Appendix S1. Details of the wetland water balance models including model evaluation

CTF thresholds of the study wetlands (source: Overton, McEwan & Sherrah 2006) were converted into wetland sill levels based on the relationship between river discharge and water levels at the corresponding river gauge, either Corowa or Tocumwal (gauged post-regulation flow data were used). Local daily pan evaporation (Class A), rainfall and estimated evapotranspiration data were provided by the Australian Bureau of Meteorology (SILO 2008). We used the mean of the SILO evapotranspiration estimates (based on vegetated areas using Penman-Monteith's equation, Chiew et al. 1995) and evaporation estimates from open water. Evaporation from open water was estimated by multiplying the pan evaporation by monthly pan coefficients of a nearby shallow lake (Hoy & Stephens 1979). Depths of the study wetlands were estimated from the River Murray floodplain digital elevation model (DEM) in ArcGIS (5 m horizontal resolution where available [12 wetlands], and 10 m horizontal resolution otherwise [12 wetlands]: MDBC 2001). We checked the accuracy of the elevation statistics by comparing the DEM-based data range with the depth range recorded in the field, and by considering the likelihood of inundation based on the wetland CTF levels. We used field data to correct obvious mistakes (Catford 2008).

To evaluate the models, we compared the presence/absence of standing water predicted by the model (post-regulation scenario) to the conditions observed while surveying (a single day per site). Because of the random stratified survey approach we were unable to characterise wetland depths based on field observation with confidence, and therefore did not compare modelled and observed wetland depths. The model correctly predicted absence of standing water in all cases (2/2 wetlands) and the presence of water in 86% of cases (19/22 wetlands; overall accuracy = 87.5%). Errors of this magnitude are common in hydrologic modelling, even when models are calibrated (Döll, Kaspar & Lehner 2003). The three wetlands falsely predicted to be dry had clearly not been connected to the river for several years, so the errors were unlikely to have stemmed from inaccurate CTF estimates or river water levels. Rather, they probably reflected exceptional cases where localised groundwater

seepage or agricultural runoff affected wetland water levels. While most wetlands had substrate with a high fraction of clay (44% mean clay content for 24 wetlands), which can effectively seal wetlands inhibiting groundwater interaction, substrate of one of the three wetlands had 20% clay content (lowest recorded). Groundwater seepage may have caused the flooding in this case.

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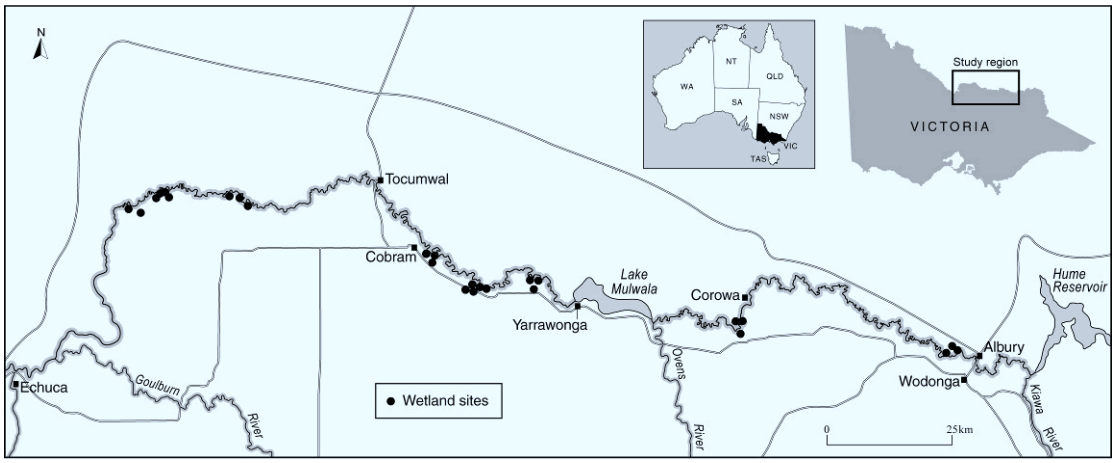

Figure S1. Map of the 24 study wetlands. Map created by Chandra Jayasuriya, The University of Melbourne.

