

ANTHONY CARAVAGGI

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CAREER HISTORY

2017-present Postdoctoral Researcher, Supporting Hen harriers in Novel Environments (SHINE),
University College, Cork

2017-present Visiting Research Fellow, studies on movement ecology and invasive species,
Queen's University Belfast

EDUCATION

2012 – 2016 PhD conservation biology/invasion ecology, Queen's University Belfast
Quantifying the impact of non-native European hares on the endemic Irish hare
Supervisors: Dr. Neil Reid, Prof. Ian Montgomery, Prof. Paulo Prodöhl

2010 – 2011 MRes Biodiversity and Conservation, University of Leeds
Research projects:

1. *Patrilineal inheritance of parasite resistance in leaf-cutter ants (Acromyrmex sp.)*
2. *Factors influencing passerine productivity in managed reed beds*

2006 – 2009 BSc Zoology with Conservation (Hons), Bangor University **Grade:** 1st
Research project: *Dietary and faecal iron levels in captive black-and-white ruffed lemurs*

RESEARCH INTERESTS

Conservation biology
Ecology (urban, invasive, community, population, movement, spatial)
Rare and endangered species
Citizen science

PEER-REVIEWED PUBLICATIONS

7 **Caravaggi A**, Montgomery WI, Reid N (*in press*) Management and control of invasive species: contrasting attitudes of environmental stakeholders and the wider rural community. *Proceedings of the Royal Irish Academy: Biology & Environment*

6 Tennant JP, Graziotin D, Jacques DC, Waldner F, Dugan JM, Mietchen D, Elkhatib Y, Collister LB, Pikas CK, Crick T, Masuzzo P, **Caravaggi A**, et al. (2017) A multi-disciplinary perspective on emergent and future innovations in peer review. *F1000Research*. 6:1151. doi: 10.12688/f1000research.12037.1

5 **Caravaggi A**, Banks P, Burton C, Finlay CMV, Hayward M, Haswell, PM, Rowcliffe JM, Wood M (*in press*) A review of camera trapping for conservation behaviour research. *Remote Sensing in Ecology and Conservation*. doi: 10.1002/rse2.48

4 **Caravaggi A** (2017) remBoot: Random Encounter Modelling and bootstrapping for variance in R. *The Journal of Open Source Software*. doi: 10.21105/joss.00176

3 **Caravaggi A**, Leach K, Santilli F, Rintala J, Helle P, Tiainen J, Bisi F, Martinoli A, Montgomery WI, Reid N (2016) Niche overlap of mountain hare subspecies and the vulnerability of their ranges to invasion by the

European hare; the (bad) luck of the Irish. *Biological Invasions*. 19: 655-674. doi: 10.1007/s10530-016-1330-z

2 **Caravaggi A**, Zaccaroni M, Riga F, Schai-Braun SC, Dick JTA, Montgomery WI, Reid N (2016) An invasive-native mammalian species replacement process captured by camera trap survey Random Encounter Models. *Remote Sensing in Ecology and Conservation*. 2: 45-58. doi: 10.1002/rse2.11

1 **Caravaggi A**, Montgomery WI, Reid N et al. (2015) Range expansion and comparative habitat use of insular, congeneric lagomorphs: invasive European hares *Lepus europaeus* and endemic Irish hares *Lepus timidus hibernicus*. *Biological Invasions*. 17: 687-698. doi: 10.1007/s10530-014-0759-1

In review

Caravaggi A, Plowman A, Wright D, Bishop C. The composition of captive ruffed lemur (*Varecia* spp.) diets in UK zoological collections, with reference to the problems of obesity and iron storage disease. *Journal of Zoo Animal Research*

Havlin P, **Caravaggi A**, Montgomery WI. The diet and abundance of an introduced insular population of Red-Necked Wallabies, *Macropus rufogriseus*. *Canadian Journal of Mammalogy*

Caravaggi A, Valley M-C, Hogg K, Freeman M, Fadaei E, Reid N, Tosh D. Circadian activity, seasonal occurrence, and predator-prey relationships of free-ranging mammals revealed by camera traps. *Hystrix, Italian Journal of Mammalogy*

Publications in preparation

Caravaggi A, Bond A. The cumulative impacts of introduced mice on the breeding success of nesting seabirds on Gough Island. To be submitted to *Biological conservation*.

