

Shit Research

In search of the elusive and rare



Darren Mann

Oxford University Museum of Natural History

Oxford University Museum of Natural History



Hope Entomological Collections

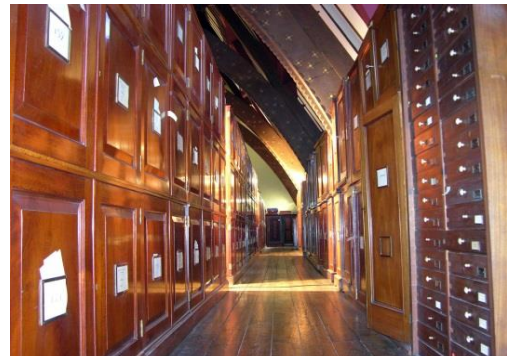
Insects, Arachnids, Myriapods

Dried & Spirit collections

>6 Million specimens

> 32,000 drawers of insects

>30,000 types



Life Collections
Earth Collections
Library & Archives
Public Engagement

<http://morethanadodo.com/>

@morethanadodo



Life Collections

M. Carnall

J.E. Hogan

D.J. Mann

B. Palumbo

Z.M. Simmons

A.D. Spooner

TCV Natural Talent Trainee

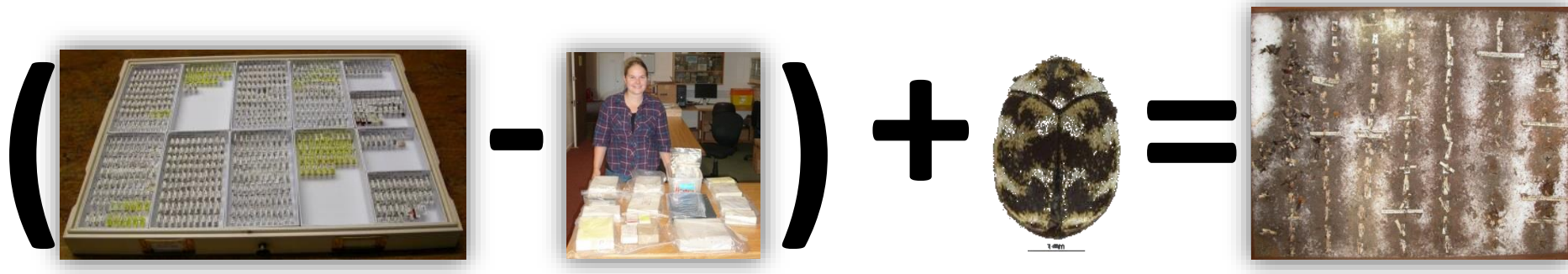
Ceri Watkins

Making Collections Safe & Accessible

& associated data



35% Decline in Natural History Curators



Is a decline in specialist curators bad for museums?

Rebecca Atkinson, 02.04.2013

Vote in our poll and have your say

Are specialist curators a dying breed? And, if they are, does it matter?

A recent survey carried out for *Museums Journal* found that the number of natural history curators has declined by more than 35% in the past decade.

The number of art curators has also fallen by over 23%, while "human history" (archaeology, world cultures and social history) curator decreased by over 5% in the same period.

This loss of expertise has implications for specialist knowledge and collections care, but to what extent does this matter to the wider role of museums and the public they serve?

Vote in our poll and have your say:

Poll

Is a decline in specialist curators bad for museums?

Yes

91%

No

9%

MUSEUMS ASSOCIATION

This poll is now closed

<http://www.museumsassociation.org/museums-journal/news/02042013-poll-is-a-decline-in-specialist-curators-bad-for-museums>

One museum curator wrote: "There are now more pandas living in Edinburgh than there are natural history curators employed in the whole of East Midlands, West Midlands and South Yorkshire put together."

Natural History Near You

Putting natural history collections on the map

advocacy@natsca.org

Natural history collections are vital for understanding and safeguarding our planet.

To make the most of them we need to know where they are held, how they are cared for and how people can access them.

This is where NatSCA needs your help!

We're crowdsourcing a map of collections in Britain & Ireland. Please help us by adding collections that you know about or correcting existing entries by visiting:

natsca.org/NHNearYou



NatSCA

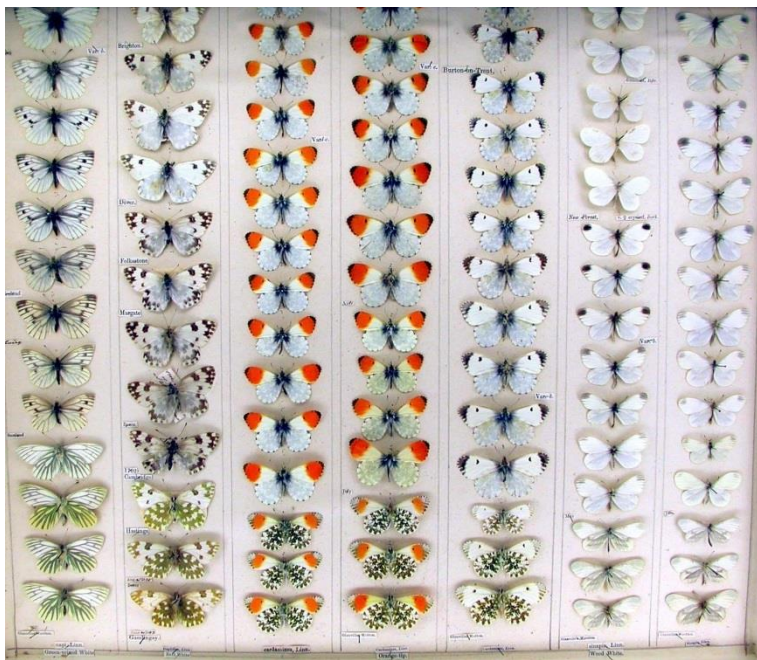
Natural Sciences Collections Association



<http://www.natsca.org/NHNearYou>

Collections = Verifiable Biodiversity Data

Collections equate to a biodiversity database, with each drawer not only containing valuable long term data, but more importantly the associated voucher specimen that can be used to validate an identification



