

Herbivore regulation of plant abundance in aquatic ecosystems

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Supporting Information

Appendix S1: Data extracted from all suitable studies in our meta-analysis. *C* = change in plant abundance (%); *T* = herbivore taxa; *D* = herbivore density (g m^{-2}); *N* = nativeness of the herbivore and plant assemblages (NN = native herbivores and native plants, IN = invasive herbivores and native plants, MN = mixed herbivores and native plants, II = invasive herbivores and invasive plants, IM = invasive herbivores and mixed plants, MI = mixed herbivores and invasive plants, MM = mixed herbivores and mixed plants, NM = native herbivores and mixed plants, NI = native herbivores and invasive plants); *G* = stage of the plant annual growth cycle for field studies (or 'transplant' for transplant experiments and laboratory studies); *H* = habitat type; *R* = herbivore species richness; *P* = plant species richness; *L* = latitude ($^{\circ}$ from equator); *E* = size of experimental area such as enclosure or enclosure (m^2); *S* = length of study (days).

<i>T</i>	<i>D</i>	<i>N</i>	<i>G</i>	<i>H</i>	<i>R</i>	<i>P</i>	<i>L</i>	<i>E</i>	<i>S</i>	<i>C</i>	Study
Bird	1.25	NN	Winter	Estuary	1	1	53.083	10000.00	61	-75.1	Verhoeven (1980)
Bird	0.32	NM	Peak	Lake	1	12	52.695	1.00	130	-23.2	Perrow <i>et al.</i> (1997)
Bird	0.20	NN	Peak	Wetland	1	6	73.267	1.00	44	-28.2	Massé, Rochefort & Gauthier (2001)
Bird	0.35	NN	Peak	Lake	8	4	55.533	20.00	92	0.0	Marklund <i>et al.</i> (2002)
Bird	0.52	IN	Winter	Estuary	1	1	40.667	9.00	180	-57.0	Dixon (2009)
Bird	1.10	NN	Winter	Wetland	1	1	29.427	4.00	135	-51.8	Smith, Vernes & Ford (2012)
Bird	3.30	NN	Peak	Wetland	1	1	38.470	1.00	150	-80.4	Haramis & Kearns (2007)

Bird	0.85	NN	Peak	Lake	5	3	53.220	36.00	184	-59.6	Hidding <i>et al.</i> (2010)
Bird	0.03	NN	Winter	Estuary	3	1	28.628	1.00	31	-24.3	Hartke <i>et al.</i> (2009)
Bird	1.02	NN	Winter	Lake	20	5	35.499	5.00	365	-72.2	Froelich & Lodge (2000)
Bird	0.22	NN	Winter	Lake	5	1	43.867	25.00	45	-40.0	Korschgen, George & Green (1988)
Bird	0.52	NN	Transplant	Lake	2	3	55.983	100.00	50	-61.0	Søndergaard <i>et al.</i> (1996)
Bird	0.78	NN	Peak	Lake	17	3	55.862	4.00	62	-39.1	Marklund & Sandsten (2002)
Bird	0.23	NN	Peak	Estuary	9	1	37.678	4.00	31	7.8	Bortolus, Iribarne & Martínez (1998)
Bird	1.33	NN	Peak	Lake	4	5	42.606	4.00	90	-36.7	Rodríguez-Villafañe, Bécares & Fernández-Aláez (2007)
Bird	0.23	NN	Peak	Estuary	8	1	37.029	9.00	92	-29.0	Rodríguez-Pérez & Green (2006)
Bird	1.60	NN	Transplant	Lake	1	1	56.022	0.16	107	-62.4	Lauridsen, Jeppesen & Andersen (1993)
Bird	0.06	MN	Growth	Lake	18	2	56.200	2.00	122	-24.8	Jupp & Spence (1977) ^a
Bird	1.21	NN	Peak	Lake	5	10	56.00	2000.00	210	-43.0	Kiørbe (1980)
Bird	2.05	NN	Growth	Lake	5	1	39.470	4.00	92	-63.1	Sandsten, Beklioglu & Ince (2005)
Bird	0.73	NM	Peak	Wetland	1	5	39.410	1.50	256	-62.7	Corti & Schlatter (2002)
Bird	1.75	IN	Peak	Estuary	1	5	41.290	6.00	146 0	-61.7	Allin & Husband (2003)
Bird	2.21	NN	Peak	Wetland	1	1	52.26	2.51	180	-31.6	van den Wyngaert <i>et al.</i> (2003)
Bird	0.55	NI	Winter	Lake	1	1	31.761	1.00	160	-57.8	Esler (1989)
Bird	2.83	NN	Peak	Wetland	12	1	50.199	225.00	60	-51.9	Anderson & Low (1976)
Bird	0.24	NN	Winter	Lake	5	2	47.390	1.88	150	-26.3	Schmieder, Werner & Bauer (2006)
Bird	1.57	MN	Peak	Lake	15	4	47.430	1.00	30	-58.9	Matuszak <i>et al.</i> (2012)
Bird	0.09	NN	Peak	Lake	1	6	45.470	25.00	122	0.0	Gayet <i>et al.</i> (2011)
Bird	3.30	NN	Growth	Estuary	1	1	43.040	0.06	105	-86.7	Rivers & Short (2007)
Bird	0.11	NN	Peak	Lake	6	1	52.433	1.00	105	-42.9	Hilt (2006)
Bird	0.15	NN	Peak	Lake	3	3	55.460	25.00	69	-40.7	Lauridsen, Sandsten & Møller (2003)
Bird	0.04	NN	Peak	Lake	7	8	52.150	2.00	415	0.0	Rip, Rawee & de Jong (2006)
Bird	2.89	IN	Peak	Estuary	1	1	37.380	10000.00	150	-92.9	Dos Santos <i>et al.</i> (2012)
Bird	3.46	NN	Winter	Estuary	1	1	54.270	1.00	120	-84.6	Tinkler, Montgomery & Elwood (2009)
Bird	0.18	NN	Growth	Lake	2	4	55.420	1.00	64	-34.6	Weisner, Strand & Sandsten (1997) ^b
Bird	3.28	NN	Peak	Lake	3	2	53.383	24.00	122	-56.0	Santamaria (2002)

