

BAT FIELDCRAFT WORKSHOP, AT KILLARNEY NATIONAL PARK, KILLARNEY, CO. KERRY.

Report ON THE FOUR-DAY EVENT

by

Conor Kelleher AMIEEM, AMIQA
Convener

11th September 2005



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Sponsored by



National Parks and Wildlife Service

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1. Background

The 10th European Bat Research Symposium was convened at the National University of Ireland campus in Galway from August 21st to 26th 2005. As part of this event, an International Bat Fieldcraft Workshop was convened at Muckross Venture Centre and Killarney National Park in Killarney, Co. Kerry from August 17th to 21st 2005.

Killarney National Park was chosen as the venue for the workshop as it is the only UNESCO Biosphere Reserve in Ireland and it was also Ireland's first National Park. It is an area renowned for its natural beauty. The park is 10,236 hectares in extent and comprises mountains and woodlands surrounding the three famous Lakes of Killarney. With the park's varied habitats, it was known that eight of the ten known Irish bat species occurred on site.

2. Aims

The idea of a Fieldcraft Workshop was decided upon as detector workshops have been undertaken over many years across Europe and North America and, since the last European Symposium in 2002, the technology and methodology has changed very little. Therefore, it was decided that the event in Killarney should be broadened to include not only detectors but also other field survey and study methods to make the workshop more beneficial. This resulted in a unique event.

Scientific names of bat species are given in the Appendices.

3. Tutors and participants

Tutors for the workshop were chosen for their experience in different aspects of bat study. All of the seven invited tutors are experts in their field.

The tutors lectured on and demonstrated the following methods:

Dr. Sinéad Biggane – *National University of Ireland, Galway, Ireland* – Radio telemetry.

Herman Limpens – *Society for the Study and Conservation of Mammals, The Netherlands* – Detectors, Leisler's bat studies.

Dr. Dean Waters – *University of Leeds, England* – Detectors, Leisler's bat studies, acoustics, detector method comparison.

Anne-Jifke Haarsma – *Leiden University, The Netherlands* – Capture methods and marking: transponders, light tagging, fur clipping, ringing, tattooing etc.

Frank Greenaway – *Natural History Museum, London, England* – Capture methods: mist-netting, harp-trapping, lures, hand-netting, cone-trapping etc.

Daniel Whitby – *Whitby Wildlife Conservation, England* – Capture methods: mist-netting, harp-trapping, lures.

Dr. Tomasz Kokurewicz – *Department of Zoology and Ecology, Agricultural University of Wroclaw, Poland* – Handling, sexing, ageing, measuring, reproductive status and preserving specimens.

The following participants attended:

Tina Aughney	Ireland
Kate Barlow	Wales
Daniel Buckley	Ireland
Jan Collins	England

Chris Corben	Australia/USA
Niall Cribbon	Ireland
Chris Damant	England
Leif Gjerde	Norway
Emma Glanville	Ireland
John Haddow	Scotland
Clare Heardman	Ireland
Kjell Isaksen	Norway
Conor Kelleher	Ireland
Irena Kranjec	Slovenia
Thomas Lilley	Finland
Kim Livengood	USA
Solveig Lubeley	Germany
Deirdre Lynn	Ireland
Colleen Mainstone	England
Ferdia Marnell	Ireland
Enda Mullen	Ireland
Brendan O'Shea	Ireland
Patrick Prevett	Australia/USA
Egoitz Salsamendi	Basque Country
Jasper Schut	The Netherlands
Knut Age Storstad	Norway
Sam Talbot	England
Emma Teeling	Ireland
Peter Twisk	The Netherlands
Diederik van Dullemen	The Netherlands

Participants were chosen after submission of a CV detailing their background and experience with bats. This ensured that all were to the relevant standard and could contribute accordingly.

Many of the participants contributed their own demonstrations. These included a presentation on the use of the Australian/USA Anabat detection system by Chris Corben, the designer.

One participant; Irena Kranjec, a student from Slovenia, was sponsored as part of the funding to attend the event. She also went on to attend the Symposium. The funding also ensured the presence of Tomasz Kokurewicz, from Poland.

4. Bats and the law

All bat species are protected under the Wildlife Act (1976) and Wildlife [Amendment] Act (2000), several of which are known to be present on site or may occur on site occasionally.

It is an offence to wilfully interfere with or destroy the breeding or resting place of these species (Wildlife Act, 1976; Wildlife [Amendment] Act 2000); there are limited exemptions for certain kinds of construction developments.

The following are considered as species of conservation interest (Red Data Book; Whilde, A, 1993): pipistrelle, Daubenton's, Leisler's and brown long-eared bats. Threatened species include the whiskered bat and Natterer's bat. All bats are listed species under Annex IV of the Habitats Directive (EU) and the lesser horseshoe is further listed under Annex II of the Directive.

The EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. Across Europe, bats are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn

Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

5. Licence applications

As all Irish bat species are protected by law, licences to catch bats using various techniques were applied for prior to the workshop. These were issued by the *National Parks and Wildlife Service*.

6. Workshop format

The workshop was divided into daytime indoor tutorials and discussion sessions followed by fieldwork at dusk which continued through the hours of darkness until dawn.

7. Fieldwork results

Initially, plans were made to investigate the mating behaviour of local male Leisler's bats. However, males were only just beginning to socialise in this way and the occurrence of song flights and stationary advertising by males was poor. No results could therefore be obtained.

