

THE CROSS BETWEEN VALUING FISH AND SUSTAINABILITY OF RESOURCES



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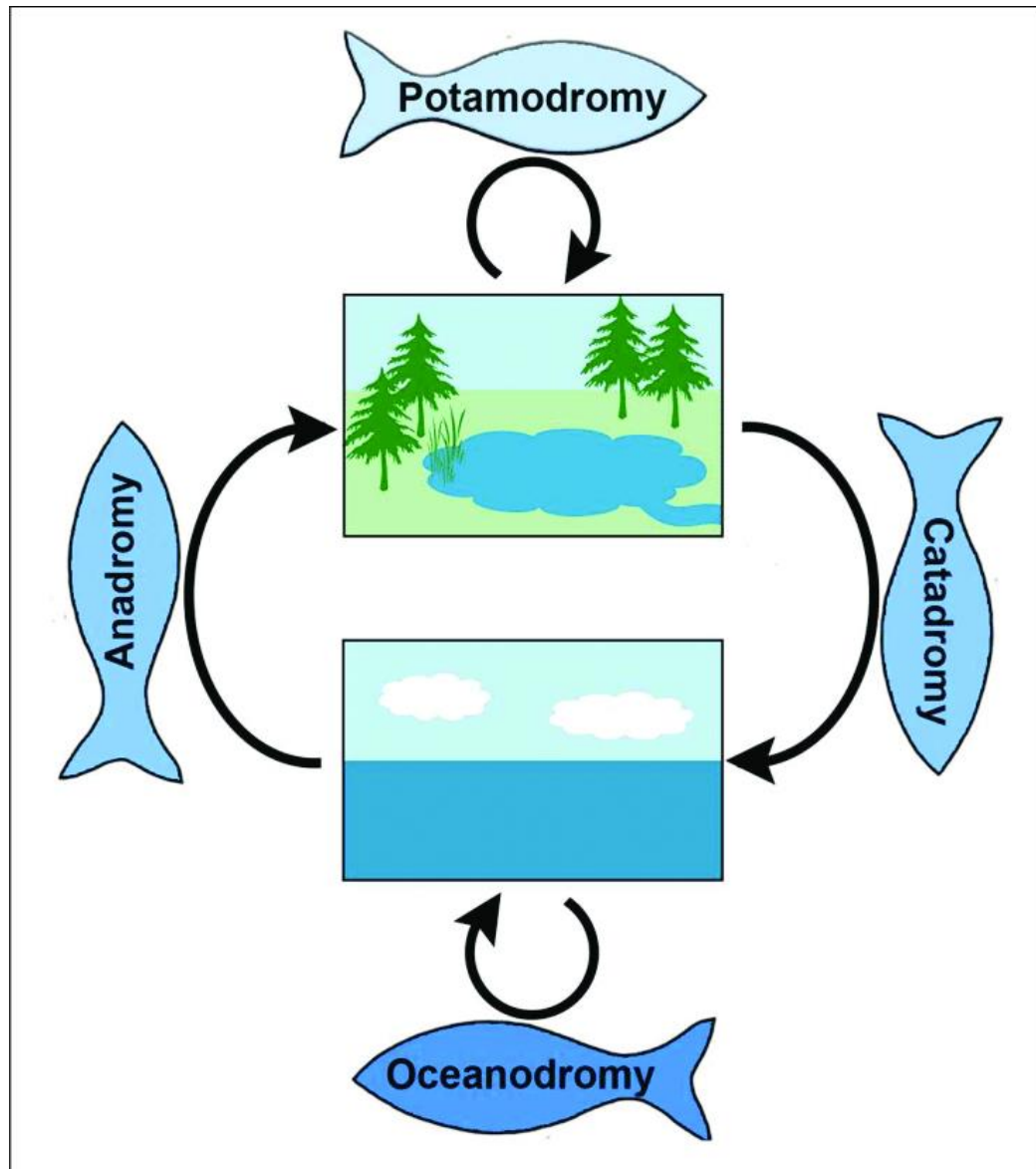


Our team works on:

- diadromous fishes in all Portuguese river basins;
- exotic species (largemouth bass), in several reservoirs in Alentejo
- wild trout in Campelo Aquaculture Station in order to develop experimental diets for breeding.

