

Supplementary material

Glacial relicts in the Alps: decline and conservation strategy for *Nuphar pumila* (Nymphaeaceae)

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Table S1. List of past and present location of *N. pumila* in the Alps and neighboring massifs. **Before 1970; 1970-2000; After 2000:** period of the last known observation of the species. **Hybrid:** recent (after 2000) indication of the presence of the hybrid *N. x spenneriana* in the site. **Conservation status:** the state of conservation of *N. pumila* in the site categorize as: Favorable, Medium favorable, Unfavorable or Unknown. **Main threats:** main threats to *N. pumila* in the site when the Conservation status is Medium favorable or Unfavorable. **References:** 1: Roweck and Reinöhl (1986), 2: Kozłowski and Eggenberg (2005), 3: Aktionsprogramm zur Sanierung ober-schwäbischer Seen (seenprogramm.de), 4: Mikolajczak and Ferrez (2005), 5: Arrigo et al. (2016), 6: Muller (2006), 7: Roweck (1988).

Site	Country	Administrative unit	Status of <i>N. pumila</i>	Before 1970	1970 - 2000	After 2000	Hybrid	Conservation status	Main threats	References
Lac de Malpas	France	Doubs	Extinct		x		x			4
Lac de Saint-Point	France	Doubs	Extinct	x						4
Lac des Mortes	France	Doubs	Extinct		x					4
Lac de Bellefontaine	France	Jura	Present			x		Unfavorable	Number of individuals	4
Lac de l'Abbaye	France	Jura	Present			x	x	Unfavorable	Number of individuals, hybridization	4, 5
Lac des Brenets	France	Jura	Extinct	x			x			4
Lac du Fioget	France	Jura	Extinct	x						4
Lac du Grand-Maclu	France	Jura	Extinct	x						4
Lac du Ratay	France	Jura	Extinct	x						4
Lac de la Fauge	France	Jura	Extinct	x						4
Lac de Foncine	France	Jura	Extinct	x						4
Lac des Perrets	France	Jura	Extinct	x						4
Lac des Rouges-Truites	France	Jura	Extinct	x						4
Lac des Rousses	France	Jura	Extinct	x						4
Lac du Grand-Etival	France	Jura	Extinct	x						4
Lac de Viremont	France	Jura	Extinct	x						4
Lac de Longemer	France	Vosges	Present		x			Unfavorable	Number of individuals	6, 7
Lac de Retournemer	France	Vosges	Present		x			Unfavorable	Number of individuals	6, 7
Lac de Machais	France	Vosges	Present		x			Favorable		6
Lac de la demoiselle	France	Vosges	Present		x			Favorable		6
Lac de la Maix	France	Vosges	Present		x			Favorable		6
Ramonchamp	France	Vosges	Present			x		Unknown		6
Rupt-sur-Moselle	France	Vosges	Present			x		Unknown		6
Girmont-Val-d'Ajol	France	Vosges	Present			x		Unknown		6
Lac de Gérardmer	France	Vosges	Extinct	x						6, 7

Lac de Blanchemer	France	Vosges	Extinct	x						6, 7
Lac de Soulzern	France	Vosges	Extinct	x						7
Lac Noir	France	Vosges	Extinct	x						7
Lac Blanc	France	Vosges	Extinct	x						7
Hohneck	France	Vosges	Extinct	x						7
Remiremont (Moselle)	France	Vosges	Extinct	x						6
Etang de Faideaugrave	France	Haute-Saône	Present			x		Medium favorable	Number of individuals	4
Viaux-dessus	France	Haute-Saône	Present			x		Favorable		4
Etang des Graviers	France	Haute-Saône	Present			x		Favorable		4
Etang de Bachetey	France	Haute-Saône	Present			x		Favorable		4, 5
Etang du Sapin-du-Haut	France	Haute-Saône	Present			x		Medium favorable	Competition	4
La Baisse de la Fontaine	France	Haute-Saône	Present			x		Unfavorable	Number of individuals, eutrophication	4
Moulin Grillot	France	Haute-Saône	Present			x		Medium favorable	Eutrophication	4
Etang du Beuchot	France	Haute-Saône	Present			x		Medium favorable	Eutrophication	4
Etangs du Bozon du Milieu	France	Haute-Saône	Present			x		Favorable		4
Etang de la Croissenière	France	Haute-Saône	Extinct		x					4
Etang des Gorgeots	France	Haute-Saône	Extinct		x					4
Etang de la Goutte Géhan	France	Haute-Saône	Extinct		x					4
Conchotte	France	Haute-Saône	Extinct	x						4
Etang Vogalu	France	Haute-Saône	Extinct	x						4
Etang des Levées	France	Haute-Saône	Extinct		x					4
La Folleterre	France	Haute-Saône	Extinct	x						4
Titisee	Germany	Baden-Württemberg (Black Forest)	Extinct	x						1, 7
Schlüchtsee	Germany	Baden-Württemberg (Black Forest)	Extinct	x			x			1, 5, 7
Feldsee	Germany	Baden-Württemberg (Black Forest)	Extinct	x						1, 7
Urseemoor	Germany	Baden-Württemberg (Black Forest)	Extinct	x			x			1, 7
Windgfallweiher	Germany	Baden-Württemberg (Black Forest)	Extinct	x						1, 5, 7
Schluchsee	Germany	Baden-Württemberg (Black Forest)	Extinct	x						1, 5, 7
Häcklerweiher	Germany	Baden-Württemberg	Present			x	(x)	Medium favorable	Eutrophication, possible hybridization	1, 3, 7
Feldersee	Germany	Baden-Württemberg	Present		x			Unfavorable	Number of individuals	1,7
Hengelesweiher	Germany	Baden-Württemberg	Present			x	x	Medium favorable	Hybridization	1, 3
Holzmühle Weiher	Germany	Baden-Württemberg	Present			x	(x)	Unfavorable	Eutrophication, possible hybridization	3, 7
Stockweiher	Germany	Baden-Württemberg	Present			x		Favorable		5, 3, 7
Metzisweiler Weiher	Germany	Baden-Württemberg	Present			x		Unfavorable	Number of individuals, competition	3
Kleiner Ursee	Germany	Baden-Württemberg	Present			x	(x)	Unfavorable	Number of individuals, possible hybridization	1, 7

