

## APPLICABILITY OF SEED BANK ASSESSMENT METHODS IN WETLANDS: ADVANTAGES AND DISADVANTAGES

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### SUPPLEMENTARY MATERIAL

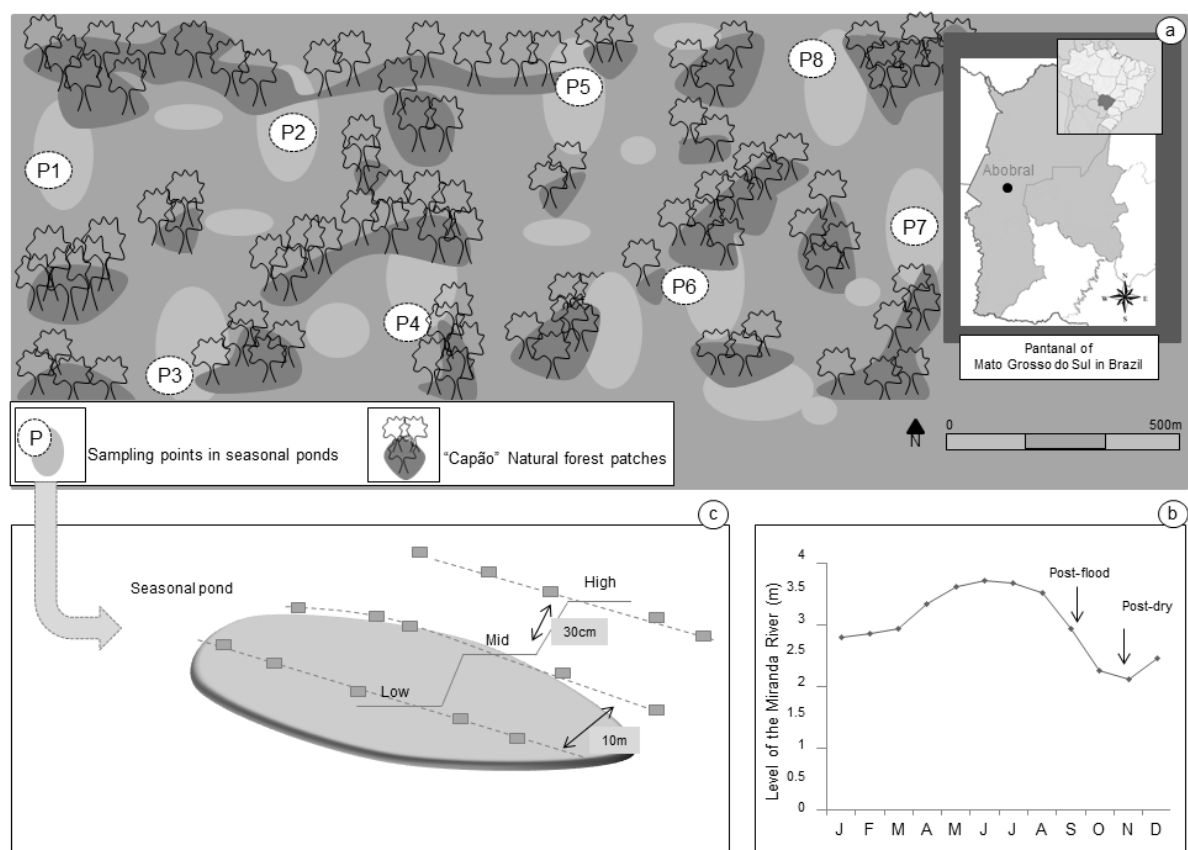
**Table S1.** List of species sampled in the soil seed bank (values of total abundance per specie), classified regarding life cycle (annual - A and perennial plants - P), growth forms (aquatic - Aq, amphibious – Am and terrestrial - T) and, methods (EME, SUB and COU), in the sub-region Abobral in the Pantanal wetland, MS, Brazil.