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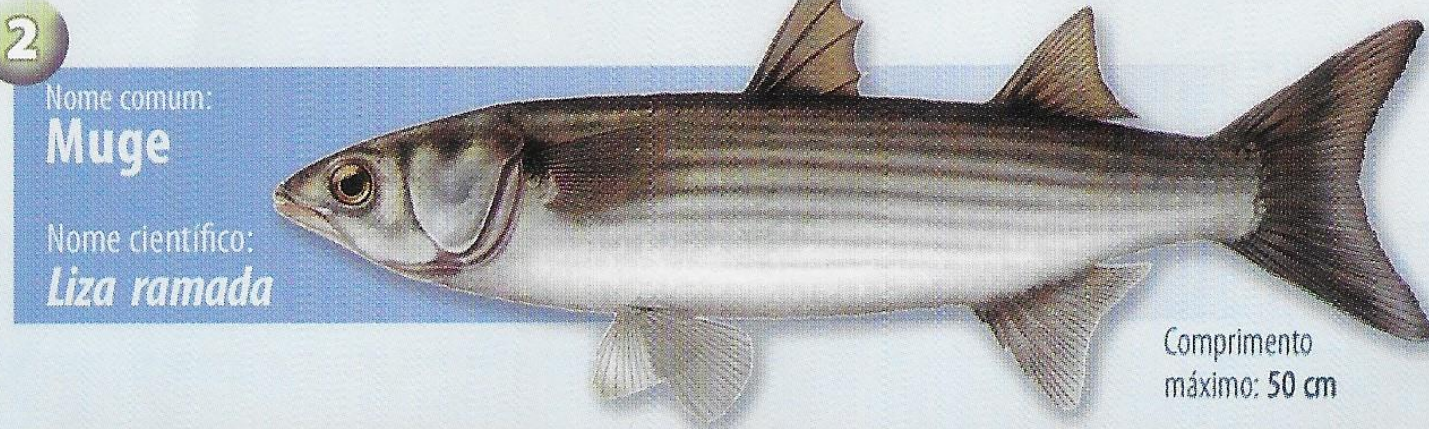


WHY WE CHOOSE DIADROMOUS SPECIES?

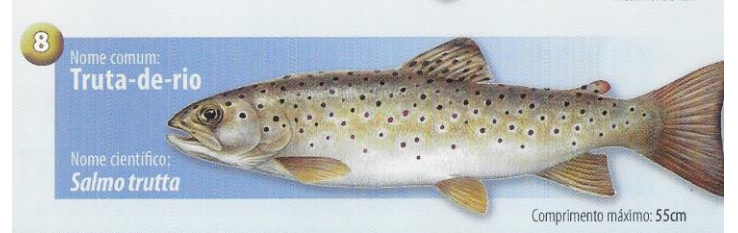
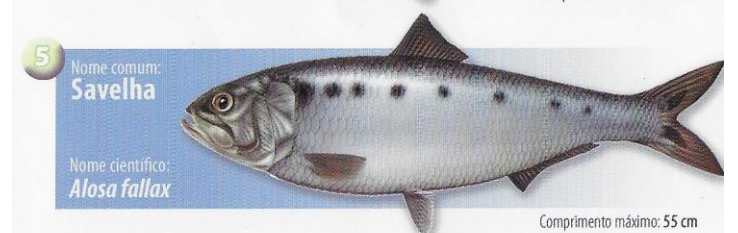
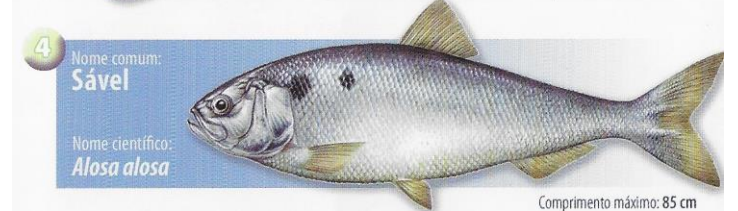
- **Diadromous fish are those that migrate between freshwater and marine water.**
- 1% of the known fish species are included in this group;
- included in the group are most of the species that we appreciate gastronomically.