Table S1. Information about all plant taxa observed in the study wetlands, including their prevalence and cover. 157 taxa in total; 127 taxa identified to species-level; 139 taxa identified to genera; 148 taxa identified to family. Status based on Randall (2007): NNW, native non-weed; NW, native weed – native to Australia but naturalized elsewhere; EW, exotic weed species. Flood groups based on Brock and Casanova's (1997) species' responses to flooding scheme with Casanova and Brock (2000) and Reid and Quinn (2004) providing additional information. Clonal, 1 indicates species known to reproduce vegetatively; Plant height refers to the maximum. Prevalence indicates percentage of 24 wetlands where taxon was observed; Mean cover is the mean absolute cover of the taxon as a percentage of a 1 m^2 quadrat across the wetlands. Taxon information from Ross and Walsh (2007), Botanic Gardens Trust (2007), Randall (2007) and Liu et al. (2008).

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Acacia mearnsii	De Wild.	MIMOSACEAE	NW	Tree	P	T		10	3	10	13.2	33.3	0.6
Acaena x *anserovina*	Orchard	ROSACEAE	NNW	Forb	P	T	1	0.4			1.26	4.2	0.0
Alternanthera denticulata	R. Br.	AMARANTHACEAE	NNW	Forb	A	T		0.4	11	10	0.23	66.7	3.0
Amphibromus neesii	Steud.	POACEAE	NNW	Gram.	P	A	1	1.5	7	10		33.3	1.0
Anthoxanthum odaratum	L.	POACEAE	EW	Gram.	P	T		1	6	9	0.53	33.3	0.7
Arenaria serpyllifolia subsp. serpyllifolia	L.	CARYOPHYLLACEAE	EW	Forb	A	T		0.3	6	9	0.07	4.2	0.1
Aster novi-belgii	L.	ASTERACEAE	NNW	Forb	P	T	1	1.4	3	12	0.4	4.2	0.0
Austrodanthonia sp. 1		POACEAE	NNW	Gram.	P	T		1	6	9	0.324	8.3	0.2
Austrodanthonia sp. 2		POACEAE	NNW	Gram.	P	T		1	6	9	0.324	12.5	0.3
Austrodanthonia sp. 3		POACEAE	NNW	Gram.	P	T		1	6	9	0.324	4.2	0.1
Austrodanthonia sp. 4		POACEAE	NNW	Gram.	P	T		1	6	9	0.324	4.2	0.1

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Avena fatua	L.	POACEAE	EW	Gram.	A	T		1.6	3	9	12	4.2	0.3
Avena sativa	L.	POACEAE	EW	Gram.	A	T		1.5	3	9	31.5	4.2	0.1
Azolla filiculoides	Lam.	AZOLLACEAE	NW	Forb		A	1	0.01				50.0	1.8
Azolla pinnata	R. Br.	AZOLLACEAE	NW	Forb		A	1	0.01				62.5	3.2
Briza minor	L.	POACEAE	EW	Gram.	A	T		0.6			0.32	8.3	0.1
Calystegia sepium	(L.) R. Br.	CONVOLVULACEAE	NNW	Forb	P	T		4	3	12	25.58	4.2	0.1
Carex gaudichaudiana	Kunth.	CYPERACEAE	NNW	Gram.	P	A	1	0.9	6	9	0.93	45.8	2.0
Carex inversa	R. Br.	CYPERACEAE	NW	Gram.	P	T	1	0.5	6	9	0.37	12.5	0.2
Carex tereticaulis	F. Muell.	CYPERACEAE	NNW	Gram.	P	A	1	1.2	6	9	1.46	37.5	3.6
Centella cordifolia	(Hook. f.) Nannf.	APIACEAE	NNW	Forb	P	T	1	0.15	4	2		8.3	0.5
Centipeda cunninghamii	(DC.) A.Br. & Asch.	ASTERACEAE	NW	Forb	P	A		0.2	7	10	0.05	37.5	1.6
Cirsium vulgare	(Savi) Ten.	ASTERACEAE	EW	Forb	B	T		1.5	4	11	2.9	37.5	0.7
Conyza bonariensis	(L.) Cronquist	ASTERACEAE	EW	Forb	A	T		1	12		0.1	4.2	0.0
Conyza sumatrensis	(Retz.) E. Walker	ASTERACEAE	EW	Forb	A	T		2	9	12	0.04	25.0	0.9
Couch 1		POACEAE		Gram.								4.2	0.5
Couch 2		POACEAE		Gram.								4.2	0.1
Cuscuta campestris	Yunck.	CUSCUTACEAE	EW	Forb	A	T		0.5	4	12	0.84	4.2	0.1
Cynodon dactylon	(L.) Pers.	POACEAE	EW	Gram.	P	T	1	0.3	3	12	0.2	45.8	2.5
Cynosurus echinatus	L.	POACEAE	EW	Gram.	A	T		1	3	9	1.46	16.7	0.3