	Life cycle	Growth forms	EME	SUB	COU
<b>ALISMATACEAE</b>					
<i>Echinodorus grandiflorus</i> Micheli	P	Aq	76	369	-
<i>E. longiscapus</i> Arechav.	P	Aq	11	-	-
<i>Helanthium tenellum</i> (Martius) Britton	P	Aq	129	904	4704
<i>Hydrocleys parviflora</i> Seub.	P	Aq	-	1769	383
<i>Limncharis flava</i> (L.) Buchenau	P	Aq	-	1674	248
<i>Sagittaria guayanensis</i> Kunth	P	Aq	-	2210	127
<b>APIACEAE</b>					
<i>Eryngium ciliatum</i> Cham. & Schltld.	A	T	182	-	-
<b>ASTERACEAE</b>					
<i>Baccharis glandulosa</i> Greenm.	P	Am	15	-	-
<i>Conyza bonariensis</i> (L.) Cronquist	A	T	111	-	-
<i>Erechtites hieraciifolius</i> (L.) Raf. ex DC.	A	T	25	-	-
<i>Gamochoaeta purpurea</i> (L.) Cabrera	A	T	11	-	-
<i>Praxelis clematidea</i> R.M. King & H. Rob.	A	T	456	-	28
<i>Stilpnopappus pantanalensis</i> H. Rob.	A	T	1586	-	1102
<i>Vernonanthura brasiliiana</i> (L.) H. Rob.	P	T	32	-	-
<b>CABOMBACEAE</b>					
<i>Cabomba furcata</i> Schult. & Schult. f.	A	Aq	-	-	51
<b>COMMELINACEAE</b>					
<i>Commelina erecta</i> L.	P	T	-	-	75
<b>CONVOLVULACEAE</b>					
<i>Aniseia martinicensis</i> (Jacq.) Choisy	P	T	906	-	11
<b>CYPERACEAE</b>					
<i>Cyperus compressus</i> L.	P	T	-	-	1036
<i>Cyperus cornelii-ostenii</i> Kük.	P	T	71	-	388