Dale Collection, OUMNH



Polyphylla fulvo – early 19th C.
Hunterian Museum, Glasgow

Museum Collection Discoveries



19th C. specimens – Lost, Destroyed or No data

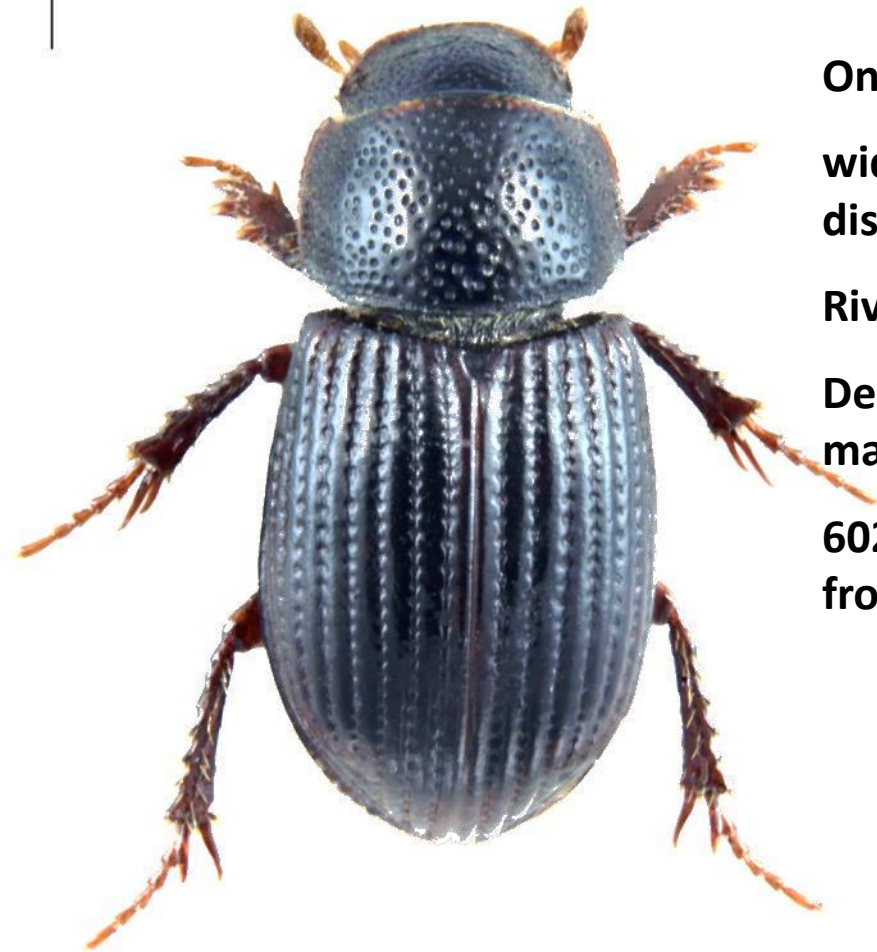


Species Discovered New from Collections



New localities & Data from Collections

Psammoporus insularis Pittino, 2006



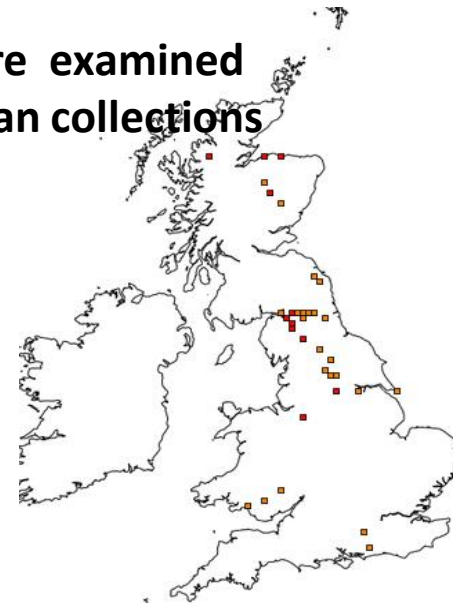
One of our only endemic species

widespread with a primarily north –western distribution.

River shingle, sandy river banks

Described as a new species to science from material in the National Museum, Cardiff

602 specimens of the genus were examined from across most major European collections



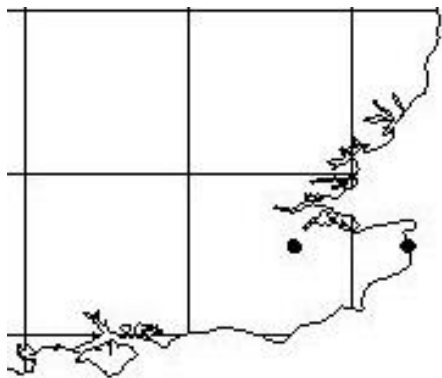
Aphodius punctatosulcatus Sturm, 1805

1998 – BENHS Collection, Ryarsh (TQ65) Kent, 1938

Further specimens Collections from Deal (TR35) in NMW,
Cardiff, WM, Liverpool, OUMNH (20 in total)

Deal – 1890-1910

Confused with *A. sphacelatus* & *A. prodromus*



Mann, D.J. 2000. 1999 Annual exhibition, Imperial College, London SW7. 27 November 1999. Winter Breeding Aphodius (Scarabaeidae).
British Journal of Entomology and Natural History 13: 179.

Mann, D.J. 2002. Changes to the British Coleoptera List published in 2000 and 2001. The Coleopterist 11(2): 52-63.

Onthophagus taurus or Not?



Onthophagus taurus (Schreber, 1759)

Extinct Native

Few historic specimens in collections

Poor data

Sites - New Forest, Exmouth, Oxford



Onthophagus illyricus (Scopoli, 1763)

?Extinct Native

Few historic specimens in collections

No data

Sites - Unknown

Not recognised in early literature



Corrugated Scarab *Brindalus porcicollis*

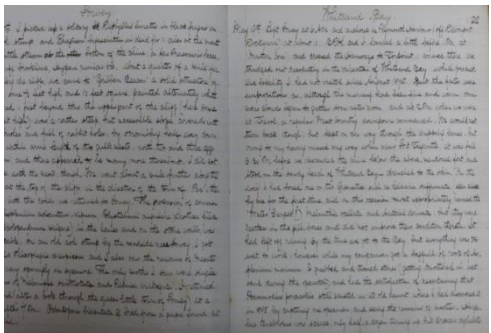
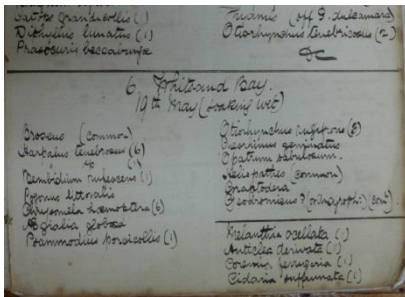


Critically Endangered

Believed extinct between 1897- 1997

Only known from Whitesand Bay, Cornwall

J.H. Keys (Plymouth City Museum) & J.J. Walker's (OUMNH) collections & archives were invaluable for this species' rediscovery



What's in a name?

