Management measures for eel in Europe

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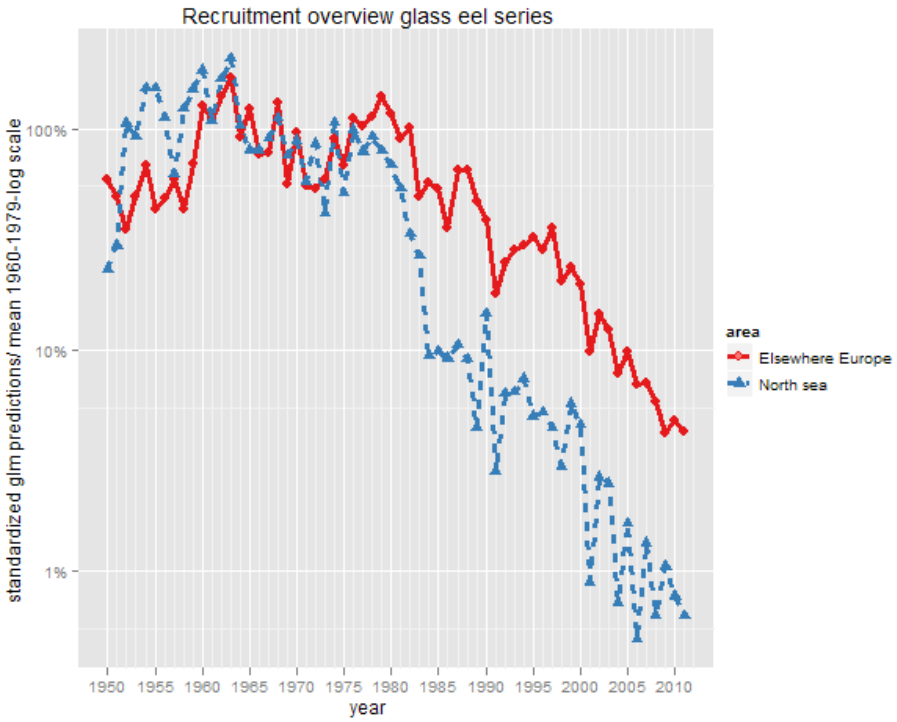
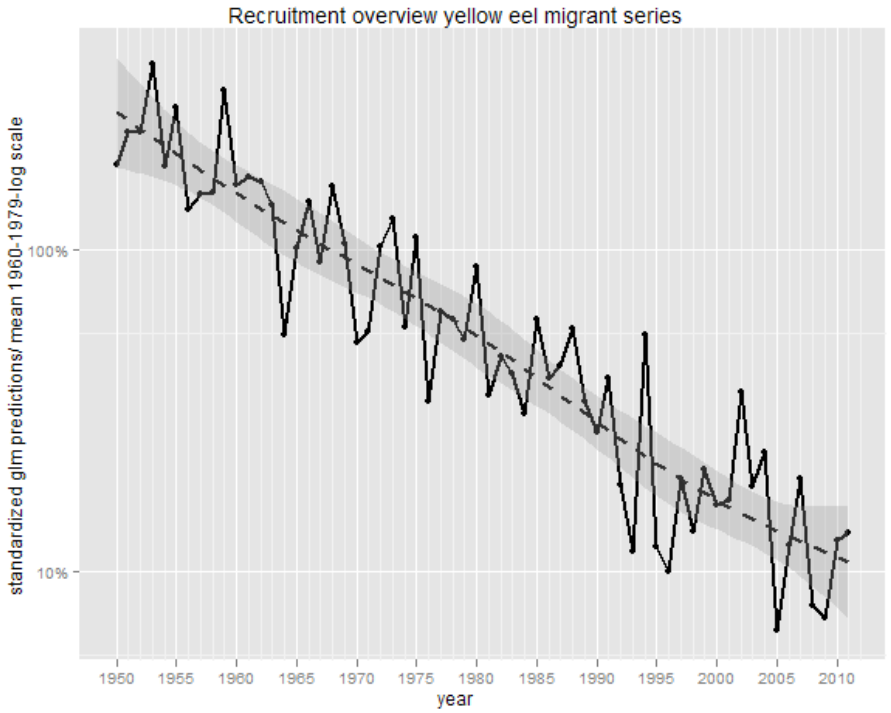
Stock status of European eel



WGEEL recruitment index: mean of estimated (GLM) glass eel recruitment for the North Sea and elsewhere in Europe.