Caravaggi A, Turner D, Cameron T. I've got a bad feeling about this: a study into factors affecting reed-nesting birds. To be submitted to *F1000 Research*.

Caravaggi A. Lagomorpha Life History. In: *Encyclopedia of Animal Cognition and Behavior*, Vonk J, Shackelford TK (eds.) ISBN 9783319550657.

Caravaggi A. Lagomorpha Navigation. In: *Encyclopedia of Animal Cognition and Behavior*, Vonk J, Shackelford TK (eds.) ISBN 9783319550657.

GRANTS AND SCHOLARSHIPS

- 2015 **Emily Sarah Montgomery Travel Scholarship**. £200, Queen's University Belfast. 7th European Congress of Mammalogy
- 2015 **Training and Travel grant**. £500, British Ecological Society. 7th European Congress of Mammalogy
- 2012 **Research grant**. £2,000, People's Trust for Endangered Species
- 2012 **Northern Ireland Environmental Agency funded PhD studentship**. Queen's University Belfast
- 2010 **Natural Environment Research Council (NERC) scholarship**. £5,000, University of Leeds.

CONFERENCE PRESENTATIONS

12 Caravaggi A, Montgomery WI, Reid N (2017) An invasion in progress: Impacts of the non-native European hare on the native Irish hare. **International Congress for Conservation Biology**

11 **Caravaggi A** (2017) Predation of seabirds by mice on Gough Island. **World Seabird Twitter Conference**

10 **Caravaggi A** (2017) University Mammal Challenge: distributed mammal surveys with student scientists. **Mammal Society Spring Conference**

9 **Caravaggi A**, Montgomery WI, Reid N (2016) Invasion ecology: quantifying the impact of non-native European hares on the endemic Irish hare. **British Ecological Society Annual Meeting**, Liverpool

8 **Caravaggi A**, Hayward M (2016) People and hedgehogs in Wales. **North Wales Mammal Symposium**, Bangor

7 **Caravaggi A**, Montgomery WI, Reid N (2016) Invasion ecology: quantifying the impact of non-native European hares on the endemic Irish hare. **Mammal Society Spring Conference**, Yarnfield

6 **Caravaggi A** (2015) Quantifying endemic uniqueness and ecological equivalency between native and invasive leporids. **7th European Congress of Mammalogy**, Stockholm, Sweden

5 **Caravaggi A**, Leach K, Santilli F, Rintala J, Helle P, Tiainen J, Bisi F, Martinoli A, Montgomery WI, Reid N (2015) Democratisation of invasive species interventions: assessing attitudes towards control of mammalian invaders. **Mammal Society Spring Conference**, Lancaster

4 **Caravaggi A**, Zaccaroni M, Riga F, Schai-Braun SC, Dick JTA, Montgomery WI, Reid N (2015) Using the Random Encounter Model to estimate spatial patterns in invasive and native hare densities in allopatry and sympatry. **Mammal Society Student Conference**, Lancaster

3 **Caravaggi A**, Montgomery WI, Reid N (2014) Using the Random Encounter Model to estimate spatial patterns in invasive and native hare densities in allopatry and sympatry. **Mammal Society Spring Conference**, Birmingham

2 **Caravaggi A**, Montgomery WI, Reid N (2013) Distribution and differential habitat associations of invasive European and endemic Irish hares. **11th International Mammal Congress**, Belfast

1 **Caravaggi A**, Montgomery WI, Reid N (2013) Invasion ecology: quantifying the impact of non-native European hares on the endemic Irish hare. **Mammal Society Student Conference**, Staffordshire

INVITED SPEAKER

2017 **Keynote**. The changing face of UK conservation. **Mammal Society Student Conference**

2016 **Keynote**. UK mammals. **Mammal Society Student Conference**, Yarnfield.

2014 **Guest lecture**. Distribution and habitat associations of hares in Ireland. **Bangor University**.

