

Pflanzenauswahl nach ökologischen Präferenzen

Plant selection according to ecological criteria

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**Nature-based
solution**

**ökologische
Präferenz der
Pflanzenarten**

**Geologie,
mineralische
Komponenten
des Wasser**

**Langzeit-
ergebnisse**



**Nature-based
solution**

**Ecological
preferences
of plants**

**Geology,
mineral
compounds of
water**

**Long-term
results**

A photograph of a pond filled with green lily pads. In the center, a single pink lotus flower is in bloom. The water is dark and reflects the surrounding greenery. The text is overlaid on the image in white, enclosed in a dashed white box.

**Pflanzen im
Schwimmteich
sollen ...**

**im Wasser
gelöste
Nährstoffe
binden**

**schön
aussehen und
gut wachsen**

**Sauerstoff
ins Wasser
einbringen**

A photograph of a pond filled with green lily pads. In the center, a pink lotus flower is in bloom. The water is dark and reflects the surrounding greenery. The text is overlaid on the image in white, with a dotted white border around the central area.

**Plants in
Natural pools
should ...**

**absorb
diluted
nutrients**

**grow well and
look pretty**

**oxygenize
the water**

ökologische Präferenz / ecological preference

Nr.	Name	Ökologisches Verhalten							Lebensf.		Soz. Verh.				Häufigk.				
		L	T	K	F	R	N	S	Leb.	B.	Gr.	K	O	V	U	M	D	Ä	G
475	Iris (Irid.)																		
01	aphylla	8	7	6	3	6	1	0	G	S	5.	2	1	3					
06	2030 germanica	8	8	3	3	8	2	0	H	S	5.	3	2		2	5	8		
12	2027 pseudacorus	7	6	3	9	×	7	0	A, G	W	1.	5	1		9	5	5		
15	2031 sambucina	9	7	6	3	9	4	0	G	S	verwildert				2	4	2		
17	2026 sibirica	8	6	5	8	6	2	0	G	S	5.	4	1		3	5	2	2	
18	2028 spuria	9	8	5	7	8	3	2	G	S	5.	4	1	1	1	4	2	1	
19	2029 variegata	7	7	6	3	×	?	0	H	S	verwildert				1	4	2	1	

Als ökologische Präferenz bezeichnet der Botaniker Heinz Ellenberg das ökologische Verhalten von Pflanzen unter Konkurrenzbedingungen in der freien Landschaft hinsichtlich verschiedener Umweltfaktoren (Licht, Temperatur, Kontinentalität, Feuchte, Bodenreaktion, Nährstoffe, Salz).

As ecological preference, the botanist Heinz Ellenberg describes the ecological behavior of plants under competitive conditions in the open landscape with regard to various environmental factors (light, temperature, continentality, humidity, soil reaction, nutrients, salt).

ökologische Präferenz / ecological preference

Der Botaniker Heinz Ellenberg hat die ökologischen Präferenzen von Pflanzen in Mitteleuropa ermittelt und einer Skala von 1 – 9 zugeordnet:

Alkalinität / Alcalinity	weich			mittel			hart		
R-Wert / R-value	(sauer/acid)			(neutral)			(alkalin/alkaline)		
Ellenberg-Wert	1	2	3	4	5	6	7	8	9
Trophie / Trophic state	nährstoffarm/poor			mässig/medium			nährstoffreich/rich		
P-Wert / P-value	(oligotroph)			(mesotroph)			(eutroph)		

Der Wert “x” bedeutet “indifferent” in ihrer ökologischen Präferenz.

Der Wert “?” bedeutet, die ökologischen Präferenz ist nicht bekannt.

The botanist Heinz Ellenberg has determined the ecological preferences of plants in Central Europe and assigned a scale of 1 - 9:

The value "x" means "indifferent" in their ecological preference.

The value "?" means that the ecological preference is unknown.

ökologische Präferenz / ecological preference

Wasserpflanzen-
liste mit den
Ellenberg –
Werten

R (Alkalinität)

und

N/P (Trophie)

und

pflanzensozio-
logischer
Zuordnung der
Arten

Water plant list
with *Ellenberg* –
values

R (Alkalinity) and

N/P (Trophic) and

phytosociological
communities

			R	N	SOZ
Alisma	plantago-aquatica	x	8	1.5 Phragmitetea, Röh	
Baldellia	ranunculoides	x	2	1.414 Hydrocotylo-Balc	
Bolboschoenus	maritimus	8	7	1.512 Bolboschoenion	
Butomus	umbellatus	x	7	1.511 Phragmition	
Carex	pendula	6	6	8.433 Alno-Ulmion	
Carex	riparia	7	4	1.514 Magnocaricion	
Cladium	mariscus	9	3	1.511 Phragmition	
Hippuris	vulgaris	8	x	1.511 Phragmition	
Iris	pseudacorus	x	7	1.51 Phragmitetalia	
Lythrum	salicaria	6	x	1.51 Phragmitetalia	
Mentha	aquatica	7	5	1.51 Phragmitetalia	
Myosotis	laxa	4	7	1.514 Magnocaricion	
Myriophyllum	alterniflorum	6	3	1.41 Littorelletalia	
Myriophyllum	verticillatum	7	8	1.312 Nymphaeion (alt	
Nymphaea	alba	7	5	1.312 Nymphaeion (alt	
Nymphoides	peltata	8	7	1.312 Nymphaeion (alt	
Phragmites	australis	7	7	1.511 Phragmition	
Potamogeton	berchtoldii	7	5	1.31 Potamogetonetali:	
Potamogeton	crispus	7	5	1.31 Potamogetonetali:	
Potamogeton	pectinatus	8	8	1.311 Potamogetonion	
Potamogeton	polygonifolius	3	2	1.4 Litorelletea Strandli	
Potamogeton	trichoides	5	4	1.311 Potamogetonion	
Ranunculus	flammula	8	2	1.415 Deschampsion li	
Ranunculus	lingua	6	7	1.511 Phragmition	
Schoenoplectus	lacustris	7	6	1.511 Phragmition	
Schoenus	nigricans	9	2	1.721 Caricion davallia	

Pflanzenmengen / plant's quantities

**Aquakultur /
aquaculture:
6-10 /m²**

**Ufer / margins:
3-7 /m²**

**einige Hundert
Pflanzen /
some hundreds
of plants**



Wasser

Wasser ist die wichtigste Komponente im Schwimmteich

Wasseranalyse und deren Interpretation notwendig

Wasserqualität definiert das biologische Reinigungssystem

		POND ANALYST		
Kunde	Reidie			
Projekt	Sesmaries			
Messstelle	Am Steg			
Berichtsdatum	10.09.2016			
Datum Messung	25.07.2015			
R (Ellenberg)	7			
P (Ellenberg)	3			
Analyseergebnisse				
Parameter	Ergebnis	Einheit	Empfehlung von / bis	Anmerkung
Temperatur	30,5	°C	/ /	
Sichttiefe	2,0	m	2,0 /	
Trübung		NTU	/ /	
O ₂		mg/l	4 / 12	
O ₂		%	80 / 120	
Leitfähigkeit	924	µS/cm	290 / 1000	
pH (Teich)	7,8		8,8 / 9,0	
Redox	222	mV	/ /	
pH	23,33		19,50 / 22,00	
Ca	128,4	mg/l	/ /	
Gesamthärte		°dH	6 / 80	
Karbonathärte	17,98	°dH	5 /	
SBV	8,42	mmol/l	2 /	
CO ₂	10,7	mg/l	1,0 / 100,0	
lakt.		mg/l	0,00 / 4,00	
lakt.		mg/l	/ / 0,02	
NO _x	1,06	mg/l	10,00 / 50,00	0,0225 €/m³ BIOFOP
NO ₃		mg/l	/ / 0,20	
SAP	0,006	mg/l	/ / 0,010	
P total	0,016	mg/l	/ / 0,020	mesotroph
Pk. Produktion		mg Cl / (cm d)	/ / 300	
pot. Algae	2	mg Cl a / l	/ / 10	eulgotroph
Limitierender Nährstoff				
REDFIELD-Formel	Masseverhältnis	C	N	P
Verhältnis C:N:P im Teich	Masseverhältnis	41	7,2	1
		293,2	22,8	1
Wachstumslimitierender Nährstoff P.				
Gefahr von Blaualgenblüte gering				

Wasser

water is the most important component in a natural pool

water analysis and it's interpretation is necessary

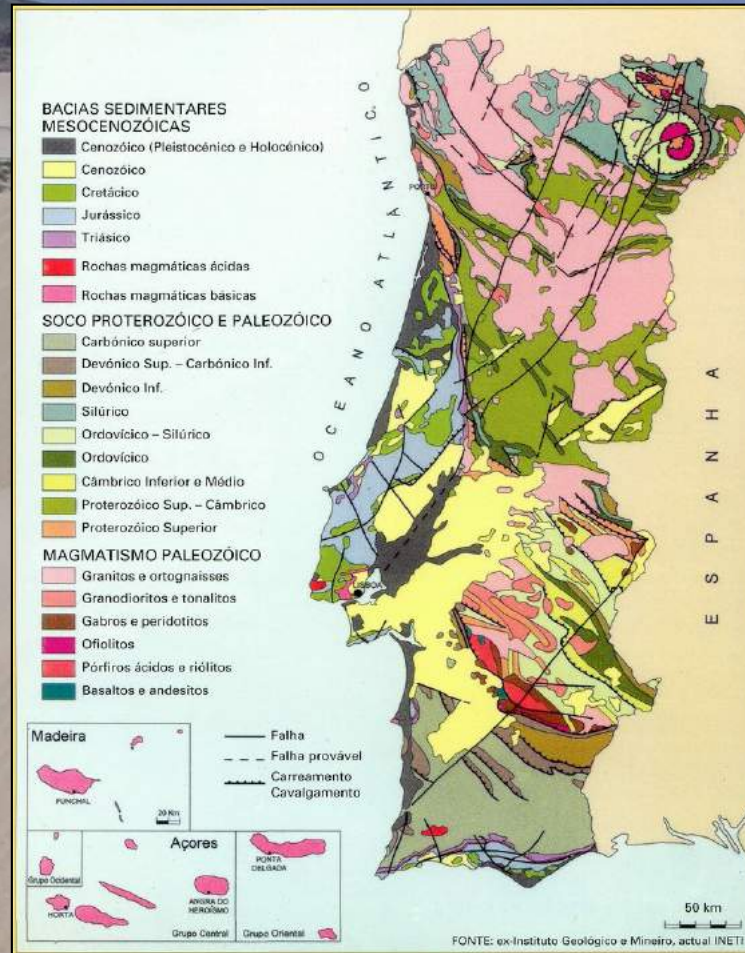
water quality defines the biological treatment system

		POND ANALYST		
Kunde	Peckle			
Projekt	Sesmaries			
Messstelle	Am Steg			
Berichtsdatum	10.09.2016			
Datum Messung	25.07.2015			
R (Ellenberg)	7			
P (Ellenberg)	3			
Analyseergebnisse				
Parameter	Ergebnis	Einheit	Empfehlung von / bis	Anmerkung
Temperatur	30,5	°C	/ /	
Sichttiefe	2,0	m	2,0 /	
Trübung		NTU	/ /	
O ₂		mg/l	4 / 12	
O ₂		%	80 / 120	
Leitfähigkeit	924	µS/cm	290 / 1000	
pH (Tisch)	7,8		8,8 / 9,0	
Redox	222	mV	/ /	
pH	23,33		19,50 / 22,00	
Ca	128,4	mg/l	/ /	
Gesamthärte		°dH	6 / 80	
Karbonathärte	17,98	°dH	5 /	
SBV	8,42	mmol/l	2 /	
CO ₂	10,7	mg/l	1,0 / 100,0	
lakt.		mg/l	0,00 / 4,00	
lakt.		mg/l	/ / 0,02	
NO _x	1,06	mg/l	10,00 / 50,00	0,0225 €/m³ BODIP
NO ₃		mg/l	/ / 0,20	
SRP	0,006	mg/l	/ / 0,010	
P total	0,016	mg/l	/ / 0,020	mesotroph
Pk. Produktion		mg Cl / (cm d)	/ / 300	
pot. Algae	2	mg Cl a / l	/ / 10	eulgotroph
Limitierender Nährstoff				
REDFIELD-Formel	Masseverhältnis	C	N	P
Verhältnis C:N:P im Tisch	Masseverhältnis	41	7,2	1
		293,2	22,8	1
Wachstumslimitierender Nährstoff P.				
Gefahr von Blaualgenblüte gering				

