APÉNDICE 1/ APPENDIX 1

Tabla A

Variables del hidroperiodo y parámetros fisicoquímicos en el SHC (\*) de noviembre 2016 a octubre 2017. Valores con diferencia significativa para p<0.05. Valores con la misma letra son estadísticamente iguales prueba de Tukey no paramétrica

Table A

Hydroperiod variables and physicochemical parameters in the SHC (\*) from November 2016 to October 2017. Values with significant difference for p <0.05. Values with the same letter are statistically equivalent (nonparametric Tukey test)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vegetación | Inundación | | Salinidad del agua (ups) | | | pH agua | | | Suelo | | | |
|  | Nivel  (cm) | Tiempo (meses) | Superficial | Intersticial | Subterránea | Superficial | Intersticial | Subterránea | Humedad (%) | Densidad aparente (g cm3) | | Potencial redox (mV) |
| **Manglar** |  |  |  |  |  |  |  |  |  |  | |  |
| Promedio ± EE (n) | 11.19 ± 2.09 (240) | 8.54 ± 0.53 (24) | 5.87 ± 0.56 (143) | 11.51 ± 0.58 (164) | 12.36 ± 0.49 (243) | 7.12 ± 0.05 (132) | 6.55 ± 0.04 (152) | 6.8 ± 0.03 (223) | 56.04 ± 1.25 (257) | 0.44 ± 0.02 (257) | | 23.37 ± 11.61 (201) |
| Mediana (RQ) | 10 (42.5)a | 8.00 (4.75)a | 3 0(7.13)a | 10.8 (9.57)a | 12.1 (9.7)a | 7.1 (0.7)a | 6.6 (0.7)a | 6.9 (0.7)a | 57.02 (32.52)a | 0.39 (0.39)a | | 14.57 (185)a |
| Mínimo - Máximo | -80 - 95 | 4.00 – 12.00 | 0 – 38 | 0 - 43.7 | 0.03 - 40.8 | 4.4 - 8.2 | 4.9 - 8.2 | 5.8 - 7.9 | 8.55 - 90.76 | 0.06 - 1.48 | | -567.43 - 671.9 |
| Q25 | -8.75 | 6.25 | 1.3 | 6.43 | 7.5 | 6.8 | 6.2 | 6.5 | 40.25 | 0.22 | | -67.93 |
| Q75 | 33.75 | 11.00 | 8.6 | 16 | 17.2 | 7.5 | 6.9 | 7.2 | 72.77 | 0.61 | | 117.07 |
| **Selva Inundable** | |  |  |  |  |  |  |  |  |  | |  |
| Promedio ± EE (n) | -26.49 ± 3.41 (99) | 2.22 ± 0.74 (9) | 4.24 ± 0.6 (21) | 6.57 ± 0.75 (46) | 6.3 ± 0.54 (98) | 6.7 ± 0.09 (20) | 6.49 ± 0.17 (40) | 6.71 ± 0.05 (93) | 49.19 ± 0.92 (99) | 0.51 ± 0.02 (99) | | 138.05 ± 20.91  (64) |
| Mediana (RQ) | -28 (55)bd | 2.00b (9.00)b | 3.5 (3.4)a | 5.5 (4.45)b | 4.95 (3.9)b | 6.6 (0.57)ab | 6.7 (0.55)ab | 6.7 (0.7)ab | 48.47 (13.33)ab | 0.51 (0.23)ab | | 119.07 (218.69)b |