During detector surveying, nine bat species were recorded in the park:

Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared, Leisler's, Daubenton's, Natterer's, whiskered/Brandt's and lesser horseshoe.

The record of Nathusius' pipistrelle is a first for Killarney National Park and indeed for Kerry. The next nearest detector record was in Dripsey in County Cork in the summer of 2001 (pers. obs.). This is a rare species and was first discovered in Ireland in October 1996. Breeding roosts have only been confirmed in Northern Ireland to date with the first being discovered in 1997. Detector records are few from the Republic and to date the species has only been detected in Cos. Wicklow, Laois, Longford, Cavan and Meath (Richardson, P. 2000). The recorded Nathusius' pipistrelle calls are depicted in Appendix 4 – these are courtesy of Chris Corben.

During mist-netting and harp-trapping, nine species of bat were caught:

Common pipistrelle, soprano pipistrelle, brown long-eared, Leisler's, Daubenton's, Natterer's, whiskered, Brandt's and lesser horseshoe.

The record of Brandt's bat is a first for the south west of Ireland as the species has only been recorded on three previous occasions: in 2003 in Wicklow Mountains National Park (E. Mullen, pers. comm.) and Cavan and in 2004 in Co. Clare (B. Keeley, pers. comm.). A biopsy wing-punch sample was taken of this bat before release. This sample will be analysed at *University College Dublin* by Dr. Emma Teeling.

The complete breakdown of captures is as follows:

Night of Thursday 18th/Friday 19th:

Muckross Peninsula (V9686):

Common pipistrelle:	1 male
Soprano pipistrelle:	7 males 11 females
Leisler's:	5 males 3 females
Brown long-eared:	4 males 1 female
Whiskered	3 males 1 female (including 2 juvenile males)
Natterer's	2 males

Whiskered/Brandt's 2 escaped before identification

Total 42 bats

Deenagh River (V9590):

Common pipistrelle: 2 males 2 females
Soprano pipistrelle: 1 female
Daubenton's: 1 female
Whiskered: 1 male
Lesser horseshoe: 1 female

Total 8 bats

Night of Friday 19th/Saturday 20th:

Muckross house drive (V9786):

Soprano pipistrelle: 8 females 7 males
Leisler's: 1 male
Brown long-eared: 1 male
Natterer's: 1 male

Total 18 bats

Night of Saturday 20th/Sunday 21st:

Dinish (V9385):

Brown long-eared: 1 adult male

Total 1 bat

Torc New Bridge (V9684):

Common pipistrelle: 1 adult male 1 juvenile female
Soprano pipistrelle: 3 adult male 1 juvenile male 2 adult females 1 juvenile female
Leisler's: 3 adult female
Brown long-eared: 1 adult male
Natterer's: 1 male
Brandt's: 1 adult female (Nulliparous)

Total 15 bats

Overall number of bats caught was 84. All were safely released.

An emergence count was also undertaken at the lesser horseshoe roost at Courtney's Cottage on the evening of the 20th. This resulted in the highest number of bats so far recorded in the building at 441.

8. Conclusion

The Fieldcraft Workshop was a great success. Most of the aims of the event were met. The feedback from participants has been excellent. Those that commented felt that they had gained a great deal from the tutors and other participants. It has set a standard for future such events especially that planned for Romania in 2008 as part of the 11th European Bat Research Symposium that year.

The workshop highlighted recent advances in the study of bats and the practical demonstrations showed their usefulness in the field. The sonic lures were especially impressive showing that various species can be attracted and easily caught for processing.

It was also useful to have an introduction to the Anabat detection system with attached PDA by its designer.

Two new species: Nathusius' pipistrelle and Brandt's bat were discovered in Kerry. The latter is subject to confirmation by DNA analysis. If confirmed, it will highlight Killarney National Park as the only site in Ireland with all ten of the known bat species present.

9. Acknowledgements

I would like to thank all the participants who attended the event and made it the success that it was. By contributing their acquired knowledge and experience of bats, techniques and methodologies in fieldcraft, the event was extremely beneficial to all concerned. I would also like to thank the tutors for their excellent presentations and organisation.

Thanks are due to Therese and Adrian Holland who catered the event to the highest standards. Going beyond their duty in providing varied recipes and diets for vegetarians, gluten free diets and nut allergists! It was a gastronomic extravaganza!

Thanks also to the Rev. Stan Evans and his wife Rosemary who provided such excellent accommodation and surroundings.

To the event's funders: the *National Parks and Wildlife Service*, grateful thanks for supporting the event and to the NPWS staff especially Conservation Ranger Brendan O'Shea for facilitating access to Killarney National Park and dealing with difficulties that arose.

Thanks also to Kate McAney for her advice and support.

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- Richardson, P. 2000 *Distribution atlas of bats in Britain and Ireland 1980 - 1999*. The Bat Conservation Trust, London, UK.
- Whilde, A. 1993 *Threatened mammals, birds, amphibians and fish in Ireland. Irish Red Data Book 2: Vertebrates*. Belfast: HMSO.

10.1 APPENDIX 1: Details of bats present within Killarney National Park

10.1.1 Common pipistrelle *Pipistrellus pipistrellus*

This species was only recently separated from its sibling, the soprano or brown pipistrelle *Pipistrellus pygmaeus*, which is detailed below (Barratt, E. M., Deauville, R. Burland, T. M., Bruford, M. W., Jones, G., Racey, P. A. & Wayne, R. K., 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland.

