Supplementary Material

Map

Description automatically generated

**Figure S1**. Points of occurrence of the Brazilian bat species.

**S2** – R code used for eliminating oversampled regions.

## Ecosystem services provided by bats

## Supplementary material - R code for removing oversampled records

# setwd("set\_directory")

# Requirements (install and load)

library(sf)

#library("lwgeom", lib.loc="C:/Program Files/R/R-3.4.4/library")

library(lwgeom)

library(dplyr)

# pt = read.csv("point\_dataset.csv", h=T)

pt = read.csv("A.1\_Raw\_dataset.csv", h=T)

pt = st\_as\_sf(pt, coords = c("long", "lat"), crs = 4326)

spp = unique(pt$species)

tmp = pt[0,c("species","geometry")]

dist = 0.41 # buffer size (user can specify).

i = 1

for(i in 1:length(spp)){

print(paste("Processando", spp[i]))

spp1 = subset(pt, species == spp[i])

if(nrow(spp1) > 15) {

spp1.buff = st\_buffer(spp1,dist = dist)

t = spp1.buff %>% st\_union() %>% st\_sf() %>% st\_cast("POLYGON")

names(t) = "geometry"

st\_geometry(t) = "geometry"

id = 1:nrow(t)

t = cbind(id,t)

pt.buff = st\_intersection(spp1,t)

x = data.frame(table(pt.buff$id))

dens = as.numeric(x$Freq / st\_geod\_area(t))

Freq1 = integer(nrow(x))

x = cbind(x,dens,Freq1)

a = which(x$dens <= mean(x$dens))

p=pt.buff[pt.buff$id %in% a,]

tmp = rbind(tmp,p[,c("species","geometry")])

b = which(x$dens > mean(x$dens))

p=pt.buff[pt.buff$id %in% b,]

a = unique(p$id)

b = 1

for(b in 1:length(a)){

p1 = subset(p,id==a[b])

v = mean(x[x$Var1 != a,"dens"])

v1 = x[x$Var1==a[b],"Freq"]

v2 = x[x$Var1==a[b],"dens"]

s = (v \* v1) / v2

p1 = p1[sample(s),c("species","geometry")]

tmp = rbind(tmp,p1)

tmp = na.omit(tmp)

}

} else {

tmp = rbind(tmp,spp1[,c("species","geometry")])

}

}

# Write new dataset

# setwd("set\_directory")

coord = st\_coordinates(tmp)

st\_geometry(tmp) = NULL

x = cbind(cbind(tmp,coord))

write.csv(x,"pts\_balanced\_filter.csv",row.names = F)