POSTER PRESENTATIONS

9 **Caravaggi A**, Vallely M-C, Hogg K, Freeman M, Fadaei E, Reid N, Tosh D (2017) Activity and temporal relationships of free-ranging mammals revealed by camera traps. **Mammal Society Spring Conference**

8 **Caravaggi A**, Montgomery WI, Reid N (2015) The democratisation of conservation: public attitudes towards lethal control of invasive leporids and implications for species management. **7th European Congress of Mammalogy**, Stockholm, Sweden

7 **Caravaggi A**, Zaccaroni M, Riga F, Schai-Braun SC, Dick JTA, Montgomery WI, Reid N (2015) Optimising camera trap Random Encounter Model survey effort: A case study using an invasive-native species replacement process. **Vth International Wildlife Management Congress**, Sapporo, Japan

- 6 Beresford NA, Wood MD, Gaschack S, Gulyaichenko EA, **Caravaggi A** (2015) Use of wildlife camera traps to within the Chernobyl Exclusion Zone. **Mammal Society Spring Conference**, Lancaster
- 5 **Caravaggi A**, Montgomery WI, Reid N (2013) Estimating hare numbers using camera trapping and the Random Encounter Model. 11th International Mammal Congress, Belfast
- 4 **Caravaggi A**, Montgomery WI, Reid N (2012) Invasion ecology: quantifying the impact of non-native European hares on the endemic Irish hare. **2nd All Ireland Mammal Symposium (AIMS)**, Dublin
- 3 **Caravaggi A**, Montgomery WI, Reid N (2012) Invasion ecology: quantifying the impact of non-native European hares on the endemic Irish hare. **4th World Lagomorph Conference**, BOKU, Vienna
- 2 **Caravaggi A**, Hughes W (2011) Patrilineal inheritance of grooming behaviour and parasite resistance in leaf-cutting ants (*Acromyrmex* sp.). **Postgraduate Student Forum**, University of Leeds
- 1 **Caravaggi A**, Bishop, C (2009) Dietary and faecal iron levels in captive black-and-white ruffed lemurs (*Varecia* spp.). **11th BIAZA Research Symposium**, Blackpool Zoo

TEACHING EXPERIENCE

As Supervisor

- 2015 MSc research project. Behaviour and stress in sympatric hare species. Queen's University, Belfast
- 2014 MSc research project. Activity and behaviour of hares in Mid-Ulster. Queen's University, Belfast
- 2014 Undergraduate residential field course. Queen's University, Belfast
- 2013 MSc research project. Estimating hare population densities. Queen's University, Belfast
- 2013 BSc research project. Resource and habitat partitioning of herbivores. Queen's University, Belfast
- 2013 Undergraduate residential field course. Queen's University, Belfast

As Instructor

- 2017 - Module development and instruction: BL6024 Quantitative skills for biologists using R
- 2016 - Course tutor: ornithology, camera traps, social media. Eco-Explore, Cardiff
- 2016 Lecturer and field ornithologist. Operation Wallacea, Ecuador
- 2015 Otter surveys, MSc, Queen's University Belfast
- 2014 Bird surveys, undergraduate module. Queen's University Belfast

As Demonstrator

- 2015 GIS, undergraduate module. Queen's University Belfast
- 2014 Animal biology, undergraduate module. Queen's University Belfast

PERSONAL DEVELOPMENT

- 2017 **Level 3 Teaching Assistant training**. E-Training Hub
- 2017 **Public Outreach Training**. Science Made Simple
- 2016 **Conservation ecology SIG workshop**. British Ecological Society Annual Meeting
- 2016 **Women in Ecology mentor training**. British Ecological Society
- 2016 **Acoustic analysis workshop**. North Wales Mammal Symposium
- 2014 **Introduction to R**. Queen's University Belfast
- 2012 **Lagomorph systematics workshop**. 4th World Lagomorph Conference, Vienna

PROFESSIONAL MEMBERSHIPS

(since)

- 2015 South Wales Mammal Group, Welsh Ornithological Society
- 2013 Society of Conservation Biology
- 2012 The Mammal Society, British Ecological Society

- 2011 Royal Society of Biology
- 2009 The British Trust for Ornithology

LICENSES AND CERTIFICATIONS

- 2014 ASPA laboratory animal handling license
- 2014 Emergency first aid; field first aid
- 2009 Bird ringing license holder, British Trust for Ornithology 'C' license. 2,000 birds
- 2008 Marine mammal medic. British Divers Marine Life Rescue. (-2011)
- 2002 Full manual UK driving license, held without incident or penalty