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Cyperus eragrostis	Lam.	CYPERACEAE	EW	Gram.	P	A	1	0.9	6	9	0.13	83.3	2.3
Cyperus exaltatus	Retz.	CYPERACEAE	NNW	Gram.	P	A	1	1.8	6	9	0.07	4.2	0.1
Cyperus gunnii	Hook. f.	CYPERACEAE	NNW	Gram.	P	A	1	1.5	6	9	0.19	8.3	0.1
Cyperus sp. 1		CYPERACEAE		Gram.	P	T						25.0	0.6
Daisy sp. 1		ASTERACEAE		Forb								12.5	0.2
Daisy sp. 2		ASTERACEAE		Forb								4.2	0.1
Daisy sp. 3		ASTERACEAE		Forb								12.5	0.3
Dichondra repens	J.R. & G. Forst.	CONVOLVULACEAE	NNW	Forb	P	T	1	0.1	8	8		37.5	0.8
Dicot seedling 1						T						8.3	0.1
Dicot sp. 1						T						29.2	0.4
Dicot sp. 2												4.2	0.0
Echium plantagineum	L.	BORAGINACEAE	EW	Forb	A	T		1.2	4	9	4.2	4.2	0.0
Eclipta platyglossa	Muell.	ASTERACEAE	NW	Forb	BA	T	1	0.25	9	9		25.0	0.5
Elatine gratioloides	A. Cunn.	ELATINACEAE	NNW	Forb	A	A	1	0.015	12		0.05	8.3	0.1
Eleocharis acuta	R. Br.	CYPERACEAE	NNW	Gram.	P	A	1	0.6	6	9	0.56	66.7	6.4
Eleocharis atricha	R. Br.	CYPERACEAE	NNW	Gram.	P	A	1	0.4	6	9		8.3	0.3
Elymus scaber var. *scaber*	(R. Br.) A. Love	POACEAE	NNW	Gram.	P	T		1.1	7	8		25.0	1.6
Epilobium hirtigerum	A. Cunn.	ONAGRACEAE	NNW	Forb	P	T	1	1.2	6	9	0.07	4.2	0.1
Eragrostis sp. 1		POACEAE		Gram.		T						12.5	0.2
Eragrostis sp. 2		POACEAE		Gram.								4.2	0.1

