2008

A bat survey of bridges identified by the All-Ireland Daubenton's bat Waterway Survey as potential bat roosts.

IRISH BAT MONITORING PROGRAMME

An Chomhairle Oidhreachta
The Heritage Council

Bat Conservation Ireland

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11/30/2008

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Bat conservation Ireland, www.batconservationireland.org

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CONTENTS

EXECUTIVE SUMMARY

Bat Conservation Ireland (BCIreland) received funding (60%) from The Heritage Council to undertake this project. This report presents work undertaken during the field season of 2008. BCIreland surveyors surveyed 80 bridges in 15 counties across the country. Twelve percent of these bridges had evidence of bats while 31% of bridges surveyed were considered suitable for roosting bats (i.e. crevices present within bridge structure suitable for roosting bats).

A 1km stretch of waterway in the vicinity of bridges were originally surveyed at least once for activity of Daubenton's bats (*Myotis daubentonii*) by All-Ireland Daubenton's bat Waterway Survey volunteers in August 2006 and/or 2007. As part of the All-Ireland Daubenton's bat Waterway Survey each volunteer team is assigned survey points selected from the EPA's National Rivers Monitoring Programme. Such survey points are generally bridges where the EPA undertakes water sampling and macroinvertebrate surveys as part of their water monitoring programmes. During analysis of volunteer survey forms participating in the All-Ireland Daubenton's bat Waterway Survey it was noted, in some instances, that a high level of bat activity was recorded adjacent to the bridges. Therefore, BCIreland applied for funding to undertake a survey of eighty bridges covered under the monitoring programme to determine whether such bridges were roosting sites for bats.

Bridges are considered to be important roosting sites for bats, in particular, the stone masonry bridges. Irish bat species have been recorded in such bridges in previous independent surveys (Shiel, 1999 and Materson *et al,* 2008). Such species include: Daubenton's bat, Natterer's bats (*Myotis nattereri)* brown long-eared bat (*Plecotus auritus),* whiskered bat (*Myotis mystacinus)* and common pipistrelle bat (*Pipistrellus pipistrellus)*. Additional surveys commissioned by local authorities have focused on stone masonry bridges because of their heritage value (e.g. Keeley, 2007). Therefore, an inventory of important bridges in relation to bats can provide local authorities with information on 'best practice' for future works on bridges as a result of road maintenance and vehicular access.

Therefore the objectives of this study were:

1. Identify bat roosts in bridges
2. Grade all bridges surveyed according to their importance as potential bat roosts
3. Identify bat species roosting in bridges
4. Raise awareness of the importance of bridges to bats
5. Provide such information (in a the form of the present report) on www.batconservationireland.org website for use by planning authorities and other interested bodies

1. INTRODUCTION

Figure 1: Daubenton's bat (Tina Aughney)

Bats constitute a large proportion of the mammalian biodiversity in Ireland. There are currently ten species of bat in Ireland representing two families. This forms almost one third of Ireland's land mammal fauna. Nine species are vesper bats and all the vespertilionid bats have a tragus (cartilaginous structure found inside the pinnea of the ear) and are distributed throughout the country. Nathusius' pipistrelle *Pipistrellus nathusii* and the Brandt's bat *Myotis brandtii* are recent editions to the list. The tenth species, the lesser horseshoe bat *Rhinolophus hipposideros*, belongs to the Rhinolophids and has a complex nose leaf structure. This species current distribution is confined to the western six counties: Mayo, Galway, Clare, Limerick, Kerry and Cork.

Bats are a species rich group widely distributed throughout a range of habitats in the Irish landscape. Due to their reliance on insect populations, specialist feeding behaviour and habitat requirements, they are considered to be valuable environmental indicators of the wider countryside (www.bats.org).

A species profile of each bat species is provided in the Appendices.

Irish bats are protected under domestic and EU legislation. In addition there are a number of international treaties that Ireland is signed up to requiring the legal protection of bats and their habitats in Europe.

1.1 Domestic Legislation

Under the Republic's Wildlife Act (1976) and Wildlife (Amendment) Act (2000) it is an offence to intentionally harm a bat or disturb its resting place.

1.2 The EU Habitats Directive

Article 12(1) of the 'Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (Habitats Directive) states:

"Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV(a) and their natural range, prohibiting:

a) all forms of deliberate capture or killing of specimens of these species in the wild;

b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration;

c) deliberate destruction or taking of eggs from the wild;

d) deterioration or destruction of breeding sites or resting places."

Figure 2: soprano pipistrelle bat (Tina Aughney)

The EU Habitats Directive (92/43/EEC) lists all Irish bat species in Annex IV and one Irish species, the lesser horseshoe bat (*Rhinolophus hipposideros*), in Annex II. Annex II includes animal species of community interest whose conservation requires the designation of Special Areas of Conservation (SACs) because they are, for example, endangered, rare, vulnerable or endemic. Annex IV includes various species that require strict protection. Article 11 of the Habitats Directive requires member states to monitor all species listed in the Habitats Directive and Article 17 requires States to report to the EU on the findings of monitoring schemes.

1.3 International Treaties

Ireland is also a signatory to a number of conservation agreements pertaining to bats such as the Bern and Bonn Conventions. The European Bats Agreement (EUROBATS) is an agreement under the Bonn Convention and Ireland and the UK are two of the 31 signatories. The Agreement has an Action Plan with priorities for implementation. Devising strategies for monitoring of populations of selected bat species in Europe is among the resolutions of EUROBATS.

Figure 3: Common pipistrelle (Tina Aughney)

1.3.1 The Berne Convention

Article 6 of the "Convention on the Conservation of European Wildlife and Natural Habitats' (Berne Convention) reads:

"Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. The following will in particular be prohibited for these species:

a) all forms of deliberate capture and keeping and deliberate killing;

b) the deliberate damage to or destruction of breeding or resting sites;

c) the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention; ...!

Appendix II lists strictly protected fauna species and this list includes "Microchiroptera, all species except *Pipistrellus pipistrellus*".