| Mínimo - Máximo | -90 – 45 | 0.00 – 6.00 | 0.1 - 10.1 | 0.1 - 23.9 | 0.1 - 27.6 | 6.1 - 7.8 | 5.7 - 7.8 | 5.7 - 7.8 | 29.54 - 73.89 | 0.2 - 0.88 | | -151.43 - 789.23 |
| Q25 | -55 | 0.00 | 2.6 | 3.6 | 3.2 | 6.43 | 6.3 | 6.3 | 42.7 | 0.38 | | 17.32 |
| Q75 | 0 | 4.00 | 6 | 8.05 | 7.1 | 7 | 6.85 | 7 | 56.03 | 0.61 | | 236.01 |
| **Tular** |  |  |  |  |  |  |  |  |  |  | |  |
| Promedio ± EE (n) | 5.56 ± 4.32 (109) | 6.5 ± 0.27 (10) | 3.36 ± 0.27 (60) | 8.2 ± 0.43 (91) | 6.2 ± 0.23 (101) | 6.67 ± 0.04 (60) | 6.2 ± 0.04 (81) | 6.63 ± 0.05 (91) | 58.39 ± 0.77 (109) | 0.42 ± 0.01 (109) | | 133.84 ± 20.14  (89) |
| Mediana (RQ) | 11 (54.5)ac | 6.50 (10)abc | 3.25 (1.8)a | 8.5 (5.2)cb | 6.1 (3.45)cb | 6.65 (0.55)cb | 6.2 (0.5)c | 6.7 (0.6)cb | 58.28 (9.54)a | 0.41 (0.18)a | | 125.9 (250.67)cb |
| Mínimo - Máximo | -95 – 130 | 5.00 – 8.00 | 0.1 - 14.1 | 0.1 - 16.2 | 0.3 - 11.5 | 5.8 - 7.2 | 5.5 - 7.4 | 5.9 - 7.8 | 34.83 - 82.69 | 0.16 - 0.86 | | -179.43 - 738.9 |
| Q25 | -27.5 | 6.00 | 2.4 | 5.9 | 4.6 | 6.43 | 5.9 | 6.3 | 53.87 | 0.32 | | -21.43 |
| Q75 | 27 | 7.00 | 4.2 | 11.1 | 8.05 | 6.98 | 6.4 | 6.9 | 63.41 | 0.5 | | 229.23 |
| **Pastizal Inundable** | |  |  |  |  |  |  |  |  |  | |  |
| Promedio ± EE (n) | -12.36 ± 9.78 (59) | 8.00 ± 0.45 (10) | 0.22 ± 0.09 (23) | 0.3 ± 0.1 (9) | 1.07 ± 0.29 (38) | 7.1 ± 0.09 (15) | 6.62 ± 0.25 (5) | 7.38 ± 0.07 (33) | 39.3 ± 2.66 (40) | 0.53 ± 0.02 (40) | 124.09 ± 22.08  (36) | |
| Mediana (RQ) | -34 (140)dbc | 8.50 (10.00)ac | 0.1 (0.1)d | 0.2 (0.3)d | 0.4 (0.78)d | 7 (0.6)abc | 6.6 (0.95)abc | 7.4 (0.85)d | 44.32 (25.57)db | 0.51 (0.13)ab | 151.23 (174.34)dbc | |
| Mínimo - Máximo | -120 – 120 | 5.00 – 9.00 | 0.1 - 2.1 | 0.1 - 1 | 0 - 9 | 6.6 - 7.8 | 6 - 7.5 | 6.8 - 8.2 | 7.77 - 71.36 | 0.18 - 0.97 | -448.77 - 328.23 | |
| Q25 | -80 | 7.50 | 0.1 | 0.1 | 0.2 | 6.8 | 6.15 | 6.9 | 25.61 | 0.46 | 48.73 | |
| Q75 | 60 | 9.00 | 0.2 | 0.4 | 0.98 | 7.4 | 7.1 | 7.8 | 51.18 | 0.59 | 223.07 | |
| KW | 62.16\* | 24.39\* | 52.42\* | 48.82\* | 156.8\* | 32.14\* | 34.85\* | 53.59\* | 54.20\* | 16.24\* | 40.84\* | |