Subfamily APHODIINAE Leach, 1815

APHODIUS Hellwig, 1798

Subgenus PLANOLINUS Mulsant & Rey, 1870

borealis Gyllenhal, 1827

putridus sensu (Sturm, 1805) **non** (Geoffroy in Fourcroy, 1785)

fasciatus (Olivier, 1789)

putridus sensu (Herbst, 1789) **non** (Geoffroy in Fourcroy, 1785)

foetidus (Fabricius, 1792) non (Herbst, 1783)

uliginosus Hardy, 1847

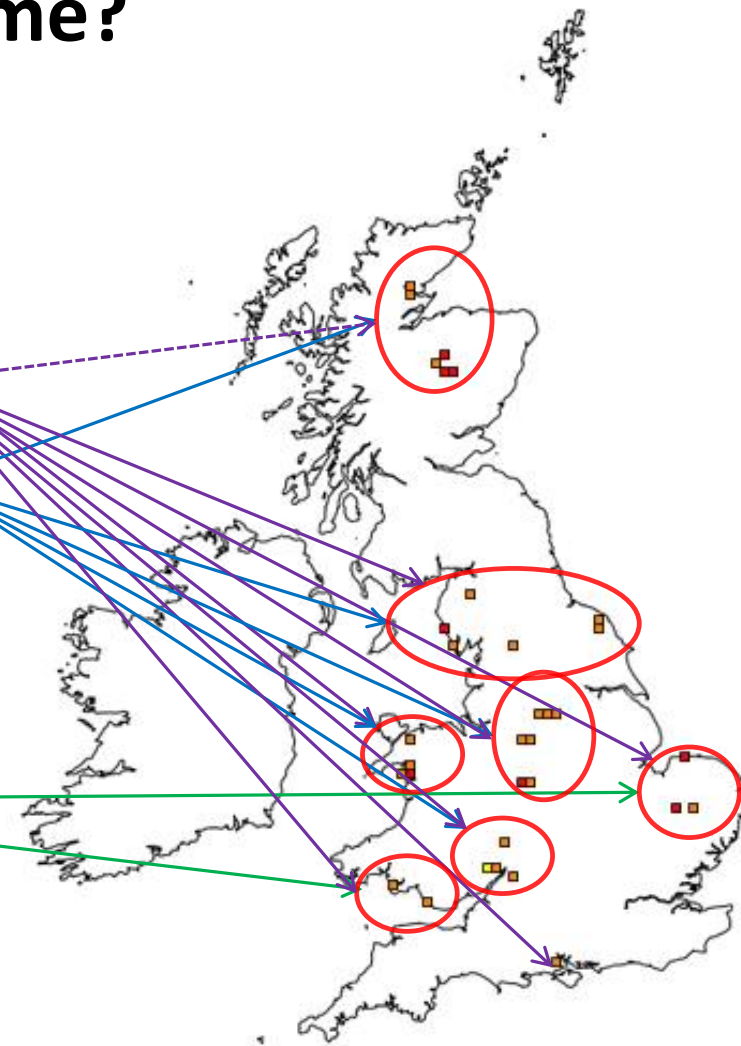
tenellus **sensu auctt.** non Say, 1823

Subgenus PLAGIOGONUS Mulsant, 1842

arenarius (Olivier, 1789)

putridus (Geoffroy in Fourcroy, 1785)

rhododactylus (Marsham, 1802)

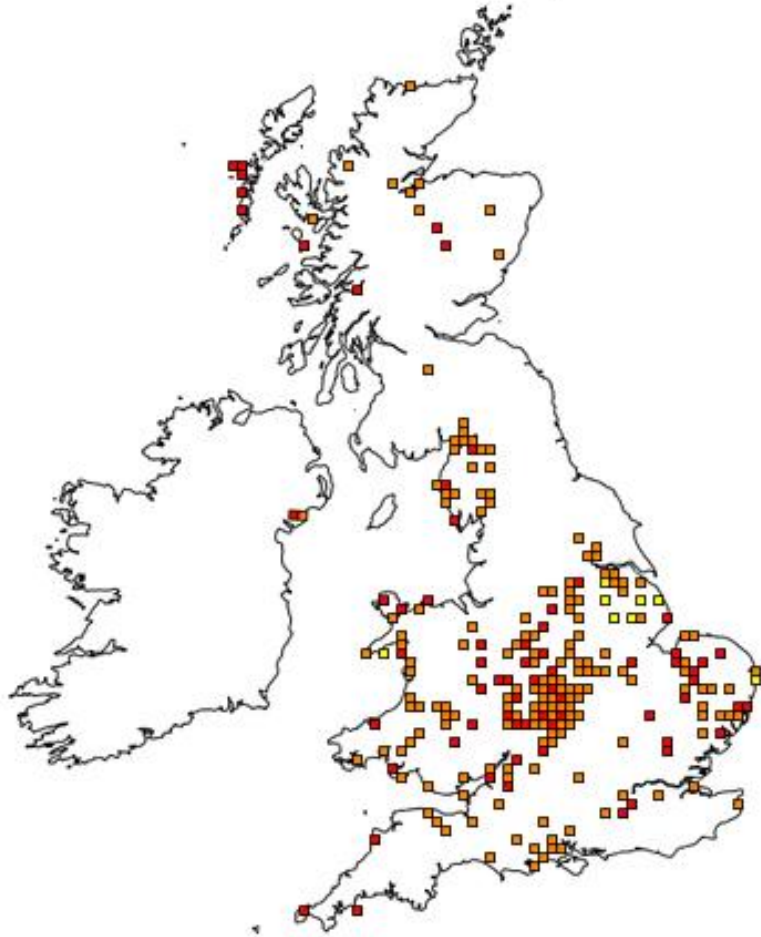


NBN Gateway - Grid map for *Aphodius*
(*Planolinus*) *fasciatus* (Olivier, 1789)

https://data.nbn.org.uk/Taxa/NHMSYS0001716958/Grid_Map - accessed Jan 2016

Splitting Species

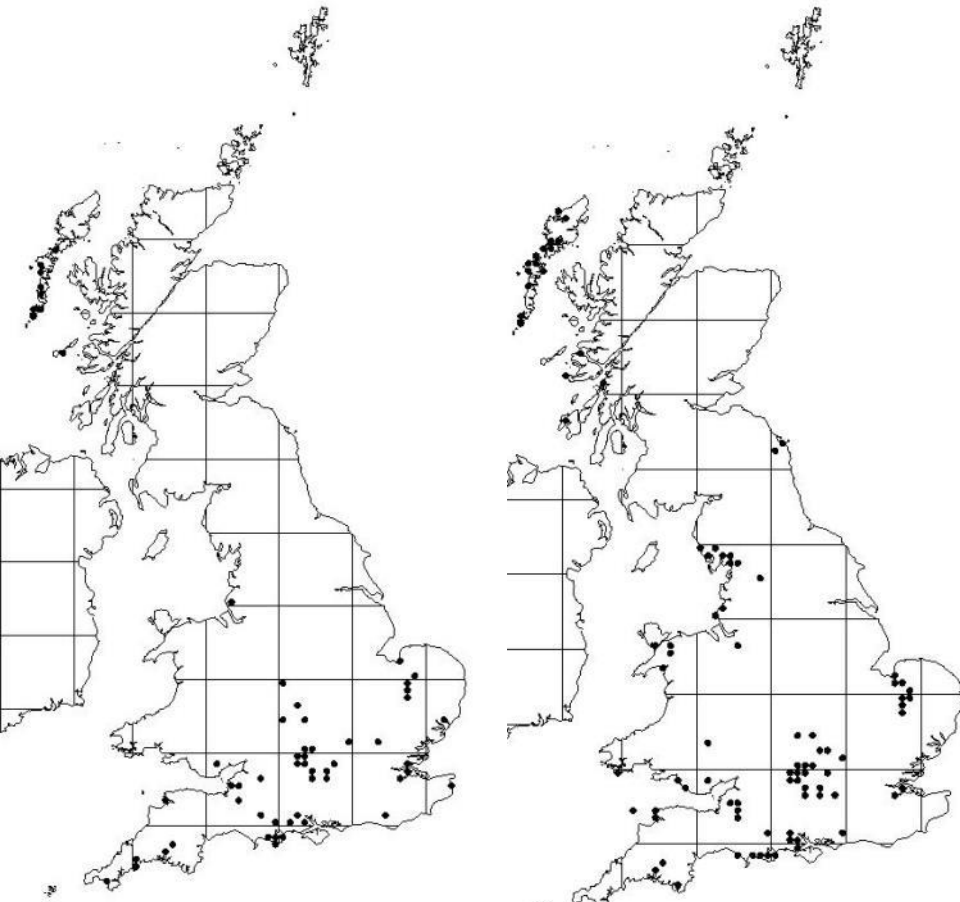
Aphodius fimetarius agg.



