



# Round Goby *Neogobius melanostomus* in European Rivers

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I. Hi!



## II. An invader to fear

### round goby in the recipient system:

#### predator

- macroinvertebrates

- fish eggs and juveniles

#### competitor

- benthic fishes

#### prey

- fish, birds, snakes

#### scavenger

#### host

- reservoir

- trap



## II. An invader to fear

documented impact on native fish assemblages:



*Janssen and Jude (2005)*

*Lauer et al. (2004)*

*Riley et al. (2008)*



+ changes in food-web structure

+ contaminant transfer

+ impact on invertebrates

**TOP 100 invasive species  
in EUROPE**





### III. Round goby in Europe



Impact on native fish  
in Europe?

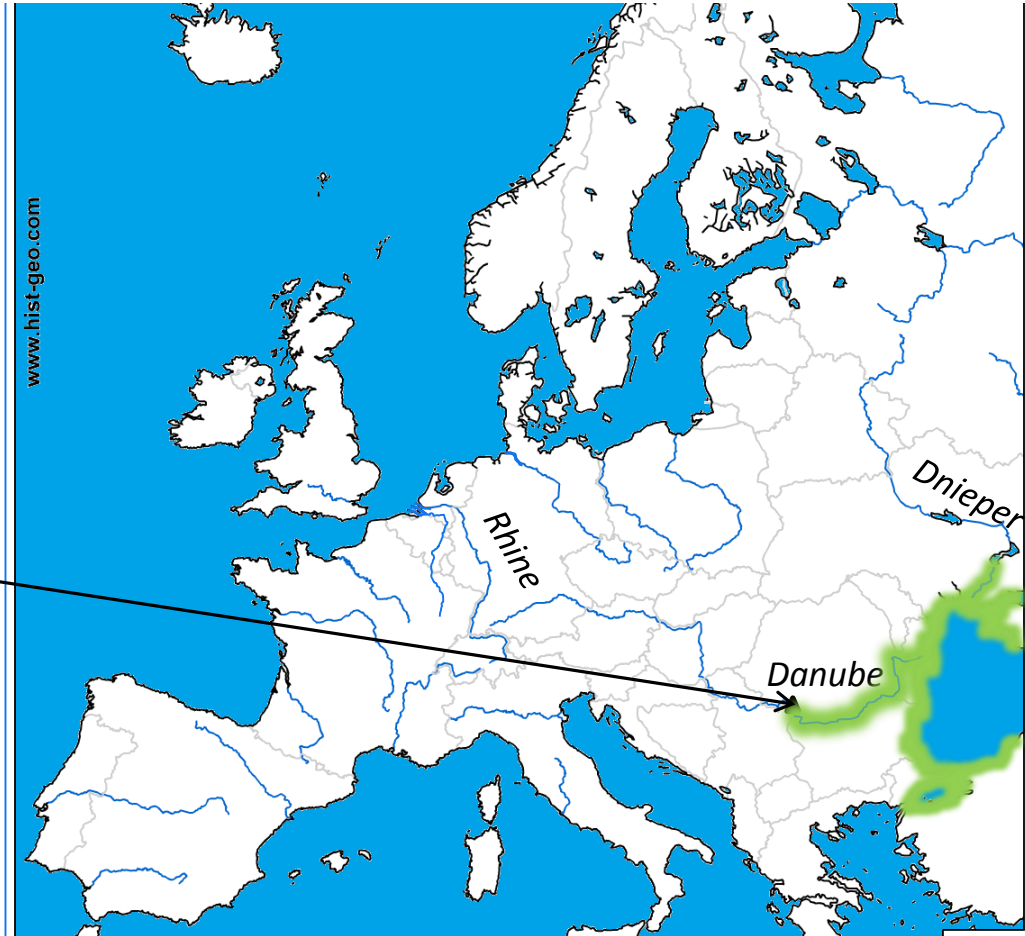


# III. Round goby in Europe



native to:

- Black Sea
- lower stretches of the Danube and Dnieper



### III. Round goby in Europe



native to:

- Black Sea
- lower stretches of the Danube and Dnieper

introduced to:

Baltic Sea (1990)

Danube (2000)

Rhine (2004)

Meuse, Oder, Elbe

tributaries,...

...to be continued



# III. Round goby in Europe



Impact on native fish  
in Europe?

