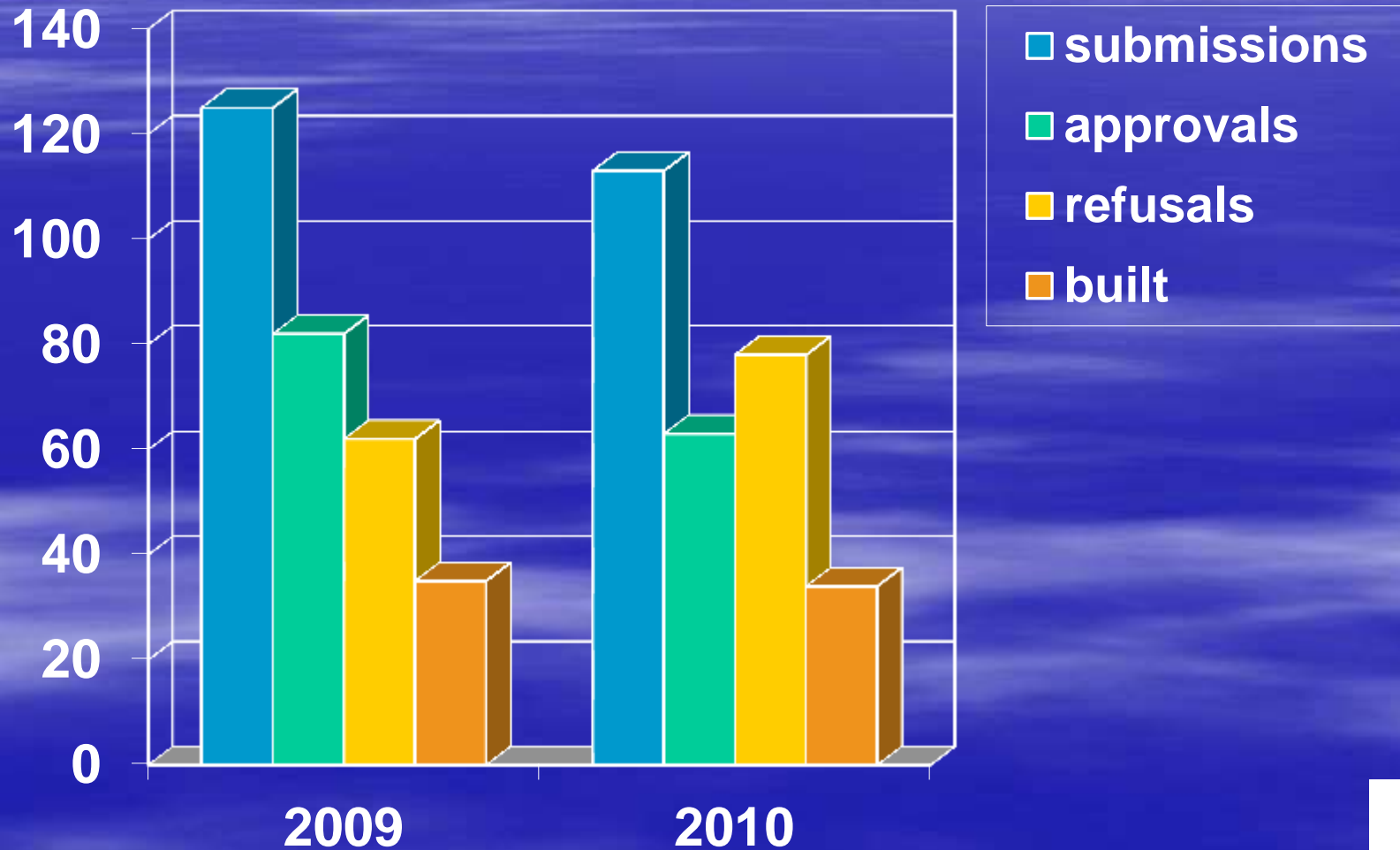




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Onshore large-scale wind development in Britain



The Telegraph

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Wind turbines 'hit' bat populations

Wind turbines are killing many thousands of bats contributing to a population decline that may be costing farmers millions of pounds, say researchers.