Comprimento máximo: 100 cm



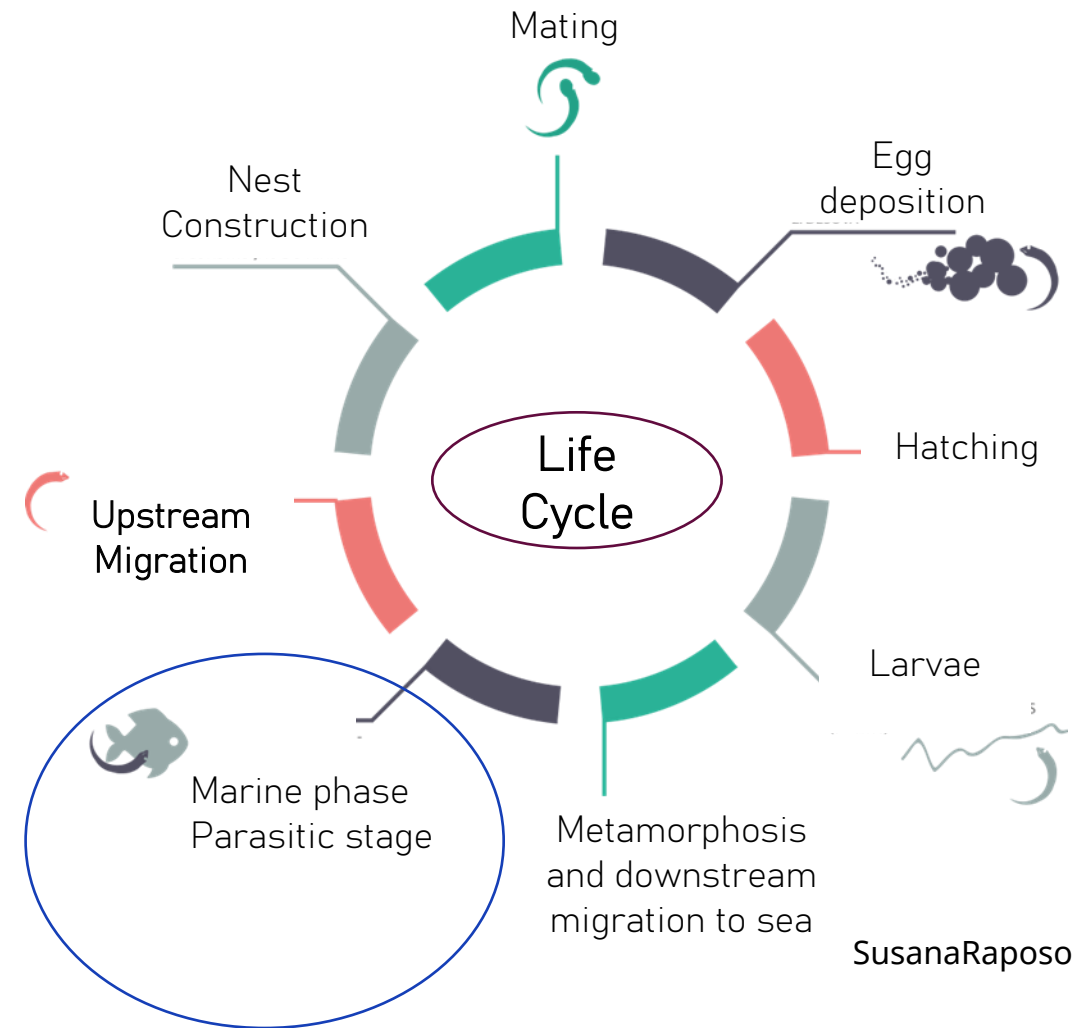
- 1: EEL
2. THINLIP MULLET
3. SEA LAMPREY
4. SHAD
5. TWAIT SHAD
6. BARBO-DO-NORTE (*Luciobarbus bocagei*)
7. BOGA COMUM (*Chondrostoma polylepis*)
8. TROUT



(as ilustrações dos peixes não estão à escala)

IS THE SEA LAMPREY A DELICACY?

- In Portugal, Spain and France, sea lamprey is considered a delicacy;
- is intensively captured during spawning migration when they enter the rivers to reproduction;
- provide hundreds of thousands of sea lamprey to restaurants every year;
- provide hundreds of thousands of euros every festivals.






