Restoration and Management of the Atlantic salmon in France: efforts / results

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551 000 km2 **Temperate atlantic** climate 60 million inhabitants 120 inhab./km2 **People live in cities**, mostly on the rivers

Human activities concentrate on the valleys and low ands

Southern limit...

Main mountains and rivers



A shrinking distribution area



The salmon rivers in France in 2005

R

F

Self-sustainable Populations

Vulnerable Populations (low abundance level)

Endangered populations = E restoration in progress = R

Aulne, Vire, Orne, Loire, Couesnon, Allier, Vienne, Dordogne, Garonne, gave de Pau, Rhin **Restoration programs for salmon in France / 1**

Mainly re-introduction : from zero !

Salmon Plan (1976-1980) – Ministry of Environnment

Migratory fishes plan (from 1981, 5 years)

1984: decentralisation – Regional level, financements by several partners (CPER)

1992: Contrat Retour aux Sources (cooperation CSP – Min. Environment)

Various solutions and initiatives since then...Programmes are going on

Restoration programs for salmon in France /2

Programs include :

-monitoring (video adults-electro-fishing juveniles, countin of redds....

- fish-passes
- stocking
- communication..

Programs are carried on by :

associations created by anglers associations

 partially designed/directed by the Conseil Supérieur de la Pêche

 constrained by the availability of financements (social perception of the utility of these measures)



Salmon restoration: the Upper Rhine





Current state of salmon restoration programmes

Requirements for the restoration (1)

- **1. Number and height of dams : a cumulative impact.**
- General improvement of migration conditions is required (dams removal, flow management)
- Need for radio-tracking programmes
- 2. Some unsolved cases due to a low attractivity of devices, e.g. Poutès dam (R. Allier: fish-lift)
 Need for a better knowledge of the upstream migration behaviour and a better efficiency of fish passes
- 3. Great need for improving downstream migration (juveniles and kelts): prevent fish from being drawn into the turbines

Requirements for the restoration of salmon populations (2)

Access to suitable spawning zones in the upstream reaches of rivers

✓ Higher quality of habitat ⇒ high juvenile production (density and growth)

Zones that should be kept for natural spawning only
 Estimation of suitable habitat area for juveniles

Requirements for the restoration of salmon populations (3)

Need to use hatchery fish supposes structures for large juvenile production and

- > to tag fish to assess success, e.g.
- Fluorescent pigments: juveniles, R. Dordogne

 Coded-wire tags: largely used for juvenile, requires double tagging (fin clipping)

Pit-tags: very effective and reliable but expensive and possible loss of the tag during spawning

But...tagging has largely disappeared from France

Requirements for the restoration of salmon populations (4)

Results of stocking depend on

the strain used (very bad results with canadian strains after first restockings in the R. Dordogne)

- Better results with acclimated or strains geographically close to the restored stock (Dordogne) or local strain (Nivelle)

 Poorer results for strains supposed to give large fish: Allier strain for R. Dordogne has given mainly grilses

Impact of hatchery fish in salmonid populations

***** Increased straying: homing rate 2-5 times lower in the grisles (R.Couesnon)

*** Lower survival rates**

***** Impaired spawning behaviour / wild fish

Disease tranmission: Gyrodactylus salaris

generates few multi-sea winter salmon

Impact of hatchery fish in salmonid populations : an important issue

Fears and interrogations at an international level (Cf. NASCO and ICES) coming from the numerous studies on interactions between hatchery and wild fish

CCL 1: the contribution of hatchery-reared fish to restore wild populations is not sufficiently evaluated

CCL 2: a need for a wide cooperation on reintroduction of salmon – share the results and analyse the "failures" ? "Break the isolation"

Rivière index : Bresle (0,280 M eggs)



Rivière index : Oir (0,120 M eggs)



Rivière index : Scorff (0,95 M eggs)



Rivière index : Nivelle (1,424 M eggs)



Management of the "natural"populations

-2 basins with exploitation : Brittany and Adour-Gaves

- Loire-Allier : closed since 1994

- Rod and line and gears in estuary (onli in the R. Adour) : 50% each

- Management at a regional level : 8 management Committees deciding the level of catches and repartition between fisheries

- Brittany managed by TACs, on a river by river basis

- Adour – Gaves basin should evoluate toward that also

What about the future ?

"When the fish die, men are threatened"