Bird	0.07	IM	Peak	Wetland	1	5	40.530	9.00	547	8.1	Stafford, Eichholz & Phillips (2012)
Bird	0.07	IM	Peak	Lake	1	13	40.460	9.00	547	18.7	Stafford, Eichholz & Phillips (2012)
Bird	1.33	NN	Peak	Estuary	1	1	43.211	25.00	365	-37.5	Gayet <i>et al.</i> (2012)
Bird	0.13	NN	Peak	Lake	4	1	52.433	1.00	61	-35.5	Körner & Dugdale (2003)
Bird	0.55	NN	Winter	Salt marsh	1	9	52.955	9.00	122	-37.2	Charman & Macey (1978)
Bird	0.81	NN	Peak	Salt marsh	2	17	58.750	25.00	61	-53.0	Bazely & Jeffries (1986)
Bird	2.53	NN	Peak	Wetland	1	6	73.000	1.00	365	-40.0	Gauthier <i>et al.</i> (2004)
Bird	2.53	NN	Peak	Wetland	1	5	73.000	1.00	59	-45.6	Gauthier <i>et al.</i> (1995)
Bird	2.65	NN	Winter	Wetland	6	5	29.250	200.00	365	-41.1	Evers <i>et al.</i> (1998)
Bird	1.61	NN	Winter	Estuary	2	1	54.540	2.56	91	-70.0	Nacken & Reise (2000)
Bird	85.53	NN	Winter	Estuary	48	1	35.044	2.25	132	-71.9	Kim <i>et al.</i> (2013)
Bird	130.90	NN	Winter	Estuary	48	1	35.044	2.25	132	-37.9	Kim <i>et al.</i> (2013)
Bird	0.60	NN	Transplant	Lake	5	2	52.150	18.00	120	-42.9	Veen <i>et al.</i> (2013)
Bird	0.30	NN	Transplant	Lake	5	2	52.120	18.00	120	-52.8	Veen <i>et al.</i> (2013)
Bird	2.10	NN	Transplant	Lake	5	2	52.100	18.00	120	-55.6	Veen <i>et al.</i> (2013)
Bird	0.60	NN	Transplant	Lake	5	2	52.180	18.00	120	-33.3	Veen <i>et al.</i> (2013)
Bird	11.00	NN	Transplant	Lake	5	2	52.100	18.00	120	-82.5	Veen <i>et al.</i> (2013)
Bird	0.40	NN	Transplant	Wetland	5	2	52.160	18.00	120	-38.6	Veen <i>et al.</i> (2013)
Mammal	20.04	MN	Winter	Wetland	2	5	29.250	4.00	365	-50.6	Evers <i>et al.</i> (1998)
Mammal	1.20	NN	Peak	Lake	1	14	47.550	4.00	79	-39.5	Qvarnemark & Sheldon (2004) ^f
Mammal	20.04	MN	Peak	Wetland	4	16	30.170	240.00	184	-58.8	Geho, Campbell & Keddy (2007) ^c
Mammal	20.04	MN	Winter	Wetland	2	2	29.350	9.00	183	-45.8	Randall & Foote (2005) ^c
Mammal	15.40	IN	Winter	Wetland	1	4	30.232	2.00	426	-58.8	Slocum & Mendelssohn (2008) ^c
Mammal	20.04	MN	Peak	Wetland	2	7	29.250	1.00	180	-50.0	Fuller <i>et al.</i> (1985) ^c
Mammal	54.36	NN	Winter	River	1	1	28.900	2.25	183	-80.0	Hauxwell, Frazer & Osenberg (2004)
Mammal	37.22	IN	Peak	Salt marsh	1	4	30.480	4.00	365	-30.3	Turner (1987) ^d
Mammal	333.66	NN	Peak	Marine	1	4	27.050	9.00	160	-84.2	Preen (1995)
Mammal	12.00	IN	Peak	Salt marsh	1	10	51.217	10000.00	136	-24.0	Ranwell (1961)

Mammal	14.80	NN	Peak	Marine	1	1	3.300	40.00	196	-55.9	de Iongh, Wenno & Meelis (1995)
Mammal	20.72	IN	Peak	Salt marsh	1	2	37.976	220.30	395	-68.4	Seliskar (2003)
Mammal	0.41	NN	Peak	Salt marsh	1	31	37.445	0.25	214	-53.8	Alberti <i>et al.</i> (2011) ^g
Mammal	15.40	IN	Peak	Wetland	1	2	30.110	24.00	730	-75.7	Ford & Grace (1998a)
Mammal	15.40	IN	Peak	Wetland	1	5	31.110	4.00	730	-52.9	Ford & Grace (1998b)
Mammal	20.04	MN	Peak	Wetland	2	4	30.250	49.00	730	-32.1	Gough & Grace (1998) ^e
Mammal	20.04	MN	Peak	Wetland	2	4	30.250	49.00	730	-51.1	Gough & Grace (1998) ^e
Mammal	15.40	IN	Transplant	Wetland	1	3	30.250	0.02	84	-72.3	Taylor, Grace & Marx (1997) ^e
Mammal	15.40	IN	Peak	Wetland	1	5	30.250	4.00	472	-37.5	Taylor & Grace (1995) ^e
Mammal	15.40	IN	Peak	Wetland	1	17	29.525	9.00	172	-48.7	Taylor <i>et al.</i> (1994) ^e
Mammal	3.17	NN	Winter	Marine	1	1	25.530	2.88	263	-45.8	Masini, Anderson & McComb (2001)
Mammal	3.17	NN	Winter	Marine	1	1	25.530	2.88	263	-59.3	Masini, Anderson & McComb (2001)
Mammal	4.00	NN	Peak	Lake	1	1	56.642	4.00	270	-44.7	Law, Jones & Willby (2014)
Mammal	20.04	MN	Peak	Wetland	2	2	29.350	9.00	128 0	-54.3	Johnson & Foote (1997)
Crustacean	100.00	IN	Peak	Lake	1	1	42.503	6.00	15	-86.7	Rodríguez, Bécares & Fernández-Aláez (2003)
Crustacean	47.00	NN	Peak	Lake	1	4	41.130	1.00	56	-60.3	Elser, Junge & Goldman (1994)
Crustacean	141.00	NN	Peak	Lake	1	4	41.130	1.00	56	-55.6	Elser, Junge & Goldman (1994)
Crustacean	5.00	NN	Transplant	Lake	1	4	54.757	4.67	35	-23.3	Chambers <i>et al.</i> (1990)
Crustacean	10.00	NN	Transplant	Lake	1	4	54.757	4.67	35	-35.0	Chambers <i>et al.</i> (1990)
Crustacean	18.00	NN	Transplant	Lake	1	4	54.757	4.67	35	18.3	Chambers <i>et al.</i> (1990)
Crustacean	80.00	IN	Transplant	Lake	1	1	46.1	1.00	28	-70.0	Lodge & Lorman (1987)
Crustacean	19.00	IN	Transplant	Lake	1	2	46.2	1.00	49	-29.0	Lodge & Lorman (1987)
Crustacean	140.00	IN	Transplant	Lake	1	2	46.2	1.00	49	-91.0	Lodge & Lorman (1987)
Crustacean	222.00	IN	Transplant	Lake	1	2	46.2	1.00	49	-98.7	Lodge & Lorman (1987)
Crustacean	22.50	IN	Transplant	Lake	1	4	46	1.50	84	-78.0	Lodge & Lorman (1987)
Crustacean	20.00	IN	Transplant	Lake	1	4	46	3.00	49	4.5	Lodge & Lorman (1987)
Crustacean	125.00	IN	Transplant	Lake	1	5	46.1	3.00	28	-7.8	Lodge & Lorman (1987)
Crustacean	7.77	II	Peak	Wetland	1	1	40.1	1.00	144	4.0	Anastácio, Frias & Marques (2000)

