Geographical Isolation of Commercially Farmed Native Sheep Breeds in the UK

Threats

disease

decrease in public funding
lack of political will to support rural communities
policies and legislation, including environmental schemes
predators
urbanisation
poor return on product, competition from other livestock
ageing population of farmers
lack of marketing support
inbreeding
loss of skills

www.heritagesheep.eu

value

the importance of the breed to its region through

adaptation and contribution to the local environment

adaptation to and ability to thrive in extensive farming systems

contribution to the local community - through social cohesion and tourism

contribution to the local economy - through demand for provenance / regional products...

endemism

endemism can be defined as the ecological state of being unique to a place

extent of geographical isolation of regional, commercially farmed sheep breeds?

Shetland

context for the endemism study

FMD epidemic in 2001 – Heritage Gene Bank

Formation of The Sheep Trust

UK National Action Plan – Heritage Sheep Breeds (HSBs)
a new category of FAnGR

ERFP commissioned scoping study of HSBs throughout EU

DG Agri, GENRES project on HSBs coordinated by The Sheep Trust

Defra funded study on endemism to determine the extent of geographical isolation of HSBs in the UK

UK National Action Plan on Farm Animal Genetic Resources

Recommended Action 17

The NSC should establish and keep under review the thresholds and priority levels for conservation action of breeds using scientifically robust criteria, further developing these as necessary. Thresholds for geographical concentration, local adaptation and breed distinctiveness, including use of other breeds or strains, need to be more clearly defined.

participating breeds

Scottish breeds	Welsh / Welsh border breeds	North of England hill breeds	South of England breeds
North Country Cheviot (Caithness type) Shetland South Country Cheviot	Brecknock Hill Cheviot Welsh Hill Speckled Face South Wales Mountain (Nelson) Clun Forest	Dalesbred Derbyshire Gritstone Herdwick Lonk Rough Fell	Devon Closewool Exmoor Horn Romney Southdown

methodology


Breed of sheep in this survey

Sticker here with breed name

CONFIDENTIAL

Personal details

Please amend if details shown incorrect

Name

Sticker here with farmer name and address to reduce form filling

Address

County

Post code

Tel

CPH

Email

If possible provide a grid reference that best locates your flock

If your flock is not located at your address above and you cannot give grid reference, name nearest village or landmark to where the major part of your flock is located

PUREBRED		OTHER BREEDS IN FLOCK		EWES	RAMS
Number of Ewes used for breeding purebred replacements		1			
Number of Ewes lambs under 1 year		2			
		3			
Total number of Ewes		4			
Total number of Rams		5			
TOTAL NUMBER OF PUREBRED SHEEP		TOTAL OF OTHER BREEDS			
	GRAND TOTAL OF ALL SHEEP (PUREBRED + OTHER BREEDS)				

the questionnaire for data gathering from the flock keepers was externally reviewed and approved by the Survey Control Liaison Unit at Defra prior to UK Ministerial approval and distribution.

reviewed by farmers for ease of completion

methodology

initial letter of proposal to Breed Society (BS) secretary

phone call to BS secretary

follow up letter detailing project to BS secretary

membership lists returned after discussion with BS

1st mailing to BS members

review and meeting with BS secretary

press releases

2nd mailing to BS members

review and discussion with BS secretary

mailing to targeted BS members via newsletters

methodology

Breed of sheep in this survey Dalesbred — **CONFIDENTIAL**

Personal details — Please amend if details below incorrect

Name

Address

E. & N. WRIGHT
STAUVIN FARM
ROEBURNDALE EAST
LANCASTER
LA2 8QS

County	LANCASHIRE	Post code	
Tel	015242 21652	CPH	21/188/10009
Email			

If possible provide a grid reference that best locates your flock SD 6164

If your flock is not located at your address above and you cannot give grid reference, name nearest village or landmark to where the major part of your flock is located