10.1.2 Soprano pipistrelle *Pipistrellus pygmaeus*

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle. The pipistrelles are the smallest and most often seen of our bats, flying at head height and taking small prey such as midges and small moths. Summer roost sites are usually in buildings but tree holes and heavy ivy are also used. Roost numbers can exceed 1500 animals in mid-summer.

Both the above species are considered as *Internationally Important*.

10.1.3 Nathusius' pipistrelle *Pipistrellus nathusii*

Nathusius's pipistrelle is a recent addition to the Irish fauna and, so far, has only been recorded breeding from the north of the island in Cos. Antrim and Down (Richardson, P, 2000) but is assumed to be spreading as the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. Detector records are now known from Cos. Longford, Cavan, Meath, Laois, Wicklow and Cork.

The status of the species has not been determined.

10.1.4 Leisler's bat *Nyctalus leisleri*

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. This species is uncommon in Europe and Ireland holds the largest national population.

The species is considered as *Internationally Important*.

10.1.5 Natterer's bat *Myotis nattereri*

This species has a slow to medium flight, usually over trees but sometimes over water. They follow hedges and treelines to their feeding sites, consuming flies, moths and caddis-flies. Natterer's bats are frequently recorded in hibernation sites in winter but there are few records of summer roosts. Those that are known are usually in old stone buildings but they have been found in trees and bat boxes.

The status of the Natterer's bat has not been determined but it is classed as *Threatened* and is listed in the *Irish Red Data Book* (Whilde, A 1993).

10.1.6 Whiskered bat *Myotis mystacinus*

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a

steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees.

Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes.

The status of the species has not been determined but it is classed as *Threatened* and is listed in the *Irish Red Data Book* (Whilde, A 1993).

10.1.7 Brandt's bat *Myotis brandtii*

This sibling species to the whiskered bat is known from two specimens collected in the summer of 2003 one each in Cos. Wicklow and Cavan. A known roost of three specimens was subsequently identified in Co. Clare in 2004. Its status is unknown.

10.1.8 Daubenton's bat *Myotis daubentonii*

This bat species feeds close to the surface of water, either over rivers, canals, ponds, lakes or reservoirs, but can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees.

It is classed as *Internationally Important*.

10.1.9 Brown long-eared bat *Plecotus auritus*

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked.

The species is considered as *Internationally Important*.

10.1.10 Lesser horseshoe bat *Rhinolophus hipposideros*

This species is the only representative of the Rhinolophidae family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. They often carry their prey to a perch to consume, leaving the remains beneath as an indication of their presence. The echolocation call of this species is of constant frequency and, on a bat detector, sounds like a melodious warble.

This species is also considered as *Internationally Important* and it is an Annex II species under the *EC Habitats Directive 1992*.

10.2 APPENDIX 2: Ecology of bats

The bat is the only mammal that is capable of true flight. There are c. 1,116 species worldwide, representing almost a quarter of all mammal species. There are thirty-five species in Europe and in Ireland ten species of bat are currently known to exist. These ten species are classified into two families, the Rhinolophidae (Horseshoe bats) and the Vespertilionidae (Common bats).

10.2.1 Prey

Bats range greatly in size and food requirements. Those in Europe and Ireland are insectivores and therefore feed exclusively on insects. All European bats generally weigh less than 30g with a wingspan of about 350mm. A Pipistrelle, weighing only 4 to 8 grammes, will eat up to 3000 insects every night, ensuring a build up of fat in the bat's body to allow it to survive the winter deep in hibernation.

10.2.2 Breeding and longevity

Irish bats can produce one young per year but, more usually, only one young is born every two years (Boyd & Stebbings, 1989). This slow rate of reproduction inhibits repopulation in areas of rapid decline. Although bats have been known to live for twenty or more years, this is rare as many die in their first year while the average lifespan, in the wild, is four years.

Bats are social animals and most species form temporary maternity colonies during the breeding seasons. These colonies are mostly breeding females but non-breeding females and males may visit the roost.

10.2.3 Threats

All bat species are in decline as they face many threats to their highly developed and specialised lifestyles. In general, their dependence on insects have left them vulnerable to habitat destruction, land drainage, agricultural intensification and increase use of pesticides. Their reliance on buildings has also made them vulnerable to repairs and use of timber treatment chemicals.

Many bats succumb to poisons used as woodworm treatments within their roosting sites (Racey, P. A. & Swift, S. 1986). Agricultural intensification, with the loss of hedgerows, treelines, woodlands and species-rich grasslands have impacted bat species also. Habitual roosting or hibernation sites in caves, mines, trees and disused buildings are also often lost to development. Summer roosts are prone to disturbance from vandals. Agricultural pesticides accumulate in their prey, reaching lethal doses (Jefferies, D. J. 1972). Chemical treatments in cattle production sterilise dung thus ensuring that no insects can breed within it to be fed upon by bats. Likewise, river pollution, from agricultural runoff, reduces the abundance of aquatic insects. Road building, with the resultant loss of foraging and roosting sites is a significant cause in the reduction of bat populations across Europe.

In Ireland, two bat species are of international importance: Lesser horseshoe bat and Leisler's bat. The whiskered bat and Natterer's bat are stated as indeterminate populations in the Irish Red Data Book for Vertebrates due to the paucity of data on their population numbers (Whilde, 1993).