Crustacean	23.31	II	Peak	Wetland	1	1	40.1	1.00	144	-64.0	Anastácio, Frias & Marques (2000)
Crustacean	38.35	II	Peak	Wetland	1	1	40.1	1.00	144	-96.0	Anastácio, Frias & Marques (2000)
Crustacean	310.50	NN	Peak	Salt marsh	1	1	37.32	0.49	121 5	-94.7	Daleo, Alberti & Iribarne (2011)
Crustacean	52.42	IM	Transplant	Lake	1	2	55.7	4.50	61	-28.2	Nyström, Brönmark & Granéli (1999)
Crustacean	49.27	NM	Transplant	Lake	1	2	55.7	4.50	61	-7.7	Nyström, Brönmark & Granéli (1999)
Crustacean	87.00	IN	Peak	Wetland	1	1	37.325	3.00	141	-86.7	Feminella & Resh (1989)
Crustacean	22.69	IN	Transplant	Lake	1	2	55.7	1.30	3	-9.7	Nyström & Strand (1996)
Crustacean	5.50	II	Transplant	Wetland	1	1	38.683	0.24	10	-29.4	Anastácio, Correia & Menino (2005)
Crustacean	6.50	II	Transplant	Wetland	1	1	38.683	0.24	10	-58.8	Anastácio, Correia & Menino (2005)
Crustacean	11.23	II	Transplant	Wetland	1	1	38.683	0.24	10	-94.1	Anastácio, Correia & Menino (2005)
Crustacean	6.61	II	Transplant	Wetland	1	1	38.683	1.20	14	-13.5	Anastácio, Correia & Menino (2005)
Crustacean	11.23	II	Transplant	Wetland	1	1	38.683	1.20	14	-28.6	Anastácio, Correia & Menino (2005)
Crustacean	18.79	II	Transplant	Wetland	1	1	38.683	1.20	14	-36.1	Anastácio, Correia & Menino (2005)
Crustacean	360.10	NN	Peak	Salt marsh	1	1	37.46	0.56	819	-31.4	Alberti <i>et al.</i> (2010)
Crustacean	720.20	NN	Peak	Salt marsh	1	1	37.46	0.56	819	-66.7	Alberti <i>et al.</i> (2010)
Crustacean	249.30	NN	Peak	Salt marsh	1	1	37.46	0.56	819	-25.0	Alberti <i>et al.</i> (2010)
Crustacean	11.42	II	Peak	Lake	1	1	46.030	2.00	56	-15.4	Maezo, Fournier & Beisner (2010)
Crustacean	47.07	II	Peak	Lake	1	1	46.030	2.00	56	-41.5	Maezo, Fournier & Beisner (2010)
Crustacean	180.01	II	Peak	Lake	1	1	46.030	2.00	56	-84.6	Maezo, Fournier & Beisner (2010)
Crustacean	150.00	IM	Transplant	Lake	1	3	52.130	1.00	42	-92.1	van der Wal <i>et al.</i> (2013)
Crustacean	150.00	IM	Transplant	Lake	1	3	52.130	1.00	42	-64.9	van der Wal <i>et al.</i> (2013)
Crustacean	15.00	NN	Growth	Lake	1	1	39.055	0.37	14	34.9	Flint & Goldman (1975)
Crustacean	35.00	NN	Growth	Lake	1	1	39.055	0.37	14	7.4	Flint & Goldman (1975)
Crustacean	65.00	NN	Growth	Lake	1	1	39.055	0.37	14	-5.7	Flint & Goldman (1975)
Crustacean	130.00	NN	Growth	Lake	1	1	39.055	0.37	14	-44.8	Flint & Goldman (1975)
Crustacean	210.00	NN	Growth	Lake	1	1	39.055	0.37	14	-52.0	Flint & Goldman (1975)
Crustacean	275.00	NN	Growth	Lake	1	1	39.055	0.37	14	-53.5	Flint & Goldman (1975)
Crustacean	57.50	IN	Peak	Lake	1	7	38.626	20.00	21	-30.9	Carreira, Dias & Rebelo (2014)

Mollusc	90.00	II	Transplant	Wetland	1	1	12.34	1.00	27	-52.4	Carlsson, Brönmark & Hansson (2004)
Mollusc	180.00	II	Transplant	Wetland	1	1	12.34	1.00	27	-58.3	Carlsson, Brönmark & Hansson (2004)
Mollusc	270.00	II	Transplant	Wetland	1	1	12.34	1.00	27	-64.3	Carlsson, Brönmark & Hansson (2004)
Mollusc	90.00	II	Transplant	Lake	1	1	22.282	1.00	33	-26.0	Fang <i>et al.</i> (2010) ^k
Mollusc	180.00	II	Transplant	Lake	1	1	22.282	1.00	33	-30.0	Fang <i>et al.</i> (2010) ^k
Mollusc	360.00	II	Transplant	Lake	1	1	22.282	1.00	33	-48.0	Fang <i>et al.</i> (2010) ^k
Mollusc	90.00	II	Transplant	Lake	1	1	22.282	1.00	34	-19.2	Fang <i>et al.</i> (2010) ^k
Mollusc	180.00	II	Transplant	Lake	1	1	22.282	1.00	34	-23.1	Fang <i>et al.</i> (2010) ^k
Mollusc	360.00	II	Transplant	Lake	1	1	22.282	1.00	34	-30.8	Fang <i>et al.</i> (2010) ^k
Mollusc	30.40	NN	Transplant	Lake	1	1	31.3	0.18	31	3.8	Li, Liu & Gu (2009) ^k
Mollusc	60.80	NN	Transplant	Lake	1	1	31.3	0.18	31	-0.6	Li, Liu & Gu (2009) ^k
Mollusc	91.20	NN	Transplant	Lake	1	1	31.3	0.18	31	-7.2	Li, Liu & Gu (2009) ^k
Mollusc	110.57	NI	Transplant	Lake	1	2	45.748	0.01	61	-37.5	Barrat-Segretain & Lemoine (2007) ¹
Mollusc	8.12	NN	Transplant	Lake	1	15	52.103	0.24	98	-22.2	Elger, Willby & Cabello-Martinez (2009)
Mollusc	40.60	NN	Transplant	Lake	1	15	52.103	0.24	98	-100.0	Elger, Willby & Cabello-Martinez (2009)
Mollusc	43.19	NN	Transplant	Lake	1	1	53.34	0.05	14	-10.8	Elger, de Boer & Hanley (2007) ¹
Mollusc	129.57	NN	Transplant	Lake	1	1	53.34	0.05	14	-35.1	Elger, de Boer & Hanley (2007) ¹
Mollusc	47.67	NN	Transplant	Lake	1	1	53.34	0.05	14	-62.5	Elger, de Boer & Hanley (2007) ¹
Mollusc	143.00	NN	Transplant	Lake	1	1	53.34	0.05	14	-100.0	Elger, de Boer & Hanley (2007) ¹
Mollusc	450.00	NM	Transplant	Wetland	1	3	17.581	0.20	20	-80.6	Carlsson & Lacouriere (2005) ^k
Mollusc	86.48	IN	Transplant	Wetland	1	3	15.551	4.00	63	-71.4	Carlsson & Brönmark (2006) ^k
Mollusc	73.50	IN	Transplant	Wetland	1	3	17.551	4.00	63	-78.6	Carlsson & Brönmark (2006) ^k
Mollusc	1333.3 3	NI	Transplant	Lake	1	1	53.48	0.00	35	-40.4	Pieczynska (2003)
Mollusc	6207.0 0	NN	Peak	Salt marsh	1	1	31.478	1.00	365	-96.2	Silliman <i>et al.</i> (2005)
Mollusc	6207.0 0	NN	Peak	Salt marsh	1	1	31.478	1.00	365	-100.0	Silliman <i>et al.</i> (2005)
Mollusc	2535.0 0	NN	Peak	Salt marsh	1	1	29.106	1.00	365	-96.0	Silliman <i>et al.</i> (2005)
Mollusc	2535.0	NN	Peak	Salt	1	1	29.106	1.00	365	-97.9	Silliman <i>et al.</i> (2005)