Gestein

Silikat-
Gesteine wie
Granit, Gneiss
Grauwacke,
Schiefer

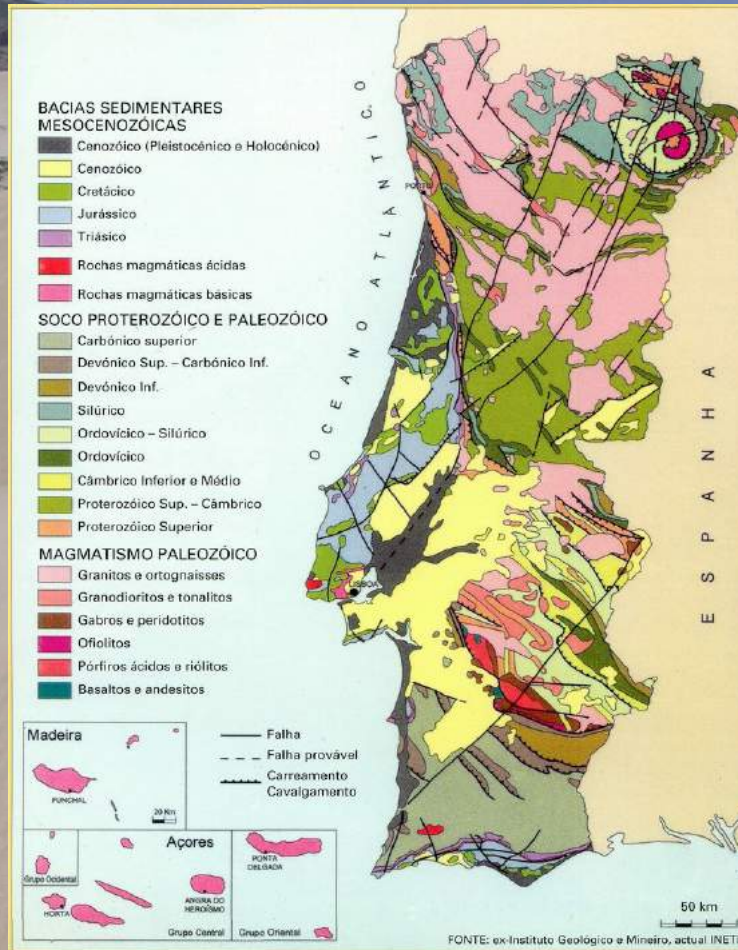
Karbonat-
Gesteine wie
Kalkstein,
Mergel,
Dolomit



Geology

Silicat rocks
such as
granite,
gneiss,
grauwacke,
xist

Carbonate
rocks such as
limestone,
marl, dolomite



Wasser

Saures Wasser:
geringe Härte (< 1-8 °dH),
niedrige Karbonatwerte,
leicht sauren Charakter
(pH 5-7),
niedrige Leitfähigkeit
(< 50 - 300 microS),
geringe Pufferkapazität

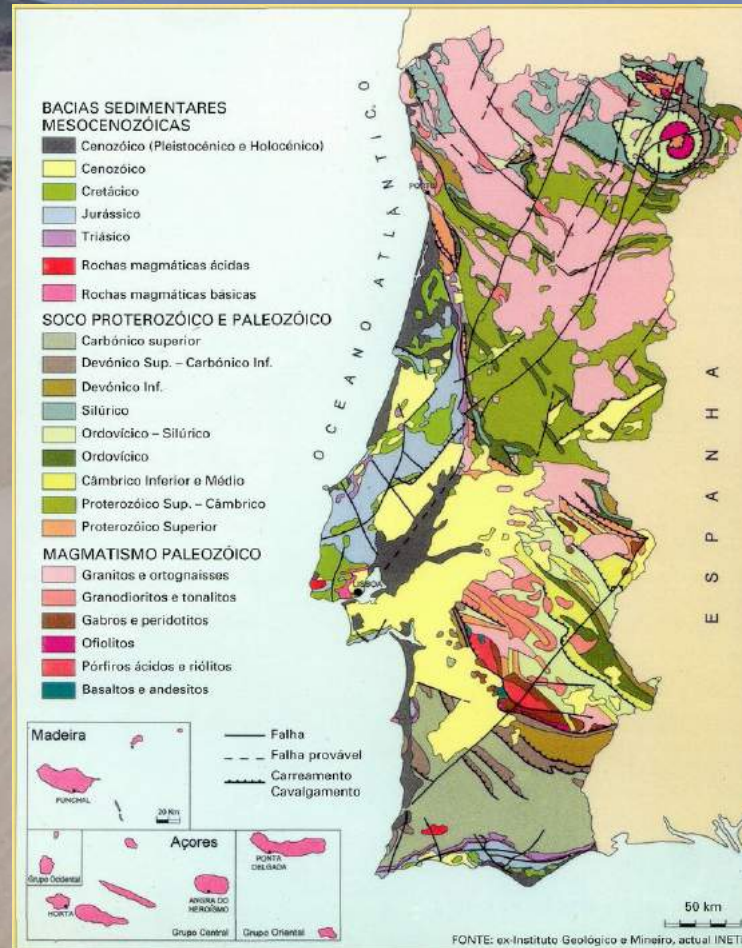
Karbonat-Wasser:
hohe Härte (5 – 40° dH),
hohe Karbonatwerte,
neutralen bis leicht
basischen Charakter
(pH 6,5 – 8,5),
hohe Leitfähigkeit
(200 – 1000 microS),
große Pufferkapazität



Water

Acid water:
low hardness (<1-8 °dH),
low carbonate values,
slightly acidic character
(pH 5-7),
low conductivity
(<50 - 300 microS),
low buffer capacity

Carbonate water:
high hardness (5-40° dH),
high carbonate values,
neutral to slightly basic
character
(pH 6.5-8.5),
high conductivity
(200 - 1000 microS),
large buffer capacity



Geologie / Geology

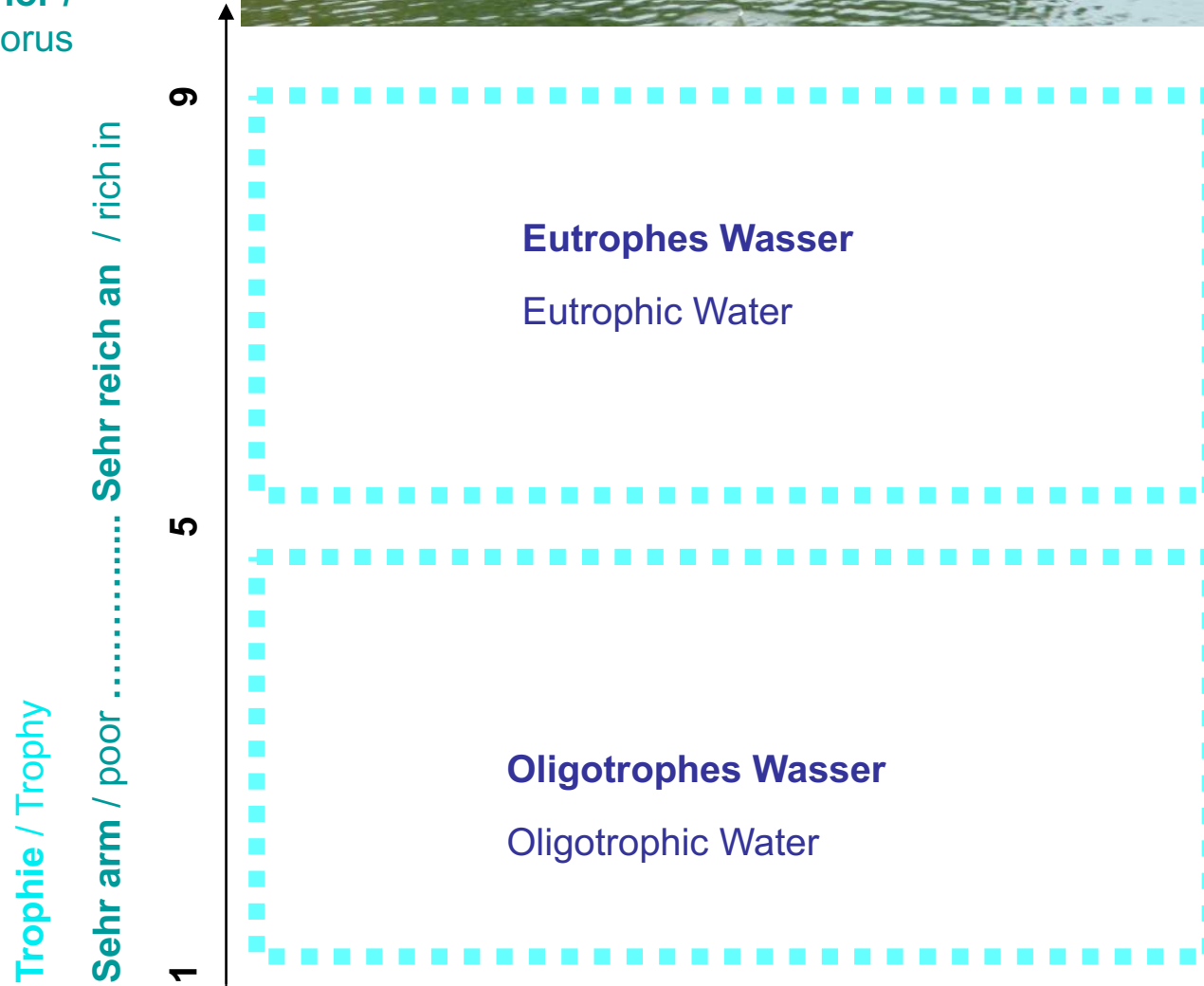
Der Alkalinitätswert korrespondiert mit der Fähigkeit von Gestein oder Wasser Säuren zu absorbieren.

Alcalinity values corresponds with the capacity of stones or water to absorb acids.



Nährstoffe / nutrients

Phosphor /
phosphorus
 PO_4

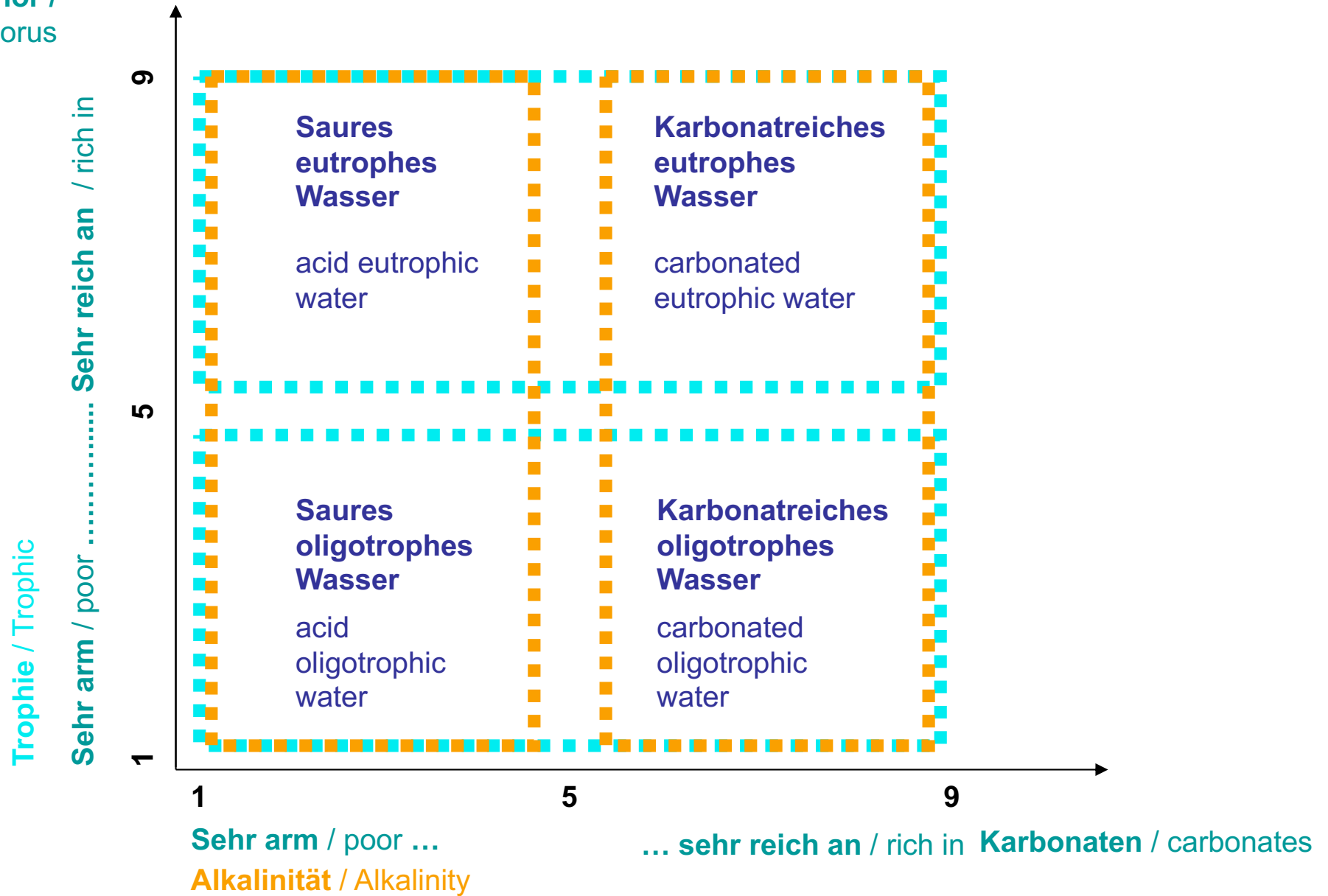


Der Phosphorgehalt
spiegelt die Trophie
des Wassers.

