

# Prussian carp – a recent invader to English waters

Angling Trust Forum – 27 June 2023

Gareth D Davies & Andy Martin  
Environment Agency



# Contents

- So what is a Prussian carp and where have we found them? – Gareth (25mins)
- Regulatory landscape, potential sources, what we are doing and what you can do – Andy (20mins)
- Q&A

# Carassius Auratus Complex (CAC)

- Carassius auratus complex is made up of 6 species
  - *C. auratus* (goldfish)
  - ***C. gibelio* (Prussian)**
  - *C. langsdorfii* (ginbuna)
  - *C. auratus grandoculis* (nigorobuna)
  - *C. carassius* (crucian)
  - *C. cuvieri* (white crucian)
  - *C. praecipuus*
- Predominantly from Asia and Eastern Europe
  - invasive populations in other European countries & Canada
- Goldfish the most widely distributed of the Genus



*Carassius carassius*



*Carassius auratus*



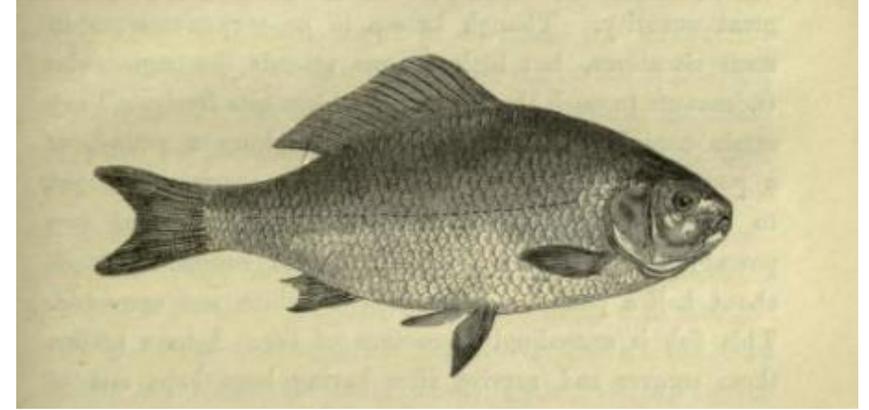
*Carassius langsdorfii*



*Carassius a. grandoculis*

# Biology

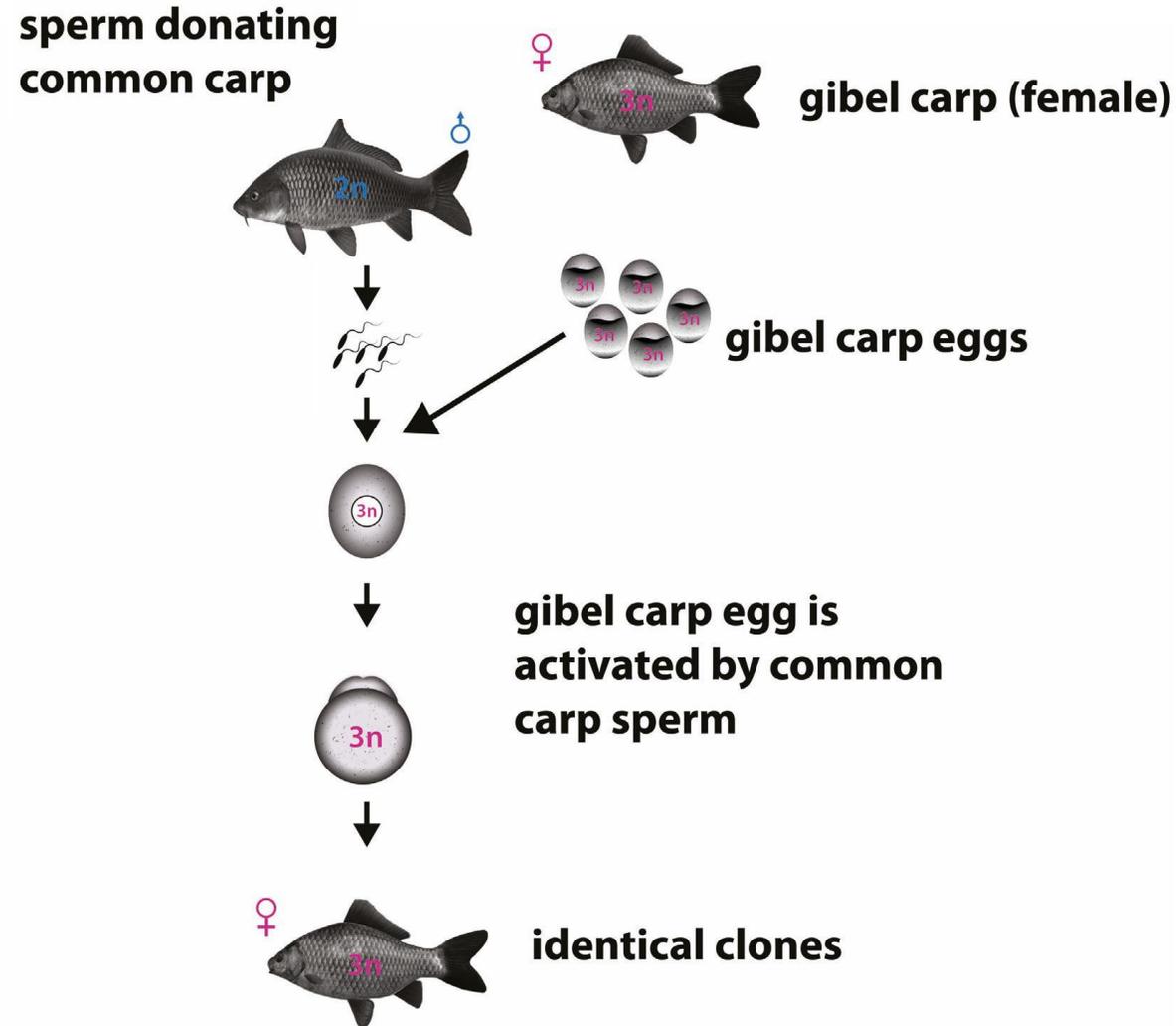
- Tolerates poor environmental conditions