	0			marsh								
Mollusc	4800.0	NN	Peak	Salt marsh	1	1	31.478	1.00	240	-88.2	Silliman & Bertness (2002)	
	0											
Mollusc	2400.0	NN	Peak	Salt marsh	1	1	31.478	1.00	240	-64.8	Silliman & Bertness (2002)	
	0											
Mollusc	4800.0	NN	Peak	Salt marsh	1	1	31.478	1.00	240	-100.0	Silliman & Bertness (2002)	
	0											
Mollusc	2400.0	NN	Peak	Salt marsh	1	1	31.478	1.00	240	-88.4	Silliman & Bertness (2002)	
	0											
Mollusc	2000.0	IN	Peak	Estuary	1	1	41.679	9.00	214	-68.2	Bertness (1984)	
	0											
Mollusc	525.00	IM	Transplant	Lake	1	5	22.282	0.80	56	-76.9	Wong, Kwong & Qiu (2009)	
Mollusc	474.00	NN	Peak	Salt Marsh	1	1	34.420	1.00	56	-35.7	Gittman & Keller (2013)	
Mollusc	46.80	NN	Transplant	Estuary	2	1	37.150	0.25	31	-35.0	Neckles, Wetzl & Orth (1993)	
Mollusc	689.23	NN	Growth	Marine	1	1	36.304	0.13	45	-54.1	Zimmerman, Kohrs & Alberte (1996)	
Mollusc	492.00	IN	Transplant	Wetland	1	3	22.264	1.00	56	-68.2	Ip <i>et al.</i> (2014)	
Insect	0.01	NI	Transplant	Lake	1	1	44.560	0.60	28	9.3	Newman <i>et al.</i> (1996)	
Insect	0.03	NI	Transplant	Lake	1	1	44.560	0.60	28	-6.8	Newman <i>et al.</i> (1996)	
Insect	0.06	NI	Transplant	Lake	1	1	44.560	0.60	28	-11.9	Newman <i>et al.</i> (1996)	
Insect	2.02	NM	Transplant	Lake	1	2	44.493	0.01	13	-14.3	Creed & Sheldon (1993)	
Insect	4.04	NM	Transplant	Lake	1	2	44.493	0.01	13	-34.5	Creed & Sheldon (1993)	
Insect	0.19	NI	Growth	Lake	1	1	44.493	0.03	41	-36.5	Creed & Sheldon (1995)	
Insect	0.38	NI	Peak	Lake	1	1	43.751	0.07	41	-47.8	Sheldon & Creed (1995)	
Insect	0.96	NI	Peak	Lake	1	1	43.751	0.07	36	-50.0	Sheldon & Creed (1995)	
Insect	0.25	NM	Transplant	Lake	1	6	43.751	0.01	10	-6.8	Sheldon & Creed (2003)	
Insect	0.51	NM	Transplant	Lake	1	6	43.751	0.01	10	-12.5	Sheldon & Creed (2003)	
Insect	0.14	NN	Transplant	Lake	1	1	26.293	0.11	20	-5.8	Sacco <i>et al.</i> (2013)	
Insect	0.28	NN	Transplant	Lake	1	1	26.293	0.11	27	-57.6	Sacco <i>et al.</i> (2013)	
Insect	0.42	NN	Transplant	Lake	1	1	26.293	0.11	23	-55.8	Sacco <i>et al.</i> (2013)	
Insect	0.56	NN	Transplant	Lake	1	1	26.293	0.11	32	-43.8	Sacco <i>et al.</i> (2013)	
Insect	0.44	II	Transplant	Lake	1	1	26.113	0.20	56	-5.7	Coetzee, Byrne & Hill (2007)	
Insect	2.25	II	Transplant	Lake	1	1	25.746	0.13	56	-40.0	Bownes, Hill & Byrne (2010)	

