Dunakiliti ship lock vs. fish lock
experiment

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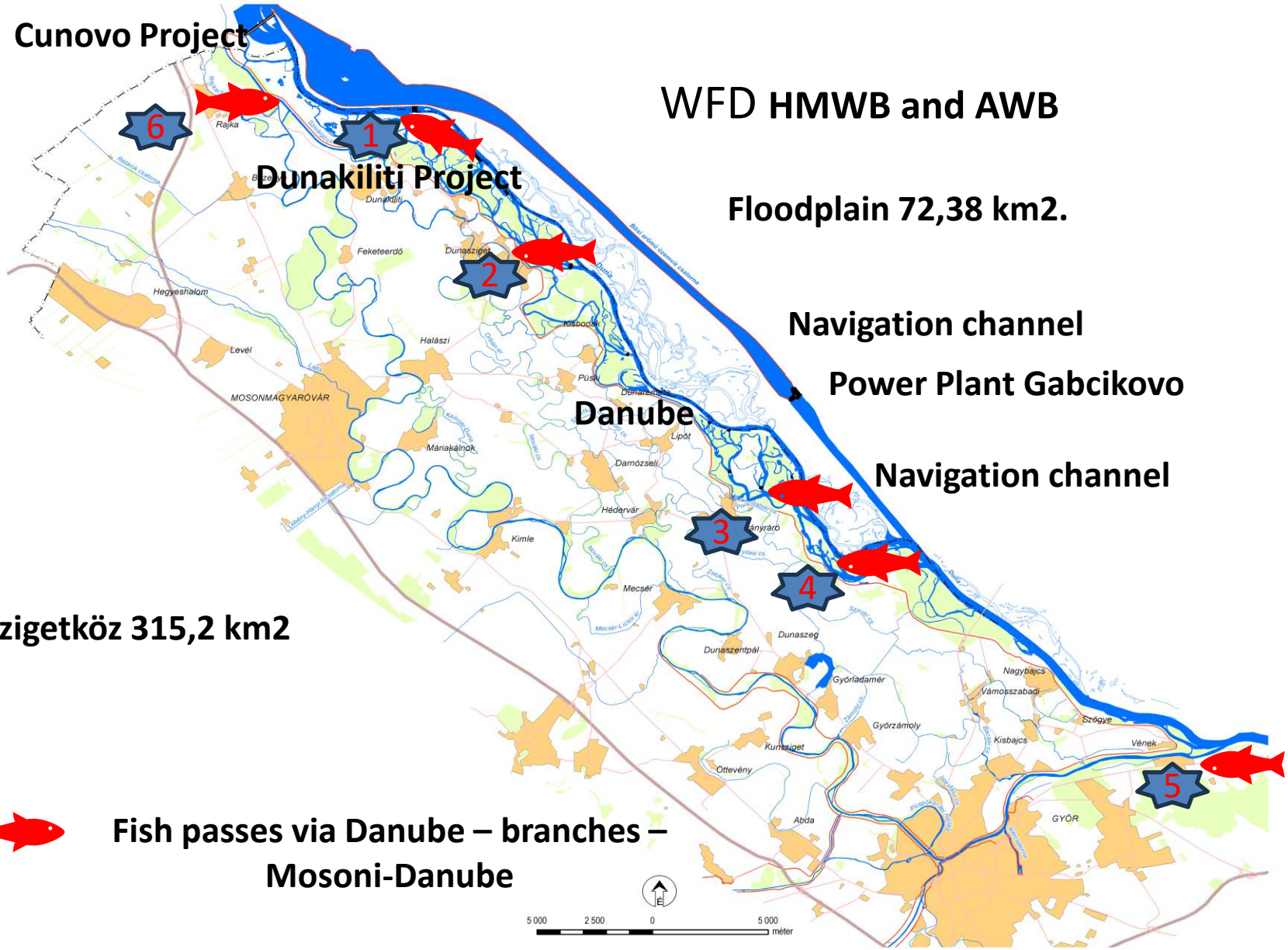
Szigetköz presently



WFD **HMWB and AWB**

Floodplain 72,38 km2.