SEA LAMPREY FESTIVALS: SOME CLUES

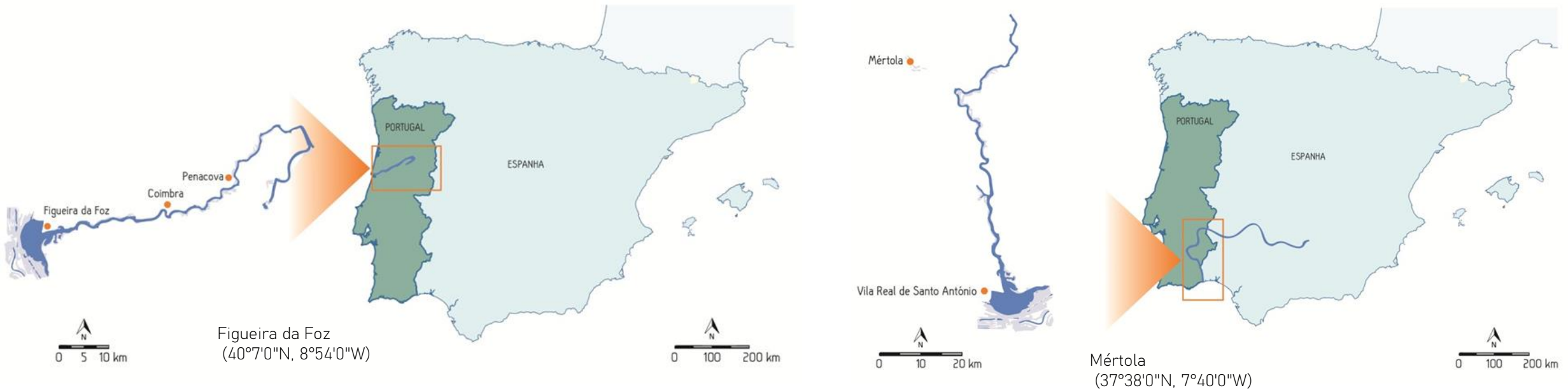


- Values of a single sea lamprey can range between €50 and €60, depending on the abundance of animals each year;
- trading price outside of official fishing markets;
- In a restaurant prices can vary between 90 and 150 euros (in the most expensive ones) during festivals

An aerial photograph showing a river with a dam in the middle. The river flows from the top left towards the bottom right. The dam is a low stone structure with water cascading over it. The surrounding landscape includes green fields, trees, and a small town in the background. The foreground is dominated by dense green foliage.

STUDY: Sea lamprey (*Petromyzon marinus* L.), a delicacy in several countries of Western Europe: chemical composition and healthy lipid index of edible muscle