	Life cycle	Growth forms	EME	SUB	COU
<i>C. haspan</i> L.	P	Am	2238	-	2161
<i>C. lanceolatus</i> Poir.	P	T	133	-	-
<i>C. surinamensi</i> Rottb.	A	Am	1675	-	2702
<i>Eleocharis acutangula</i> (Roxb.) Schult.	P	Aq	28	381	4913
<i>E. filiculmis</i> Kunth	P	Aq	-	-	249
<i>E. geniculata</i> (L.) Roem. & Schult.	P	Aq	-	-	22
<i>E. minima</i> Kunth	A	A	3038	1640	641
<i>Fimbristylis</i> Vahl	A	T	224	-	178
<i>Fimbristylis dichotoma</i> (L.) Vahl	A	T	902	-	2259
<i>Killingia brevifolia</i> Rottb.	P	Am	1444	-	-
<i>Lipocarpa micrantha</i> (Vahl) G.C. Tucker	A	T	968	-	20
<i>L. humboldtiana</i> Nees	P	Am	24	-	1101
<i>Scirpus supinus</i> L.	P	Aq	-	1905	3550
<b>EUPHORBIACEAE</b>					
<i>Caperonia castaneifolia</i> (L.) A. St.-Hil.	P	Am	23	-	95
<i>C. palustris</i> (L.) A. St.-Hil.	P	T	4	-	-
<i>Croton glandulosus</i> L.	A	T	3	-	-
<i>C. trinitatis</i> Millsp.	A	T	1208	-	1225
<i>Euphorbia hirta</i> L.	A	T	976	-	800
<i>E. hyssopifolia</i> L.	A	T	27	-	23
<i>Euphorbia thymifolia</i> L.	A	T	1174	-	1680
<i>Microstachys hispida</i> (Mart.) Govaerts	P	T	334	-	389
<b>GENTIACEAE</b>					
<i>Schultesia guianensis</i> (Aubl.) Malme	A	T	5	-	-
<b>HELIOTROPIACEAE</b>					
<i>Euploca filiformis</i> (Lehm.) J.I.M.Melo & Semir	A	T	2435	-	1386
<i>E. procumbens</i> (Mill.) Diane & Hilger	A	T	-	-	179
<i>Heliotropium indicum</i> L.	A	T	21	-	-
<b>HYDROCHARITACEAE</b>					
<i>Najas</i> L.	A	Aq	-	-	24
<b>ISOETACEAE</b>					
<i>Isoetes pedersenii</i> H.P. Fuchs ex Hickey	P	Am	33	504	36280
<b>LAMIACEAE</b>					
<i>Hyptis brevipes</i> Poit.	A	T	3375	-	7092
<i>H. lorentziana</i> O. Hoffm.	A	T	105	-	535
<b>LEGUMINOSAE</b>					
<i>Aeschynomene fluminensis</i> Vell.	P	Am	-	-	6
<i>A. histrix</i> Poir	P	Am	13	-	-
<i>Chamaecrista</i> (L.) Greene	P	T	-	-	471
<i>Crotalaria micans</i> Link	P	T	-	-	310
<i>Mimosa pigra</i> L.	P	T	-	-	13
<i>M. weddeliana</i>	P	T	-	-	12
<i>Senna aculeata</i> (Pohl ex Benth.) H.S. Irwin & Barneby	P	T	13	-	-
<b>LYTHRACEAE</b>					
<i>Rotala ramosior</i> (L.) Koehne	A	Am	5919	4258	1211
<b>MALVACEAE</b>					
<i>Melochia simplex</i> A. St.-Hil.	P	T	337	-	154
<i>Sida cerradoensis</i> Krap.	A	T	32	-	1248
<i>S. rhombifolia</i> L.	P	T	-	-	180
<i>S. viarum</i> A. St.-Hil.	P	T	50	-	70
<i>Turnera melochioides</i> Cambess.	A	T	299	-	153
<b>NYMPHAEACEAE</b>					
<i>Nymphaea amazonum</i> Mart. & Zucc.	P	Aq	-	51	287
<i>N. gardneriana</i> Planch.	P	Aq	-	654	38
<b>OCHNACEAE</b>					
<i>Sauvagesia erecta</i> L.	A	T	32	-	-
<b>ONAGRACEAE</b>					

