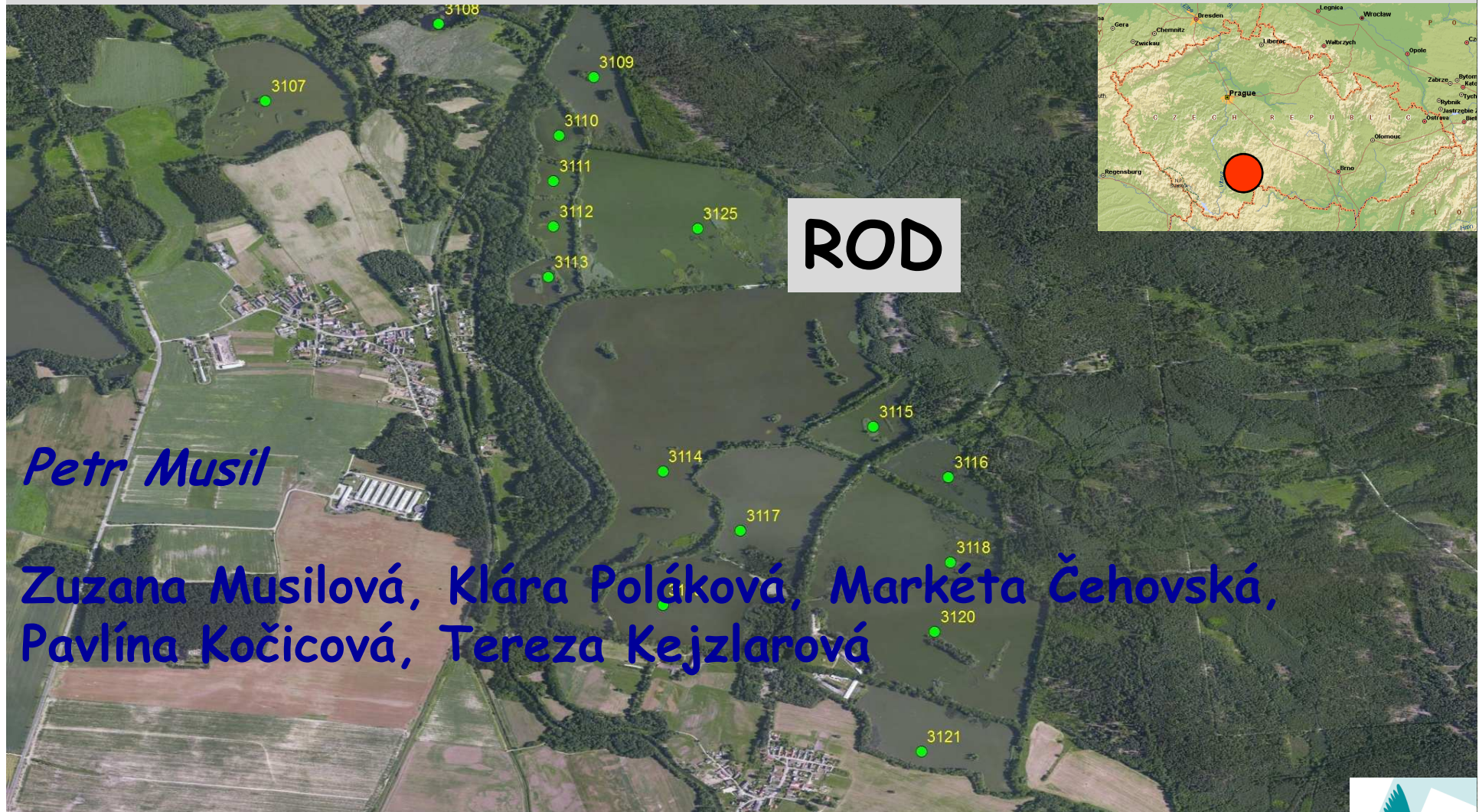
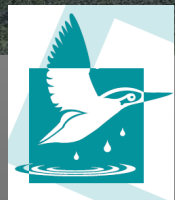


# Vliv alternativního obhospodařování rybníků na hnízdní populace vodních ptáků: příklad rybníka

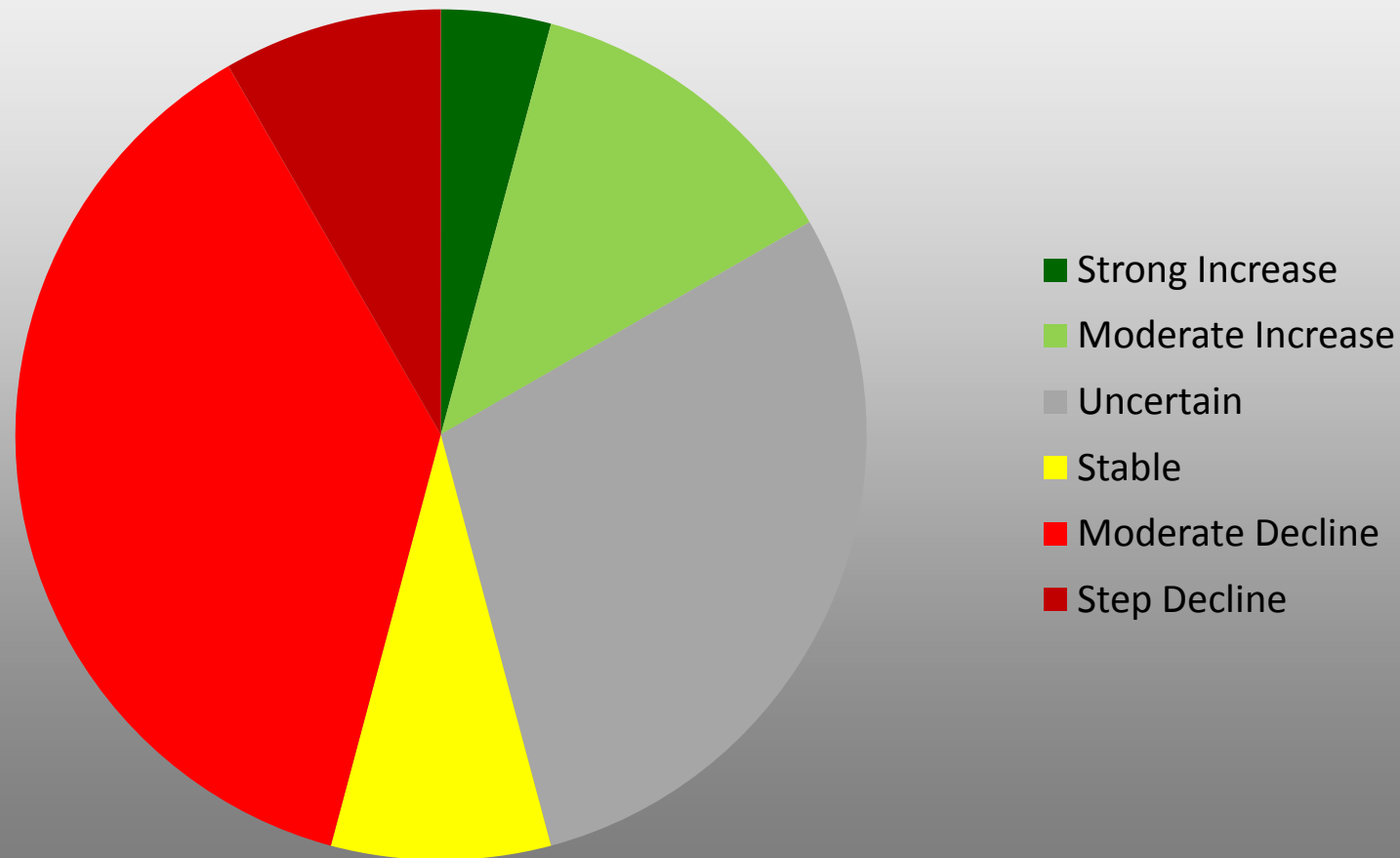


Katedra ekologie, Fakulta životního prostředí, ČZU, Praha



# Trendy početnosti hnízdních populací

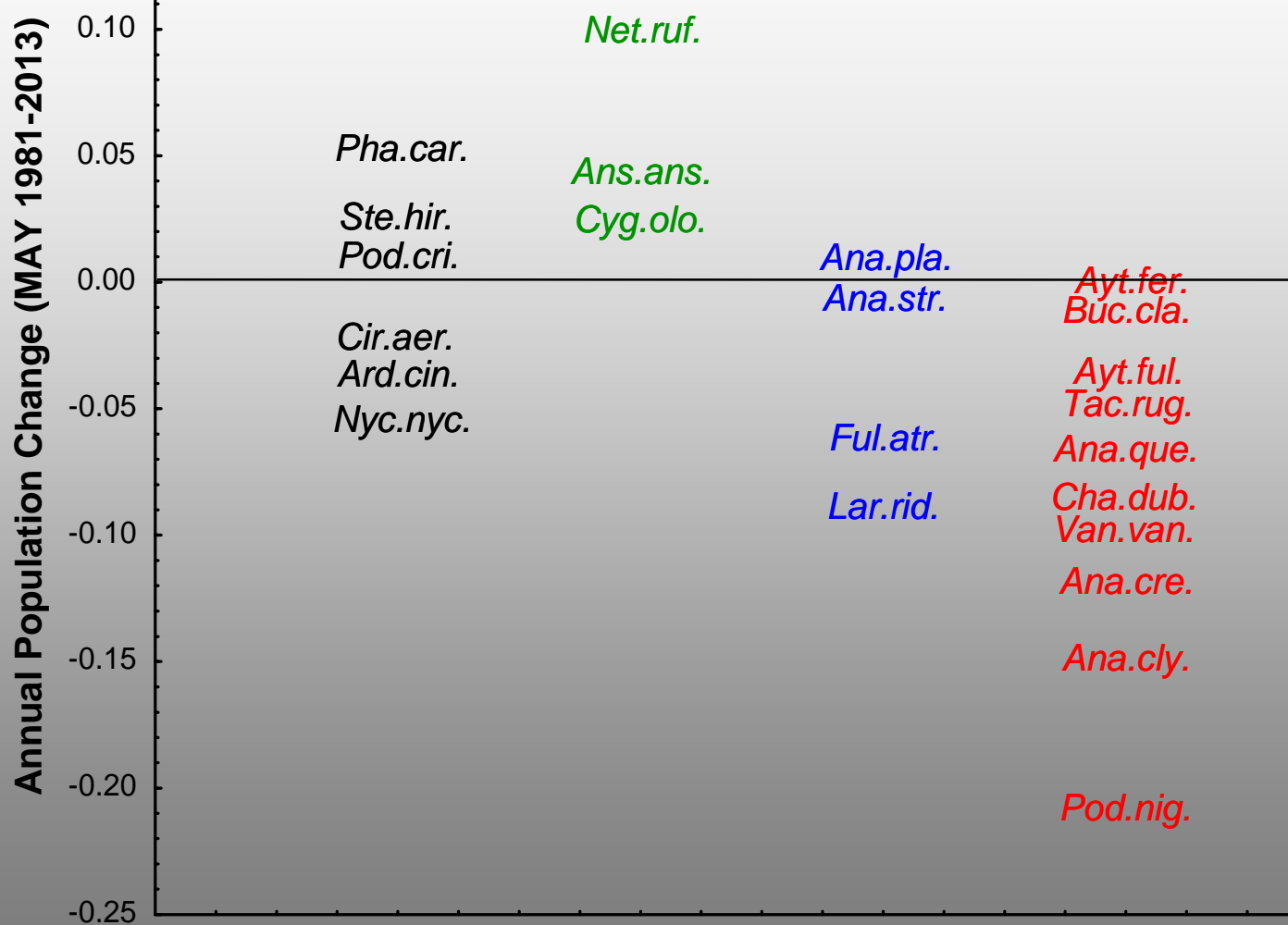
- TRIM software (ver. 3.52, Statistic Netherlands)
- vyhodnoceno 23 nejpočetnějších druhů (1981-2013)



Musil et al. in prep.