The phosphorus value
reflects the trophic
state of the water.

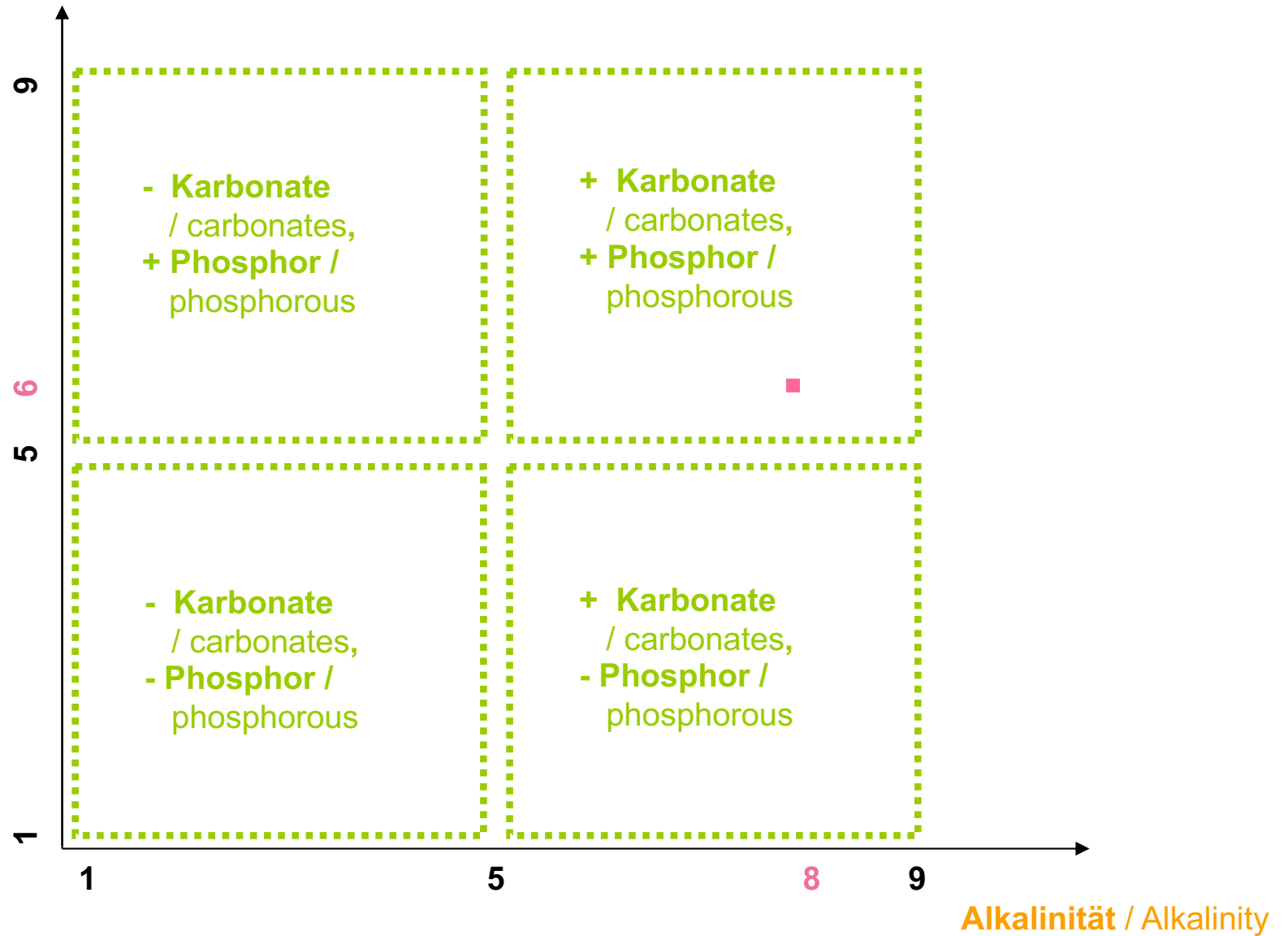
Wassertypen / water types

Phosphor /
phosphorus
PO₄

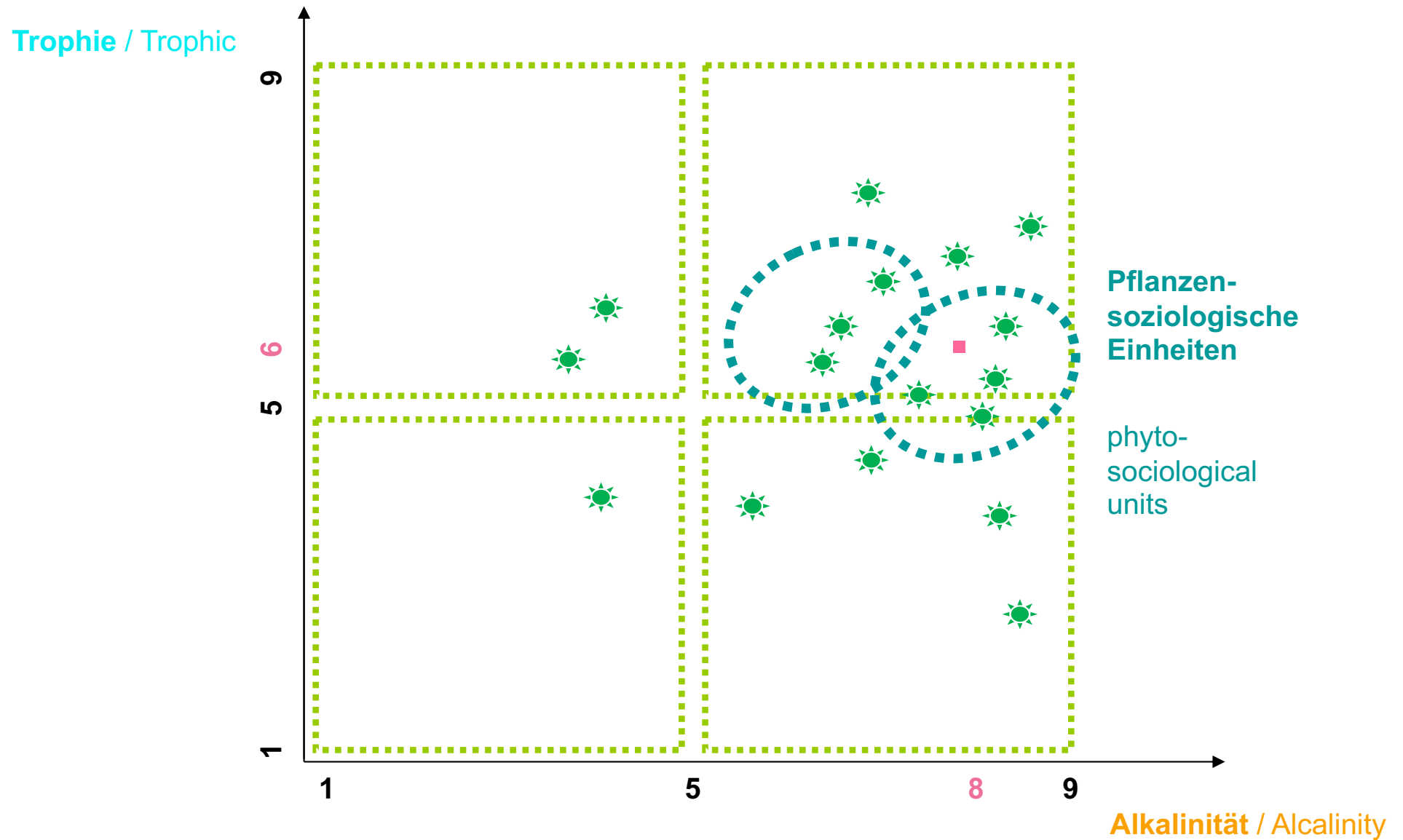


Wassertypen / water types

Trophie / Trophic



Wassertypen & Pflanzen / water types & plants



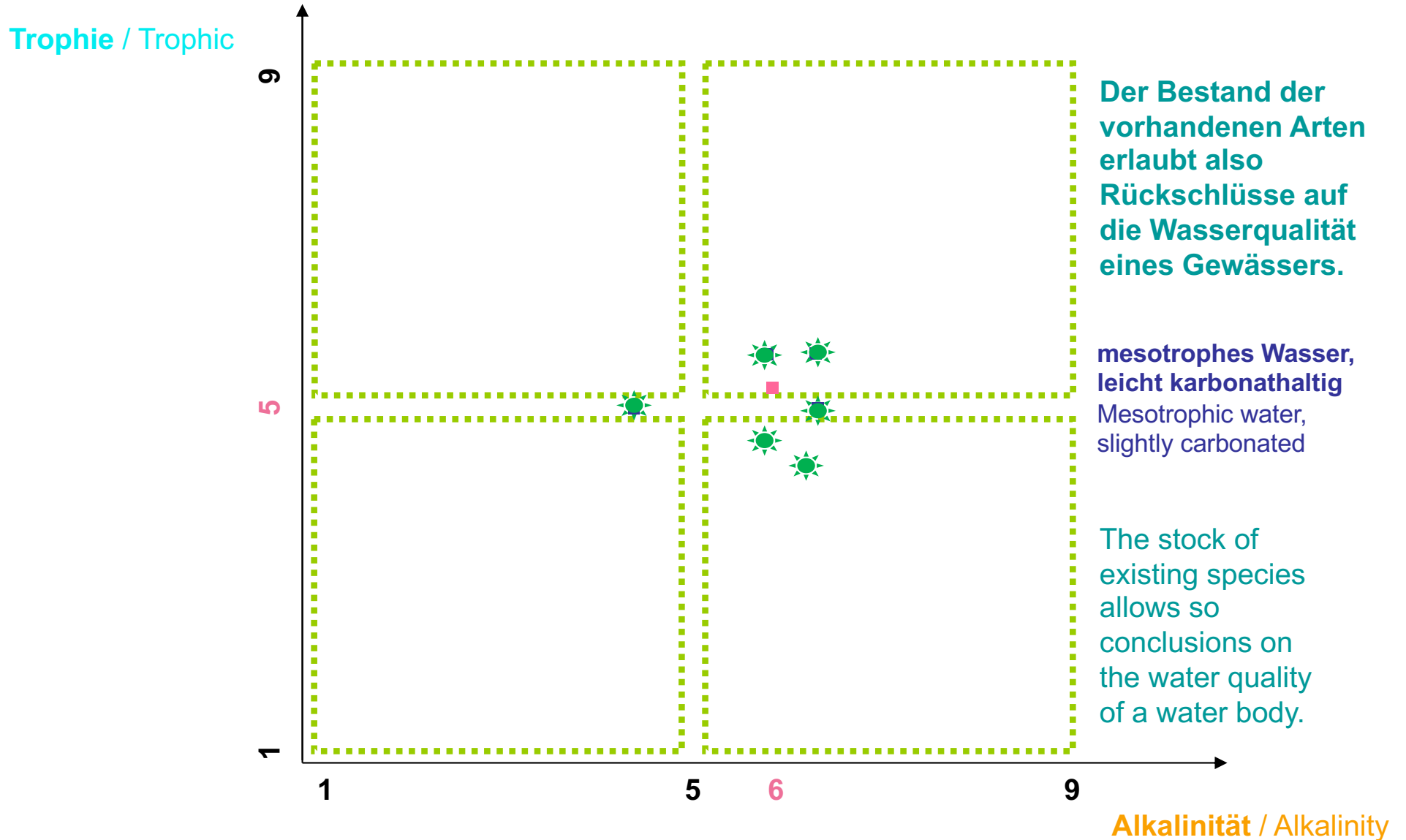
Beispiel aus der Natur

Example from nature:

