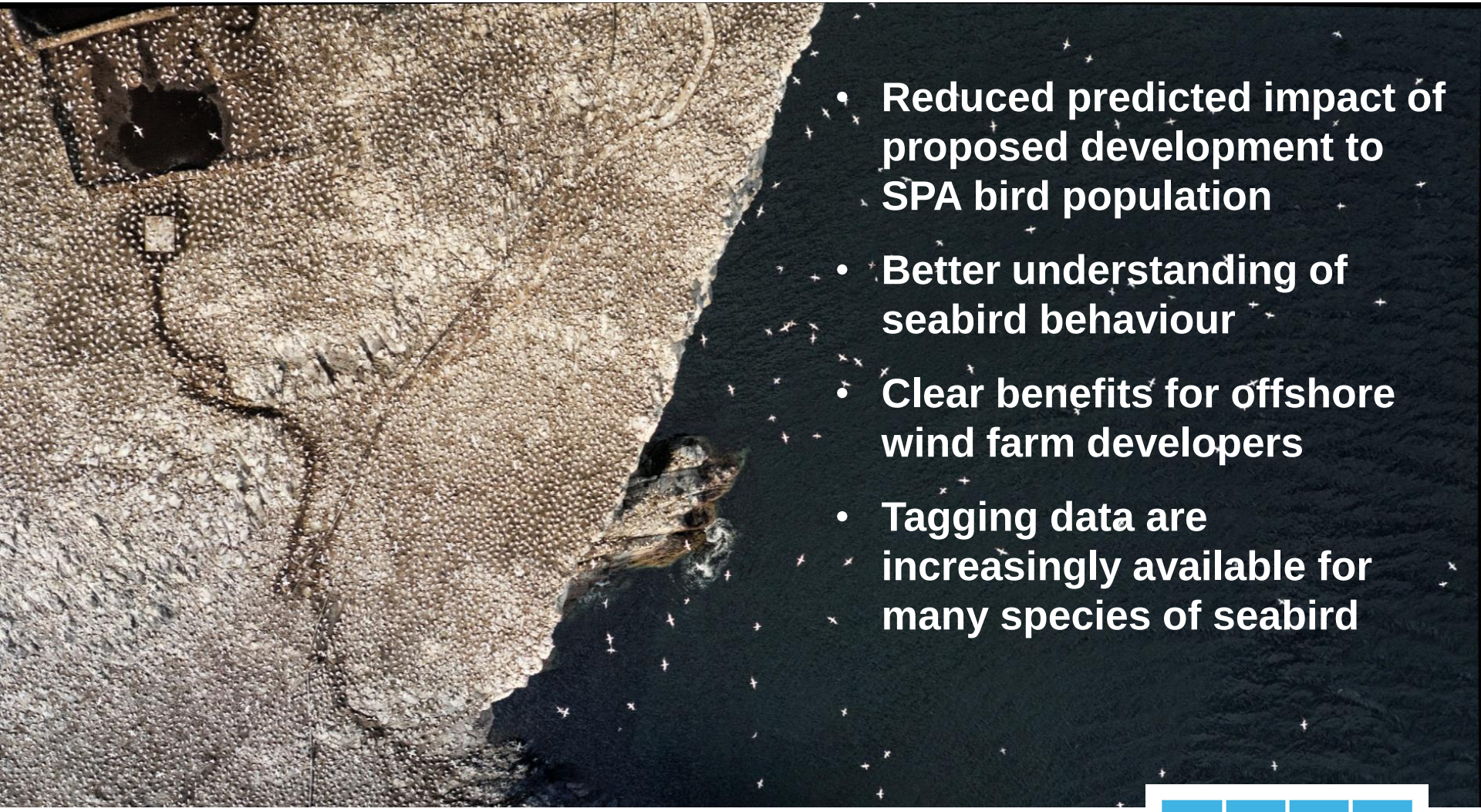
Decline in seabird presence with SPA colony distance



Precautionary assessment

- Behaviour (sitting or flying) was not taken into account
- Estimate based on 50 % nocturnal activity
- Less than 1 % of total time gulls spent flying offshore in the wind farm area was at night
- Had behaviour and nocturnal activity been taken into account collision risk would have been further reduced

Summary



- Reduced predicted impact of proposed development to SPA bird population
- Better understanding of seabird behaviour
- Clear benefits for offshore wind farm developers
- Tagging data are increasingly available for many species of seabird

Laura Jervis
l.jervis@apemltd.co.uk
+44(0)1244 520460
www.apemltd.co.uk