# Potravní specializace



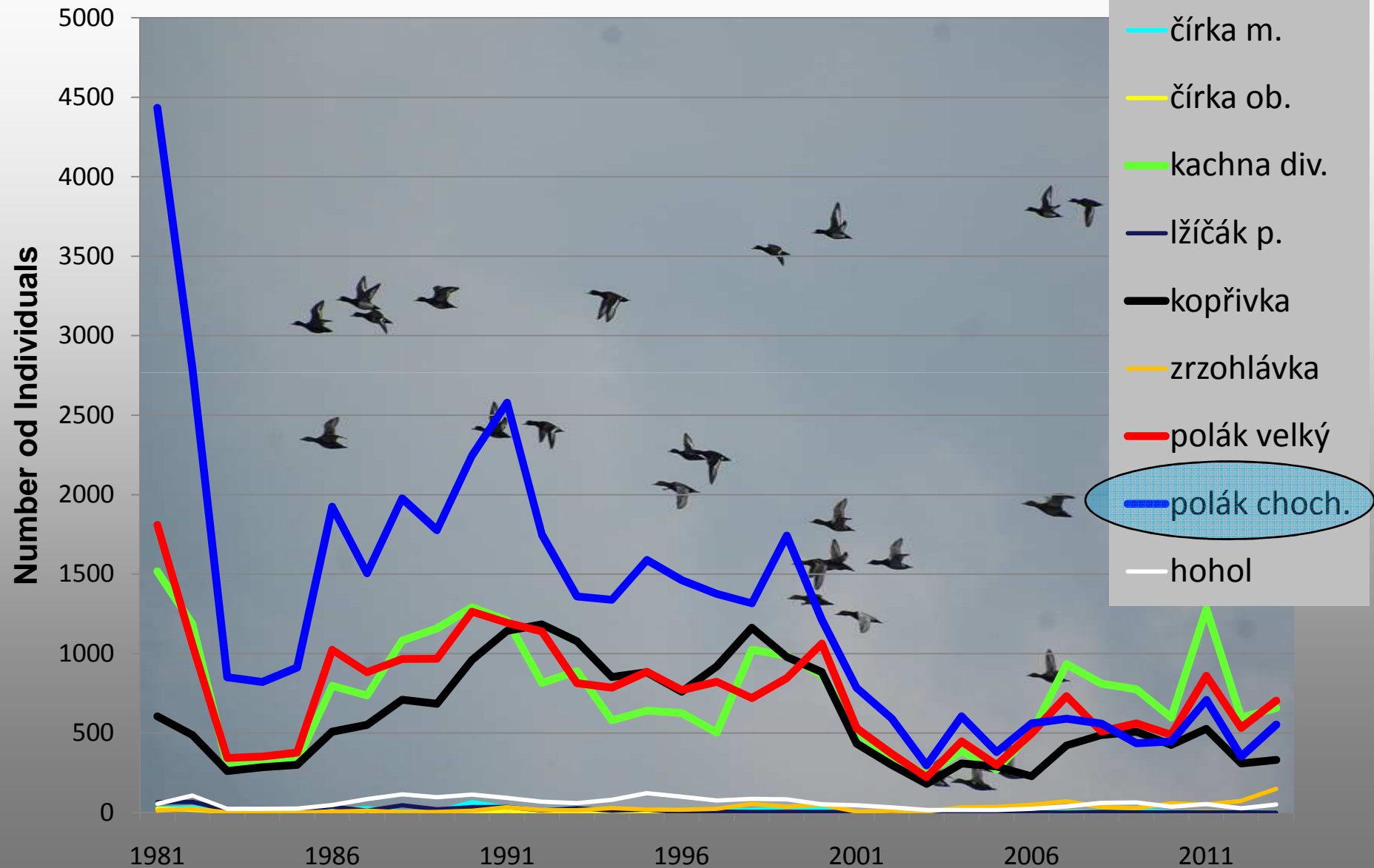
Rybožraví  
Dravci

Herbivorní

Omnivorní

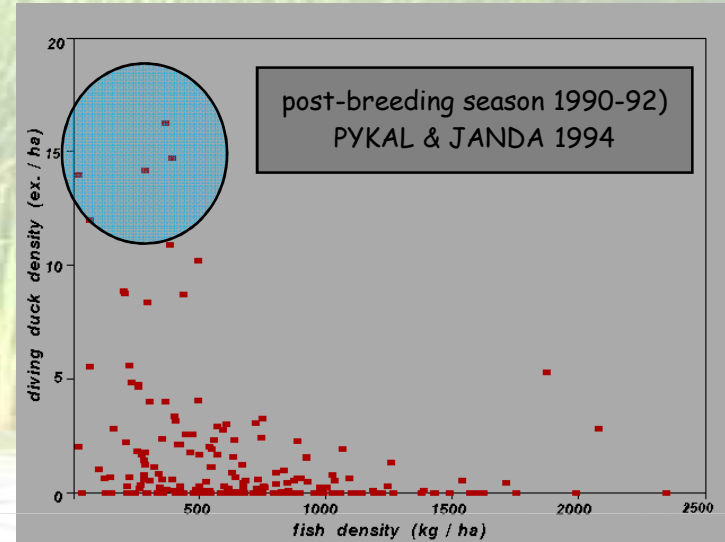
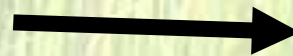
Bentofágní  
Insectivorní

# Dlouhodobé trendy početnosti hnízdních populací kachen (květen 1981-2015)

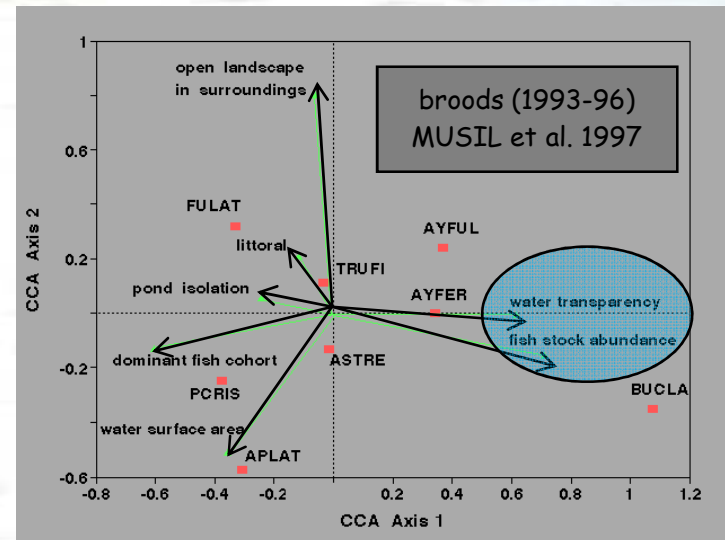
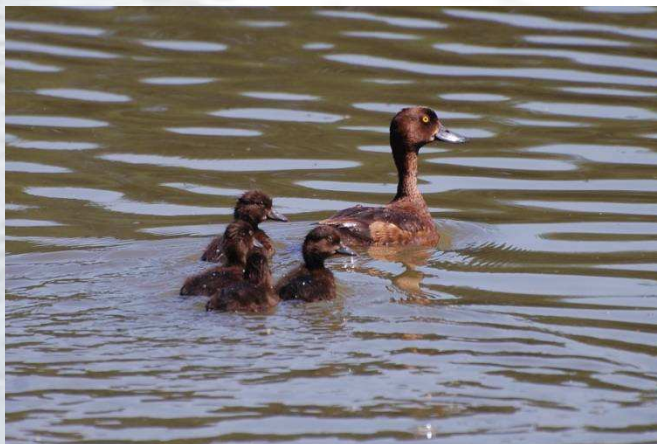