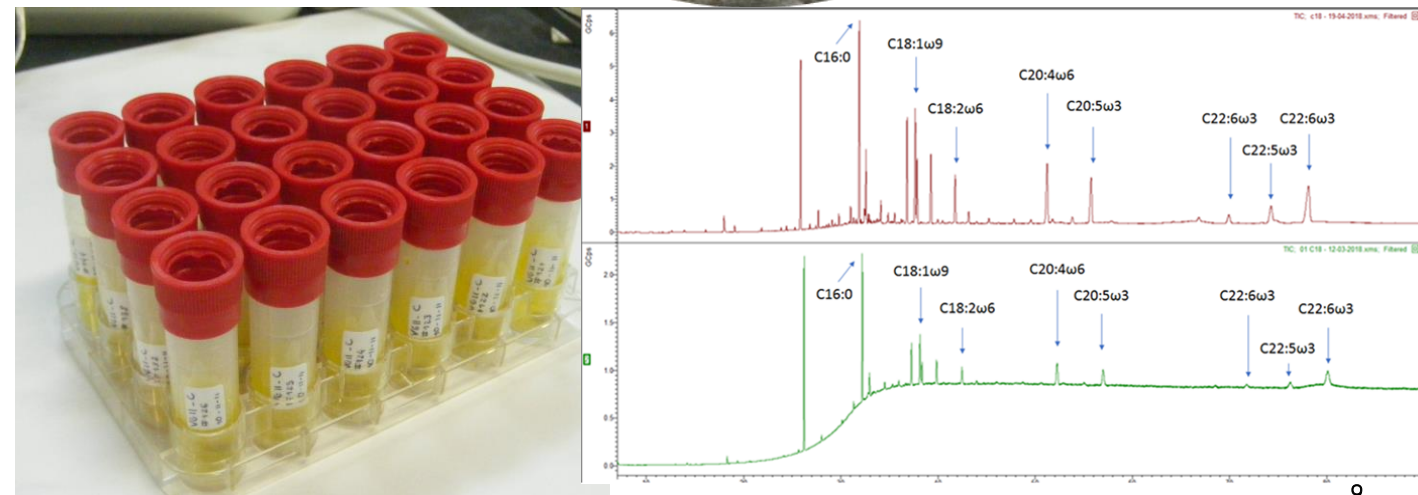
SEA LAMPREY CHEMICAL COMPOSITION AND HEALTHY LIPID INDEX OF EDIBLE MUSCLE



A total of 60 adult sea lampreys were captured by local fishermen in commercial fishing areas in the River Mondego and in the River Guadiana to study proximate composition and healthy lipid indexes (Ventura Master Thesis).

IS BETTER SEA LAMPREY FROM MONDEGO RIVER OR FROM GUADIANA RIVER?

- Edible muscle of the Guadiana animals revealed significantly higher levels of crude protein and moisture;
- Edible muscle of Mondego animals, presented significantly higher values of gross energy and total lipids.



IS BETTER SEA LAMPREY FROM MONDEGO RIVER OR FROM GUADIANA RIVER?

Edible muscle of sea lamprey from both river basins presents:

- a high lipid content (50,7g/100g, dry weight)
- a low total cholesterol (0.056g/100 g, dry weight)
- a very high $\omega 3/\omega 6$ ratio typical from marine species (11,2).



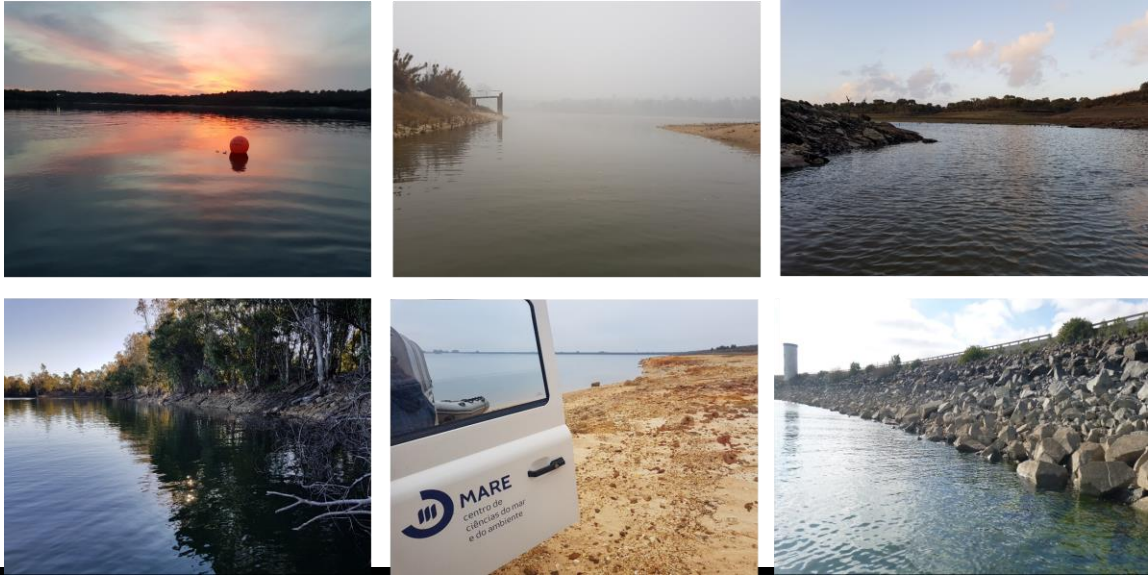
Species	Moisture (%)	Total Lipids (%)	Crude Protein (%)	Ash (%)	Gross Energy Content (Kcal/100g)	Reference
Sea lamprey (<i>Petromyzon marinus</i>)	64,9	18,2	17,1	0,9	243	This study
Atlantic mackerel (<i>Scomber scombrus</i>)	64,3	13,4	20,3	1,40	202	Bandarra et al., 2004
Gilt-head (sea) bream (<i>Sparus aurata</i>)	68,9	9,8	19,7	1,40	167	
Atlantic Salmon (<i>Salmo salar</i>)	60,5	21,9	16,2	1,30	262	
European pilchard (<i>Sardina pilchardus</i>)	63,4	16,4	18,4	1,70	221	
European eel (<i>Anguilla anguilla</i>)	57,4	27,7	13,4	1,20	303	
Atlantic bluefin tuna (<i>Thunnus thynnus</i>)	68,7	4,9	24,1	1,50	140	