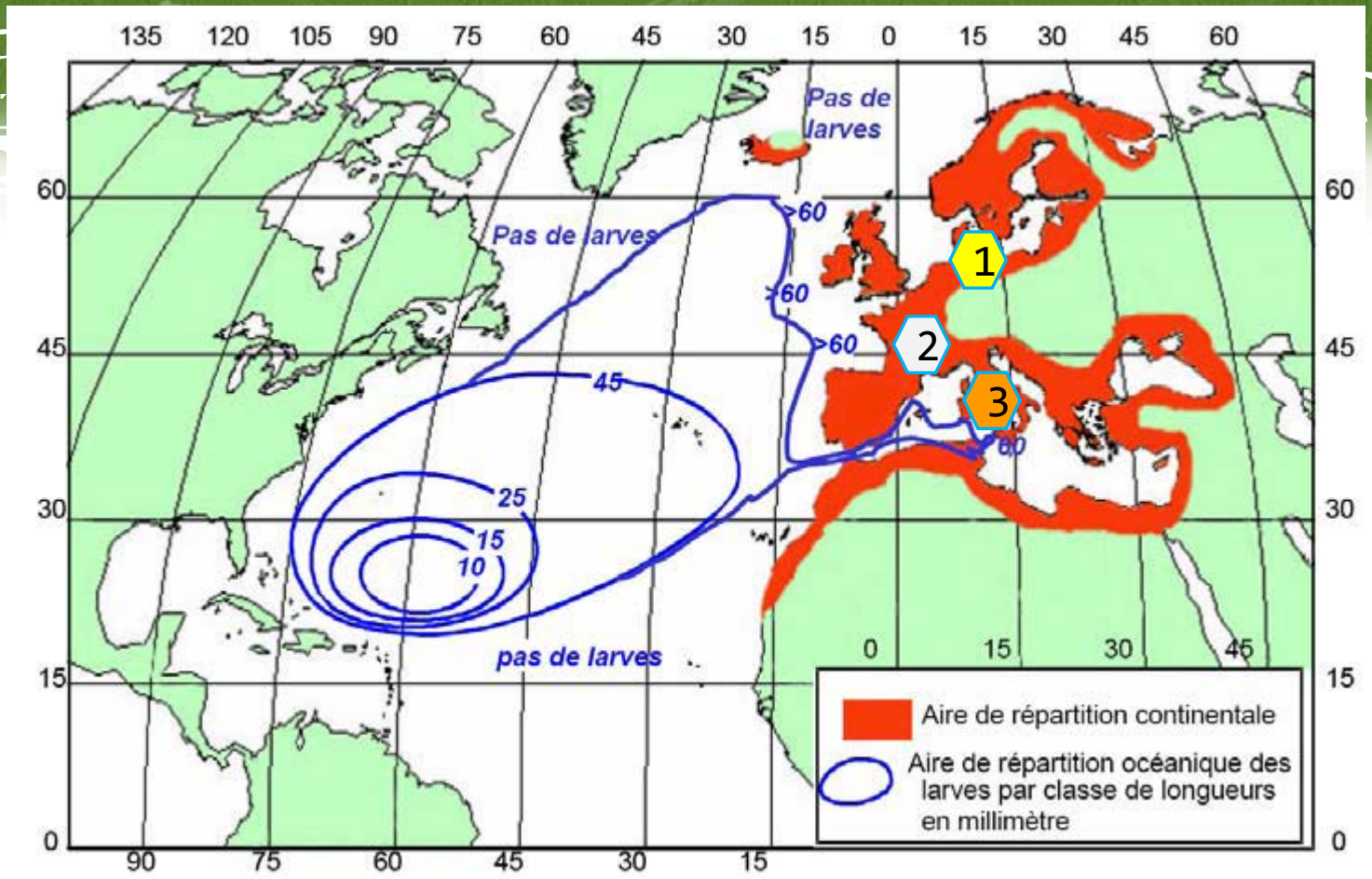


Mean of estimated (GLM) yellow eel recruitment and smoothed trends for Europe.