1.3.2 The EUROBATS Agreement

The 'Agreement on the Conservation of Populations of European Bats' (EUROBATS) was negotiated under the 'Convention for the Conservation of Migratory Wild Species' (Bonn Convention) and came into force in January 1994. The legal protection of bats and their habitats are given in Article III as fundamental obligations:

"1. Each Party shall prohibit the deliberate capture, keeping or killing of bats except under permit from its competent authority.

b) Each Party shall identify those sites within its own area of jurisdiction which are important for the conservation status, including for the shelter and protection, of bats. It shall, taking into account as necessary economic and social considerations, protect such sites from damage or disturbance. In addition, each Party shall endeavour to identify and protect important feeding areas for bats from damage or disturbance."

The Agreement covers all European bat species except non-migratory endemics of the Atlantic Islands.

The fundamental obligations cited above are fulfilled by national law in accordance with the EU Habitats Directive.

Figure 4: Natterer's bat (Tina Aughney)

2. BATS IN IRELAND

2.1 National Status of Irish bat species

The Irish Red Data Book of Vertebrates, listed all Irish populations of bats (those species that were known to occur in Ireland at the time) as Internationally Important. Two Irish species, the lesser horseshoe bat and the Leisler's bat (*Nyctalus leisleri*), were assigned IUCN European threat categories (VU A2c and LR: nt, respectively). VU A2c indicated that the lesser horseshoe bat population in Ireland is vulnerable to decline and such declines may be predicted for the future if there is a decline in occupancy, extent of occurrence or quality of habitat. Ireland holds important European populations of Leisler's bat, which was formerly categorised as LR (lower risk): nt (near threatened). The conservation status of bats in Ireland and Europe has been recently updated. The threat level for the lesser horseshoe bat is now described as near threatened for Europe and the European States, but within Ireland its population is considered to have good prospects. The status of the European Leisler's bat population has been changed from nt to Least Concern and within Ireland it is considered to have good prospects. This species is still, however, infrequent in the rest of Europe compared with Ireland where it is quite common.

Figure 5: Natterer's bat (Tina

There has been an increase in levels of knowledge of Irish bats in the past 20 years, mainly due to increased numbers of researchers and bat workers. Despite high levels of legal protection for all species, until 2003 there was no systematic monitoring of any species apart from the lesser horseshoe bat in the Republic of Ireland. The car-based bat monitoring scheme (2003-2008), the Daubenton's Bat Waterways Survey (2006-2008), the pilot of woodland bat monitoring (2006-2007) and the brown long-eared bat monitoring scheme (2007-2010) are helping to redress the imbalance and ensure countrywide coverage and monitoring of a number of species including our important Leisler's bat. In addition, the BATLAS 2010 (2008-2010) aims to compliment all of the on-going monitoring programmes and systematically survey the remaining of the country for the distribution of the four common bat species: soprano pipistrelle, common pipistrelle, Leisler's bat and Daubenton's bat on a 10km square level.

2.2 All-Ireland Daubenton's bat Waterway Survey

The Daubenton's Bat Waterway Survey is the current monitoring protocol in operation for monitoring bats at waterways in the UK and is under the management of The Bat Conservation Trust (BCT). It was introduced in the UK in 1997 and focuses on Daubenton's bat activity along waterways such as rivers and streams (but excludes ponds and lakes) as this species is known to have a high dependency on such waterbodies for foraging. It is considered that the Daubenton's Bat Waterway Survey is an ideal method to introduce inexperienced volunteers to bat surveying. Consequently, it was the first field-based volunteer-dependent monitoring programme to be piloted in Ireland for monitoring bats.

BCIreland piloted the All-Ireland Daubenton's Bat Waterway Survey in the Republic of Ireland and Northern Ireland using the BCT methodology in August 2006 and repeated the survey in August 2007 and 2008. Methodology is as follows:

- Surveyors are assigned a choice of 2 or 3 survey starting points. These points lie within 10km of the surveyor's preferred area and are selected from the EPA's National Rivers Monitoring Programme in the Republic of Ireland and the Water Quality Management Unit dataset under the EHS, Northern Ireland.

- Surveyors undertake a day visit (with landowner's permission) to assess if a site is suitable and safe to survey. One site is chosen and ten points approximately 100m apart are marked out along a 1km stretch.

- The surveyors then revisit the site on two evenings in August and start surveying 40 minutes after sunset. At each of the ten points, the surveyor records Daubenton's bat activity for four minutes using a heterodyne bat detector and torchlight (Walsh *et al.*, 2001). The methodology is designed to be simple, robust and repeatable in order to meet the basic principles of monitoring theory (Catto *et al*, 2003).

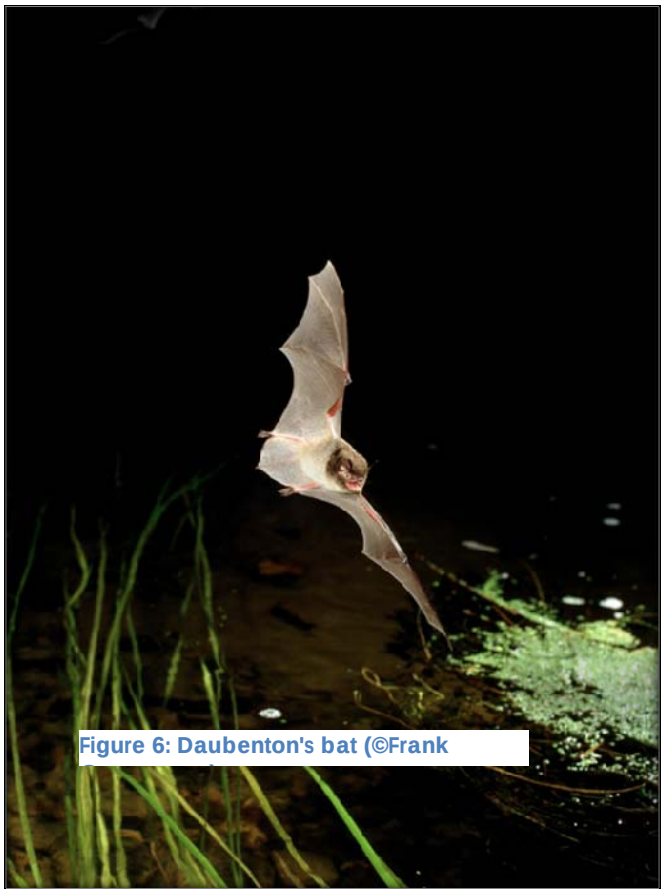


Figure 6: Daubenton's bat (©Frank

- Bat passes are either identified as Daubenton's bat or 'Unsure' Daubenton's bat. Daubenton's bat passes are identified only if the bat is heard and seen flying over the water surface.

