Use of remote video surveillance to investigate deer behaviour in relation to wildlife deterrents, roads and vehicles

Dr Jochen Langbein

Three Counties Traffic Partnership

Bedfordshire county council

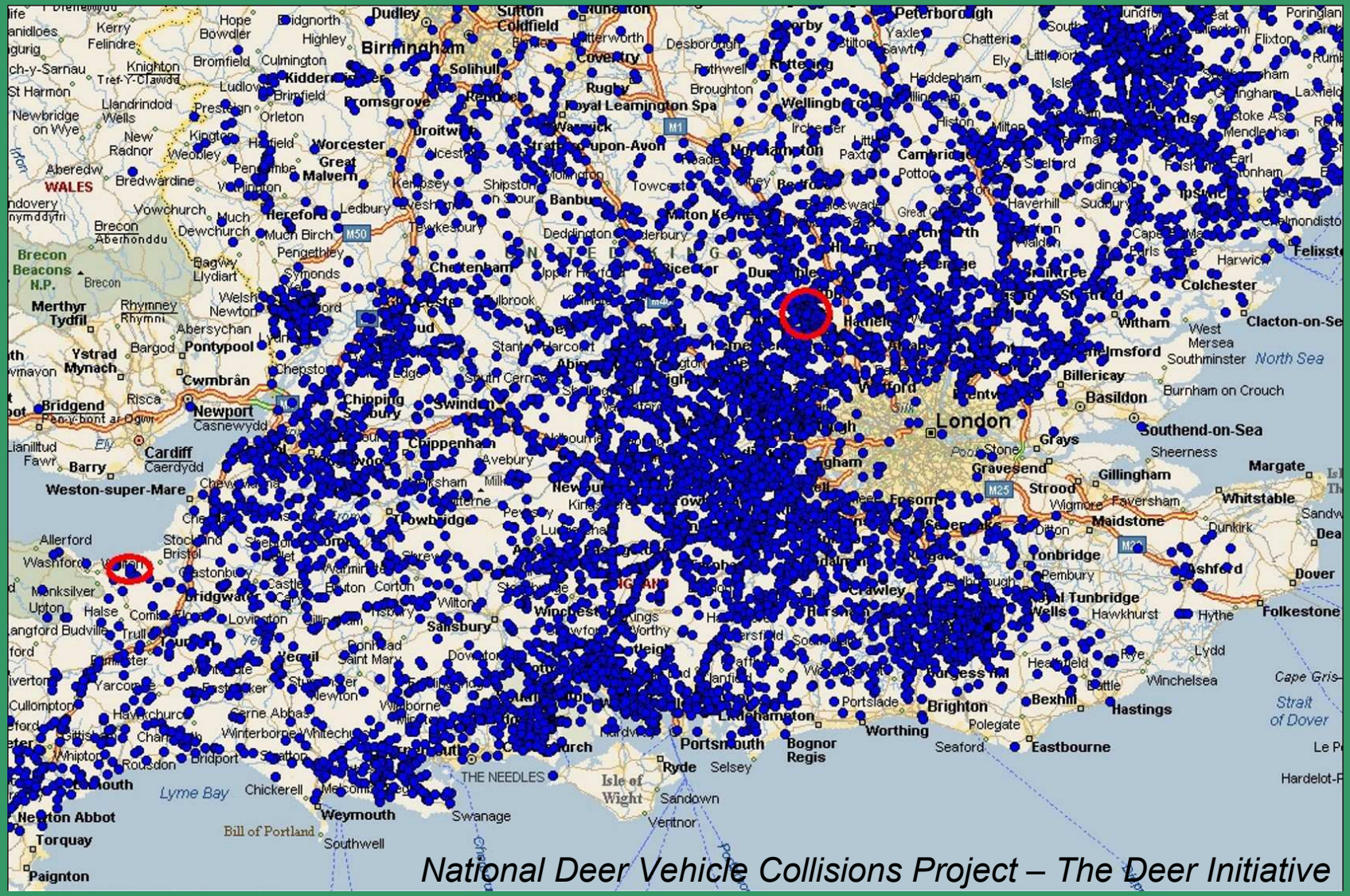
Hertfordshire

&

Somerset County Council

SOMERSET County Council

Reported Deer Collisions 2000-2005 *Trial locations*



National Deer Vehicle Collisions Project – The Deer Initiative

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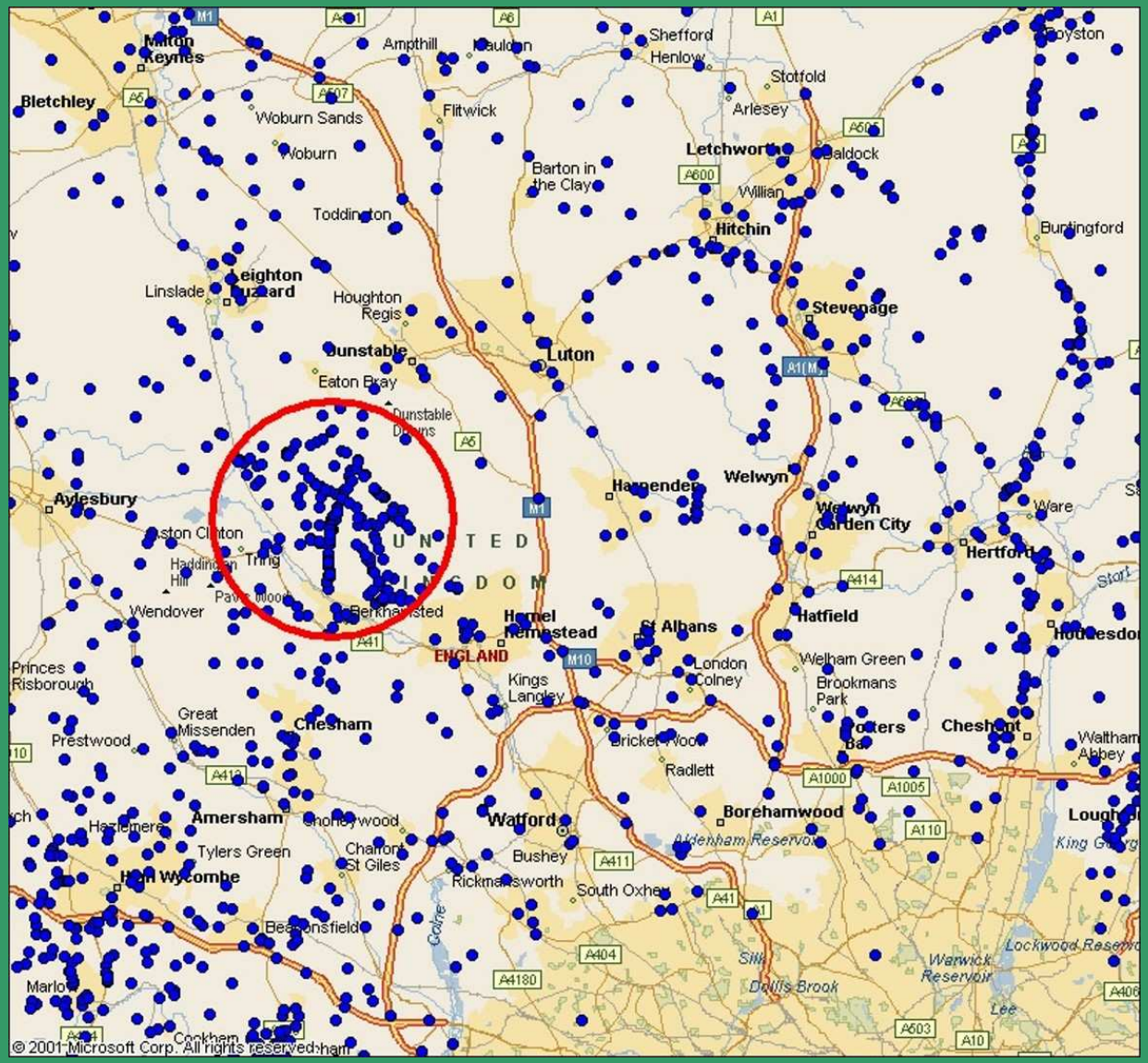
● *Reported Deer Collisions 2000-2005* ⬭ *Trial locations*



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B4506 Ashridge

Dumbach Animal activated Signs (May 2006)

Eurocontor Ecopillars (Oct. 2005)

Traffic flow >5000 Vehicles per day

Wegu-Gft Acoustic Reflectors (Sep. 2005)

1 km

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First Animal activated deer warning system in UK
(Hertfordshire Highways)

First Animal activated deer warning system in UK
(Hertfordshire Highways)

A39 Quantock Hills :
WEGU-Gft Acoustic Reflector trial (Oct. 2005 ...)