10.3 APPENDIX 3: Photographic record



Plate 1: Workshop base: Muckcross Venture Centre



Plate 2: Workshop registration pack

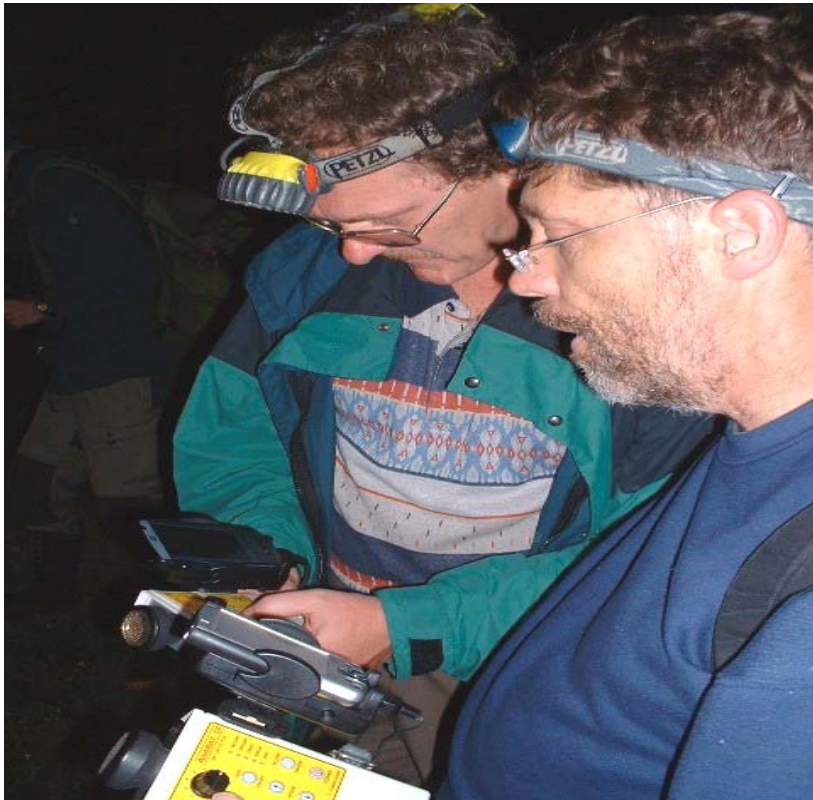


Plate 3: Chris Corben showing Anabat system to Tomasz Kokurewicz



Plate 4: Harp-trap with Autobat sonic lure



Plate 5: Afternoon lecture session with Anne-Jifke Haarsma



Plate 6: Light tags



Plate 7: Anne-Jifke Haarsma demonstrating the use of mist-netting



Plate 8: Sinéad Biggane and Enda Mullen prepare for radio tracking demonstration



Plate 9: Soprano pipistrelle being examined

10.4 APPENDIX 4: Sonograms of recorded Nathusius' pipistrelle calls

All screen captures courtesy of Chris Corben.

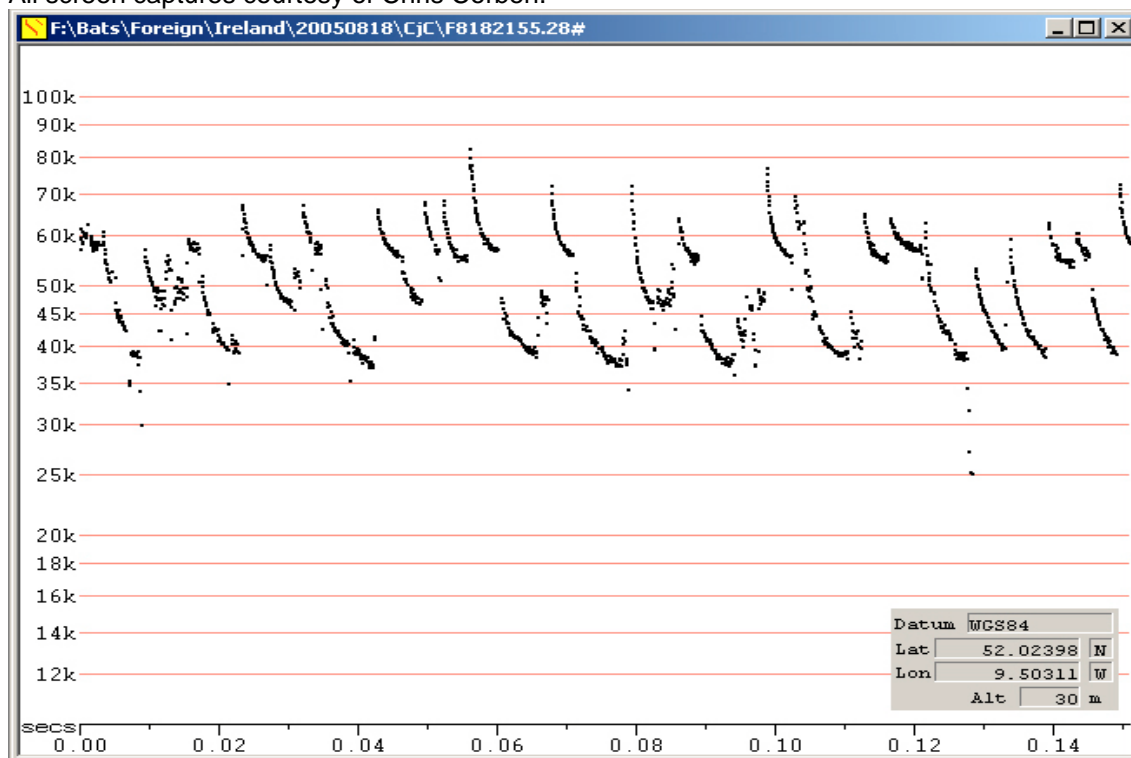


Plate 1: Nathusius', common and soprano pipistrelles in moderate clutter 18 August @ 21.55