Szigetköz 315,2 km2

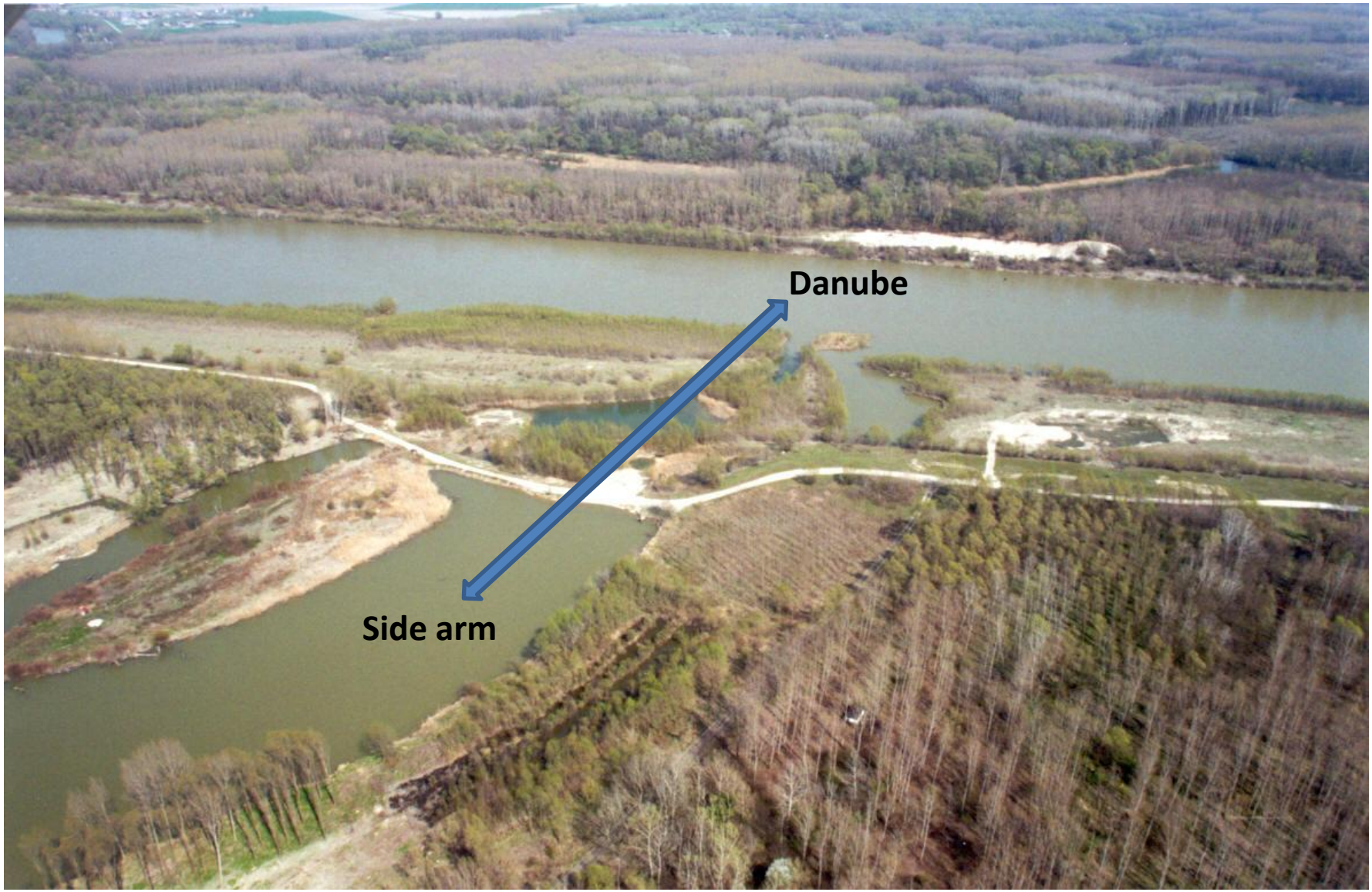
Fish passes via Danube – branches – Mosoni-Danube