By **Richard Alleyne**, Science Correspondent 8:00PM BST 31 Mar 2011

 49 Comments

Scientists found the blades of wind turbines were a major threat to bats particularly when they are migrating.

Bats are useful to farmers because they eat large numbers of crop damaging insects, reducing the amount that has to be spent on pesticides.

Writing in the journal *Science*, the researchers estimated that bats could be worth billions to agriculture around the world.

Several migratory tree-living species of bats were being slaughtered "in unprecedented numbers" by wind turbines, said the researcher.



© AP



© Alamy

Threat: Thousands of bats have died after being sucked into the rotor blades of wind turbines costing farmers millions, researchers say



Aims of NBTS:

- Establish whether British wind turbines kill bats.
- Estimate the scale of effects
- Look for relationships with habitat and wind speed
→ mitigation methods applicable to UK.
- Assess predictive value of pre-construction acoustic surveys



i. Single-mast turbines

(30-80m; 15-75mW)

- Huge development
- Little preconstruction surveying
- Becoming permitted development
- Focus research on bat hotspots e.g. SAC sites



ii. Large installations

- 48 sites in 2yrs
- Sites with >4 turbines & $>60\text{m}$
- Carcass surveys 50m radius
- Acoustic surveys at height & ground
- Focus on peak mortality period



HOW?

