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Eucalyptus camaldulensis	Dehnh.	MYRTACEAE	NW	Tree	P	T		30			2.4	66.7	1.5
Euchiton sphaericus	(Willd.) A. Anderb.	ASTERACEAE	NW	Forb	A	T		0.5	12			8.3	0.0
Eulalia aurea	(Bory) Kunth	POACEAE	NNW	Gram.	P	T	1	1	10	1	0.25	8.3	0.1
Ferny grass		POACEAE		Gram.		T						8.3	0.2
Galium aparine	L.	RUBIACEAE	EW	Forb	A	T		1.5	6	8	8.9	8.3	0.1
Grass sp. 1		POACEAE		Gram.		T						8.3	0.4
Grass sp. 2		POACEAE		Gram.								8.3	0.2
Gratiola peruviana	L.	SCROPHULARIACEAE	NNW	Forb	P	A		0.3	6	9	0.02	12.5	0.4
Gratiola pubescens	R. Br.	SCROPHULARIACEAE	NNW	Forb	P	A		0.2	6	10	0.01	4.2	0.0
Hemarthria uncinata var. *uncinata*	R. Br.	POACEAE	NNW	Gram.	P	T		1	3	12		4.2	0.0
Hydrocotyle sibthorpioides	Lam.	APIACEAE	NW	Forb	P	A	1	0.1	10			16.7	0.6
Hypochaeris glabra	L.	ASTERACEAE	EW	Forb	A	T		0.4	9	9	0.69	29.2	1.1
Hypochaeris radicata	L.	ASTERACEAE	EW	Forb	A	T		0.8	9	9	0.8	54.2	1.4
Isotoma fluviatalis subsp. *australis*	(R. Br.) F. Muell. ex Benth.	CAMPANULACEAE	NNW	Forb	P	A	1	0.05	4	11	0.04	20.8	0.8
Juncus acuminatus	Mich.	JUNCACEAE	EW	Gram.	P	T	1	0.6	6	9	0.04	4.2	0.2
Juncus aridicola	L.A.S. Johnson	JUNCACEAE	NW	Gram.	P	T	1	1.15	6	9		12.5	0.8

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Juncus flavidus	L.A.S. Johnson	JUNCACEAE	NNW	Gram.	P	T	1	0.9	6	9		4.2	0.1
Juncus fockei	Buchenau	JUNCACEAE		Gram.	P		1	0.45	6	9	0.01	4.2	0.1
Juncus gregiflorus	L.A.S. Johnson	JUNCACEAE	NNW	Gram.	P	T	1	3	6	9		37.5	1.7
Juncus holoschoenus	R. Br.	JUNCACEAE	NNW	Gram.	P	T	1	0.75	6	9	0.04	12.5	0.2
Juncus ingens	N.A. Wakef.	JUNCACEAE	NNW	Gram.	P	A	1	4	6	9		66.7	10.7
Juncus sp. 1		JUNCACEAE	NNW	Gram.	P	T	1		6	9		12.5	1.1
Juncus subsecundus	N.A. Wakef.	JUNCACEAE	NW	Gram.	P	T	1	0.7	6	9	0.01	45.8	2.0
Juncus usitatus	L.A.S. Johnson	JUNCACEAE	NW	Gram.	P	T	1	1.1	6	9	0.01	12.5	1.1
Lachnagrostis filiformis	J.F. Gmel.	POACEAE	NNW	Gram.	PA	A		0.7	6	9	0.14	66.7	3.3
Lactuca saligna	L.	ASTERACEAE	EW	Forb	BA	T		1	6	10	0.57	4.2	0.1
Lactuca serriola	L.	ASTERACEAE	EW	Forb	B	T		2	8	9	0.58	25.0	0.8
Lemna disperma	Hegelm.	LEMNACEAE	NNW	Forb		A	1		1	5		29.2	0.4
Lobelia concolor	R. Br.	CAMPANULACEAE	NNW	Forb	P	T		1.14				4.2	0.1
Lolium perenne	L.	POACEAE	EW	Gram.	BA	T		0.8	3	9	2	25.0	2.1
Lotus angustissimus	L.	FABACEAE	EW	Forb	PA	T		0.4	2	11	0.41	4.2	0.1
Lotus uliginosus	Schkuhr	FABACEAE	EW	Forb	P	T	1	0.8			1	4.2	0.0
Ludwigia palustris	(L.) Elliott	ONAGRACEAE	EW	Forb	P	A	1	0.2	6	12	0.04	37.5	0.9