# Effect of fishpond management on waterbird numbers

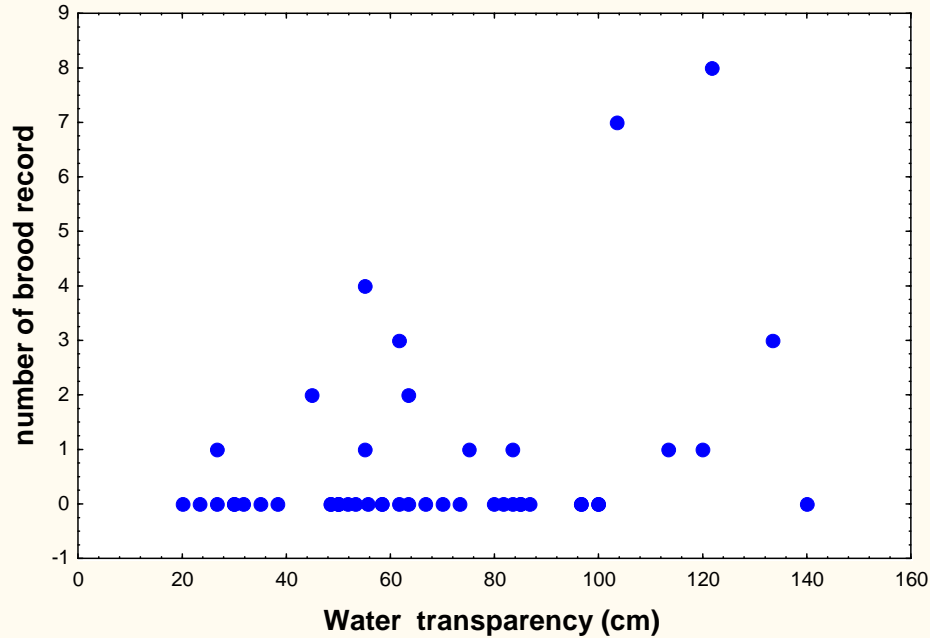
adults



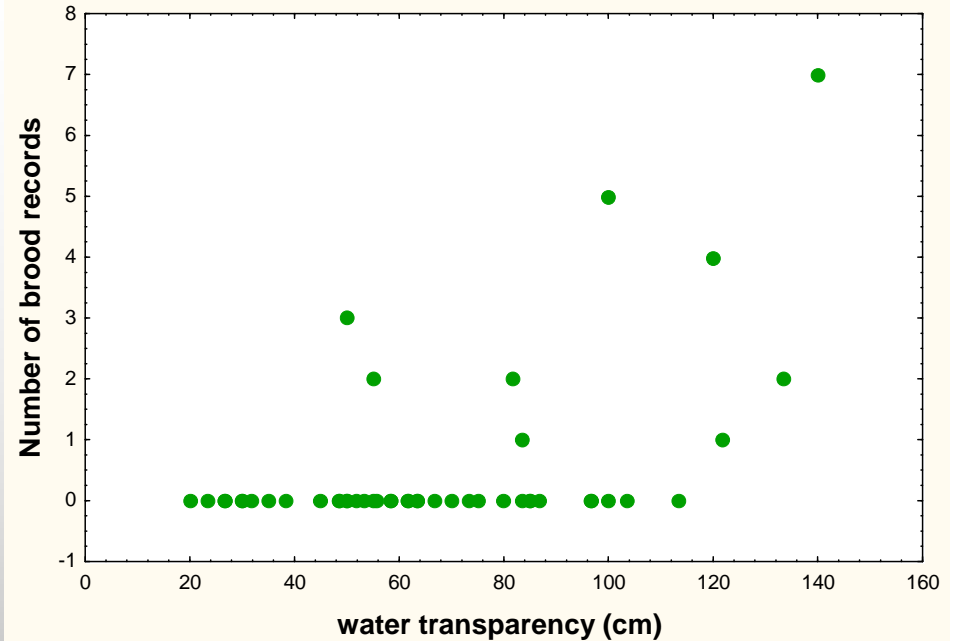
broods



TUFTED DUCK



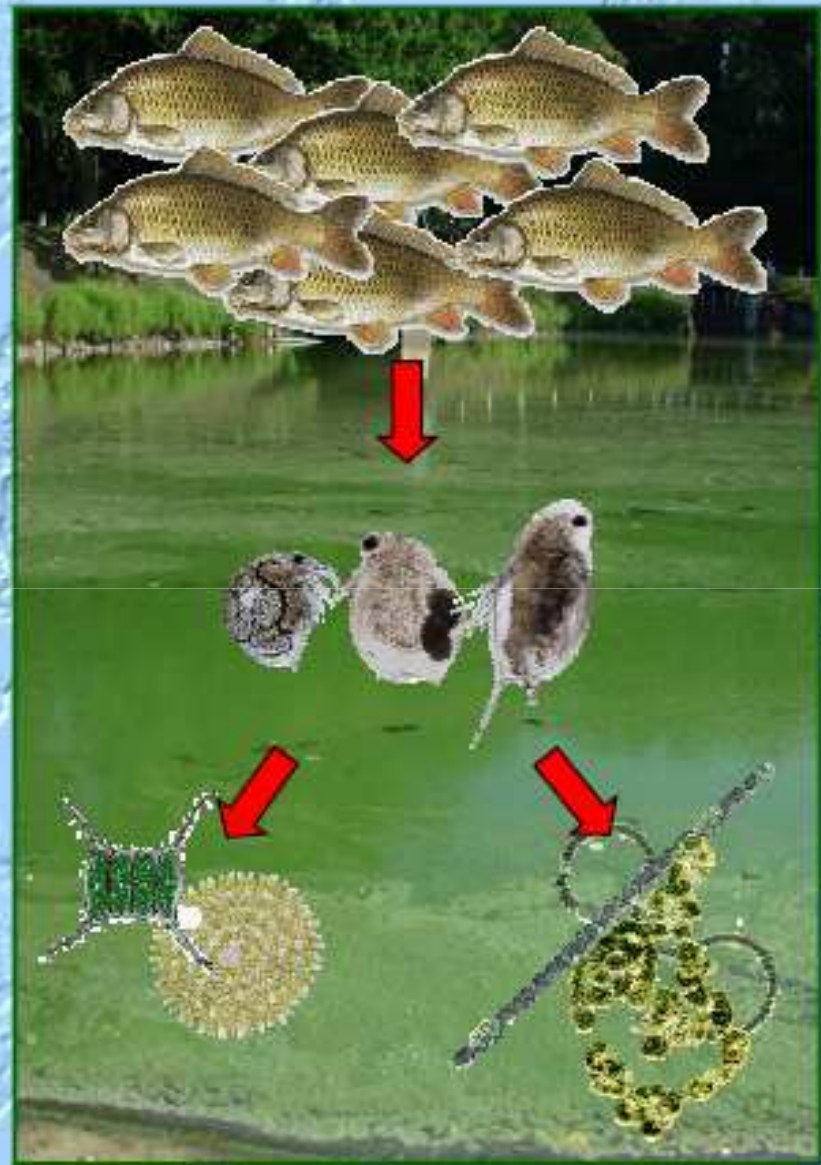
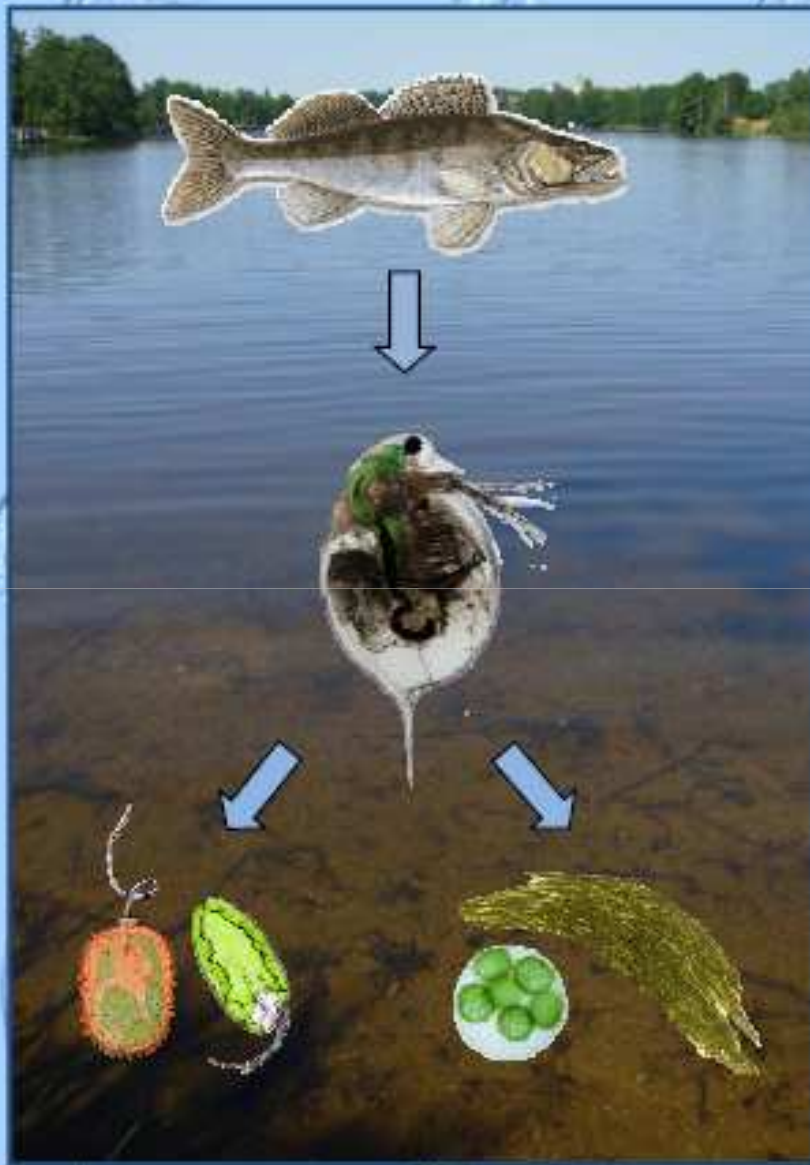
GOLDENEYE



## Broods of Tufted Duck and Goldeneye:

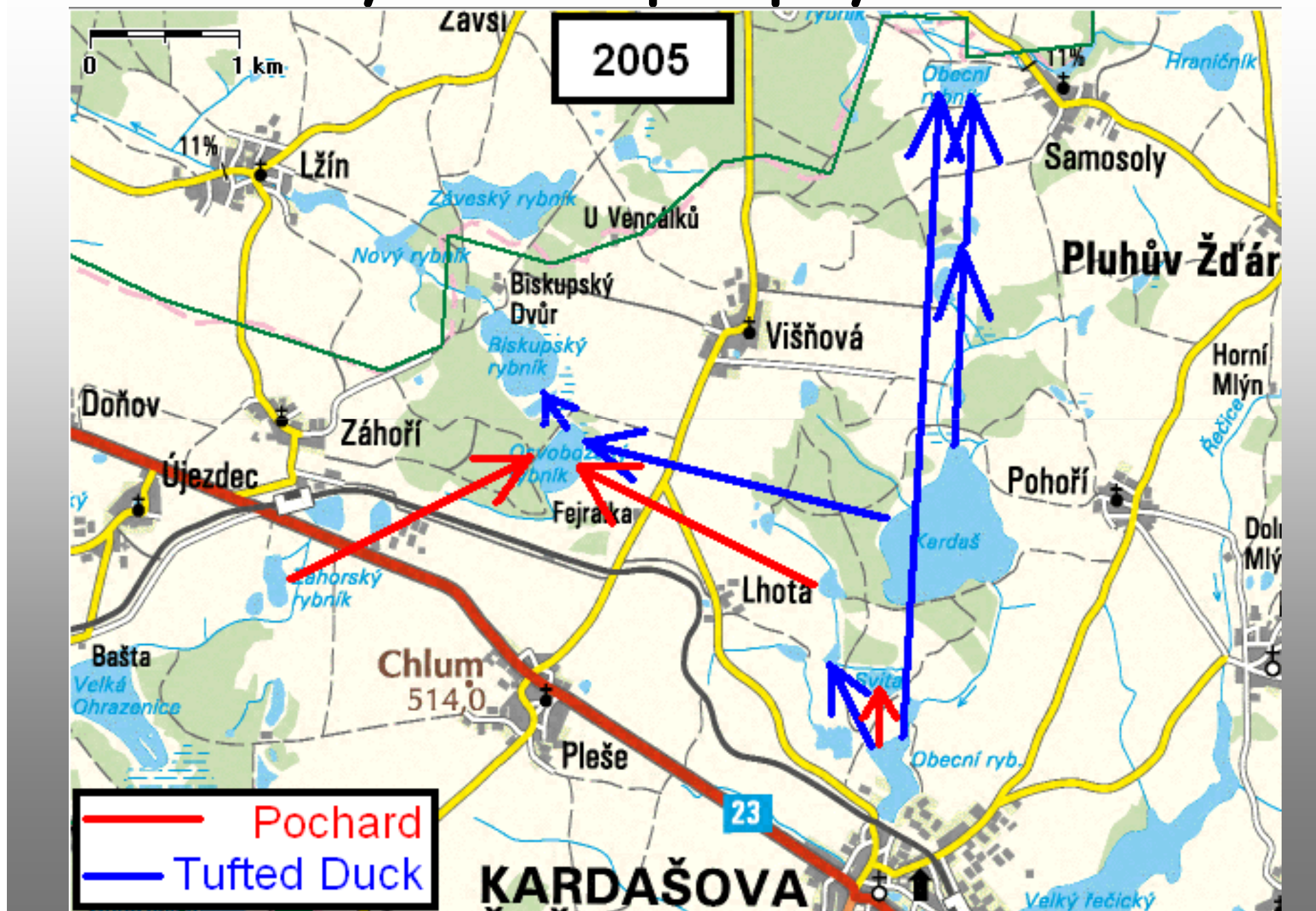
- almost no records on ponds with transparency under 50 cm
- recorded on almost all ponds with water transparency **more than 100 cm**





Potužák *et al.* 2011

# Přesuny rodinek potápivých kachen

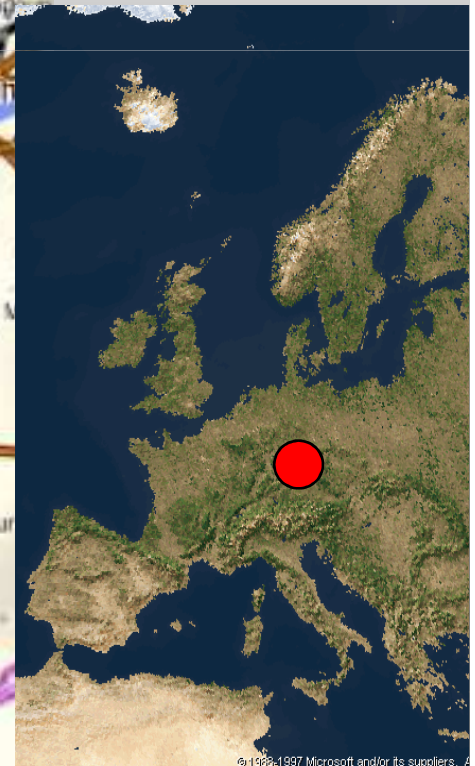
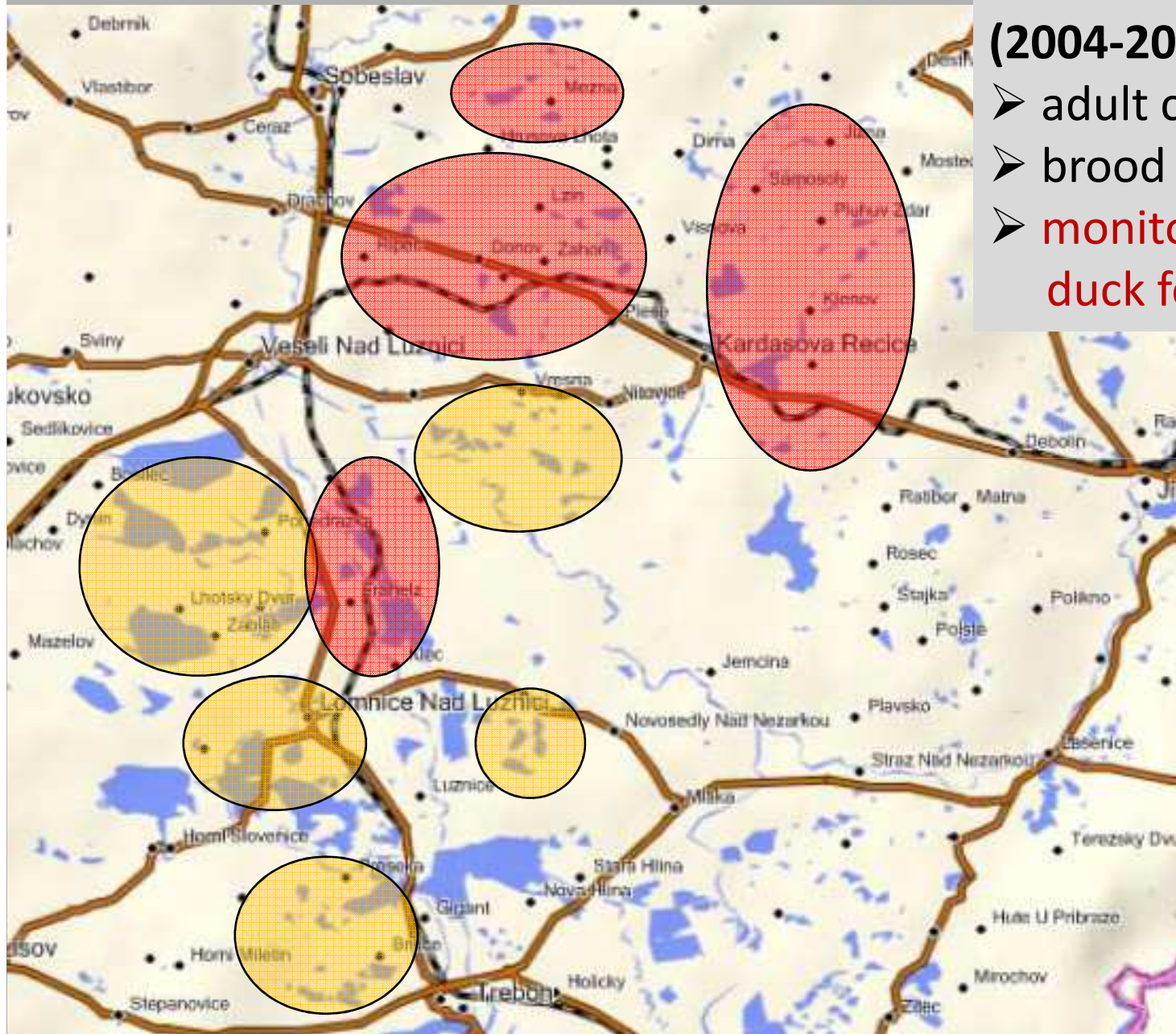