PUREBRED	Dalesbred	OTHER BREEDS IN FLOCK		EWES	RAMS
Number of Ewes used for breeding purebred replacements	350	1.	SWALEDALE	600	
Number of Ewe lambs under 1 year	180	2.	TEESWATER	15	12
Total number of Ewes FOR CROSS BREEDING	300	3.	LEICESTER	25	20
Total number of Rams	10	4.			
TOTAL NUMBER OF PUREBRED SHEEP	840	TOTAL OF OTHER BREEDS	1512	640	32
GRAND TOTAL OF ALL SHEEP IN FLOCK					

high reply rate – 72% of 16 breeds

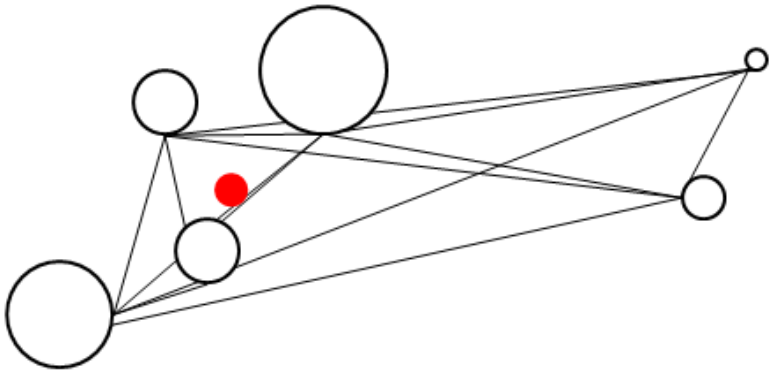
methodology

access database designed by Jonathon Drake VLA

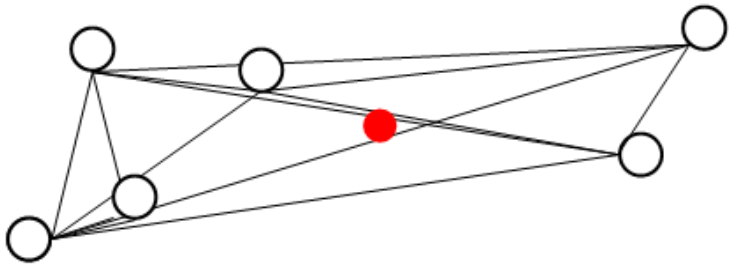
data entry by A. Carson and S. Steele

mapping performed by M. Elliott and J. Groom Defra, Economics and Statistics Programme, York

2007 / 2008



Mean centre of flocks - weighted



Mean centre of flocks – non weighted

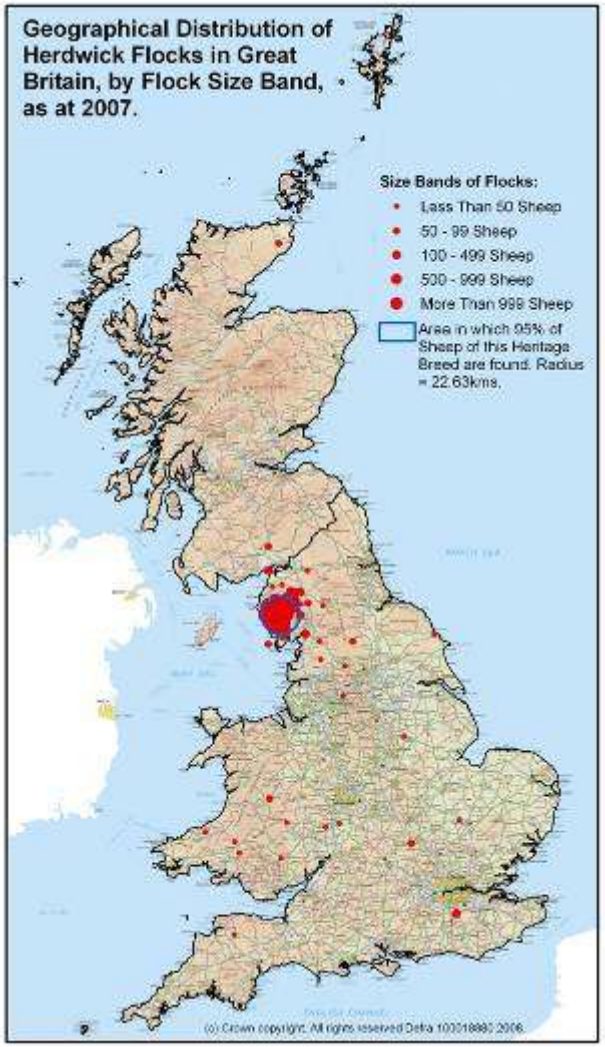
the mean centre shifts depending on whether or not you take into account the size of the flocks… i.e. you can look and see where the flocks are - or you can look and see where the sheep are...