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Ludwigia peploides subsp. *montevidensis*	(Spreng.) P.H. Raven	ONAGRACEAE	EW	Forb	P	A	1	0.1	6	12	102.35	62.5	2.1
Lycopus australis	R. Br.	LAMIACEAE	NNW	Forb	P	T	1	1.5	5	12	0.49	4.2	0.0
Lythrum hyssopifolia	L.	LYTHRACEAE	NW	Forb	A	T		0.5	6	9	0.5	25.0	0.4
Marsilea drummondii	A. Braun	MARSILEACEAE	NNW	Forb		A	1					4.2	0.1
Mentha pulegium	L.	LAMIACEAE	EW	Forb	P	T	1	0.4	10	9	0.1	12.5	0.1
Mentha sp. 1		LAMIACEAE	NNW	Forb		T						4.2	0.0
Microlaena stipoides var. *stipoides*	(Labill.) R. Br.	POACEAE	NNW	Gram.	P	T	1	0.7	12		4.97	4.2	0.0
Mollugo verticillata	L.	MOLLUGINACEAE	NW	Forb	A	T		0.3	4	12	0.09	4.2	0.1
Myriophyllum crispatum	Orchard	HALORAGACEAE	NW	Forb	P	A	1	0.1	5	10		66.7	7.7
Myriophyllum papillosum	Orchard	HALORAGACEAE	NNW	Forb	P	A	1	0.1	5	10		37.5	3.4
Nymphoides crenata	(F. Muell.) Kuntze	MENYANTHACEAE	NNW	Forb	P	A	1	2	9	9		16.7	0.3
Oplismenus aemulus	(R.Br.) Roem. & Schult.	POACEAE	NNW	Gram.	P	T		0.3	12			4.2	0.2
Ottelia ovalifolia subsp. *ovalifolia*	(R. Br.) Rich.	HYDROCHARITACEAE	NNW	Forb	PA	A		1	5	11	0.22	16.7	0.2
Paspalum dilatatum	L.	POACEAE	EW	Gram.	P	T		2	9	9	1.5	29.2	1.0
Paspalum distichum	L.	POACEAE	NW	Gram.	P	A	1	0.5	3	12		58.3	4.0

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Persicaria decipiens	(R. Br.) K.L. Wilson	POLYGONACEAE	NNW	Forb	P	A	1	1	7	11	1.07	33.3	1.3
Persicaria filiformis	(Thunb. Ex Murray) Nakai & W.T.Lee	POLYGONACEAE	EW	Forb	P	T	1	1.2			2.08	8.3	0.5
Persicaria hydropiper	(L.) Spach	POLYGONACEAE	EW	Forb	P	A	1	1.5	5	12	2.032	29.2	0.9
Persicaria lapathifolia	(L.) Gray	POLYGONACEAE		Forb	P		1	1.8	10	8	1.54	4.2	0.3
Persicaria praetermissa	(Hook. f.) H. Hara	POLYGONACEAE	NNW	Forb	P	T		1	7	12		16.7	1.1
Persicaria prostrata	(R. Br.) Sojak	POLYGONACEAE	NNW	Forb	P	A	1	0.1	7		1.2	58.3	2.2
Phalaris aquatica	L.	POACEAE	EW	Gram.	P	T	1	1.5	3	9	1.66	4.2	0.2
Phalaris minor	Retz.	POACEAE	EW	Gram.	A	T		1.8	3	9	1.71	4.2	0.1
Phragmites australis	(Cav.) Trin. ex Steud.	POACEAE	NW	Gram.	P	A	1	6	3	9	0.11	29.2	2.9
Plantago lanceolata	L.	PLANTAGINACEAE	EW	Forb	BA	T		0.2	8	9	1.3	8.3	0.2
Poa labillardierei var. *labillardierei*	Steud.	POACEAE	NNW	Gram.	P	T		1.2	11		0.3	25.0	1.5
Polygonum aviculare	L.	POLYGONACEAE	EW	Forb	PA	T	1	0.1	8	10	1.3	16.7	0.2
Polypogon monspieliensis	(L.) Desf.	POACEAE	EW	Gram.	A	T		0.8	3	9	0.1	4.2	0.1
Potamogeton sulcaltus	A. Benn.	POTAMOGETONACEAE	NNW	Forb	P	A	1	4	9	9	1.94	4.2	0.1