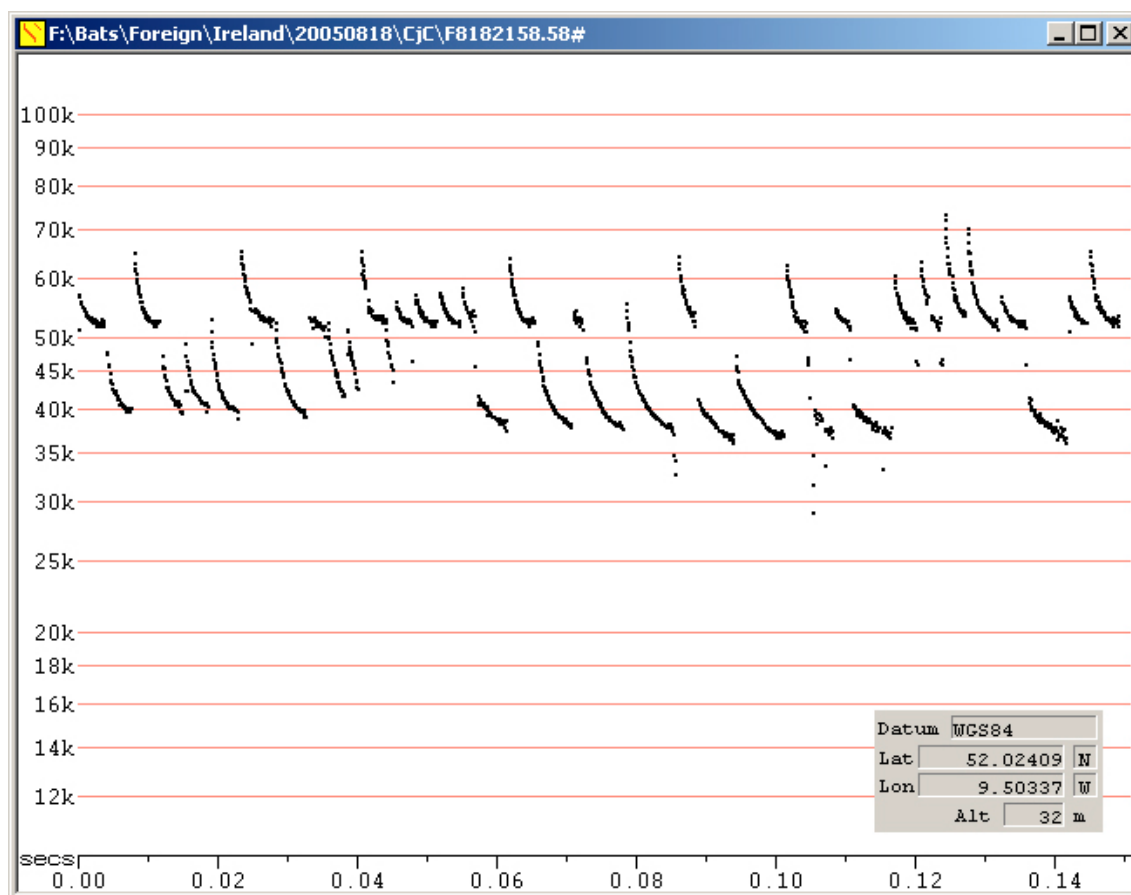


Plate 2: Nathusius' pipistrelle with soprano pipistrelle in clutter 18 August @ 21.58