- Bat passes that are heard, sound like Daubenton's, but are not seen in flight may be another species. Therefore, these heard but not seen bats are recorded as 'Unsure' Daubenton's bat passes. The number of times a bat passes the surveyor is counted, although this may be just one individual bat passing back and forth along the same stretch of river. Therefore counting bat 'passes' is a measure of activity, not individuals, and results are quoted as the number of bat 'passes' per survey period (No. of bat 'passes'/40 minutes).

- Surveyors record a number of parameters including air temperature, weather data and waterway characteristics.

- Volunteers are required to undertake surveying in pairs for safety reasons. One member of the team is designated as the Surveyor 1 and uses the bat detector and torch while Surveyor 2 documents the numbers of 'passes' and other information on recording sheets. Information on the bat detection skills of Surveyor 1 and make of bat detector is requested for incorporation into analyses.

- On completion of both survey nights, surveyors are requested to return completed recording sheets and map (with the ten survey spots marked out) to BCIreland for analysis and reporting.

A total of 134 waterway sites were surveyed in 27 counties in 2006. Daubenton's bat 'passes' were recorded on 122 waterway sites (91%). During the repeated survey in 2007 and a total of 199 waterway sites were surveyed in all 32 counties of the island. Daubenton's bat 'passes' were recorded on 171 waterway sites (86%). In 2008, a preliminary total of 168 waterway sites in 31 counties were surveyed.

2.3 Bridges and bats

A number of studies on bat usage of bridges have been undertaken in recent years. Smiddy (1991) was one of the first surveys undertaken on bat usage in bridges in Ireland. He recorded that 14% of bridges surveyed in County Cork and 11% of bridges surveyed in County Waterford had bat evidence. Shiel (1999) surveyed a number of bridges on a seasonal basis in Counties Leitrim and Sligo and found that 38% of structures had bats present. Keeley (2007) surveyed bridges in Counties Offaly and Laois and noted that 15% of structures had bat evidence. While Masterson *et al* (2008) surveyed bridges (n=113) in the Sullane and Laney River Catchments, County Cork and reported that 11% of bridges had bat evidence.

3. BRIDGE SURVEY

3.1 Survey area

Eighty bridges were surveyed in fifteen counties across the country.

3.2 Methodology

The survey methodology followed that of Billington and Norman (1997). This methodology involved a grading system where the bridge examined was categorised as follows:

0 = no potential (no suitable crevices)

1 = crevices present may be of use to bats

2 = crevices ideal for bats but no evidence of usage

3 = evidence of bats (e.g. bats present, droppings etc.)

Evidence of bats is in the form of actual bats (visual or audible), bat droppings, urine staining, grease marks (oily secretions from glands) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicated that bat usage of a crevice has occurred in the recent past. To complete this grading, each bridge was inspected. A high-powered, narrow beamed torch was used to inspect crevices, holes, cracks and joints beneath bridge arches and abutments, within culverts and within any external structures that may offer a roosting site for bats. Where necessary, an endoscope was employed for deep crevices not accessible using a torch. Where a bat was recorded in a structure but not identified to species level, a dusk detector survey was undertaken to confirm species identification. For a small number of bridges, dusk survey was undertaken to determine the number of bats roosting within the bridge. In some cases, due to high water levels, arches of some bridges were not fully accessible and therefore assessment was aided by photographs.

All bridges were surveyed at least once and, where possible, a follow-up survey was completed. The data recording sheet used by Masterson *et al* (2008) was adopted for this survey. A data recording sheet was completed for each bridge surveyed and this gathered descriptive information on the bridge structure, adjacent habitats, bat usage and importance for bats. In addition, grid reference was taken for all surveyed bridges.

In addition, surveyors also recorded other fauna evidence e.g. otter spraints. Such information is an additional value to bridge assessment.