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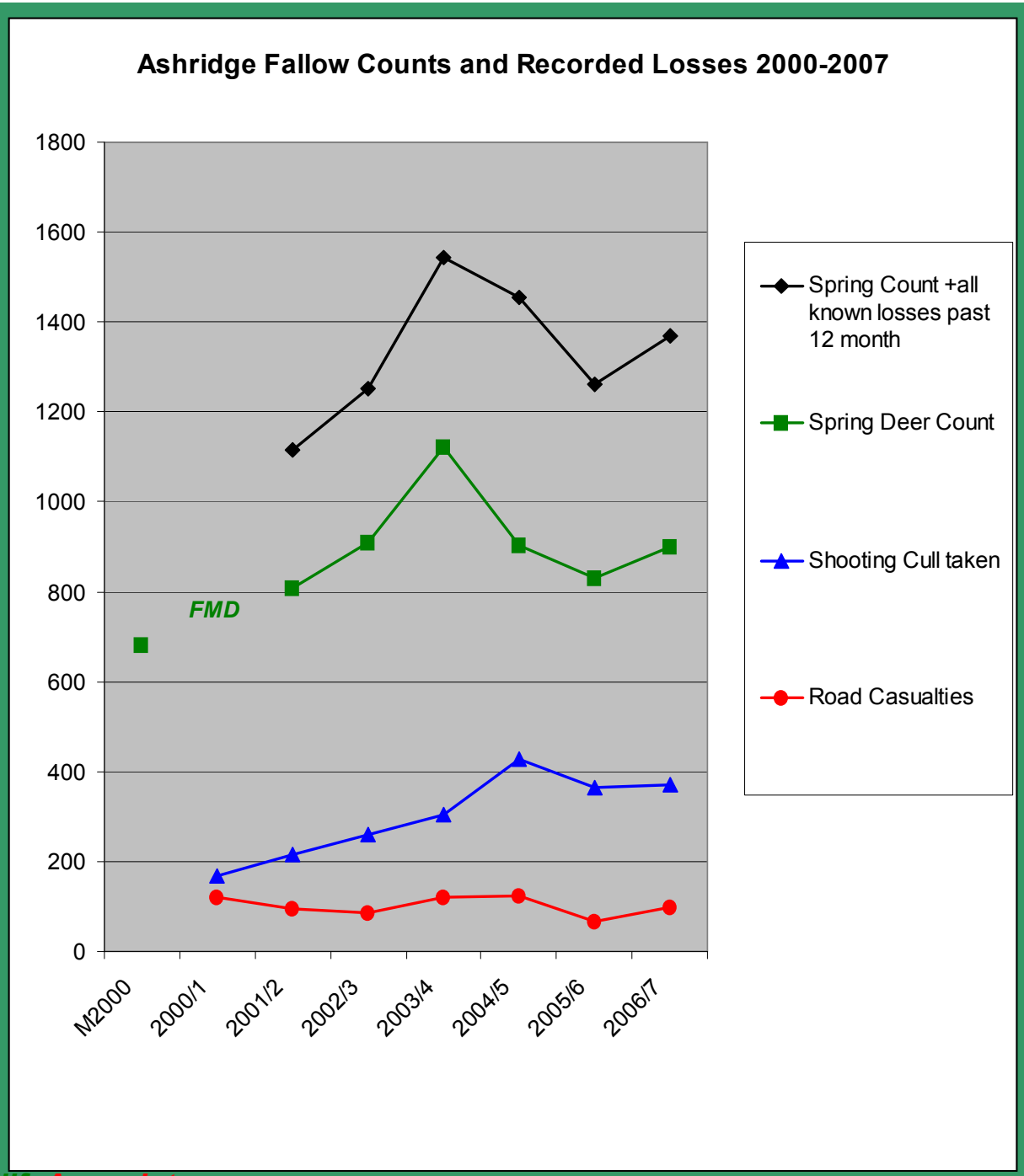
Confounding factors:

Variation in Deer Collisions between years may arise through changes including in e.g.:

- **Deer abundance**
- **Cull taken**
- **Distribution of cull activity**
- **Other local disturbance / events**
- **Agricultural cropping**
- ***Proportion* reported**
- **Publicity and Signage**
- **Traffic volume / speed**
- **Verge vegetation management**

- **…..as well as potential effects of Deterrents**



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- Digital covert video ;
- 2 - 3 cameras (for control + trial sections)
- 93 days filmed (61 Ashridge / 32 Quantocks)
- c. 1800 hrs useable footage
- >400 groups of deer filmed at road
- plus c. 100 fox, badger crossings