new data from the study

number of purebred sheep by breed – importance of data collection from individual flock keepers to gain an accurate census

population structure – number of flocks comprising a breed varied immensely; size of individual flocks within each breed showed numbers of flocks per size range differed for each breed

spatial distribution – individual flocks placed on the map and geo-referenced


Geographical Distribution of Herdwick Flocks in Great Britain, by Flock Size Band, as at 2007.
Size Bands of Flocks:
Less Than 50 Sheep
50 - 99 Sheep
100 - 499 Sheep
500 - 999 Sheep
More Than 999 Sheep
Area in which 95% of Sheep of this Heritage Breed are found. Radius = 22.63kms.
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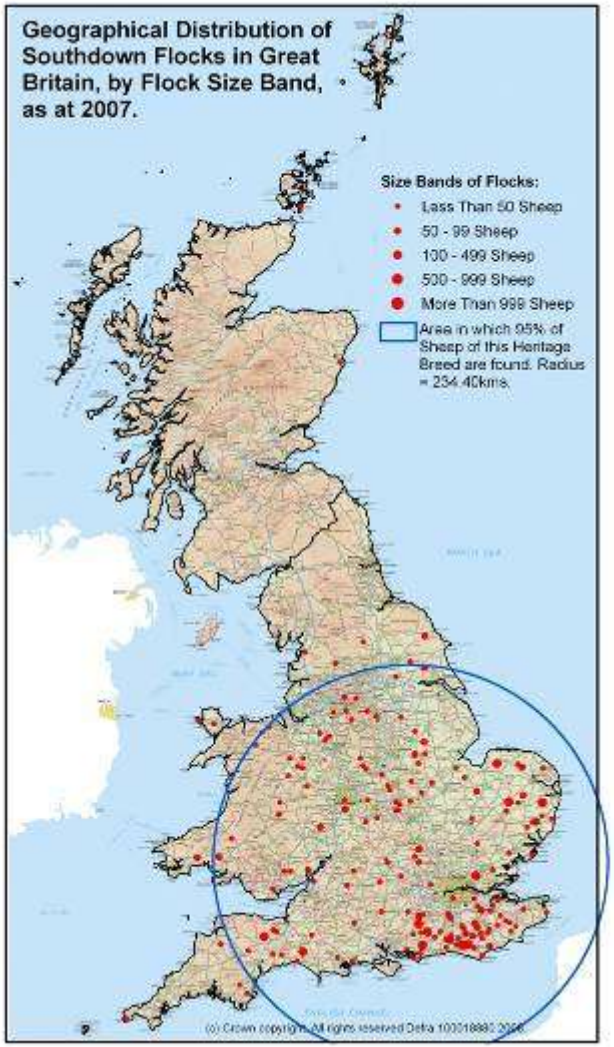

Geographical Distribution of Southdown Flocks in Great Britain, by Flock Size Band, as at 2007.
Size Bands of Flocks:
Less Than 50 Sheep
50 - 99 Sheep
100 - 499 Sheep
500 - 999 Sheep
More Than 999 Sheep
Area in which 95% of Sheep of this Heritage Breed are found. Radius = 234.40kms.