*“This fish is exceedingly tenacious of life. I have known them to recover and survive having been kept out of water thirty hours.”* William Yarrell.

- Broad, omnivorous diet
- Exists in both diploid and polyploid forms
- Invasive pops. dominated by females
- Unique method of reproduction....

# Biology



**= very successful invader!**

# Impacts



- Increases water turbidity and modify ecosystems
- Can become dominant sp. in some systems
- Significant reductions in native fish populations in Europe
  - no evidence of extirpations.
- Genetic introgression with other *Carassius* species

# History of events

c. 2019

- Noted references to '*Carassio*' in fisheries

Dec 2020

- Obtained sample from a fishery in NW

Jan 2021

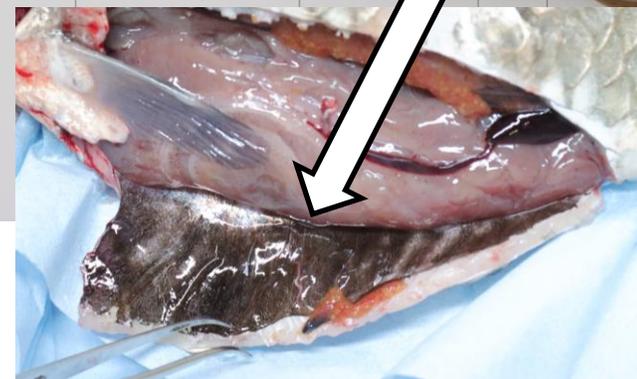
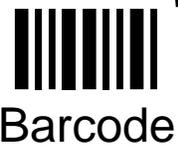
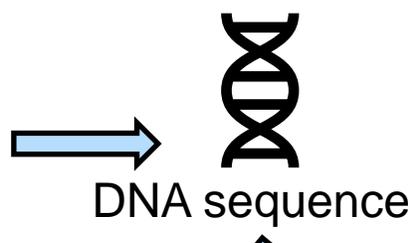
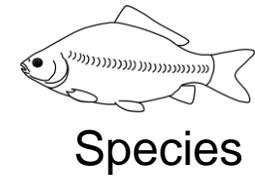
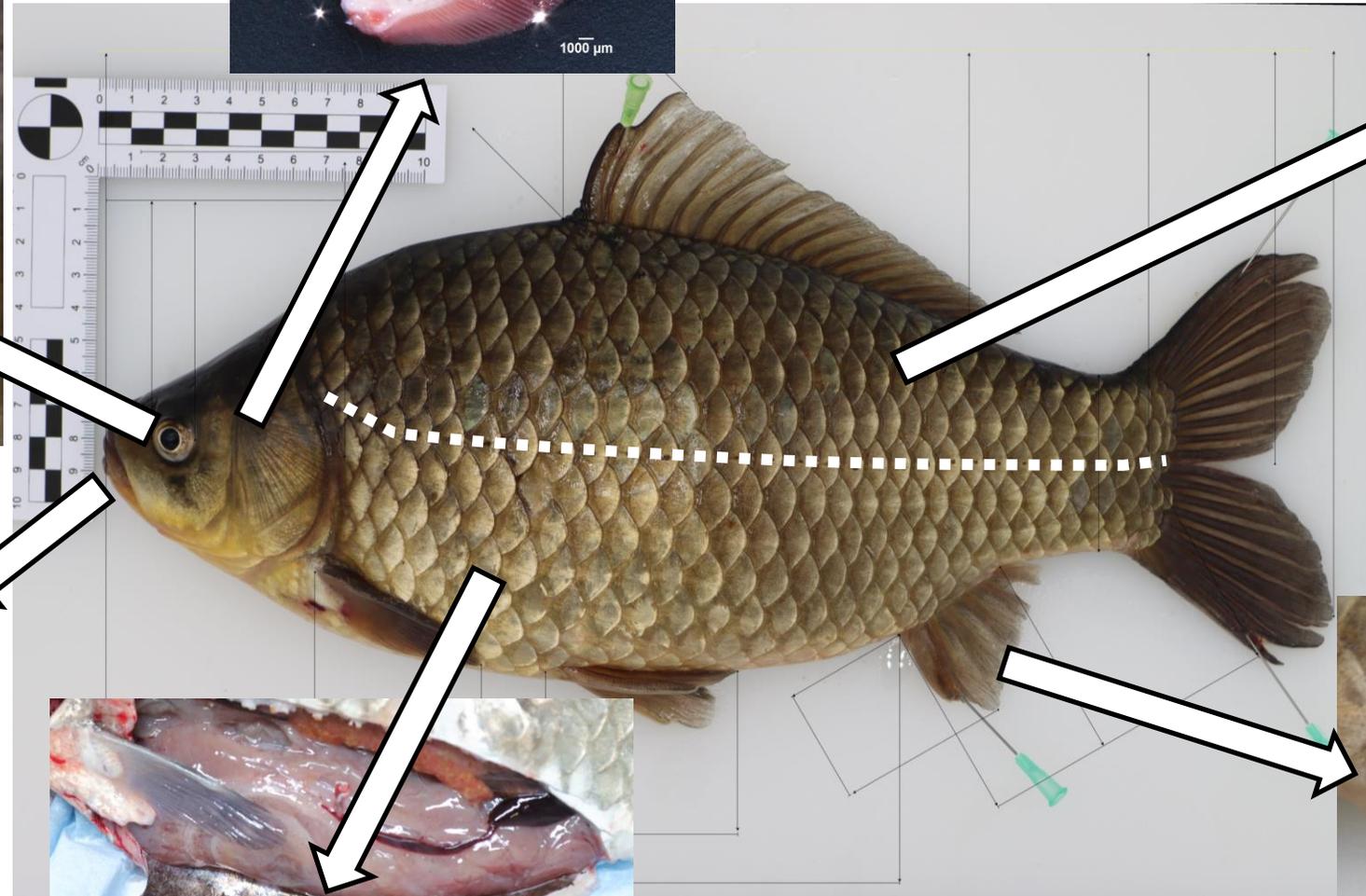
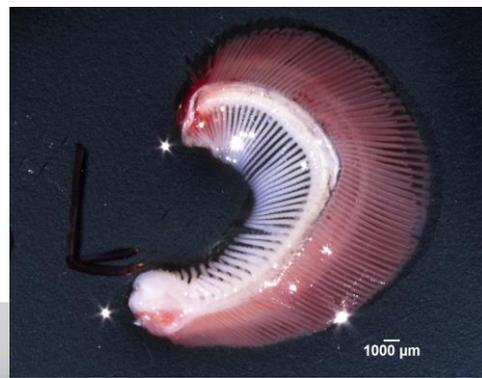
- Confirmed the identification

June 2023

- Confirmed presence in 7 sites
  - 17 more suspected to contain
- Detection of 2 other NN *Carassius* species as part of investigations