Video studies

To view example video clips go to:
www.deercollisions.co.uk/pages/avoid.html

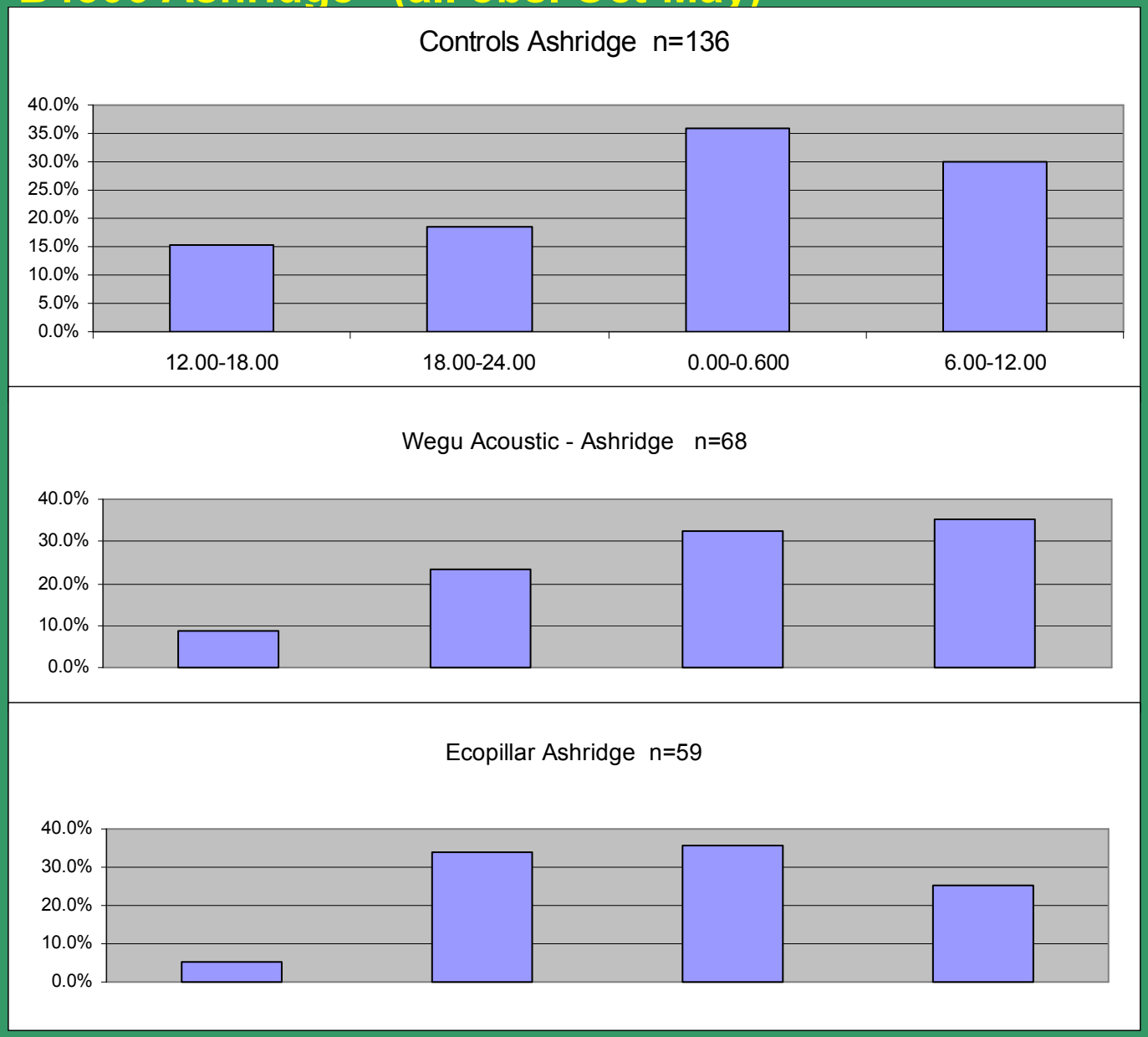
Video studies - :

- Much greater frequency of road crossings than expected
- Great variability in response to traffic & deterrents