APÉNDICE 1/ APPENDIX 1

Tabla B

Variables del hidroperiodo y parámetros fisicoquímicos en el SHC (\*) durante la temporada de secas de noviembre 2016 hasta abril 2017. Valores con diferencia significativa para p<0.05. Valores con la misma letra son estadísticamente iguales (Tukey no paramétrica)

Table B

Hydroperiod variables and physicochemical parameters in the SHC (\*) during the dry season from November 2016 to April 2017. Values with significant difference for p <0.05. Values with the same letter are statistically equivalent (nonparametric Tukey test)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vegetación | Inundación | Salinidad del agua (ups) | | | pH agua | | | Suelo | | | |
| Nivel  (cm) | Superficial | Intersticial | Subterránea | Superficial | Intersticial | Subterránea | Humedad (%) | Densidad aparente (g cm3) | Potencial redox (mV) | |
| Manglar | | | | | | | | | | | |
| Promedio ± EE (n) | -4.99 ± 2.66 (102) | 10.02 ± 1.22 (46) | 13.5 ± 1(72) | 14.28 ± 0.84 (106) | 7.17 ± 0.07(33) | 6.71 ± 0.06(60) | 6.99 ± 0.04(86) | 55.19 ± 1.95(108) | 0.46 ± 0.03(108) | | 51.6 ± 11.9(98) |
| Mediana (RQ) | 2(33.75)a | 7.85(10.45)a | 12.8(11.82)a | 13.8(11.42)a | 7.2(0.6)a | 6.65(0.7)a | 7(0.52)a | 56.98(32.83)a | 0.41(0.38)a | | 43.73(174.34)a |
| Mínimo - Máximo | -80 - 45 | 1.6 - 38 | 0.02 - 43.7 | 0.03 - 40.8 | 6.1 - 8 | 5.7 - 8.2 | 6.2 - 7.8 | 13.78 - 90.76 | 0.06 - 1.24 | | -187.43 - 275.23 |
| Q25 | -21.5 | 3.4 | 7.98 | 8.53 | 6.9 | 6.3 | 6.78 | 39.64 | 0.23 | | -43.77 |
| Q75 | 12.25 | 13.85 | 19.8 | 19.95 | 7.5 | 7 | 7.3 | 72.47 | 0.61 | | 130.57 |
| **Selva Inundable** | | | | | | | | | | | |
| Promedio ± EE (n) | -43.89 ± 3.84 (45) | **8.2** | 6.48 ± 1.27 (24) | 6.26 ± 0.95 (45) | **6.2** | 6.78 ± 0.07 (19) | 6.85 ± 0.05 (40) | 48.77 ± 1.43 (45) | 0.51 ± 0.02 (45) | | 106.91 ± 24.69  (32) |
| Mediana (RQ) | -40(41.5)b |  | 5.1(5.98)b | 4(4.7)b |  | 6.8(0.4)ab | 6.9(0.38)ab | 48.61(16.67)bd | 0.48(0.22)b | | 100.23(230.68)ab |
| Mínimo - Máximo | -90 - 4 |  | 0.1 - 23.9 | 0.1 - 27.6 |  | 6.2 - 7.5 | 6.1 - 7.6 | 29.54 - 68.95 | 0.24 - 0.8 | | -151.43 - 319.57 |
| Q25 | -69 |  | 3.15 | 2.75 |  | 6.5 | 6.63 | 40.36 | 0.41 | | 9.65 |
| Q75 | -27.5 |  | 9.13 | 7.45 |  | 6.9 | 7 | 57.03 | 0.62 | | 240.33 |
| **Tular** | | | | | | | | | | | |
| Promedio ± EE (n) | -22.88 ± 4.05 (49) | 4.7 ± 0.4 (10) | 9.39 ± 0.71 (45) | 6.63 ± 0.36 (43) | 6.65 ± 0.1 (10) | 6.27 ± 0.05 (35) | 6.74 ± 0.04 (33) | 59.91 ± 1.31 (49) | 0.39 ± 0.02 (49) | | 148.53 ± 20.33 (49) |
| Mediana (RQ) | -21(38)c | 4.35(1.8)a | 10.1(6.3)ab | 6.4(3.5)cb | 6.65(0.33)c | 6.2(0.3)c | 6.8(0.3)cb | 58.96(11.82)a | 0.37(0.15)a | | 174.9(144)bc |
| Mínimo - Máximo | -95 - 16 | 3.1 - 7.3 | 0.1 - 16.2 | 0.3 - 11.5 | 6 - 7.2 | 5.8 - 7.4 | 6.1 - 7.1 | 40.88 - 82.69 | 0.17 - 0.66 | | -179.43 - 376.23 |
| Q25 | -36 | 3.9 | 6.9 | 4.9 | 6.50 | 6.1 | 6.6 | 54.71 | 0.3 | | 95.4 |
| Q75 | 2 | 5.7 | 13.2 | 8.4 | 6.83 | 6.4 | 6.9 | 66.54 | 0.45 | | 239.4 |
| **Pastizal Inundable** | | | | | | | | | | | |
| Promedio ± EE (n) | -19.98 ± 10.05 (40) | 0.15 ± 0.02 (14) | 0.3 ± 0.1 (9) | 0.78 ± 0.35 (25) | 6.88 ± 0.1 (6) | 6.62 ± 0.25 (5) | 7.42 ± 0.1 (20) | 44.4 ± 2.59 (31) | 0.51 ± 0.03 (31) | | 147.71 ± 16.51 (31) |
| Mediana (RQ) | -37(106)ac | 0.1(0.1)d | 0.2(0.3)db | 0.4(0.45)d | 6.9(0.53)ac | 6.6(0.95)ab | 7.4(0.87)d | 46.77(19.89)db | 0.49(0.12)ab | | 164.23(166.67)dcb |
| Mínimo - Máximo | -120 - 90 | 0.1 - 0.3 | 0.1 - 1 | 0 - 9 | 6.6 - 7.2 | 6 - 7.5 | 6.8 - 8.2 | 15.6 - 71.36 | 0.18 - 0.97 | | -22.77 - 328.23 |
| Q25 | -70 | 0.1 | 0.1 | 0.2 | 6.6 | 6.15 | 6.93 | 34.62 | 0.44 | | 59.23 |
| Q75 | 36 | 0.2 | 0.4 | 0.65 | 7.13 | 7.10 | 7.8 | 54.51 | 0.57 | | 225.9 |
| KW | 40.66\* | 35.69\* | 38.23\* | 84.46\* | 13.7\* | 29.78\* | 31.48\* | 26.83\* | 17.59\* | | 25.22\* |

APÉNDICE 1/ APPENDIX 1

Tabla C

Variables del hidroperiodo y parámetros fisicoquímicos en el SHC (\*) durante la temporada de lluvias de mayo a octubre de 2017. Valores con diferencia significativa para p<0.05. Valores con la misma letra son estadísticamente iguales prueba de Tukey no paramétrica