Natürliche Vegetation / natural vegetation:
Nymphaea alba - Weisse Seerose 7/5
Schoenoplectus palustris – Flechtbinse 7/6
Gratiola linifolia – Sumpf-Gnadenkraut 6/6
Thelypteris palustris – Sumpffarn 5/4
Alnus glutinosa – Erle 6/x



Beispiel aus der Natur / Example from nature:





**Heimische
Arten
verwenden**

**Keine
exotischen
invasiven
Arten nutzen!**

**verantwortungsvoll mit
der Umwelt
umgehen**

**invasive
Arten
verursachen
grosse
Schäden**



**use of native
species**

**No use
of exotic
invaders!**

**responsible
treatment of
the
environment**

**invasive
species
cause
huge
damages**

Kunde Quinta do Pomarinho
 Projekt Taafel
 Messstelle Brunnen
 Berichtsdatum 13.01.2015

Saures oligotrophes Wasser / acid oligotrophic water

Analyseergebnisse

Orientierungswerte / recommendations

Parameter	Ergebnis	Einheit	Empfehlung von / bis	Anmerkung
Leitfähigkeit	216	µS/cm	200 / 1000	
pH (Teich)	6,4	-	6,9 / 9,0	
Redox		mV	/	
rH	-	-	19,50 / 22,00	
Ca	11	mg/l	/	
Gesamthärte	2,97	°dH	6 / 30	
Karbonathärte	1,54	°dH	5 /	346.0 g/m ³ OPTILAKE
SBV	0,55	mmol/l	2 /	
CO ₂	23,6	mg/l	1,0 / 100,0	
NH ₄	0,05	mg/l	0,00 / 4,00	
NH ₃		mg/l	/ 0,02	
NO ₃	11,99	mg/l	10,00 / 50,00	
NO ₂	0,05	mg/l	/ 0,20	
SRP	0,002	mg/l	/ 0,010	
P total	0,006	mg/l	/ 0,020	oligotroph
Pot. Produktion	99	mg C/ (cm ² d)	/ 300	oligotroph
pot. Algae	1	mg Cl.a / l	/ 10	oligotroph

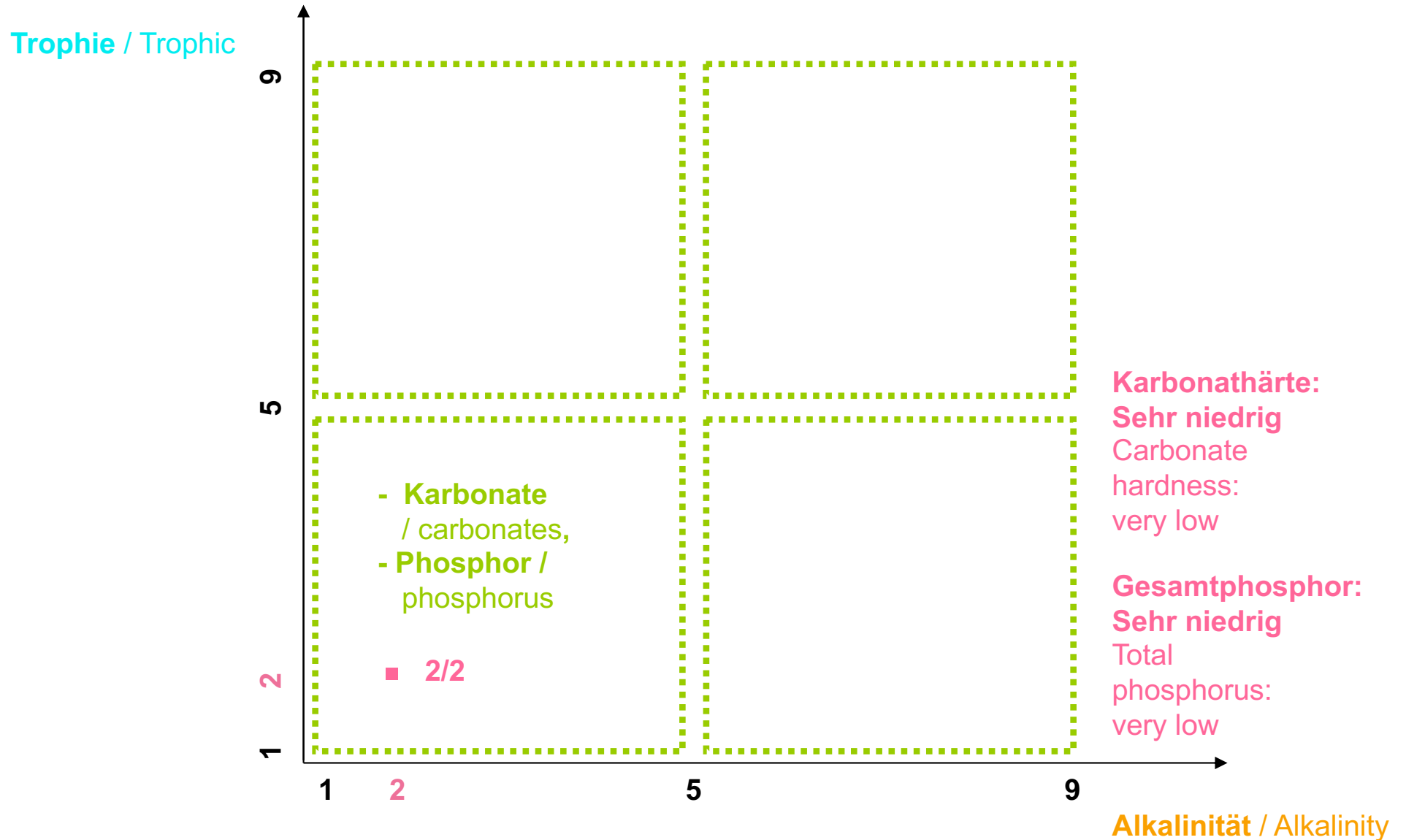
Karbonathärte:
 Sehr niedrig
 Carbonate hardness:
 very low

Gesamtphosphor:
 Sehr niedrig
 Total phosphorus:
 Very low

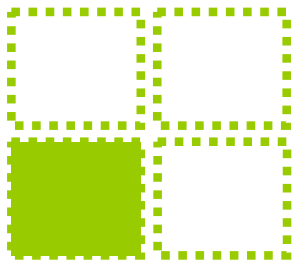
Limitierender Nährstoff		C	N	P
REDFIELD-Formel	Masseverhältnis	41	7,2	1
Verhältnis C:N:P im Teich	Masseverhältnis	1.075,6	464,3	1

Wachstumslimitierender Nährstoff P.
 Gefahr von Blaualgenblüte gering

Saures oligotrophes Wasser / acid oligotrophic water

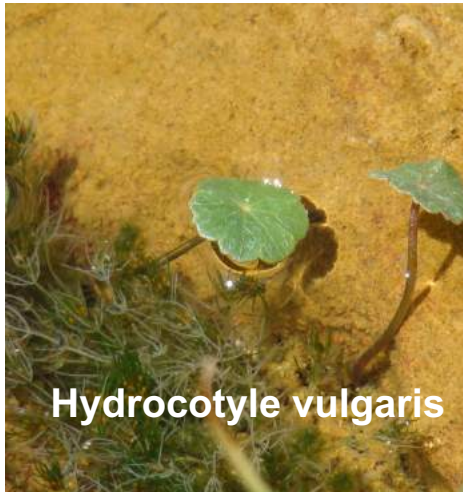


Saures oligotrophes Wasser / acid oligotrophic water



Repräsentative Art / representative species: *Potamogeton gramineus*

Saures oligotrophes Wasser / acid oligotrophic water



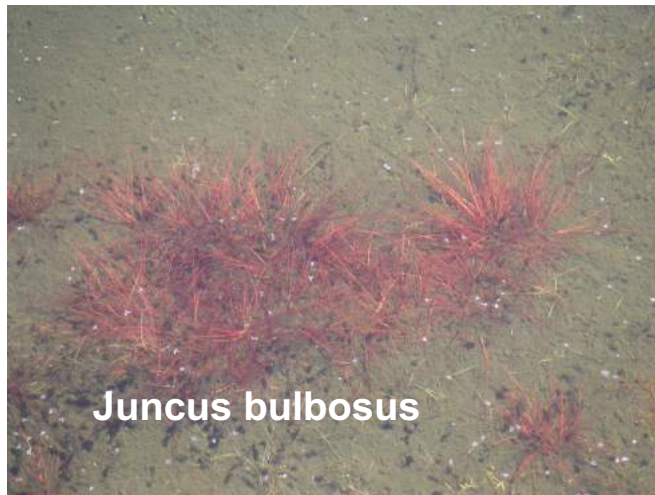
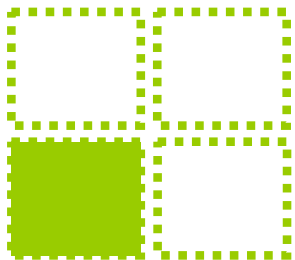
Hydrocotyle vulgaris



Potamogeton gramineus



Utricularia australis



Juncus bulbosus



Myriophyllum alterniflorum

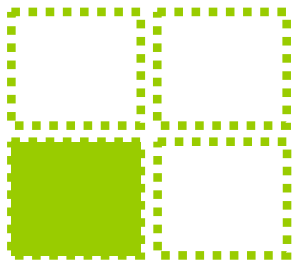
Repräsentative Art / representative species: *Potamogeton gramineus*

Saures oligotrophes Wasser / acid oligotrophic water



Repräsentative Art / representative species: *Potamogeton gramineus*

Saures oligotrophes Wasser / acid oligotrophic water



Repräsentative Art / representative species: *Potamogeton gramineus*

Saures oligotrophes Wasser / acid oligotrophic water



Familia	Nome	R	N	SOZ
Callitriche	hermaphroditica	4	3	1.31 Potamogetonei
Potamogeton	schweinfurthii	5	4	1.31 Potamogetonei
Potamogeton	gramineus	5	5	1.311 Potamogetoni
Potamogeton	trichoides	5	4	1.311 Potamogetoni
Utricularia	australis	5	3	1.312 Nymphaeion (
Nymphaea	Odorata	7	5	1.312 Nymphaeion (
Potamogeton	polygonifolius	3	2	1.4 Littorelletea Stra
Juncus	bulbosus	5	2	1.41 Littorelletalia
Myriophyllum	alterniflorum	6	3	1.41 Littorelletalia
Hypericum	elodes	2	1	1.414 Hydrocotylo-E
Juncus	heterophyllos	2	1	1.414 Hydrocotylo-E
Hydrocotyle	vulgaris	3	2	1.414 Hydrocotylo-E
Lobelia	urens	3	2	1.414 Hydrocotylo-E
Marsilea	batardae	3	2	1.414 Hydrocotylo-E
Pilularia	globulifera	4	2	1.414 Hydrocotylo-E
Baldellia	ranunculoides	x	2	1.414 Hydrocotylo-E
Lythrum	junceum	3	3	1.51 Phragmitetalia
Eleocharis	palustris	x	?	1.51 Phragmitetalia
Iris	pseudacorus	x	7	1.51 Phragmitetalia
Fuirena	pubescens	4	3	1.514 Magnocaricioi
Carex	vulpina	x	5	1.514 Magnocaricioi
Cyperus	longus	x	5	1.514 Magnocaricioi
Juncus	atriculatus	x	2	1.7 Scheuchzerio-C
Carex	nigra	3	2	1.73 Caricetalia nigr
Juncus	effusus	3	4	5.41 Molinietaalia
Juncus	conglomeratus	4	3	5.41 Molinietaalia
Scutellaria	minor	4	2	5.414 Juncion acutif
Juncus	acutiflorus	5	3	5.414 Juncion acutif
Juncus	rugosus	5	3	5.414 Juncion acutif
Lotus	pedunculatus	5	3	5.414 Juncion acutif
Anagallis	tenella	x	2	5.414 Juncion acutif