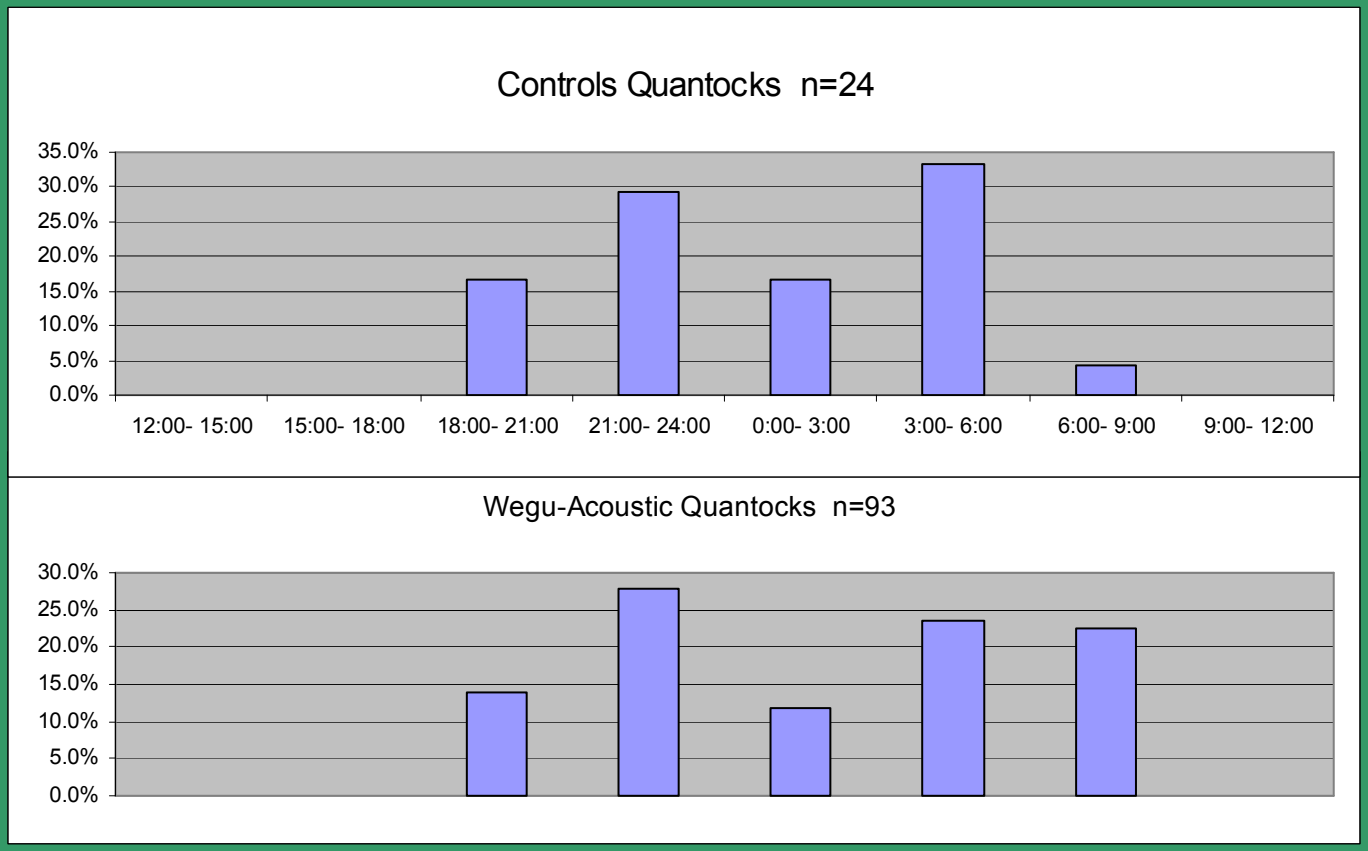
Video studies -

- High level of crossings recorded
- Wide variability in response to traffic & deterrents
- Red deer cross more ‘carefully’ vs fallow ?)

i. Diurnal distribution of deer video clips at roadside : B4506 Ashridge (all obs. Oct-May)



ii. Diurnal distribution of deer video clips recorded at roadside: A39 Quantocks



Delay after most recent vehicle below animal(s) entered roadway

Ashridge : Fallow Deer

Controls		>5 sec	5-10s	10-20s	20-30s	30-60s	1-2min	2-5min	>5min	Total
Crossed	dark	10	9	6	5	7	4	5	13	59
	light	15	5	3	3	4	3	-	-	33
Not cross	dark	3	4	1	1	2	-	1	4	16
	light	3	2	1	2	3	1	-	-	12
Total		31	20	11	11	16	8	6	17	120

Wegu-Gft

Crossed	dark	3	4	4	3	6	2	3	-	25