**Table S1a**. Correlation index (Pearson method) between temperature derived bioclimatic variables. Green cells indicate pairs of highly correlated variables.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | bio1 | bio2 | bio3 | bio4 | bio5 | bio6 | bio7 | bio8 | bio9 |
| bio1 | 1,0000 | -0,3287 | 0,6518 | -0,6784 | 0,7403 | 0,9188 | -0,6201 | 0,8328 | 0,9090 |
| bio10 | 0,8752 | -0,1905 | 0,2652 | -0,2472 | 0,9185 | 0,6939 | -0,2610 | 0,8876 | 0,6617 |
| bio11 | 0,9628 | -0,4132 | 0,7941 | -0,8493 | 0,5665 | 0,9645 | -0,7724 | 0,7048 | 0,9577 |
| bio12 | 0,4403 | -0,4360 | 0,4709 | -0,5373 | 0,1080 | 0,5455 | -0,5594 | 0,2219 | 0,4971 |
| bio13 | 0,4887 | -0,3290 | 0,6350 | -0,6870 | 0,0806 | 0,5733 | -0,6068 | 0,2422 | 0,5739 |
| bio14 | 0,0184 | -0,4388 | -0,0634 | 0,0367 | -0,0770 | 0,1440 | -0,2086 | -0,0342 | 0,0272 |
| bio15 | 0,1289 | 0,3155 | 0,3636 | -0,3013 | 0,0249 | 0,0463 | -0,0384 | 0,0867 | 0,1665 |
| bio16 | 0,4952 | -0,3359 | 0,6370 | -0,6929 | 0,0875 | 0,5805 | -0,6111 | 0,2494 | 0,5805 |
| bio17 | 0,0308 | -0,4356 | -0,0625 | 0,0344 | -0,0630 | 0,1519 | -0,2095 | -0,0238 | 0,0355 |
| bio18 | -0,1187 | 0,0070 | -0,2267 | 0,1105 | -0,2184 | -0,1752 | 0,0737 | 0,0427 | -0,2299 |
| bio19 | 0,3695 | -0,5380 | 0,5094 | -0,4093 | 0,0973 | 0,5500 | -0,5706 | 0,1255 | 0,4922 |
| bio2 | -0,3287 | 1,0000 | -0,2525 | 0,4435 | 0,1543 | -0,6137 | 0,7884 | -0,1356 | -0,4456 |
| bio3 | 0,6518 | -0,2525 | 1,0000 | -0,9083 | 0,1646 | 0,7572 | -0,7680 | 0,3032 | 0,7962 |
| bio4 | -0,6784 | 0,4435 | -0,9083 | 1,0000 | -0,0914 | -0,8236 | 0,8859 | -0,3078 | -0,8357 |
| bio5 | 0,7403 | 0,1543 | 0,1646 | -0,0914 | 1,0000 | 0,4803 | 0,0295 | 0,7883 | 0,5145 |
| bio6 | 0,9188 | -0,6137 | 0,7572 | -0,8236 | 0,4803 | 1,0000 | -0,8626 | 0,6398 | 0,9487 |
| bio7 | -0,6201 | 0,7884 | -0,7680 | 0,8859 | 0,0295 | -0,8626 | 1,0000 | -0,2744 | -0,7844 |
| bio8 | 0,8328 | -0,1356 | 0,3032 | -0,3078 | 0,7883 | 0,6398 | -0,2744 | 1,0000 | 0,5623 |
| bio9 | 0,9090 | -0,4456 | 0,7962 | -0,8357 | 0,5145 | 0,9487 | -0,7844 | 0,5623 | 1,0000 |

**Table S1b**. Correlation index (Pearson method) between precipitation derived bioclimatic variables. Green cells indicate pairs of highly correlated variables.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | bio10 | bio11 | bio12 | bio13 | bio14 | bio15 | bio16 | bio17 | bio18 | bio19 |
| bio1 | 0,875 | 0,962 | 0,440 | 0,4887 | 0,0184 | 0,1289 | 0,4952 | 0,0308 | -0,118 | 0,3695 |
| bio10 | 1,0000 | 0,7208 | 0,2524 | 0,2019 | 0,0774 | -0,0585 | 0,2093 | 0,0919 | -0,1236 | 0,2618 |
| bio11 | 0,7208 | 1,0000 | 0,5214 | 0,6027 | 0,0148 | 0,1854 | 0,6104 | 0,0246 | -0,1378 | 0,4301 |
| bio12 | 0,2524 | 0,5214 | 1,0000 | 0,8711 | 0,5987 | -0,2787 | 0,8892 | 0,6109 | 0,3730 | 0,6674 |
| bio13 | 0,2019 | 0,6027 | 0,8711 | 1,0000 | 0,2112 | 0,1783 | 0,9920 | 0,2181 | 0,2907 | 0,5385 |
| bio14 | 0,0774 | 0,0148 | 0,5987 | 0,2112 | 1,0000 | -0,8029 | 0,2184 | 0,9930 | 0,3644 | 0,5278 |
| bio15 | -0,0585 | 0,1854 | -0,2787 | 0,1783 | -0,8029 | 1,0000 | 0,1573 | -0,8186 | -0,2233 | -0,2781 |
| bio16 | 0,2093 | 0,6104 | 0,8892 | 0,9920 | 0,2184 | 0,1573 | 1,0000 | 0,2259 | 0,2917 | 0,5525 |
| bio17 | 0,0919 | 0,0246 | 0,6109 | 0,2181 | 0,9930 | -0,8186 | 0,2259 | 1,0000 | 0,3713 | 0,5353 |
| bio18 | -0,1236 | -0,1378 | 0,3730 | 0,2907 | 0,3644 | -0,2233 | 0,2917 | 0,3713 | 1,0000 | -0,1714 |
| bio19 | 0,2618 | 0,4301 | 0,6674 | 0,5385 | 0,5278 | -0,2781 | 0,5525 | 0,5353 | -0,1714 | 1,0000 |
| bio2 | -0,1905 | -0,4132 | -0,4360 | -0,3290 | -0,4388 | 0,3155 | -0,3359 | -0,4356 | 0,0070 | -0,5380 |
| bio3 | 0,2652 | 0,7941 | 0,4709 | 0,6350 | -0,0634 | 0,3636 | 0,6370 | -0,0625 | -0,2267 | 0,5094 |
| bio4 | -0,2472 | -0,8493 | -0,5373 | -0,6870 | 0,0367 | -0,3013 | -0,6929 | 0,0344 | 0,1105 | -0,4093 |
| bio5 | 0,9185 | 0,5665 | 0,1080 | 0,0806 | -0,0770 | 0,0249 | 0,0875 | -0,0630 | -0,2184 | 0,0973 |
| bio6 | 0,6939 | 0,9645 | 0,5455 | 0,5733 | 0,1440 | 0,0463 | 0,5805 | 0,1519 | -0,1752 | 0,5500 |
| bio7 | -0,2610 | -0,7724 | -0,5594 | -0,6068 | -0,2086 | -0,0384 | -0,6111 | -0,2095 | 0,0737 | -0,5706 |
| bio8 | 0,8876 | 0,7048 | 0,2219 | 0,2422 | -0,0342 | 0,0867 | 0,2494 | -0,0238 | 0,0427 | 0,1255 |
| bio9 | 0,6617 | 0,9577 | 0,4971 | 0,5739 | 0,0272 | 0,1665 | 0,5805 | 0,0355 | -0,229 | 0,4922 |