Case study 1:  
The River Dyje





# III. Case study 1: The River Dyje

## the River Dyje

Danubian tributary

channelised

rip-rap banks

river width 40 m

sampling

2002-2004

2008-2013

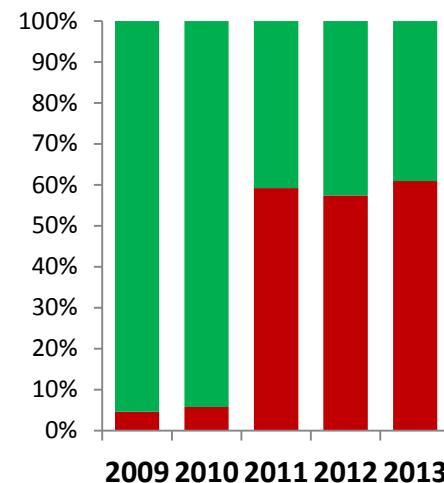
10 sites



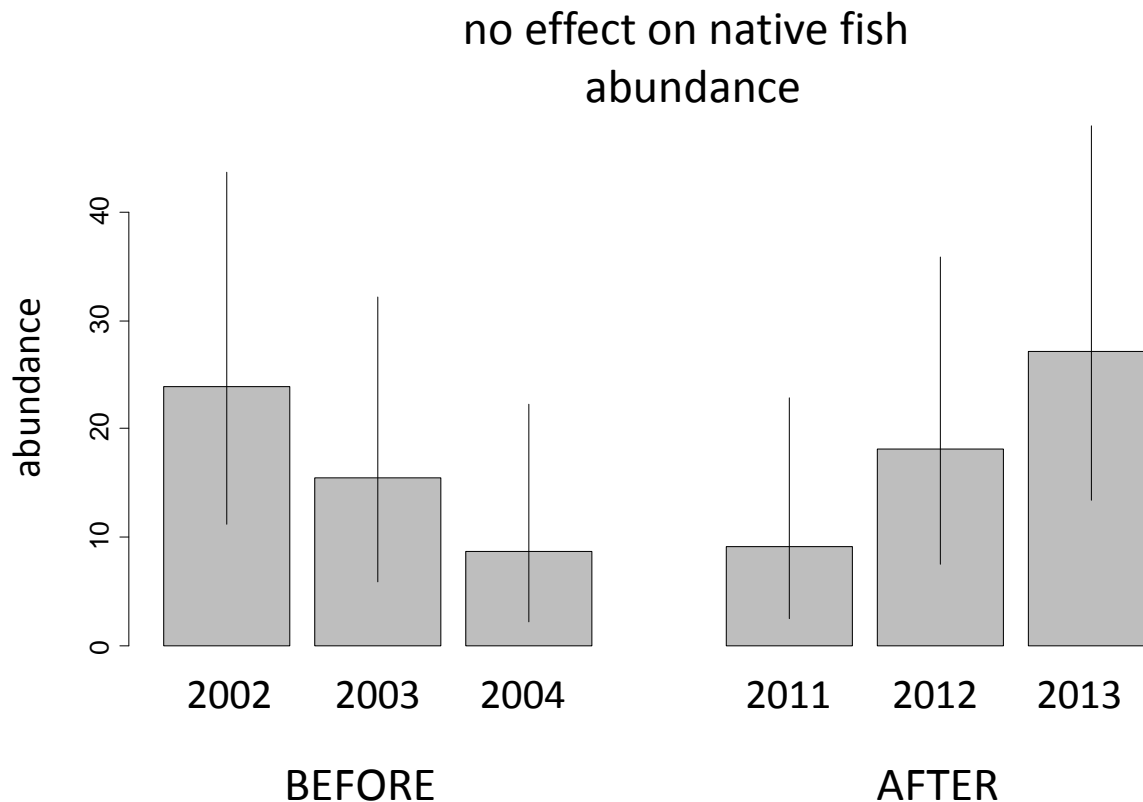
## round goby

first occurrence 2008

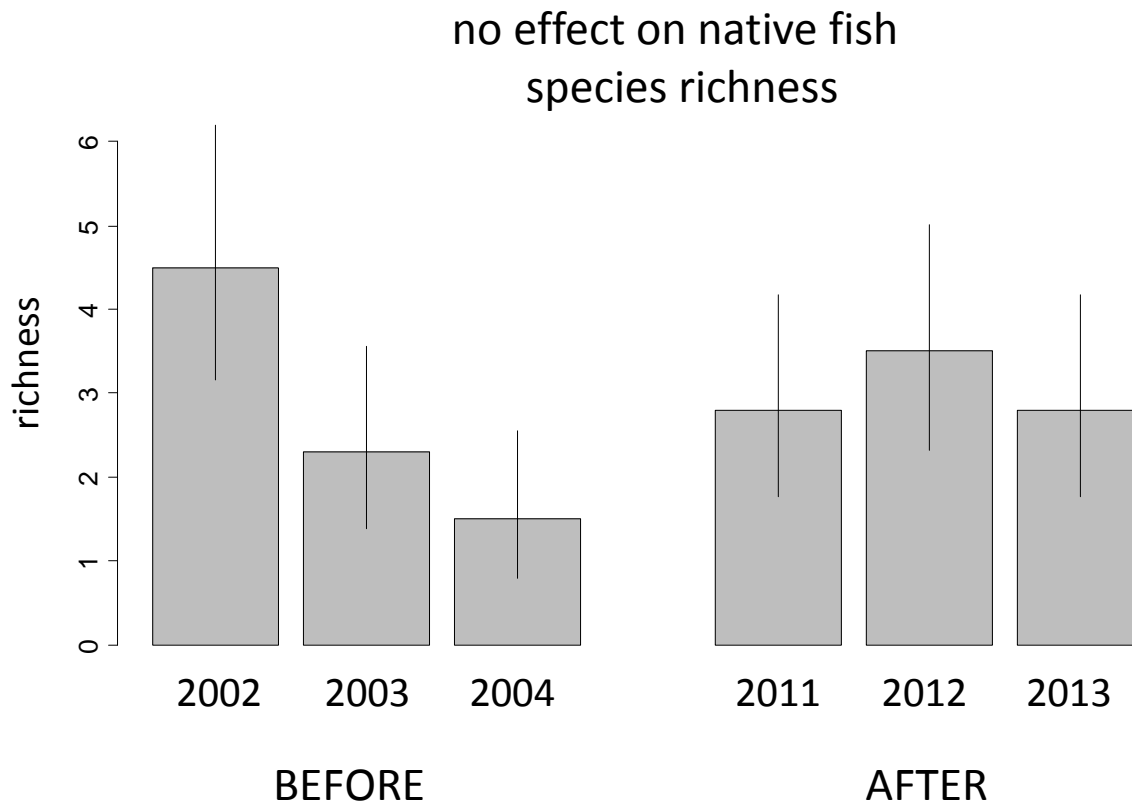