# Identification



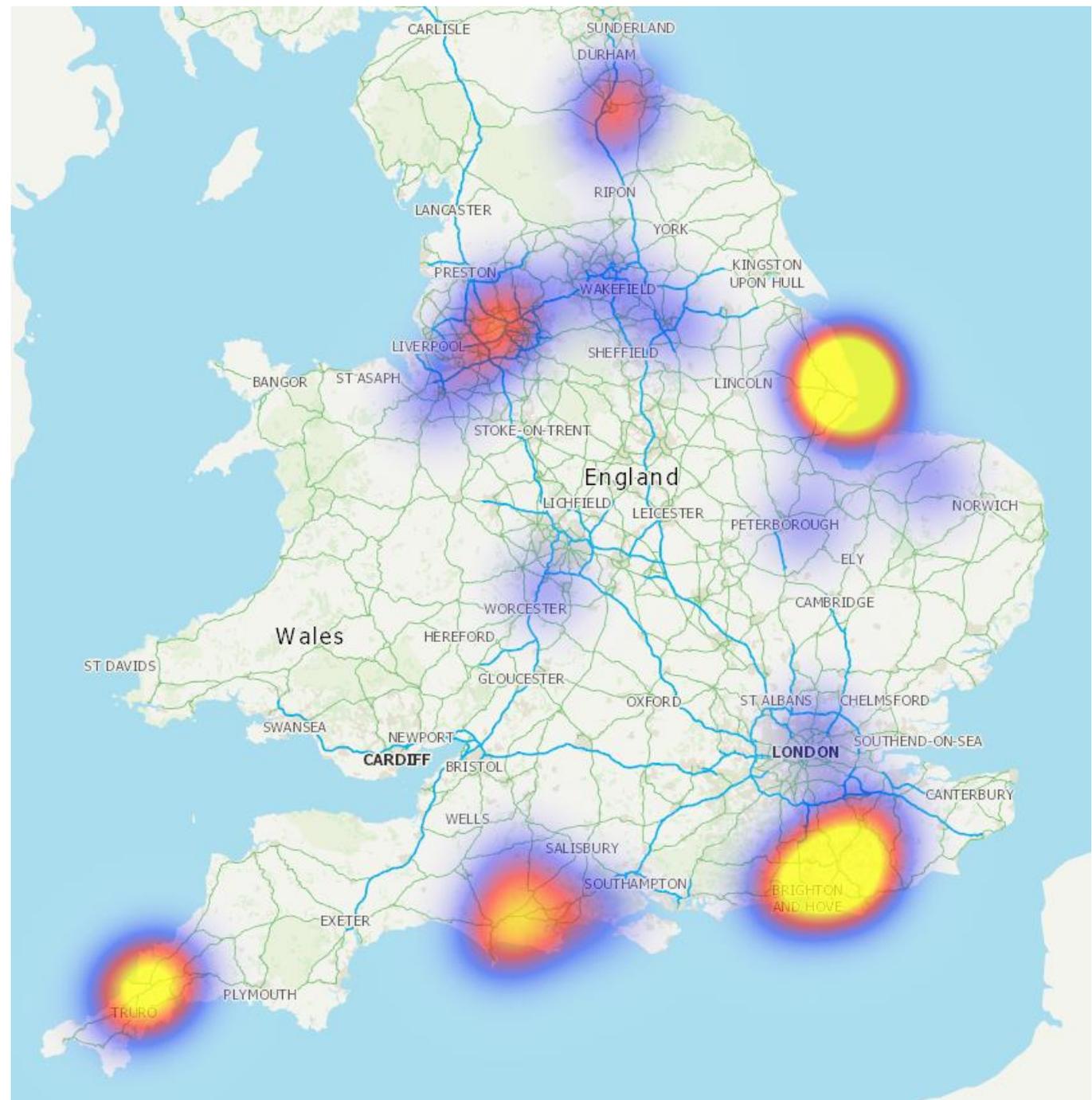
Species

DNA sequence

Barcode

# Distribution

- England:
  - Widespread, but isolated
- Wales & Scotland:
  - None detected to date



# Publicity



## Prussian Carp and Related Species August 2022

We have confirmed the presence of an invasive non-native freshwater fish called Prussian carp in England. Through our investigations we have initially detected two further, similar-looking non-native fish species known commonly as 'ginbuna' and 'nigorbuna'. It is illegal to import any of these fish into the UK due to the risk they pose to our native fish populations and fisheries. Our National Fisheries Laboratory are undertaking detailed analyses of the physical and genetic characteristics of these cryptic fish species to better understand their distribution and the risk they pose. Please report any suspicions or sightings of these fish to us immediately.