Note the logarithmic scale on the y-axis

Cited: ICES Advice 2011 Book9

Habitat zones of the European eel



Distribution of eel larvae in the North Atlantic depending on their length, starting from the approximate spawning zone in the Sargasso Sea. In red, the continental habitat zones of the European eel (source: Adam, 1997).

Cited from: http://www.onema.fr/IMG/EV/EV/plus/Eel-plaq_anguille.pdf

Activities of European eel management

1999; ICES advised "The eel stock is outside safe biological limits and the current fishery is not sustainable.

2003; ICES proposed a limit reference point of 50% for the escapement of silver eels from the continent in comparison of pristine condition.

2007; the management framework for the European eel stock was established through an EU Regulation. COUNCIL REGULATION (EC) No 1100/2007

EU Regulation

The objective of the EU Regulation is to allow an escapement to the sea of the biomass of silver eel of at least 40% pristine level (Blim=40%B_0).

Eel Management Plan

To achieve the objective of EU Regulation, member countries have developed **eel management plans (EMPs)** in their territory (sometimes at river basin level).

Each EMP shall contain a description and an analysis of the present situation of the eel population (in the eel river basin) and relate it to the target level of escapement.

Each EMP shall contain a time schedule for the attainment of the target of escapement

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Management measures

An EMP may contain, but is not limited to the following measures;

- reducing commercial fishing activity,
- restricting recreational fishing,
- restocking,
- improve habitat,
- transportation of silver eel from inland to sea,
- combating predators,
- temporary switching off of hydro power turbines
- measures related to aquaculture

R (EC) 1100/2007 Article 2(8)

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Reporting and Evaluation

Each Member State shall report to the Commission, initially every third year, with the first report to be presented by 30 June 2012.
Reports shall outline monitoring, effectiveness and outcome, and in particular shall provide the best available estimates of :

The silver eel biomass
The level of fishing effort
The level of mortality factors outside the fishery
The amount of eel less than 12cm in length caught and the proportions of this utilized for different purposes.

R (EC) 1100/2007 Article 9

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Danish EMP

- **The Danish Eel Management Plan – two main elements:**

- ・**Inland fresh water:** reducing anthropogenic mortalities so as to permit with high probability the escapement to the sea of at least 40 % of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock.
- ・**Marine water:** introducing reductions in fishing effort by at least 50% relative to the average effort deployed from 2004 to 2006. (measures concerning community waters)

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Measures in Danish inland freshwater

In order to achieve the 40% target, a series of measures are introduced:

- - Reduction in fishing effort by min. 50%, aiming at out phasing
- - Improvements to eel habitats
- - Extensive stocking of eel
- - Intensified and strengthened control measures
- - Intensified monitoring of eel migration and mortality
- - Improved possibilities for eel migration (Hydropower / aquaculture)
- - Integrated management of predators
- - Monitoring and research on parasites and contaminants

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Measures in Danish marine waters

In order to achieve the 50% target, a series of measures are introduced:

- - At least 50% reduction in commercial fishing effort
- - 50% reduction in recreational fishing effort
- - Increase in minimum legal size of eel
- - Out phasing of hook-line fisheries
- - Ban on trawls, seine nets, spears and a number of other gear types.
- - Intensified and strengthened control measures
- - Intensified monitoring of eel migration and mortality

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EEL MANAGEMENT IN THE BALTIC REGION.
A COMPARATIVE ANALYSIS

Measures in the approved EMP's to reduce eel fishing mortality in the Baltic Sea (main countries only)

State	Reduced fishing coast	Reduced fishing inlands	Preregulations catches	Recreational fishing	Minimum length (cm)	Increased control
Sweden	50%	50%	~700-800t	Prohibited	65/40	Yes
Denmark	50%	50%	~700-800t	50% reduction	35	Yes
Poland	25%	25%	270t	2 eels/d	50	Yes

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EEL MANAGEMENT IN THE BALTIC REGION.
A COMPARATIVE ANALYSIS

Other stock enhancing measures in the approved EMP of the Baltic Region

State	Glass eel stocking no. Ind. (millions/year)	Reduction in other anthropogenic mortality	Increased control	Predator control
Sweden	2,50	40%	Yes	–
Denmark	Extensive, no amount given	40%	Yes	Yes, eg. Cormorant
Poland	13,00	34%(Vistula) / 29%(Oder)	Yes	Cormorant

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Eel stock status indicators within the region, current and pristine (main countries and total).