dominant from 2011 on



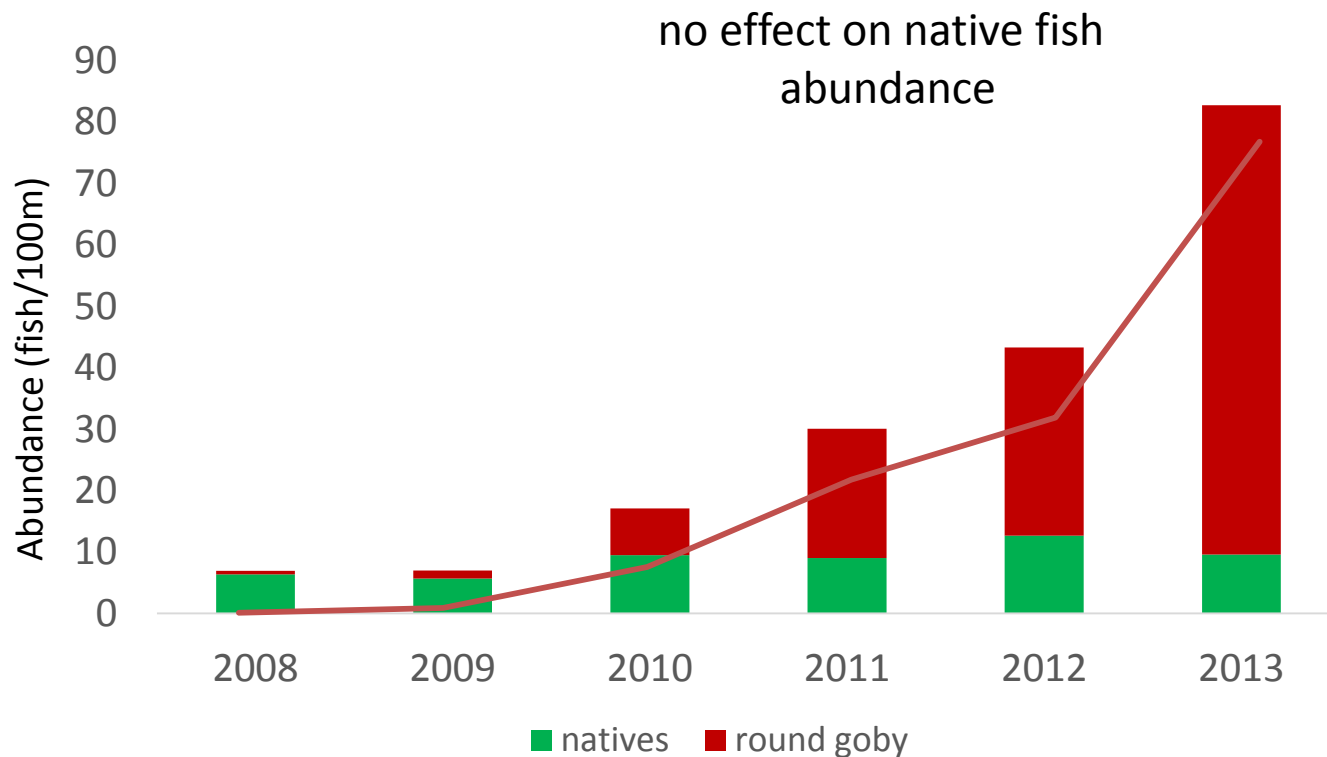
### III. Case study 1: The River Dyje



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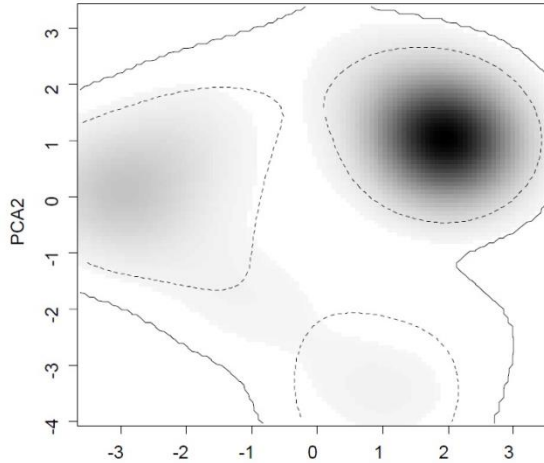
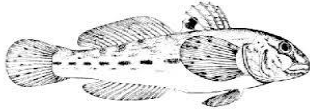


### III. Case study 1: The River Dyje

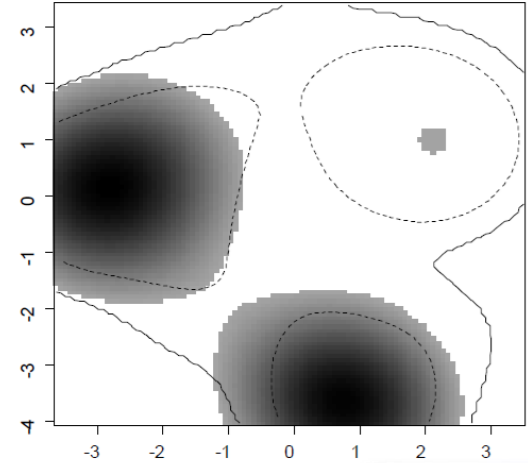
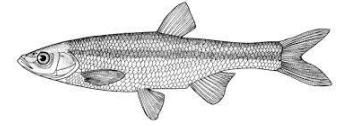