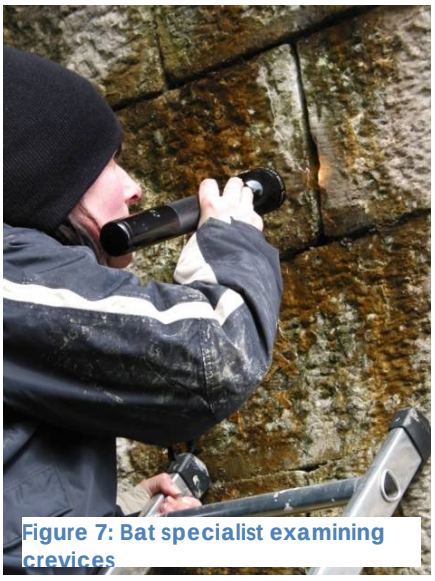


Figure 7: Bat specialist examining crevices

4. BRIDGE SURVEY RESULTS

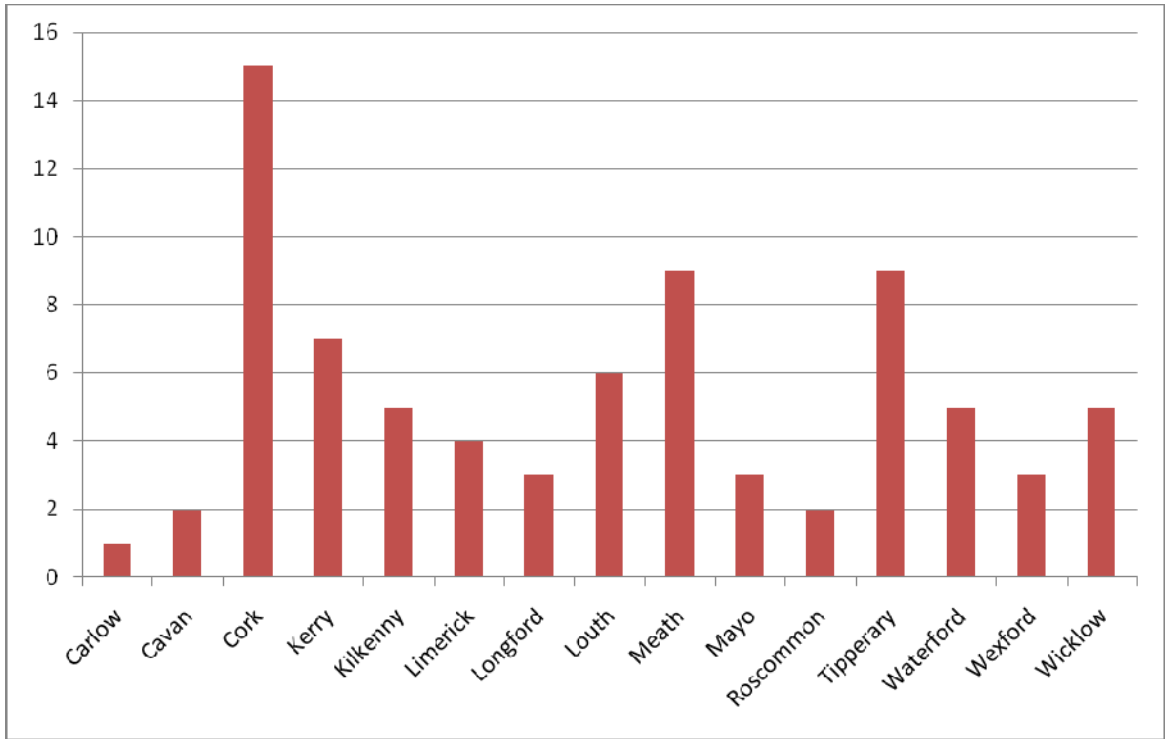
4.1 Surveyed Bridges

The array of bridges surveyed ranges from single arched stone bridges to multiple arched stone bridges to concrete culverts and to concrete expansion bridges. As is often the case, many of the original stone bridges have been modernised with concrete (i.e. concrete extensions or additional supports) to facilitate modern vehicular movement on roadways. Fifteen of the bridges surveyed were concrete bridges while all remaining bridges were originally constructed from sandstone or limestone.

Figures 8-10: Examples of bridges surveyed in 2008 – Cabragh Bridge, County Tipperary; Flesk Bridge, County Kerry and Ballea Bridge, County Cork (Photos: Ger Stanton).

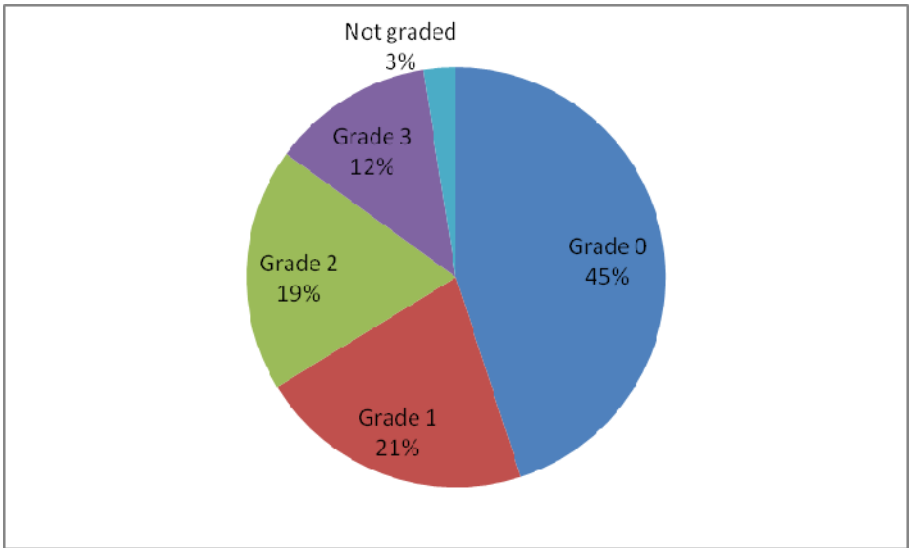
The number of bridges surveyed per county is presented below. The highest number of bridges were surveyed in County Cork (n-15) followed by County Tipperary (n=9) and County Meath (n=9).

Graph 1: Number of bridges surveyed according to location (n=80).



4.2 Bridge grading

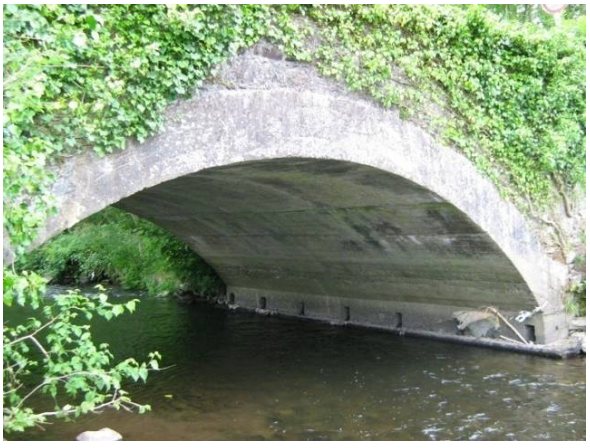
A summary of the number of bridges by grade is presented below (Graph 2). Two bridges visited could not be fully assessed and graded due to high water levels.



Graph 2: Bridges categorised according to their suitability to roosting bats.

Grade 0

Overall, a total of 36 bridges were classified as Grade 0, i.e. not having bat roost potential. Such bridges were either modern concrete bridges or stone masonary bridges that were pressure grouted and gunited with concrete under the arches. The majority of these bridges were stone masonry bridges that were pressure grouted and gunited (n=16) and concrete bridges (i.e. culverts or modern expansion bridges (n=14). The remaining 6 bridges were stone mason bridges with modern concrete extensions. All of the stone masonry bridges were sealed with cement.