IF YOU CATCH IT, DO YOU EAT IT?



Photo by GAMEFISH Team

- The largemouth bass (*Micropterus salmoides*) is a freshwater species from the Great Lakes region (USA);
- In Portugal, is one of the most interesting angling species present in lakes or dam reservoirs.



**PROXIMATE COMPOSITION,
NUTRITIONAL LIPID QUALITY, AND
HEALTH INDICES OF LARGEMOUTH
BASS (*MICROPTERUS SALMOIDES*
LACÉPÈDE, 1802) FROM SEVERAL
MEDITERRANEAN RESERVOIRS**

- freshwater species most captured and eaten in Mediterranean regions, especially where traditional marine wild and fresh fish is less available;
- However, proximate composition of their fillet and its gastronomic interest can vary greatly according to the environmental quality of habitat, season of capture and stage of development.

IF YOU CATCH IT, DO YOU EAT IT?

- this study marks a first step on the valuation of wild largemouth bass as a natural food item;
- results can be used by local managers in a sustainable way, to increase the economic value of this species, and the benefits in terms of food quality for the consumers.



Photos by André Jorge

RESULTS FOR LARGEMOUTH BASS OF PÓVOA E MEADAS, MONTE NOVO E MORGAVEL RESERVOIRS (Jorge, Master Thesis)

	ΣSFA	ΣMUFA	ΣPUFA
Mo W	37.86%	26.10%	34.69%
PM W	26.38%	20.45%	52.12%
MN W	26.18%	18.84%	53.99%
Mo S	28.73%	20.33%	49.97%
PM S	28.20%	22.23%	46.60%
MN S	30.19%	20.32%	47.01%