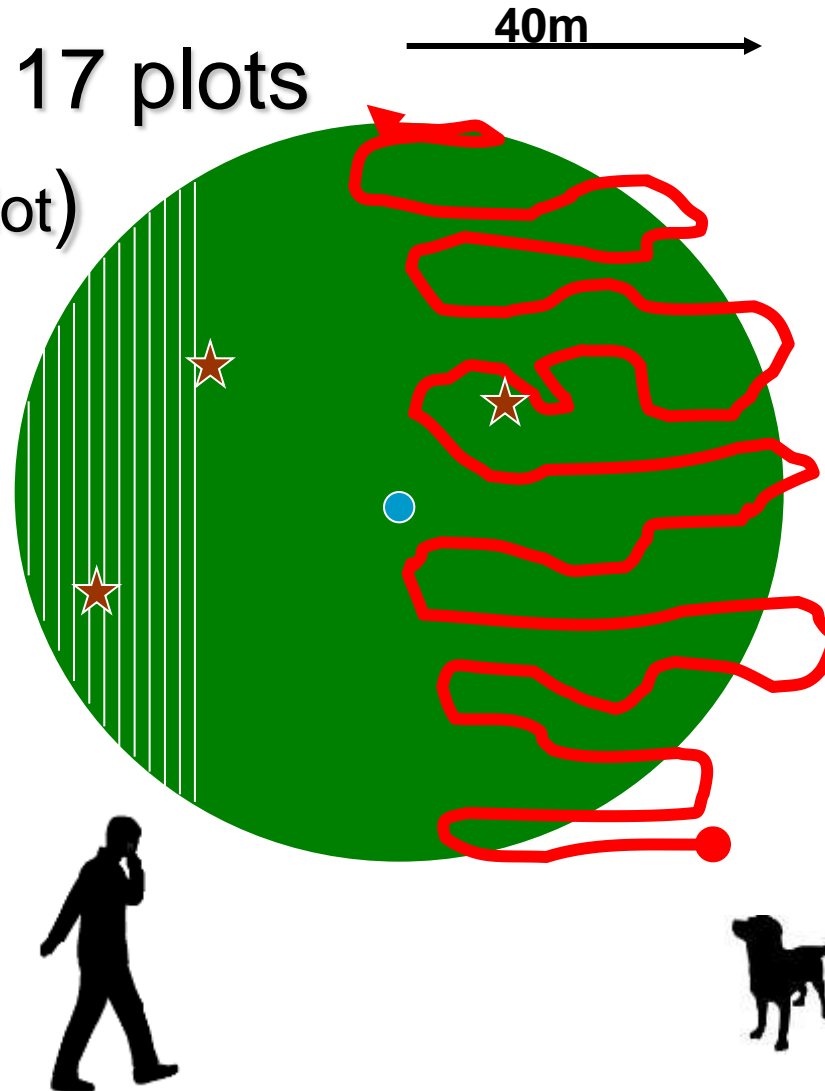






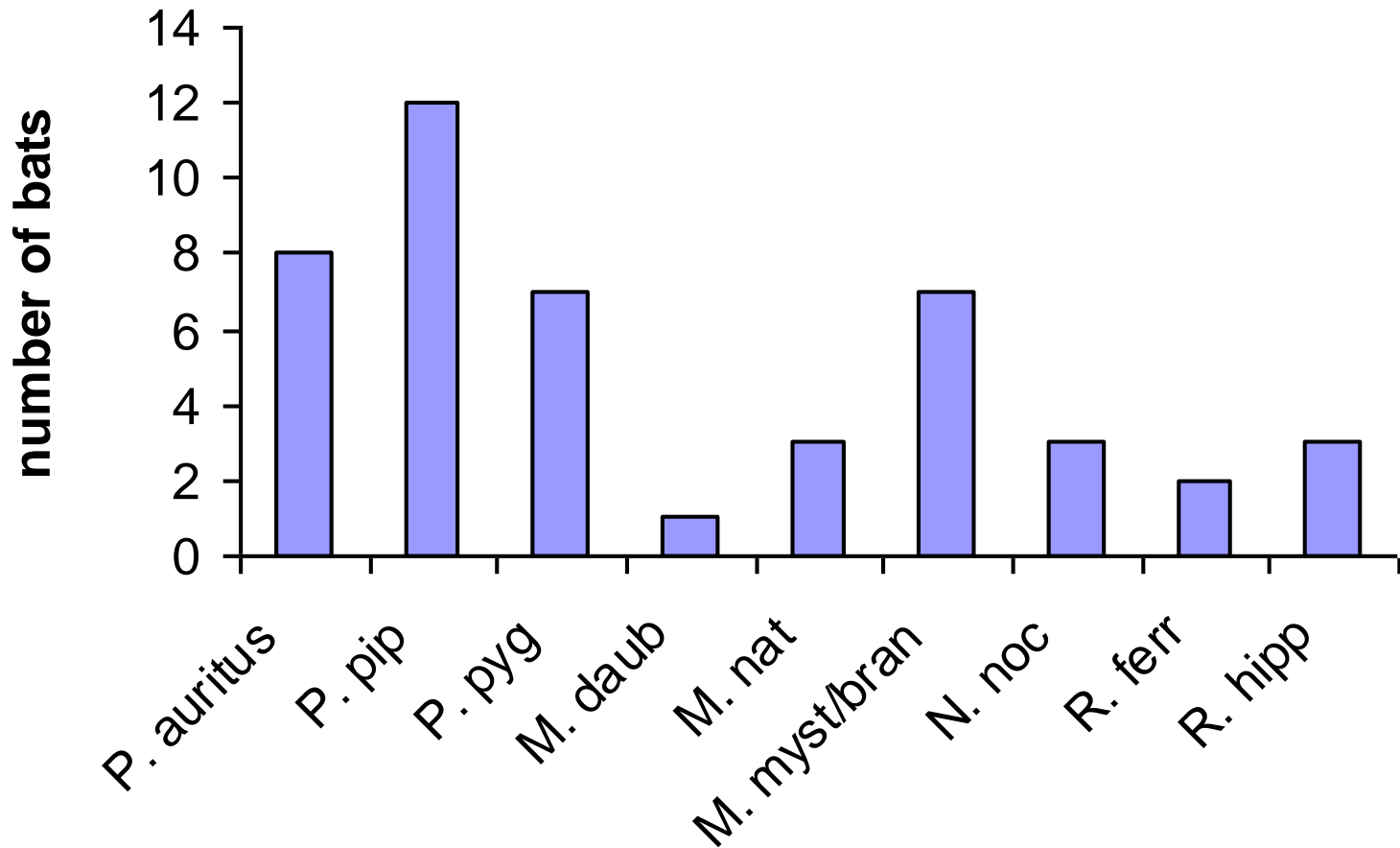
Experimental design

- 46 bats at 17 plots
(mean 2.7/plot)
- 2 sites
- 2 dogs
- 4 humans
- N=123 searches

