Implementation of river continuity restoration in Italy: context, levers and bottlenecks, national strategies and plans, perception of this policy, links with other policies implementation

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BARRIER MODIFICATION OR REMOVAL

FISH PASSES

RESERVOIR MANAGEMENT
TIME PERIOD: 1960 - 2000

SURFACE BALANCE:
- 362.500 m²/anno

VOLUME BALANCE:
- 2.537.500 m³/anno

% of Italian coastline suffering erosion

14,5 km² in 40 years
BARRIER MODIFICATION OR REMOVAL
BARRIER MODIFICATION OR REMOVAL

CATCHMENT: 413 km²
RIVER LENGTH: 47 Km

80 buildings
have been destroyed

300 meters of beach
have been eroded

2000

NOCE STREAM (CALABRIA, SOUTHERN ITALY)

2001
BARRIER MODIFICATION OR REMOVAL

2001 → 2006

18 barriers (out of 25) have been lowered

NOCE STREAM (CALABRIA, SOUTHERN ITALY)
BARRIER MODIFICATION OR REMOVAL

BEFORE

AFTER
BARRIER MODIFICATION OR REMOVAL

MARETA STREAM (BOZEN, NORTHERN ITALY)
BUT...

between 2009 and 2013 the number of hydropower plants with power < 1 MW has increased of **673 units** (from 1270 to 1943), performing

+ 53% in terms of numerousness

+ 0,8% in terms of installed power

... and thousand of new authorizations are still pending.

(CIRF, 2014)
FISH PASSES

1891 ➔ first Italian fish pass scheme (Ticino river)

1910 ➔ first Italian fish pass guideline (written by Luigi Orsenigo)

1914 ➔ first Italian fish pass legal framework (Royal Decree 1486/1914)

1984 ➔ first Italian fish pass conference (hosted in Modena)

picture from Ferri et al., 2010
FISH PASSES

2006

European Inland Fisheries and Aquaculture Advisory Commission (EIFAAC)

Working Party on Fish Passage Best Practices

2011

Guidelines on the design of nature-like passes
Priorization Index (IP)

\[ IP_s = Ms \cdot I = \left( L_v + L_m \right) \cdot \frac{L_m}{L_v \cdot H} \cdot \sum k_i \]


Pini Prato et al. (2010)
A river basin strategy is often missing.

Required on a default basis as a mitigation measure for new barriers (or revamping of existing ones), but even when not necessary.

Monitoring and management almost never implemented (or even foreseen).

DOES IT MAKE SENSE?
BUT...

Mainly fine sediments.

Water discharge based on Minimum Instream Flow, not yet on Ecological Flow (but legal framework has changed).

TO BE CONTINUED
2016 - new legal provision
River Basin MAs have to prepare a Sediment Management Plan within the next update of their RBMPs (2021)

WFD ↔️ FD

NATIONAL LAW 221/2015
(art. 117, c. 2-quater)
adoption: 28/12/2015
publication: 18/01/2016
entry into force: 02/02/2016
Catchment-based sediment management plan

Definition:
Diagnostic and management tool on river HYMO behaviour (integrating both WFD and FD)

Objectives:
- Solid discharge equilibrium
- River setting (form and processes)
- Hydraulic infrastructures management

Main contents:
a) Diagnostic framework
b) Definition of specific objectives for HYMO restoration
c) Identification of measures and monitoring criteria

Tipology of measures:
a) Recovering river HYMO continuity (longitudinal, lateral and vertical)
   - solid discharge
   - floodplain reconnection
   - lateral mobility
b) Morphological enhancement of river corridor
Connectivity Index (IC)

\[ IC = \log_{10} \left( \frac{D_{up}}{D_{dn}} \right) \]


Marchi et al. (2013)
What *Ecosystem Services* from HYMO river restoration?

How to include *Ecosystem Services* into river governance?
OPEN ISSUES

capitalizing Ecosystem Services from river de-fragmentation is a threat itself

→ need for integrated assessment + inclusive governance

Ecosystem Services from river de-fragmentation are not always relevant

→ need for context analysis and stakeholder mapping

TOWARDS A BARRIER MANAGEMENT APPROACH
THANK YOU FOR YOUR ATTENTION

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