Figures 11-12: Examples of modern work completed on stone masonry bridges, rendering them unsuitable for roosting bats (Photos: Ger Stanton).

Grade 1

A total of 17 bridges were classified as Grade 1, i.e. crevices present which may be of use to bats. The majority of these bridges were stone masonry bridges (n=13). The remaining 4 bridges were stone masonry bridges with modern concrete extensions.

Grade 2

A total of 15 bridges were classified as Grade 2, i.e. crevices ideal for bats but no evidence of usage. The majority of these bridges were stone masonry bridges (n=10). The remaining 4 bridges were stone masonry bridges with modern concrete extensions and one modern expansion bridge.

Grade 3

Overall, a total of 10 bridges were classified as Grade 3, i.e. bats or bat evidence was recorded. Nine of these bridges had bats roosting within crevices (Daubenton's bats and Natterer's bats) while bat droppings only were recorded at the remaining bridge. The majority of these bridges were stone masonry bridges (n=7). The remaining 5 bridges were stone masonry bridges with modern concrete extensions.

If Grade 0 bridges are excluded from the equation and if only bridges with suitable crevices or evidence of bat usage are considered, 52% of the bridges (n = 45 bridges) surveyed are potentially suitable to roosting bats.

NB: Bridges may move from Grade 1 & 2 to Grade 2 & 3 with repeated seasonal surveys similar to that undertaken in Shiel, 1999.

Figure 12: Daubenton's bats in crevice (Ger Stanton)

Figure 13: Daubeton's bat in crevice (Ger Stanton)

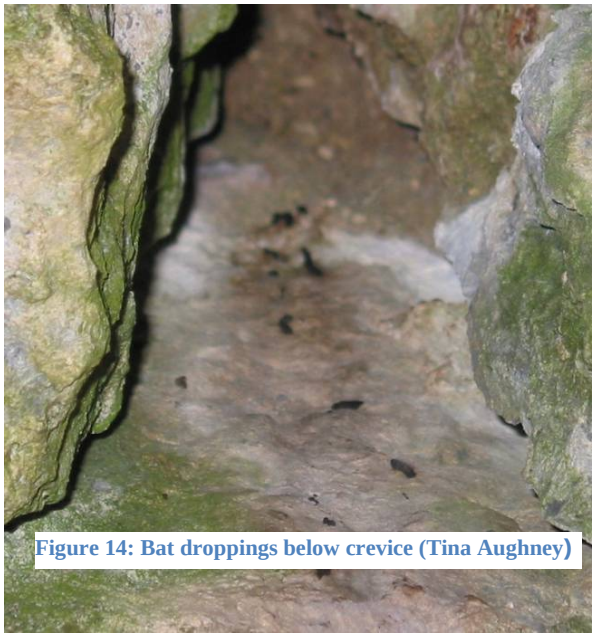


Figure 14: Bat droppings below crevice (Tina Aughney)

4.3 County by County Results

To facilitate the availability of information gathered by this survey to local authorities, all of the bridges and survey results are presented below according to each county (in alphabetical order).

4.3.1 County Carlow

One bridge was surveyed in County Carlow, which was not suitable for roosting bats (i.e. Grade 0).

Kilcarry Bridge (River Slaney) S89400 62500	
Description	5 arch sandstone bridge
Grade (bat evidence)	**0** No crevice available (arches cemented)

Figure 15: Kilbarry Bridge (Hannah Denniston)

4.3.2 County Cavan

Two bridges were surveyed in County Cavan, one of which was suitable for roosting bats (i.e. Grade 2-3 bridges).

Nine Eyes Bridge (River Blackwater) N63040 83380	
Description	9 arch limestone bridge
Grade (bat evidence)	**0** All arches pressure grouted
Notes	Otter spraints
Ramor Woods Bridge (River Blackwater) N	
Description	Single arch limestone bridge
Grade (bat evidence)	**2** Small number of deep crevices
Notes	Otter spraints, Dipper, Grey wagtail

4.3.3 County Cork

15 bridges were surveyed in County Cork, 7 of which were suitable for roosting bats (i.e. Grade 2-3 bridges). Three of the surveyed bridges had bats roosting within crevices (4 Daubenton's bats and 1 Natterer's bat).


Figures 16-17: Drumcarra Bridge and Carrigaphocca Bridge

Kimaloda Bridge (River Arigideen) W45195 45566)	
Description	8 arch bridge
Grade (bat evidence)	**2** Crevices available to bats
Notes	Otter spraints, Sand Martins (in sand banks)
Ballea Bridge (Owenboy River) W71218 62769	
Description	3 arch sandstone bridge
Grade (bat evidence)	**2** Crevices available in all arches
Charles Bridge (River Blackwater) W24811 94404	
Description	5 arch sandstone bridge
Grade (bat evidence)	**3** 3 x Daubenton's bat (2/9/08)
Notes	Pearl water mussels
Coolmucky Bridge (River Bride) W46037 67916	
Description	Concrete span bridge
Grade (bat evidence)	**0** No available crevices
Bannow Bridges (River Lee)	
Description	3 arch sandstone bridge
Grade (bat evidence)	**1** Few suitable crevices
Tower Bridge (Shoumagh River) W58620 74551	
Description	5 arch sandstone and brick bridge
Grade (bat evidence)	**2** Suitable crevices in dry arches
Notes	Otter spraints under 2 arches
Dripsey Lower (Dripsey River)	
Description	2 arch sandstone bridge
Grade (bat evidence)	**2** Suitable crevices
Notes	Grey wagtail
Carrigagulla Bridge (Laney River) W38946 83016	
Description	2 arch sandstone and concrete bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	Otter spraints
Charles Bridge (River Bride) W45289 67554	
Description	5 arch sandstone bridge
Grade (bat evidence)	**3** 1 x Daubenton's bat (2/9/08)
Notes	