Wilson, C.R. 2001. *Aphodius pedellus* (DeGeer), a species distinct from *A. fimetarius* (Linnaeus) (Coleoptera: Aphodiidae). Tijdschrift voor Entomologie 144: 137-143.

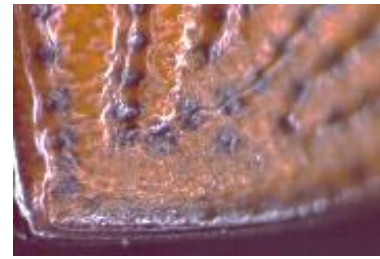
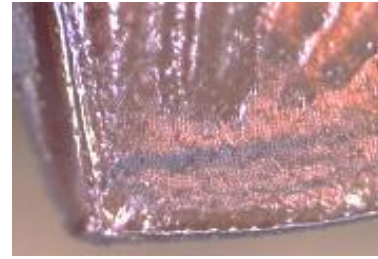
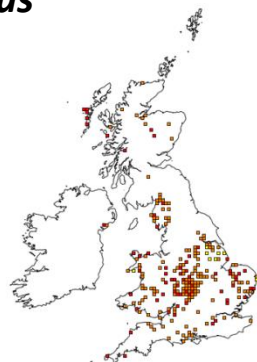
Fery, H. & Rössner, E. 2015. Notes on the *Aphodius* (s.str.) *fimetarius*-complex – morphology, taxonomy, nomenclature and worldwide distribution (with emphasis on the Iberian Peninsula, Austria and Germany) (Scarabaeoidea: Scarabaeidae: Aphodiinae). Linzer biol. Beitr. 47(1): 459-489

Aphodius fimetarius agg.



fimetarius

pedellus



fimetarius



pedellus

GB Scarabaeoidea IUCN Review

101 species assessed

34% IUCN Conservation Status
(exc. RE = 27%)

- 9 Regionally Extinct [RE]
- 4 Critically Endangered [CR (PE)]
 - Possibly Extinct
- 2 Critically Endangered [CR]
- 1 Endangered [EN]
- 7 Vulnerable [VU]
- 9 Near Threatened [NT]
- 1 Data Deficient [DD]
- 1 Nationally Rare [NR]
- 18 Nationally Scarce [NS]
- 42 Least Concern [LC]
- 7 Established Non Native - (Not Applicable) [NA]

GB Scarabaeoidea IUCN Review



All Species

■ IUCN Status
 ■ GB Status
 ■ Least Concern
 ■ Introduced (Established)



Coprophagic Only

RE



Aphodius punctatosulcatus
Aphodius scrofa
Aphodius varians
Onthophagus taurus
Onthophagus verticicornis
Platycerus caraboides
Pleurophorus caesus
Polyphylla fullo
Trox perlatus

CR(PE)



Aphodius subterraneus
Aphodius quadrimaculatus
Heptaulacus testudinarius
Copris lunaris

CR



Aphodius brevis
Brindalus porcicollis

EN



Aegialia rufa

VU



Aphodius sordidus
Aphodius lividus
Euheptaulacus sus
Diastictus vulneratus
Onthophagus fracticornis
Onthophagus nuchicornis
Gnorimus nobilis

NT



Amphimallon fallenii
Aphodius arenarius
Aphodius paykulli
Aphodius porcus
Geotrupes mutator
Gnorimus variabilis
Melolontha hippocastani
Psammodymus asper
Trox sabulosus

Multitude of Ecosystem Functions & Services

- Dung removal
- Fly control
- Parasite suppression
- Nutrient cycling
- Plant growth enhancement
- Enhance soil structure
- Secondary seed dispersal
- Pollination
- Reduction of greenhouse gas emissions
- U.K. cattle industry c. £367 million/year



Consequences of alternative and conventional endoparasite control in cattle for dung-associated invertebrates and ecosystem functioning

S.A. Beynon^{a,*}, M. Peck^a, D.J. Mann^b, O.T. Lewis^a

Ecological Entomology

Ecological Entomology (2015), 40 (Suppl. 1), 124–135

DOI: 10.1111/een.12240

INSECTS AND ECOSYSTEM SERVICES SPECIAL ISSUE

The application of an ecosystem services framework to estimate the economic value of dung beetles to the U.K. cattle industry

SARAH A. BEYNON,¹ WARWICK A. WAINWRIGHT² and MICHAEL CHRISTIE² ¹Dr Beynon's Bug Farm, St Davids, Pembrokeshire, U.K. and ²The School of Management and Business, Institute of Management, Business and Information Science, Aberystwyth University, Aberystwyth, U.K.



