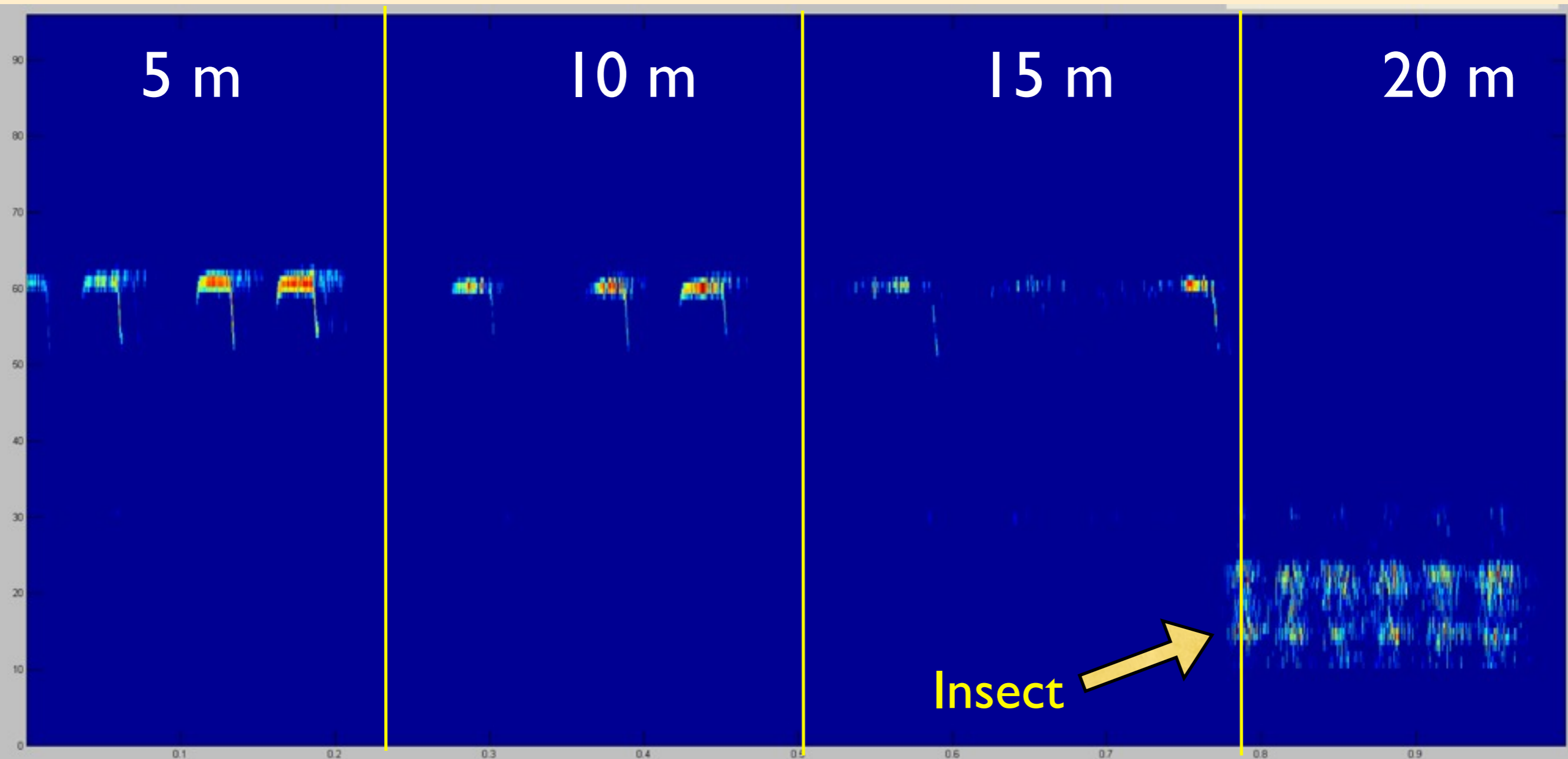


4. Detection Ranges

Q: Why does my detector only hear *P. parnellii* out-to 15m? Do I have a feeble detector?