	light	8	4	2	2	2	1	-	-	19
Not cross	dark	2	3	3	1	-	-	-	-	9
	light	3	-	2	-	2	-	-	-	7
Total		16	11	11	6	10	3	3	-	60

Ecopillar										
Crossed	dark	3	2	-	3	1	1	1	-	11
	light	1	5	5	1	4	1	1	-	18
Not cross	dark	1	2	-	-	1	-	2	4	10
	light	-	1	2	1	2	2	2	-	10
Total		5	10	7	5	8	4	6	4	49

Median:

night

day

Muntjac

Muntjac - All	2				1		1	2	6

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Delay after most recent vehicle before animals entered roadway

A39-Quantocks : Red Deer

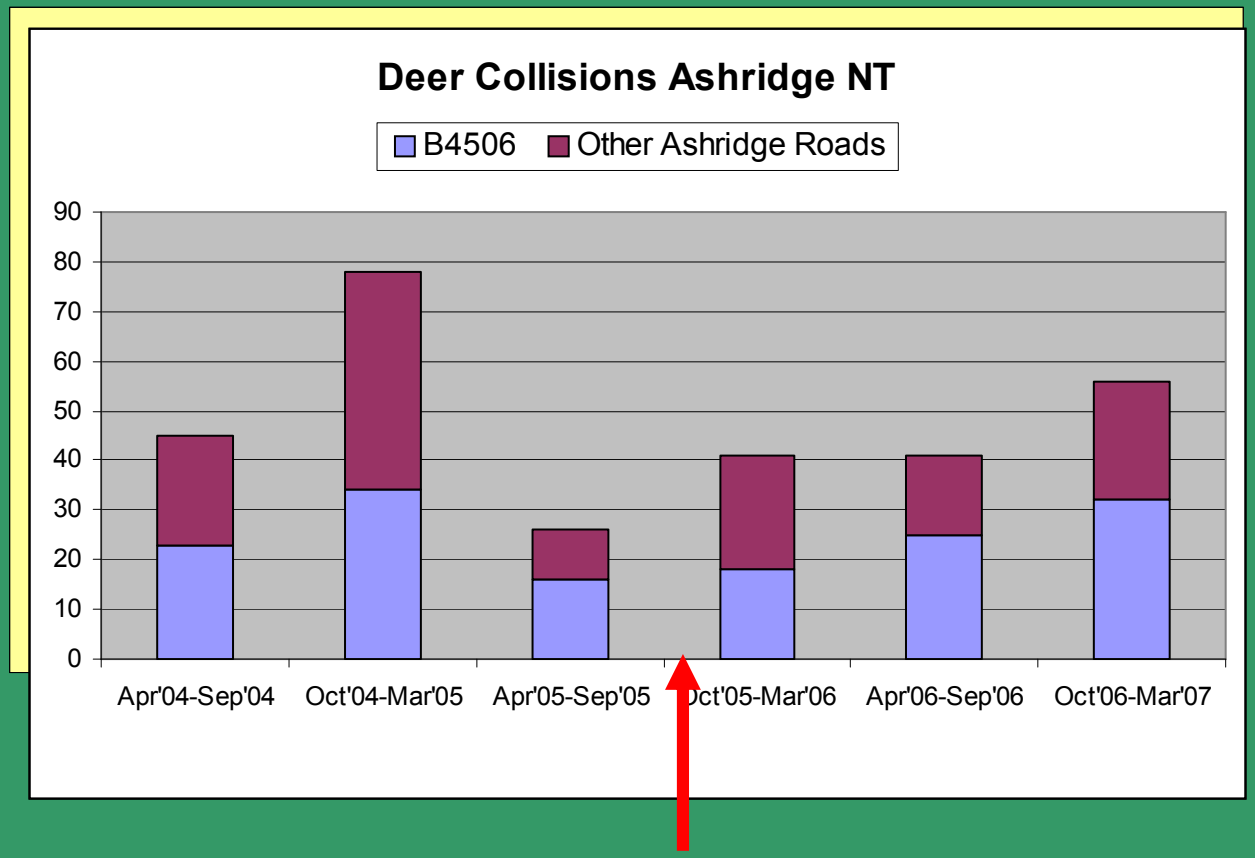
Controls		>5 sec	5-10s	10-20s	20-30s	30-60s	1-2min	2-5min	>5min	Total
Crossed	dark	-	-	-	1	7	7	2	2	19
	light	-	-	-	-	-	-	-	-	-
Not cross	dark	-	-	-	1	-	1	2	1	5
	light	-	-	-	-	-	-	-	-	-
Total		-	-	-	2	7	8	4	3	24