Insect	3.38	II	Transplant	Lake	1	1	25.746	0.13	56	-54.0	Bownes, Hill & Byrne (2010)
Insect	3.75	II	Transplant	Lake	1	1	25.746	0.13	56	-64.0	Bownes, Hill & Byrne (2010)
Insect	4.50	II	Transplant	Lake	1	1	25.746	0.13	56	-60.0	Bownes, Hill & Byrne (2010)
Insect	5.63	II	Transplant	Lake	1	1	25.746	0.13	56	-72.0	Bownes, Hill & Byrne (2010)
Insect	7.50	II	Transplant	Lake	1	1	25.746	0.13	56	-70.0	Bownes, Hill & Byrne (2010)
Insect	0.53	II	Transplant	Wetland	1	1	24.584	0.20	42	-33.3	Lu & Ding (2010)
Insect	0.01	II	Transplant	Wetland	1	1	24.584	0.20	42	-9.1	Lu & Ding (2012)
Insect	0.01	II	Transplant	Wetland	1	1	24.584	0.20	42	21.1	Lu & Ding (2012)
Insect	0.26	NN	Transplant	Lake	1	1	23.080	0.20	61	4.3	Ding <i>et al.</i> (2006)
Insect	0.51	NN	Transplant	Lake	1	1	23.080	0.20	61	-4.3	Ding <i>et al.</i> (2006)
Insect	1.28	NN	Transplant	Lake	1	1	23.080	0.20	61	-17.4	Ding <i>et al.</i> (2006)
Insect	0.36	NI	Transplant	Lake	1	1	43.140	2.25	86	6.1	Ding & Blossey (2005) ^h
Insect	0.71	NI	Transplant	Lake	1	1	43.140	2.25	86	3.0	Ding & Blossey (2005) ^h
Insect	1.78	NI	Transplant	Lake	1	1	43.140	2.25	86	9.1	Ding & Blossey (2005) ^h
Insect	0.28	NN	Peak	River	1	1	31.501	0.01	179	-25.6	Wallace & O'Hop (1985)
Insect	1.00	II	Transplant	Lake	1	1	25.445	0.27	28	-22.9	Bownes, Hill & Byrne (2010)
Insect	2.99	II	Transplant	Lake	1	1	25.445	0.27	28	-29.7	Bownes, Hill & Byrne (2010)
Insect	1.00	IN	Transplant	Lake	1	1	25.445	0.27	28	-13.5	Bownes, Hill & Byrne (2010)
Insect	2.99	IN	Transplant	Lake	1	1	25.445	0.27	28	0.0	Bownes, Hill & Byrne (2010)
Insect	0.11	II	Peak	Lake	2	1	25.010	4.00	320	-40.0	Aguilar <i>et al.</i> (2003)
Insect	0.02	II	Transplant	River	1	1	6.401	0.22	56	-35.9	Ajuonu <i>et al.</i> (2009)
Insect	0.10	II	Transplant	River	1	1	6.401	0.22	56	-40.6	Ajuonu <i>et al.</i> (2009)
Insect	0.06	II	Transplant	River	1	1	6.401	0.22	56	-45.3	Ajuonu <i>et al.</i> (2009)
Insect	0.03	II	Transplant	River	1	1	6.401	0.22	56	-33.3	Ajuonu <i>et al.</i> (2009)
Insect	0.26	II	Transplant	River	2	1	6.401	0.22	56	-70.8	Ajuonu <i>et al.</i> (2009)
Insect	0.14	II	Transplant	River	2	1	6.401	0.22	56	-58.3	Ajuonu <i>et al.</i> (2009)
Insect	0.56	II	Transplant	Lake	1	1	26.089	1.60	127	-42.5	Center, Steward & Bruner (1982)
Insect	1.13	II	Transplant	Lake	1	1	26.089	1.60	127	-79.2	Center, Steward & Bruner (1982)
Insect	1.69	II	Transplant	Lake	1	1	26.089	1.60	127	-92.5	Center, Steward & Bruner (1982)
Insect	0.04	IM	Transplant	Lake	1	2	33.045	5.30	420	-33.3	Doyle <i>et al.</i> (2007)
Insect	0.17	II	Transplant	River	1	1	27.285	0.59	56	-74.2	Heard & Winteron (2000)
Insect	0.17	II	Transplant	River	1	1	27.285	0.59	56	-44.1	Heard & Winteron (2000)

Insect	0.17	II	Transplant	River	1	1	27.285	0.59	56	-48.4	Heard & Winteron (2000)
Insect	0.17	II	Transplant	River	1	1	27.285	0.59	56	-41.2	Heard & Winteron (2000)
Insect	0.49	II	Transplant	Wetland	1	1	42.026	0.38	25	-19.4	Matos & Obrycki (2007)
Insect	0.49	II	Transplant	Wetland	1	1	42.026	0.38	12	-46.3	Matos & Obrycki (2007)
Insect	0.97	II	Transplant	Wetland	2	1	42.026	0.38	25	-5.2	Matos & Obrycki (2007)
Insect	0.49	II	Transplant	Wetland	1	1	42.026	0.38	25	-48.5	Matos & Obrycki (2007)
Insect	0.49	II	Transplant	Wetland	1	1	42.026	0.38	12	-48.5	Matos & Obrycki (2007)
Insect	0.97	II	Transplant	Wetland	2	1	42.026	0.38	25	-37.3	Matos & Obrycki (2007)
Insect	0.97	II	Transplant	Wetland	2	1	42.026	0.38	25	25.4	Matos & Obrycki (2007)
Insect	0.17	NN	Transplant	Wetland	1	1	34.360	0.02	30	-17.9	Sosa, Cordo & Sacco (2007)
Insect	0.18	NN	Transplant	Wetland	1	1	34.360	0.02	30	-11.2	Sosa, Cordo & Sacco (2007)
Insect	0.22	II	Peak	Wetland	1	1	30.200	0.10	182 6	-19.2	Parys & Johnson (2013)
Insect	9.92	MM	Peak	Wetland	3	7	30.000	1.00	109 5	-70.5	Tipping <i>et al.</i> (2008)
Insect	5.60	NN	Winter	Lake	1	1	26.050	0.16	71	-72.5	Van, Wheeler & Center (1998)
Insect	1.68	NN	Winter	Lake	1	1	26.050	0.16	84	-20.3	Van, Wheeler & Center (1998)
Insect	5.60	NN	Peak	Lake	1	1	26.050	0.16	29	-68.4	Van, Wheeler & Center (1998)
Insect	1.68	NN	Peak	Lake	1	1	26.050	0.16	62	-43.1	Van, Wheeler & Center (1998)
Insect	0.29	IN	Winter	Lake	1	1	26.050	0.16	84	60.0	Van, Wheeler & Center (1998)
Insect	0.19	IN	Winter	Lake	1	1	26.050	0.16	71	10.0	Van, Wheeler & Center (1998)
Insect	0.48	IN	Peak	Lake	1	1	26.050	0.16	42	76.2	Van, Wheeler & Center (1998)
Insect	0.29	IN	Peak	Lake	1	1	26.050	0.16	49	38.5	Van, Wheeler & Center (1998)
Fish	64.08	NM	Transplant	Lake	1	5	22.282	0.80	56	-57.7	Wong, Kwong & Qiu (2009)
Fish	11.25	NN	Peak	Lake	3	1	52.433	1.00	61	-57.0	Körner & Dugdale (2003)
Fish	11.25	MN	Peak	Lake	3	1	52.433	1.00	105	-50.0	Hilt (2006)
Fish	45.00	IM	Transplant	Lake	1	7	53.067	4.00	30	-52.3	Fowler & Robson (1978)
Fish	15.00	IM	Transplant	Lake	1	7	53.067	4.00	30	-32.6	Fowler & Robson (1978)
Fish	45.00	IM	Transplant	Lake	1	7	53.067	4.00	330	-28.4	Fowler & Robson (1978)
Fish	15.00	IM	Transplant	Lake	1	7	53.067	4.00	330	-40.5	Fowler & Robson (1978)
Fish	48.70	IM	Transplant	Lake	1	7	53.067	4.00	12	-54.4	Fowler & Robson (1978)
Fish	17.40	IM	Transplant	Lake	1	7	53.067	4.00	12	-20.9	Fowler & Robson (1978)