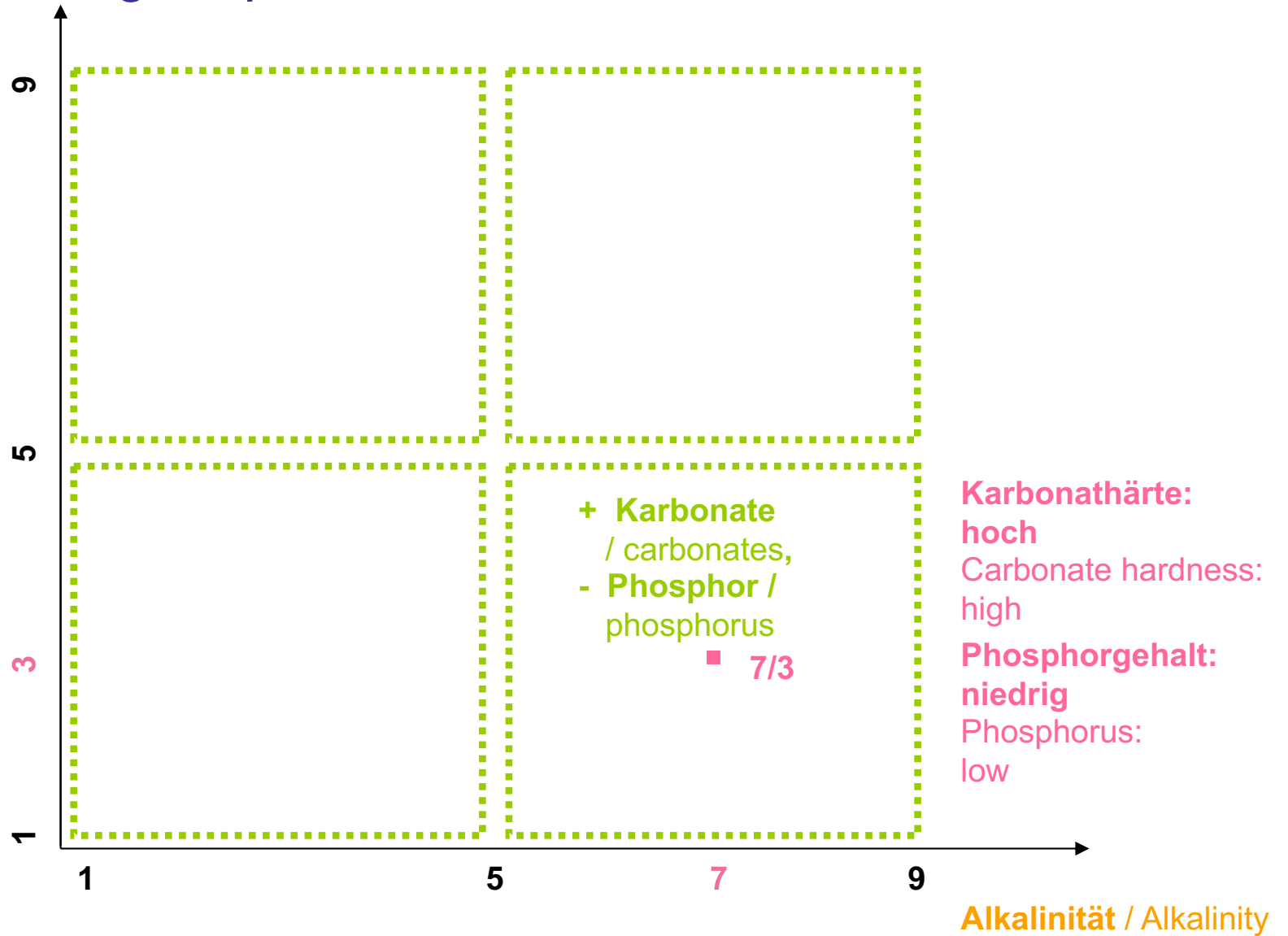
pflanzen-
soziologische
Zuordnung /
plant's
sociological
classification

Saures oligotrophes Wasser / acid oligotrophic water

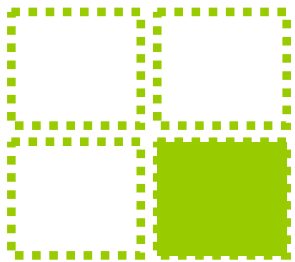


Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water

Trophie / Trophic



Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water



Repräsentative Art / representative species: *Potamogeton nodosus*

Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water



Potamogeton coloratus



Callitriche hamulata



Potamogeton nodosus

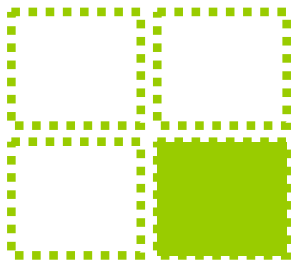


Groenlandia densa



Repräsentative Art / representative species: *Potamogeton nodosus*

Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water



Repräsentative Art / representative species: *Potamogeton nodosus*

Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water



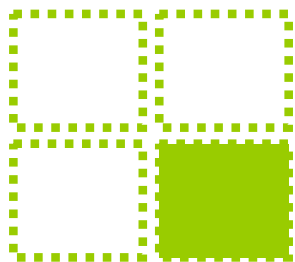
Myosotis lusitanica



Hippuris vulgaris



Juncus subnodulosus



Repräsentative Art / representative species: *Potamogeton nodosus*

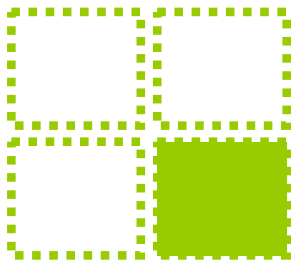
Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water



Familia	Nome	R	N	SOZ
Potamogeton	schweinfurthii	5	4	1.31 Potamogetonei
Potamogeton	perfoliatus	7	6	1.311 Potamogetoni
Potamogeton	coloratus	8	8	1.311 Potamogetoni
Nymphaea	spec.	7	5	1.312 Nymphaeion (
Potamogeton	natans	7	5	1.312 Nymphaeion (
Callitriche	hamulata	6	4	1.313 Ranunculion f
Groenlandia	densa	8	5	1.313 Ranunculion f
Potamogeton	nodosus	8	5	1.313 Ranunculion f
Ranunculus	penicillatus	6	x	1.313 Ranunculion f
Mysiophyllum	alterniflorum	6	3	1.41 Littorelletalia
Baldellia	ranunculoides	x	2	1.414 Hydrocotylo-E
Ranunculus	flammula	8	2	1.415 Deschampsio
Myosotis	lusitanica	9	2	1.415 Deschampsio
Eleocharis	acicularis	x	2	1.417 Eleocharition
Carex	pseudocyperus	6	5	1.51 Phragmitetalia
Alisma	lanceolata	7	5	1.51 Phragmitetalia
Mentha	aquatica	7	5	1.51 Phragmitetalia
Lythrum	salicaria	6	x	1.51 Phragmitetalia
Cladium	mariscus	9	3	1.511 Phragmition
Schoenoplectus	lacustris	7	6	1.511 Phragmition
Hippuris	vulgaris	8	x	1.511 Phragmition
Samolus	valerandi	7	5	1.512 Bolboschoeni
Schoenoplectus	kueckenthalianus	7	7	1.512 Bolboschoeni
Carex	riparia	7	4	1.514 Magnocaricio
Cyperus	longus	x	5	1.514 Magnocaricio
Carex	elodes	6	x	1.514.1 Carex elata-
Schoenus	nigricans	9	2	1.721 Caricion daval
Typha	minima agg	8	2	1.722 Caricion bicol
Lythrum	portula	3	4	3.1 Isoeto-Nanojunc
Juncus	subnodulosus	7	3	5.415 Calthion

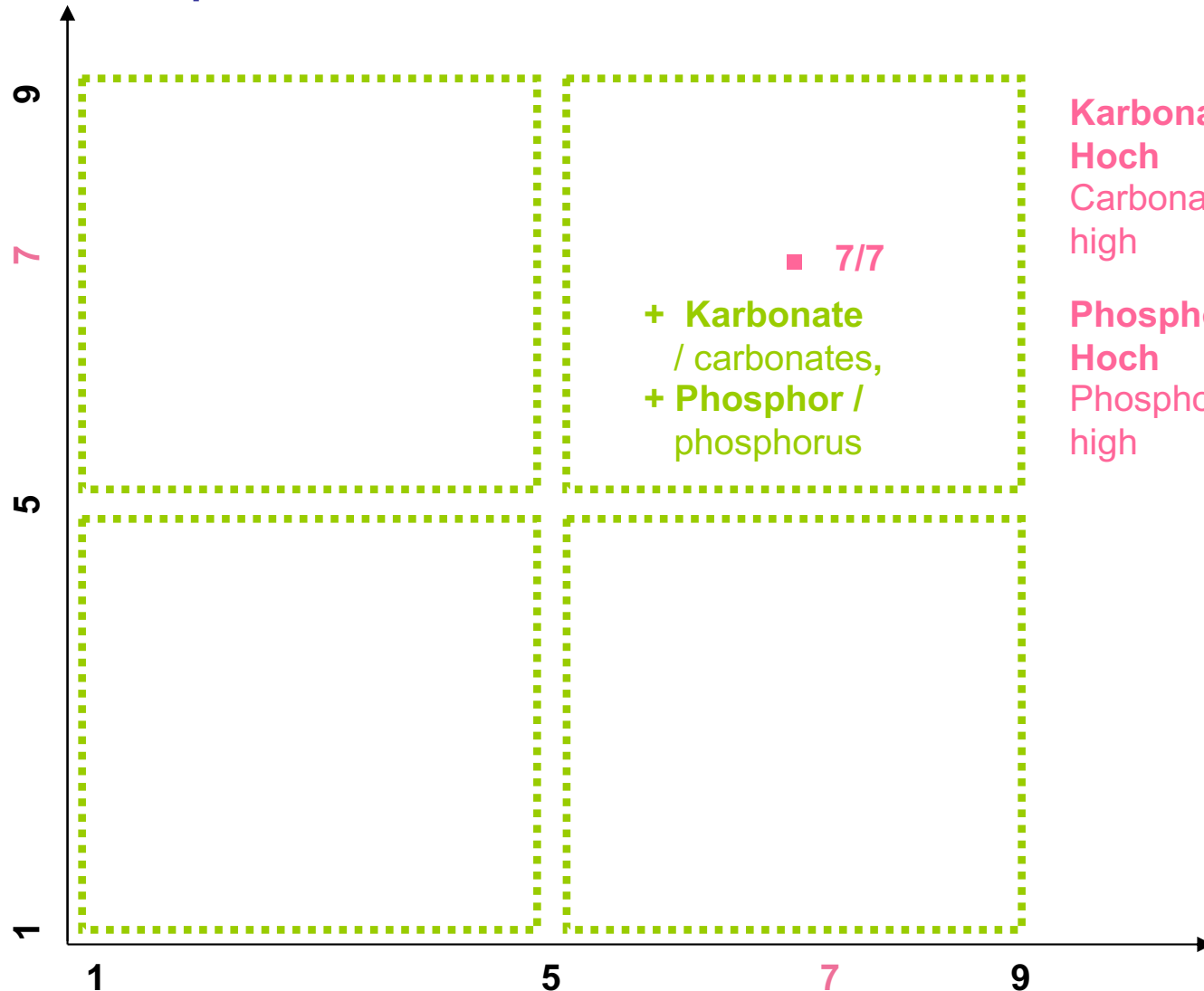
pflanzen-
soziologische
Zuordnung /
phyto-
sociological
classification