Under Recorded Group



Steve Lane



Ceri Watkins



Sally-Ann Spence



Major Contributors

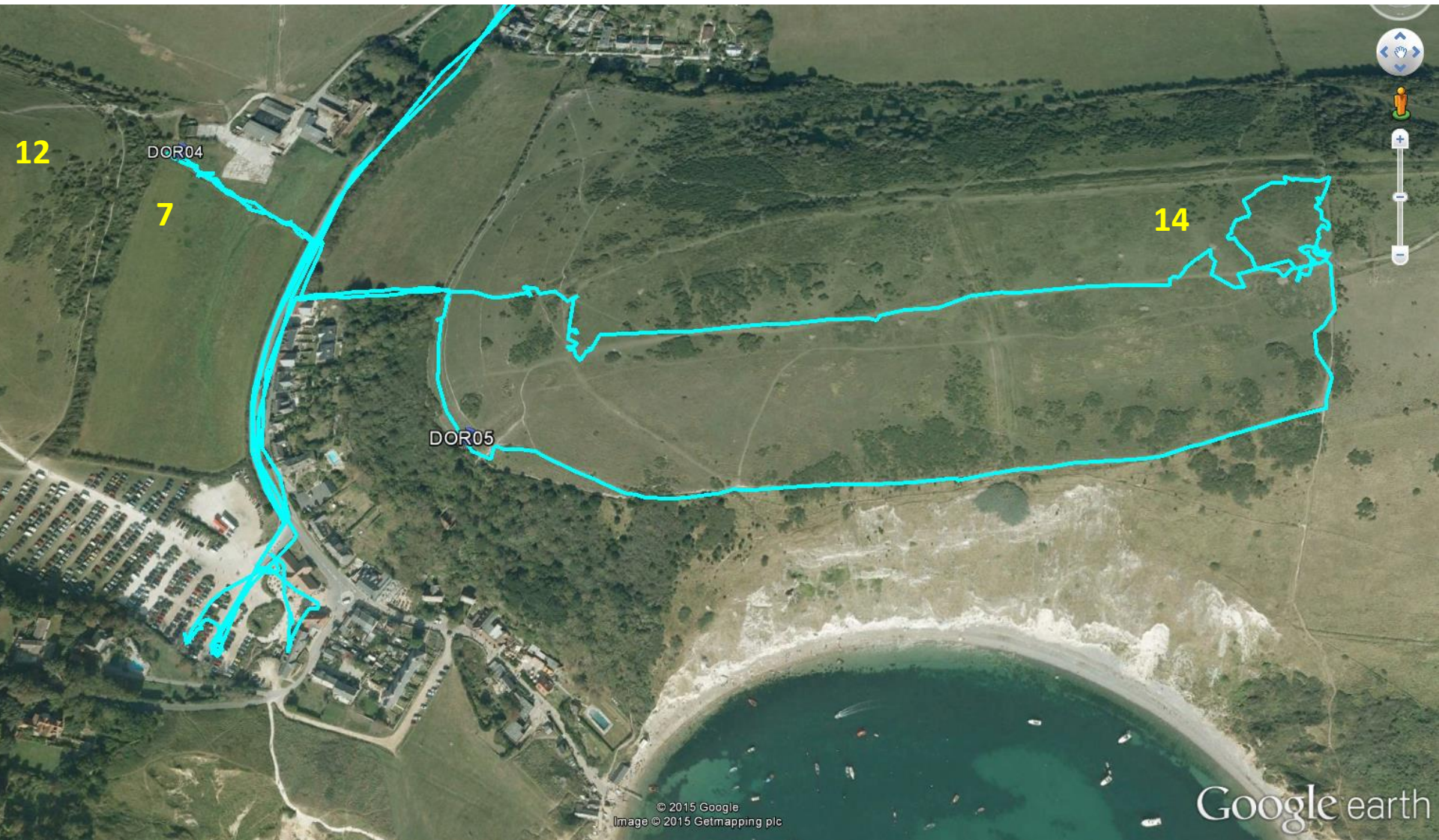
Dung



Sampling



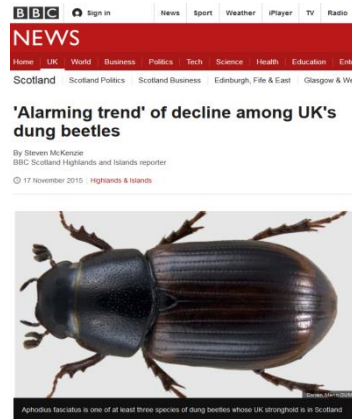
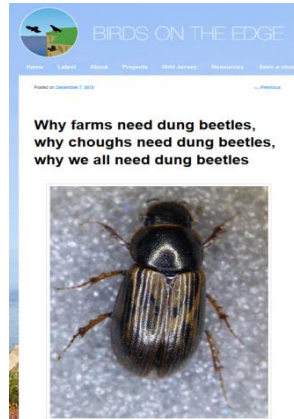
Sampling



West Lulworth, Bindon Hill - Semi-improved Grassland + good dung – 14 species - *O. medius*
West Lulworth, Hambury Farm - Improved grassland – poor dung = 7 species

Advocacy, Outreach & Training

DUMP (Dung beetle UK Mapping Project)



[#dungisfun](#) [#dungathon](#) [#Turd Tuesday](#) [#DUMP](#)