Carrigaphocca Bridge (River Foherish) W29636 73766	
Description	7 arch sandstone and concrete bridge
Grade (bat evidence)	**1** Few suitable crevices
Linnamilla Bridge (Sullane River) W31139 72814	
Description	Single arch sandstone bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	Otter spraints
Drumcarra Bridge (River Lee) W29558 67786	
Description	5 arch concrete and sandstone bridge
Grade (bat evidence)	**3** 1 x Natterer's bat (2/9/08)
Notes	
Upper Glanmire Bridge (Glashaboy River) W71464 73766	
Description	Concrete span bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	Otter spraints
Priest's Bridge (Owenboy River)	
Description	Concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Bawnafinny Bridge (Martin River) W58790 75412	
Description	Single concrete band bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	Mink spraints

Figures 18-19: Bridges and Bridge (Photos: Ger Stanton)

4.3.4 County Kerry

7 bridges were surveyed in County Kerry, 2 of which were suitable for roosting bats (i.e. Grade 2-3 bridges). One bridge had roosting bats (4 Daubenton's bats) at the time of surveying.


Figures 20-21: Beaufort Bridge and Finuge Bridge (Photos: Ger Stanton)

Finuge Bridge (River Feale) Q95111 32113	
Description	Modern concrete bridge
Grade (bat evidence)	**2** Suitable crevices between joints
Notes	Otter spraints
Bridge u/s Ardsheem/Smeem confluence V68908 67530	
Description	Single arch sandstone bridge
Grade (bat evidence)	**1** Few available crevices
Notes	Otter spraints
Bridge u/s Upper Lake (Owenreagh River) V88422 82104	
Description	5 arch sandstone bridge
Grade (bat evidence)	**3** 4 x Daubenton's bats (13/6/08)
Notes	Otter spraints
Bridge west of Emlagh Townland (Emlagh River) Q64800 03300	
Description	Concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	
Racecoure Footbridge (River Feale) Q98084 33646	
Description	Concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	
Flesk Bridge (River Flesk) V96725 89468	
Description	Concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	
Beaufort Bridge (River Laune) V88166 92633	
Description	12 arch sandstone bridge
Grade (bat evidence)	**0** All arches pressure grouted
Notes	

4.3.5 County Kilkenny

Five bridges were surveyed in County Kilkenny, one of which was suitable for roosting bats (i.e. Grade 2-3 bridges).


Figures 22-23: Kells Bridge and Threecastles Bridge (Photos: Hannah Denniston)

Threecastles Bridge (River Nore) S45821 62709	
Description	7 arch limestone bridge
Grade (bat evidence)	**0** No suitable crevices (photo assessment)
Notes	Arches not accessible due to deep water
Graiguenamanagh Bridge (River Barrow) S70724 43544	
Description	7 arch limestone bridge
Grade (bat evidence)	**2** Crevices available (photo assessment)
Notes	Arches not accessible due to deep water
Dinin Bridge (Dinin River) S47890 62850	
Description	3 arch stone bridge with concrete
Grade (bat evidence)	**0** No crevices available (arches concreted)
Notes	
Ballycoppigan Bridge (Mountain River) S73435 49860	
Description	Single arch limestone bridge
Grade (bat evidence)	Arch not accessible due to deep water
Notes	
Kells Bridge (Kings River) S49415 43690	
Description	8 arch limestone bridge
Grade (bat evidence)	**2** Crevices available (photo assessment)
Notes	Arches not accessible due to deep water

4.3.6 County Limerick

4 bridges were surveyed in County Limerick, none of which were suitable for roosting bats (i.e. Grade 0).


Figures 24-25: Annacoty Bridge and Gortnagarde Bridge (Photos: Ger Stanton)

Gortnagarde Bridge (Bilboa Bridge) R78000 50500	
Description	2 arch concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	Otter spraints, Cray fish
Coolagh Bridge (Greanagh River) R44349 46357	
Description	Single arch sandstone bridge
Grade (bat evidence)	**0** No suitable crevices
Annacotty Bridge (Mulkear River) R64300 57700	
Description	5 arch sandstone bridge with concrete repairs
Grade (bat evidence)	**0** No suitable crevices
Notes	Otter spraints, Sand Martin's nests
Old Forge Bridge (River Barnakyle) R	
Description	2 arch sandstone bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	Otter spraints

4.3.7 County Longford

3 bridges were surveyed in County Longford, 1 of which was suitable for roosting bats (i.e. Grade 2-3 bridges) and is known to have a large Daubenton's roost.

Newcastle Bridge (Inny River) N18300 57000	
Description	Arch limestone and sandstone
Grade (bat evidence)	**3** 91 x Daubenton's bats (emergence count)
Notes	Otter spraints
Scally's Bridge (Royal Canal) N23000 60100	
Description	Single arch limestone bridge
Grade (bat evidence)	**0** No crevices
Notes	Otter spraints
Shrule Bridge (Inny River) N13500 55900	
Description	Modern expansion bridge
Grade (bat evidence)	**0** No crevices
Notes	Otter spraints, Grey wagtail

4.3.8 County Louth

Six bridges were surveyed in County Louth, 1 of which was suitable for roosting bats (i.e. Grade 2-3 bridges) and one Grade 3 bridge with positive evidence of bats.

Castlebellingham Bridge (River Glyde) O06000 95100	
Description	4 arch limestone and sandstone bridge
Grade (bat evidence)	**0** All arches pressure grouted
Notes	Moorhen
Ardee Bridge (River Dee) N95285 90665	
Description	Single arch sandstone and concrete bridge
Grade (bat evidence)	**0** No crevices
Notes	
St. John's Bridge (Castletown River) J03000 09700	
Description	4 arch limestone and sandstone bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	Grey wagtail and Kingfisher
Drumcar Bridge (River Dee)	
Description	4 arch stone bridge with concrete base
Grade (bat evidence)	**3** Bat droppings (Daubenton's bat) (5/9/08)
Notes	Otter spraints and Grey wagtail
Stephenstown Bridge (River Fane)	
Description	3 arch limestone and concrete bridge
Grade (bat evidence)	**0** No crevices
Notes	Grey Heron
Lurgankeel Bridge (Kilcurry River) J02728 11980	
Description	2 arch sandstone bridge
Grade (bat evidence)	**0** No crevices
Notes	Grey wagtail

4.3.9 County Meath

9 bridges were surveyed in County Meath, 4 of which were suitable for roosting bats (i.e. Grade 2-3 bridges). Three of these four bridges provided roosting for Daubenton's bats (4 individuals) and Natterer's bat (1 individual) with droppings only recorded at the remaining bridge.

