Supplemental Information "Multiple Mortality Events in Bats: A Global Review", *Mammal Review* 2016, O'Shea, Cryan, Hayman, Plowright, Streicker.

We provide summaries of pertinent details regarding multiple mortality events of bats in a series of nine appendices. Appendix S10 lists all references cited in Appendices S1-S9. Events are given by region alphabetically, then chronologically within regions. The number of events entered into tallies are given in parentheses under the "Description" column. We attempted to be conservative in designating numbers of events. Unfortunately not all sources provide enough information to allow accurate judgments in each case. Generally we considered events extending over multiple years as one event per year, and events observed at more than one dispersed location as separate events. We considered events impacting more than one species of bat as separate events for each species, unless there was insufficient information on numbers per species. Events with insufficient information for each species were treated as single events. Scientific names follow Simmons (2005) in Wilson and Reeder's (2005) Mammal Species of the World, 3rd edition (http://www.vertebrates.si.edu/msw/mswcfapp/msw/index.cfm), with the exceptions of *Myotis escalerai (*Ibáñez *et al*. 2006), *Perimyotis subflavus*, and *Parastrellus hesperus* (Hoofer *et al*. 2006).

Appendix S4. Reports of multiple bat deaths due to environmental contaminants, including pesticides.

Region and Species	**Date**	**Description**	**Location**	**Source**	**Case**
Australia					
Pteropus alecto, Pteropus poliocephalus, Pteropus scapulatus	1980s	Necropsies of bats and comparisons of lead concentrations in tissues with domestic animal toxicity suggest higher exposure in urban areas, with 11 of 37 bats presumed to have suffered lead poisoning. (1 event)	Brisbane, Queensland, Australia	Hariono *et al*. 1993	S4-1
Europe					

Rhinolophus ferrumequinum	unspecified	Lindane used against wood boring beetles; "an estimated 15,000 bats were killed". (1 event)	Unspecified, Great Britain	Stebbings 1988	S4-2
Rhinolophus ferrumequinum	1952	Over 100 found dead following chemical treatment of timbers for wood-boring insect control at a roost. (1 event)	England	Stebbings 1971 cited in Braaksma & van der Drift 1972, Braaksma 1973	S4-3
Rhinolophus ferrumequinum	1953	Lindane used against wood boring beetles. Many thousands killed, estimates based on seven wheelbarrow loads of carcasses. (1 event)	Dorset, England	Stebbings & Arnold 1987, Stebbings 1987	S4-4
Plecotus auritus	Ca. 1962-1972	Ca. 300 bats found dead in church lofts treated with remedial pesticides. (1 event)	The Netherlands	Braaksma 1973	S4-5
Eptesicus serotinus	1964	14 bats found dead in church loft after wood treated with lindane, lindane present in tissues. (1 event)	Zuid-Holland, The Netherlands	Braaksma 1973	S4-6
Eptesicus serotinus, Plecotus auritus, Myotis dasycneme, Pipistrellus sp.	1963-1969	78 dead bats of four species were found dead at 6 roosts in buildings soon after chemical treatment of timbers for wood-boring insects and decay. (5 events)	The Netherlands	Braaksma & van der Drift 1972	S4-7

Myotis dasycneme	1973, 1977	137 dead bats counted in a church treated with lindane and DDT. (2 events)	Berlikum, The Netherlands	Voûte 1980	S4-8
Myotis dasycneme	1974-1981	Annual juvenile mortality 20% in 1974 to 77% in 1977 (ca. 40-100 deaths) following treatment of timbers with DDT, lindane, PCP. Deaths coincident with treatment, and high residues in carcasses. Decomposition prevented confirmatory analysis of brains. (5 events)	Church at Berlikum, The Netherlands	Leeuwangh & Voûte 1985; Voûte 1981	S4-9
Rhinolophus ferrumequinum, Pipistrellus pipistrellus, Plecotus auritus, Myotis brandtii, Myotis daubentonii, Myotis mystacinus, Myotis nattereri	1982-1987	Details 23 case incidents of multiple bats found dead after treatment of timbers in roosts in Britain, primarily with dieldrin or lindane. (6 events, numbers of carcasses not specified in every case).	Britain	Mitchell-Jones *et al*. 1989	S4-10
Rhinolophus ferrumequinum	Pre-1986	Colony of 1,500 killed by application of dieldrin as wood preservative (no diagnostic chemical residue data provided). (1 event)	Unspecified, Great Britain	Stebbings & Griffith 1986	S4-11