Table C

Hydroperiod variables and physicochemical parameters in the SHC (\*) during the rainy season from May to October 2017. Values with significant difference for p <0.05. Values with the same letter are statistically equivalent (nonparametric Tukey test)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Vegetación | Inundación | Salinidad del agua | | | pH agua | | | Suelo | | |
|  | Nivel | Superficial | Intersticial | Subterránea | Superficial | Intersticial | Subterránea | Humedad  (%) | Densidad aparente (g cm3) | Potencial redox (mV) |
| Manglar | |  |  |  |  |  |  |  |  |  |
| Promedio ± EE (n) | 23.14 ± 2.63 (138) | 3.9 ± 0.47 (97) | 9.95 ± 0.64 (92) | 10.88 ± 0.55 (137) | 7.1 ± 0.06 (99) | 6.45 ± 0.06 (92) | 6.77 ± 0.04 (137) | 56.53 ± 1.63 (149) | 0.43 ± 0.02 (149) | -3.48 ± 19.3 (103) |
| Mediana (RQ) | 25.00 (37)a | 2.00(4.4)a | 9.1 (7.2)a | 10.9 (8.5)a | 7 (0.7)a | 6.5 (0.8)a | 6.7 (0.8)a | 57.02 (32.32)a | 0.39 (0.37)a | -14.43 (181.67)a |
| Mínimo - Máximo | -64 - 95 | 0 - 18.5 | 0 - 32.3 | 0.1 - 33.9 | 4.4 - 8.2 | 4.9 - 8 | 5.8 - 7.9 | 8.55 - 89.4 | 0.06 - 1.48 | -567.43 - 671.9 |
| Q25 | 3 | 0.9 | 6 | 5.9 | 6.8 | 6 | 6.3 | 40.42 | 0.2 | -77.77 |
| Q75 | 40 | 5.3 | 13.2 | 14.4 | 7.5 | 6.8 | 7.15 | 72.74 | 0.57 | 103.9 |
| Selva Inundable | |  |  |  |  |  |  |  |  |  |
| Promedio ± EE (n) | -12 ± 4.52 (54) | 4.05 ± 0.59 (20) | 6.66 ± 0.76 (22) | 6.34 ± 0.59 (53) | 6.72 ± 0.09 (19) | 6.5 ± 0.1 (21) | 6.6 ± 0.07 (53) | 49.54 ± 1.19 (54) | 0.51 ± 0.02 (54) | 169.2 ± 33.25 (32) |
| Mediana (RQ) | -10 (46)b | 3.4 (3.13)a | 6.25 (3.9)b | 5.6 (3.65)b | 6.6 (0.5)ab | 6.4 (0.6)a | 6.4 (0.85)ab | 48.46 (11.24)b | 0.52 (0.24)b | 119.07 (193)b |
| Mínimo - Máximo | -84 - 45 | 0.1 - 10.1 | 0.1 - 15.4 | 2.2 - 24.9 | 6.1 - 7.8 | 5.7 - 7.8 | 5.7 - 7.8 | 32.49 - 73.89 | 0.2 - 0.88 | -69.77 - 789.23 |
| Q25 | -30 | 2.6 | 4.15 | 3.4 | 6.5 | 6.2 | 6.2 | 44.44 | 0.36 | 40.9 |
| Q75 | 16 | 5.73 | 8.05 | 7.05 | 7 | 6.8 | 7.05 | 55.68 | 0.6 | 233.9 |
| Tular | |  |  |  |  |  |  |  |  |  |
| Promedio ± EE (n) | 28.78 ± 5.56 (60) | 3.09 ± 0.3 (50) | 7.02 ± 0.44 (46) | 5.88 ± 0.31 (58) | 6.67 ± 0.05 (50) | 6.15 ± 0.07 (46) | 6.57 ± 0.07 (58) | 57.14 ± 0.89 (60) | 0.44 ± 0.02 (60) | 115.84 ± 37.4 (40) |
| Mediana (RQ) | 25.5 (22)ac | 2.9 (1.5)a | 7.35 (5.55)c | 5.8 (3.08)cb | 6.65 (0.6)cb | 6.05 (0.63)a | 6.4 (0.9)ab | 57.16 (7.87)a | 0.43 (0.2)abc | 58.07 (208.17)abc |
| Mínimo - Máximo | -77 - 130 | 0.1 - 14.1 | 2.5 - 13.9 | 0.6 - 10.6 | 5.8 - 7.2 | 5.5 - 7.2 | 5.9 - 7.8 | 34.83 - 71.2 | 0.16 - 0.86 | -177.43 - 738.9 |
| Q25 | 14.75 | 2.33 | 3.68 | 4.15 | 6.4 | 5.8 | 6.1 | 53.78 | 0.33 | -33.85 |
| Q75 | 36.75 | 3.83 | 9.23 | 7.23 | 7 | 6.43 | 7 | 61.66 | 0.53 | 174.32 |
| Pastizal Inundable | |  |  |  |  |  |  |  |  |  |
| Promedio ± EE (n) | 3.68 ± 21.79 (19) | 0.33 ± 0.22 (9) |  | 1.63 ± 0.5 (13) | 7.24 ± 0.11 (9) |  | 7.33 ± 0.11 (13) | 21.75 ± 4.13 (9) | 0.57 ± 0.02 (9) | -22.37 ± 108.69  (5) |
| Mediana (RQ) | 60 (188)a | 0.1 (0.05)d |  | 0.5 (2.55)d | 7.3 (0.45)abc |  | 7.3 (0.65)a | 19.4 (17.45)d | 0.59 (0.12)dbc | 45.23 (338)abc |
| Mínimo - Máximo | -100 - 120 | 0.1 - 2.1 |  | 0.1 - 5.9 | 6.8 - 7.8 |  | 6.8 - 8 | 7.77 - 47.31 | 0.46 - 0.65 | -448.77 - 147.57 |
| Q25 | -98 | 0.1 |  | 0.25 | 7 |  | 7 | 11.36 | 0.5 | -208.27 |
| Q75 | 90 | 0.15 |  | 2.8 | 7.45 |  | 7.65 | 28.81 | 0.62 | 129.73 |
| KW | 36.15\* | 28.82\* | 14.60\* | 60.66\* | 33.95\* | 12.36\* | 23.49\* | 34.33\* | 17.18\* | 21.15\* |

APÉNDICE 2/ APPENDIX 2

Familias y especies identificadas en el manglar (M), selva inundable (SI), tular (T) y pastizal inundable (PI), en el sistema de humedales El Castaño. Estatus de protección: A. amenazada, NOM059; LR (lc) Riesgo bajo, preocupación menor, IUCN. Forma de vida: Hi. hierba, Arb. arbusto, Ár. árbol, T. trepadora, Epí. Epífita. Hábitat: T. terrestre, D. dulceacuícola, S. salobre. Tipo de distribución: N. nativa, Ex. exótica, En. endémica. Registro: NCh. no hay registros en Chiapas.