Wegu-Gft										
Crossed	dark	7	11	14	8	18	15	3	4	80
	light	-	-	-	-	-	-	-	-	-
Not cross	dark	2	-	1	1	2	4	2	-	12
	light	-	-	-	-	-	1	-	-	1
Total		9	11	15	9	20	20	5	4	93

Foxes (both areas combined)

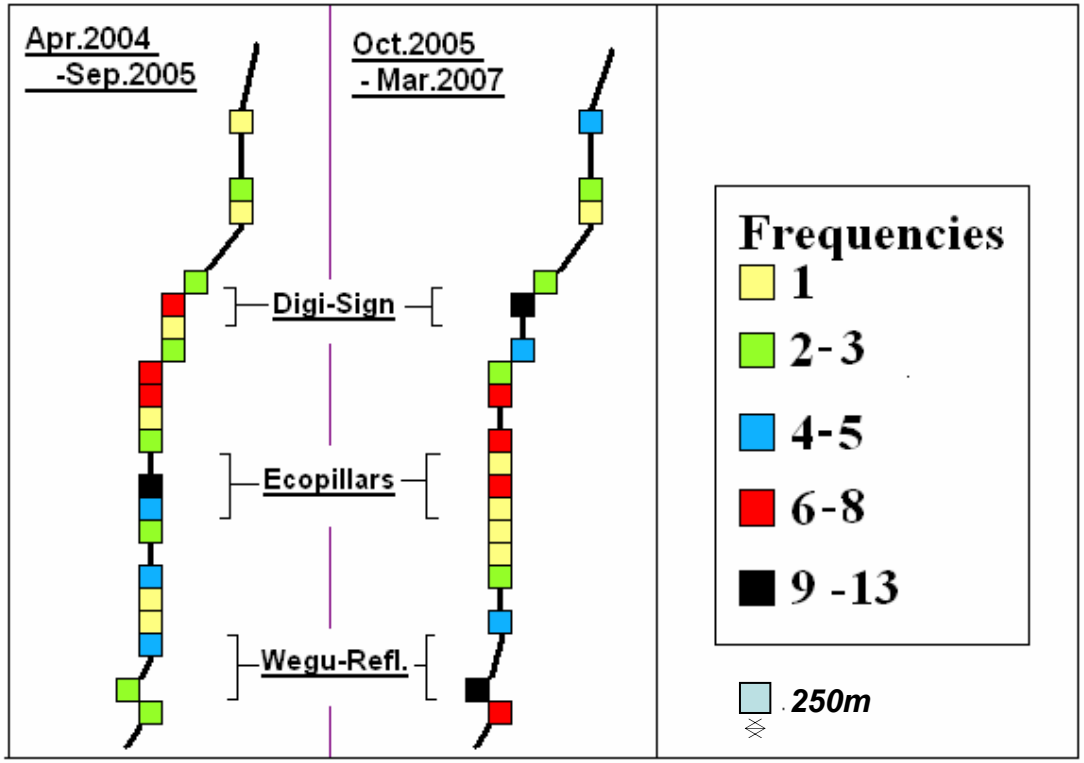
Fox crossings	>5 sec	5-10s	10-20s	20-30s	30-60s	1-2min	2-5min	>5min	Total
Control	1	4	4	1	6	4	2	5	27
Wegu-Gft	1	3	-	-	3	4	3	4	18
Ecopillar	1	-	3	1	5	3	4	4	21
total	3	7	7	2	14	11	9	13	66

Change in numbers of DVC at Ashridge



Deterrent installation

Number and distribution of Deer casualties
Before / After mitigation



Treatment	Apr'04-Sep'04	Oct'04-Mar'05	Apr'05-Sep'05	Oct'05-Mar'06	Apr'06-Sep'06	Oct'06-Mar'07	Apr'07-Sep'07
Wegu	5	2	1	4	6	5	1
Ecopillar	4	4	5	2	4	4	2
Control	14	28	10	12	15	23	12
[Digi-Sign)	(3)	(6)	(0)	(2)	(2)	(9)	0