Dunakiliti area and the floodplain water dotation works

Dunakiliti area

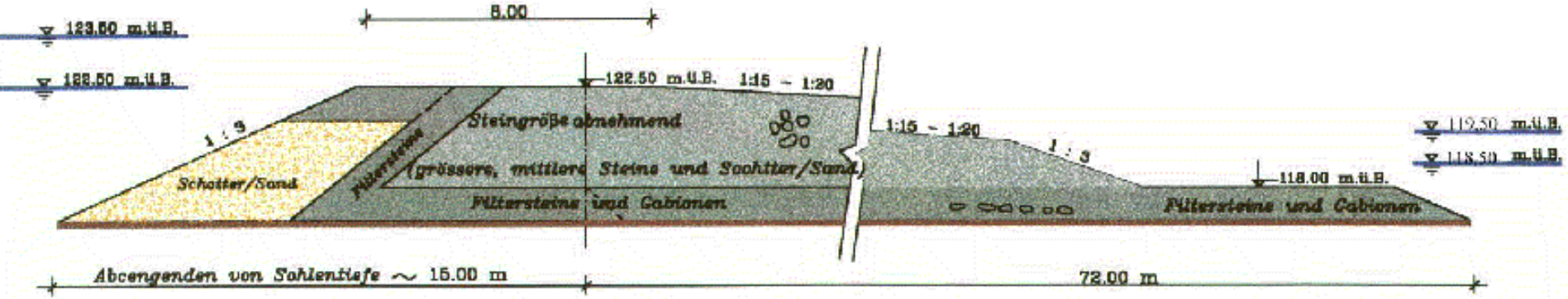
- Dunakiliti weir
- Shiplock
- Rock ramp
- Water abstraction

Low water situation Δh 3-4 m.



High water situation Δh over 1 m.

1.Dunakiliti Danube rock ramp 1995 Δh 3,50 m.



2. Cikola branches vs. Danube Denkpál 1997
Δh 3,80 m.

3. Ásványi branch vs. Danube 2015 Δh 2,90 m.

4. Bagamér branch vs. Danube 2015 Δh3,35 m.

5. Vének Duna – Mosoni-Duna 2023 Δh 2,0 m.

6. Rajka Mosoni-Duna – Floodplain – Duna 2015 Δh 2,70 m.

„What does the return of sturgeon mean for fish pass design and river restoration?” (Luke Hussey)

Many of the fish passes constructed today designed to accommodate comparatively smaller migratory fish.

The morphological size of adult sturgeon means they would demand much larger passes, which would in turn require a greater proportion of river flow (e.g. attraction water)! ICPDR – ICPER exchange of experiences Atlantic sturgeon Elbe Geestacht/Danube sturgeon .

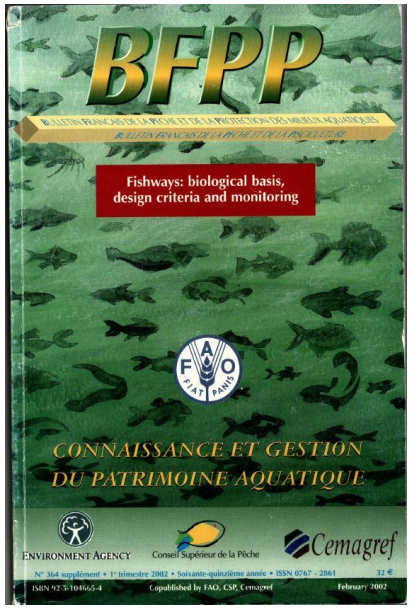
Migration into a new changed habitat (e.g. reservoir), will be suitable spawning-ground for sturgeon species “site fidelity”? Problematic survival questions? Downstream migration?