Observation:

BIO1 = Annual Mean Temperature

BIO2 = Mean Diurnal Range (Mean of monthly (max temp - min temp))

BIO3 = Isothermality (BIO2/BIO7) (×100)

BIO4 = Temperature Seasonality (standard deviation ×100)

BIO5 = Max Temperature of Warmest Month

BIO6 = Min Temperature of Coldest Month

BIO7 = Temperature Annual Range (BIO5-BIO6)

BIO8 = Mean Temperature of Wettest Quarter

BIO9 = Mean Temperature of Driest Quarter

BIO10 = Mean Temperature of Warmest Quarter

BIO11 = Mean Temperature of Coldest Quarter

BIO12 = Annual Precipitation

BIO13 = Precipitation of Wettest Month

BIO14 = Precipitation of Driest Month

BIO15 = Precipitation Seasonality (Coefficient of Variation)

BIO16 = Precipitation of Wettest Quarter

BIO17 = Precipitation of Driest Quarter

BIO18 = Precipitation of Warmest Quarter

BIO19 = Precipitation of Coldest Quarter

**Table S2**. Bat species recognized to occur in Brazil (Nogueira et al., 2018) with their guild and size information, i.e., forearm (FA) and size class (S = small, M = medium, L = large). Column ‘Model?’ indicates whether a species was successfully modeled. Colum ‘Source’ indicates the reference where the FA information came from (see a list following the table).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Seq** | **Family** | **Species** | **Guild** | **FA** | **Size** | **Model?** | **Source** |
| 1 | Emballonuridae | *Centronycteris maximiliani* | I | 45.0 | S | Yes | 14 |
| 2 | *Cormura brevirostris* | I | 46.5 | M | Yes | 19 |
| 3 | *Cyttarops alecto* | I | 47.0 | M | No | 27 |
| 4 | *Dicliduris isabella* | I | 59.3 | M | No | 10 |
| 5 | *Diclidurus albus* | I | 66.0 | M | Yes | 16 |
| 6 | *Diclidurus ingens* | I | 71.5 | L | No | 7 |
| 7 | *Dicludurus scutatus* | I | 54.2 | S | No | 16 |
| 8 | *Peropteryx kappleri* | I | 46.0 | M | Yes | 16 |
| 9 | *Peropteryx leucoptera* | I | 45.0 | S | Yes | 18 |
| 10 | *Peropteryx macrotis* | I | 38.3 | S | Yes | 38 |
| 11 | *Peropteryx palidoptera* | I | 41.0 | S | No | 32 |
| 12 | *Peropteryx trinitatis* | I | 39.0 | S | No | 31 |
| 13 | *Rhynchonycteris naso* | I | 37.0 | S | No | 19 |
| 14 | *Saccopteryx bilineata* | I | 46.0 | M | Yes | 19 |
| 15 | *Saccopteryx canescens* | I | 38.0 | S | Yes | 19 |
| 16 | *Saccopteryx gymnura* | I | 34.0 | S | No | 19 |
| 17 | *Saccopteryx leptura* | I | 41.0 | S | Yes | 16 |
| 18 | Furipteridae | *Furipterus horrens* | I | 35.5 | S | Yes | 19 |
| 19 | Molossidae | *Cynomops abrasus* | I | 45.0 | L | Yes | 22 |
| 20 | *Cynomopsr geenhali* | I | 36.0 | M | No | 3 |
| 21 | *Cynomops mastivus* | I | 43.0 | M | No | 22 |
| 22 | *Cynomops milleri* | I | 31.5 | S | No | 3 |
| 24 | *Cynomops planirostris* | I | 30.5 | S | Yes | 8 |
| 25 | *Eumops auripendulus* | I | 61.0 | L | Yes | 3 |
| 26 | *Eumops bonariensis* | I | 48.0 | M | Yes | 3 |
| 27 | *Eumops chimaera* | I | 67.3 | M | No | 12 |
| 28 | *Eumops dabbenei* | I | 76.5 | L | Yes | 19 |
| 29 | *Eumops delticus* | I | 47.6 | M | No | 8 |
| 30 | *Eumops glaucinus* | I | 60.5 | L | Yes | 3 |
| 31 | *Eumops hansae* | I | 39.0 | M | No | 3 |
| 32 | *Eumops maurus* | I | 52.0 | L | No | 3 |
| 33 | *Eumops patagonicus* | I | 54.5 | M | Yes | 11 |
| 34 | *Eumops perotis* | I | 76.5 | L | Yes | 3 |
| 35 | *Eumops trumbulli* | I | 66.5 | L | No | 3 |
| 36 | *Molossops neglectus* | I | 35.5 | M | No | 3 |
| 37 | *Molossops temminckii* | I | 28.5 | S | Yes | 3 |
| 38 | *Molossus aztecus* | I | 38.0 | S | No | 13 |