### Prussian Carp

Prussian carp (*Carassius gibelio*), are native to central and eastern Europe but have been introduced to many other countries, either intentionally for food or angling, or inadvertently due to their similarities with other *Carassius* species. Prussian carp may also go by the names gibel carp, gibelio, carassio and silver crucians. Prussian carp were first detected in England in 2020 and have been confirmed in four stillwater fisheries.



### Ginbuna and Nigorbuna

Ginbuna (*Carassius langsdorfii*), are native to Asia but have been recorded in Europe and North America. They can also go by the common name of silver crucian carp. Nigorbuna (*Carassius auratus grandoculis*) are native to Japan, specifically Lake Biwa and its tributaries. It is unclear whether nigorbuna represents a distinct species or whether it is a sub-species of goldfish (*Carassius auratus*). Both species share many identifying features with each other and those of Prussian carp, however recent genetic analysis show both these fish are distinct from Prussian carp and crucians (*Carassius carassius*).

## NEWS

Home | Cost of Living | War in Ukraine | Climate | UK | World | Business | Politics | Culture | Tech

England | Local News | Regions | Cambridgeshire

## Non-native Prussian carp 'threat' to UK fish, Environment Agency warns

18 May



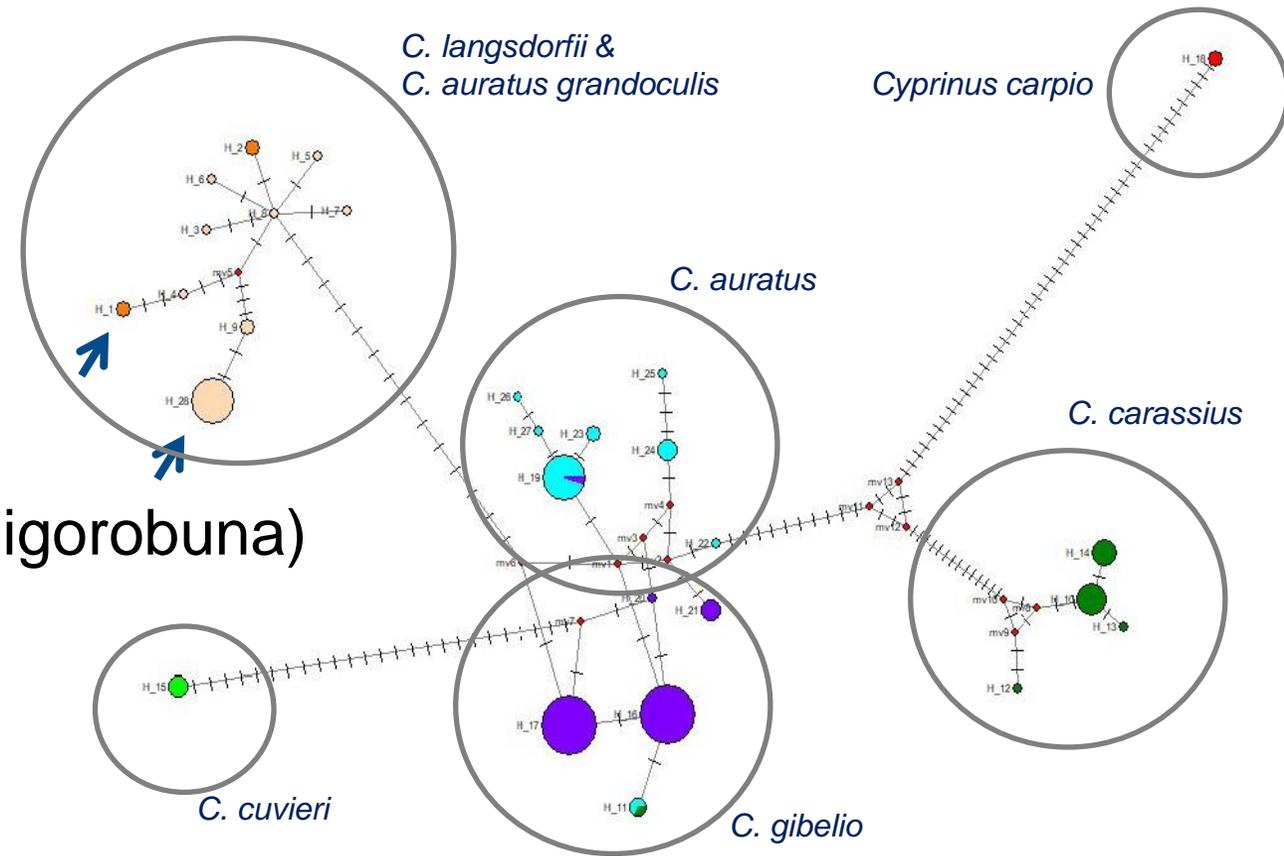
The Prussian carp is non-native to the UK and can affect other fish