Poor Quality Dung





Good habitat + Good Dung = High Diversity



2 hours sampling

A. ater

A. depressus

A. erracticus

A. fimetarius

A. foetens

A. fossor

A. granarius

A. haemorrhoidalis

A. luridus

A. pusillus

A. rufipes

A. rufus

O. joannae

O. fracticornis

O. similis

G. pyreneaus

G. Spiniger

17 species

Semi/unimproved calcareous grassland

Permanent grazing by Cattle, Horse & Sheep Dung

Dirty Dog



Minotaur Burrow



Wasted Resource



On Dunes

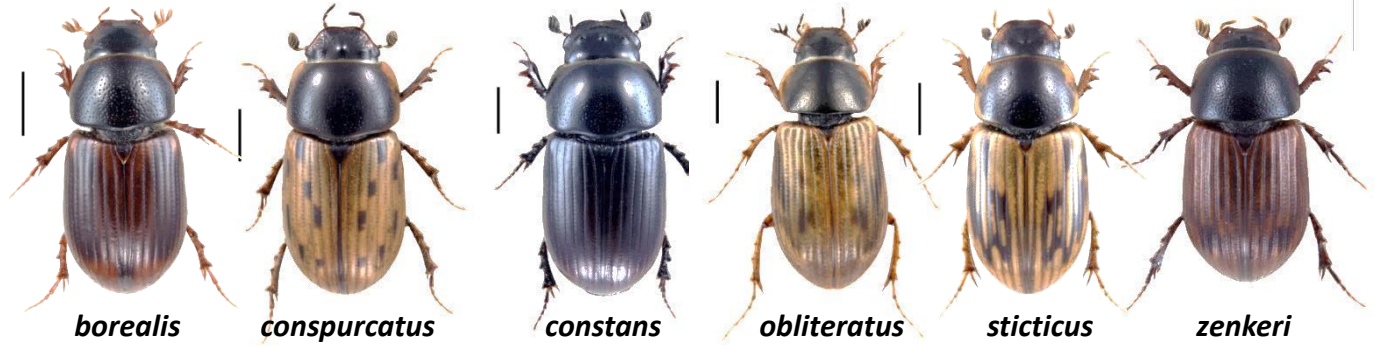


104 - *O. joannae*
4 - *O. nuchicornis*
4 - *O. similis*

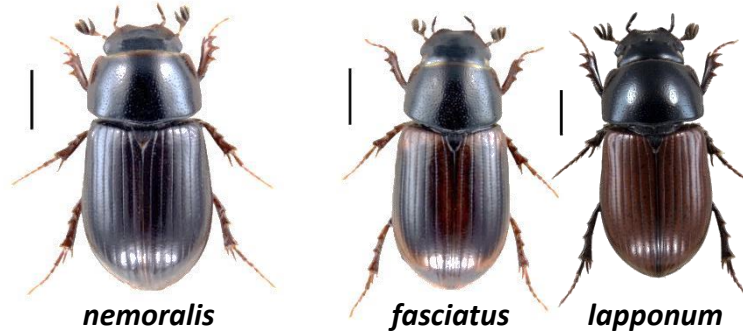
Habitat Aware



Scrub - Woodland



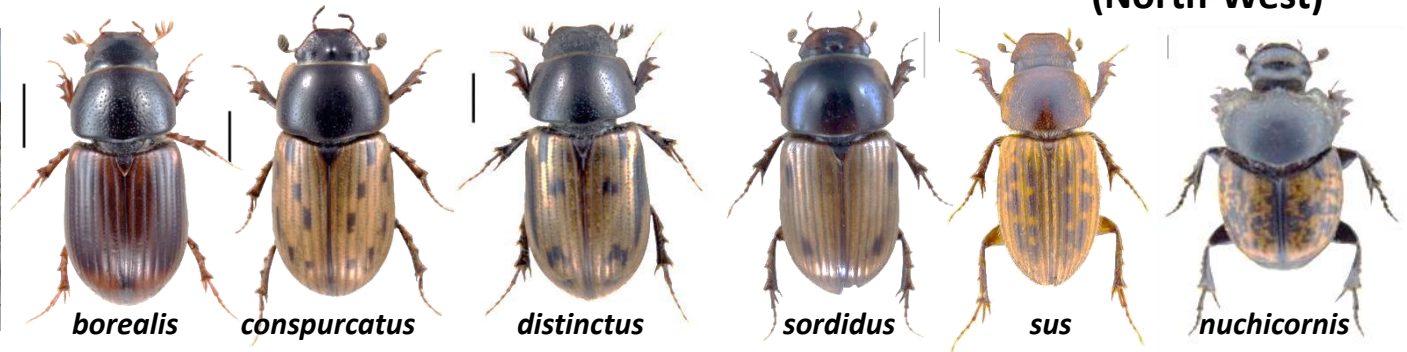
Woodland (North)