**Table S3.** Continuation…

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Seq** | **Family** | **Species** | **Guild** | **FA** | **Size** | **Model?** | **Source** |
| 39 |  | *Molossus coibensis* | I | 35.0 | M | No | 3 |
| 40 | *Molossus currentium* | I | 41.5 | M | No | 3 |
| 41 | *Molossus fluminensis* | I | 43.5 | L | No | 38 |
| 42 | *Molossus molossus* | I | 41.5 | L | No | 3 |
| 43 | *Molossus pretiosus* | I | 45.0 | L | No | 3 |
| 44 | *Molossus rufus* | I | 50.0 | L | Yes | 3 |
| 45 | *Neoplatymops mattogrossensis* | I | 30.0 | S | Yes | 3 |
| 46 | *Nyctinomops aurispinosus* | I | 50.5 | L | No | 3 |
| 47 | *Nyctinomops laticaudatus* | I | 44.0 | M | Yes | 3 |
| 48 | *Nyctinomops macrotis* | I | 58.2 | L | Yes | 3 |
| 49 | *Promops centralis* | I | 54.0 | L | Yes | 3 |
| 50 | *Promops nasutus* | I | 48.0 | M | Yes | 3 |
| 51 | *Tadarida brasiliensis* | I | 42.5 | S | Yes | 19 |
| 52 | Mormoopidae | *Pteronotus alitonus* | I | 61.7 | L | No | 29 |
| 54 | *Pteronotus gymnonotus* | I | 52.5 | M | Yes | 3 |
| 55 | *Pteronotus personatus* | I | 44.0 | S | Yes | 3 |
| 56 | *Pteronotus rubiginosus* | I | 63.9 | L | Yes | 29 |
| 57 | Natalidae | *Natalus macrourus* | I | 38.0 | S | Yes | 3 |
| 58 | Noctilionidae | *Noctilio albiventris* | I | 62.0 | L | No | 3 |
| 59 | *Noctilio leporinus* | C | 80.0 | L | Yes | 3 |
| 60 | Phyllostomidae | *Ametrida centurio* | F | 28.5 | S | Yes | 3 |
| 61 | *Anoura caudifer* | N | 35.3 | S | Yes | 3 |
| 62 | *Anoura geoffroyi* | N | 40.3 | S | Yes | 3 |
| 63 | *Artibeus anderseni* | F | 39.0 | S | Yes | 3 |
| 64 | *Artibeus bogotensis* | F | 37.4 | S | No | 42 |
| 65 | *Artibeus cinereus* | F | 38.0 | S | No | 3 |
| 66 | *Artibeus concolor* | F | 47.5 | M | Yes | 3 |
| 67 | *Artibeus fimbriatus* | F | 64.0 | L | Yes | 30 |
| 68 | *Artibeus gnomus* | F | 38.0 | S | Yes | 3 |
| 69 | *Artibeus lituratus* | F | 71.5 | L | Yes | 3 |
| 70 | *Artibeus obscurus* | F | 64.0 | L | Yes | 3 |
| 71 | *Artibeus planirostris* | F | 64.5 | L | Yes | 3 |
| 72 | *Carollia benkeithi* | F | 36.5 | S | Yes | 3 |
| 73 | *Carollia brevicauda* | F | 34.5 | S | Yes | 3 |
| 74 | *Carollia perspicillata* | F | 41.0 | M | No | 3 |
| 75 | *Chiroderma doriae* | F | 52.5 | M | Yes | 28 |
| 76 | *Chiroderma trinitatum* | F | 36.4 | S | Yes | 19 |
| 77 | *Chiroderma villosum* | F | 47.0 | M | Yes | 3 |
| 78 | *Choeroniscus minor* | N | 32.5 | S | Yes | 3 |
| 79 | *Chrotopterus auritus* | C | 82.0 | M | Yes | 3 |