# Monitoring of Breeding Waterbirds

Field work  
on 180 fishponds  
(2004-2015):

- adult census (Apr-Aug)
- brood survey
- monitoring marked duck females

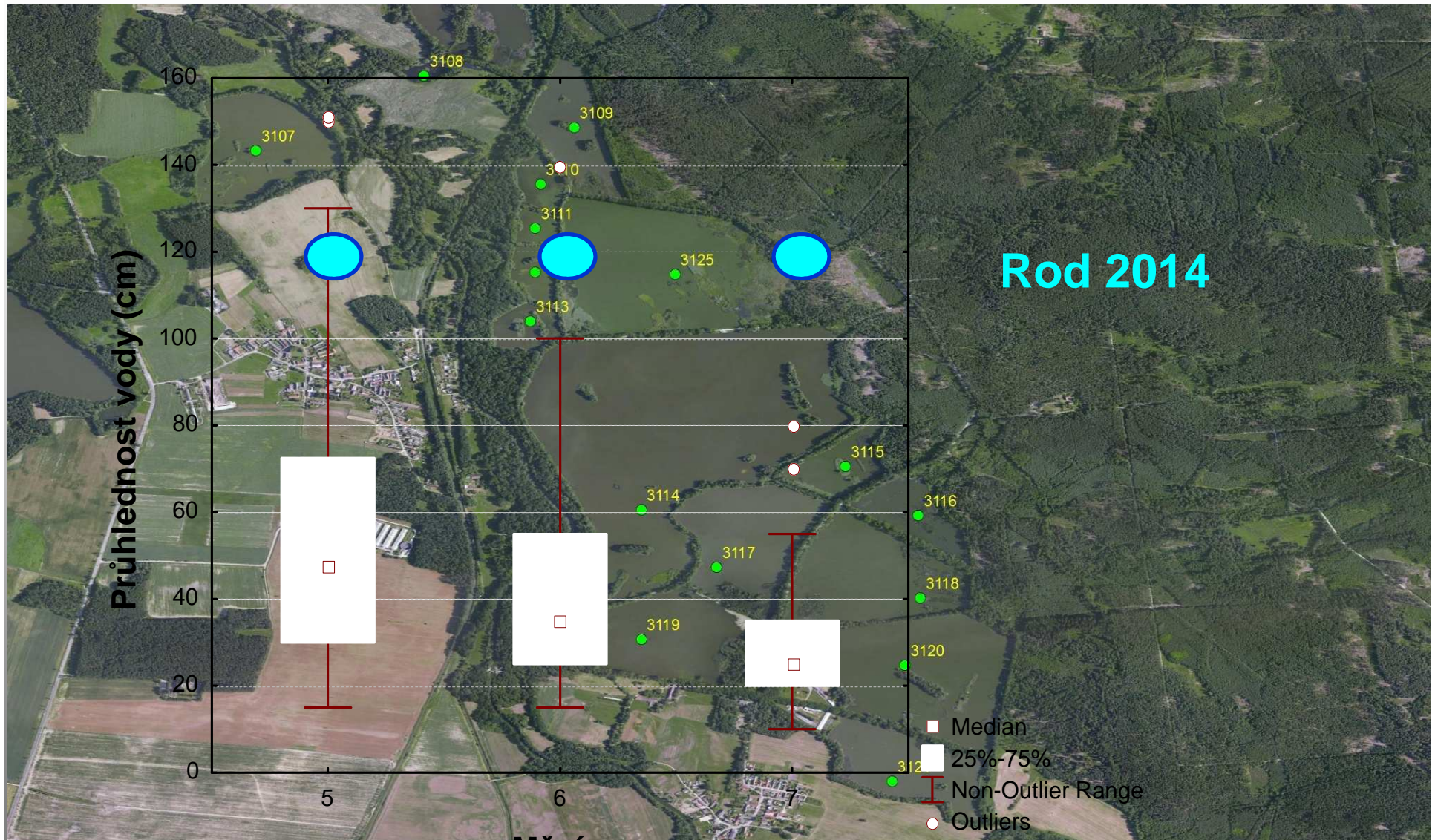


# Rod 2014



Alternativní rybí obsádka: candát a lín

# Průhlednost vody 2014



# Rod 2014

Druh	Třeboňsko	Rod	Rod %
Potápka roháč	46	1	2.2
Potápka černokrká	3	0	0.0
Potápka malá	18	2	11.1
Labuť velká	45	1	2.2
Husa velká	64	2	3.1
Kachna divoká	112	0	0.0
Kopřivka obecná	57	1	1.8
Zrzohlávka rudozobá	23	3	13.0
Polák velký	65	8	12.3
Polák chocholačka	66	11	16.7
Hohol severní	9	4	44.4
Lyska černá	46	4	8.7

# Rod 2015



Samice poláka chocholačky vodí 2 vlastní mlád'ata  
a 2 mlád'ata zrzohlávky rudozobé.

# Rod 2015



# Rod 2015



# Rod 2015





# Rod 2015



# Rod 2015



Exkurse 2.8. 2015

# Rod 2015



Exkurse 2.8.2015

# Rod 2015



Exkurse 2.8.2015

# Rod 2015



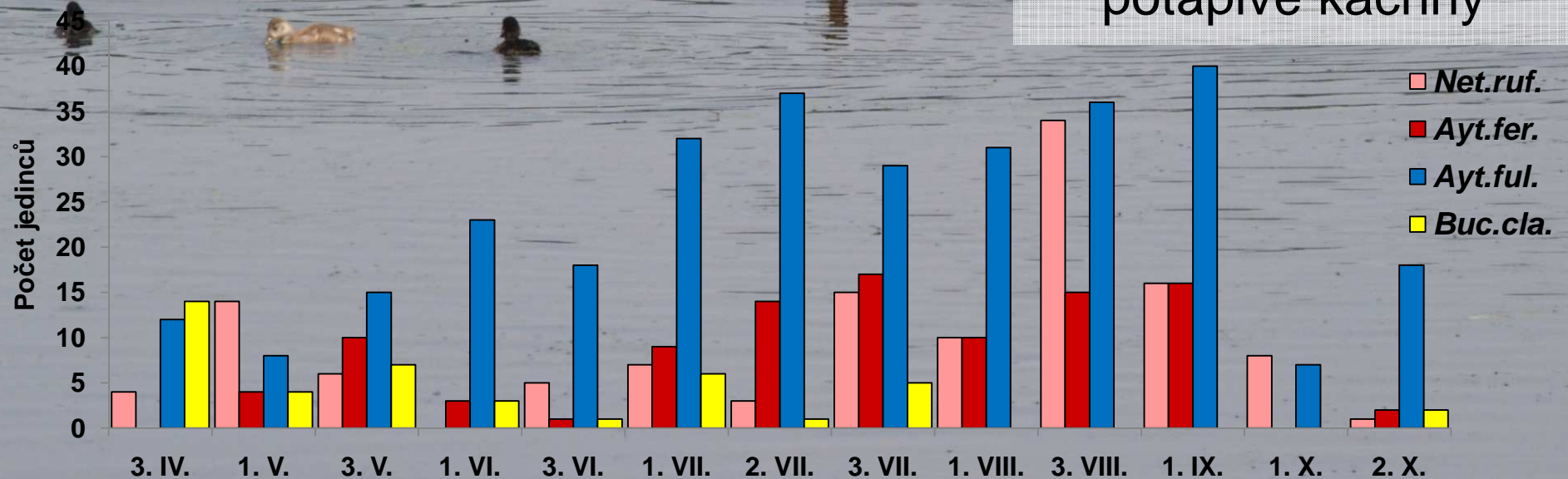
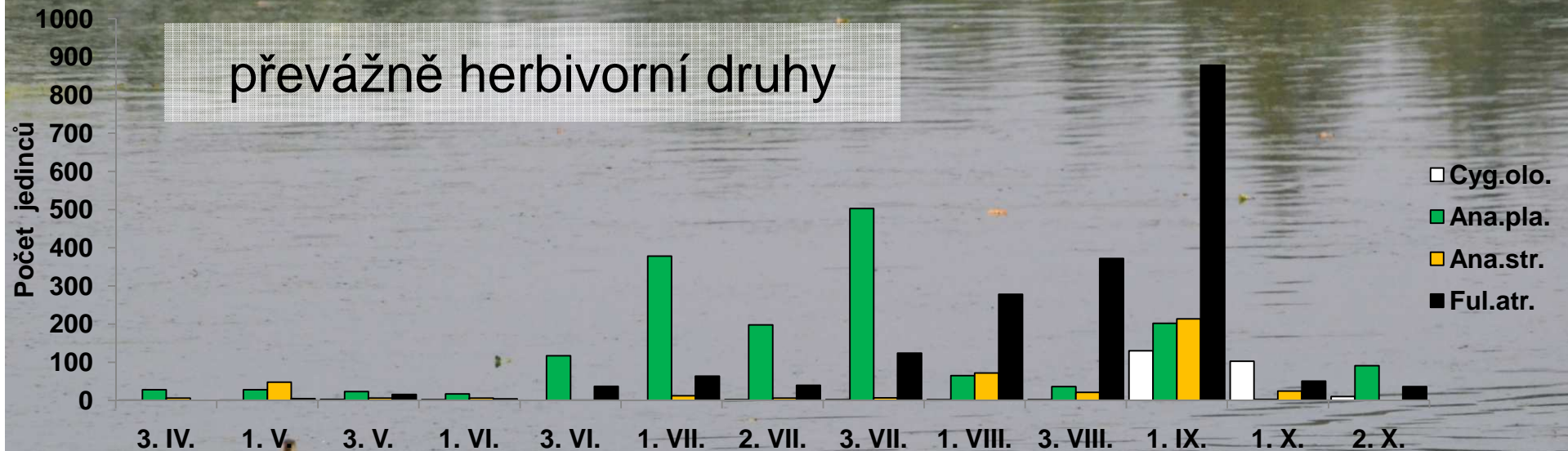
Exkurse 2.8.2015