- Additional contact details to follow....



# Other *Carassius* spp.

- Detected 2 other *Carassius* spp.
- *Carassius langsdorfii* (Ginbuna)
- *Carassius auratus grandoculis* (Nigorobuna)
- Previously not recorded in UK



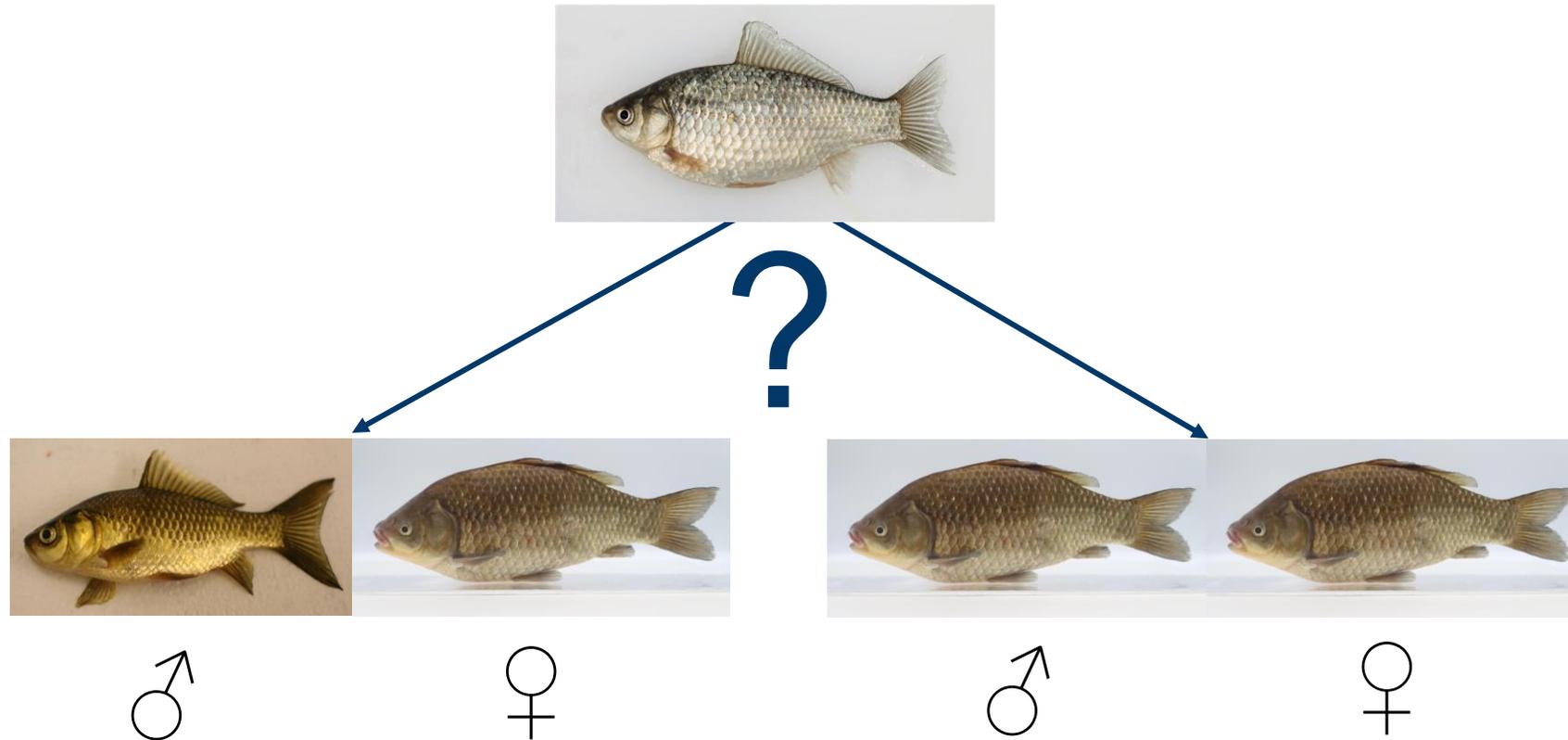
*Carassius langsdorfii*



*Carassius a. grandoculis*

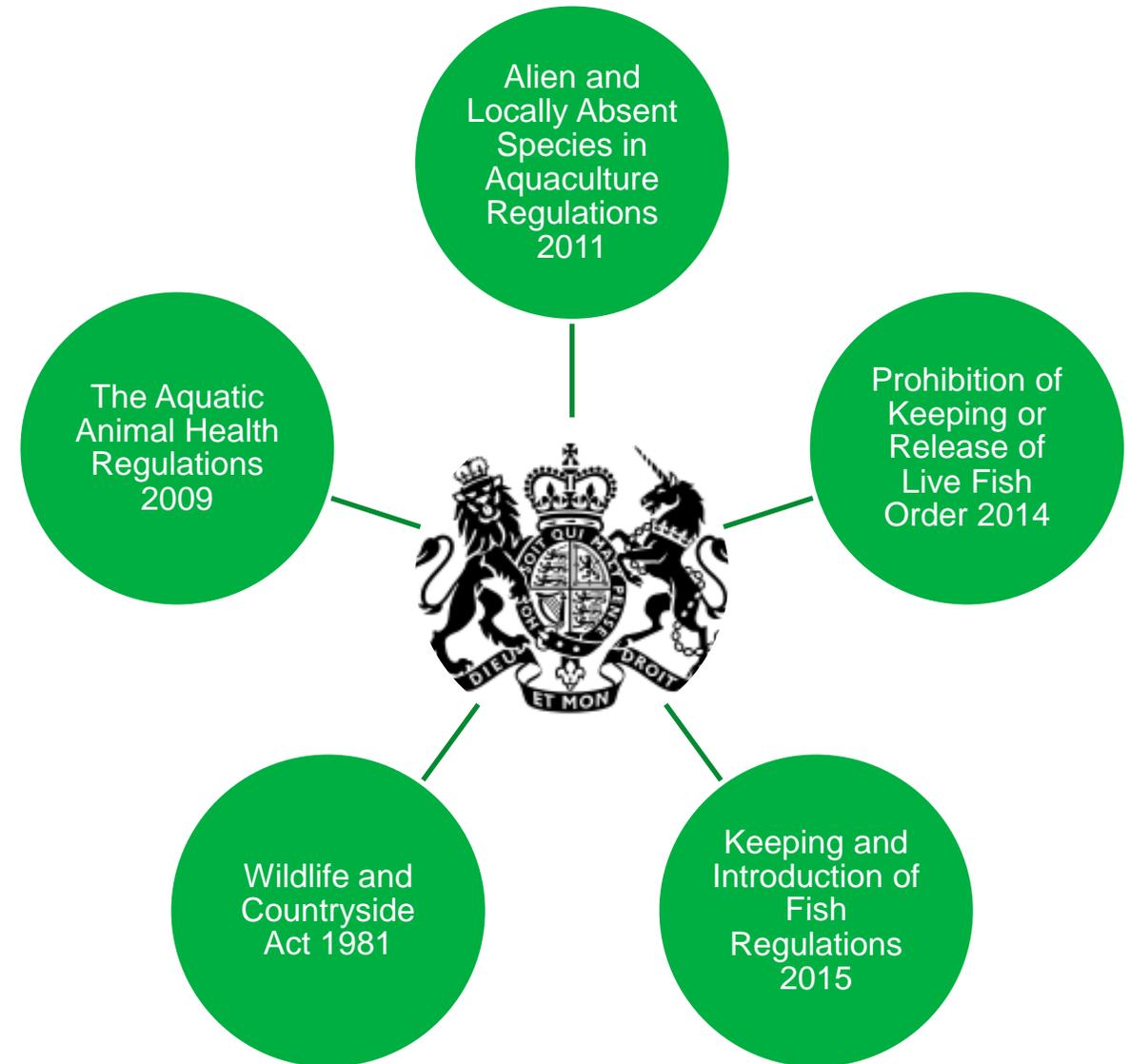
# Next generation sequencing (NGS)