	Life cycle	Growth forms	EME	SUB	COU
<i>Ludwigia grandiflora</i> (Michx.) Greuter & Burdet	P	Am	81	-	80
<i>L. inclinata</i> (L. f.) M. Gómez	A	Am	53	69	-
<i>L. octovalvis</i> (Jacq.) P.H. Raven	A	Am	5620	-	4485
<b>OPHIOGLOSSACEAE</b>					
<i>Ophioglossum nudicaule</i> L. f.	A	Am	255	-	-
<b>OROBANACEAE</b>					
<i>Agalinis glandulosa</i> (G.M.Barroso) V.C. Souza	A	T	116	-	-
<b>PHYLLANTHACEAE</b>					
<i>Phyllanthus stipulatus</i> (Raf.) G.L. Webster	P	T	-	89	-
<i>P. orbiculatus</i> Rich.	P	T	14	-	10
<b>PLANTAGINACEAE</b>					
<i>Angelonia salicariifolia</i> Bonpl.	P	Am	906	-	89
<i>Bacopa australis</i> V.C. Souza	A	A	1904	2395	173
<i>B. myriophylloides</i> Wettst.	P	A	100	24	-
<i>B. salzmännii</i> (Benth.) Wettst. ex Edwall	P	A	674	87	-
<i>B. stricta</i> (Schrad.) Edwall	A	Am	112	-	-
<i>Scoparia dulcis</i> L.	A	T	280	-	-
<i>S. montevidensis</i> (Spreng.) R.E. Fr.	A	T	2416	-	22
<b>POACEAE</b>					
<i>Axonopus purpusii</i> (Mez) Chase	P	T	555	-	1111
<i>Cynodon dactylon</i> (L.) Pers.	P	T	743	-	-
<i>Digitaria bicornis</i> (Lam.) Roem. & Schult.	P	T	811	-	-
<i>D. ciliaris</i> (Retz.) Koeler	P	T	-	-	99
<i>D. fuscescens</i> (J. Presl) Henrard	P	T	790	-	434
<i>Eragrostis articulata</i> (Schrank) Nees	A	T	39	-	12
<i>E. bahiensis</i> Schrad. ex Schult.	A	T	-	-	15
<i>Hemarthria altissima</i> (Poir.) Stapf & C.E. Hubb.	P	T	11	-	-
<i>Leersia hexandra</i> G.C. Tucker	P	T	-	21	-
<i>Panicum dichotomiflorum</i> Michx.	P	T	-	-	336
<i>Paspalum alnum</i> Chase	P	T	507	-	82
<i>P. plicatulum</i> Michx.	P	T	57	-	519
<i>Pennisetum glaucum</i> (L.) R. Br.	P	T	81	-	-
<i>Reimarochloa acuta</i> (Flüggé) Hitchc.	P	T	239	-	27
<i>Setaria parviflora</i> (Poir.) Kerguelen	A	T	1325	-	1560
<i>Steinchisma laxum</i> (Sw.) Zuloag	A	T	160	-	465
<i>Urochloa humidicola</i> (Rendle) Morrone & Zuloaga	P	T	45	-	801
<b>POLYGALACEAE</b>					
<i>Polygala timoutoides</i> Chodat	A	T	12	-	-
<i>P. leptocaulis</i> Torr. & A. Gray	A	Am	-	-	110
<i>P. molluginifolia</i> A. St.-Hil. & Moq.	A	Am	149	-	96
<b>POLYGOLACEAE</b>					
<i>Polygonum acuminatum</i> Kunth	P	Am	-	-	12
<i>P. punctatum</i> Elliott	P	Am	284	-	34
<b>PONTERIACEAE</b>					
<i>Heteranthera limosa</i> (Sw.) Willd.	P	Aq	-	288	200
<i>Pontederia parviflora</i> Alexander	P	Aq	-	-	105
<i>P. subovata</i> (Seub.) Lowden	P	Aq	330	502	76
<b>PORTULACACEAE</b>					
<i>Portulaca fluvialis</i> D. Legrand	P	T	211	-	-
<i>P. pilosa</i> L.	A	T	196	-	1297
<b>RUBIACEAE</b>					
<i>Borreria eryngioides</i> Cham. & Schltdl.	A	Am	377	-	45
<i>Diodia kuntzei</i> K. Schum.	P	T	1572	-	1038
<i>Richardia grandiflora</i> (Cham. & Schltdl.) Steud.	A	T	6248	-	2714
<i>Spermacoce glabra</i> Michx.	P	T	-	-	31