Karbonatreiches oligotrophes Wasser / carbonated oligotrophic water



Karbonatreiches eutrophes Wasser / carbonated eutrophic water

Trophie / Trophic

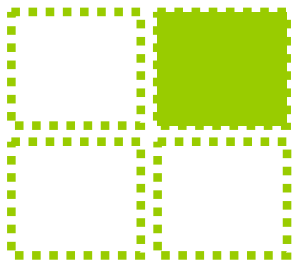


Karbonathärte:
Hoch
Carbonate hardness:
high

Phosphorgehalt:
Hoch
Phosphorus:
high

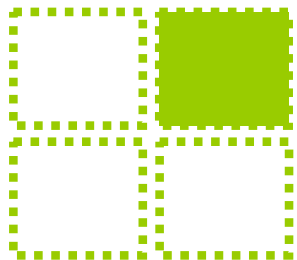
Alkalinität / Alkalinity

Karbonatreiches eutrophes Wasser / carbonated eutrophic water



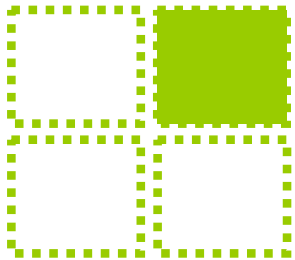
Repräsentative Art / representative species: *Potamogeton pectinatus*

Karbonatreiches eutrophes Wasser / carbonated eutrophic water



Repräsentative Art / representative species: *Potamogeton pectinatus*

Karbonatreiches eutrophes Wasser / carbonated eutrophic water



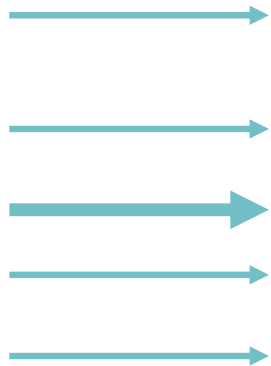
Rorippa nasturtium-officinale



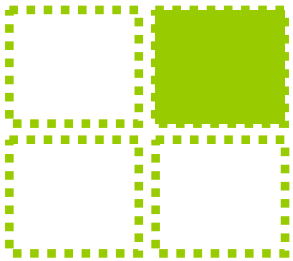
Bolboschoenus maritimus

Repräsentative Art / representative species: *Potamogeton pectinatus*

Karbonatreiches eutrophes Wasser / carbonated eutrophic water

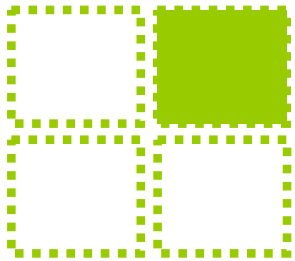


Familia	Nome	R	N	SOZ
Potamogeton	lucens	6	7	1.31 Potamogetonei
Potamogeton	schweinfurthii	5	4	1.31 Potamogetonei
Vallisneria	spiralis	7	7	1.31 Potamogetonei
Potamogeton	perfoliatus	7	6	1.311 Potamogetoni
Potamogeton	coloratus	8	8	1.311 Potamogetoni
Potamogeton	pectinatus	9	7	1.311 Potamogetoni
Nymphaea	spec.	7	5	1.312 Nymphaeion (
Nymphoides	peltata	8	7	1.312 Nymphaeion
Potamogeton	natans	7	5	1.312 Nymphaeion (
Myriophyllum	verticillatum	7	8	1.312 Nymphaeion (
Groenlandia	densa	8	5	1.313 Ranunculion f
Potamogeton	nodosus	8	5	1.313 Ranunculion f
Callitriche	hamulata	7	7	1.313 Ranunculion f
Ranunculus	penicillatus	6	x	1.313 Ranunculion f
Alisma	plantago-aquatica	x	8	1.5 Phragmitetea, R
Carex	pseudocyperus	6	5	1.51 Phragmitetalia
Acorus	calamus	7	7	1.51 Phragmitetalia
Phalaris	arundinacea	7	7	1.51 Phragmitetalia
Iris	pseudacorus	x	7	1.51 Phragmitetalia
Sagittaria	sagittifolia	7	6	1.511 Phragmition
Schoenoplectus	lacustris	7	6	1.511 Phragmition
Phragmites	australis	7	7	1.511 Phragmition
Butomus	umbellatus	x	7	1.511 Phragmition
Hippuris	vulgaris	8	x	1.511 Phragmition
Schoenoplectus	kueckenthalianus	7	7	1.512 Bolboschoeni
Bolboschoenus	maritimus	8	7	1.512 Bolboschoeni
Veronica	beccabunga	7	6	1.513 Sparganio-Gly
Nasturtium	officinale	7	7	1.513 Sparganio-Gly
Carex	crupina	7	7	1.514 Magnocaricior
Veronica	catenata	7	7	3.211 Bidention
Eupatorium	cannabinum	7	8	3.521 Calystegion s

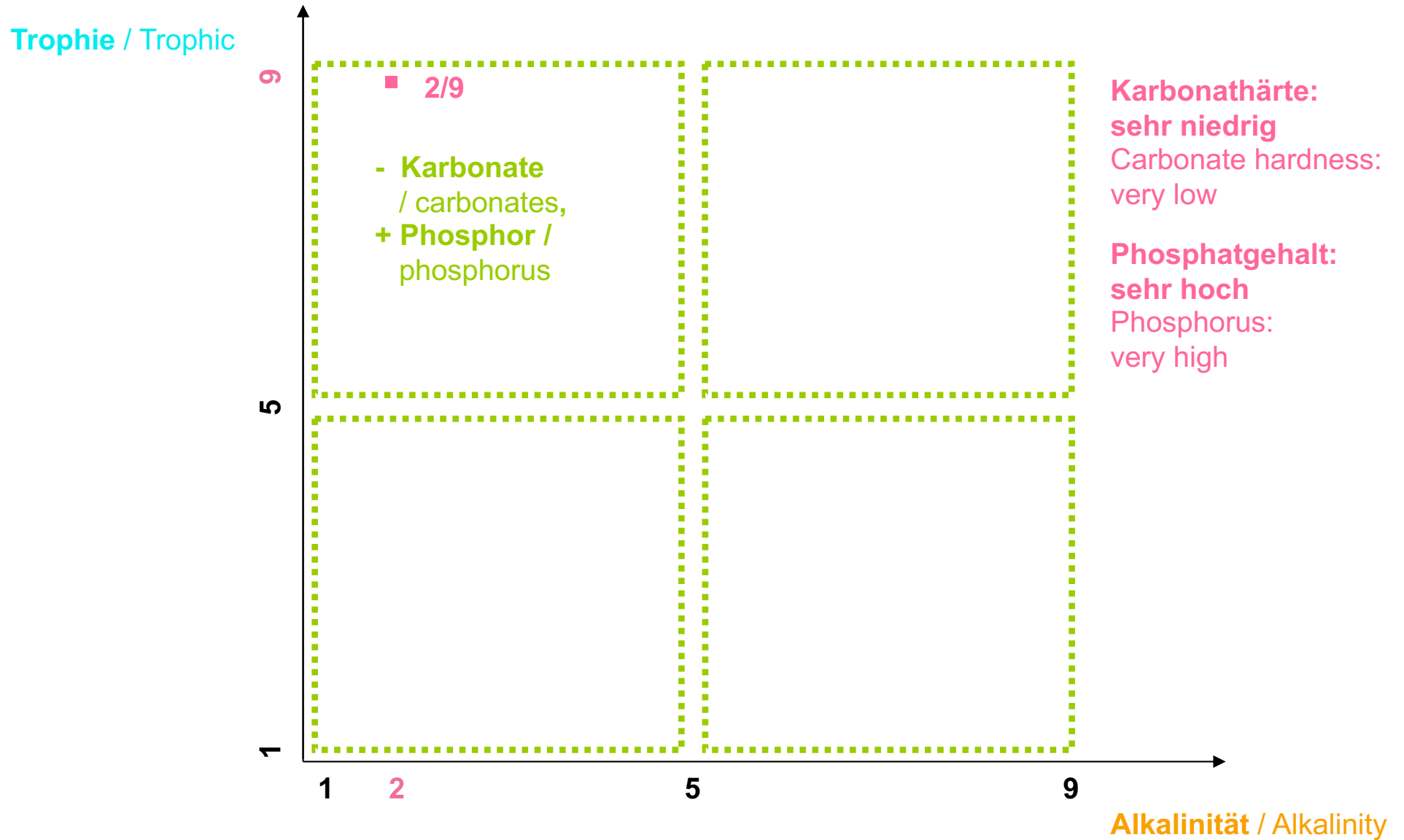


pflanzen-
soziologische
Zuordnung /
plant's
sociological
classification

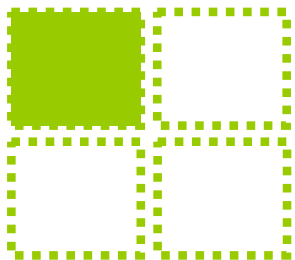
Karbonatreiches eutrophes Wasser / carbonated eutrophic water



Saures eutrophes Wasser / acid eutrophic water

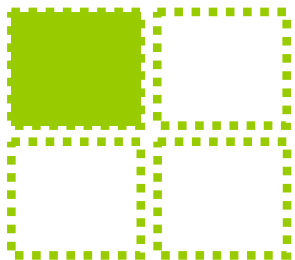
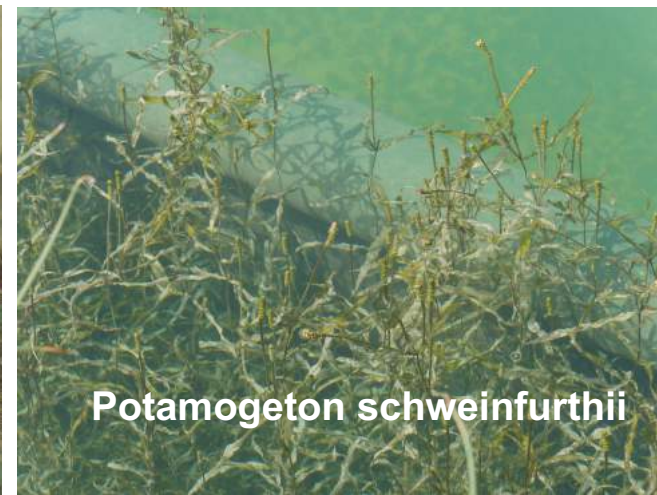
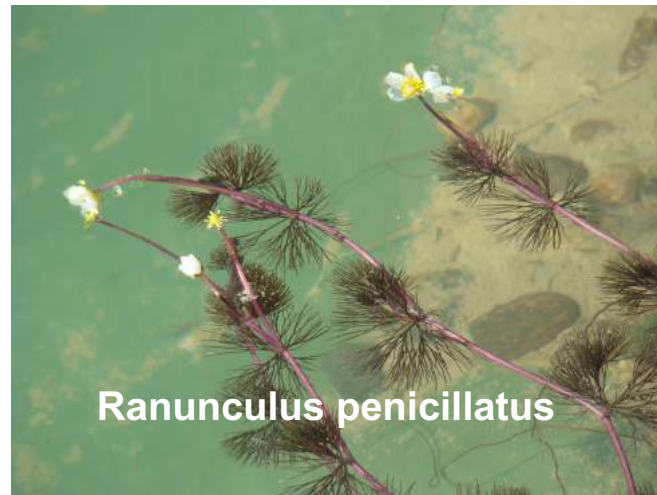
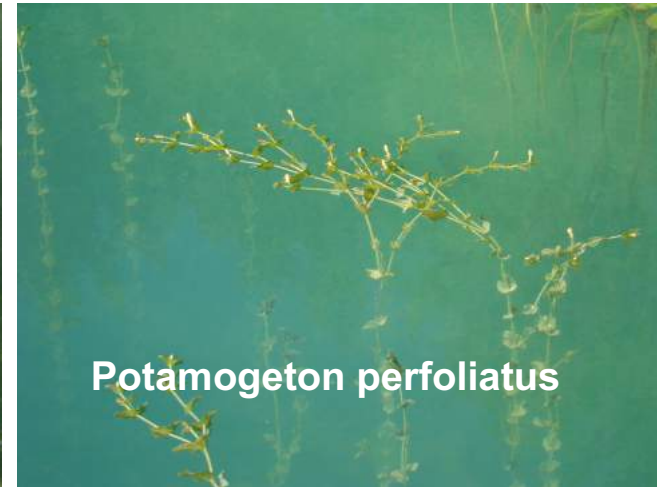