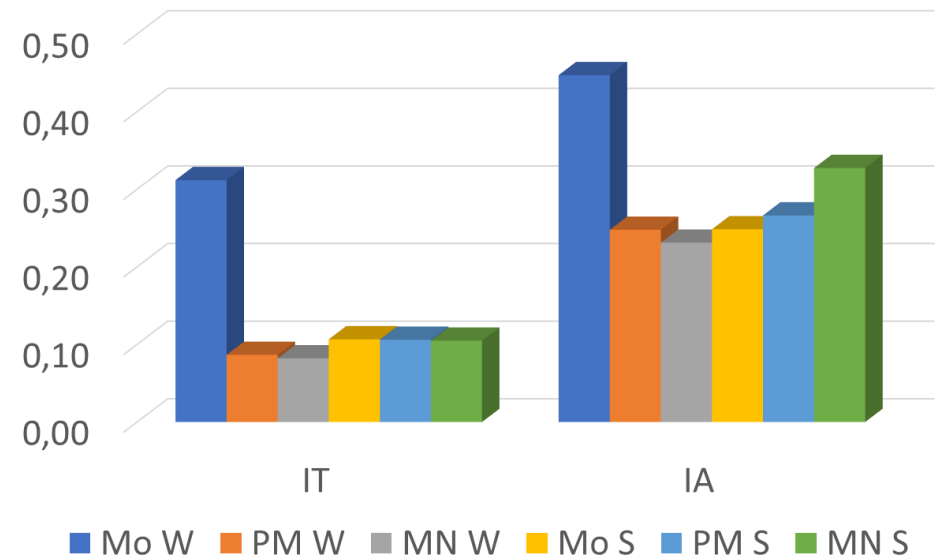
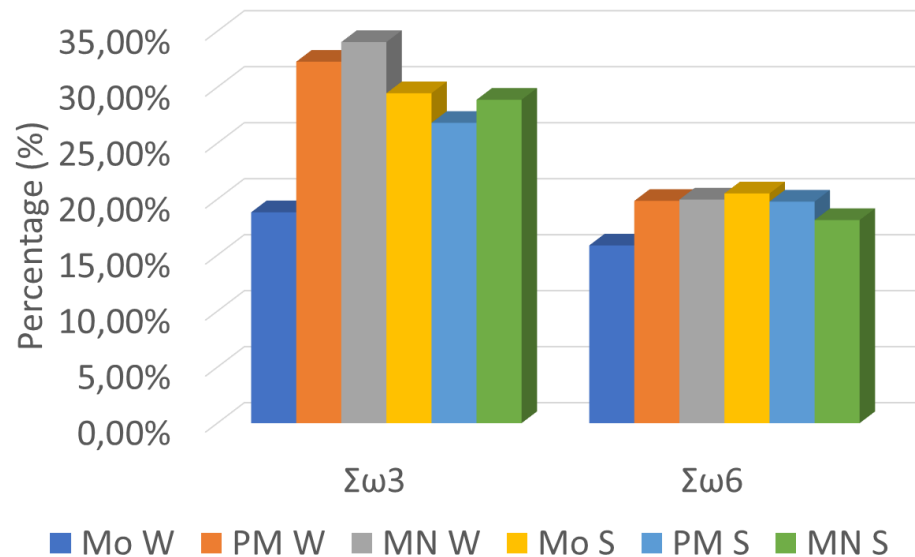
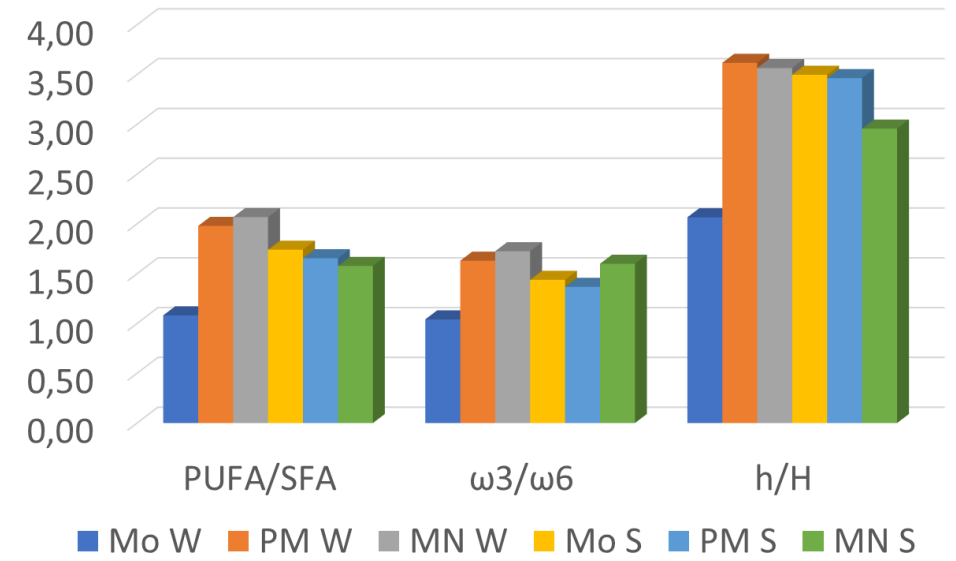




Photo by Carlos Alexandre

THE CASE OF PROJECT CRER
- THE PARTNERSHIP
BETWEEN THE CÂMARA DE
FIGUEIRÓ DOS VINHOS AND
THE UNIVERSITY OF ÉVORA

In this project our team develop research related to different diets to produce wild trout to sustainable restocking of the water courses in the region.