Rhinolophus ferrumequinum	1999-2001	40, 78, and 51 carcasses of juveniles found in summer. Suggested to be due to lead and pentachlorophenol poisoning based on various laboratory findings, but no diagnostic data provided. (3 events)	Trévarez Castle, Finistère, France	Gremillet & Boireau 2004	S4-12
Islands					
Mystacina tuberculata	Jan-Feb 2009	115 deaths due to secondary poisoning by rodenticide diphacinone (1 event)	Pureora Forest Park, New Zealand	Dennis & Gartrell 2015	S4-13
North America					
Myotis grisescens	Summer 1976	39 dead juveniles; brains of most dead juveniles analysed had lethal dieldrin concentrations. (2 events)	Two caves in Missouri, USA	Clark *et al*. 1978b	S4-14
Myotis sodalis	1976	Brains of dead bats with lethal concentrations of dieldrin, suspected lethal mix of dieldrin and heptachlor at two roosts; guano beneath another roost with concentrations of dieldrin indicative of lethality (carcass numbers not estimated). (1 event)	Caves in Missouri and Indiana, USA	O'Shea & Clark 2002	S4-15

Myotis grisescens	Summer 1977	74 dead bats; brains of analysed subsample all had lethal dieldrin concentrations. (1 event)	Cave in Franklin County, Missouri, USA	Clark *et al*. 1980	S4-16
Myotis grisescens	Jul 1978	103 dead bats; analysed subsample with lethal dieldrin concentrations. (1 event)	Cave in Franklin County, Missouri, USA	Clark *et al*. 1983b	S4-17
Myotis grisescens	Jul 1980	18 dead bats; analysed subset had residues of dieldrin diagnostic of lethal exposure, plus heptachlor, endrin. (1 event)	Hunter Cave, Boone County, Missouri, USA	Clark *et al*. 1983a	S4-18
Myotis grisescens	1980-1981	49 dead bats in a colony of 500; analysed subset had residues of dieldrin diagnostic of lethal exposure, plus heptachlor. (1 event)	Devil's Icebox Cave, Boone County, Missouri, USA	Clark *et al*. 1983a	S4-19
Myotis grisescens	1982	Total carcasses not estimated; lethal levels of dieldrin verified in brains of 2 dead bats. (1 event)	Holton Cave, Boone County, Missouri, USA	Clawson & Clark 1989	S4-20
Myotis grisescens	1986	"More than 1,000, perhaps several times more"; DDD and endrin or metabolite concentrations suggestive of organochlorine	Cave Springs Cave, Alabama, USA	Clark *et al*. 1988	S4-21

		poisoning in some bats analysed; bacteriological, virological, and histopathological analyses showed no evidence of disease. (1 event)			
Unspecified	Prior to 1987	"many dead passerines and bats in oil pits of southeastern New Mexico". (1 event)	Southeastern New Mexico, USA	Flickinger & Bunck 1987	S4-22
Unspecified	Jul-Sep 1987	32 carcasses in cyanide ponds of gold mining operation. (1 event)	Coeur-Rochester mine, Nevada, USA	Clark & Hothem 1991	S4-23
Unspecified	Oct-Dec 1988	12 carcasses in cyanide ponds of gold mining operation. (1 event)	Green Springs mine, Nevada, USA	Clark & Hothem 1991	S4-24
Unspecified	Aug-Oct 1988	51 carcasses in cyanide ponds of gold mining operation. (1 event)	Cyprus Copperstone Mine, Arizona, USA	Clark & Hothem 1991	S4-25
Myotis lucifugus	July 2009	30 dead bats, carbamate poisoning. (1 event)	Valley County, Idaho, USA	U.S. Geological Survey 2015c	S4-26