Families and species identified in the mangrove (M), freshwater swamp (SI), freshwater marsh (T) and flooded grassland (PI), in the El Castaño wetland system. Protection status: A. threatened, NOM059; LR (lc) Low risk, Least Concern, IUCN. Biological form: Hi. herb, Arb. shrub, Ár. tree, T. climber, Epí. Epiphyte. Habitat: T. terrestrial, D. freshwater, S. brackish. Distribution Type: N. native, Ex. exotic, En. Endemic. Registration: NCh. no records in Chiapas.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Familia** | **Especie** | **M** | **SI** | **T** | **PI** | **Estatus de protección** | **Forma de vida** | **Hábitat** | **Distribución** | **Registro** |
| Pteridaceae E.D.M. Kirchn., 1831 | *Acrostichum aureum* L. | x | x | x |  | LR (lc). | Hi | T | N | x |
| Asteraceae, Bercht. & J. Presl, 1820 | *Ambrosia peruviana* All. |  |  |  | x |  | Hi | T | N | x |
| Convolvulaceae, Juss. 1789 | *Aniseia martinicensis*  (Jacq.) Choisy |  |  |  | x | LR (lc). | Hi | D, T | N | x |
| Acanthaceae Juss., 1789 | *Avicennia germinans* (L.) L. | x |  |  |  | A, LR (lc). | Ár, Arb | D, T, S | N | x |
| Poaceae Barnhart, 1895 | *Brachiaria decumbens* Stapf |  |  | x | x |  | Hi | T | N | NCh |
| Bromeliaceae Juss, 1789 | *Bromelia pinguin* L. | x |  |  |  |  | Epí | T | N | x |
| Euphorbiaceae Juss., 1789 | *Caperonia palustris* (L.) A. St.-Hil. |  |  |  | x |  | Hi | T | N | x |
| Sapindaceae Juss., 1789 | *Cardiospermum halicacabum* L. |  |  |  | x |  | Hi, Tr | T | N | x |
| Ceratophyllaceae Gray, 1822 | *Ceratophyllum demersum* L. |  |  |  | x | LR (lc). | Hi | D | N | x |
| Pteridaceae E.D.M. Kirchn., 1831 | *Ceratopteris thalictroid* (L.) Brongn. |  |  |  | x | LR (lc). | Hi | T | N | NCh |
| Vitaceae Juss., 1789 | *Cissus sicyoides* L. | x | x |  | x |  | Hi | T | N | x |
| Combretaceae R. Br., 1810 | *Combretum laxum* Jacq. |  | x |  |  |  | Tr, Arb, Ár | D, T | N | x |
| Combretaceae R. Br., 1810 | *Conocarpus erectus* L. | x |  |  |  | A, LR (lc). | Ár, Arb | D, S | N | x |
| Violaceae Batsch, 1802 | *Corynostylis arborea* (L.)SF Blake |  |  |  | x |  | Tr | T | N | x |
| Amaryllidaceae J. St.-Hil. 1805 | *Crinum americanum* L. |  |  | x |  |  | Hi | T | N | ? |
| Amaryllidaceae J. St.-Hil. 1805 | *Crinum erubescens* Aiton | x | x |  |  |  | Hi | D | N | x |
| Euphorbiaceae Juss., 1789 | *Croton argenteus* L. |  |  |  | x |  | Hi | T | N | x |
| Cucurbitaceae Juss., 1789 | *Cucumis anguria* L. |  |  |  | x |  | Hi | T | Ex | x |
| Apocynaceae Juss., 1789 | *Cynanchum angustifolium* Pers. |  |  | x | x |  | Hi | T | ? | x |
| Poaceae Barnhart, 1895 | *Cynodon dactylon (L.)* Pers*.* |  |  |  | x |  | Hi | T | Ex | x |
| Fabaceae Lindl., 1836 | *Cynometra oaxacana* Brandegee | x | x |  |  |  | Ár, Arb | T | N | x |
| Cyperaceae Juss., 1789 | *Cyperus giganteus* Vahl |  |  | x | x |  | Hi | D | N | x |
| Fabaceae Lindl., 1836 | *Desmodium incanum* (Sw.) DC. |  |  |  | x |  | Hi | T | N | x |
| Fabaceae Lindl., 1836 | *Desmodium scorpiurus* (Sw.) Poir. |  |  |  | x |  | Hi | T | N | x |
| Asteraceae, Bercht. & J. Presl, 1820 | *Eclipta prostrata* (L.) L. |  |  |  | x | LR (lc). | Hi | D | N | x |
| Pontederiaceae Kunth, 1815 | *Eichornia crassipes* (Mart.) Solms |  |  |  | x |  | Hi | D | Ex | x |
| Arecaceae Bercht. & J. Presl, 1820 | *Elaeis guineensis* Jacq. |  | x |  |  | LR (lc). | Ár | T | Ex | x |
| Cyperaceae Juss., 1789 | *Eleocharis geniculata* (L.) Roem. & Schult. |  |  |  | x | LR (lc). | Hi | D | N | x |
| Cyperaceae Juss., 1789 | *Eleocharis palustris* (L.) Roem. & Schult. |  |  |  | x | LR (lc). | Hi | D | N | NCh |
| Fabaceae Lindl., 1836 | *Entada polystachya* (L.) DC. |  | x |  |  |  | Arb, Tr | T | ? | x |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Familia** | **Especie** | **M** | **SI** | **T** | **PI** | **Estatus de protección** | **Forma de vida** | **Hábitat** | **Distribución** | **Registro** |
| Moraceae Gaudich., 1835 | *Ficus maxima* Mill |  | x |  |  |  | Ár, Epí | T | N | x |
| Apocynaceae Juss., 1789 | *Funastrum clausum* (Jacq.) Schltr. |  |  | x | x |  | Hi, Tr | D, T | N | x |
| Malvaceae Juss., 1789 | *Guazuma ulmifolia* Lam. |  | x |  |  |  | Ár, Arb | D, T | N | x |
| Malvaceae Juss., 1789 | *Hampea trilobata* Standl. |  | x |  |  |  | Ár, Arb | T | En | x |