**Table S2.** Continuation…

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Seq** | **Family** | **Species** | **Guild** | **FA** | **Size** | **Model?** | **Source** |
| 80 |  | *Desmodus rotundus* | H | 57.5 | M | No | 3 |
| 81 | *Diaemus youngii* | H | 53.0 | L | No | 19 |
| 82 | *Diphyla ecaudata* | H | 56.0 | S | No | 3 |
| 83 | *Dryadonycteris capixaba* | N | 30.7 | S | No | 6 |
| 84 | *Gardenerycteris crenulatum* | I | 48.0 | M | No | 15 |
| 85 | *Glossophaga comisarisi* | N | 34.5 | S | No | 19 |
| 86 | *Glossophaga longirostris* | N | 38.5 | M | No | 19 |
| 87 | *Glossophaga soricina* | N | 35.5 | S | Yes | 19 |
| 88 | *Glyphonycteris behnii* | I | 47.0 | M | No | 11 |
| 89 | *Glyphonycteris daviesi* | I | 55.5 | M | No | 3 |
| 90 | *Glyphonycteris sylvestris* | I | 40.5 | S | No | 3 |
| 91 | *Hsunycteris pattoni* | N | 32.0 | S | No | 36 |
| 92 | *Hsunycteris thomasi* | N | 32.5 | S | Yes | 19 |
| 93 | *Lampronycteris brachyotis* | I | 41.0 | M | No | 3 |
| 94 | *Lichonycteris degener* | N | 33.0 | S | Yes | 3 |
| 95 | *Lionycteris spurrelli* | N | 35.0 | S | Yes | 3 |
| 96 | *Lonchophylla bokermanni* | N | 38.5 | M | Yes | 5 |
| 97 | *Lonchophylla dekeyseri* | N | 36.9 | M | Yes | 1 |
| 98 | *Lonchophylla inexpectata* | N | 34.2 | S | No | 23 |
| 99 | *Lonchophylla mordax* | N | 33.9 | S | Yes | 19 |
| 100 | *Lonchophylla peracchii* | N | 35.5 | M | No | 34 |
| 101 | *Lonchorhina aurita* | I | 50.5 | M | Yes | 19 |
| 102 | *Lonchorhina inusitata* | I | 54.5 | M | No | 3 |
| 103 | *Lophostoma brasiliense* | I | 34.0 | S | Yes | 3 |
| 104 | *Lophostoma carrikeri* | I | 45.9 | L | No | 3 |
| 105 | *Lophostoma schulzi* | I | 44.0 | M | No | 3 |
| 106 | *Lophostoma silvicola* | I | 54.5 | L | No | 3 |
| 107 | *Macrophyllum macrophyllum* | I | 36.0 | S | Yes | 3 |
| 108 | *Mesophylla macconnelli* | F | 31.5 | S | Yes | 3 |
| 109 | *Micronycteris hirsuta* | I | 43.0 | S | Yes | 3 |
| 110 | *Micronycteris homezorum* | I | 35.5 | S | No | 3 |
| 111 | *Micronycteris megalotis* | I | 34.0 | S | Yes | 3 |
| 112 | *Micronycteris microtis* | I | 34.5 | S | No | 3 |
| 113 | *Micronycteris minuta* | I | 34.0 | S | Yes | 3 |
| 114 | *Micronycteris sanborni* | I | 34.0 | S | Yes | 3 |
| 115 | *Micronycteris schmidtorum* | I | 35.5 | S | Yes | 3 |
| 116 | *Mimon bennettii* | I | 55.0 | M | Yes | 3 |
| 117 | *Neonycteris pusilla* | I | 34.0 | S | No | 3 |
| 118 | *Phylloderma stenops* | I | 74.0 | L | Yes | 3 |