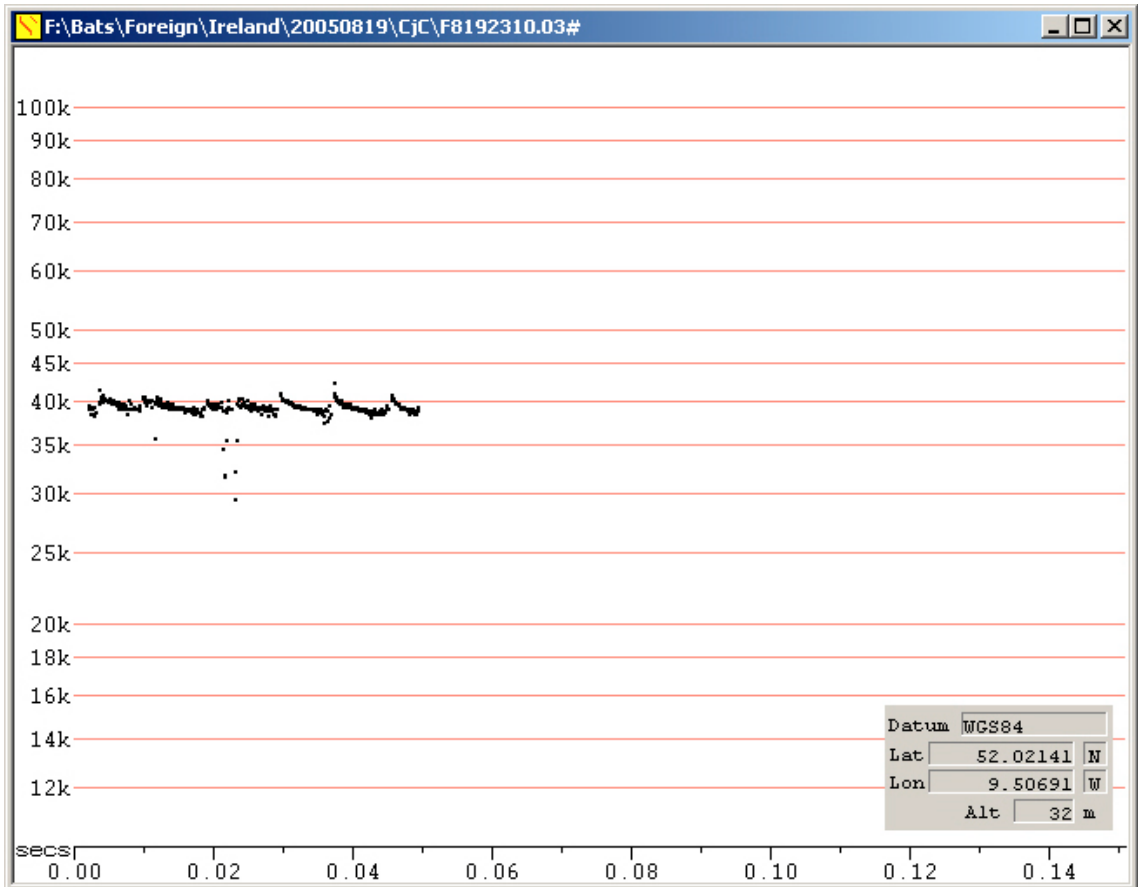


Plate 3: Possible Nathusius' but also likely to be common pipistrelle 19 August @ 23.10