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Prunus cerasifera cv. *atropurpea*	Ehrh.	ROSACEAE	EW	Tree	P	T		8	3	9	430	4.2	0.1
Pseudognaphalium luteoalbum	(L.) Hilliard & B.L. Burtt	ASTERACEAE	NNW	Forb	A	T		0.45	4	9	0.1	8.3	0.4
Pseudoraphis spinescens	(R. Br.) Vickery	POACEAE	NNW	Gram.	P	A	1	10	3	12		62.5	7.9
Ranunculus inundatus	R. Br. ex DC.	RANUNCULACEAE	NNW	Forb	P	A		0.3	6	9		20.8	0.7
Ranunculus sceleratus subsp. sceleratus	L.	RANUNCULACEAE	EW	Forb	A	T		0.6	4	11	0.2	4.2	0.1
Ricciocarpus natans	L.	RICCIACEAE	NNW	Forb		A						20.8	0.8
Rorippa palustris	(L.) Besser	BRASSICACEAE	EW	Forb	BA	T	1	1			0.07	20.8	0.5
Rubus fruticosus agg.	L.	ROSACEAE	EW	Tree	P	T	1	2	4	11	2.89	8.3	0.2
Rumex brownii	Campd.	POLYGONACEAE	NW	Forb	P	T		0.8	5	10	1.5	16.7	0.3
Rumex conglomeratus	Murray	POLYGONACEAE	EW	Forb	P	T		1.5	5	10	1.5	8.3	0.1
Rumex crispus	L.	POLYGONACEAE	EW	Forb	P	T		1.5	7	6	1.5	12.5	0.4
Rumex pulcher subsp. pulcher	L.	POLYGONACEAE	EW	Forb	P	T		0.6	4	9	2.1	12.5	0.1
Rumex sp. 1		POLYGONACEAE	NNW	Forb	P	T					1.2	4.2	0.1
Rumex sp. 2		POLYGONACEAE	NNW	Forb	P	T					1.2	4.2	0.1
Sagittaria platyphylla	(Engelm.) J.G. Sm.	ALISMATACEAE	EW	Forb	P	A	1	1	5	11		12.5	0.7
Salix x *rubens*	Schrank	SALICACEAE	EW	Tree	P	T		16				4.2	0.3

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Senecio quadridentatus	Labill.	ASTERACEAE	NNW	Forb	P	T		1	4	9	0.173	16.7	0.4
Solanum physalifolium var. *nitidibaccatum*	Rusby (Bitter) Edmonds	SOLANACEAE	EW	Forb	A	T		0.5	4	11		4.2	0.1
Spear sorrel		POLYGONACEAE		Forb	A	T						4.2	0.0
Spergularia rubra	(L.) J. Presl & C. Presl.	CARYOPHYLLACEAE	EW	Forb	BA	T		0.3	3	9	0.07	8.3	0.1
Spirodela punctata	(G. Mey.) C.H. Thomps.	LEMNACEAE	NW	Forb		A			6	9		8.3	0.9
Stellaria angustifolia	Hook.	CARYOPHYLLACEAE	NNW	Forb	P	A		0.05	4	9		29.2	1.9
Stellaria caespitosa	Hook. f.	CARYOPHYLLACEAE	NNW	Forb	A	T		0.15				4.2	0.4
Stellaria sp. 1		CARYOPHYLLACEAE	NNW	Forb		T		0.1				16.7	0.8
Trifolium angustifolium var. *Angustifolium*	L.	FABACEAE	EW	Forb	A	T		0.6	4	9	1.9	8.3	0.1
Trifolium arvense var. *arvense*	L.	FABACEAE	EW	Forb	A	T		0.4	7	6	0.4	8.3	0.1
Trifolium campestre	Schreb.	FABACEAE	EW	Forb	A	T		0.5	7	7	0.3	8.3	0.2
Trifolium glomeratum	L.	FABACEAE	EW	Forb	A	T		0.35	5	8	0.4	4.2	0.1
Trifolium repens var. *repens*	L.	FABACEAE	EW	Forb	A	T		0.3	5	7	0.6	4.2	0.3
Trifolium striatum	L.	FABACEAE	EW	Forb	A	T		0.3	5	10	1.9	4.2	0.0
Triglochin dubia	R. Br.	JUNCAGINACEAE	NNW	Gram.	P	A	1	0.75	5	11		16.7	0.7
Triglochin procera	R. Br.	JUNCAGINACEAE	NNW	Gram.	P	A	1	2	5	11	25.01	58.3	1.3