- Used to sequence entire genomes
- Investigate nuclear and mitochondrial genome
- Identify markers to design sp. specific assays



# Regulatory status

- Import to UK – Fish Health Inspectorate / UK Border Force
- Keeping in aquaria - Fish Health Inspectorate
- Aquaculture production – Fish Health Inspectorate
- Introduction & keeping in inland waters – Env Agency
- Release to the “wild” – Natural England



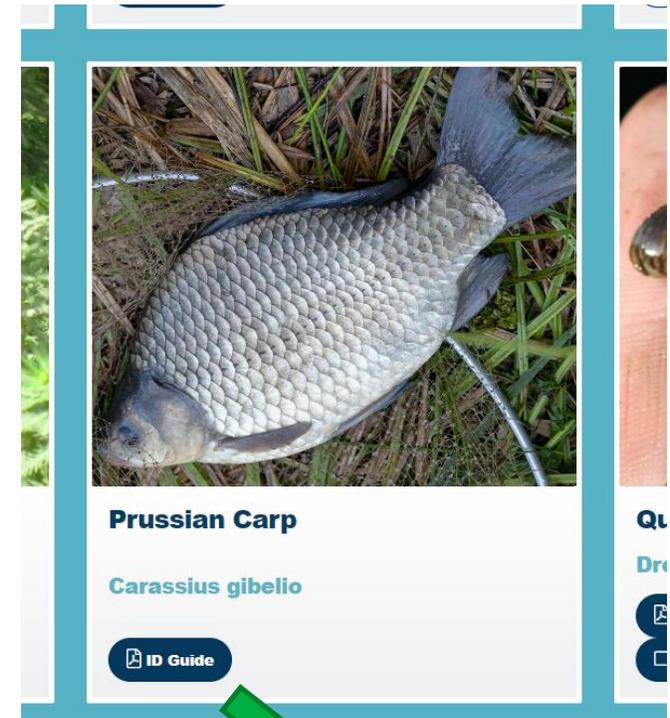
# Pathways into England and potential sources

- Import for food – only permitted reason
- Aquarian & ornamental trade
- Aquaculture production for stocking
- Transfer between waters / fisheries
- We continue to work with FHI to identify potential sources of these fish – historic / contemporary



# Controls and work to date

- Built a picture of distribution
- Raised awareness with fishery community
  - ID guide on Angling Trust website
- Restrictions at fisheries
  - Containment and movements off-site
  - Not undertaking a EA required eradication or removal at this time
- Worked with government and other agencies
  - Worked with GBNNS Secretariate to produce a risk assessment for Prussian carp
  - Current controls agreed with defra members
  - Informed Minister through Monthly Biosecurity Meeting



# What's coming next

- Refining approach to confirm identification
  - Molecular
  - eDNA
- Furthering investigations of sources
  - Additional resources within National Enforcement Services
- Continuing to understand distribution and impact
  - This will inform approach going forward



# Protecting your fishery

Be a smart fish buyer:

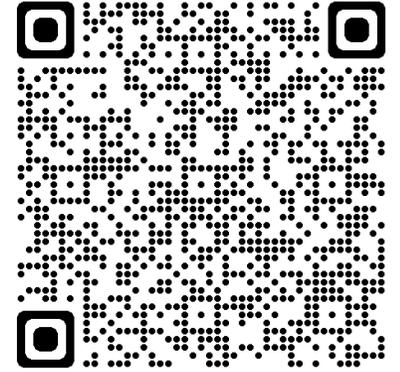
- Always be present when the fish are stocked
- Never accept fish that were not on the original order
- Never accept fish that you are not sure of their identity
- If the fish arrive in bad condition or are not what you are expecting then it's the suppliers problem

Once they are in it's very difficult to get them out... And they may not be alone



# Further Info and reporting

- Prussian carp and friends ID guide – [Angling Trust's non-native species page](#)
- EA incident helpline 0800 80 70 60
- Please send images / reports to our National Fisheries Laboratory [non-natives@environment-agency.gov.uk](mailto:non-natives@environment-agency.gov.uk)



## Q&A