| Boraginaceae Juss., 1789 | *Heliotropium indicum* L |  |  |  | x |  | Hi | D | N | x |
| Pontederiaceae Kunth, 1815 | *Heteranthera limosa* (Sw.) Willd. |  |  |  | x |  | Hi | D | N | x |
| Malvaceae Juss., 1789 | *Hibiscus pernambucensis* Arruda | x |  |  |  |  | Ár, Arb | T | ? | ? |
| Poaceae Barnhart, 1895 | *Hymenachne amplexicaulis* (Rudge) Nees |  |  |  | x |  | Hi | D | N | ? |
| Euphorbiaceae Juss., 1789 | *Hippomane mancinella* Arruda | x |  |  |  |  | Ár | T | N | ? |
| Fabaceae Lindl., 1836 | *Inga laurina* (Sw.) Willd. |  |  | x |  |  | Ár, Arb | T | N | ? |
| Convolvulaceae, Juss. 1789 | *Ipomoea alba* L. |  |  |  | x |  | Hi | T | N | ? |
| Convolvulaceae, Juss. 1789 | *Ipomoea quamoclit* L. |  |  |  | x |  | Hi | T | N | x |
| Malvaceae Juss., 1789 | *Kosteletzkya depressa* (L.) O.J. Blanch., Fryxell & D.M. |  |  |  | x |  | Hi | D | N | x |
| Combretaceae R. Br., 1810 | *Laguncularia racemosa* (L.) C.F. Gaertn. | x | x |  |  | A, LR (lc). | Ár, Arb | D, T, S | N | x |
| Araceae | *Lemna minor* L. |  |  |  | x | LR (lc). | Hi | D | ? | x |
| Onagraceae | *Ludwigia octovalvis* (Jacq.) P.H. Raven |  |  |  | x | LR (lc). | Hi | D, S | N | x |
| Cucurbitaceae Juss., 1789 | *Luffa operculata* (L.) Cogn. |  |  |  | x |  | Hi | T | N | x |
| Malvaceae Juss., 1789 | *Malvaviscus arboreus* Cav. |  | x |  |  |  | Ár, Arb | D, T | N | x |
| Asteraceae, Bercht. & J. Presl, 1820 | *Mikania cordifolia* (L. f.) Willd. |  |  |  | x |  | Hi | T | N | x |
| Asteraceae, Bercht. & J. Presl, 1820 | *Mikania micrantha* Kunth |  |  | x |  |  | Hi | T | N | x |
| Fabaceae Lindl., 1836 | *Mimosa pudica* L. |  |  |  | x | LR (lc). | Hi | T | N | x |
| Fabaceae Lindl., 1836 | *Neptunia oleracea* Lour |  |  |  | x | LR (lc). | Hi | T | N | x |
| Nymphaeaceae | *Nymphaea ampla* (Salisb.) DC. |  |  |  | x |  | Hi | D | N | x |
| Nymphaeaceae | *Nymphaea odorata* Aiton |  |  |  | x | LR (lc). | Hi | D | N | ? |
| Malvaceae Juss., 1789 | *Pachira aquatica* Aubl. | x | x |  |  |  | Ár | D | N | x |
| Poaceae Barnhart, 1895 | *Panicum maximum* Jacq. |  |  |  | x |  | Hi | T | N | ? |
| Poaceae Barnhart, 1895 | *Paspalum conjugatum* P.J. Bergius |  |  |  | x | LR (lc). | Hi | T | N | x |
| Poaceae Barnhart, 1895 | *Paspalum virgatum* L*.* |  |  |  | x |  | Hi | D, T | N | x |
| Passifloraceae Juss. ex Roussel | *Passiflora foetida* L. |  |  | x | x |  | Hi | D, T | N | x |
| Passifloraceae Juss. ex Roussel | *Passiflora sexocellata* Schltdl. |  |  | x |  |  | Hi | T | N | x |
| Sapindaceae Juss., 1789 | *Paullinia pinnata* L. |  | x | x | x |  | Hi, Tr | D, T | N | x |
| Verbenaceae | *Phyla nodiflora* (L.) Greene |  |  |  | x | LR (lc). | Hi | D, T | N | x |
| Phyllanthaceae Martinov | *Phyllanthus elsiae* Urb. |  |  | x | x |  | Ár, Arb | T | N | x |
| Araceae | *Pistia stratiotes* L. |  |  |  | x | LR (lc). | Hi | D | N | x |
| Fabaceae Lindl., 1836 | *Pithecellobium dulce* (Roxb.) Benth. |  |  |  | x |  | Ár, Arb | T | N | x |
| Rhizophoraceae | *Rhizophora mangle* L. | x | x |  |  | A, LR (lc). | Ár | D, T, S | N | x |
| Fabaceae Lindl., 1836 | *Rhynchosia reniformis* DC. |  |  |  | x |  | Hi |  | ? | x |
| Arecaceae Bercht. & J. Presl, 1820 | *Sabal mexicana* Mart. | x | x |  |  |  | Ár | D, T | En | x |
| Aizoaceae Martinov | *Sesuvium maritimum* (Walter) Britton, Sterns & Poggenb. |  |  | x |  |  | Hi | T | N | ? |
| Smilacaceae Vent. | *Smilax lasioneura* Hook. |  |  |  | x |  | Hi | T | N | ? |
| Solanaceae Juss. | *Solanum americanum* Mill. |  |  | x |  |  | Hi | T | N | x |
| Solanaceae Juss. | *Solanum hirtum* Vahl |  |  |  | x |  | Hi |  | ? | ? |
| Solanaceae Juss. | *Solanum incanum* L. |  |  |  | x |  | Hi |  | ? | ? |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Familia** | **Especie** | **M** | **SI** | **T** | **PI** | **Estatus de protección** | **Forma de vida** | **Hábitat** | **Distribución** | **Registro** |
| Solanaceae Juss. | *Solanum myriacanthum* Dunal |  |  |  | x |  | Hi | T | N | x |
| Solanaceae Juss. | *Solanum nigrum* L. |  |  | x |  |  | Hi | T | N | x |
| Boraginaceae Juss., 1789 | *Tabebuia rosea (*Bertol.) DC. |  | x |  |  |  | Hi | T | N | x |
| Typhaceae | *Typha domingensis* Pers. |  |  | x |  | LR (lc). | Hi | D, S | N | x |
| Fabaceae Lindl., 1836 | *Zygia conzattii* (Standl.) Britton & Rose | x | x |  | x |  | Ár, Arb | D, T | N | x |