Taxa	Author	Family	Status	Growth form	Life history	Flood group	Clonal	Plant height (m)	Time in flower (months)	Start of flowering (month)	Seed mass (g)	Prevalence (%)	Mean cover (%)
Triticum aestivum	L.	POACEAE	EW	Gram.	A	T		1	3	9	35.96	8.3	0.1
Typha orientalis	C. Presl	TYPHACEAE	NW	Gram.	P	A	1	4	5	11	0.2	12.5	0.9
Verbena bonariensis	L.	VERBENACEAE	EW	Forb	P	T		2	4	10	0.17	25.0	0.4
Vicia hirsuta	(L.) Gray	FABACEAE	EW	Forb	A	T		0.8	3	9	5.7	4.2	0.0
Vicia monantha subsp. *triflora*	(Ten.) B.L. Burtt & P. Lewis	FABACEAE	EW	Forb	A	T		0.8	6	6	38	8.3	0.1
Vicia sativa subsp. *nigra*	(L.) Ehrh.	FABACEAE	EW	Forb	A	T		1	6	6	17.3	8.3	0.1
Wahlenbergia fluminalis	(J.M. Black) E. Wimm. ex H. Eichler	CAMPANULACEAE	NNW	Forb	P	T		0.8	12		0.01	8.3	0.0
Unknown sp. 1												4.2	0.1
Unknown sp. 2												4.2	0.2
Unknown sp. 3												4.2	0.1
Unknown sp. 4												41.7	1.4
Unknown sp. 5												8.3	0.1

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Table S2. Classification details, foliar cover and prevalence of the 10 species analysed (the most abundant and prevalent taxa in survey). †Origin & weed status based on Randall (2007); ^Information from Botanic Gardens Trust (2007); sizes of plants observed were within the bounds reported here, but did not always reach the maximum. #Species classification based on Brock & Casanova (1997) and Reid & Quinn (2004).

Species†	Family^	Flood response group#	Growth form	Life history^	Height (m)^	Mean cover (%)	Maximum cover (%)	Wetland presence (%)	Transform-ation
Native non-weeds									
Alternanthera denticulata R. Br.	Amaranthaceae	Terrestrial	Forb	Annual	0.1-0.4	4.5	22.5	66.7	Log_{10}
Eleocharis acuta R. Br.	Cyperaceae	Amphibious	Gram.	Perennial	0.1-0.6	8.9	28.9	66.7	Sq-root
Juncus ingens N.A. Wakef.	Juncaceae	Amphibious	Gram.	Perennial	1.2-4.0	17.9	76.8	66.7	Sq-root
Pseudoraphis spinescens (R. Br.) Vickery	Poaceae	Amphibious	Gram.	Perennial	0.4-1.0	11.5	48.3	62.5	Log_{10}
Native weeds									
Myriophyllum crispatum Orchard	Haloragaceae	Amphibious	Forb	Perennial	0.25-0.6	19.1	68.2	66.7	Sq-root
Paspalum distichum L.	Poaceae	Amphibious	Gram.	Perennial	0.4-0.7	16.3	58.5	58.3	Log_{10}
Exotic weeds									
Cynodon dactylon (L.) Pers.	Poaceae	Terrestrial	Gram.	Perennial	0.1-0.3	8.4	57.6	45.8	Log_{10}
Cyperus eragrostis Lam.	Cyperaceae	Amphibious	Gram.	Perennial	0.25-0.9	15.4	50.2	83.3	Sq-root
Hypochaeris radicata L.	Asteraceae	Terrestrial	Forb	Annual	0.15-0.8	5.1	18.4	54.2	Log_{10}
Ludwigia peploides subsp. *montevidensis* (Spreng.) P.H. Raven	Onagraceae	Amphibious	Forb	Perennial	Prostrate	8.6	26.1	62.5	Log_{10}

Table S3. Descriptive statistics of eight flood regime variables under pre-regulation and post-regulation conditions, and percentage change in values from pre- to post-regulation conditions. Data were not transformed. Units for pre- and post-regulation conditions in square brackets in first column; SE, standard error of mean; Med., median; *Sites decr., % of sites where variable values decreased with river regulation; #Sites incr., % of sites where variable values increased; Trend, overall direction of change (– decrease, + increase, 0 no change); Vvariables that indicated variability flood parameter; ^only 11 sites experienced drawdown under pre-regulation conditions, whereas 18 did in post-regulation conditions: changes in timing are based on 11 wetlands only.