Saures eutrophes Wasser / acid eutrophic water



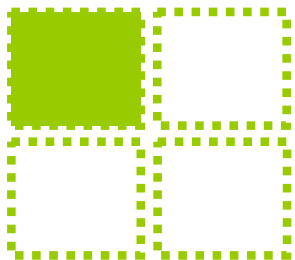
Repräsentative Art / representative species: ***Potamogeton schweinfurthii***
(*Ludwigia palustris*, *Polygonum amphibium*)

Saures eutrophes Wasser / acid eutrophic water



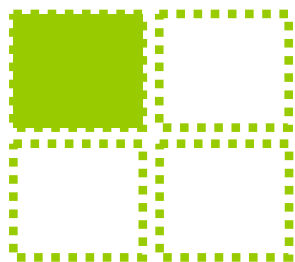
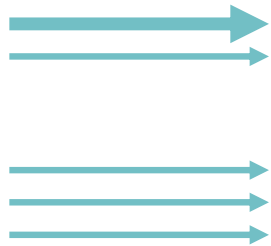
Repräsentative Art / representative species: *Potamogeton schweinfurthii*

Saures eutrophes Wasser / acid eutrophic water



Repräsentative Art / representative species: *Potamogeton schweinfurthii*

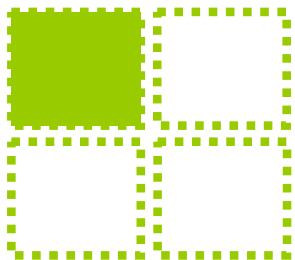
Saures eutrophes Wasser / acid eutrophic water



Familia	Nome	R	N	SOZ
Potamogeton	pusillus agg.	6	x	1.31 Potamogetonei
Potamogeton	schweinfurthii	5	4	1.31 Potamogetonei
Vallisneria	spiralis	7	7	1.31 Potamogetonei
Potamogeton	lucens	6	5	1.31 Potamogetonei
Myriophyllum	spicatum	9	7	1.31 Potamogetonei
Potamogeton	perfoliatus	7	6	1.311 Potamogetoni
Nymphaea	spec.	7	5	1.312 Nymphaeion (
Ranunculus	penicillatus	6	x	1.313 Ranunculion f
Myriophyllum	alterniflorum	6	3	1.41 Littorelletalia
Baldellia	ranunculoides	x	2	1.414 Hydrocotylo-E
Pilularia	globulifera	4	2	1.414 Hydrocotylo-E
Myosotis	stolonifera	x	4	1.414 Hydrocotylo-E
Eleocharis	acicularis	x	2	1.417 Eleocharition
Eleocharis	palustris	x	?	1.51 Phragmitetalia
Iris	pseudacorus	x	7	1.51 Phragmitetali
Carex	pseudocyperus	6	5	1.51 Phragmitetalia
Schoenoplectus	lacustris	7	6	1.511 Phragmition
Phragmites	australis	7	7	1.511 Phragmition
Cyperus	longus	x	5	1.514 Magnocaricio
Carex	stricta	x	5	1.514.1 Carex elata-
Carex	elodes	6	x	1.514.1 Carex elata-
Juncus	atriculatus	x	2	1.7 Scheuchzerio-C
Carex	nigra	3	2	1.73 Caricetalia nigr
Preslia	cervina	x	5	3.1 Isoeto-Nanojunc
Epilobium	hirsutum	8	8	3.521 Calystegion s
Juncus	effusus	3	4	5.41 Molinietaalia
Juncus	conglomeratus	4	3	5.41 Molinietaalia
Lythrum	salicaria	6	x	5.412 Filipendulion
Juncus	acutiflorus	5	3	5.414 Juncion acutif
Lotus	pedunculatus	5	3	5.414 Juncion acutif
Osmunda	regalis	4	5	8,211 Alnion glutino
Thelypteris	palustris	5	6	8.211 Alnion glutino

pflanzen-
soziologische
Zuordnung /
phyto-
sociological
classification

Saures eutrophes Wasser / acid eutrophic water



Ergebnisse

Vielfältige und gut angepasste Bepflanzung, die zur Schönheit und Eigenart des Badegewässers beiträgt.

Pro Wassertyp steht eine Auswahl von 30 bis 50 Arten von Ufer- und Unterwasserpflanzen zur Verfügung.

Mehr als 15 Jahre positive Erfahrung - so gut wie keine Ausfälle von gepflanzten Arten

Leistungsfähige und robuste Pflanzenbestände, die zur guten Wasserqualität beitragen.

Ergebnisse

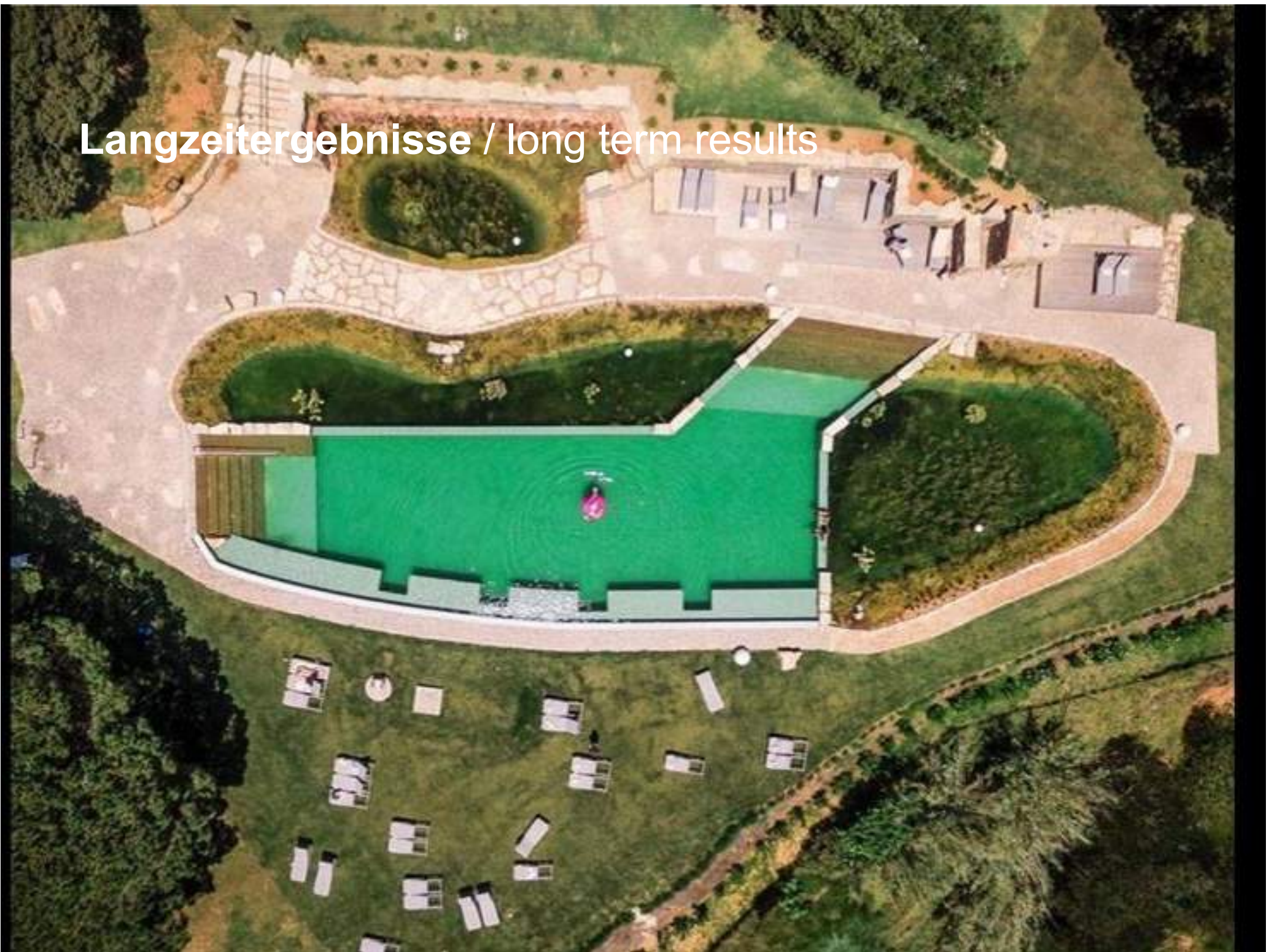
Diverse and well-adapted planting, which contributes to the beauty and peculiarity of the natural pool.

There is a choice of 30 to 50 types of margin and underwater plants per type of water.

More than 15 years of positive experience - no failures of planted species.

Powerful and robust plant stands, which contributes to good water quality.

Langzeitergebnisse / long term results





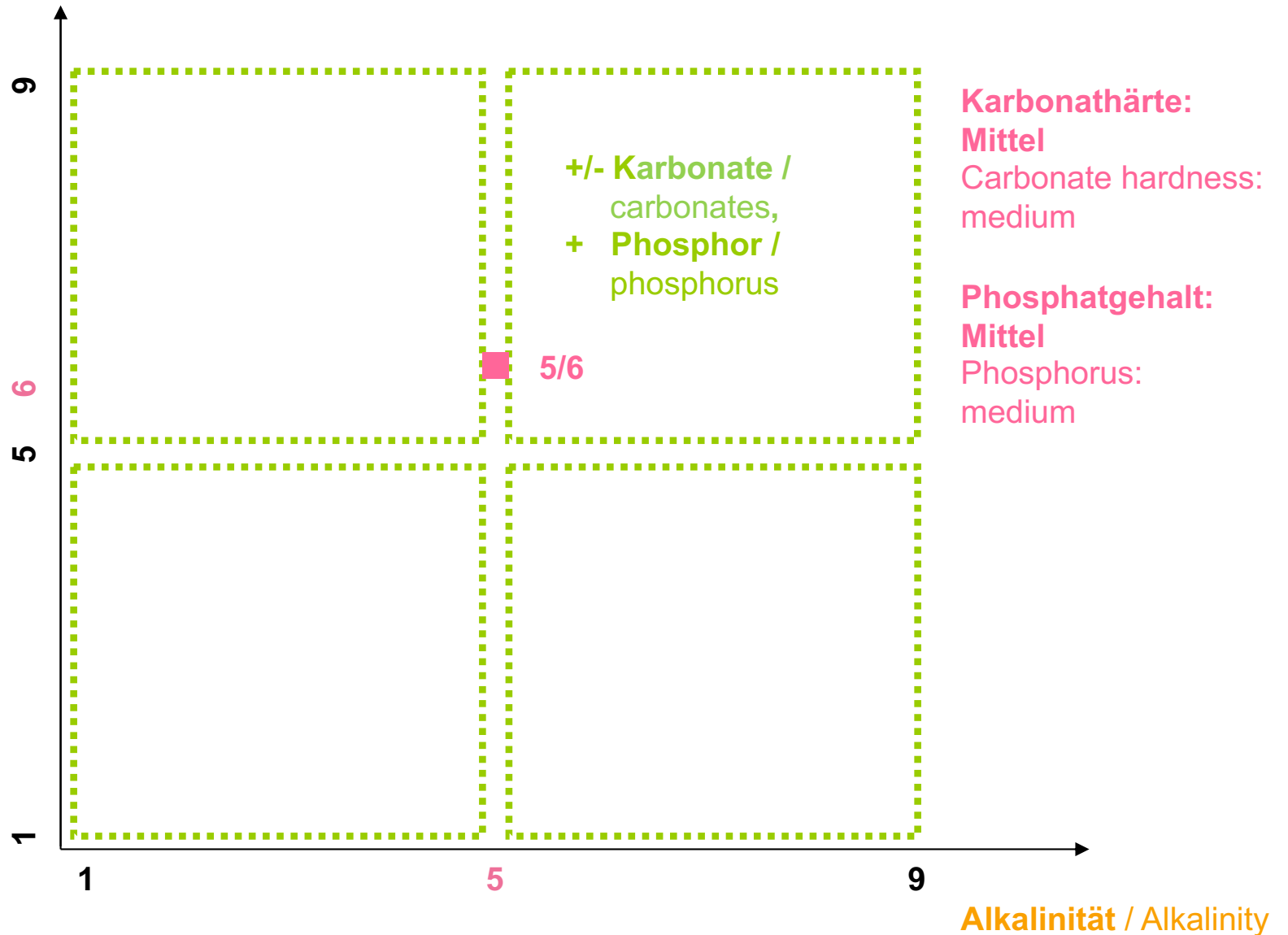




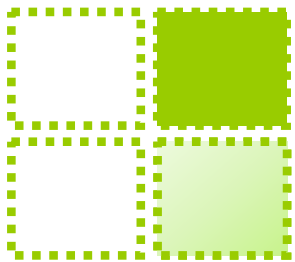


Mesotrophes, leicht karbonathaltiges Wasser / mesotrophic, slightly carbonated water