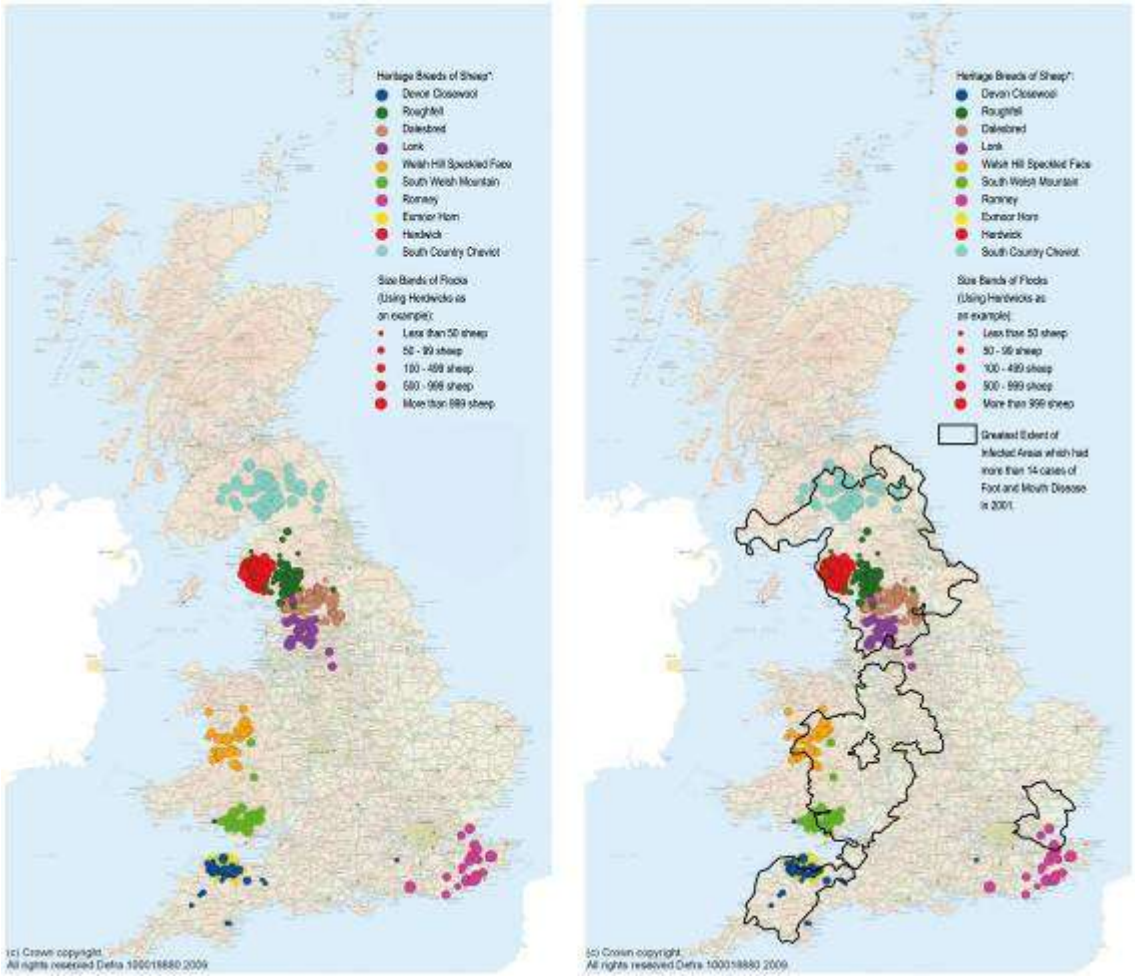
peer-reviewed publication in international scientific journal

"Geographical isolation of native sheep breeds in the UK
– Evidence of endemism as a risk factor to genetic resources" (2008)

A. Carson[1]. M. Elliott[2], J. Groom[2], A. Winter[3], D. Bowles[1,4]

1.The Sheep Trust, 2.Defra, Economics and Statistics Programme, 3.University of Liverpool, 4.Universiity of York

