|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1. Bird and mammal species photographed during the four-year study and their relative abundance (independent photos /sampling effort\* 1000) in the El Eden Ecological Reserve, Quintana Roo, Mexico | | | | | |
| Name common/scientific | By-weight group | Relative Abundance (RA) | | | |
| 2008 | 2010 | 2011 | 2012 |
| Jaguar/  *Panthera onca* |  | 29.48 | 6.08 | 3.27 | 27.60 |
| Cougar/  *Puma concolor* |  | 21.52 | 7.48 | 14.03 | 19.65 |
| Ocelot/  *Leopardus pardalis* |  | 16.37 | 7.95 | 8.42 | 14.97 |
| Armadillo/  *Dasypus novemcinctus* | sm-mam | 2.80 | 0.46 | 0.93 |  |
| Opossum/  *Didelphis* sp | sm-mam | 6.55 | 1.40 | 2.80 | 0.46 |
| Anteater/  *Tamandua mexicana* | med-mam |  | 0.93 |  |  |
| Squirrel/  *Sciurus* sp | med-mam |  |  |  | 4.21 |
| Agouti/  *Dasyprocta puntata* | sm-mam |  |  |  | 0.93 |
| Lowland paca/  *Cuniculus paca* | med-mam |  | 0.46 | 0.46 | 5.14 |
| Striped hog-nosed skunk /  *Conepatus semiestratus* | sm-mam | 1.40 | 0.93 |  | 1.87 |
| Spotted skunk/  *Spilogale putorius* | sm-mam |  |  |  | 0.46 |
| Tayra/  *Eira barbara* | med-mam |  | 0.46 | 2.80 |  |
| Coati/  *Nasua narica* | med-mam | 16.84 | 8.42 | 7.48 | 3.74 |
| Margay*/*  *Leopardus wiedii* | sm-mam | 1.87 | 2.80 | 0.46 | 2.33 |
| Jaguarundi (Eyra cat)/  *Herpailurus jaguaroundi* | med-mam |  | 0.46 |  |  |
| Raccoon/  *Procyon lotor* | med-mam |  | 0.46 |  |  |
| Gray fox/  *Urocyon cinereoargenteus* | sm-mam | 36.96 | 12.63 | 5.14 | 12.63 |
| Coyote/  *Canis latrans* | med-mam |  |  | 2.80 |  |
| Spider monkey/  *Ateles geoffroyi* | med-mam |  |  |  | 1.40 |
| White-tailed deer/  *Odocoileus virginianus* | lrg-mam | 12.16 | 1.40 | 1.87 | 7.01 |
| Red brocket/  *Mazama temama* | lrg-mam | 3.74 | 1.40 | 0.46 | 1.40 |
| Collared peccary/  *Tayassu tajacu* | lrg-mam | 7.95 | 3.27 | 2.33 | 5.14 |
| Grey-necked wood rail/  *Aramides cajanea* | sm-brd | 2.33 |  |  | 2.33 |
| Plain chachalaca/  *Ortalis vetula* | sm-brd | 1.87 | 0.46 |  | 0.46 |
| Great curassow/  *Crax rubra* | lrg-brd | 8.42 | 4.21 | 4.67 | 3.27 |
| Ocellated turkey/  *Meleagris ocellata* | lrg-brd | 43.05 | 5.61 | 19.65 | 35.09 |
| Human/  *Homo sapiens* |  | 60.36 | 114.64 | 276.55 | 269.06 |

Species grouped by weight. Groups: small mammal (sm-mam), medium-sized mammal (med-mam), large mammal (lrg-mam), small bird (sm-brd), large bird (lrg-brd).

Table 2. Environmental variables considered for the generalized linear models (GLM). By studied year (2008, 2010-2012) and 18 models with information from the four years at the El Eden Ecological Reserve, Quintana Roo, Mexico by *Puma concolor*.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Environmental variables | AIC 2008 | AIC  2010 | AIC  2011 | AIC  2012 | AIC  Full |
| 0 | Nil | 93.6 | 53.6 | 68.6 | 99.5 | 320.7 |
| 1 | Co-predators per AP. | 90.5 | 59.0 | 74.0 | 81.5 | 315.9 |
| 2 | Co-predators per AP, AVS | 87.6 | 57.0 | 68.6 | 80.0 | 308.9 |
| 3 | All sp + human | 89.2 | 51.8 | 63.1 | 94.8 | 314.7 |
| 4 | All sp + human AVS | 76.9 | 41.8 | 55.6 | 86.2 | 300.2 |
| 5 | All sp + co-predators + human | 79.3 | 55.8 | 57.7 | 91.6 | 307.9 |
| 6 | All sp + co-predators + human AVS | 72.9 | 40.6 | 55.7 | 86.2 | 291.6 |
| 7 | All sp + human per AP | 98.9 | 59.8 | 66.7 | 98.6 | 318.6 |
| 8 | All sp + human per AP AVS | 82.9 | 35.8 | 57.6 | 75.5 | 295.6 |
| 9 | All sp + co-predators + human per AP | 94.6 | 66.2 | 63.7 | 99.4 | 303.4 |
| 10 | All sp + co-predators + human per AP AVS | 80.6 | 43.6 | 51.7 | 70.1 | 288.2.8 |
| 11 | EF | 88.9 | 56.2 | 75.5 | 107.1 | 326.78 |
| 12 | EF AVS | 84.8 | 55.3 | 68.63 | 99.5 | 320.2 |
| 13 | EF + all sp + human | 89.1 | 51.8 | 63.7 | 98. | 296.5 |
| 14 | EF + all sp + human AVS | 76.2 | 35.2 | 47.5 | 84.7 | 290.6 |
| 15 | All sp by weight group | 89.2 | 54.7 | 73.0 | 105.3 | 328.20 |
| 16 | All sp by weight group AVS | 87.5 | 50.0 | 69.3 | 98.2 | 320.7 |
| 17 | All sp by weight group + EF | 86.2 | 49.8 | 75.7 | 112.4 | 329.9 |
| 18 | All sp by weight group + EF, AVS | 79.0 | 47.8 | 68.6 | 98.2 | 322.2 |