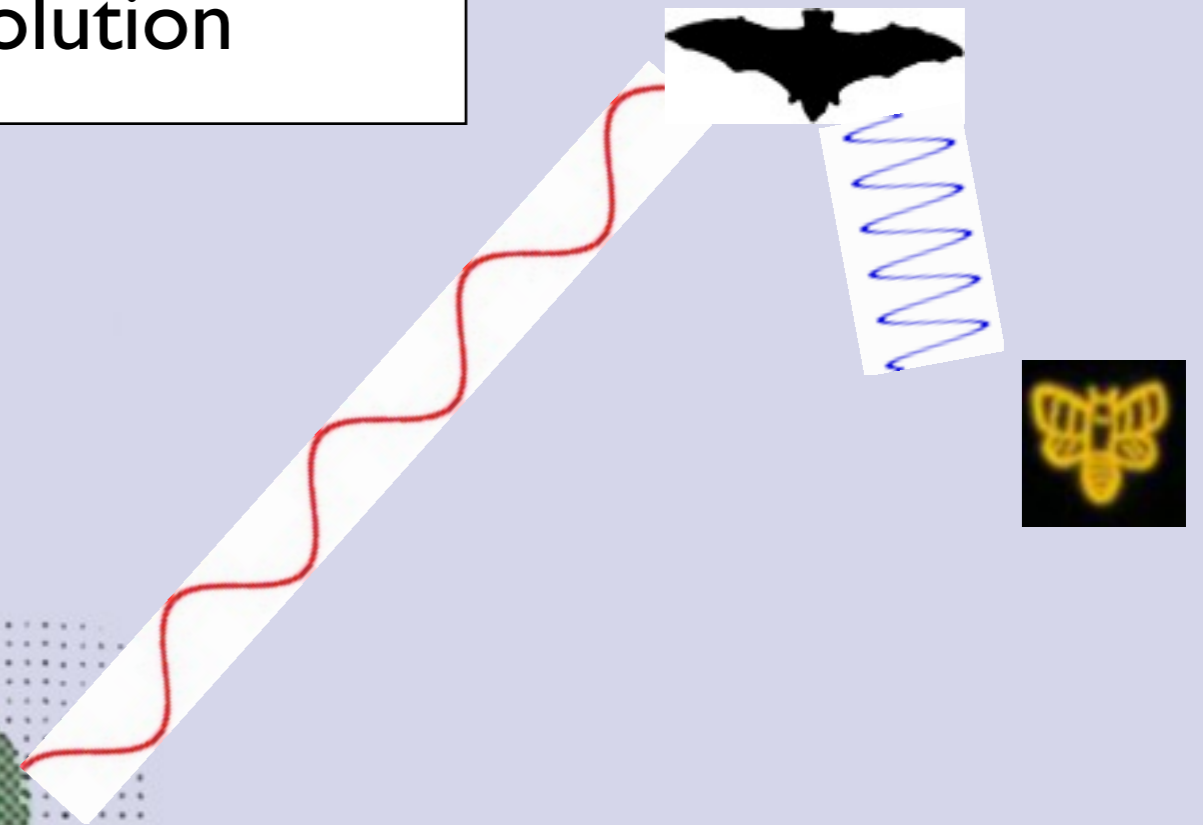


Pteronotus parnellii



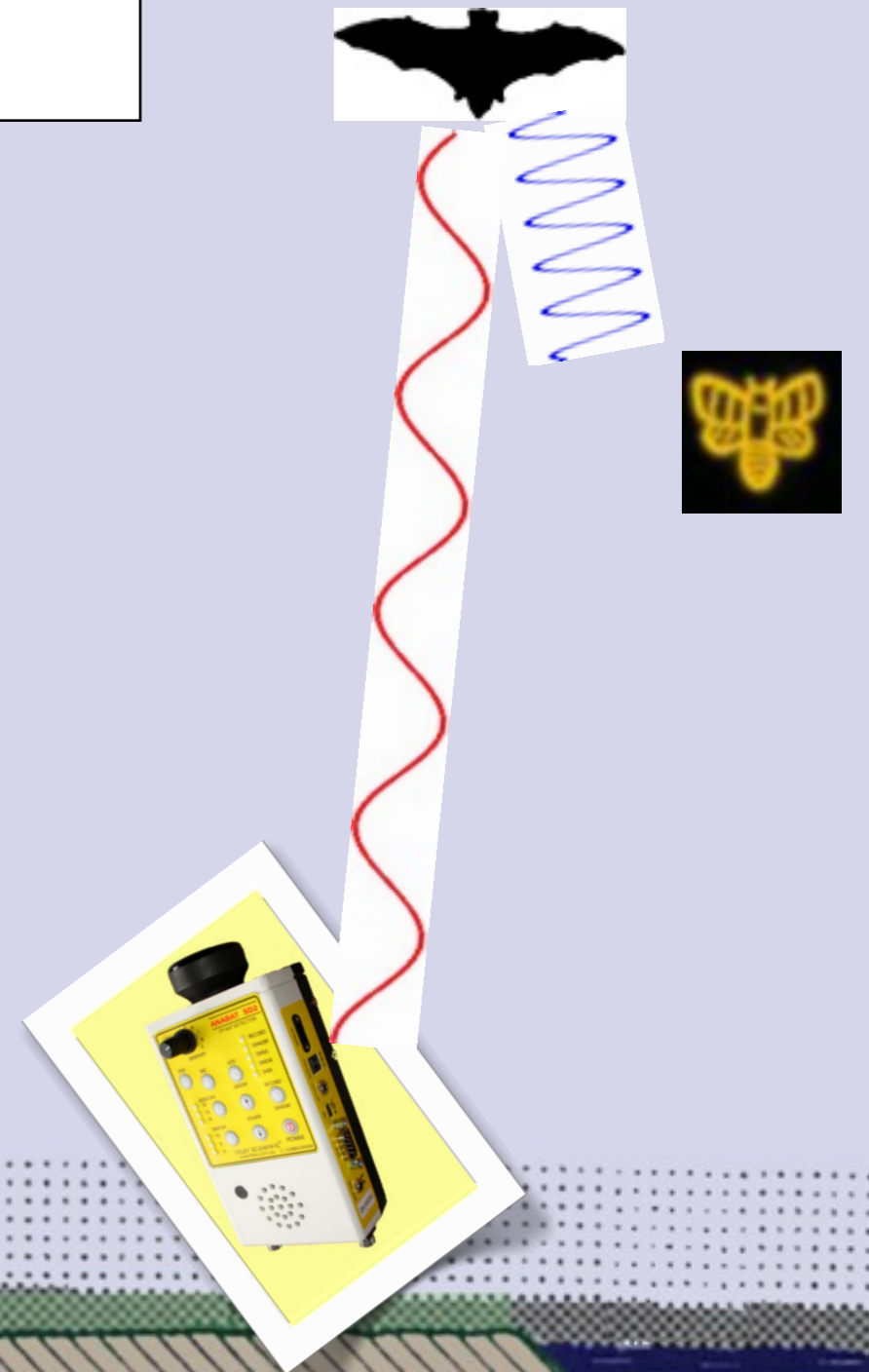
RECALL: Acoustics 101

- Lower frequency waves carry farther
- Higher frequencies attenuate
- Higher frequencies give better resolution