site 4

# IV. Lack of effect – ‘vacant’ niche?



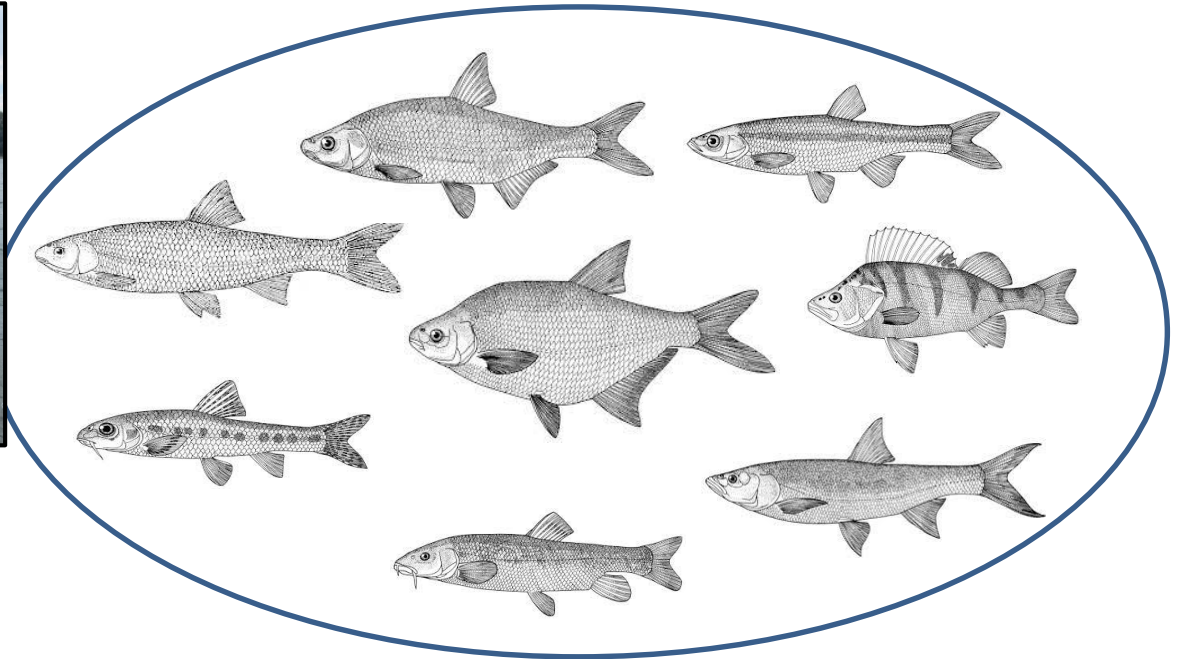
NO (HABITAT)  
NICHE OVERLAP





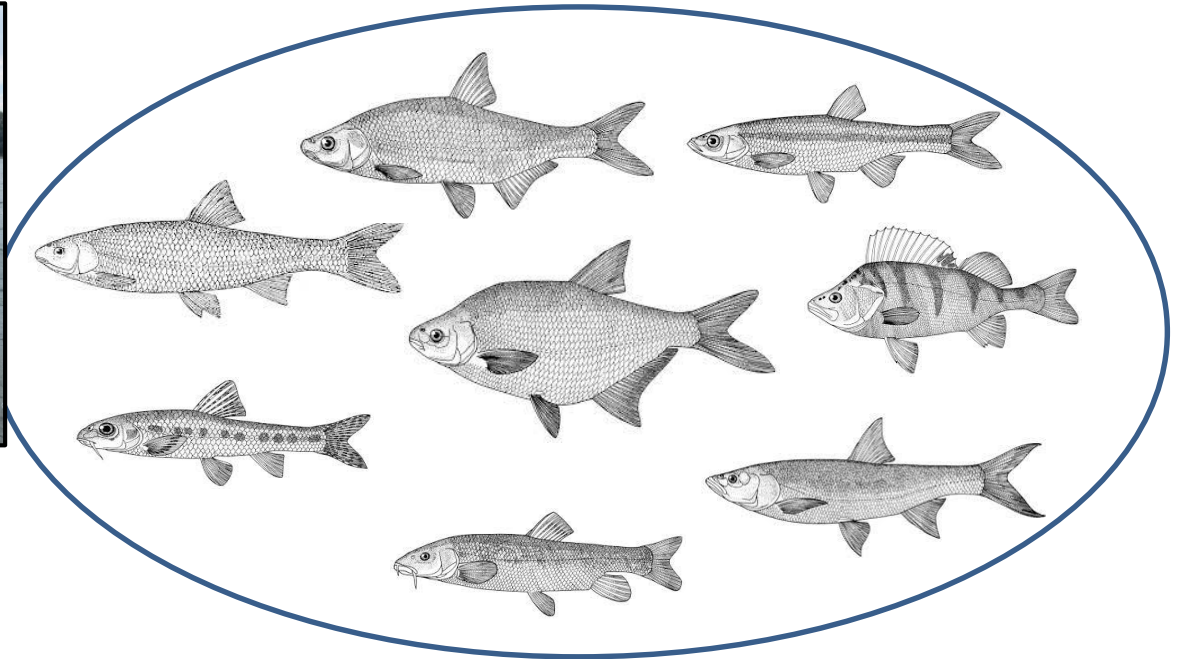