Reuteweiher	Germany	Baden-Württemberg	Present		x			Unknown		1, 7
Schlossweiher bei Sigglen	Germany	Baden-Württemberg	Present			x		Favorable		1,3, 5, 7
Rösslerweiher	Germany	Baden-Württemberg	Present			x	(x)	Medium favorable	Eutrophication, possible hybridization	3
Grundweiher	Germany	Baden-Württemberg	Present			x		Medium favorable	Competition	7, 3
Buchsee	Germany	Baden-Württemberg	Extinct	x						7
Boscherweiher	Germany	Baden-Württemberg	Extinct	x						7
Grosser Ursee	Germany	Baden-Württemberg	Extinct	x			x			1, 3, 7
Wurzacher Ach	Germany	Baden-Württemberg	Extinct	x						7
Schwindelsee	Germany	Baden-Württemberg	Extinct	x						7
Schwaigfurter weiher	Germany	Baden-Württemberg	Extinct	x						1, 7
Osterholzweiher	Germany	Baden-Württemberg	Extinct	x						1, 7
Scheibensee	Germany	Baden-Württemberg	Extinct	x						1, 7
Taufachmoos	Germany	Baden-Württemberg	Extinct	x						7
Sticherweiher	Germany	Bayern	Present			x		Unfavorable	Number of individuals	5
Röhrenmoos	Germany	Bayern	Present			x	x	Medium favorable	Hybridization	5
Notzenweiher	Germany	Bayern	Present		x			Unfavorable	Number of individuals, possibly extinct	7
Weiler Korbsee bei Bidingen	Germany	Bayern	Extinct	x			x			7
Waldweiher bei Schlachters	Germany	Bayern	Extinct	x						1, 7
Klosterhof bei Wald	Germany	Bayern	Extinct	x			x			7
Attelsee	Germany	Bayern	Extinct	x						7
Teich bei Bad Tölz	Germany	Bayern	Extinct	x						7
Wesslinger See	Germany	Bayern	Extinct	x						7
Neuweiher	Germany	Bayern	Extinct	x						7
Spitzingsee	Germany	Bayern	Extinct	x						7
Weiher bei Konstanz	Germany	Bayern	Extinct	x						7
Filzweiher	Germany	Bayern	Extinct		x		x			5
Haldensee	Austria	Tyrol	Present			x		Favorable		7, 5
Gräppelensee	Switzerland	St-Gall	Present			x		Favorable		2, 5
Kämmoosteich	Switzerland	Zürich	Present			x	x	Medium favorable	Hybridization	2, 5
Lac des Joncs	Switzerland	Fribourg	Present			x		Unfavorable	Number of individuals, competition	2, 5
Lac de Lussy	Switzerland	Fribourg	Extinct			x	x			2, 5
Hüttensee	Switzerland	Zürich	Extinct	x						2
Egelsee	Switzerland	Zürich	Extinct	x						2
Lützelsee	Switzerland	Zürich	Extinct	x						2
Near Wädenswill	Switzerland	Zürich	Extinct	x						2
Manansee	Switzerland	Luzern	Extinct	x						2
Baldeggersee	Switzerland	Luzern	Extinct	x						2
Soppensee	Switzerland	Luzern	Extinct	x						2
Wauwillermoos	Switzerland	Luzern	Extinct	x						2

Sempachersee	Switzerland	Luzern	Extinct	x						2
Rothsee	Switzerland	Luzern	Extinct	x						2
Sarnersee	Switzerland	Obwalden	Extinct	x						2
Lauerzersee	Switzerland	Schwyz	Extinct	x						2
Aegerisee	Switzerland	Zug	Extinct	x						2