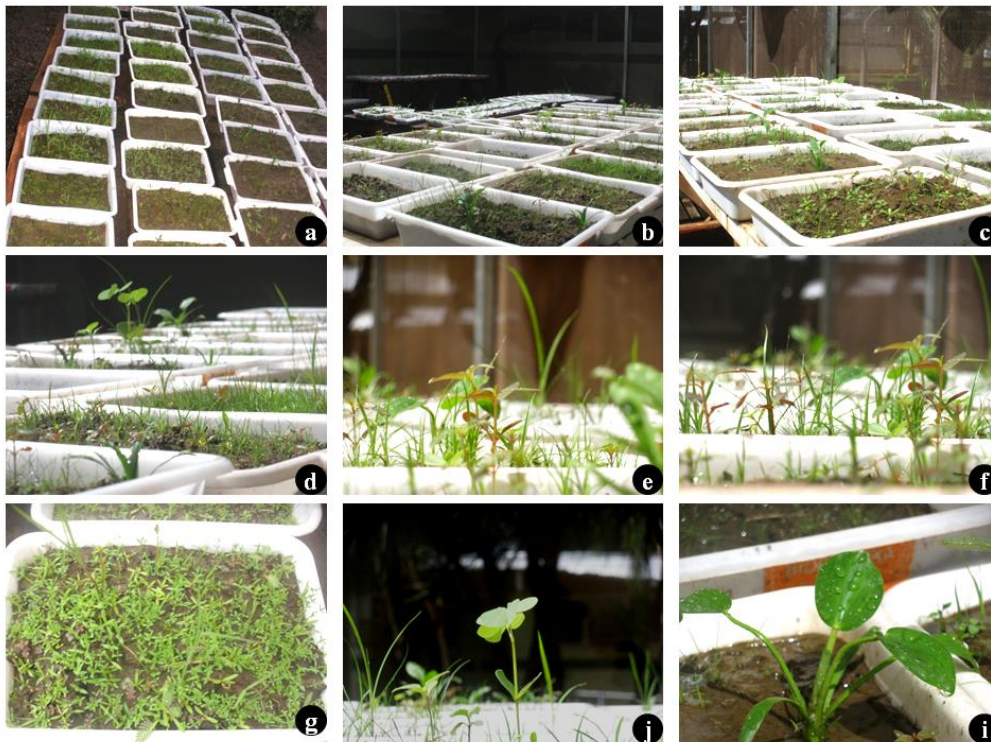
	Life cycle	Growth forms	EME	SUB	COU
<i>Staelia thymoides</i> Cham. & Schlttdl.	A	Am	60	-	-
<b>VERBENACEAE</b>					
<i>Lippia alba</i> (Mill.) N.E. Br. ex Britton & P.			45	-	-
Wilson	P	T			
sp1					122
sp2	-	-	-	-	88
sp3	-	-	-	-	11
sp4	-	-	-	-	83
sp5	-	-	-	-	65
sp6	-	-	-	-	19
sp7	-	-	-	-	19
sp8	-	-	-	-	16
sp9	-	-	-	-	266
sp10	-	-	-	-	80
sp11	-	-	-	-	215
sp12	-	-	-	-	46
sp13	-	-	-	-	114
sp14	-	-	-	-	12
sp15	-	-	-	-	43
sp16	-	-	-	-	41



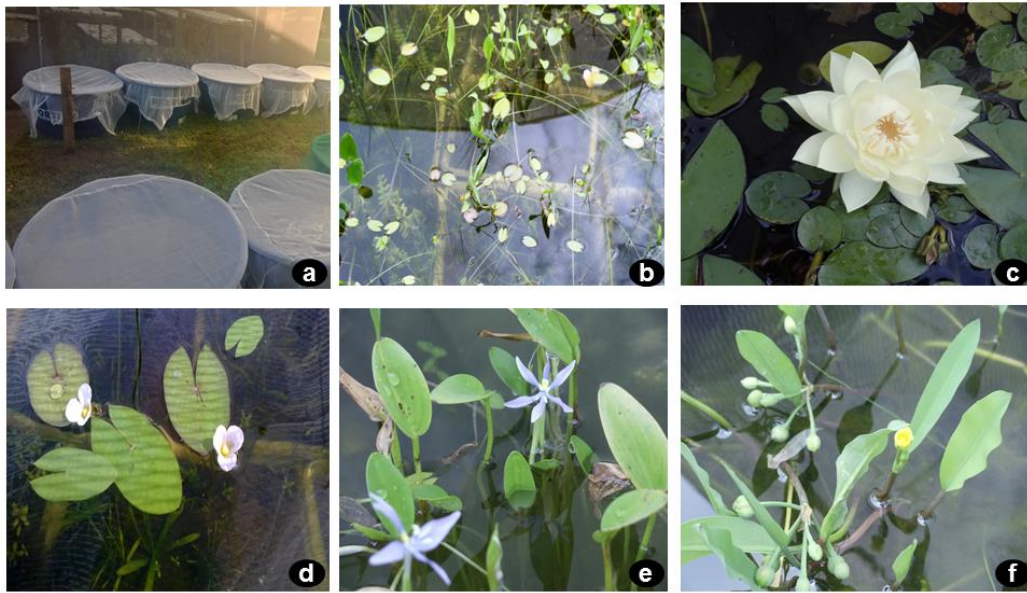
**Figure S1.** Seasonally flooded grassland in the Pantanal wetland (Central-West Brazil). (a) Sampling points including eight seasonal ponds (P1, P2, P3 and P4 in grassland dominated by *Urochloa humidicola*, and P5, P6, P7 and P8 in native grassland), (b) representation of the transects following the topographic levels (low, mid and high) in each sampled pond, with five random samples, (c) mean monthly level of the Miranda River, arrows showing the sampled seasonal periods (post-dry and post-flood), between the years 2005-2015.