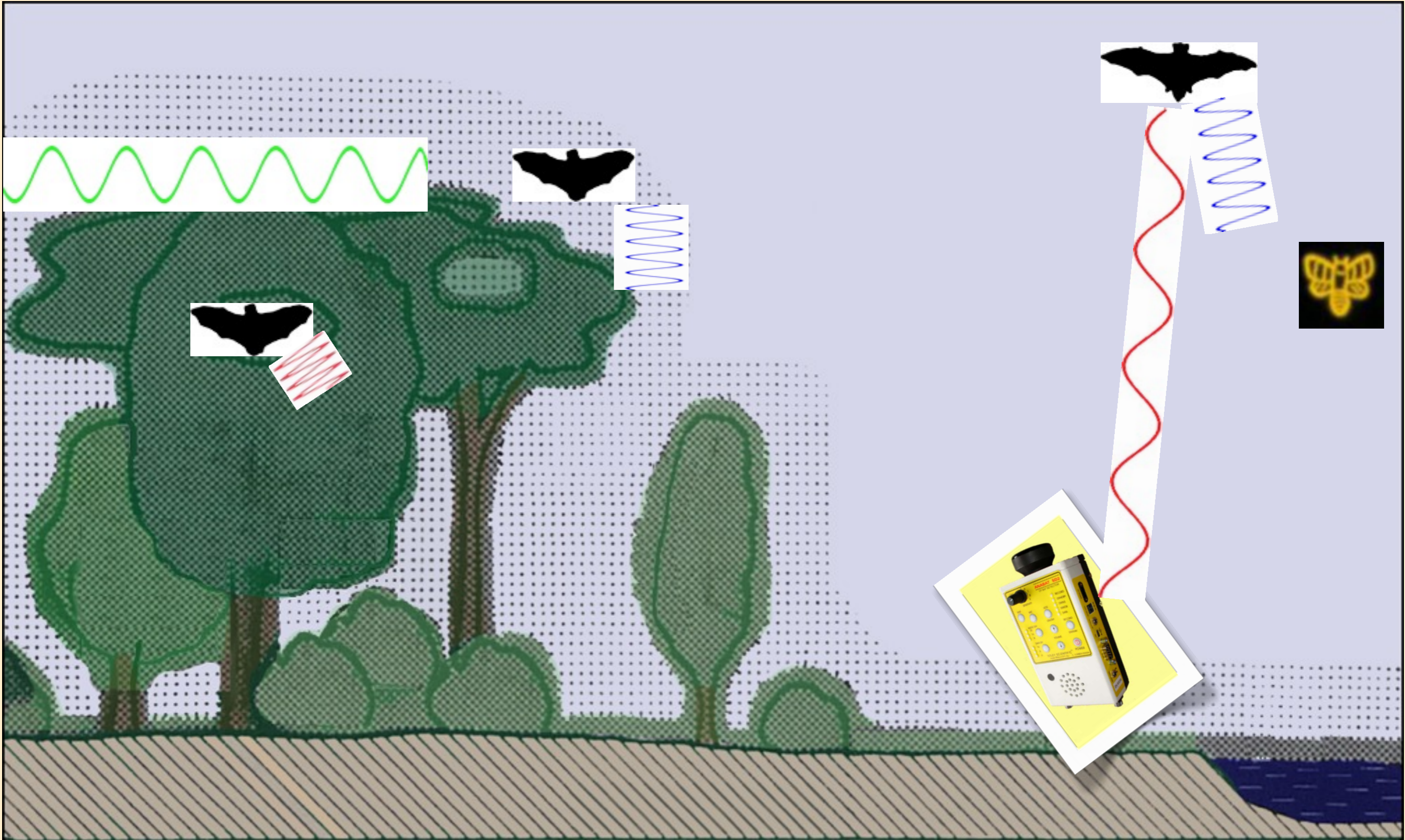
RECALL: Acoustics 101

- Lower frequency waves carry farther
- Higher frequencies attenuate
- Higher frequencies give better resolution