Flood parameter and explanatory variables	Pre-regulation				Post-regulation				Change associated with river regulation [%]						
	Mean	SE	Med.	Range	Mean	SE	Med.	Range	Mean	SE	Med.	Range	Sites decr.*	Sites incr.#	Trend
Depth max. [m]	5.7	0.4	5.2	9.8	5.6	0.4	5.1	9.8	-2.6	0.4	-1.8	8.1	100	0	–
Depth SE [m]V	0.01	0.00	0.01	0.02	0.01	0.00	0.01	0.02	24.7	7.9	15.0	132.8	21	79	+
Total time flooded [%]	98.0	1.3	100	30.9	93.0	2.1	96.7	43.1	-5.3	1.3	-3.3	18.1	67	0	–
Flood duration med. [days]	79.3	8.4	100	100	33.6	9.8	0.6	100	-57.4	9.4	-75.5	99.9	67	0	–
Connect. duration max. [days]	73.7	18.0	57.5	431.0	53.5	14.6	36.0	352.0	-28.7	2.3	-32.4	44.1	96	0	–
Connect. duration med. [days]	9.5	0.9	8.0	22.0	21.3	12.3	8.8	298.0	48.6	41.2	3.1	1028.5	29	50	+
Drawdown start [month]^	1.6	0.5	Mar	Dec-Apr	3.5	0.8	Apr	Jan-Dec	-3.8	8.4	8.3	91.7	27	55	+
Flood time med. [month]	7.0	0.0	Jul	Jul	6.9	0.1	Jul	Jun-Jul	-1.4	1.0	0.0	16.7	8	0	–

Table S4. Results of best subsets multiple linear regressions for the proportional cover of exotic/native groups and absolute cover of 10 species using 8 hydrological change variables. All models met analytical assumptions apart from multicollinearity when interactions were included; results of overall additive regressions (i.e. without interactions) are reported; 3 variables selected for each model (degrees of freedom: 3, 20); Adj. r^2, adjusted r^2; X indicates inclusion of variable in model; ‡native non-weed; ¶native weed; §exotic weed; exclusion of outliers did not change overall significance of models; see Table 1 for transformations.

Response variables	Depth max.	Depth SE	Total time flooded	Flood duration med.	Connection duration max.	Connection duration med.	Drawdown start	Flood time med.	*F*-ratio	*P*	Adj. r^2	Mallow's C_p
All natives	X	X					X		8.37	0.001	0.490	4.6
T native non-weeds				X		X		X	2.56	0.087	0.182	2.1
A native non-weeds	X			X			X		12.62	<0.001	0.624	0
T native weeds				X	X		X		1.18	0.347	0.036	-0.3
A native weeds	X	X			X				3.70	0.031	0.278	1.5
All exotics	X			X		X			5.56	0.006	0.373	1.5
T exotic weeds	X					X		X	5.71	0.006	0.402	0.3
A exotic weeds	X		X	X					4.45	0.017	0.330	5.2

Response variables	Depth max.	Depth SE	Total time flooded	Flood duration med.	Connection duration max.	Connection duration med.	Drawdown start	Flood time med.	*F*-ratio	*P*	Adj. r^2	Mallow's C_p
A. denticulata‡		X	X				X		6.25	0.004	0.429	2.5
E. acuta‡	X					X		X	4.42	0.017	0.328	2.0
J. ingens‡	X			X				X	4.06	0.023	0.304	1.0
P. spinescens‡	X						X	X	4.59	0.015	0.339	2.0
M. crispatum¶	X	X				X			2.89	0.064	0.213	0.2
P. distichum¶	X		X				X		2.99	0.058	0.221	0.0
C. dactylon§	X		X			X			2.21	0.123	0.147	0.9
C. eragrostis§		X		X		X			3.14	0.051	0.234	3.4
H. radicata§				X	X	X			1.27	0.316	0.036	-0.6
L. peploides§			X	X			X		1.49	0.251	0.066	2.9