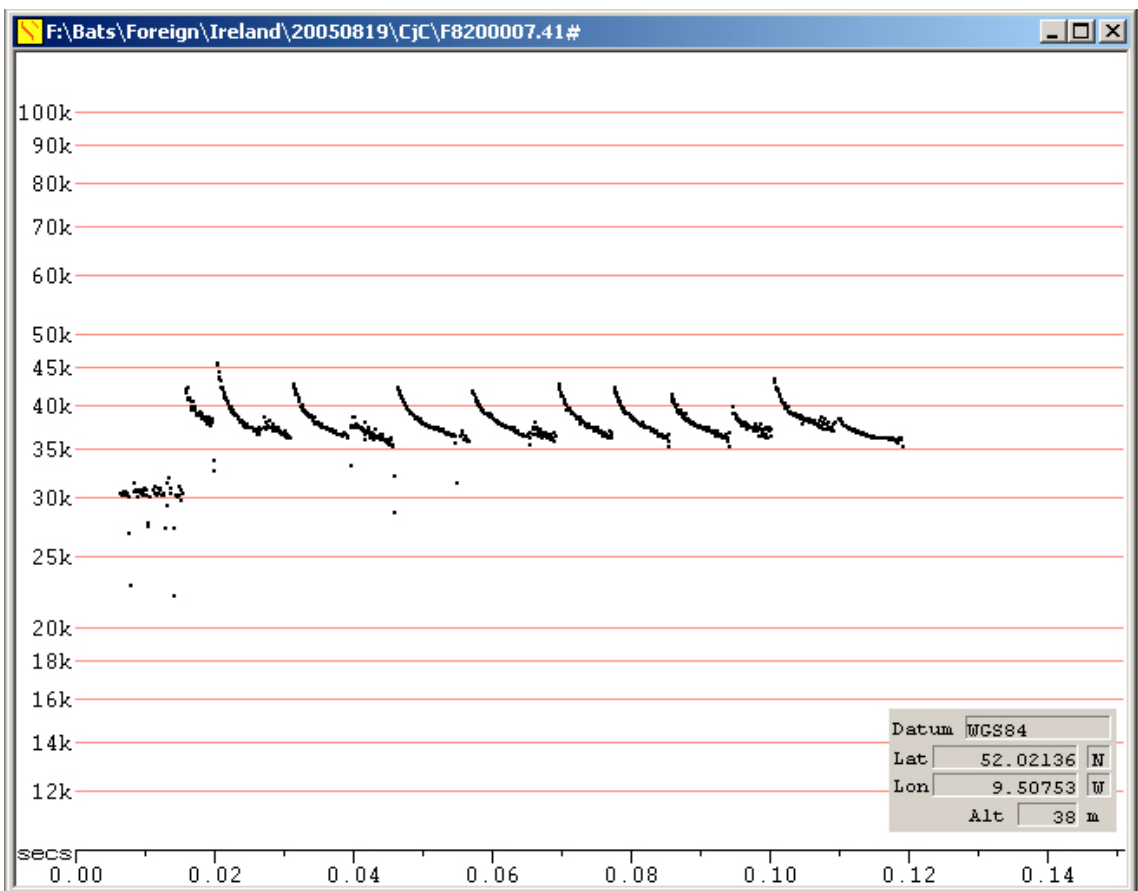


Plate 4: Nathusius' pipistrelle in low clutter 20 August @ 00.07

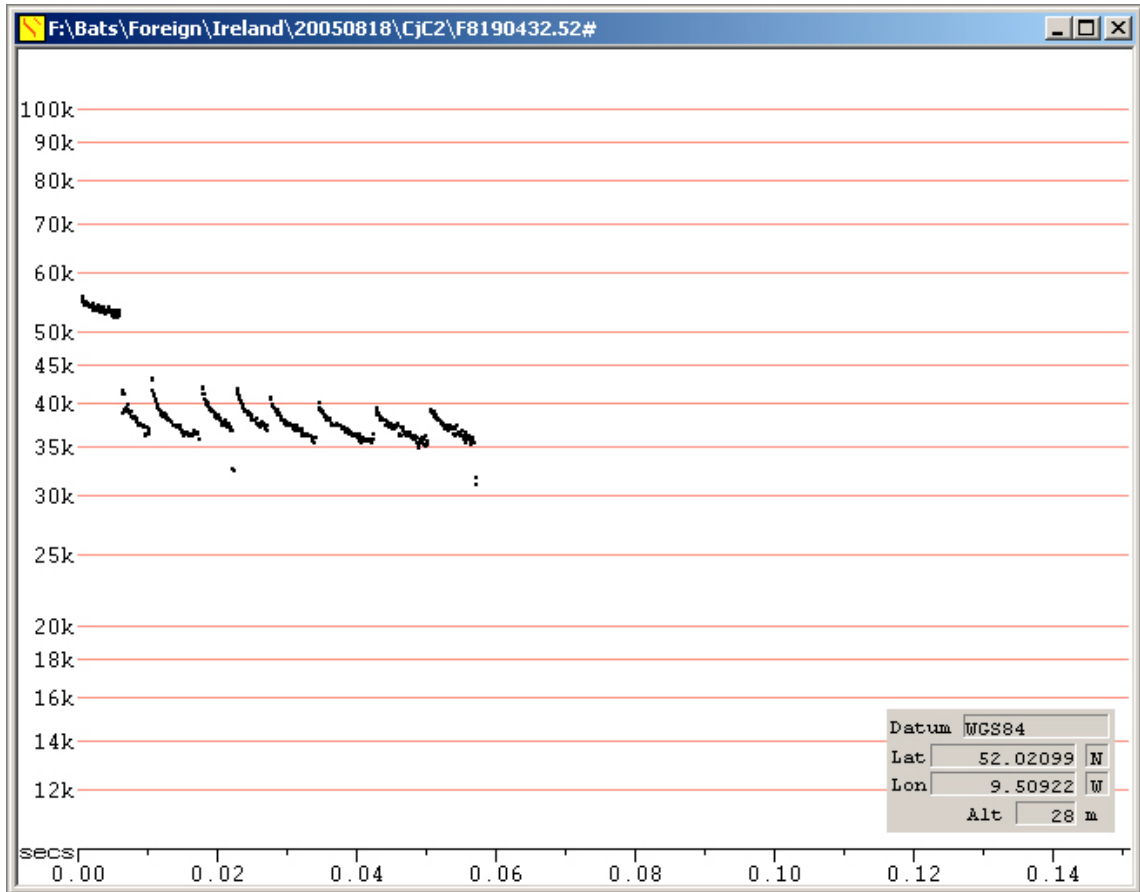


Plate 5: Nathusius' in clutter with single common pipistrelle call 19 August @ 04.32