APÉNDICE 3/ APPENDIX 3





Curvas de acumulación de especies del manglar, selva inundable, tular y pastizal inundable en el SHC.

Accumulation curves species of mangroves, freshwater swamp, freshwater marsh and flooded grassland in the SHC

APÉNDICE 4/ APPENDIX 4

Tabla A

Densidad, densidad relativa, frecuencia, frecuencia relativa, área basal, dominancia relativa y el índice de valor de importancia en el manglar y selva inundable del Sistema de Humedales el Castaño

Table A

Density, relative density, frequency, relative frequency, basal area, relative dominance and importance value index in the mangrove and freshwater swamp of the El Castaño Wetlands System

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Humedales/especies | Densidad  Ind ha-1 | Densidad relativa (%) | Frecuencia | Frecuencia relativa (%) | Área basal  m2ha-1 | Dominancia Relativa  (%) | IVI |
| Manglar |  |  |  |  |  |  |  |
| *Laguncularia racemosa* | 994.40 | 51.11 | 1.00 | 35.21 | 6.47 | 31.59 | 117.91 |
| *Rhizophora mangle* | 684.80 | 35.20 | 0.96 | 33.80 | 9.66 | 47.14 | 116.14 |
| *Avicennia germinans* | 152.00 | 7.81 | 0.32 | 11.27 | 2.92 | 14.26 | 33.34 |
| *Pachira aquatica* | 73.60 | 3.78 | 0.20 | 7.04 | 0.53 | 2.58 | 13.41 |
| *Sabal mexicana* | 6.40 | 0.33 | 0.12 | 4.23 | 0.55 | 2.69 | 7.24 |
| *Zygia conzattii* | 16.80 | 0.86 | 0.12 | 4.23 | 0.09 | 0.44 | 5.53 |
| *Conocarpus erectus* | 16.00 | 0.82 | 0.08 | 2.82 | 0.16 | 0.78 | 4.42 |
| *Cynometra oaxacana* | 1.60 | 0.08 | 0.04 | 1.41 | 0.11 | 0.52 | 2.01 |
| Total | 1945.60 | 100 | 2.84 | 100 | 20.50 | 100 | 300 |
| Selva Inundable |  |  |  |  |  |  |  |
| *Pachira aquatica* | 2974 | 91.34 | 1.00 | 25.64 | 19.91 | 84.23 | 201.21 |
| *Rhizophora mangle* | 100.00 | 3.07 | 0.80 | 20.51 | 2.46 | 10.41 | 34.00 |
| *Zygia conzattii* | 114.00 | 3.50 | 0.80 | 20.51 | 0.25 | 1.08 | 25.09 |
| *Cynometra oaxacana* | 22.00 | 0.68 | 0.40 | 10.26 | 0.23 | 0.96 | 11.89 |
| *Sabal mexicana* | 10.00 | 0.31 | 0.30 | 7.69 | 0.44 | 1.88 | 9.88 |
| *Tabebuia rosea* | 16.00 | 0.49 | 0.30 | 7.69 | 0.04 | 0.19 | 8.37 |
| *Laguncularia racemosa* | 14.00 | 0.43 | 0.10 | 2.56 | 0.26 | 1.09 | 4.08 |
| *Ficus maxina* | 4.00 | 0.12 | 0.10 | 2.56 | 0.02 | 0.08 | 2.76 |
| *Guazuma ulmifolia* | 2.00 | 0.06 | 0.10 | 2.56 | 0.02 | 0.10 | 2.72 |
| Total | 3256 | 100 | 3.90 | 100 | 23.64 | 100 | 300 |