**Upland Grassland
(North-West)**



**Coastal Dunes - Sandy
Soil Grassland**



A Winter Wonderland



A. consputus



A. prodromus



A. sphacelatus



A. punctatosulcatus



A. conspurcatus



A. distinctus



A. paykulli



A. obliteratus

Onthophagus fracticornis



IUCN UK – Vulnerable - 11 sites in the UK

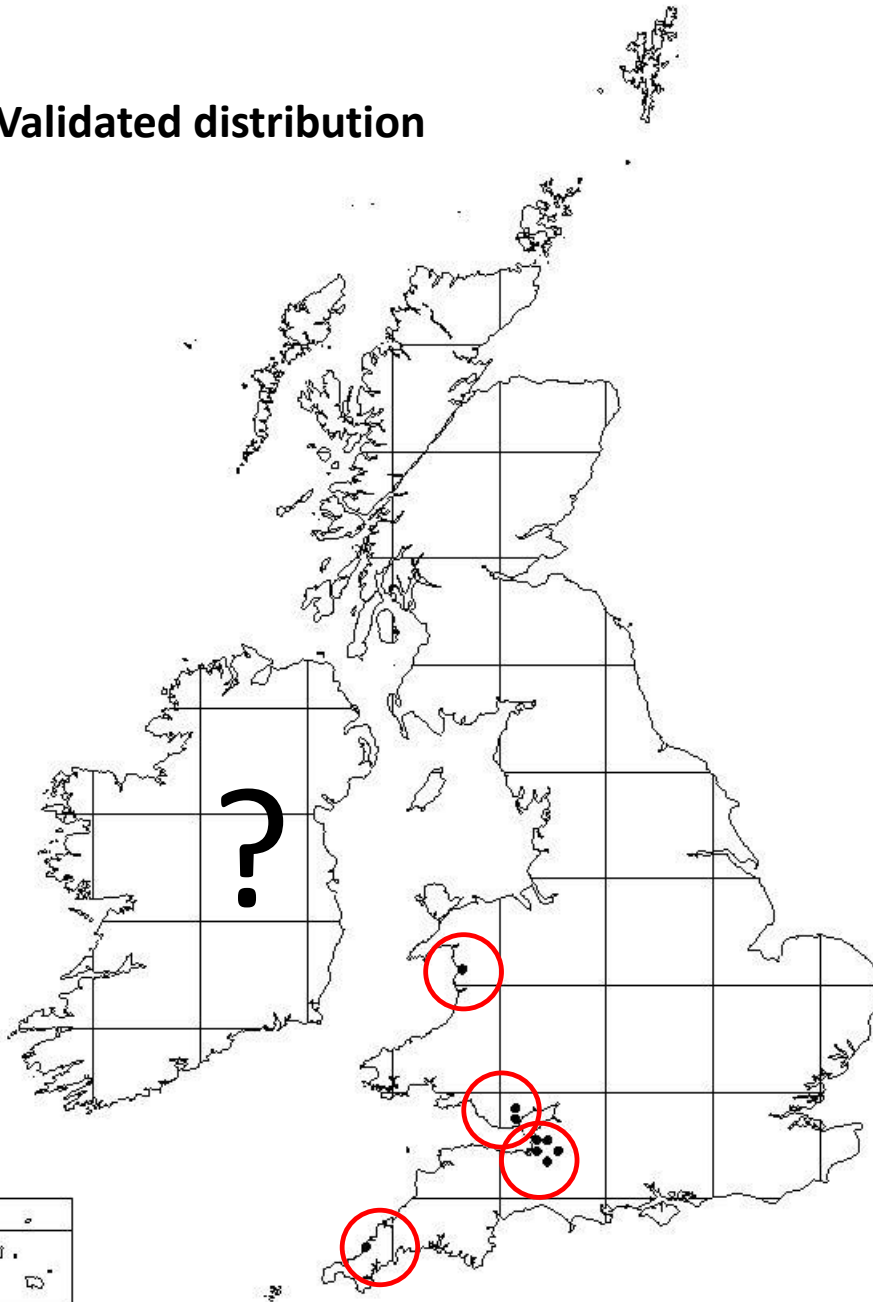
Mendips – 5 recent sites, 3 historic

Wales – 3 historic records

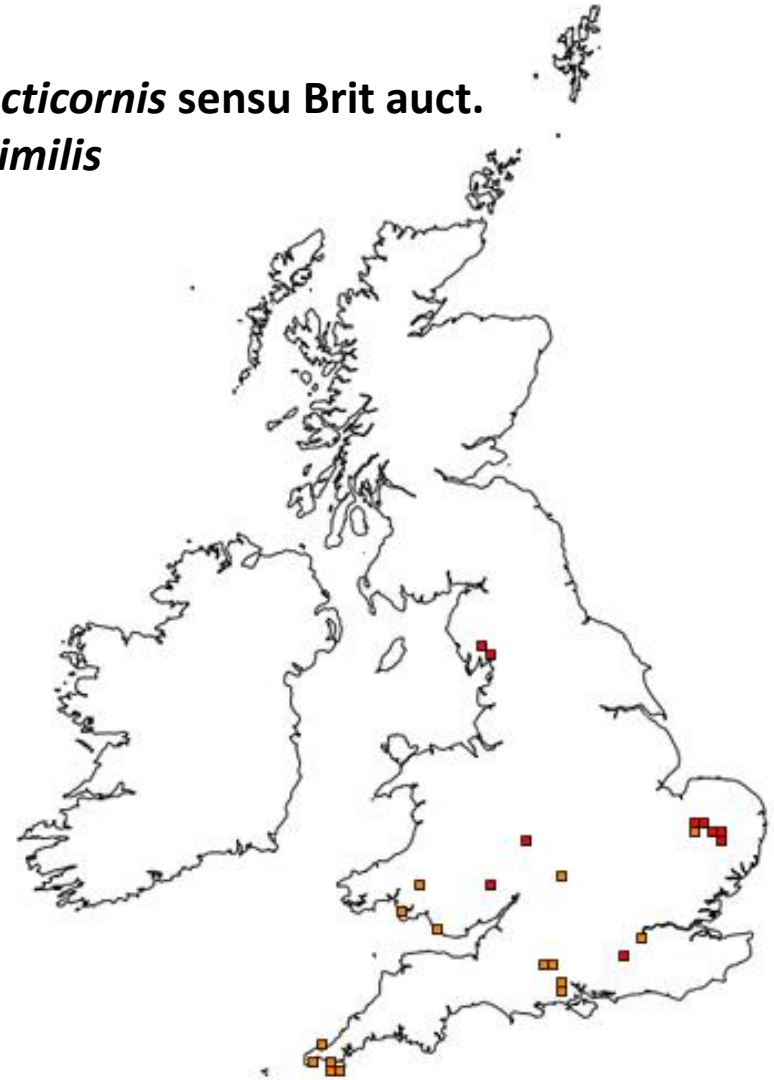
- **Matley Bog, New Forest – re-determined as *O. similis***
- **Johnson, 1991: N. Wales**
- **1998: Museum specimens in Cardiff & Oxford dating from 1898-1928**
- **Gibbs, 2000: 1st modern record**
- **Duff, 2006: D.G. Brown specimen recognised**
- **Duff et al. 2007 published**
- **2008-2015: additional sites on the Mendips**
 - **Survey of >25 sites**
- **2015: Bristol City Museum historic records**

Onthophagus fracticornis

Validated distribution

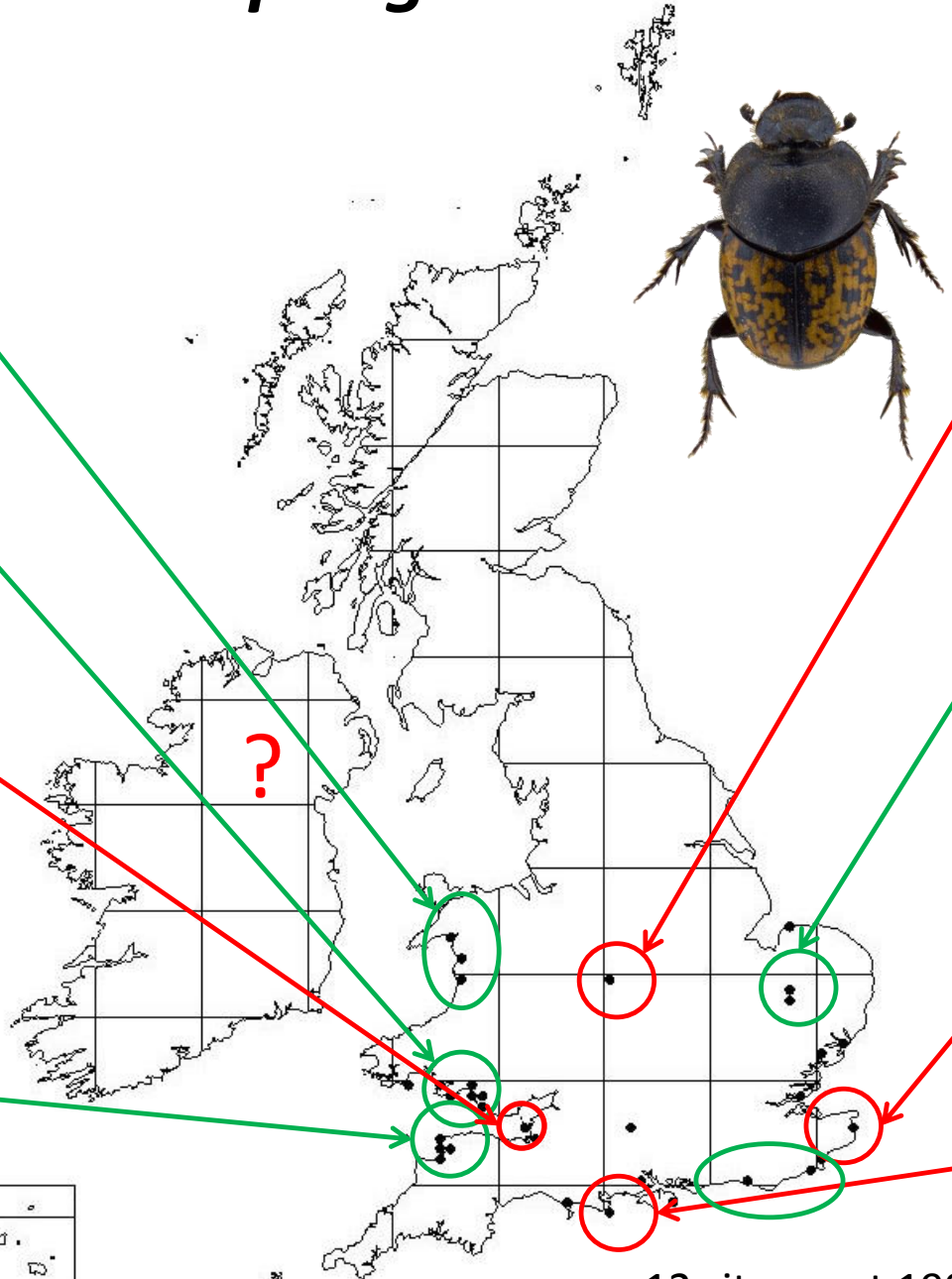
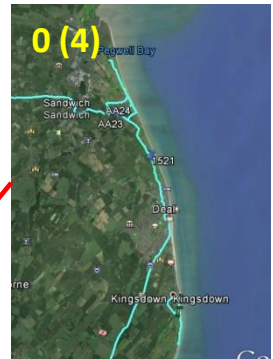
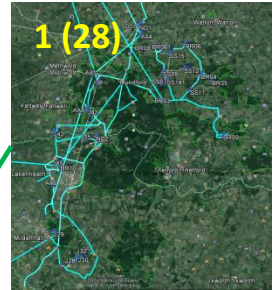
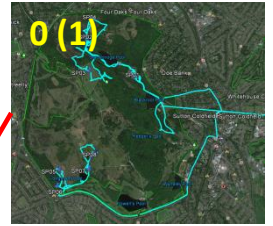
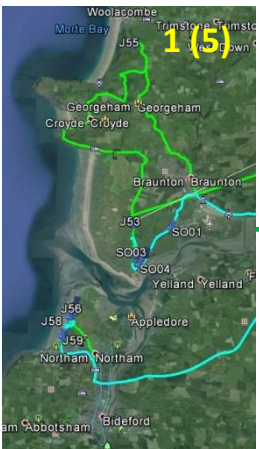
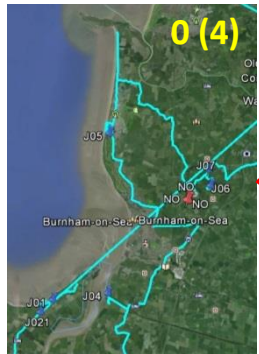
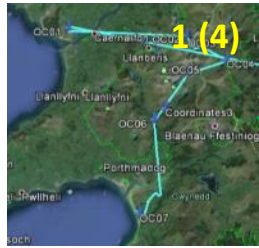