Livestock Science [LIVSCI 873] and available on-line at Science Direct


Heritage Breeds of Sheep*:
Devon Closewool
Roughfell
Dalesbred
Lonk
Welsh Hill Speckled Face
South Welsh Mountain
Romney
Exmoor Horn
Hardwick
South Country Cheviot
Size Bands of Flocks
(Using Hardwicks as
an example):
Less than 50 sheep
50 - 99 sheep
100 - 499 sheep
500 - 999 sheep
More than 999 sheep
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Heritage Breeds of Sheep*:
Devon Closewool
Roughfell
Dalesbred
Lonk
Welsh Hill Speckled Face
South Welsh Mountain
Romney
Exmoor Horn
Hardwick
South Country Cheviot
Size Bands of Flocks
(Using Hardwicks as
an example):
Less than 50 sheep
50 - 99 sheep
100 - 499 sheep
500 - 999 sheep
More than 999 sheep
Greatest Extent of
Infected Areas which had
more than 14 cases of
Foot and Mouth Disease
in 2001
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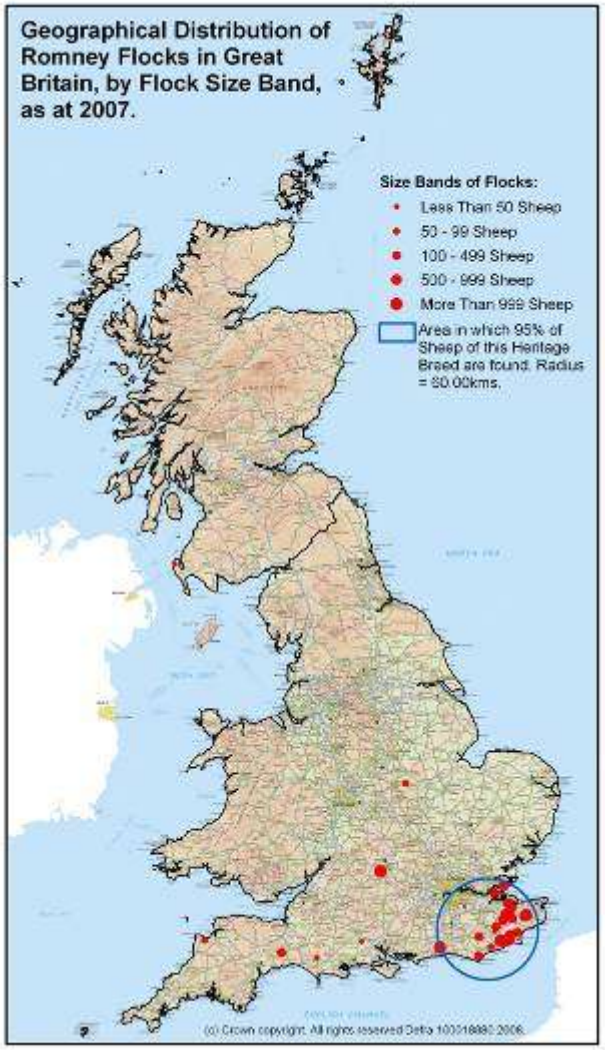
Geographical Distribution of Romney Flocks in Great Britain, by Flock Size Band, as at 2007.
Size Bands of Flocks:
Less Than 50 Sheep
50 - 99 Sheep
100 - 499 Sheep
500 - 999 Sheep
More Than 999 Sheep
Area in which 95% of Sheep of this Heritage Breed are found. Radius = 80.00kms.
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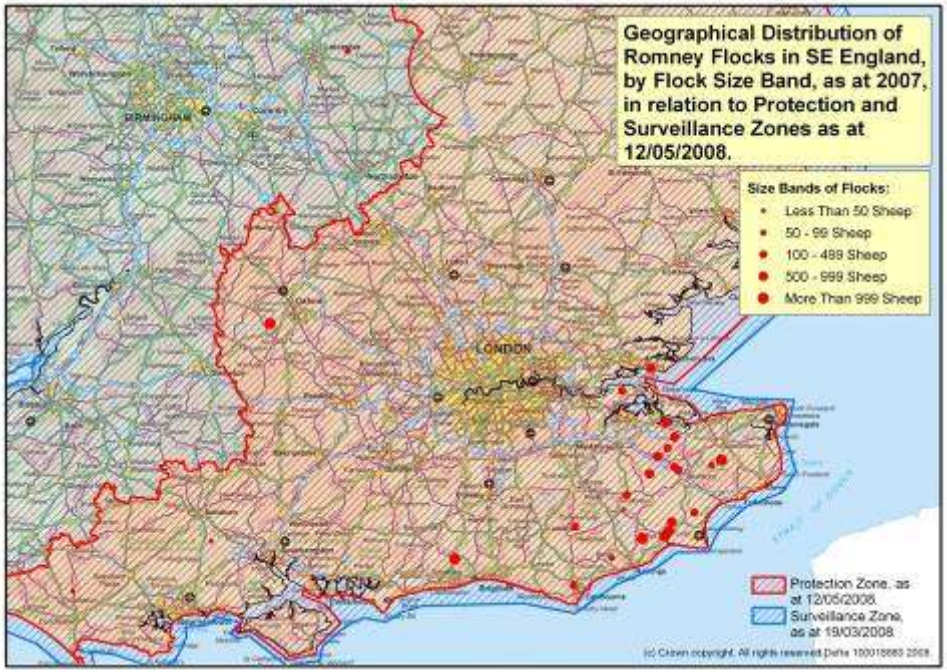
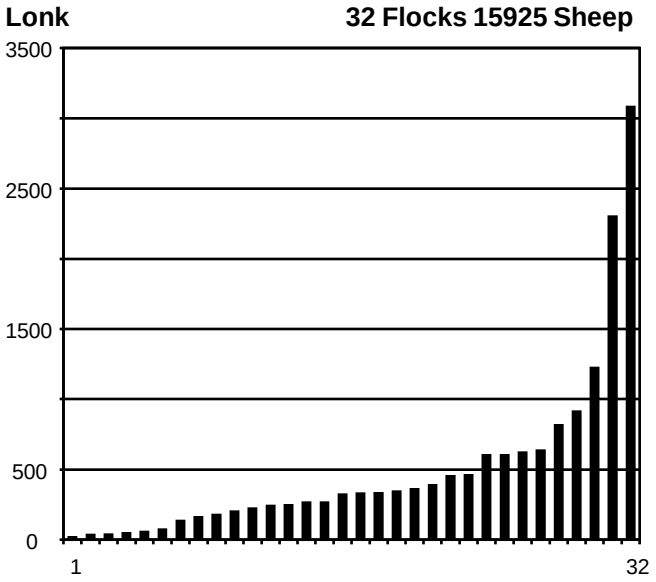
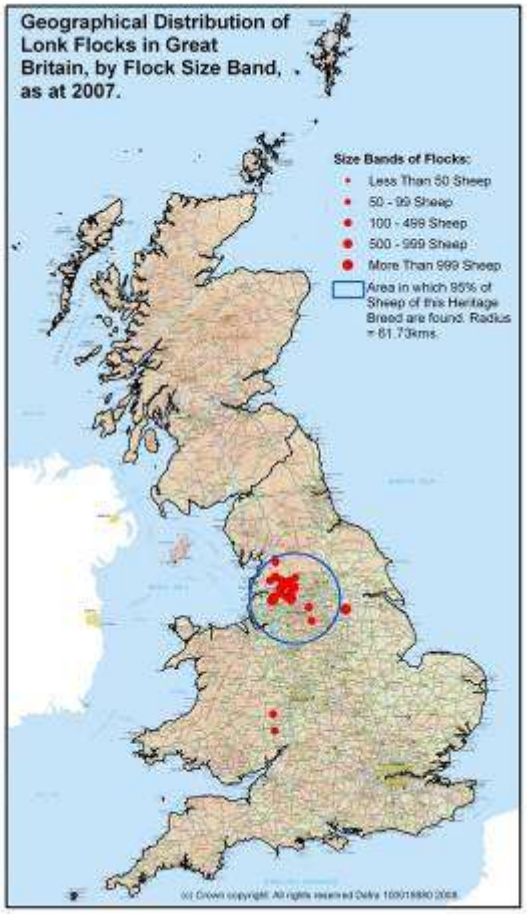
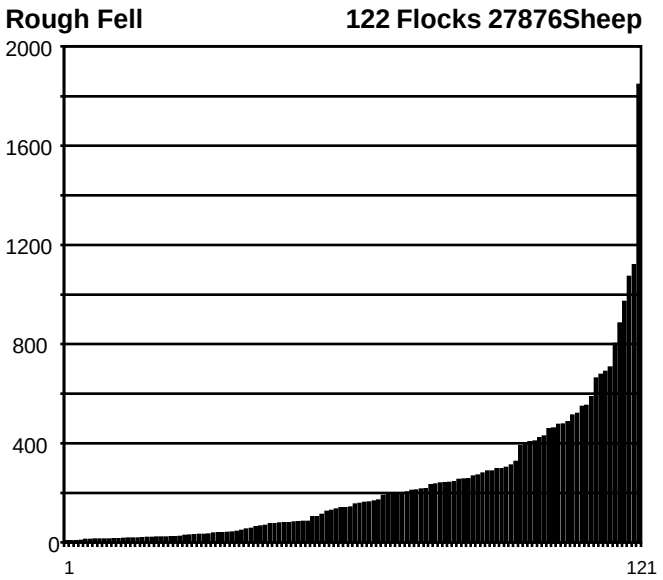