APÉNDICE 4/ APPENDIX 4

Tabla B

Frecuencia, frecuencia relativa, cobertura, cobertura relativa y el índice de valor de importancia en el tular del Sistema de Humedales el Castaño

Table B

Frequency, relative frequency, coverage, relative coverage and the importance value index in freshwater marsh of the El Castaño Wetlands System

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tular** | **Frecuencia** | **Frecuencia relativa (%)** | **Cobertura** | **Cobertura relativa (%)** | **IVI** |
| *Typha domingensis* | 0.9 | 42.45 | 0.43 | 42.66 | 85.12 |
| *Sesuvium maritimum* | 0.2 | 9.43 | 0.1 | 10.33 | 19.76 |
| *Acrostichum aureum* | 0.17 | 8.02 | 0.08 | 8.34 | 16.36 |
| *Cynanchum angustifolium* | 0.15 | 7.08 | 0.05 | 5.1 | 12.17 |
| *Solanum americanum* | 0.18 | 8.49 | 0.03 | 2.75 | 11.24 |
| *Crinum americanum* | 0.15 | 7.08 | 0.03 | 2.75 | 9.83 |
| *Cyperus giganteus* | 0.1 | 4.72 | 0.03 | 2.75 | 7.47 |
| *Funastrum clausum* | 0.1 | 4.72 | 0.03 | 2.75 | 7.47 |
| *Passiflora foetida* | 0.04 | 1.89 | 0.03 | 3.27 | 5.16 |
| *Phyllanthus elsiae* | 0.04 | 1.89 | 0.03 | 2.75 | 4.64 |
| *Mikania micrantha* | 0.03 | 1.42 | 0.03 | 2.75 | 4.17 |
| *Passiflora sexocellata* | 0.02 | 0.94 | 0.03 | 2.75 | 3.7 |
| *Brachiaria decumbens* | 0.01 | 0.47 | 0.03 | 2.75 | 3.23 |
| *Inga laurina* | 0.01 | 0.47 | 0.03 | 2.75 | 3.23 |
| *Paullinia pinnata* | 0.01 | 0.47 | 0.03 | 2.75 | 3.23 |
| *Solanum nigrum* | 0.01 | 0.47 | 0.03 | 2.75 | 3.23 |
| Total | 2.12 | 100 | 1 | 100 | 200 |

APÉNDICE 4/ APPENDIX 4

Tabla C

Frecuencia, frecuencia relativa, cobertura, cobertura relativa y el índice de valor de importancia en el pastizal inundable del Sistema de Humedales el Castaño

Table C

Frequency, relative frequency, coverage, relative coverage and the importance value index in flooded grassland of the El Castaño Wetlands System

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Pastizal Inundable** | **Frecuencia** | **Frecuencia relativa (%)** | **Cobertura** | **Cobertura relativa (%)** | **IVI** |
| *Paspalum conjugatum* | 0.89 | 14.57 | 0.07 | 7.00 | 21.57 |
| *Solanum hirtum* | 0.55 | 9.00 | 0.05 | 4.62 | 13.62 |
| *Brachiaria decumbens* | 0.01 | 0.16 | 0.12 | 12.16 | 12.32 |
| *Phyla nodiflora* | 0.43 | 7.04 | 0.04 | 4.35 | 11.39 |
| *Mimosa pudica* | 0.52 | 8.51 | 0.02 | 2.26 | 10.78 |
| *Ambrosia peruviana* | 0.50 | 8.18 | 0.02 | 1.65 | 9.84 |
| *Cynodon dactylon* | 0.30 | 4.91 | 0.02 | 2.14 | 7.05 |
| *Solanum myriacanthum* | 0.11 | 1.80 | 0.05 | 5.20 | 7.00 |
| *Neptunia oleracea* | 0.11 | 1.80 | 0.04 | 3.84 | 5.64 |
| *Eclipta prostrata* | 0.29 | 4.75 | 0.01 | 0.84 | 5.58 |
| *Eichornia crassipes* | 0.07 | 1.15 | 0.04 | 4.34 | 5.49 |
| *Mikania cordifolia* | 0.01 | 0.16 | 0.05 | 5.21 | 5.37 |
| *Aniseia martinicensis* | 0.23 | 3.76 | 0.01 | 1.47 | 5.23 |
| *Cardiospermum halicacabum* | 0.26 | 4.26 | 0.01 | 0.83 | 5.08 |
| *Kosteletzkya depressa* | 0.13 | 2.13 | 0.02 | 2.47 | 4.60 |
| *Cynanchum angustifolium* | 0.17 | 2.78 | 0.02 | 1.72 | 4.50 |
| *Paspalum virgatum* | 0.07 | 1.15 | 0.03 | 3.15 | 4.30 |
| *Heteranthera limosa* | 0.06 | 0.98 | 0.03 | 2.69 | 3.67 |
| *Croton argenteus* | 0.16 | 2.62 | 0.01 | 0.91 | 3.53 |
| *Hymenachne amplexicaulis* | 0.14 | 2.29 | 0.01 | 1.22 | 3.51 |
| *Ludwigia octovalvis* | 0.13 | 2.13 | 0.01 | 0.77 | 2.90 |
| Resto de las especies | 1.10 | 17.98 | 0.36 | 31.89 | 49.93 |
| Total | 6.11 | 100.00 | 1.00 | 100.00 | 200.00 |