Ecopillar signal response trials for fallow and red deer

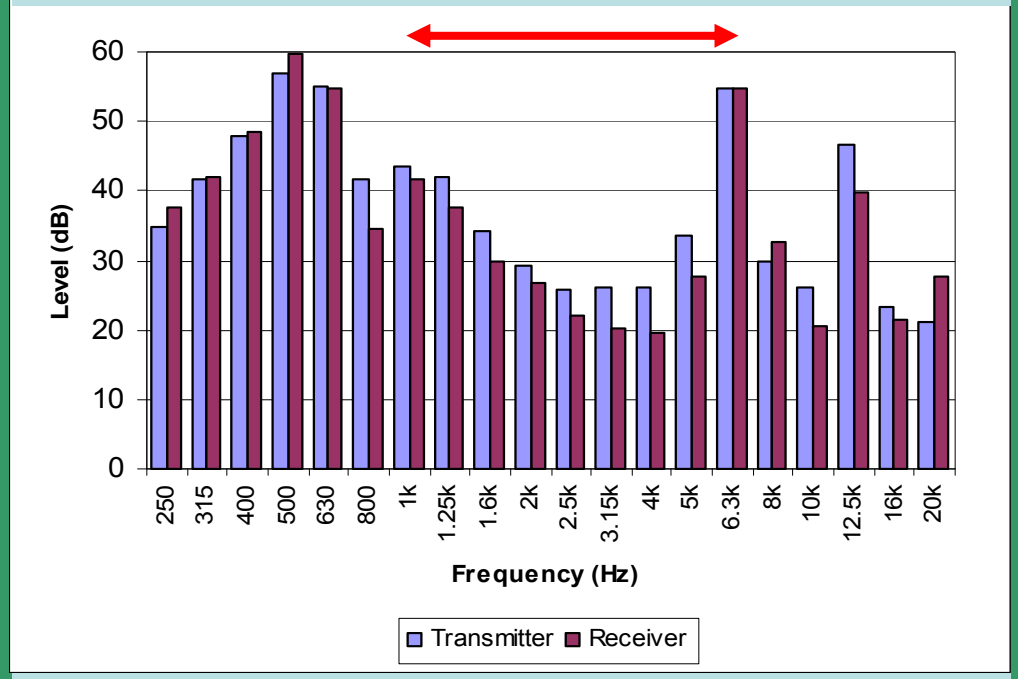
- **Response trials: fast habituation to Ecopillar signals by fallow and red deer.**

- **Response trials with Roe / Muntjac needed;**
- **& re Wegu-acoustic and other new devices**

Highfield & Petty, June 2007 - Somerset Scientific Services)

Ecopillar (type IV)

Frequecy Spectra of alarm signals (assessed at 30° at 20cm)



No true 'infrasound' detected (5-20Hz)

Attempts in lab. to trigger pillar to pillar (transmitter to receiver) unsuccessful

- *Literature indicates deer hearing most sensitive from 1kHz – 8kHz (reviews e.g. D'Angelo et al . 2004)*

From Acoustic measurements, Highfield & Petty, 2007 (Somerset Scientific Services) concluded:

- ***"The Ecopillar device produces noise at low levels likely to be dominated by traffic noise or background noise in woodland during windy conditions when separation distance from an alarm is more than 10m ".***

- ***& "probable that deer need to be within 3m of pillar for alarm to be distinctive above interfering noise from an approaching car ; ….even if it were able to trigger at 60m".***

Most other studies into effectiveness of ultrasound scaring devices on deer for e.g. crop protection also negative (e.g. Belant et al 1998) .

Redesigned *Eurocontor* replacement device now provided for testing ; Four to be installed at local blackspot on B4506

Integration of range of measures needed
- matched to local situation :

- Public awareness / posters / media
- Driver awarenes e.g. Interactive signs
- Speed limits, traffic calming critical
- Coordinated deer control / planning of cull
- Verge management
- Dog walker / visitor control
- Undisturbed sanctuary areas
- Wildlife Deterrents (??)

UK Highways Economic Note 1:
(at 2005 cost)

Recommended average 'Values of Prevention' of road accidents by severity of highest casualty :

- Fatal : **£ 1,645,110**
- Serious: **£ 188,960**
- Slight: **£ 19,250**
- *(Damage only £ 1,710)*

Average per Accident: **£ 64,460**

Cost / Benefit

In last five years 80 human injury DVCs recorded in Hertfordshire + Buckinghamshire + Bedfordshire