# Rod 2015



Exkurse 2.8.2015

# Rod 2015 - sezónní dynamika početnosti

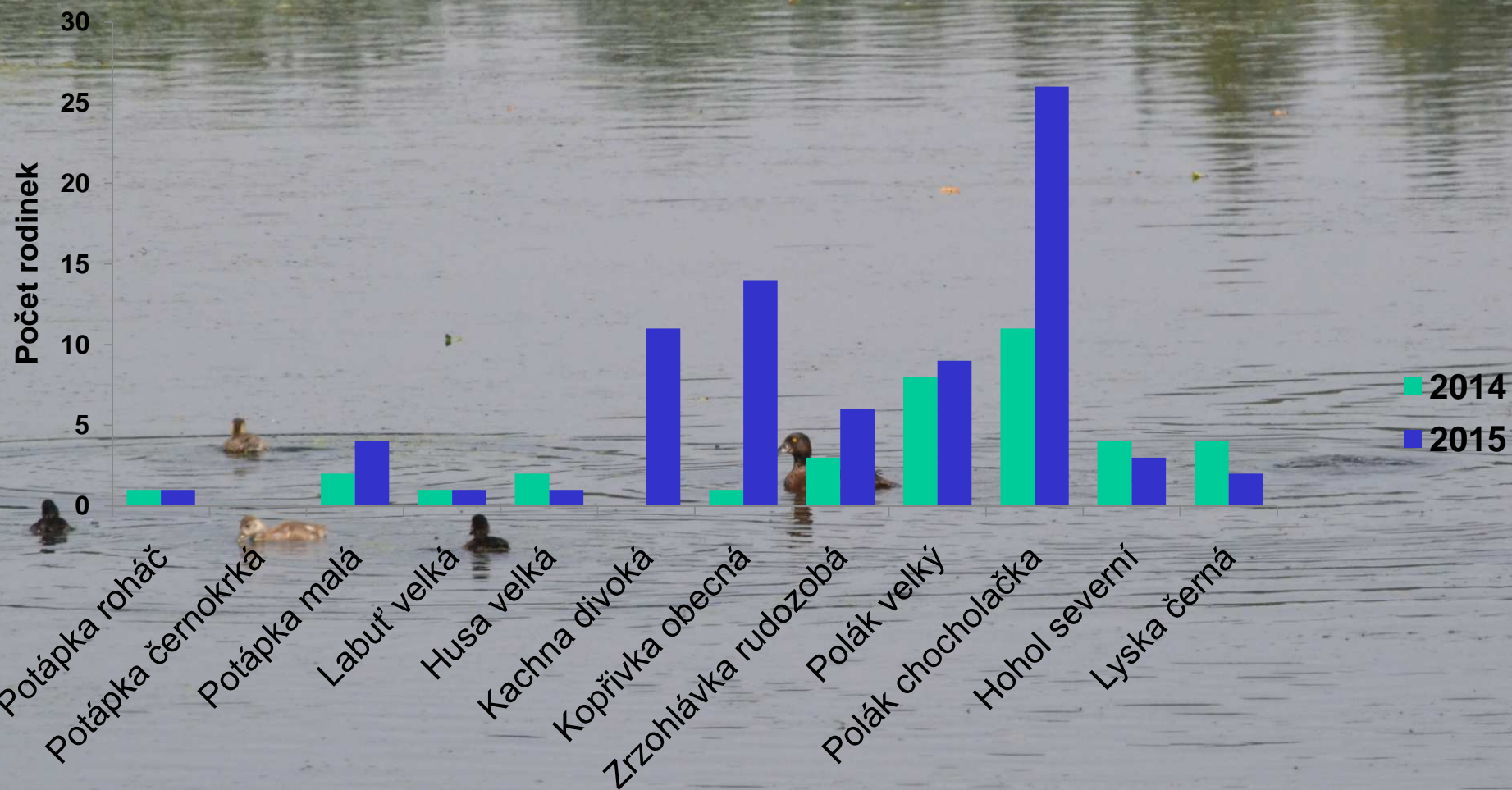


# Rod 2014 a 2015 - rodinky

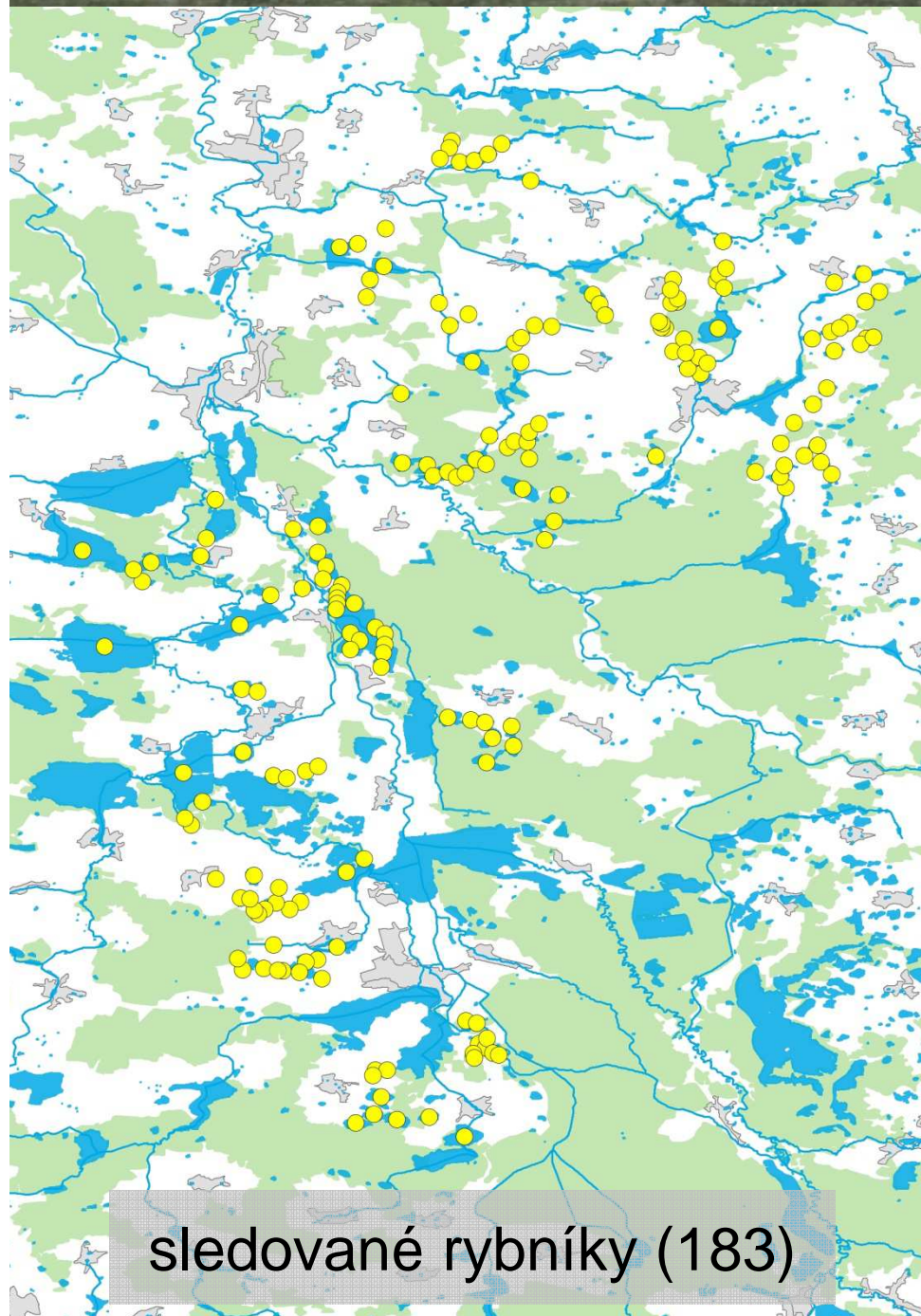
Druh	2014			2015		
	Třeboňsko	Rod	Rod %	Třeboňsko	Rod	Rod %
Potápka roháč	46	1	2.2	57	1	1.8
Potápka černokrká	3	0	0.0	1	0	0.0
Potápka malá	18	2	11.1	36	4	11.1
Labuť velká	45	1	2.2	28	1	3.6
Husa velká	64	2	3.1	105	1	1.0
Kachna divoká	112	0	0.0	99	11	11.1
Kopřivka obecná	57	1	1.8	67	14	20.9
Zrzohlávka rudozobá	23	3	13.0	14	6	42.9
Polák velký	65	8	12.3	48	9	18.8
Polák chocholačka	66	11	16.7	69	26	37.7
Hohol severní	9	4	44.4	19	3	15.8
Lyska černá	46	4	8.7	26	2	7.7