Geographical Distribution of Romney Flocks in SE England, by Flock Size Band, as at 2007, in relation to Protection and Surveillance Zones as at 12/05/2008.
Size Bands of Flocks:
Less Than 50 Sheep
50 - 99 Sheep
100 - 499 Sheep
500 - 999 Sheep
More Than 999 Sheep
LONDON
Protection Zone, as at 12/05/2008
Surveillance Zone, as at 19/03/2008

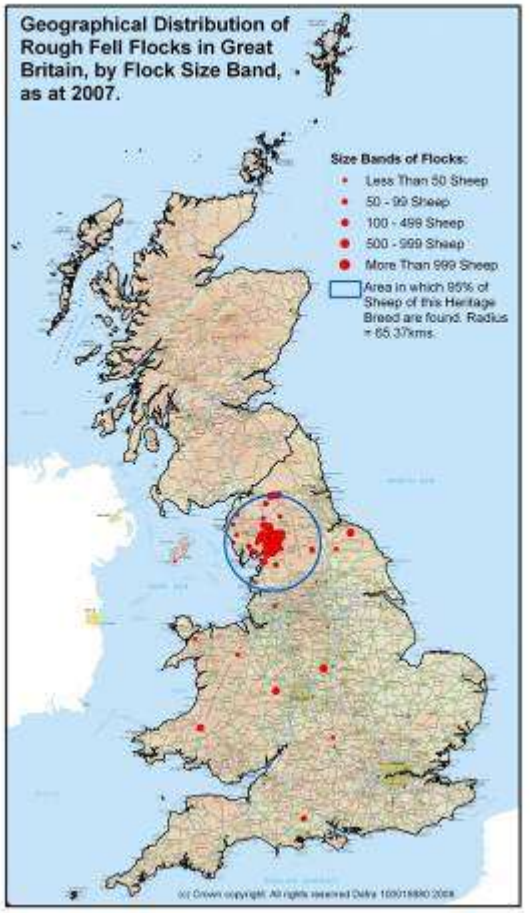
population structure





population structure





lack of standardisation across breed societies

breed societies do not always have up to date information nor quantitative data

qualification for registration is variable

not all breed societies register females

lack of standardisation across breed societies

	Flock Book	Registration of Rams	Registration of females	Pedigree information	Electronic records
Brecknock Hill Cheviot	1971 – 2001	NO	NO	NO	NO
Caithness Cheviot	1912	YES TATOO	YES TATOO	OWNER	NO
South Country Cheviot	1892	YES	NO	SIRE OF Ram recorded	NO
Clun Forest	1925	YES TATOO OR TAG FLOCK YEAR AND NUMBER	OPTIONAL	OWNER	PLAN TO USE GRASSROOTS
Dalesbred	1931	YES	%	2 GENERATION MATERNAL PEDIGREE OF RAM	HOME COMPUTER
Derbyshire Gritstone	1907	YES	10%	NO	NO

lack of standardisation across breed societies

	Flock Book	Registration of Rams	Registration of females	Pedigree information	Electronic records
Devon Closewool	1923	YES	YES	NO	EXCEL
Exmoor Horn	1906	YES	HORN MARK	NO	EXCEL
Herdwick	1920	YES EAR TAG	NO	NO	NO
Lonk	1905	YES	% Horn burn	NO	NO
Rough Fell	1926	YES	NO	NO	NO
Romney	1895	YES	YES	YES	EXCEL
Shetland	1926	YES	YES	NO	EXCEL
Southdown	1893	YES	YES	YES	GRASSROOTS
South Wales Mountain	NONE	NO	NO	NO	NO
Welsh Hill Speckled face	1964	YES	NO	NO	NO

country report - problems

Heritage breeds with no information on numbers of females

Romney

South Wales Mountain sheep

Welsh Hill Speckled face

Brecknock Hill Cheviot

Shetland Island sheep

confusing definitions

Shetland

Derbyshire Gritstone

Lonk

(Manx Loughtan IOM sheep not included)

confusing definitions

2004 (Commission Regulation (EC) No. 817/2004) risk status threshold for sheep of 10,000 breeding females

RBST/RBI numeric thresholds serve as a guideline for their watchlist – 3000 registered breeding females

different lists / different breeds at risk

HLS FEP Handbook 2004 - 33 breeds

New options for Environmental Stewardship 2006 – 42 breeds

Breeds at Risk Register – 35 breeds

8 - 10 geographically isolated breeds not on any list

conclusions

endemism presents a major risk to commercially farmed native breeds existing in significant numbers

to gain an accurate census for conservation and prioritisation purposes - either new standardisation across breed societies is required or direct interactions with individual breeders should be undertaken

recommendations

geo-referencing data of each breed should underpin legislation – a robust evidence-base now exists to demonstrate geographical isolation

both the number and individual size of breeding units/flocks for each breed of sheep should contribute to the estimation of risk of endangerment

a new framework and process for inclusion of sheep breeds to be prioritised in the event of a disease outbreak should be initiated urgently