Fish	50.00	IM	Transplant	Lake	1	5	53.067	4.00	18	-93.2	Fowler & Robson (1978)
Fish	25.00	IM	Transplant	Lake	1	5	53.067	4.00	18	-75.9	Fowler & Robson (1978)
Fish	12.50	IM	Transplant	Lake	1	5	53.067	4.00	18	-46.8	Fowler & Robson (1978)
Fish	2.72	IM	Winter	Lake	1	5	38.758	49.00	245	-52.9	Kirkagac & Demir (2006)
Fish	15.00	NM	Transplant	Lake	1	2	55.7	300.00	70	-37.2	Hansson, Johansson & Persson (1987)
Fish	30.00	NM	Transplant	Lake	1	2	55.7	300.00	70	-65.0	Hansson, Johansson & Persson (1987)
Fish	20.89	NM	Peak	Lake	1	3	52.12	9.00	75	-13.9	Dorenbosch & Bakker (2012)
Fish	82.56	IM	Peak	Lake	1	3	52.12	9.00	75	-82.9	Dorenbosch & Bakker (2012)
Fish	43.28	IN	Peak	Lake	1	3	43.533	64.00	71	-24.3	Crivelli (1983)
Fish	58.09	IN	Peak	Lake	1	3	44.533	64.00	71	-45.9	Crivelli (1983)
Fish	59.60	IN	Peak	Lake	1	3	45.533	64.00	71	-38.4	Crivelli (1983)
Fish	64.68	IN	Peak	Lake	1	3	46.533	64.00	71	-49.6	Crivelli (1983)
Fish	72.56	IN	Peak	Lake	1	3	47.533	64.00	71	-50.7	Crivelli (1983)
Fish	90.50	IN	Peak	Wetland	1	4	39.333	175.00	91	-63.0	Sidorkewicj <i>et al.</i> (1998)
Fish	125.00	IN	Peak	Wetland	1	4	39.333	175.00	91	-83.2	Sidorkewicj <i>et al.</i> (1998)
Fish	240.00	IN	Peak	Wetland	1	4	39.333	175.00	128	-68.0	Sidorkewicj <i>et al.</i> (1998)
Fish	405.00	IN	Peak	Wetland	1	4	39.333	175.00	128	-100.0	Sidorkewicj <i>et al.</i> (1998)
Fish	50.44	IN	Growth	Wetland	1	6	42.200	0.65	17	-69.7	King & Hunt (1967)
Fish	16.32	IN	Transplant	Lake	1	4	40.106	6.25	42	-38.5	Miller & Crawl (2006)
Fish	2.90	IN	Peak	Lake	1	9	49.100	80.00	60	-20.0	Pípalová (2002)
Fish	100.00	IN	Growth	Lake	1	1	40.000	12.00	40	-25.9	Dall Armellina, Bezic & Gajardo (1999)
Fish	200.00	IN	Growth	Lake	1	1	40.000	12.00	40	-63.0	Dall Armellina, Bezic & Gajardo (1999)
Fish	100.00	IN	Growth	River	1	3	40.000	8.00	70	-86.2	Dall Armellina, Bezic & Gajardo (1999)
Fish	200.00	IN	Growth	River	1	3	40.000	8.00	70	-95.4	Dall Armellina, Bezic & Gajardo (1999)
Fish	1500.00	IN	Peak	River	1	2	25.429	150.00	365	-93.4	Belal (2007)
Fish	3300.00	IN	Peak	River	1	2	25.429	150.00	365	-99.6	Belal (2007)
Fish	4750.00	IN	Peak	River	1	2	25.429	150.00	365	-99.7	Belal (2007)

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Fish	200.00	NN	Peak	Lake	2	1	42.503	6.00	15	-58.3	Rodríguez, Bécares & Fernández-Aláez (2003)
Fish	20.00	MN	Peak	Lake	4	2	53.007	4.00	42	-33.3	Williams, Moss & Eaton (2002)
Fish	70.00	MN	Peak	Lake	4	2	53.007	4.00	42	-58.7	Williams, Moss & Eaton (2002)
Fish	9.60	MN	Growth	Lake	2	1	39.47	4.00	92	-63.1	Sandsten, Beklioglu & Ince (2005)
Fish	95.90	IN	Transplant	Lake	1	9	51.811	250.00	107	-100.0	Stott & Robson (1970)
Fish	784.70	IN	Transplant	Lake	1	5	38.773	7.07	74	-84.3	Buck, Baur & Rose (1975)
Fish	0.61	IN	Transplant	Lake	1	5	34.29	12.00	20	0.0	Roberts <i>et al.</i> (1995)
Fish	2647.5 0	IN	Transplant	Lake	1	1	38.153	2500.00	70	-100.0	Lembi <i>et al.</i> (1978)
Fish	2647.5 0	IN	Transplant	Lake	1	1	38.153	2500.00	70	-99.5	Lembi <i>et al.</i> (1978)
Fish	1187.5 0	IN	Transplant	Lake	1	1	38.153	2500.00	70	-98.5	Lembi <i>et al.</i> (1978)
Fish	5940.0 0	IN	Transplant	Lake	1	1	38.153	2500.00	70	-100.0	Lembi <i>et al.</i> (1978)
Fish	5745.0 0	IN	Transplant	Lake	1	1	38.153	2500.00	70	-100.0	Lembi <i>et al.</i> (1978)
Fish	25.50	MM	Peak	River	2	2	54.243	8500.00	152	-64.6	Petridis (1990)
Fish	45130	MN	Transplant	Lake	3	1	37.48	5.00	21	-80.6	de Winton, Taumoepeau & Clayton (2002) ⁱ
Fish	451.30	MN	Transplant	Lake	3	1	37.48	6.25	70	-90.0	Dugdale <i>et al.</i> (2006)
Fish	70.18	NI	Transplant	River	1	1	19.150	0.228	22	-25.0	Doupé <i>et al.</i> (2010)
Fish	70.18	NI	Transplant	River	1	1	19.150	0.228	22	-32.5	Doupé <i>et al.</i> (2010)
Fish	70.18	NI	Transplant	River	1	1	19.150	0.228	22	-7.1	Doupé <i>et al.</i> (2010)
Fish	5.60	IM	Peak	Lake	1	6	28.246	800000	912	-15.0	Shireman & Maceina (1981)
Fish	2.47	NN	Peak	Marine	7	3	25.400	0.09	180	-18.3	Bourque & Fourqurean (2013)
Fish	18.52	NN	Peak	Marine	7	3	25.350	0.09	180	-21.7	Bourque & Fourqurean (2013)
Fish	8.64	NN	Peak	Marine	7	3	25.300	0.09	180	-38.3	Bourque & Fourqurean (2013)
Fish	4.94	NN	Peak	Marine	7	3	25.250	0.09	180	5.7	Bourque & Fourqurean (2013)
Fish	171.20	NN	Peak	Marine	1	1	42.200	0.25	30	-55.7	Tomas, Turon & Romero (2005)
Fish	124.00	NN	Peak	Marine	1	1	42.200	0.25	30	-39.0	Tomas, Turon & Romero (2005)