## IV. Lack of effect – ‘vacant’ niche?

river channelisation

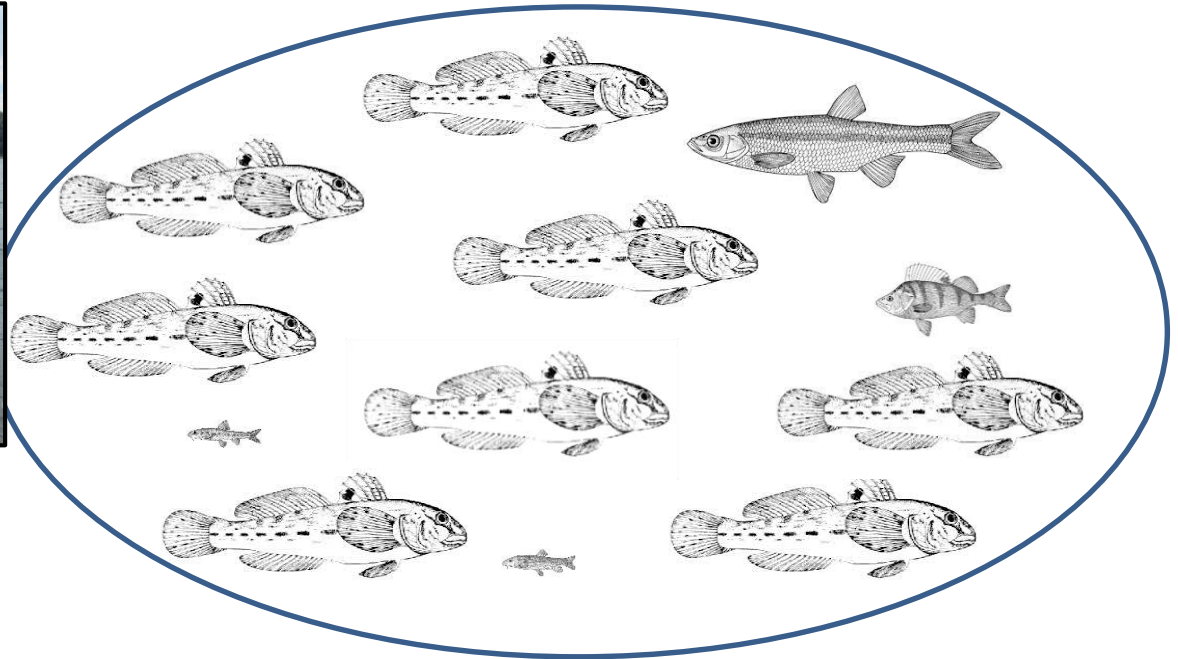
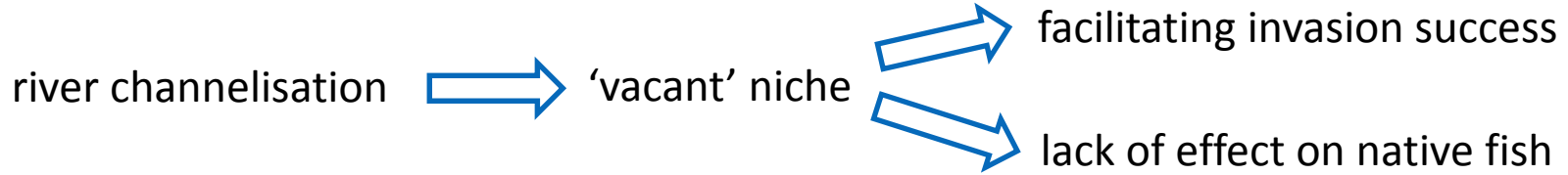