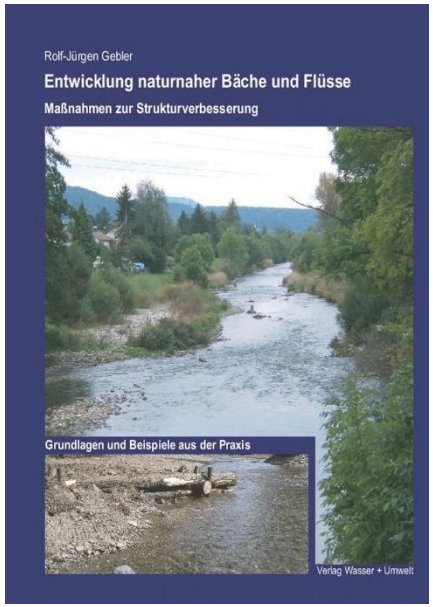
In the face of climate change, facilitating the migration of these large fish becomes yet more problematic!

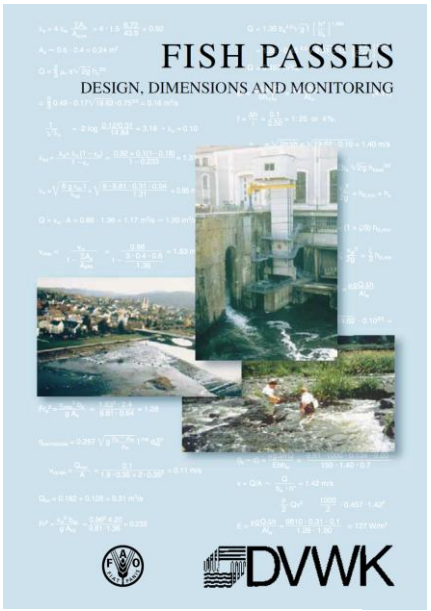
Restoration principles NWA

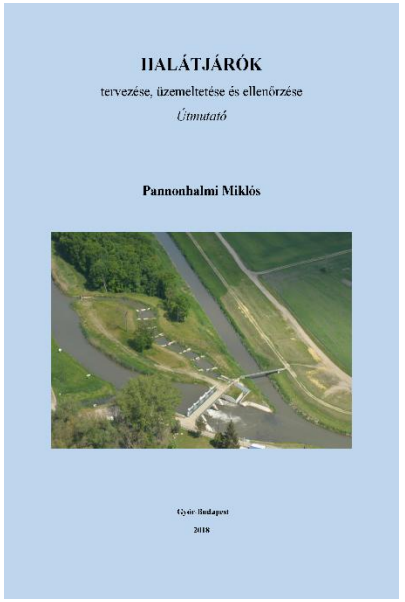
1. Design the system for minimum maintenance.
2. Design a system that utilizes natural energies.
3. Design the system with the hydrologic and ecological landscape and climate.
4. Design the system to fulfill multiple goals, but at least one major objective and several secondary objectives.
5. Design the system as an ecotone.
6. Give the system time.
7. Designe the system for function, not form.
8. Do not overengineer restoration design.

Backgrounds









icpdr iksd

International Commission for the Protection of the Danube River

Internationale Kommission zum Schutz der Donau

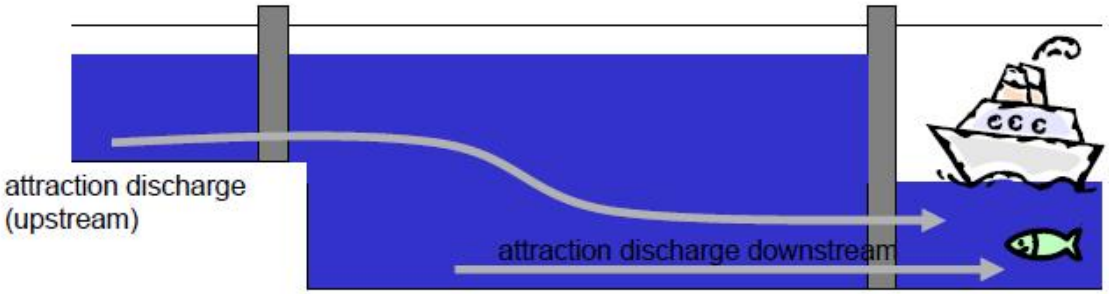
Measures for ensuring fish migration at transversal structures
Technical Paper