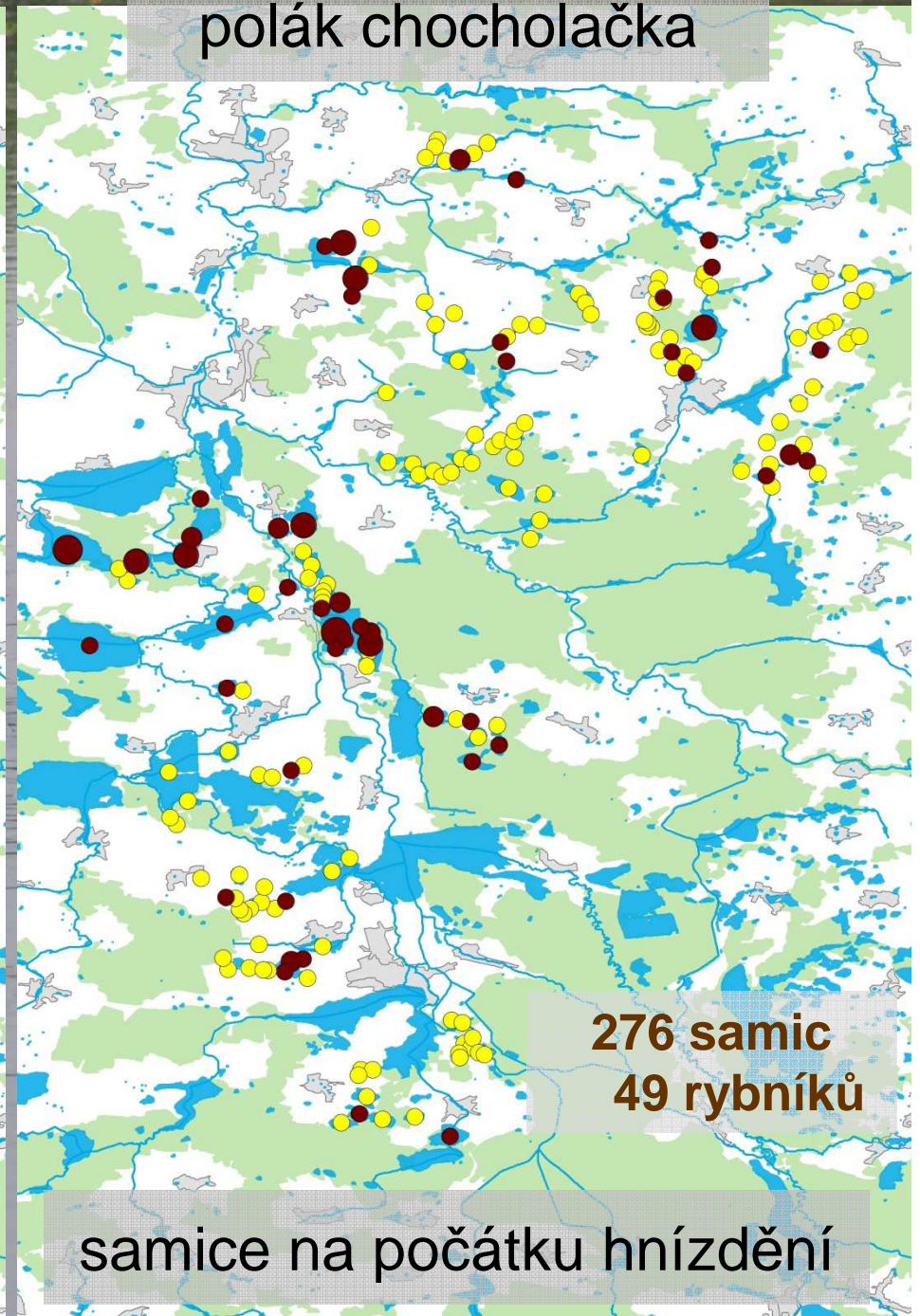
# Rod 2014 a 2015 - rodinky



polák chocholačka



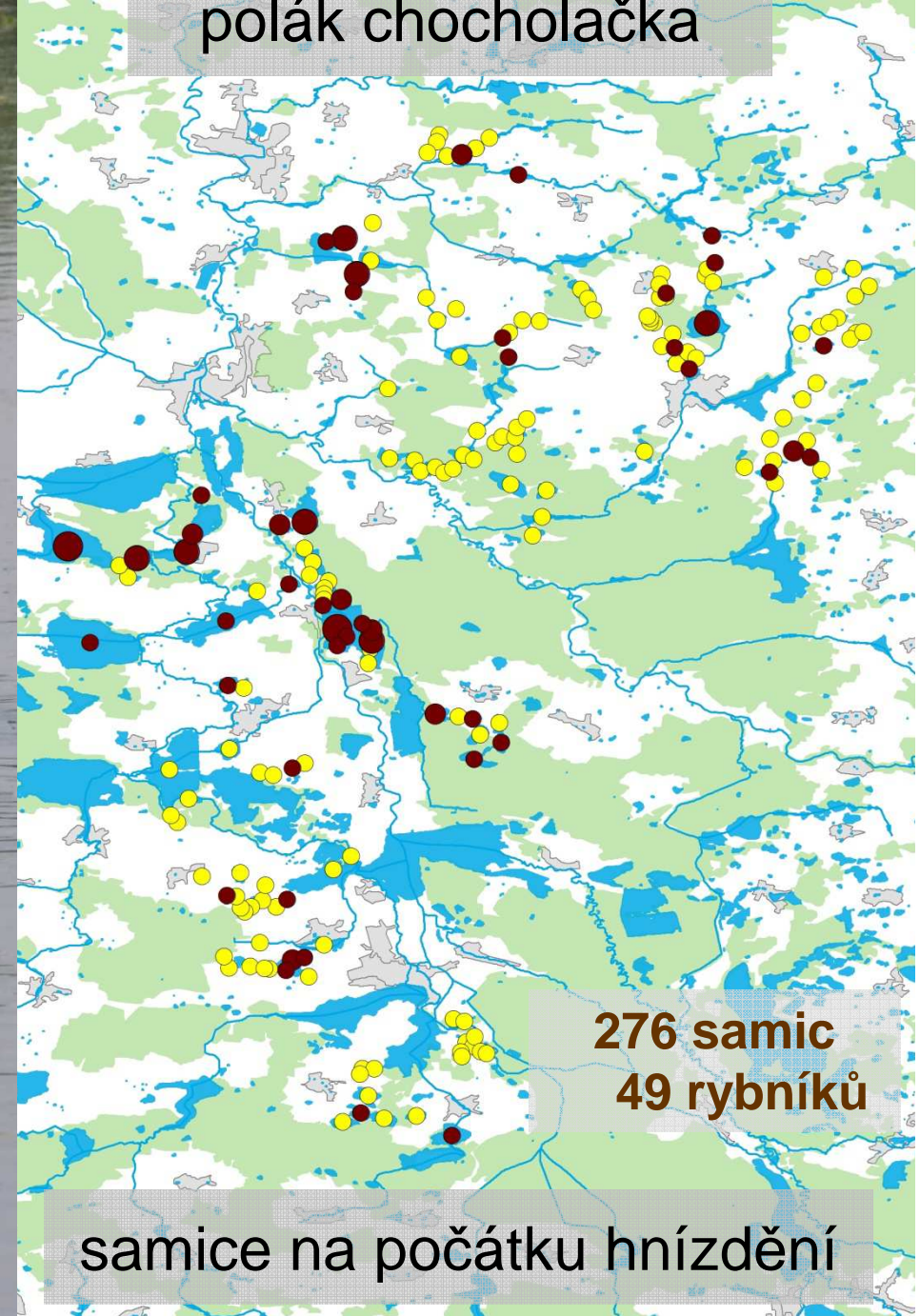
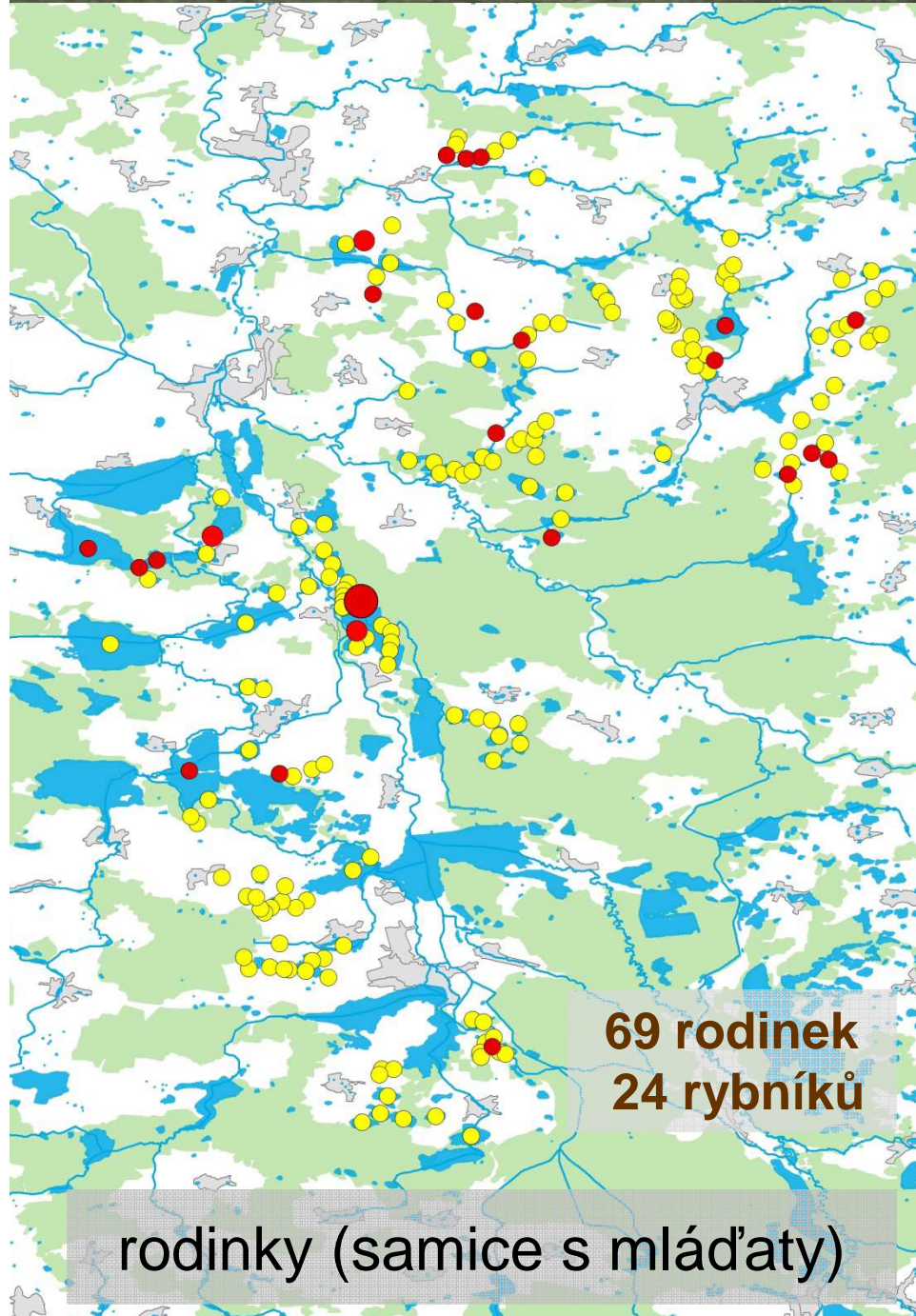
sledované rybníky (183)




276 samic  
49 rybníků

samice na počátku hnízdění

polák chocholačka



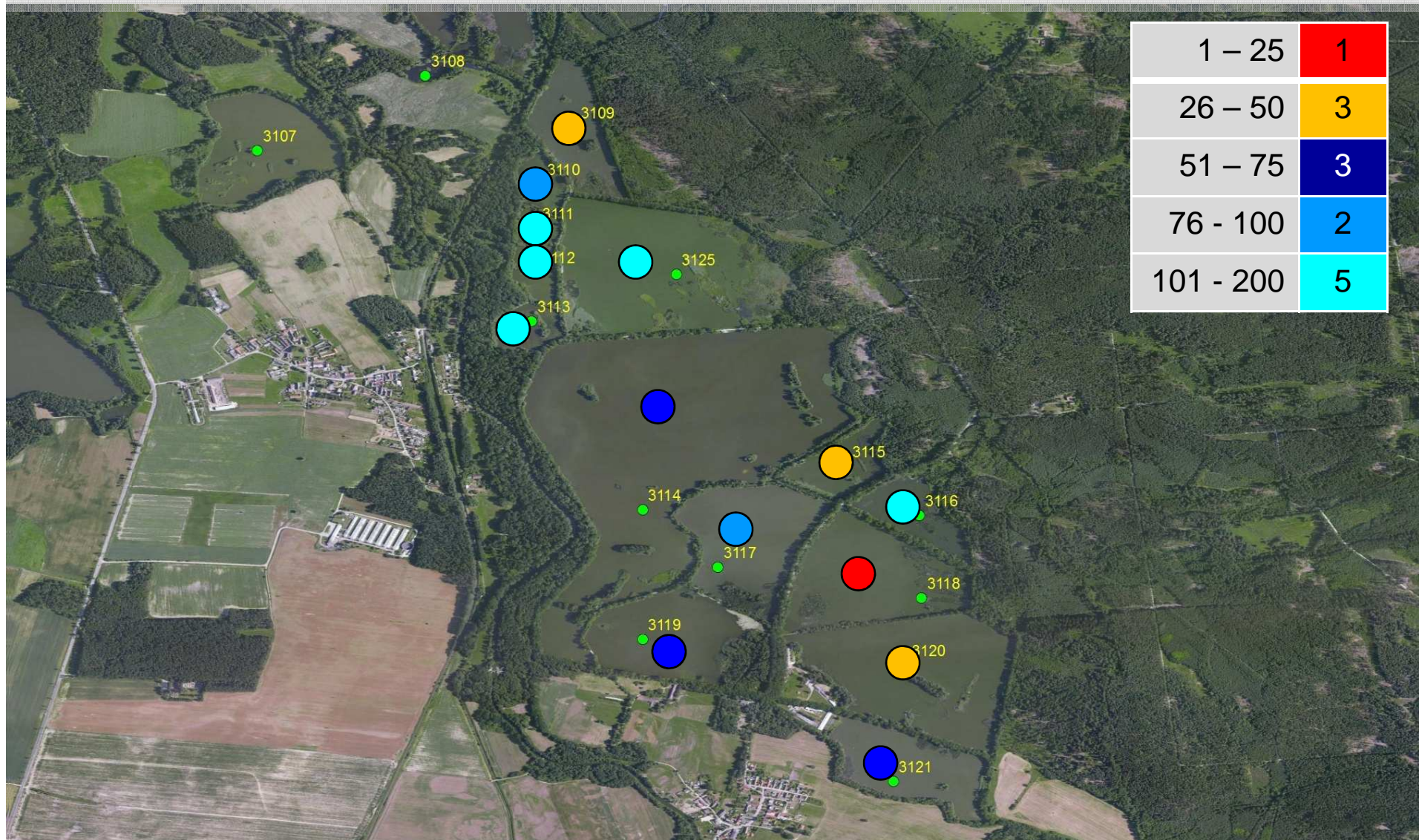
# 2014 + 2015: Hnízdění na Nadějské soustavě - přesun na Rod

Druh		odchyceno	zjištěno na RODu	zjištěno na RODu s mládřaty	zjištěno jinde s mládřaty
<i>Kachna divoká</i>		6	2	0	0
<i>Kopřivka obecná</i>		3	0	0	0
<i>Zrzohlávka rudozobá</i>		5	3	3	1 *
<i>Polák velký</i>		6	3	2	1 *
<i><b>Polák chocholačka</b></i>		<b>20</b>	<b>14</b>	<b>11</b>	<b>2 *</b>