## IV. Lack of effect – ‘vacant’ niche?

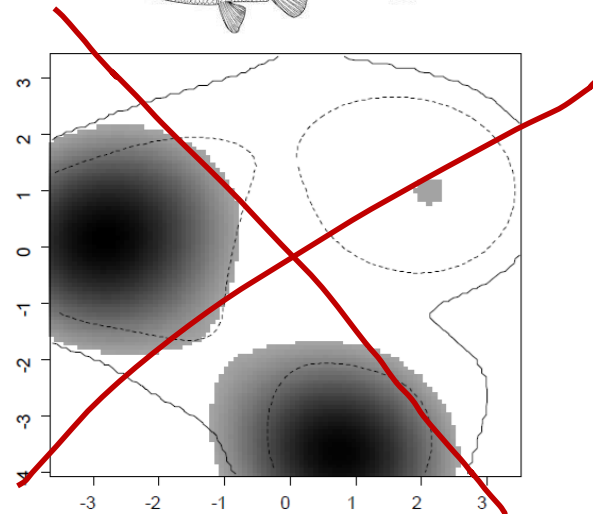
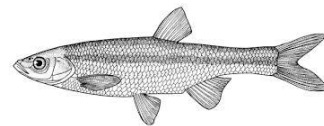
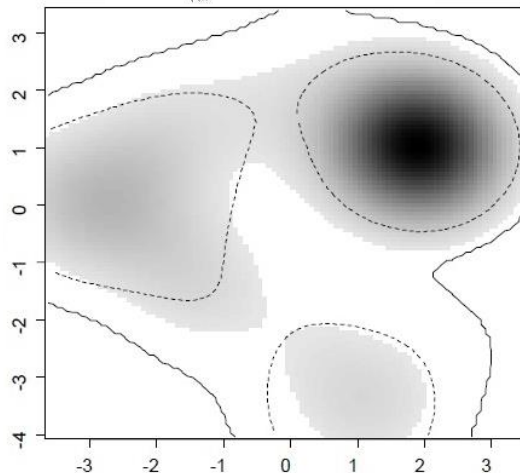
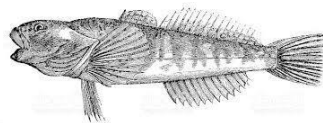
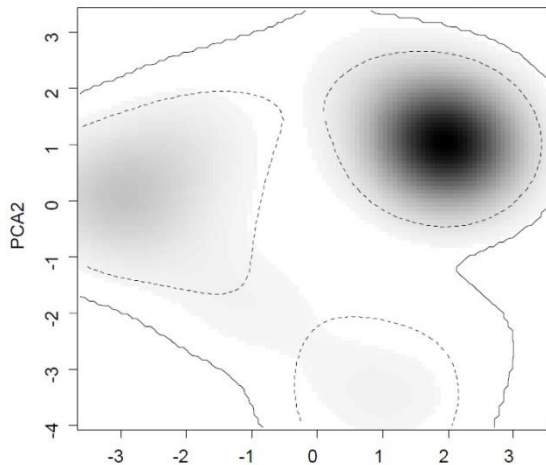
river channelisation → ‘vacant’ niche



## IV. Lack of effect – ‘vacant’ niche?



# V. Impact on cottids



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Impact on native fish  
in Europe?

www.hist-geo.com



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Research Article

## Invasive Ponto-Caspian gobies rapidly reduce the abundance of protected native bullhead

Nils van Kessel<sup>1,2,3,7</sup>, Martijn Dorenbosch<sup>1,3</sup>, Jan Kranenborg<sup>4,7</sup>, Gerard van der Velde<sup>5,6,7</sup> and Rob S.E.W. Leuven<sup>2,7,\*</sup>





## VI. Case study 2: The River Danube



Impact on native fish  
in Europe?