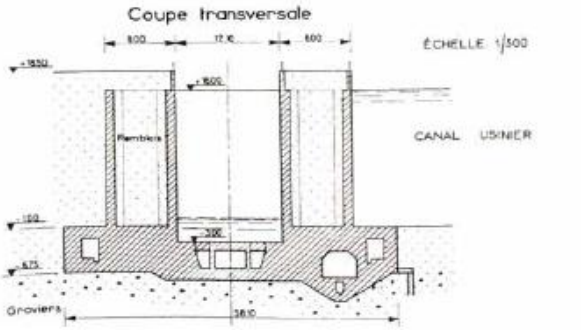
Proposal for junction Danube and Navigation Channel

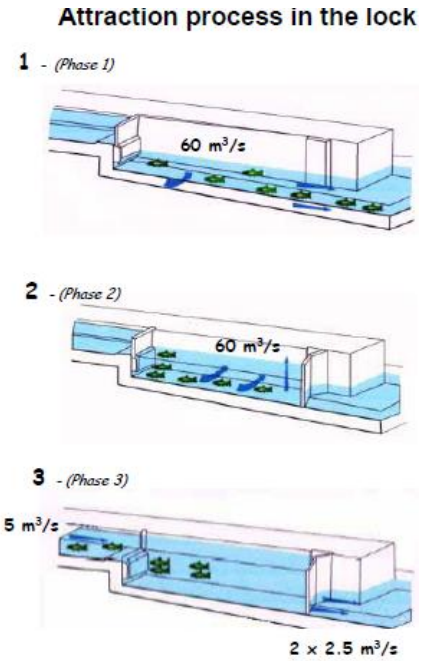
Proposals for development Dunakiliti area

Ship lock vs. Fish lock

Passage of migrating fishe using ship locks is usually accidental and unintended. The ship locks are generally located in relatively calm zones. Sufficient attraction water flow needed for migrations behavior of fishes. In spite of all precautions numerous locks have proved to be efficient, or totally inefficient. The maintenance of locks must be changed or use locks out of regular operation. Overall, fish locks are considered inefficient and might only serve as alternative passage for particular species such as sturgeons.