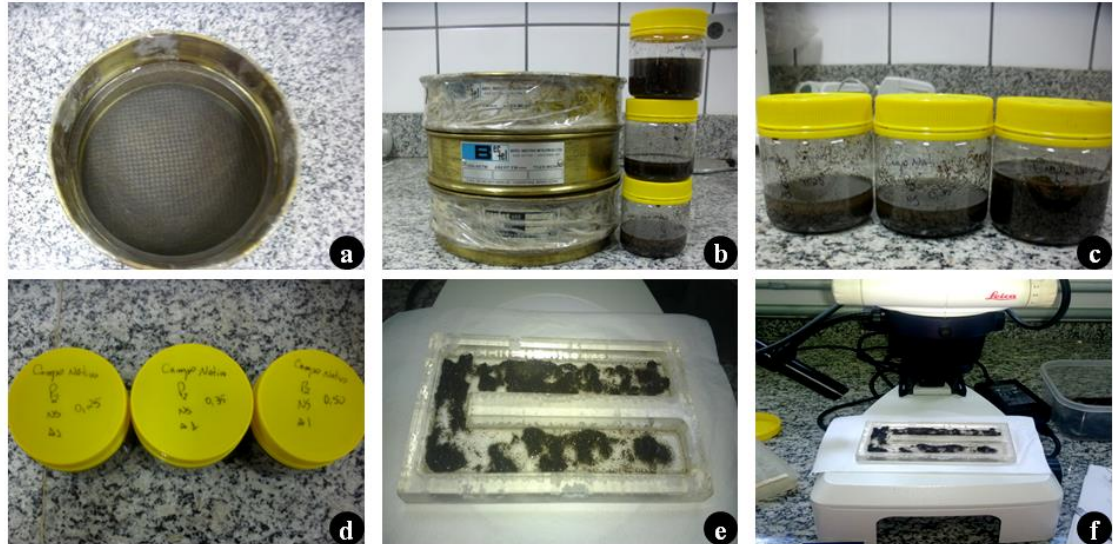
**Figure S2.** Collection process at Fazenda São Bento in the Abobral subregion, Pantanal, MS, Brazil. (a) Sample delimited by 20 x 20 cm, (b) Soil collected with the aid of a shovel, (c) Seed bank soil 3 cm deep, (d) Soil stored in a plastic bag to be transported.



**Figure S3.** Method I: seedling emergence in a greenhouse (EME) (a-g) trays arranged, (h) seedling emergence, (i) Leguminosae seedling and (j) *Pontederia subovata* seedling.



**Figure S4.** Method II: seedling emergence with submersion of 30cm of water (SUB) (a) Tanks containing trays with soil, (b) trays with seedling emergence, (c) *Nymphaea gardneriana* Planch. (d) *Sagittaria guayanensis* Kunth (e) *Heteranthera limosa* (Sw.) Willd. (f) *Limnocharis flava* (L.) Buchenau.



**Figure S5.** Method III: Seed counting (COU) (a), (b) Sieves used for soil washing in mesh sizes 0.50, 0.35 and 0.25 mm. (c), (d) Seeds in pots with 70 % alcohol. (e), (f) Plate used for screening, counting and identification with the aid of a stereoscopic microscope.