Fish	46.80	NN	Peak	Marine	1	1	42.200	0.25	30	-35.0	Tomas, Turon & Romero (2005)
Fish	300.00	IN	Winter	Lake	1	4	42.050	600.00	90	-80.0	Parkos, Santucci & Wahl (2006)
Fish	300.00	IN	Winter	Lake	1	4	42.050	600.00	90	-37.9	Parkos, Santucci & Wahl (2006)
Echinoderm	212.50	NN	Peak	Marine	1	1	5.010	2.00	58	-60.3	Vonk, Pijnappels & Stapel (2008)
Echinoderm	212.50	NN	Peak	Marine	1	1	5.010	2.00	58	-86.7	Vonk, Pijnappels & Stapel (2008)
Echinoderm	212.50	NN	Peak	Marine	1	1	5.010	2.00	58	-86.5	Vonk, Pijnappels & Stapel (2008)
Echinoderm	2000.00	NN	Peak	Marine	1	1	25.000	1.00	365	-81.1	Rose <i>et al.</i> (1999)
Echinoderm	200.00	NN	Peak	Marine	1	3	29.480	1.00	92	-25.0	Valentine <i>et al.</i> (1997)
Echinoderm	400.00	NN	Peak	Marine	1	3	29.480	1.00	92	-30.4	Valentine <i>et al.</i> (1997)
Echinoderm	50.00	NN	Peak	Marine	1	3	32.000	4.00	70	-56.8	McGlathery (1995)
Echinoderm	50.00	NN	Peak	Marine	1	3	32.000	4.00	70	-78.7	McGlathery (1995)
Echinoderm	4400.00	NN	Peak	Marine	2	1	37.270	4.00	184	-91.3	Ruiz <i>et al.</i> (2009)
Echinoderm	1200.00	NN	Growth	Marine	1	3	30.000	5.02	122	-100.0	Heck & Valentine (1995)
Echinoderm	200.00	NN	Winter	Marine	1	3	30.000	1.00	18	-42.1	Valentine & Heck (1991)
Echinoderm	400.00	NN	Winter	Marine	1	3	30.000	1.00	18	-63.2	Valentine & Heck (1991)
Echinoderm	800.00	NN	Winter	Marine	1	3	30.000	1.00	18	-73.7	Valentine & Heck (1991)
Echinoderm	1600.00	NN	Winter	Marine	1	3	30.000	1.00	18	-84.2	Valentine & Heck (1991)
Echinoderm	200.00	NN	Peak	Marine	1	3	30.000	1.00	18	-34.1	Valentine & Heck (1991)
Echinoderm	400.00	NN	Peak	Marine	1	3	30.000	1.00	18	-45.5	Valentine & Heck (1991)
Echinoderm	800.00	NN	Peak	Marine	1	3	30.000	1.00	18	-81.8	Valentine & Heck (1991)
Echinoderm	1600.00	NN	Peak	Marine	1	3	30.000	1.00	18	-88.6	Valentine & Heck (1991)
Echinoderm	200.00	NN	Winter	Marine	1	3	30.000	1.00	18	-41.7	Valentine & Heck (1991)
Echinoderm	400.00	NN	Winter	Marine	1	3	30.000	1.00	18	-72.2	Valentine & Heck (1991)
Echinoderm	800.00	NN	Winter	Marine	1	3	30.000	1.00	18	-86.1	Valentine & Heck (1991)
Echinoderm	1600.00	NN	Winter	Marine	1	3	30.000	1.00	18	-91.7	Valentine & Heck (1991)
Echinoderm	40.00	NN	Peak	Marine	1	3	25.000	1.00	61	-3.1	Valentine <i>et al.</i> (2000)
Echinoderm	80.00	NN	Peak	Marine	1	3	25.000	1.00	61	-10.8	Valentine <i>et al.</i> (2000)

Echinoderm	200.00	NN	Winter	Marine	1	1	25.450	2.00	42	-33.3	Macia (2000)
Echinoderm	400.00	NN	Winter	Marine	1	1	25.450	2.00	42	-62.8	Macia (2000)
Echinoderm	200.00	NN	Peak	Marine	1	1	25.450	2.00	42	-39.6	Macia (2000)
Echinoderm	400.00	NN	Peak	Marine	1	1	25.450	2.00	42	-35.8	Macia (2000)
Echinoderm	368.13	NN	Peak	Marine	1	3	35.280	0.16	169	-61.1	Burnell <i>et al.</i> (2013)
Echinoderm	368.13	NN	Peak	Marine	1	3	35.280	0.16	169	-68.4	Burnell <i>et al.</i> (2013)

^a Herbivore counts given by: Allison & Newton (1974).

^b Herbivore counts given by: Hargeby *et al.* (1994).

^c Herbivore counts given by: Evers *et al.* (1998).

^d Herbivore counts given by: Goodloe *et al.* (2000).

^e Herbivore counts given by: Ford & Grace (1998).

^f Herbivore counts given by: Vucetich & Peterson (2004).

^g Herbivore counts given by: Bonaventura *et al.* (2003).

^h Herbivore individual body mass given by: Kouki (1993).