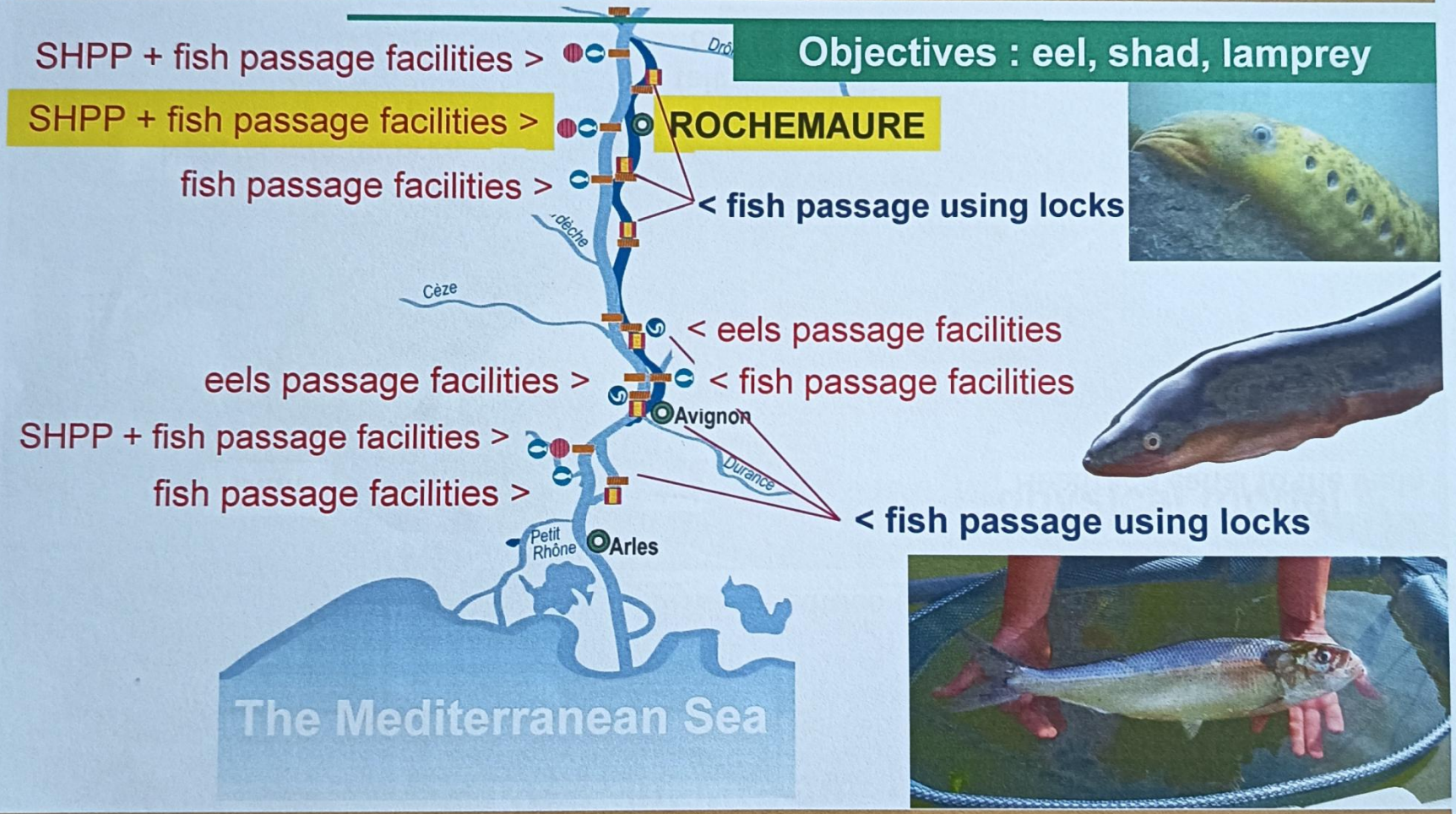






Strategy for fish migration on the Rhône River

Compagnie Nationale du Rhône
L'ENERGIE A L'ETAT PUR



Objectives : eel, shad, lamprey

Use of navigation locks for fish passage
French experience Rhone

The ship locks are normally in the undisturbed water space, no attraction water for fishes, noisy area, manoevure place. River Rhone there are a chain of ship locks. Using the River Information System (RIS) the locks have a fish locks modus. Attraction water discharge up to 60 m^3/s. Interesting alternative to do **„all mitigation measures”** principle.

Dunakiliti ship locks Δh 5,70 m.

Lenght 125 m. Width 24,1 m.