Case study 2:  
The River Danube

www.hist-geo.com



# VI. Case study 2: The River Danube

the River Danube

r.km 1900, Austria

channelized

rip-rap banks

river width 300 m

sampling 2005-2015



**round goby**

first occurrence 2002

most abundant species  
1/3 of the catch

+ 3 other invasive gobiids



## VI. Case study 2: The River Danube



Round goby from 2002

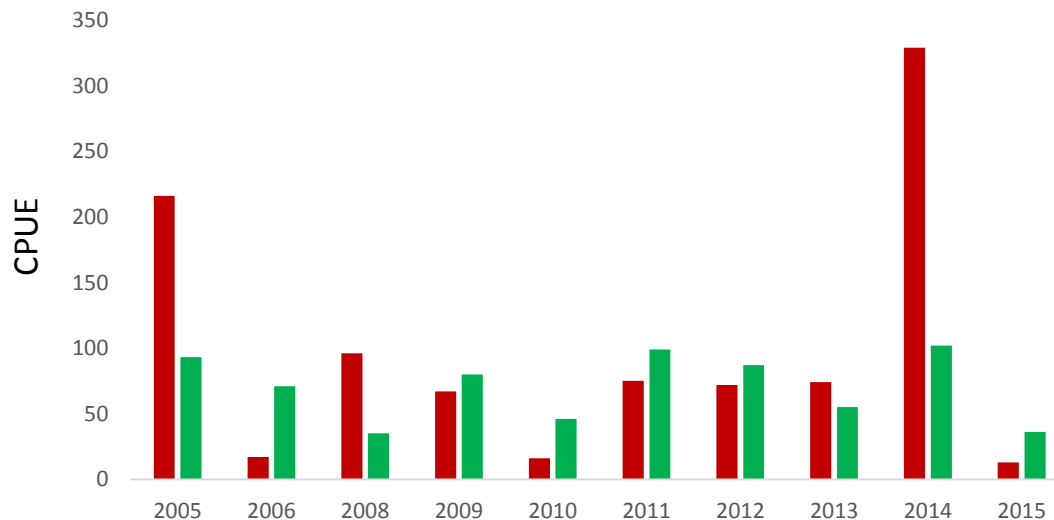
most abundant species  
1/3 of the catch