PROFESSIONAL SERVICE

Peer reviewer: Journal of Zoology; Mammal Research; Remote Sensing in Ecology and Conservation; Zoo Biology; Journal of Natural History; Invasive Species Compendium

- 2017 SCB Participatory and Citizen Science **Working Group member**
- 2017 **Conference volunteer**, The Mammal Society Spring Conference
- 2016 Session chair, **Community Ecology**, British Ecological Society Annual Meeting
- 2016 **Committee member**, South Wales Mammal Group
- 2016 **Coordinator** of The Mammal Society's University Mammal Challenge
- 2016-17 British Ecological Society Women in Ecology (WIE) **mentor**
- 2016- **Review College member**, British Ecological Society
- 2016- **Student Engagement Officer**, The Mammal Society Council
- 2015 **Student committee advisor**, Mammal Society Student Conference
- 2014 **Coordinator**, Mammal Society Student Conference
- 2013-17 **UK STEM Ambassador**
- 2013 **Principal coordinator**, Mammal Society Student Conference
- 2013 **Volunteer**, 11th International Mammal Congress, Belfast
- 2012-15 EBEE **postgraduate representative**, Queen's University Belfast
- 2012-15 SBS **Athena SWAN committee**, Queen's University Belfast
- 2010-12 **Volunteer**. Royal Society for the Protection of Birds
- 2010-11 **Volunteer** Conservation Volunteers, Leeds University 2008-09
- 2007-09 **Founding committee & publicity officer**, Bangor University Zoological Society.
- 2008-08 **Volunteer**, Treborth Botanic Gardens, Bangor
- 2006-09 **Undergraduate student representative**, Bangor University Biological Sciences

OUTREACH

Community/group talks

Schools, natural history groups, student groups and local interest groups in Wales, England, Northern Ireland, Ireland, USA and Canada, in person and via video. Including remote project development, mentoring and advisement.

- 2017 Co-created @SciCommGames environmental and science communication Twitter games
- 2017 Contributed to CBS News article
- 2017 **Enquiry Zone scientist**, I'm a Scientist, Get Me Out of Here!
- 2017 **Partner scientist**, Student Science Partnerships
- 2017 **Interview** for Washington Post on science communication
- 2016 **Advisor** to National Geographic on red fox ecology
- 2016 **Invited author**, Shropshire Mammal Group newsletter
- 2016 **Volunteer**, Letters to a Pre-Scientist
- 2016 **Mammal (hares) consultant** for The Mammal Society
- 2015 **Featured curator**, Biotweeps (~6.5k followers)

- 2014 **Created Biotweeps**, a science communication Twitter project
- 2014 **Invited expert**, Multi-school careers advice and speed-networking event
- 2013 **Volunteer science presenter**, ornithology, Techniquet, Cardiff
- 2013 **Wildlife consultant** for Biological records for the North East of Scotland (NESBReC)
- 2013 **Interview**, 'Hare' raising project in Mid-Ulster, Mid Ulster Mail.
- 2013 **Created The Ringing Planet**, a bird-ringing Twitter project
- 2013 **Bird ID and ringing demonstrator**, Bridgend
- 2013 **Bioblitz naturalist**, Carmarthen
- 2013 **Conservation group participant**, I'm a Scientist, Get Me out of Here
- 2013 **Bird ringing demonstrator**, Wildlife Trust of South and West Wales
- 2012 **Bird ringing demonstrator**, Wildlife Trust of South and West Wales
- 2011 **Bioblitz naturalist**, Carmarthen