Slane Bridge (River Boyne) N96400 73610	
Description	13 arch limestone bridge
Grade (bat evidence)	**1** Few crevices in accessible arches
Notes	Otter spraints, Grey heron, Moorhen
O'Dalys Bridge (River Blackwater) N65300 80320	
Description	6 arch sandstone bridge
Grade (bat evidence)	**3** 2 x Daubenton's bats (8/8/08)
Notes	Otter spraints, Grey wagtail
Ramparts (River Boyne) N87400 67400)	
Description	Single arch limestone bridge
Grade (bat evidence)	**3** 1 x Daubenton's bat (23/9/08)
Notes	
Athboy Bridge (Athboy River) N71690 64260	
Description	Single arch limestone bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	Dipper and Grey wagtail
Donaghpatrick Bridge (River Blackwater) N81940 72310	
Description	6 arch sandstone and concrete bridge
Grade (bat evidence)	**3** 1 x Natterer's bat, 1 x Daubenton's bat

Notes	Bats located in wet arches, bird's nests
Dunboyne-Loughsallagh Bridge (Tolka River) O02800 41700	
Description	Single concrete culvert
Grade (bat evidence)	**0** No crevices
Dardistown Bridge (River Nanny) O11140 70200	
Description	4 arch sandstone bridge
Grade (bat evidence)	**3** Bat droppings on one arch (20/6/08)
Notes	Bird's nest
Milltown Bridge (Broadmeadow) O07210 51770	
Description	2 arch limestone bridge
Grade (bat evidence)	**0** No crevices
Oldbridge (Boyne Canal) O04600 76200	
Description	Single arch limestone bridge
Grade (bat evidence)	**0** No crevices
Notes	Otter spraints

4.3.10 County Mayo

3 bridges were surveyed in County Mayo, 1 of which was suitable for roosting bats (i.e. Grade 2-3 bridges).


Figures 26-27: Belclare Bridge and Rosgalive Bridge (Photos: Hannah Denniston)

Belclare Bridge (Owenwee River) L95998 82163	
Description	2 arch sandstone and concrete bridge
Grade (bat evidence)	**2** Crevices available in limestone section
Rosgalive Bridge (Owengarve River) L88660 96312	
Description	Modern concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Notes	Grey wagtail
Bridge u/s of Westport House (Carrowbeg River) L99404 84624	
Description	Single arch limestone bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	Grey Heron

4.3.11 County Roscommon

A total of 2 bridges were surveyed in County Roscommon, 1 of which was suitable for roosting bats (i.e. Grade 2-3 bridges).

Castlecoote Bridge (River Suck) M80863 62621	
Description	7 arch limestone and concrete bridge
Grade (bat evidence)	**2** Suitable crevices (photo assessment)
Notes	Arches not accessible due to deep water
Knockvicar Bridge (Boyle River) G87286 05541	
Description	6 arch limestone bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	Otter spraints

4.3.12 County Tipperary

A total of 9 bridges were surveyed in County Tipperary, 2 of which were suitable for roosting bats (i.e. Grade 2-3 bridges).

Cappa Old Bridge (River Aherlow) R99354 29318	
Description	5 arch bridge with modern extension
Grade (bat evidence)	**2** Crevices in older arches
1st Fethard Bridge (Clashawley River) S20488 34918	
Description	3 arch sandstone bridge
Grade (bat evidence)	**1** Few crevices
Notes	Otter spraints
2nd Fethard Bridge (Clashawley River) S20889 34846	
Description	4 arch sandstone bridge
Grade (bat evidence)	**0** All arches pressure grouted
Notes	Otter spraints
Thurles Bridge (River Suir) S12957 58535	
Description	7 arch limestone and concrete bridge
Grade (bat evidence)	**2** Suitable crevices
Notes	Otter spraints
Kilsheelan Bridge (River Suir) S28630 23247	
Description	4 arch sandstone, limestone and concrete bridge
Grade (bat evidence)	**1** Few crevices
Notes	Otter spraints, Grey heron
Cabragh Bridge (River Suir) S	
Description	4 arch sandstone bridge
Grade (bat evidence)	**1** No crevices
Notes	Otter spraints, Grey heron
Tyone Bridge (River Nenagh) R87700 77900	
Description	4 arch sandstone and brick bridge
Grade (bat evidence)	**0** No crevices
Notes	Otter spraints, Grey heron
Knocklofty Bridge (River Suir) S14500 20628	
Description	3 arch sandstone bridge
Grade (bat evidence)	**0** No crevices
Notes	Otter spraints, Cray fish
Bridge nth of Coolruntha (Mulkear River) R80600 68700	
Description	Concrete expansion bridge
Grade (bat evidence)	**0** No crevices

4.3.13 County Waterford

A total of 5 bridges were surveyed in County Waterford, 2 of which were suitable for roosting bats (i.e. Grade 2-3 bridges).

Tallow Bridge (River Bride) W99800 94400	
Description	11 arch sandstone bridge
Grade (bat evidence)	**0** All arches pressure grouted
Notes	Otter spraints
Bridge west Carrickduston (Whelan's Bridge River) S50671 07637	
Description	Single arch sandstone bridge, concrete repairs
Grade (bat evidence)	**1** Few suitable crevices
Notes	Otter and mink spraints
Bridge u/s Blackwater confl. (Owennashad River) X08084 91143	
Description	2 arch sandstone bridge
Grade (bat evidence)	**2** Suitable crevices
Notes	Otter spraints
Colligan Bridge (Colligan River) S21858 97983	
Description	Single sandstone bridge
Grade (bat evidence)	**1** Few suitable crevices
Notes	
Kilbarry Walkway Bridge (St. John's River) S99051 08782	
Description	Single sandstone bridge
Grade (bat evidence)	**2** Suitable crevices
Notes	Otter spraints, Brown trout

4.3.14 County Wexford

A total of 3 bridges were surveyed in County Wexford, none of which were suitable for roosting bats (i.e. Grade 2-3 bridges).