+ three other invasive  
gobiids



European bullhead

1/4 of the catch



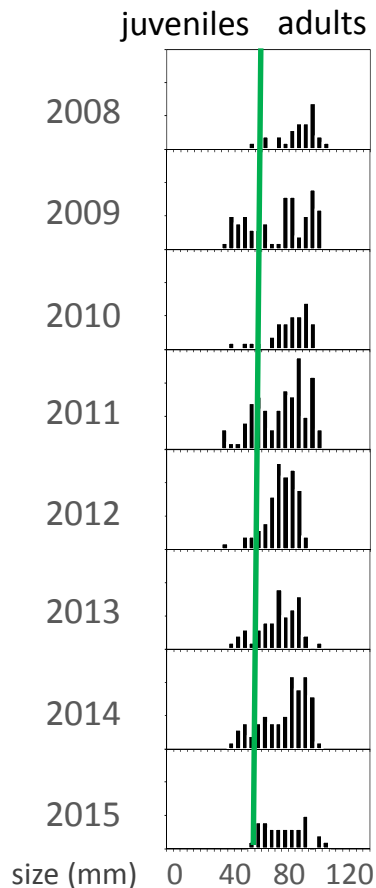
## VI. Case study 2: The River Danube



Round goby from 2002

most abundant species  
1/3 of the catch

+ three other invasive  
gobiids



European bullhead

1/4 of the catch

+ stable, reproducing  
population

# VI. Case study 2: The River Danube



Round goby from 2002

most abundant species  
1/3 of the catch

+ three other invasive  
gobiids

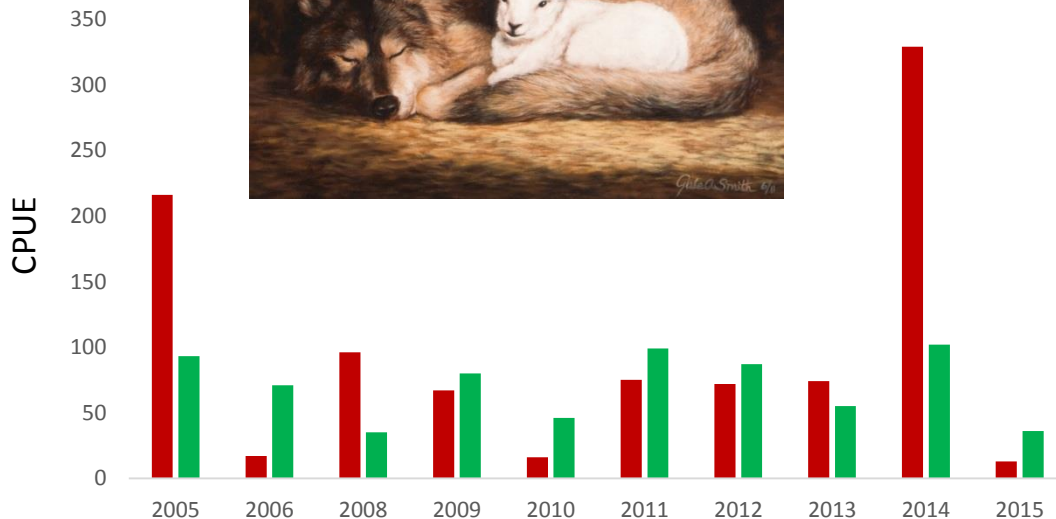
LACK OF THE (EXPECTED) EFFECT



European bullhead

1/4 of the catch

+ stable, reproducing  
population





## VII. Impact in Europe?



variable  
impact

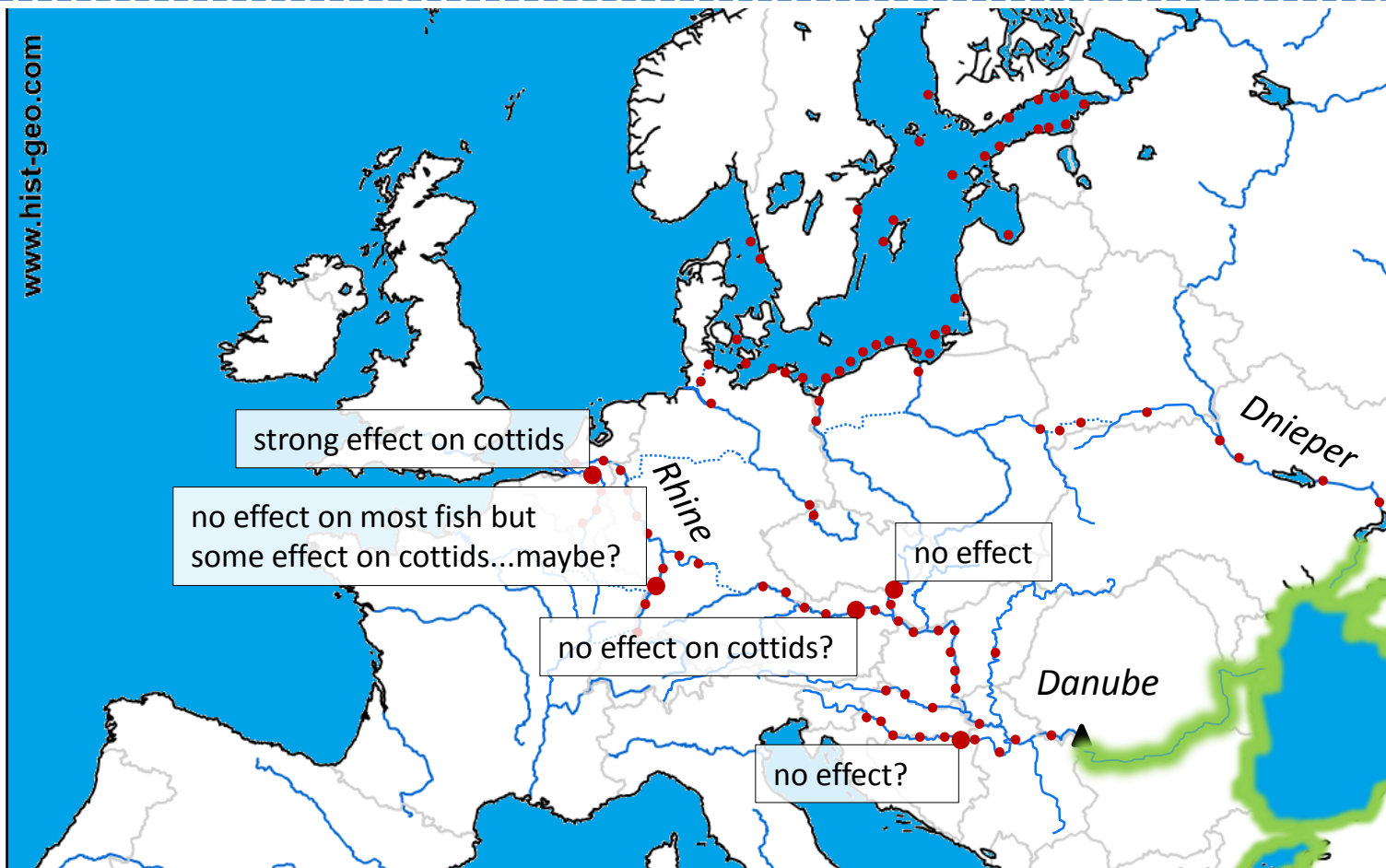


## VII. Impact in Europe?



variable  
impact

not enough  
information



## VIII. Variable impact

MECHANISMS ?

SUGGESTED...

predation  
(eggs, juveniles)



competition  
for food



competition  
for shelter



spawning  
interference



## VIII. Variable impact

### MECHANISMS ?

competition  
for food



## VIII. Variable impact

### MECHANISMS ?

predation  
(eggs, juveniles)



spawning  
interference





# VIII. Variable impact

## MECHANISMS

## HIERARCHY?

predation  
(eggs, juveniles)



competition  
for food



competition  
for shelter



spawning  
interference



## IX. Keep in mind...



**Thank you for  
your attention**

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