fracticornis sensu Brit auct.
= *similis*



NBN Gateway - Grid map for *Onthophagus*
(*Paleonthophagus*) *fracticornis* (Preysslner, 1790)
https://data.nbn.org.uk/Taxa/NHMSYS0001719301/Grid_Map - accessed Jan 2016

Onthophagus nuchicornis



12 sites post 1990

Onthophagus nuchicornis



lividus

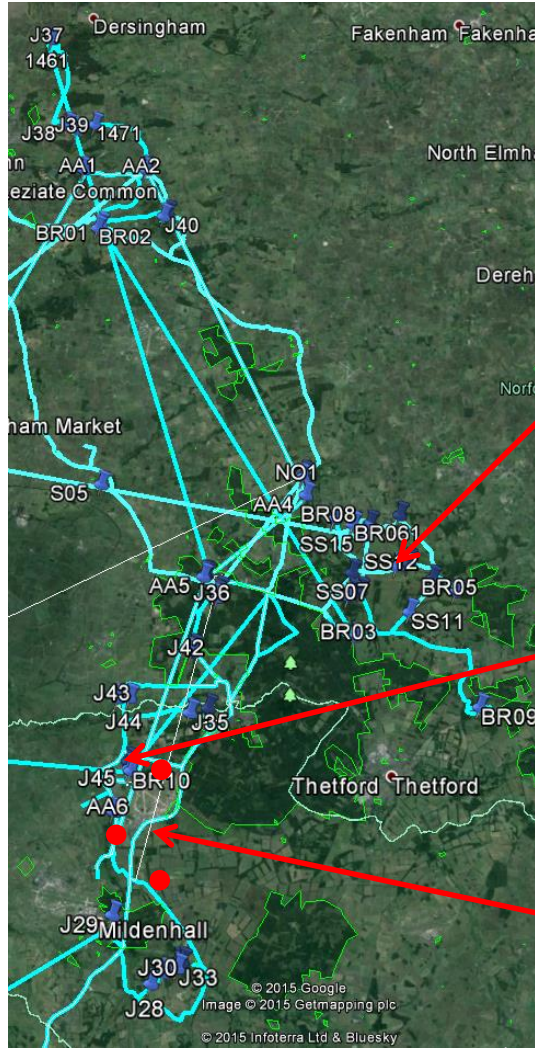


sordidus



sus

Vulnerable species



Nationally Scarce Species

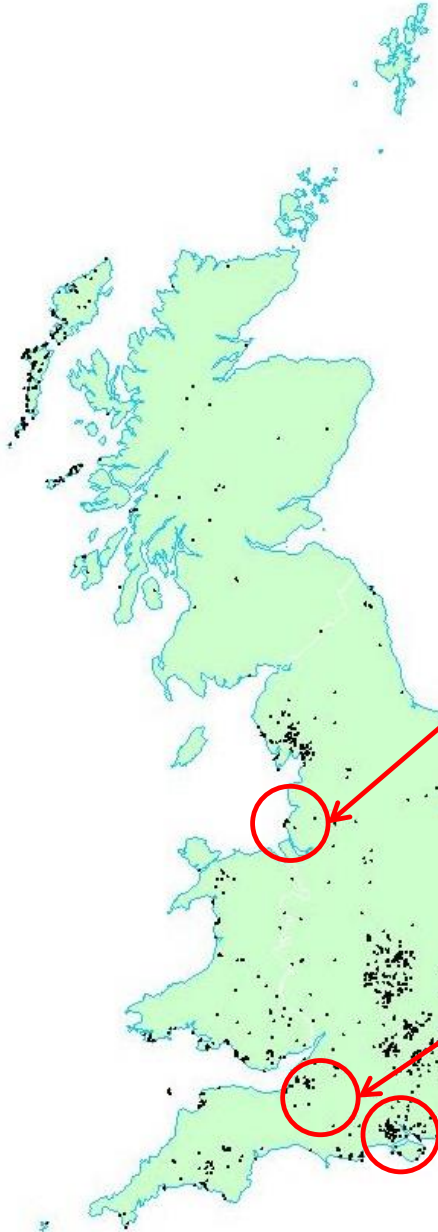


What's Next?



Collections & Literature: verification & data mining

Data Cleaning of NRS data



rufa



brevis

Targeted Surveys

Hand Searching
Trapping



4-maculatus



vulneratus

Funding for DUMP

Dung beetle

UK

Mapping

Project



verticicornis



lunaris

ID Guides

Outreach

Survey under-recorded areas

Hand Searching

Trapping



subterraneus



4-maculatus



testudinarius

Acknowledgements

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In addition, Jay Hands, Charlie Rose, Sally-Ann Spence and Ceri Watkins helped with data extraction from literature, Museum collections and with some survey work.

Thanks to the following museum curators for access to collections under their care: Guy Knight (World Museum, Liverpool); Mark Pavett & Mike Wilson (National Museums, Wales); Rhian Rowson (Bristol Museum & Art Gallery); Max Barclay (Natural History Museum, London); Dmitri Logunov (Manchester Museum); Jeanne Robinson (The Hunterian (Zoology), University of Glasgow), Peter Chandler (BENHS Collections).