**THE CASE OF PROJECT CRER -
ADAPTATION OF THE CAMPELO
AQUACULTURE STATION FOR
RE STOCKING PROGRAMS**



Photos by CRER Project Team

- Trout and salmon are the species most used in aquaculture for restocking programs;
- Aims to avoid the extinction or sharp decrease of population numbers;
- Improvement, to keep species at the highest possible economic value;
- Conservation, aiming to maintain stocks of endangered species

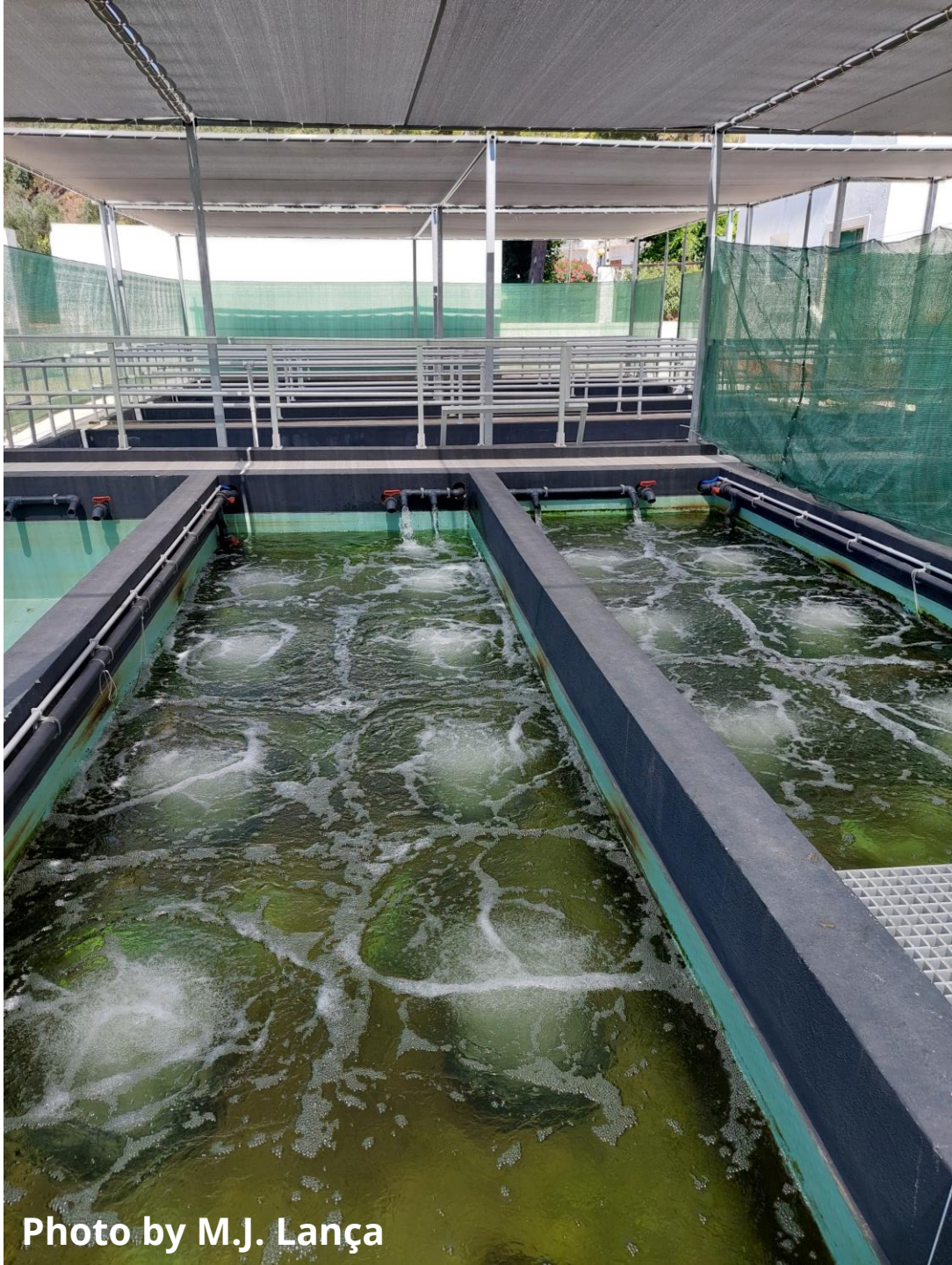


Photo by M.J. Lança



Photo by M.J. Lança

Thank You



Minho River
by M.J. Lança