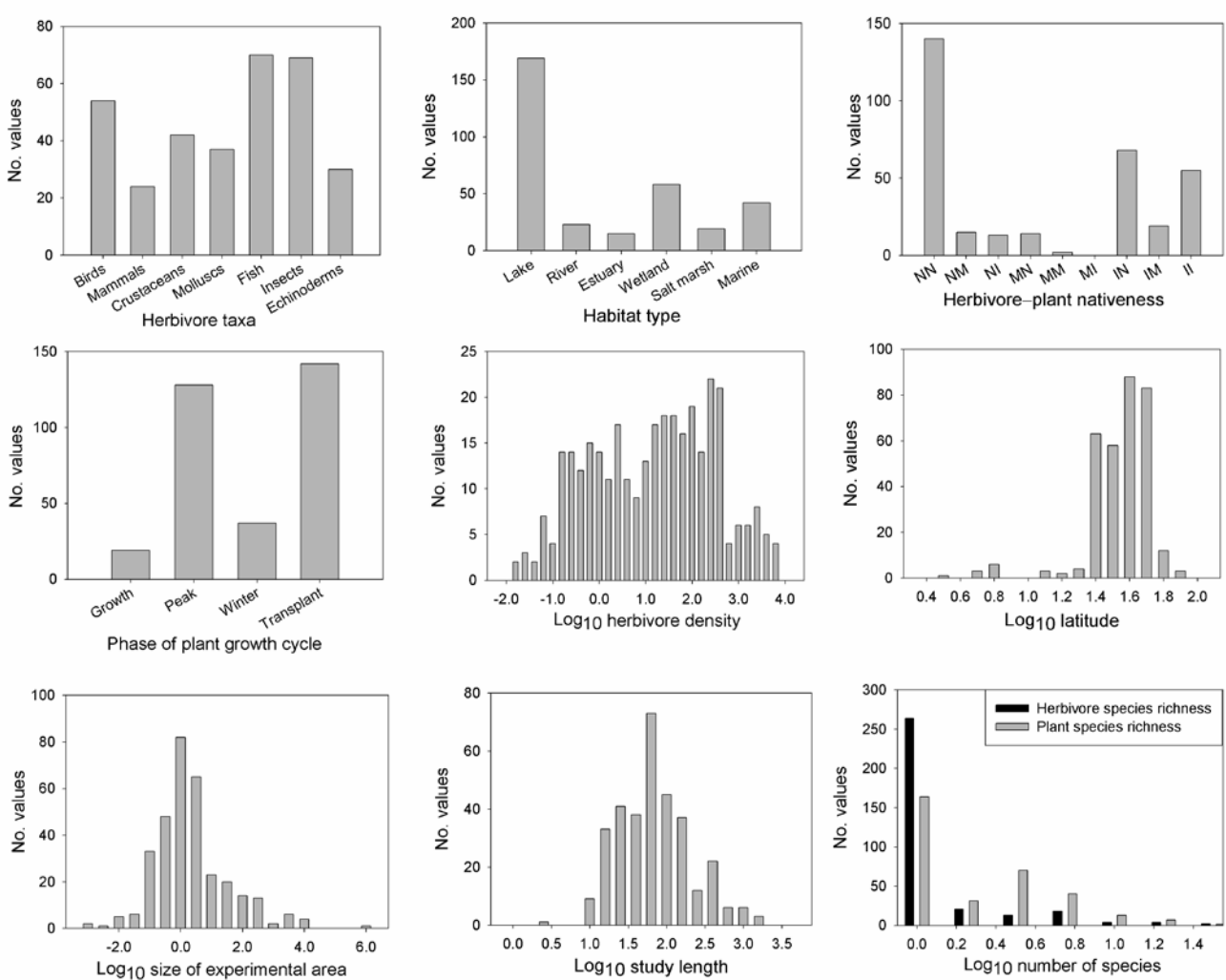
ⁱ Herbivore counts given by: Dugdale *et al.* (2006).

^j Herbivore individual body mass given by: Grahame (1973).

^k Herbivore length–mass relationship (1.5 g mm^{-1}) given by: Carlsson, Brönmark & Hansson (2004).

^l Herbivore length–mass relationship (0.065 g mm^{-1}) given by: Elger, Willby & Cabello-Martinez (2009).

Appendix S2: The distribution of values within the 10 explanatory variables used in the meta-analysis. Plant–herbivore assemblage biogeography abbreviations: NN = native herbivores and native plants, IN = invasive herbivores and native plants, MN = mixed herbivores and native plants, II = invasive herbivores and invasive plants, IM = invasive herbivores and mixed plants, MI = mixed herbivores and invasive plants, MM = mixed herbivores and mixed plants, NM = native herbivores and mixed plants, NI = native herbivores and invasive plants.



Appendix S3: A summary of the Variance Inflation Factors (VIFs) associated with the predictor variables; *D* = herbivore density; *L* = latitude; *E* = size of experimental area; *S* = length of study; *R* = herbivore assemblage species richness; *P* = plant assemblage species richness; *T* = herbivore taxa; *N* = plant–herbivore nativeness; *H* = habitat type; *G* = stage of the plant annual growth cycle. VIFs for each continuous variable were calculated as $1/(1-R^2)$, based on the R^2 value associated with a linear regression of a predictor variable on all other predictor variables in our dataset.

Response variable	Explanatory variables	R^2	VIF
<i>D</i>	<i>L, E, S, R, P, H, G, N, T</i>	0.77	4.35
<i>L</i>	<i>D, E, S, R, P, H, G, N, T</i>	0.44	1.79
<i>E</i>	<i>D, L, S, R, P, H, G, N, T</i>	0.56	2.27
<i>S</i>	<i>D, L, E, R, P, H, G, N, T</i>	0.47	1.88
<i>R</i>	<i>D, L, E, S, P, H, G, N, T</i>	0.47	1.87
<i>P</i>	<i>D, L, E, S, R, H, G, N, T</i>	0.50	2.01

Appendix S4: A summary of the *post-hoc* comparisons between herbivore taxa and herbivore–plant nativeness groups. Significant differences are indicated in bold. Nativeness of the herbivore and plant assemblages: NN = native herbivores and native plants, IN = invasive herbivores and native plants, MN = mixed herbivores and native plants, II = invasive herbivores and invasive plants, IM = invasive herbivores and mixed plants, MI = mixed herbivores and invasive plants, MM = mixed herbivores and mixed plants, NM = native herbivores and mixed plants, NI = native herbivores and invasive plants.

Variable	Contrast	<i>P</i> value
Herbivore taxa	Crustaceans – Birds	1.000
	Echinoderms – Birds	0.025
	Fish – Birds	0.002
	Insects – Birds	0.019
	Mammals – Birds	0.887
	Molluscs – Birds	0.013
	Echinoderms – Crustaceans	0.087
	Fish – Crustaceans	0.022
	Insects – Crustaceans	0.013
	Mammals – Crustaceans	0.974
	Molluscs – Crustaceans	0.059
	Fish – Echinoderms	1.000
	Insects – Echinoderms	< 0.001
	Mammals – Echinoderms	0.697
	Molluscs – Echinoderms	1.000
	Insects – Fish	< 0.001
	Mammals – Fish	0.608
	Molluscs – Fish	1.000
	Mammals – Insects	0.003
	Molluscs – Insects	< 0.001
Molluscs – Mammals	0.661	

Herbivore–plant nativeness	IM – II	0.998
	IN – II	< 0.001
	MM – II	0.877
	MN – II	0.868
	NI – II	0.144
	NM – II	0.995
	NN – II	0.476
	IN – IM	0.271
	MM – IM	0.962
	MN – IM	0.998
	NI – IM	0.115
	NM – IM	0.948
	NN – IM	0.999
	MM – IM	1.000
	MN – IN	0.907
	NI – IN	< 0.001
	NM – IN	0.019
	NN – IN	0.038
	MN – MM	0.996
	NI – MM	0.287
	NM – MM	0.756
	NN – MM	0.984
	NI – MN	0.034
	NM – MN	0.704
	NN – MN	1.000
	NM – NI	0.849
	NN – NI	0.002
	NN – NM	0.546
