

# Fish Net - Turkey



A new project working towards the  
conservation of Turkey's endemic  
freshwater fishes

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# Overview

- Why Turkey?
- Focal species
- Partners
- Locations
- What we found
- Future plans



# Background – Why Turkey?

- 269 freshwater fishes
- 52 endemic freshwater fish species
- 155 on IUCN Red List
- 37 Data Deficient





# What are the threats?

- Water abstraction
- Damming
- Introduced species
- Pollution



# Target group – *Aphanius sp.*

- *Aphanius anatoliae* complex - DD
- *Aphanius transgrediens* - CR
- *Aphanius sureyanus (burduricus)* - CR
- *Aphanius splendens* - CR





# Other species

- *Cobitis phyrigica*
- *Pseudophoxinus ninae*
- *Oxynemacheilus* sp.



# Our partners

**Fish Net  
Turkey**

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graph TD; A[Fish Net Turkey] --- B[Hacettepe University]; A --- C[Doga Dernegi]; A --- D[Vienna Zoo]; A --- E[Zoological Society of London];
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**Hacettepe  
University**

**Doga Dernegi**

**Vienna Zoo**

**Zoological Society  
of London**

# Hacettepe University - **HUBIOM**

- Prof. Dr. Füsün Erk'akan, Head of the Ichthyology Department and Turkey's leading authority on freshwater fishes. Her enthusiastic team has excellent experience of Turkish fish taxonomy, survey methodology, habitat assessments and water quality analysis.





# Doğa Derneği (DD)



- Works throughout Turkey, primarily campaigning and conducting biological assessments. They provided the Key Biodiversity Areas for Turkey (the first country to designate these) Doğa Derneği is working in the Burdur Basin and contributed to the development of the Burdur Lake Ramsar Management Plan prepared with the support of the local community and government.



# Vienna Zoo

- Has one of the most diverse collections of *Aphanius* species.. In cooperation with the University of Vienna and the RSCN (Royal Society for Conservation of Jordan Nature) they conducted the first fish ecological investigation of the status and endangerment of *Aphanius sirhani*, The survey was the basis for the classification of *A. sirhani* as Critically Endangered in the IUCN Red List.





# Zoological Society of London



- Has >50 years experience in research and management of endangered freshwater fish. Has worked with researchers, government/non-government agencies and communities internationally to increase knowledge, awareness and conservation of threatened freshwater fishes. Conducts national and international Red List assessments.





# The start of collaboration



- Meeting in January 2010 in Ankara
- Introductions to our organisations
- Review of the species and locations
- Agreed plan for scoping visit
- Agreed a plan for future collaboration

# Location

## Anatolian Lakes region, South-central Turkey

- Lake Acı - Acıgöl
- Kaklick Cave
- Lake Salda
- Lake Burdur
- Lake Eğirdir
- Eflatun Pınar



# Lake Aci - Acıgöl

- *"the bitter lake"*
- Its surface area varies greatly through the seasons, with 100 km<sup>2</sup> in spring and 35 km<sup>2</sup> in late summer, with a maximum depth of 1.63 m.
- The lake is notable for sodium sulphate reserves extensively used in the industry and Turkey's largest commercial sodium sulphate production operations are based here.





# Lake Aci - Acıgöl

- High density of *Gambusia holbrooki*
- Extensive de-watering, especially during dry season



# *Aphanius anatoliae transgrediens*



- Critically Endangered (IUCN)
- Recorded from six springs
- Found in only three in 2010

# Kaklick Cave

- 100 metres long
- A spring that spurts out on the surface and then flows back underground shortly afterwards through the cave in cascading layers of limestone and travertine
- Looks like a subterranean Pamukkale
- Sulphurous and acidic with a low pH
- Very warm water





# Kaklick Cave

- A popular tourist spot with Turkish people
- Relatively protected and monitored.
- Human created pools with dense vegetation and picnic areas



# *Aphanius anatoliae*?



- First observed by Professor Erkakan in 2006
- Distinctly different in appearance from other *Aphanius* species
- Found in both the cave and above ground springs

# Lake Salda

- The lake area covers 4,370 hectares, its depth reaches 196 m. making the deepest in Turkey
- A crater lake
- One of the few places where ancient stromolite algae grows
- Very warm water along shore





# Lake Salda

- Considered a protected area due to its recreational value
- Some drop in depth due to water diversion
- Potential pollutants from nearby agriculture



# *Aphanius splendidus* & *Aphanius anatoliae*



- Morphologically distinctive
- Some range overlap
- More genetic work needed to determine relationship

# Lake Burdur

- large saline lake of tectonic origin
- Seventh largest lake in Turkey with an area of 250.00 km<sup>2</sup> and maximum depth reported between 50 and 110 m due to water level fluctuations
- An important wetland site for many bird species
- A designated Ramsar site.





# Lake Burdur

- Eight dams block all the water flow to the lake
- water abstraction for agriculture (orchards)
- Aquapark and popular recreation sites surround the lake.
- Burdur City is adjacent to the lake
- Lake levels dropping considerably since 1987



# *Aphanius sureyanus (burduricus)*



- Critically Endangered (IUCN)
- Continuous habitat alteration as the lake drops
- Some local awareness



# Lake Eğirdir

- "*Eğirdir Gölü*" in Turkish.
- Near the town of the same name
- Has an area of 482 km<sup>2</sup> and the maximum depth of 16.5 metres
- Fourth largest lake in Turkey





# Lake Eğirdir

- Heavily used by the local people for recreation, irrigation and domestic requirements
- Two hydroelectric power stations that utilise the lake's water
- Introduced *Gambusia holbrooki*



# *Aphanius anatoliae anatoliae*



- Found in good numbers at the main sampling site
- However despite the lake's size, only a small percentage contains suitable habitat along the shore

# Eflatun Pinar

- "lilac-coloured spring"
- An ancient worship site with a small temple to honour one of the Hittite gods
- Tourist attraction but with little on-site protection





# Eflatun Pinar

- Some protection due to the historic significance of the site
- Regularly used for livestock watering
- Nearby dwellings rely on the water supply



# *Aphanius anatoliae anatoliae*



- The population density of *Aphanius anatoliae* was good
- *Pseudophoxinus anatolicus* and *Oxynemacheilus sp* shared the same habitat
- Large amount of aquatic vegetation which provided hiding and spawning sides for the *Aphanius* and *Pseudophoxinus* species.



# Next steps

- Signing of a Memorandum of Understanding between all project partners (in progress)
- Further genetic analysis of all populations
- Additional surveys to determine range of each species within its habitat
- Programme of regular monitoring to learn about seasonal changes to habitat





# Next steps



- Identify a strategy for each site and implement a conservation management plan
- Integrate *Aphanius* species into existing conservation measures
- Make improvements to habitats where possible

# Next steps

- Raise awareness of these species where appropriate through school programmes, media, community forums
- Conduct a Red List workshop to assess those species and populations that are Data Deficient



# Next steps



- Secure safety net populations *ex-situ* in Turkey (Hacettepe University) and Vienna Zoo/ZSL
- Build a facility at Hacettepe University for holding populations
- Train staff and students in fish husbandry



# Next steps

- Conduct surveys of other Turkish *Aphanius* species: *A. asquamatus*, *A. danfordii*, *A. villwocki*
- Secure funding for an initial three year project



# Thank you



- **European Union of Aquarium Curators**
- **Darwin Fund**
- Professor Erk'akan – Hacettepe University
- Begum Iscen – Hacettepe University
- Ferdi Akarsu - Doğa Derneği
- Dr. Özge Balkiz - Doğa Derneği
- Emile Farmer – British Killifish Association