Experiment stages/attraction water

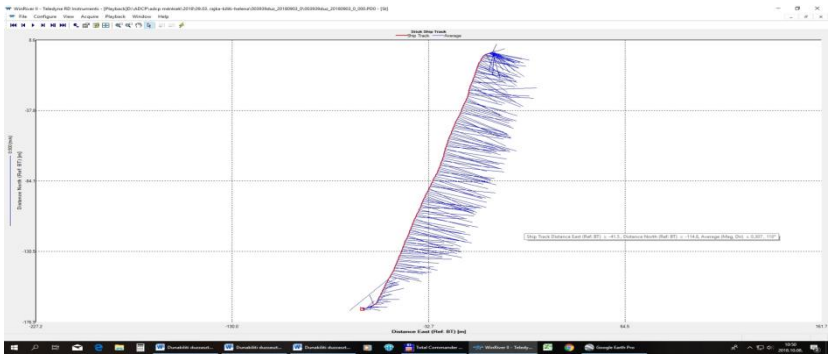
Water velocities measurements

Up- and down-streams of the works 10 series

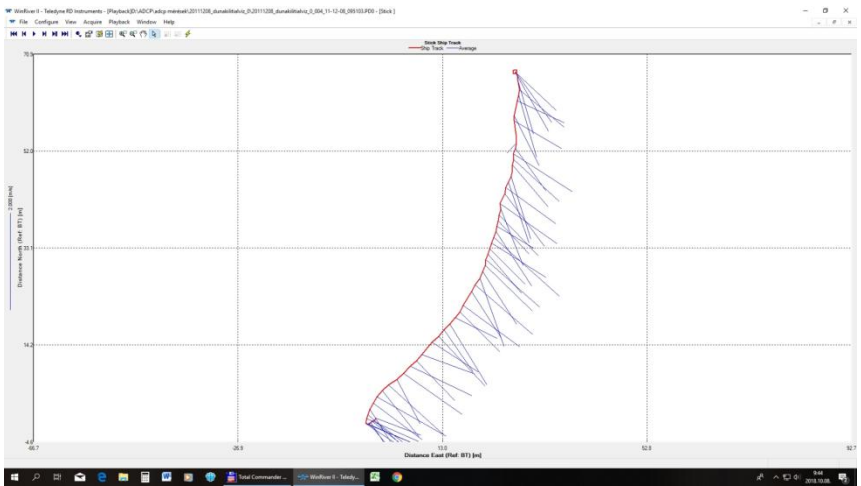
Details:
- gate,
- sluice,
- openings,
- positions,
- cross sections,

in NTDWA paper

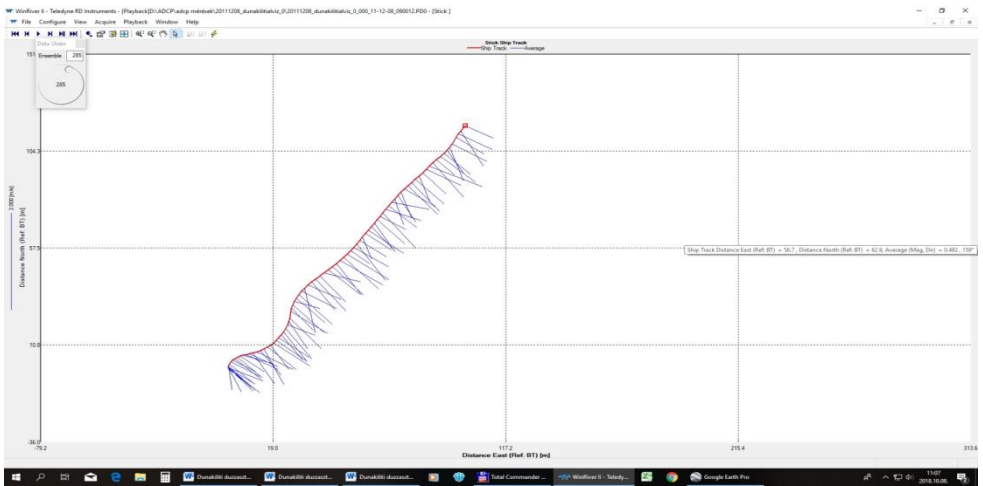
Dunakiliti weir upstream Velocities vectors: bank 0,2 m/sec, middle 0,3 m/sec



Downstream 20 m.
Velocities vectors: bank 1,2 m/sec, middle 1,5 m/sec



Downstream 400 m.
Velocities vectors : bank 0,6 m/sec, middle 0,8 m/sec



First results

Alburnus alburnus, Rutilus rutilus, Neogobius,
Gymnocephalus cernua

Fishes are not stupid, some are very sophisticated, not wronger - not like of us - they're just simply different. /Max-Planck Inst./

Thank you for your attention