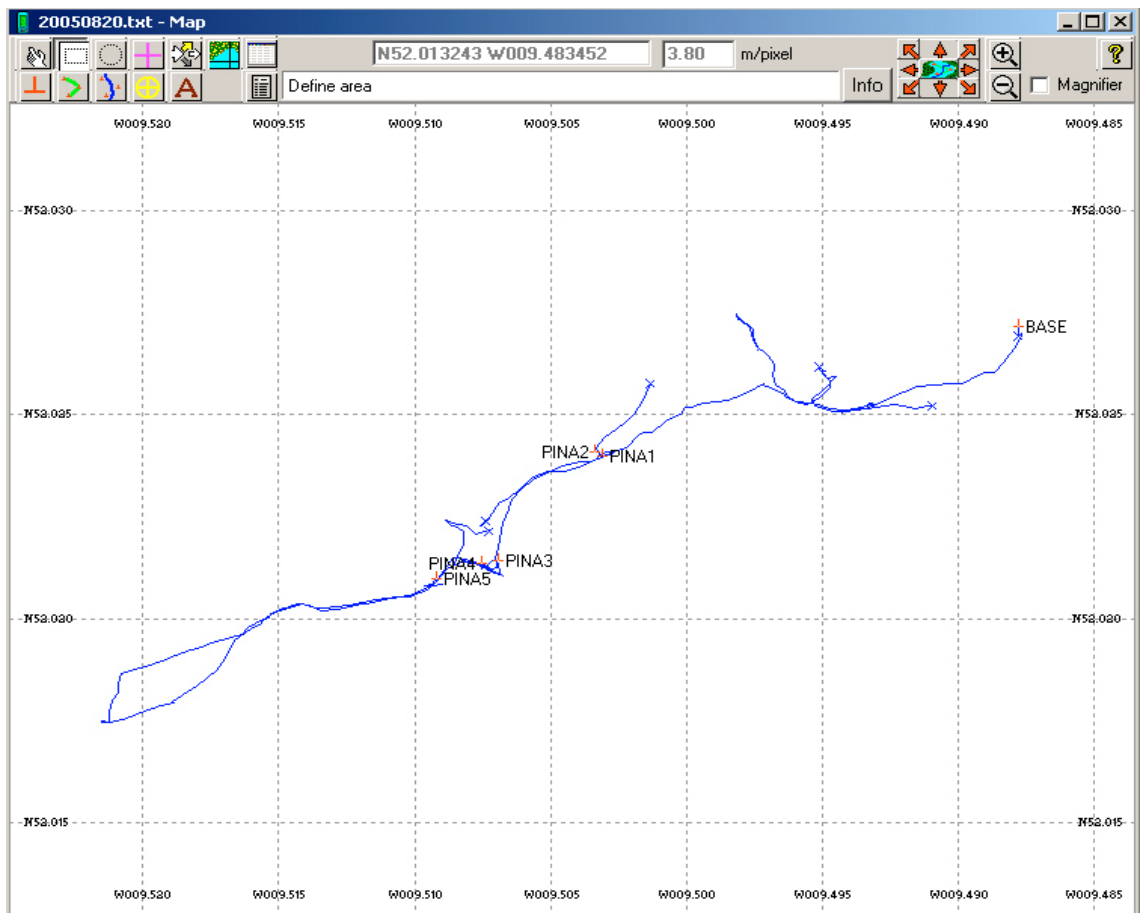


Plate 6: Locations of Nathusius' calls on National Grid. BASE is Venture Centre.

10.5 APPENDIX 5: Programme of the event

Bat Fieldcraft Workshop 17th – 21st August 2005 Muckross Venture Centre & Killarney National Park, Ireland

Tutors: Sinéad Biggane, Frank Greenaway, Anne-Jifke Haarsma, Tomasz Kokurewicz, Herman Limpens, Dean Waters, Daniel Whitby.

Participants: Tina Aughney, Kate Barlow, Daniel Buckley, Chris Corben, Niall Cribbon, Chris Damant, Leif Gjerde, Emma Glanville, Angela Graham, John Haddow, Clare Heardman, Kjell Isaksen, Conor Kelleher, Irena Kranjec, Thomas Lilley, Kim Livengood, Solveig Lubeley, Deirdre Lynn, Colleen Mainstone, Ferdia Marnell, Enda Mullen, Brendan O’Shea, Patrick Prevett, Egoitz Salsamendi, Jasper Schut, Knut Age Storstad, Sam Talbot, Emma Teeling, Peter Twisk, Diederik van Dullemen.

Workshop Programme

Wednesday 17th August 2005

- 16.00:** Registration/settling in
- 18.00:** Dinner
- 19.00:** Commencement of Workshop - brief introduction to Killarney National Park
Brendan O’Shea, Park Ranger
- 19:15** Overview of workshop
Conor Kelleher
- 19.30:** Leisler’s bat (*Nyctalus leisleri*) studies - an outline
Herman Limpens & Dean Waters
- 20.30:** Depart for fieldwork - participants will be divided into groups
- 20.52:** **Sunset** - Leisler’s survey work in the field under guidance of Tutors
- 24.00:** Refreshment break and collection of results
- 01.00:** Leisler’s survey work in the field under guidance of Tutors
- 06.24:** **Sunrise** - Return to hostel and bed

Thursday 18th August 2005

- 13.00:** Breakfast
- 14.00:** Free time to explore
- 16.00:** Mapping of results from previous night, discussion
Herman Limpens & Dean Waters
- 16.30:** Radio-Tracking
Sinéad Biggane
- 17.00:** Capture methods
Frank Greenaway & Daniel Whitby
- 18.00:** Dinner
- 19.00:** Capture methods above water
Anne-Jifke Haarsma
- 19.15:** Detector studies - an outline
Herman Limpens & Dean Waters
- 20.15** Depart for fieldwork - groups will be assigned to Tutors
- 20.49:** **Sunset** - Demonstration of radio-tracking and capture methods by Tutors
- 24.00:** Refreshment break and collection of results
- 01.00:** Fieldwork under supervision of Tutors
- 06.26:** **Sunrise** - Return to hostel and bed

<i>Friday 19th August 2005</i>

- 13.00:** Breakfast
- 14.00:** Free time to explore
- 16.00:** Mapping of results from previous night, discussion
All
- 16.30:** Marking and recapture methods
Anne-Jifke Haarsma
- 18.00:** Dinner
- 19.00:** Bats in the hand
Tomasz Kokurewicz
- 20.00** Depart for fieldwork - groups will be assigned to Tutors
- 20.48:** **Sunset** - Handling, marking and Leisler's studies under supervision of Tutors
- 24.00:** Refreshment break and collection of results
- 01.00:** Fieldwork under supervision of Tutors
- 06.27:** **Sunrise** - Return to hostel and bed

Saturday 20th August 2005

- 13.00:** Breakfast
- 14.00:** Free time to explore
- 16.00:** Detectors: getting the most from your equipment
- 17.00:** Summing up of workshop findings to date: open discussion on detectors/methods *Dean Waters*
- 18.00:** Dinner
- 19.00:** Final discussion period
- 20.00:** Depart for fieldwork - groups will be assigned to Tutors
- 20.45:** **Sunset** - Fieldwork under supervision of Tutors
- 24.00:** Refreshment break
- 01.00:** Final collection/discussion of results
- 02.00:** Bed

Sunday 21st August 2005

- 10.00:** Breakfast
- 11.30:** Departure by coach to Symposium
- 15.00:** Arrival in Galway

10.6 APPENDIX 6: List of participants

Tutors	From	Email
Sinéad Biggane	Ireland	sinead.biggane@NUIGALWAY.IE
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		daniel@whitbywildlifeconservation.co.uk
Daniel Whitby	England	k
Participants		
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