

Bioacoustic libraries: an overview

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sound recording and the development of bioacoustics libraries

McMurdo Sound, Antarctica, 1911



landmarks in sound recording

1889	first bioacoustic recording	captive bird, Germany on Edison cylinder
1900	wild birds recorded	on Edison cylinder in England
1910	published recording	captive Nightingale <i>Erithacus megarhynchos</i> in Germany
1927	published recording of wild bird	78 rpm disc: Nightingale <i>Erithacus megarhynchos</i> , England
1929	recordings of wild birds, USA	optical film soundtrack, Kellogg & Allen at Cornell, USA
1948	first sound archive	Borror Lab., USA
1950-	systematic collecting	

the first animal recordings by region

Paleartic	1889	L Koch, Germany: Indian Shama
Nearctic	1892	Garner, USA: captive primates
Australasian	1931	Littlejohn, Australia: Superb Lyrebird <i>Menura novaehollandiae</i> (Menuridae)
Antarctic	1934	Emperor Penguin <i>Aptenodytes forsteri</i> (Spheniscidae)
Oriental	1937	Carpenter expedition: Hornbill sp (Bucerotidae)
Neotropical	1940s	Birds recorded on Barro Colorado Island, Panama

then...

Animal sound recording began with Ludwig Koch (1882-1973) in Germany.

Impractical equipment...



Portable tape recorders, parabolas and gun mics transformed location recording – analogue tape widely used until 1990s



And now..

Modern portable recorders and microphones:

- Lightweight
- battery operated
- high quality
- rugged

This has led to a rapid increase in the availability of good quality audio samples



the world's oldest natural sound collections

Collection	Location	Est.	Species	Cuts	Strengths
Macaulay Library	Ithaca, USA	1956	7,000	160,000	World
British Library Sound Archive	London, UK	1969	10,000	150,000	World
Tierstimmenarchiv	Berlin, Germany	1952	2,500	110,000	C Europe, mammals
Rohrer Laboratory of Bioacoustics	Ohio, USA	1948	1,400	31,000	USA
Witjampers Bird Communication Library	Pretoria, South Africa	1979	3,000	30,000	Africa
Australian National Wildlife Collection	Lyneham, Australia	1961	800	30,000	Australia
Arquivo Sonoro Neotropical	São Paulo, Brazil	1978	1,000	25,000	Brazil
Florida Museum of Natural History	Florida, USA	1973	3,000	25,000	Neotropics

collecting policies of large bioacoustic archives

- to collect systematically recordings from local, national or global regions
- to collect samples representing regional, individual and seasonal variations in vocalisations
- to collate recordings from many individual collectors of sounds

Bioacoustic libraries

- Most are based in museums or universities
- Some have general collecting policy, others very focussed (e.g., CSIRO national collection of Australian insects sounds)
- Functions: acquisition/description/preservation/access
- Varied uses:
 - science: description, comparison, analysis, playback, taxonomy, identification, luring & trapping, pest deterrence
 - education and entertainment: museums and zoos, teaching, websites, tv and radio, audio publications

world summary of bioacoustic archives (1)

- Over 0.5 million audio samples in major sound archives, mostly collected in last 50 years
 - Other museum collections of animal specimens collected over past 200 years: many millions of samples (e.g. London Natural History Museum has over 1 million bird eggs)
- 1965: 25% of the 10,000 bird species had been recorded, i.e. represented by at least 1 sample
- 2003: >90% all bird species recorded

world summary of bioacoustic archives (2)

- Birds:
 - Insufficient audio samples for many birds species, especially in the species-rich tropical regions
 - Example: lack of voice data for a taxonomic study of Grey-headed Quail Dove *Geotrygon caniceps* (Columbidae) of Cuba and Hispaniola (Garrido et al 2002; *Bird. Cons. Int.* 12:169-187); **and inaccurate data for this species on commercial recordings.**
 - Recordings on published CDs or on www are not always reliable as scientific data.
- Other taxonomic groups (mammals, amphibians, invertebrates) are more poorly represented

Archival principles

- Long-term planning
- Institutional and financial support
- Technical and biological staff
- Equipment and storage facilities
- Preservation of audio integrity
- Data standardisation
- Commitment to preservation, including disaster recovery
- Protection of intellectual property and copyrights
- Access provision
- Cooperation between archives
- Advice and assistance to recordists

On-line collections

- Borror Lab: 26,000 files
- British Library: 1,000 files (browse only)
- Macaulay library – marine collection on-line
- Xenocanto.com – neotropical birds online – thousands of recordings
- Others...?
- ?How to prioritise which private collections can be saved?