Trophie / Trophic



Mesotrophes, leicht karbonathaltiges Wasser
/ mesotrophic, slightly carbonated water



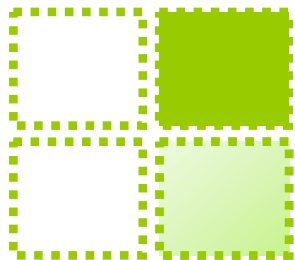
Repräsentative Art / representative species: *Potamogeton schweinfurthii*

Mesotrophes, leicht karbonathaltiges Wasser / mesotrophic, slightly carbonated water



Repräsentative Art / representative species: *Potamogeton schweinfurthii*

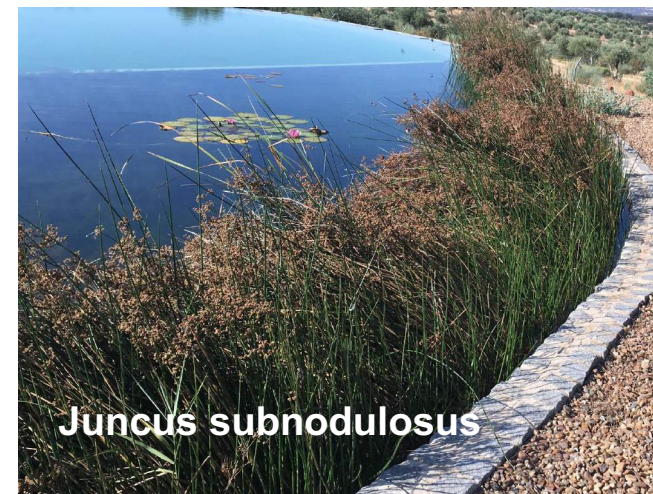
Mesotrophes, leicht karbonathaltiges Wasser / mesotrophic, slightly carbonated water



Epilobium hirsutum



Bolboschoenus maritimus

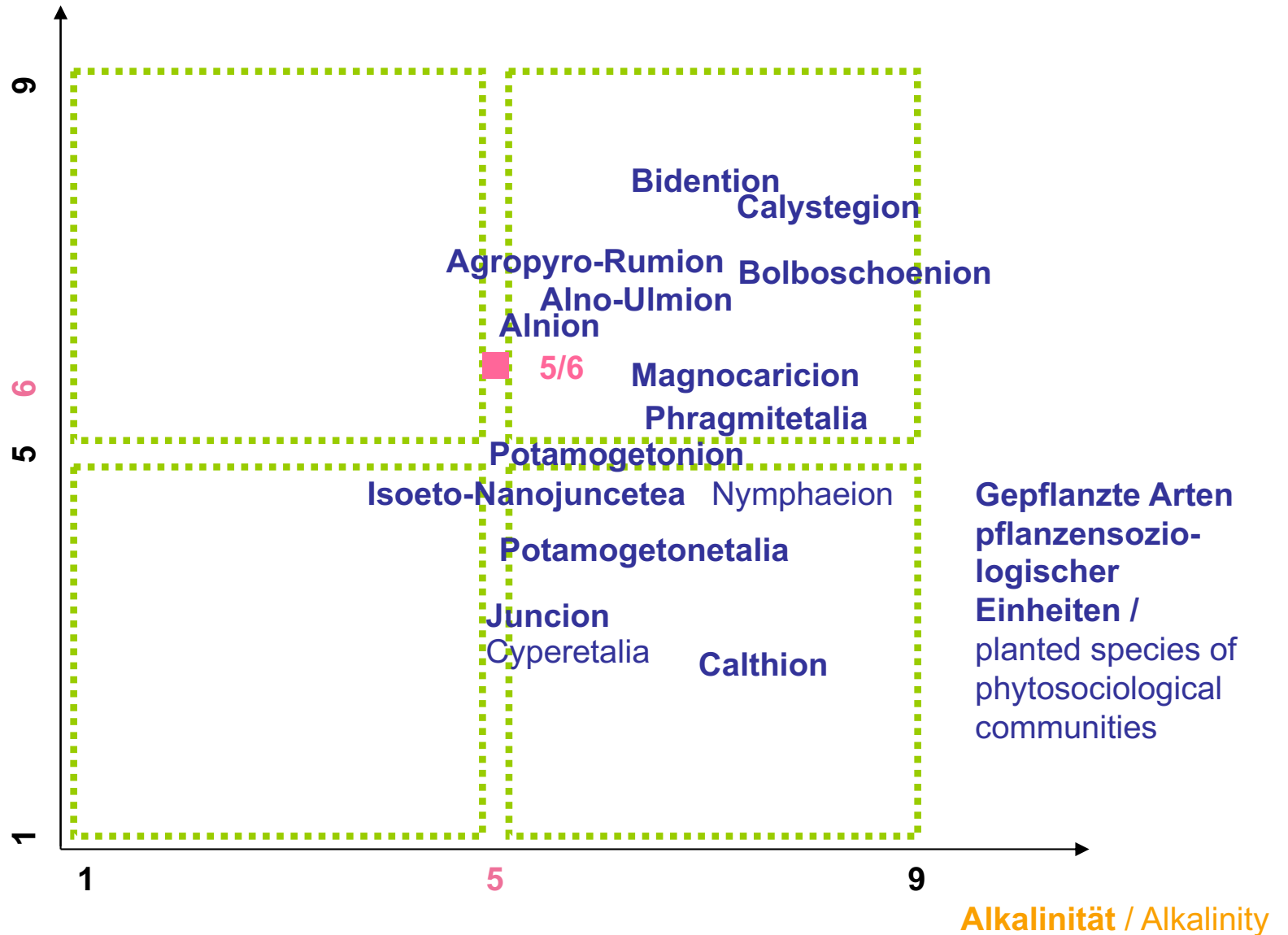


Juncus subnodulosus

Repräsentative Art / representative species: *Potamogeton schweinfurthii*

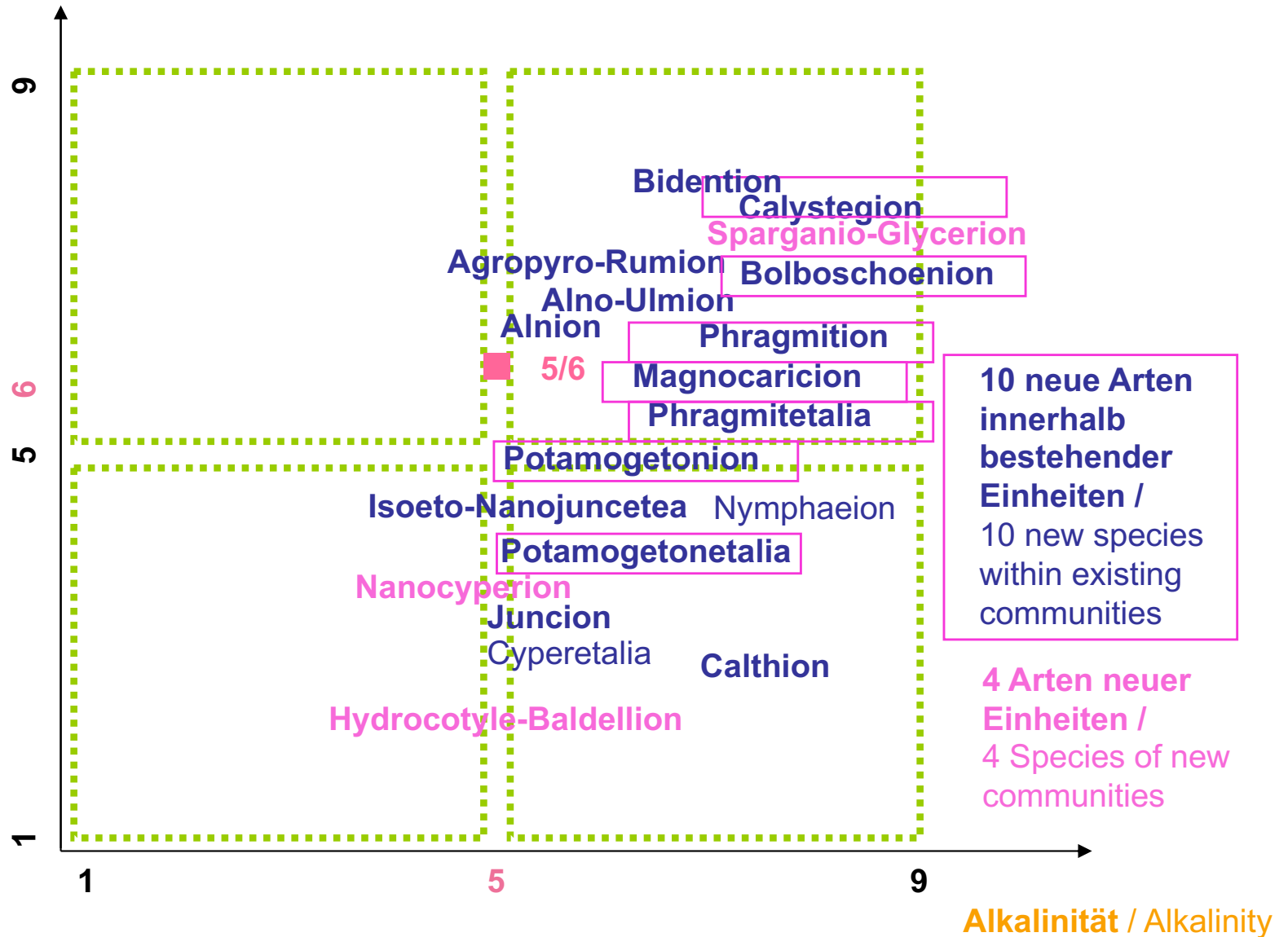
Mesotrophes, leicht karbonathaltiges Wasser / mesotrophic, slightly carbonated water

Trophie / Trophic



Mesotrophes, leicht karbonathaltiges Wasser / mesotrophic, slightly carbonated water

Trophie / Trophic



Langzeitergebnisse / long term results

Das mesotrophe, leicht karbonathaltige Wasser ist dem Füllwasser sehr ähnlich und spiegelt die ökologischen Präferenzen der Pflanzen im Schwimmteich.

Der gute Wuchs der gepflanzten Arten belegt die Widerstandsfähigkeit der Bepflanzung nach ökologischen Präferenzen.

Anstieg der Biodiversität durch spontan erschienene Arten, die sich in das Spektrum der ausgewählten pflanzensoziologischen Einheiten eingliedern.

Das Resultat der pflanzensoziologischen Ergebnisse bestätigt die angemessene und richtige Auswahl der gepflanzten Arten.

Langzeitergebnisse / long term results



The mesotrophic, slightly carbonated water is very similar to the filling water quality and reflects the ecological preferences of the plants in the swimming pond.

The increase of dominant species proves the resilience of the planting according to ecological preferences.

Increase in biodiversity through spontaneously occurring species, which are integrated into the spectrum of selected phytosociological communities.

The result of the phyto-sociological results confirms the appropriate and correct selection of the planted species.

Claudia Schwarzer
Bio Piscinas, Lda.
www.biopiscinas.pt

Danke für Ihre Aufmerksamkeit!
Thank you for your attention!



10. Internationaler Schwimmteich-Kongress
Warschau, Polen – 9.-10. September 2019