\* pouze rok 2014 a všechny se později objevily na Rodu

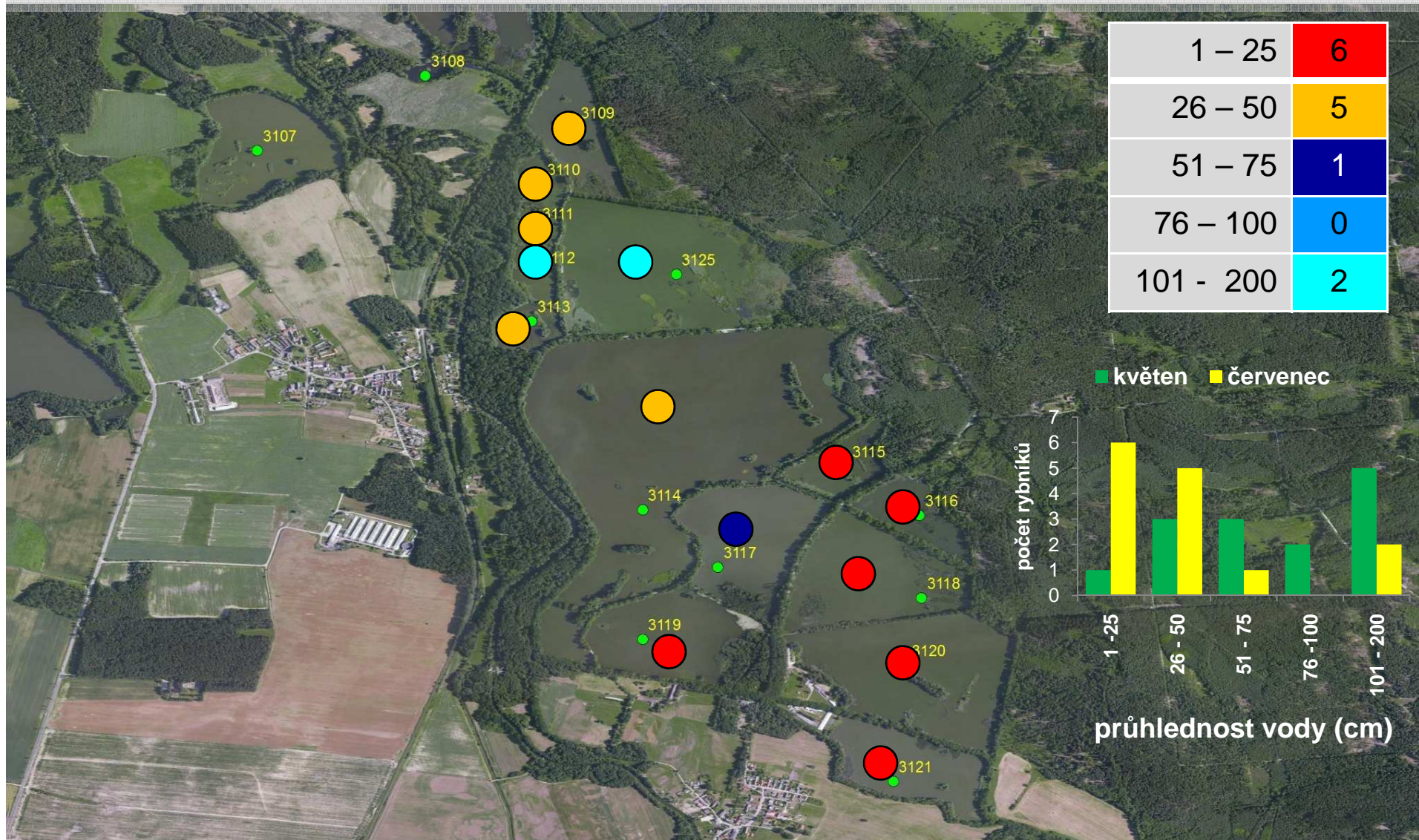


# Průhlednost vody - květen 2015



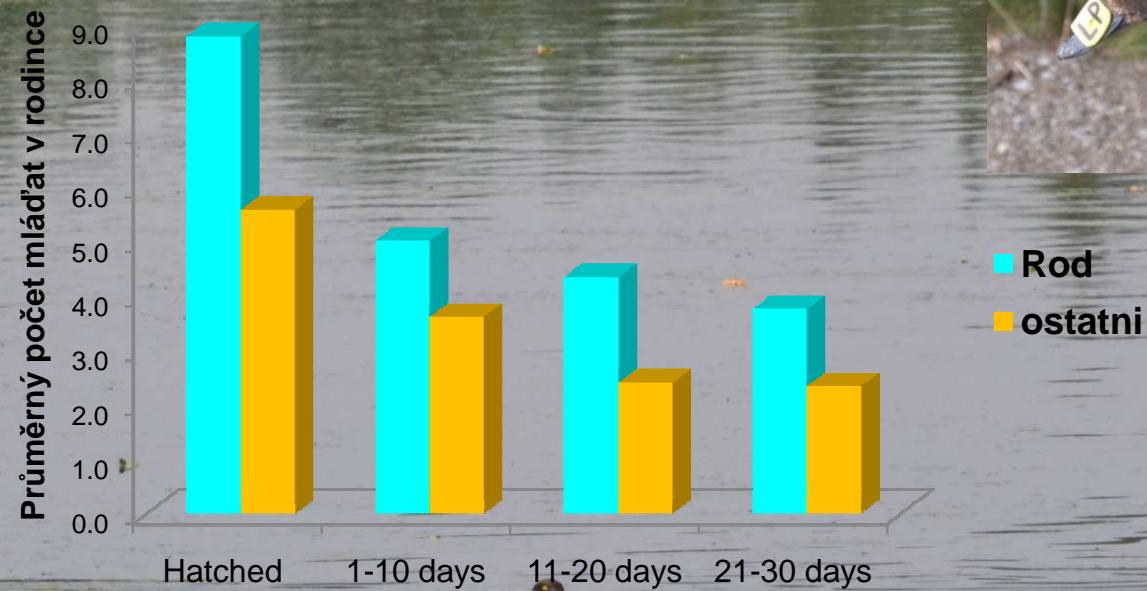
Barevná škála znázorňuje průhlednost vody, čísla udávají počty rybníků v jednotlivých kategoriích.

# Průhlednost vody - červenec 2015



Barevná škála znázorňuje průhlednost vody, čísla udávají počty rybníků v jednotlivých kategoriích.

# Polák chocholačka - 2015



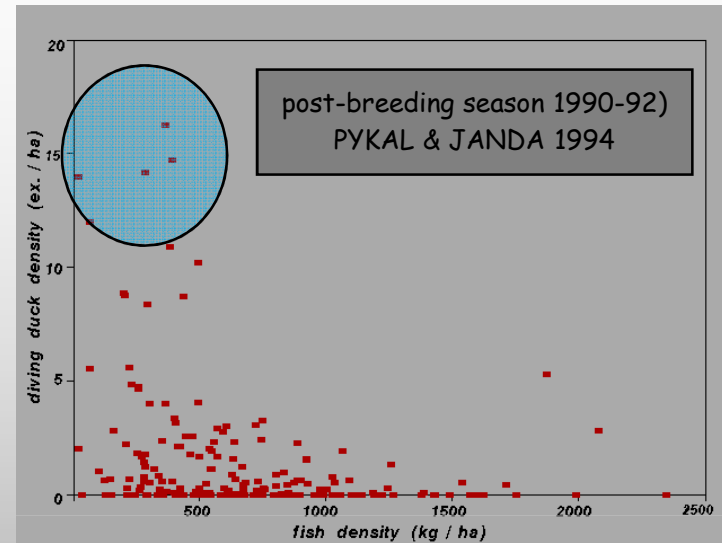
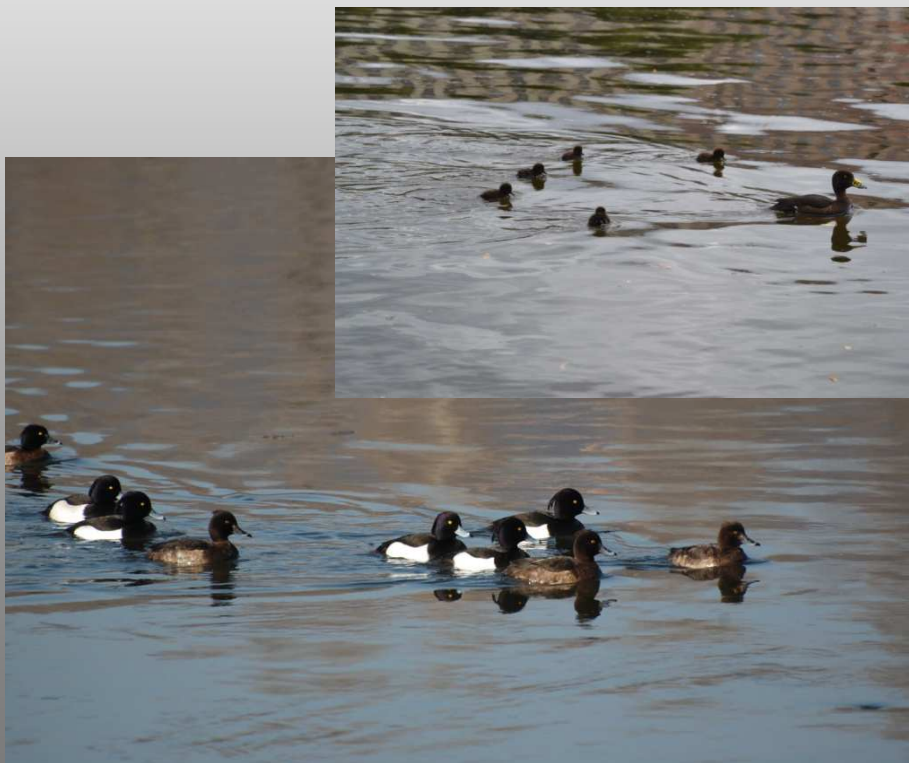
pouze rodinky  
značených  
samic: 8 + 7

# Tufted Duck

# *Aythya fuligula*

## Benthophagous species:

We expected Density dependent regulation of reproduction output due to effect of competition between Carp and Tufted Duck



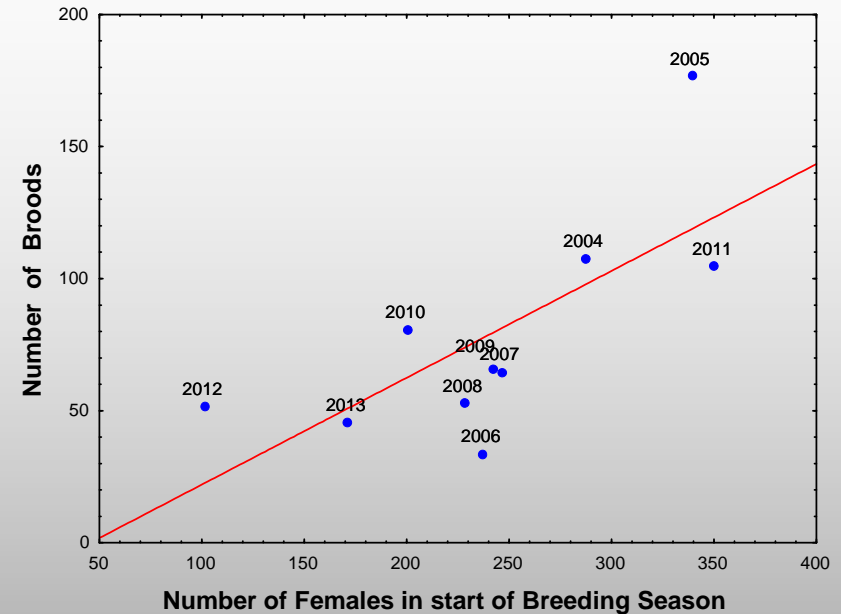
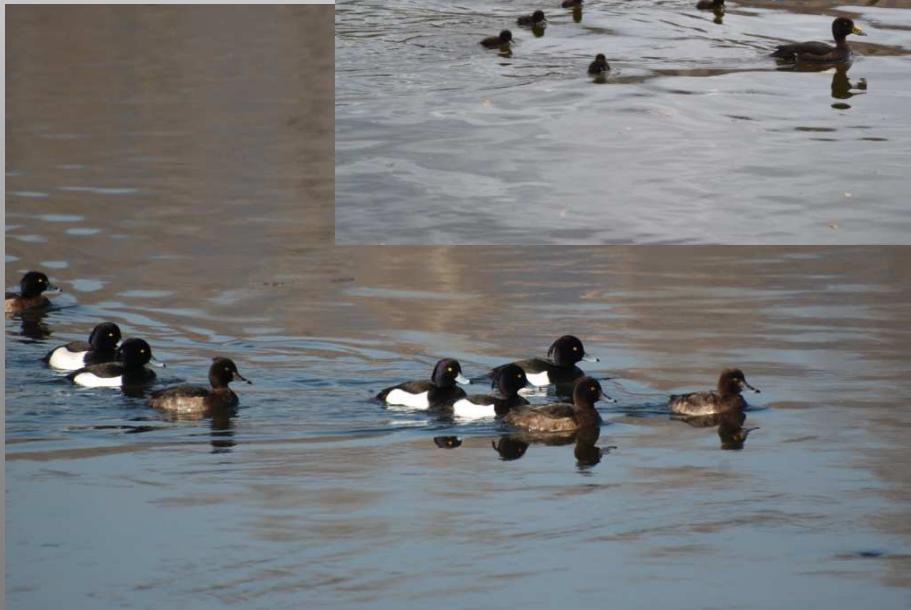


# Tufted Duck

# *Aythya fuligula*

## ~~Benthophagous species:~~

~~We expected Density-Dependent regulation of reproduction output due to effect of competition between Carp and Tufted Duck~~



Numbers of broods are positively correlated with Population Size in the beginning of Breeding season.