Activity pattern (AP); after variable selection as per AIC (AVS); environmental factors -distance to bodies of water, vegetation type, path type, prey or co-predator traces, plant cover- (EF). All species, considered all species photographed with impendent records (All SP

Table 3. Selection and use of environmental variables at the El Eden Ecological Reserve, Quintana Roo, Mexico by the cougar (*Puma concolor*), (α< 0.05) \* significant difference, (+) used more than their availability proportion, (-) used less than their availability proportion.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Resource | Year | Observed proportion | Expected  proportion | Interval | | Use |
| Lower | Upper |
| Vegetation |  |  |  |  |  |  |
| Medium forest | 2008\* | 0.54 | 0.33 | 0.35 | 0.72 | (+) |
|  | 2010 | 0.75 | 0.50 | 0.44 | 1.00 |  |
|  | 2011\* | 0.22 | 0.45 | 0.18 | 0.26 | (-) |
|  | 2012 | 0.37 | 0.34 | 0.32 | 0.42 |  |
| Acahual | 2008\* | 0.46 | 0.67 | 0.28 | 0.65 | (-) |
|  | 2010 | 0.25 | 0.50 | 0.00 | 0.56 |  |
|  | 2011\* | 0.78 | 0.55 | 0.74 | 0.82 | (+) |
|  | 2012 | 0.63 | 0.66 | 0.58 | 0.68 |  |
| Path |  |  |  |  |  |  |
| Trail | 2008 | 0.54 | 0.38 | 0.35 | 0.74 |  |
|  | 2010 | 0.75 | 0.50 | 0.44 | 1.00 |  |
|  | 2011\* | 0.23 | 0.50 | 0.19 | 0.27 | (-) |
|  | 2012 | 0.40 | 0.34 | 0.34 | 0.45 |  |
| Firebreak | 2008 | 0.07 | 0.13 | 0.00 | 0.17 |  |
|  | 2010 | 0.06 | 0.18 | 0.00 | 0.25 |  |
|  | 2011 | 0.13 | 0.10 | 0.10 | 0.16 |  |
|  | 2012 | 0.17 | 0.21 | 0.13 | 0.21 |  |
| Dirt road | 2008 | 0.39 | 0.50 | 0.22 | 0.59 |  |
|  | 2010 | 0.19 | 0.32 | 0.00 | 0.46 |  |
|  | 2011\* | 0.64 | 0.40 | 0.60 | 0.69 | (+) |
|  | 2012 | 0.44 | 0.45 | 0.38 | 0.49 |  |

Table 4. Environmental variables that determine cougar presence in the El Eden Ecological Reserve, Quintana Roo, Mexico (AIC, 288.26).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Coefficient | Standard error | z | Pr >|z| |
| (Intercept) | -6.47 | 0.19 | -32.58 | 0.00 |
| diurnal\_human | 0.02 | 0.00 | 4.64 | 0.00 |
| diurnal\_peccari | 0.69 | 0.15 | 4.41 | 0.00 |
| crepuscular\_coati | 0.51 | 0.27 | 1.88 | 0.05 |
| crepuscular\_ocellated turkey | -0.84 | 0.51 | -1.64 | 0.09 |
| diurnal\_ocellated turkey | 0.47 | 0.14 | 3.22 | 0.00 |
| nocturnal\_margay | -0.69 | 0.36 | -1.91 | 0.05 |
| diurnal\_jaguar | -0.30 | 0.15 | -1.99 | 0.04 |
| nocturnal\_jaguar | 0.56 | 0.11 | 4.94 | 0.00 |
| crepuscular\_jaguar | 0.37 | 0.14 | 2.52 | 0.01 |
| crepuscular\_ocelot | -0.66 | 0.27 | -2.39 | 0.01 |
| nocturnal\_ocelot | 0.17 | 0.05 | 3.01 | 0.00 |
| diurnal\_gray fox | -0.57 | 0.21 | -2.65 | 0.00 |
| crepuscular\_gray fox | 0.27 | 0.15 | 1.77 | 0.07 |
| nocturnal\_opossum | 0.40 | 0.14 | 2.90 | 0.00 |
| nocturnal\_armadillo | -1.34 | 0.63 | -2.12 | 0.03 |