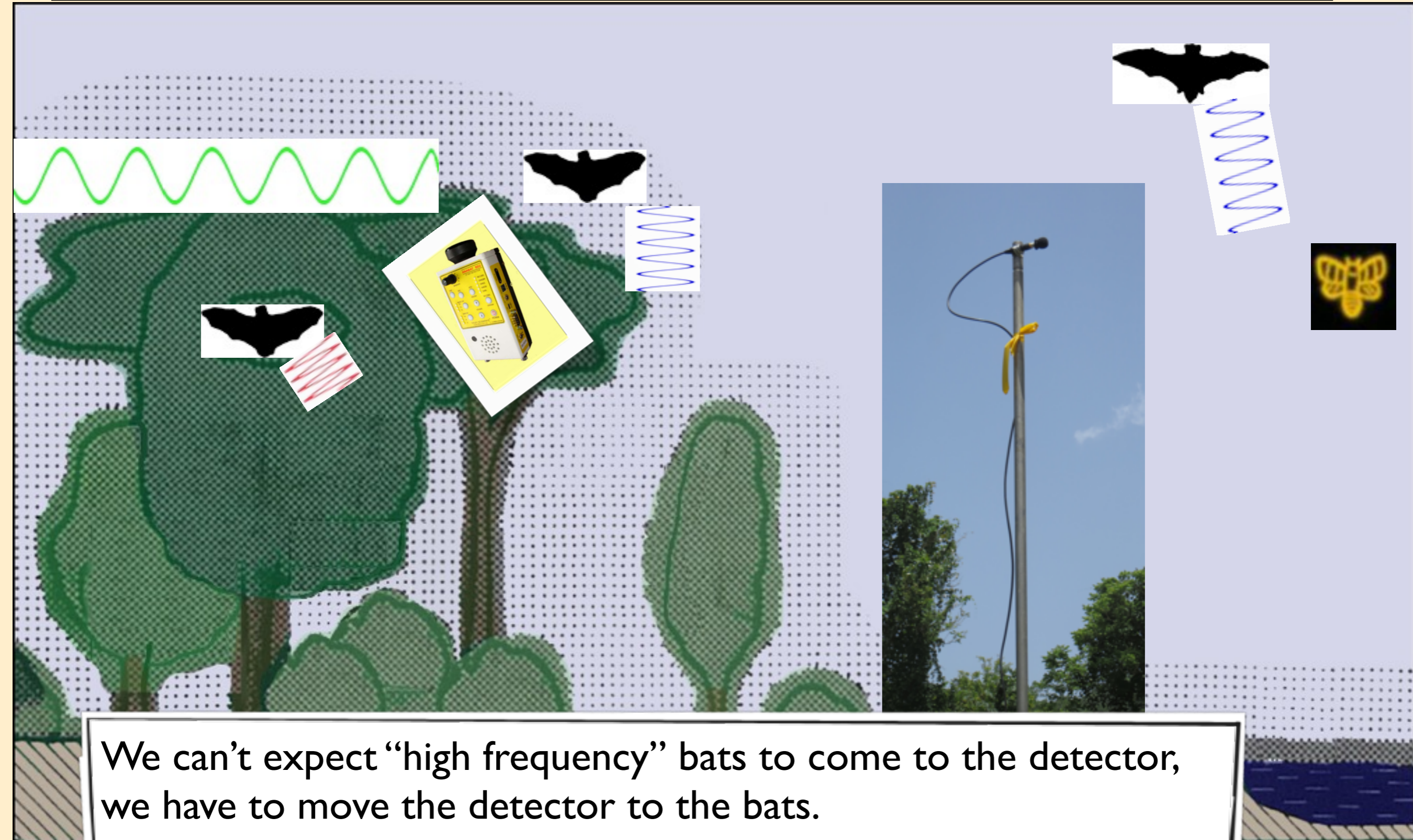
4. Detection Ranges

Q: Do I have a feeble detector?



4. Detection Ranges

Q: No! Bats in cluttered forest emit “feeble” high-frequency calls.