***Tufted Ducks produce more young in good years.***

# Breeding site fidelity

Třeboň Biosphere Reserve (Czechia) in 2001-2013:

- **163** females of **Tufted Duck**

- Caught and marked by nasal saddles

➤ Program MARK 6.2 (White & Burnham, 1999)



	<b>Tufted Duck</b>
<b>Apparent survival probability</b>	0.650 ± 0.025
<b>Resighting probability</b>	0.674 ± 0.038

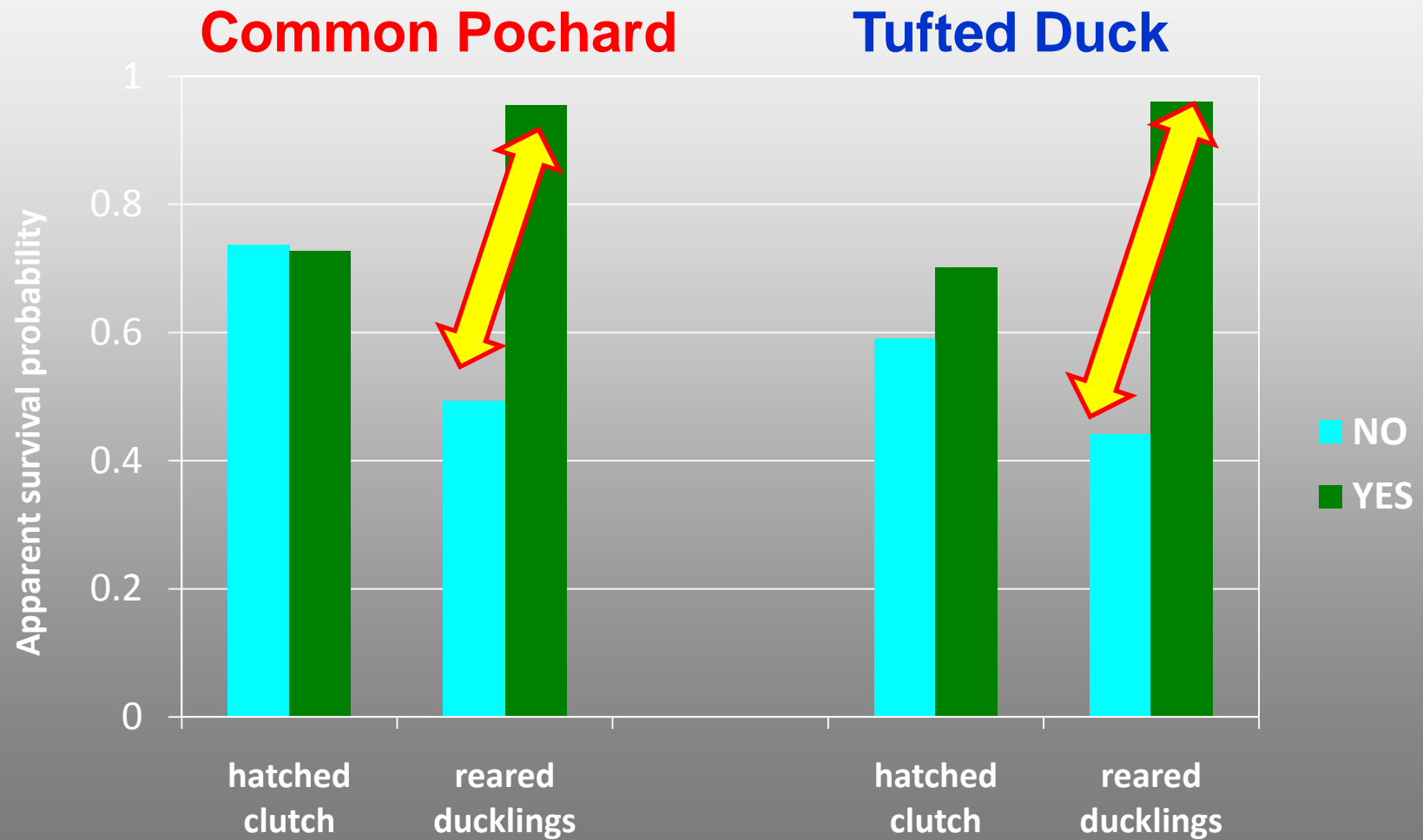
## Model selection for site fidelity (*apparent survival*) using different models: **Tufted Duck (n=163)**

Model	np	AIC	$\Delta$ AIC	AIC weight	Deviance
<b><math>\Phi</math> (ml123)p(.)</b>	<b>2</b>	<b>183.0372</b>	<b>0</b>	<b>0.9909</b>	<b>178.9556</b>
$\Phi$ (ml4567)p(.)	2	192.4214	9.3842	0.00908	188.3397
$\Phi$ (group)p(.)	2	207.0527	24.0155	0.00001	202.9711
$\Phi$ (s31)p(.)	2	210.1215	27.0843	0	206.0399
$\Phi$ (egg)p(.)	2	210.8235	27.7863	0	206.7419
$\Phi$ (s44)p(.)	2	210.9758	27.9386	0	206.8941
$\Phi$ (clutch)p(.)	2	211.0617	28.0245	0	206.98
$\Phi$ (weight)p(.)	2	211.5652	28.528	0	207.4836
$\Phi$ p(.) PIM	2	211.5989	28.5617	0	207.5173
$\Phi$ (layr)p(.)	3	212.9154	29.8782	0	206.751

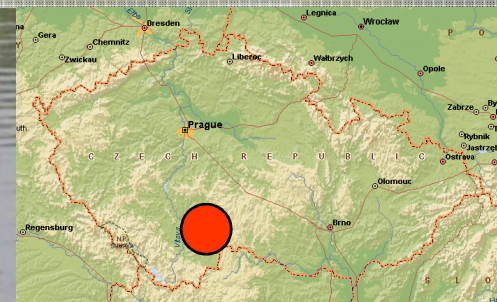
AIC –Akaike’s information criterion;  $\Delta$  AIC - differences between that model and the model with the lowest AIC;  
 $\Phi$  - apparent survival probability; p - recapture probability; (.), -time independent effect;  
**ml123 – ducklings in age less than 4 weeks**; ml4567 – ducklings in age 4 and more; group – local breeding density; egg – clutch size (investment); clutch – hatching probability; weight – female body weight (body condition); layr – relative laying date; s31 & s44 – fishpond system (breeding site)

## Breeding site fidelity (*Apparent survival probability*)

in females differing in reproduction success, i.e. females with hatched clutch and females, which reared ducklings.

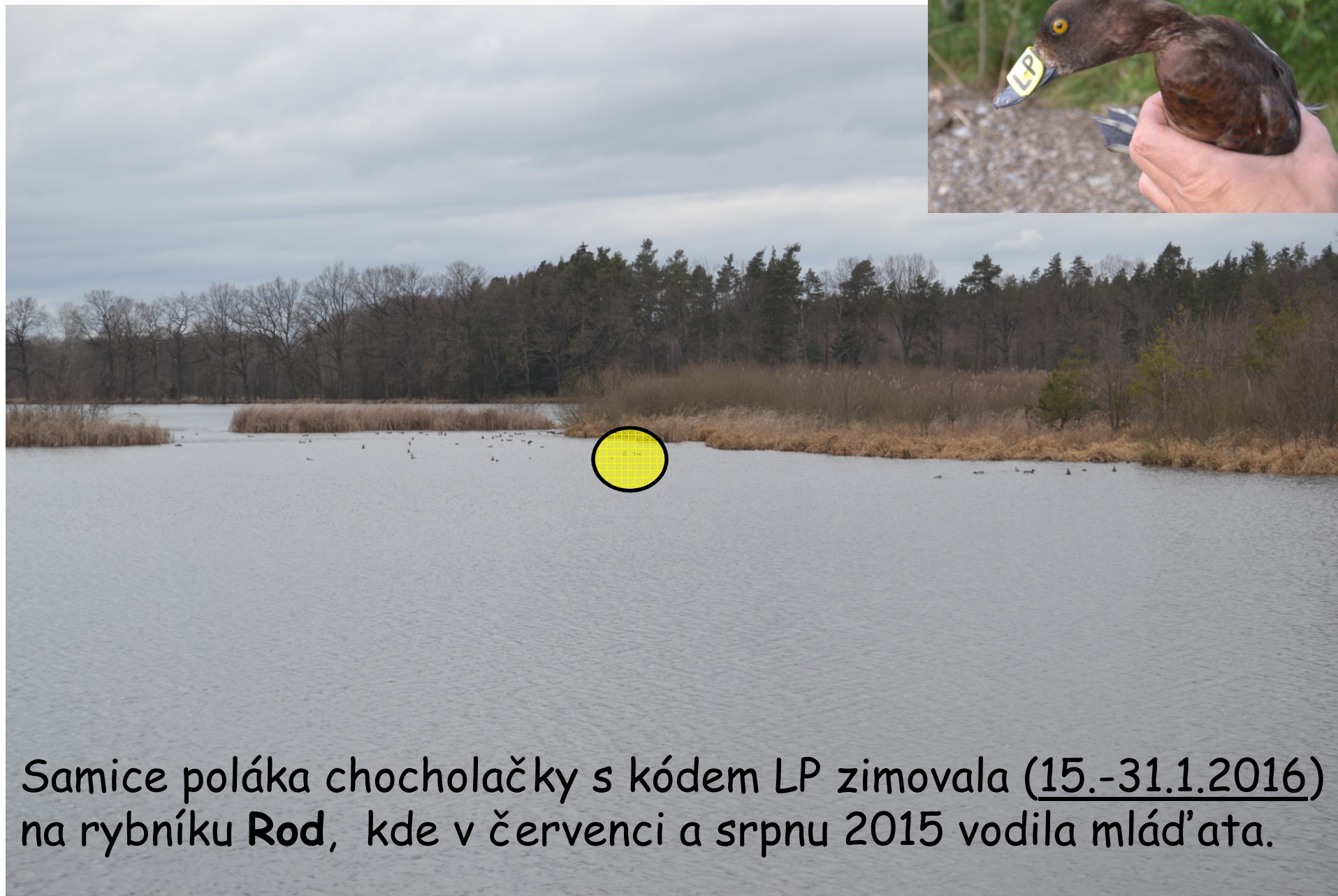


Rod 2016 ???



Přijďte se podívat není to daleko ...

A překvapení na konec...



Samice poláka chocholačky s kódem LP zimovala (15.-31.1.2016) na rybníku **Rod**, kde v červenci a srpnu 2015 vodila mlád'ata.

Děkuji za pozornost