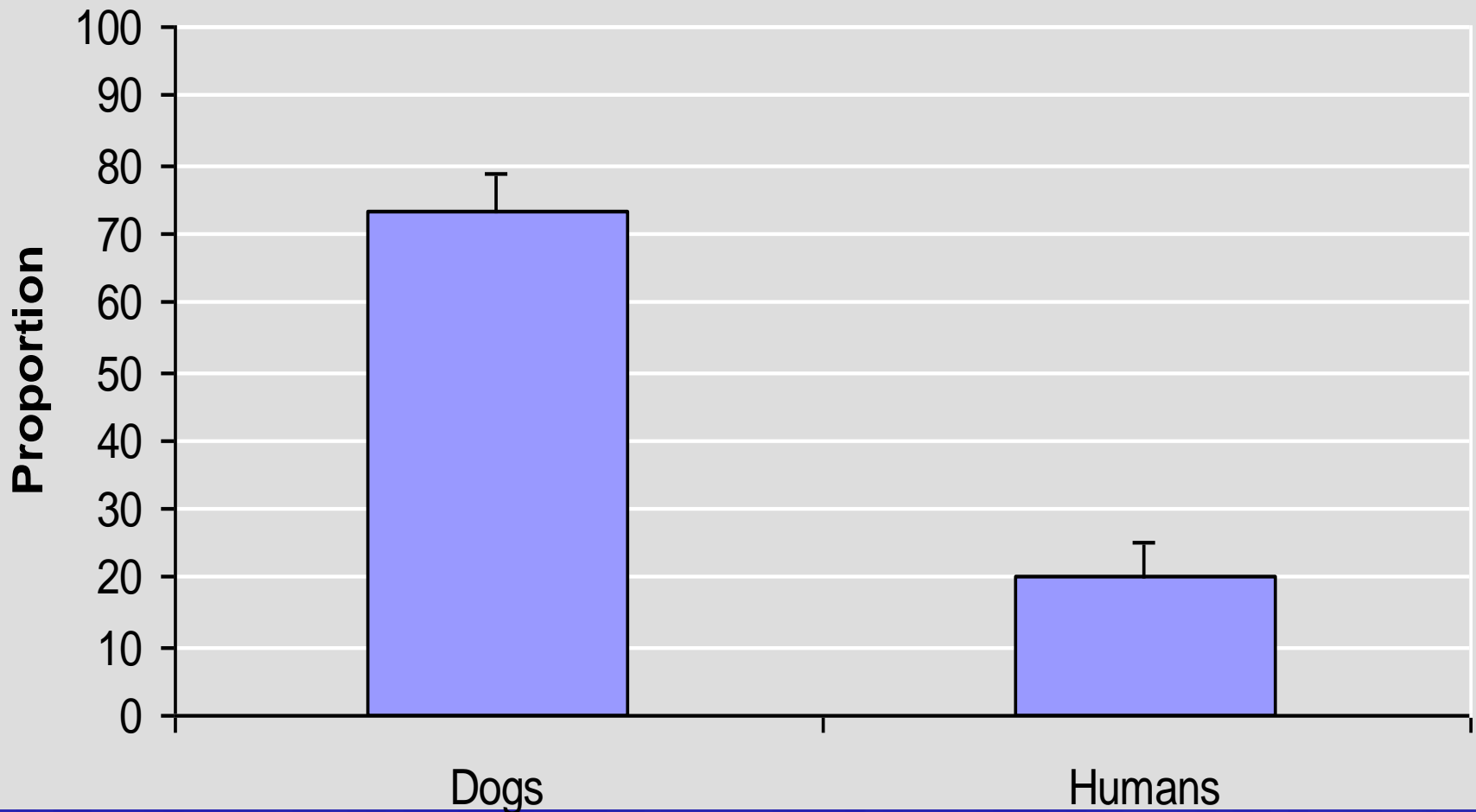


Random
selection of
turbines,
placement of
bats, & allocation
of searcher

Bat species used



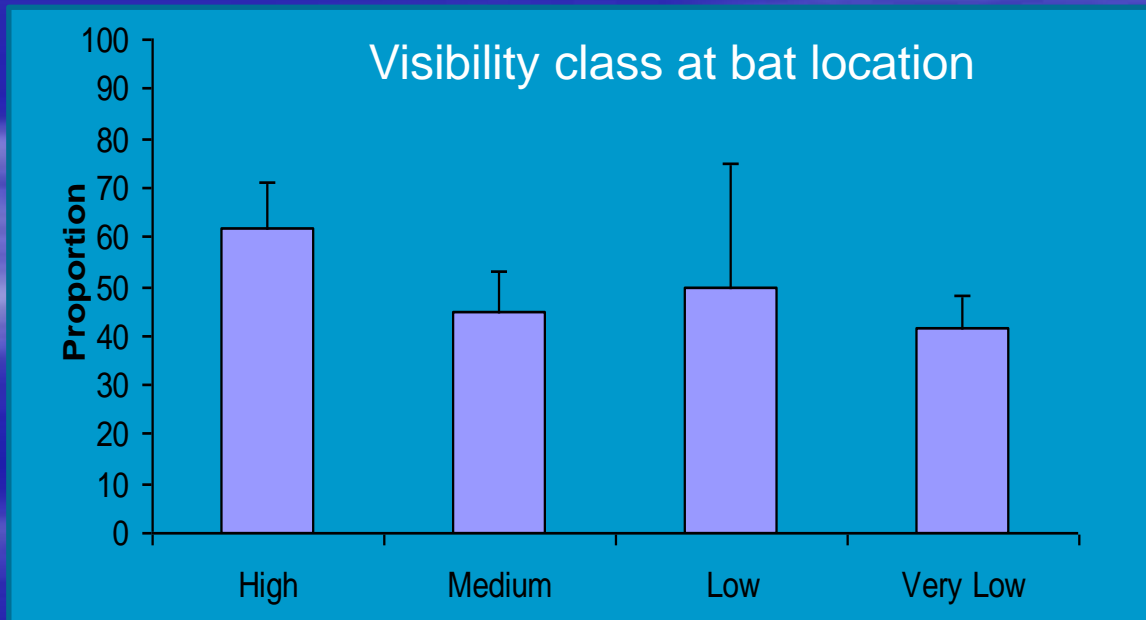
Simple proportion of bats located



Generalized mixed effects model (R, lmer) of probability of location for each bat, adjusting for repeated measures. Search type highly significant ($p < 0.001$).

Factors potentially associated with retrieval

All models include batID as random factor	AICC	P
Searcher type	134.0	<0.0001
Searcher type, veg height	135.3	0.0353
Searcher type, visibility class	129.4	0.0146
Searcher type, vis class, visclass*searcher	132.7	0.4317
Searcher type, bat species	144.4	0.6937
Searcher type, bat species, bat species*searcher	148.7	0.1640



Summary

- Dogs consistently better than humans
- Dog-human differential applies across all habitats tested (in UK, most sites at least 'moderate')
- Dogs have their limits & find 'very difficult' habitat difficult too!
- Huge time saving (40 mins cf. 2.5 hrs)



LIMITS & CAUTIONS

- Working dogs not pets!
- Need to have dogs with extremely high drive to achieve repeated retrievals.
- High set-up costs, kennelling etc.
- Common standards being produced, and testing required to show comparability of handlers and dogs.



Thanks to:

- Tom August, Philippa Hardman, Danielle Linton, Rhys Goodhead (field staff)
- Mick Swindells (trainer of dogs and handlers)
- Ecotricity
- Ozzy & Bracken!



Defra