MEDIA APPEARANCES, PROFILES AND MENTIONS

Written

- 2017 Rejected by the Rainforest, I F-ing Love Conservation
- 2017 Introducing the University Mammal Challenge, The Mammal Society 2016 Is there intelligent life on Earth? Save our Souls magazine
- 2016 A chat with Dr. Anthony Caravaggi. Biotechn.asia
- 2016 Camera traps reveal a hare-raising situation. RSEC blog, ZSL
- 2016 On closer inspection, it looks like a hare transplant. QUBio
- 2015 Living with aliens. SciLogs
- 2015 Communities and conservation in developing countries. QUBio
- 2015 Putting wildlife in the frame. QUBio
- 2015 Astrotweeps and Biotweeps—rotating Twitter accounts. Crastina.se
- 2015 Media battle highlights importance of scientific credit. ScienceNews
- 2015 Dear Alice, the hare might be sane after all. QUBio
- 2015 BBC News. Counting Irish hares at Belfast International Airport
- 2015 A call for beautiful prose in papers. Nature News
- 2014 Mountain hare and Irish hare. The Mammal Society
- 2014 A receding hare line and a brown toupée. QUBio

Radio

- 2017 BBC Coventry & Warwickshire
- 2017 Invited guest, The Edgar Ortega Radio Show
- 2016 SciComm podcast, Episodes 7 & 8, with Dr. Mike
- 2015 BBC Radio Ulster
- 2015 BBC News School Report for St. Pius X, Magherafelt's Biodiversity Club
- 2015 BBC Radio Ulster, Good Morning Ulster
- 2013 RTÉ Radio 1, Mooney Goes Wild,

Television

- 2015 Countryfile, BBC
- 2013 River Bann, RTÉ Television

COMPUTER SKILLS

Statistics

R (packages include MuMIn, lme4, ggplot, remBOOT, maptools, raster, SDMTools, StatMatch, pdist, glmmulti), SPSS, Minitab, Distance, Mark

GIS

R, ArcGIS; QGIS

Others

MaxEnt, MAVIS NVC, Patch Analyst, GeneMapper, Microsoft office, GitHub, RMarkdown, graphics packages (e.g. Photoshop), bespoke software

STATISTICAL SKILLS

General linear and mixed-effects models
Principal Components Analysis
Species Distribution Modelling
Discriminant Function Analysis
Diversity indices
Mahalanobis and Euclidean distance
Cross-correlation functions
Model averaging
Random Encounter Models
Other parametric and non-parametric tests

FIELD SKILLS

Off-road driving (4x4)
Multi-taxa surveys and identification
Habitat surveys
Animal handling (amphibians, reptiles, invertebrates, and small-to-large birds and mammals)
Bird ringing (British Trust for Ornithology C license)
Orienteering

Additional professional experience

2017	Assistant, pied flycatcher nestbox monitoring, Cardiff University
2017	Breeding Bird Survey, British Trust for Ornithology
2011-12	Small mammal surveys, field assistant, University of Leeds
2011-12	Ecologist, great crested newt and bat surveys, Haycock and Jay, Ecologists
2011-12	Habitat management, Conservation Volunteers, University of Leeds
2011	Bat survey assistant, Haycock and Jay, Ecologists
2011	Snake survey assistant, Dr. Axel Barlow
2010-11	Ornithological technician, bird territory mapping, Cardiff University
2010-11	Breeding Bird Surveys, British Trust for Ornithology
2010	Wading bird surveys, British Trust for Ornithology
2009	Data analyst, butterfly foodwebs, Bangor University
2007-09	Pine marten surveys, Snowdonia Mammal Group
2007-09	Woodland bird and invertebrate surveys, Treborth Botanic Gardens, Bangor
2006-08	Ornithological technician, bird breeding and behaviour, Dr. Geoff Gibbs

LABORATORY SKILLS

Multi-taxa dissection (mammal, bird, amphibian, invertebrate)
Species identification via microscopy
Ethological studies
Tissue sampling
DNA manipulation
Electrophoresis
Atomic absorption and colourimetric spectroscopy
Specimen preparation
Soil chemical and biological analysis

REFERENCES

Dr. Neil Reid. School of Biological Sciences, MBC, 97 Lisburn Road, Belfast BT9 7BL
Telephone: +44 (0)28 9097 2746 Email: neil.reid@qub.ac.uk

Prof. Ian Montgomery. School of Biological Sciences, MBC, 97 Lisburn Road, Belfast BT9 7BL
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Prof. Jaimie Dick. School of Biological Sciences, MBC, 97 Lisburn Road, Belfast BT9 7BL
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