**Table S2.** Continuation…

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Seq** | **Family** | **Species** | **Guild** | **FA** | **Size** | **Model?** | **Source** |
| 119 |  | *Phyllostomus discolor* | I | 62.0 | L | Yes | 3 |
| 120 | *Phyllostomus elongatus* | I | 66.0 | L | No | 3 |
| 121 | *Phyllostomus hastatus* | C | 85.0 | M | Yes | 3 |
| 122 | *Phyllostomus latifolius* | I | 58.5 | L | No | 3 |
| 123 | *Platyrrhinus angustirostris* | F | 37.5 | S | No | 37 |
| 124 | *Platyrrhinus aurarius* | F | 52.5 | M | No | 3 |
| 125 | *Platyrrhinus brachycephalus* | F | 37.5 | S | Yes | 3 |
| 126 | *Platyrrhinus fusciventris* | F | 37.5 | M | No | 3 |
| 127 | *Platyrrhinus incarum* | F | 37.5 | S | Yes | 3 |
| 128 | *Platyrrhinus infuscus* | F | 58.0 | L | Yes | 3 |
| 129 | *Platyrrhinus lineatus* | F | 47.5 | M | Yes | 3 |
| 130 | *Platyrrhinus recifinus* | F | 42.9 | M | Yes | 33 |
| 131 | *Pygoderma bilabiatum* | F | 40.0 | S | Yes | 26 |
| 132 | *Rhinophylla fischerae* | F | 31.5 | S | Yes | 3 |
| 133 | *Rhinophylla pumilio* | F | 34.5 | S | Yes | 3 |
| 134 | *Scleronycteris ega* | N | 34.0 | S | No | 3 |
| 135 | *Sphaeronycteris toxophyllum* | F | 39.5 | M | No | 3 |
| 136 | *Sturnira giannae* | F | 45.0 | M | No | 39 |
| 137 | *Sturnira tildae* | F | 46.0 | M | No | 3 |
| 138 | *Sturnira lilium* | F | 40.5 | S | Yes | 3 |
| 139 | *Sturnira magna* | F | 57.5 | L | No | 3 |
| 140 | *Tonatia bidens* | I | 54.0 | M | Yes | 3 |
| 141 | *Tonatia maresi* | I | 55.0 | M | Yes | 43 |
| 142 | *Trachops cirrhosus* | C | 61.5 | L | No | 3 |
| 143 | *Trinycteris nicefori* | I | 41.0 | S | Yes | 3 |
| 144 | *Uroderma bilobatum* | F | 42.0 | M | No | 3 |
| 145 | *Uroderma magnirostrum* | F | 42.0 | M | Yes | 3 |
| 146 | *Vampyressa pusilla* | F | 33.0 | S | Yes | 3 |
| 147 | *Vampyressa thyone* | F | 33.0 | S | No | 3 |
| 148 | *Vampyriscus bidens* | F | 36.0 | S | Yes | 3 |
| 149 | *Vampyriscus brocki* | F | 32.0 | S | No | 3 |
| 150 | *Vampyrodes caraccioli* | F | 51.5 | M | Yes | 3 |
| 151 | *Vampyrum spectrum* | C | 101.0 | L | Yes | 3 |
| 152 | *Xeronycteris vieirai* | N | 37.2 | M | Yes | 25 |
| 153 | Thyropteridae | *Thryoptera devivoi* | I | 36.5 | S | No | 3 |
| 154 | *Thyroptera discifera* | I | 33.5 | S | Yes | 3 |
| 155 | *Thyroptera lavali* | I | 39.0 | S | No | 8 |
| 156 | *Thyroptera tricolor* | I | 36.5 | S | Yes | 3 |
| 157 | *Thyroptera wynneae* | I | 34.0 | S | No | 3 |
| 158 | Vespertilionidae | *Epitesicus chiriquinus* | I | 45.5 | M | No | 3 |