Figures 28-29: Scarawalsh Bridge and Margerry's Bridge (Photos: Hannah Denniston)

Poulsack Bridge (Sow River) T04800 27000	
Description	Single arch limestone and concrete bridge
Grade (bat evidence)	**0** No suitable crevices – arch concreted
Margerry's Bridge (River Bann) T11441 59337	
Description	3 arch sandstone and limestone bridge
Grade (bat evidence)	Arches not accessible due to deep water
Scarawalsh Bridge (River Slaney) S98375 45068	
Description	6 arch sandstone and limestone bridge
Grade (bat evidence)	**1** Few crevices available (photo assessment)
Notes	Arches not accessible due to deep water

4.3.15 County Wicklow

A total of 5 bridges were surveyed in County Wicklow, 1 of which was suitable for roosting bats (i.e. Grade 2-3 bridges).

Figures 30-31: Annagolan Bridge and Roddenagh Bridge (Photos: Hannah Denniston)

Ballard Bridge (Avonmore River) T14420 95670	
Description	Concrete expansion bridge
Grade (bat evidence)	**0** No suitable crevices
Nun's Cross Bridge (Vartry River) T25600 97900	
Description	3 arch limestone bridge
Grade (bat evidence)	**1** Few suitable crevices (photo assessment)
Notes	Arches not accessible due to deep water
Roddenagh Bridge (River Ow) T11700 79200	
Description	3 arch sandstone bridge
Grade (bat evidence)	**2** Suitable crevices
Ashford Bridge (Vartry River) T27047 97405	
Description	Modern concrete bridge
Grade (bat evidence)	**0** No suitable crevices
Annagolan Bridge (Vartry River) T22200 99300	
Description	5 arch limestone bridge
Grade (bat evidence)	**0** No suitable crevices (photo assessment)
Notes	Arches not accessible due to deep water

4.4 Non-bat fauna recorded

Surveyors recorded any non-bat fauna records during surveys. The majority of these were otter spraints which were recorded at 31 bridges while a variety of bird species (Grey heron, Grey wagtail, Kingfisher and Dipper) were recorded at 18 bridges. A sand martin colony was located adjacent to one bridge. Mink scats were recorded at two bridges and invertebrates, namely freshwater crayfish and fresh water pearl mussels, were recorded at three bridges.

Figure 32: Sand martin colony (Photo: Ger Stanton)

Figure 33: Otter spraint (Photo: Ger Stanton)

5. SUMMARY AND RECOMMENDATIONS

- 12% bridges surveyed had either roosting bats or evidence of roosting bats. This is similar to findings of other previous surveys in Ireland. All of these bridges are masonry bridges. No bats or evidence of bats was recorded within any of the modern bridges surveyed.

- 52% of bridges surveyed had potential roosting sites for bats, the majority of which were masonry bridges. Therefore, any works on bridges should ideally have a bat surveyed completed prior to works to ensure that bats are not excluded or entombed in bridges.

- Of the 16 modern bridges surveyed, only one bridge had the potential to provide roosting sites for bats. Such bridges are ideal candidates for the erection of bat boxes or the incorporation of bat tubes as part of wildlife enhancement works.

- Many of the bridges have heavy ivy growth. Such vegetation can provide roosting sites for bats in the spring and autumn months and therefore should remain on bridges or allowed to regrow after maintenance work has been completed.

- Many of the bridges provide nesting sites for birds or feeding sites for both mammals and birds.

- Local authorities should ideally have an inventory of bridges within their county and, where possible, an assessment similar to the content of this report prepared to aid maintenance works. Assessment should followed methodology as detailed in Shiel, 1999 and where necessary, a bat detector assessment should be undertaken for those bridges not fully accessible.

- This report will be forwarded to Local Authorities and made available on the Bat Conservation Ireland websites www.batconservationireland.org.

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Appendix: Species descriptions

These are brief descriptions of the species bat recorded in Ireland (written by Conor Kelleher).

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.

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.

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.

Leisler's bat Nyctalus leisleri

Leisler's are dark brown and Ireland's largest bat. Due to its wide distribution in numerous numbers across Ireland and of its dramatic worldwide decline, the Irish population is considered to be very important. According to O'Sullivan (1994) Ireland now holds the largest population of this species. Their echolocation calls are around 23 kHz and they emerge early in the evening, flying high. Leisler's prefer to roost in trees and buildings and during the autumn, males establish colonies in tree holes or buildings to attract females. They feed on non-biting midges and moths / beetles later in the season.

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).

Whiskered/brandts bat *Myotis mystacinus/brandtii*

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).

Daubenton's bat *Myotis daubentonii*

Daubenton's have a reddish face, dry-white underside and uniformly brown and rounded short ears. They are considered to be a specialist skimmer of water picking insects from air or water surface. In general, maternity roosts in summer are found in bridges, old stone buildings or hollow trees and research has shown that Daubenton's bat will rarely use bat boxes as either maternity or temporary roosts. They hibernate in underground sites in small crevices. They emerge late in the evening and Daubenton's bats feed mainly on caddis flies and aquatic larvae.

O Sullivan (1994) reported in the 1985-88 Wildlife Service Survey a total 200 roosts located by Conservation Rangers but the majority of which only contained small numbers (1-10 individuals). Whilde (1993) considered that the main treats to this species are pointing and reinforcing bridges.

Nathusius' pipistrelle *Pipistrellus nathusii*

Nathusius's pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, P, 2000) and also in Fermanagh, Longford and Cavan (B. Keeley, pers. comm.). It has also recently been recorded in Counties Cork and Kerry.