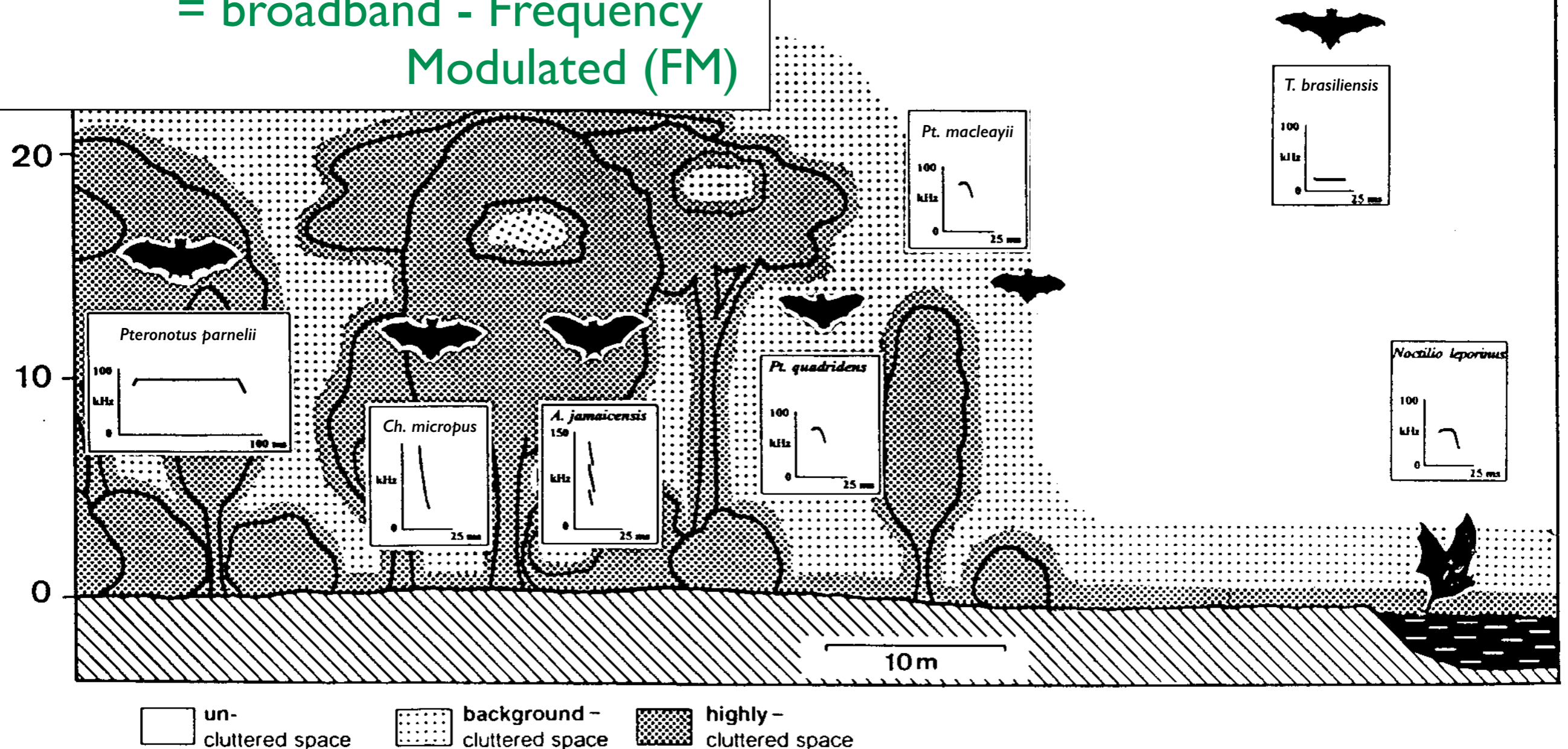


We can't expect “high frequency” bats to come to the detector, we have to move the detector to the bats.

Acoustics Characteristics in a Bat Soundscape

Cluttered travel & hunt
 = Constant Frequency (CF)
 or
 = broadband - Frequency Modulated (FM)

Uncluttered (open space) travel
 = narrowband (quasi-CF) &
 low freq
 Hunt = broadband - FM



Estimated Detection Distances of JM Bats:

(w/ Pettersson D1000X: Sampling rate = 384 kHz; full gain)

SPECIES	RECORDING CONDITION	DISTANCE
Mormoopidae (Insectivores)		
<i>Pteronotus parnellii</i>	Wild: commuting flyway	15 m
<i>Pteronotus macleayii</i>	Wild: hunting in yard	8 m
<i>Pteronotus quadridens</i>	Wild: hunting in yard	8 m
<i>Mormoops blainvillei</i>	Wild: flight along road	10 m
Phyllostomidae		
<i>Artibeus jamaicensis</i> (frugivore)	Wild: open-space flight	5 m
<i>Ariteus flavescens</i> (frugivore)	Transmitted bat	5 m
<i>Erophylla sezekorni</i> (nectarivore)	Zipline	3 m
<i>Monophyllus redmani</i> (nectarivore)	Exiting Windsor Cave	3 m
<i>Glossophaga soricina</i> (nectarivore)	Corridor in house	2 m
<i>Macrotus waterhousii</i> (insectivore)	Corridor in house	2 m
Natalidae		
<i>Chilonatalus micropus</i> (insectivore)	Zipline	3 m
Molossidae		
<i>Tadarida brasiliensis</i> (insectivore)	Wild: open-space flight	20 m
<i>Molossus molossus</i> (insectivore)	Wild: open-space flight	20 m