**Table S2.** Continuation…

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Seq** | **Family** | **Species** | **Guild** | **FA** | **Size** | **Model?** | **Source** |
| 159 |  | *Eptesicus brasiliensis* | I | 43.0 | M | Yes | 35 |
| 160 | *Eptesicus diminutus* | I | 39.5 | S | Yes | 3 |
| 161 | *Eptesicus furinalis* | I | 39.0 | S | Yes | 35 |
| 162 | *Eptesicus taddeii* | I | 46.5 | M | Yes | 21 |
| 163 | *Histiotus alienus* | I | 45.8 | M | No | 41 |
| 164 | *Histiotus diaphanotpterus* | I | 45.4 | M | No | 9 |
| 165 | *Histiotus laephotis* | I | 46.9 | M | Yes | 20 |
| 166 | *Histiotus montanus* | I | 47.7 | M | Yes | 19 |
| 167 | *Histiotus velatus* | I | 46.0 | M | Yes | 3 |
| 168 | *Lasiurus blossevillii* | I | 39.5 | S | Yes | 3 |
| 169 | *Lasiurus castaneus* | I | 45.0 | M | No | 3 |
| 170 | *Lasiurus ebenus* | I | 45.7 | M | No | 4 |
| 171 | *Lasiurus ega* | I | 46.0 | M | Yes | 3 |
| 172 | *Lasiurus egregius* | I | 49.0 | S | No | 3 |
| 173 | *Lasiurus villosissimus* | I | 51.8 | M | Yes | 40 |
| 174 | *Myotis albescens* | I | 34.0 | S | Yes | 3 |
| 175 | *Myotis izecksohni* | I | 37.4 | M | No | 2 |
| 176 | *Myotis lavali* | I | 34.0 | S | No | 2 |
| 177 | *Myotis levis* | I | 40.8 | S | Yes | 24 |
| 178 | *Myotis nigricans* | I | 34.0 | S | Yes | 3 |
| 179 | *Myotis riparius* | I | 34.5 | S | Yes | 3 |
| 180 | *Myotis ruber* | I | 40.0 | S | Yes | 17 |
| 181 | *Myotis simus* | I | 38.5 | S | Yes | 3 |
| 182 | *Rhogeessa hussoni* | I | 29.5 | S | Yes | 3 |
| 183 | *Rhogeessa io* | I | 30.0 | S | No | 3 |

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