@ 16 injury accidents per year the annual

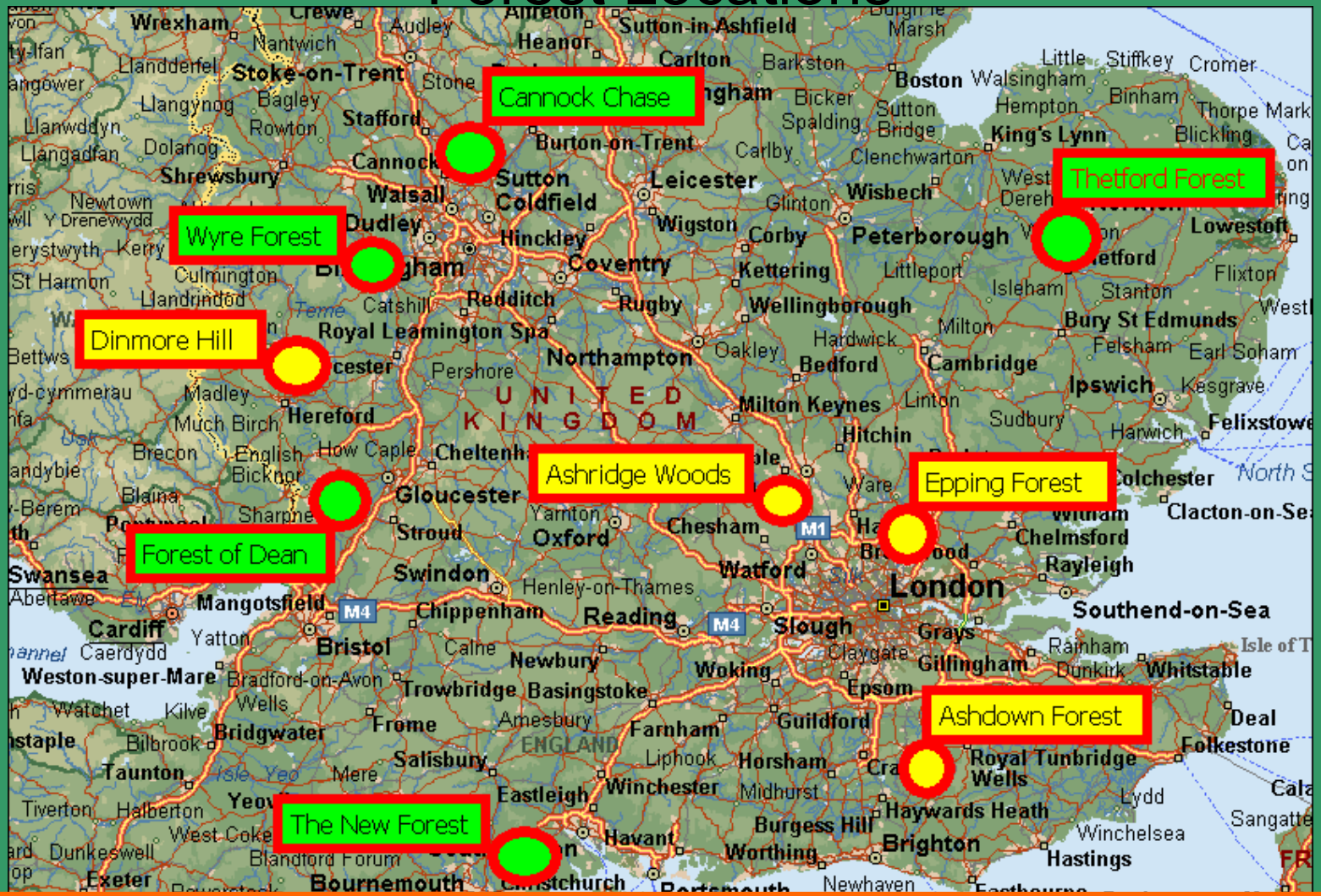
"value of prevention" =

£1,040,000 per year

Hence - £1,000,000 spending over five years on DVC prevention across the Three Counties could produce substantial net savings IF results in fall of DVCs by just by just 20% or more.

….. a realistic target, even at lesser spend ?

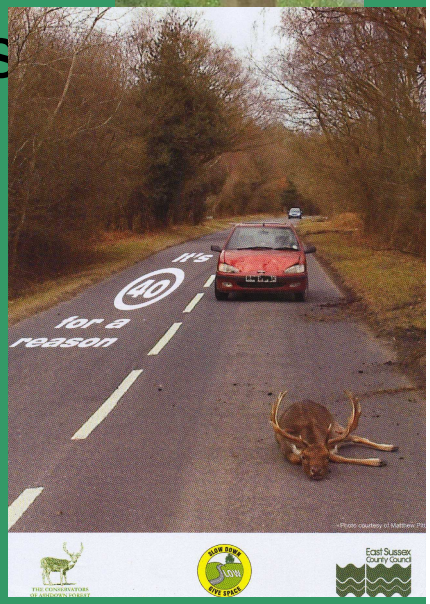
Forest Locations



Deer Road Kills <u>recorded</u> in 5yrs 2001-2005 in these nine Forest alone exceeds *> 4500 and include c. 105 human injury accidents.*

Approaches being tried elsewhere

- Dinmore Hill – deer control
  & Ecopillar trials
- Forest of Dean - temporary signage
- Cannock - cover/uncover reflectors
- Epping - dead hedge / reflectors in gaps
- Ashdown - awareness posters , plus
  enhanced road signage
- Thetford – rumble strips




Chan Maneesilasam

Thank you

- *Hertfordshire Highways &* mouchelparkman
- *The National Trust*
- *Chilterns AONB*
- *Buckinghamshire C C*
- *Bedfordshire C C*
- *Somerset C C*

& The Deer Initiative Partnership