State	Pristine silver eel escapement	Productive water suface	Produc-tivity	Current silver eel escapement	Current/ pristine	Expected time until 100% recovery	Comment
	tons	ha	kg/ha	tons	%	years	
	B0			Bcurrent	%SSB	T-recovery	
Sweden	3659-8310	2 700 000	2	930	10-25%	200	true stock recovery time.
Denmark	1100	60 000	18.3	100	9%	-	excludes 7000 t pristine and 600 t current from marine waters
Poland	(2164)	4 000 000	0.5	(198)	9%	-	
Total	12,422	>18 $\times 10^6$	0.68	2 387	19%		

French EMP

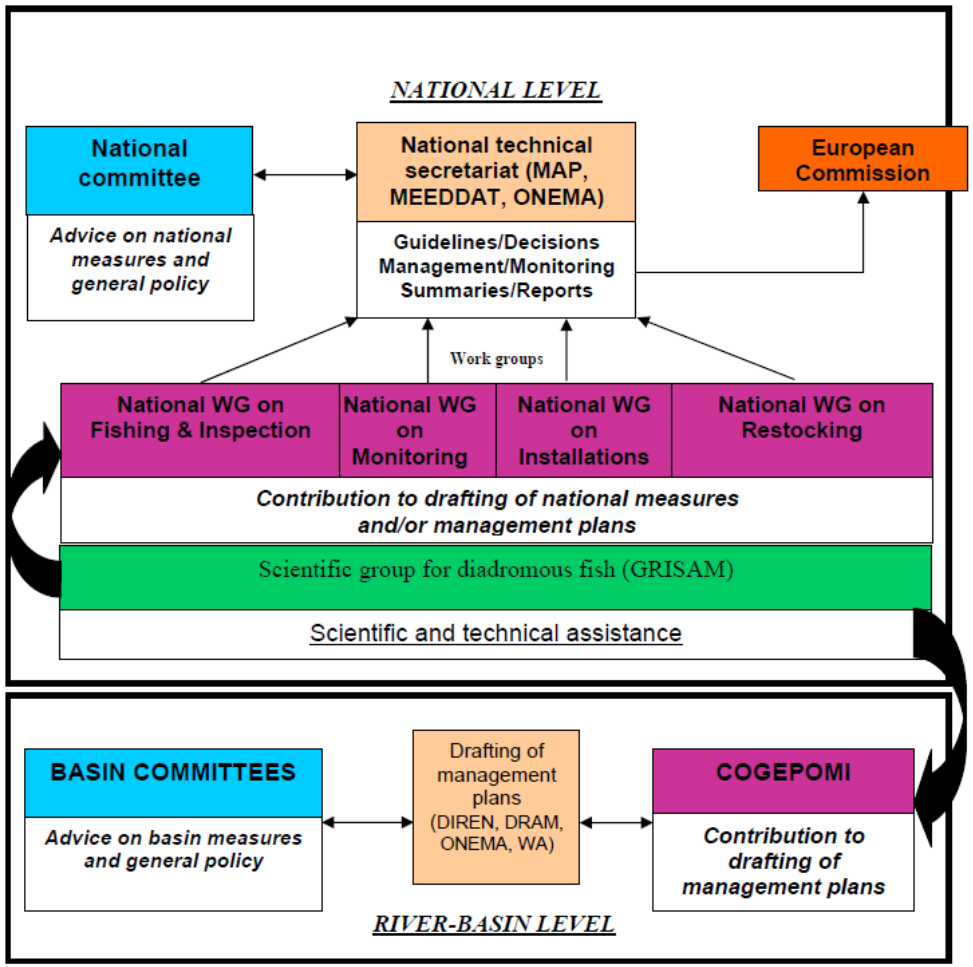
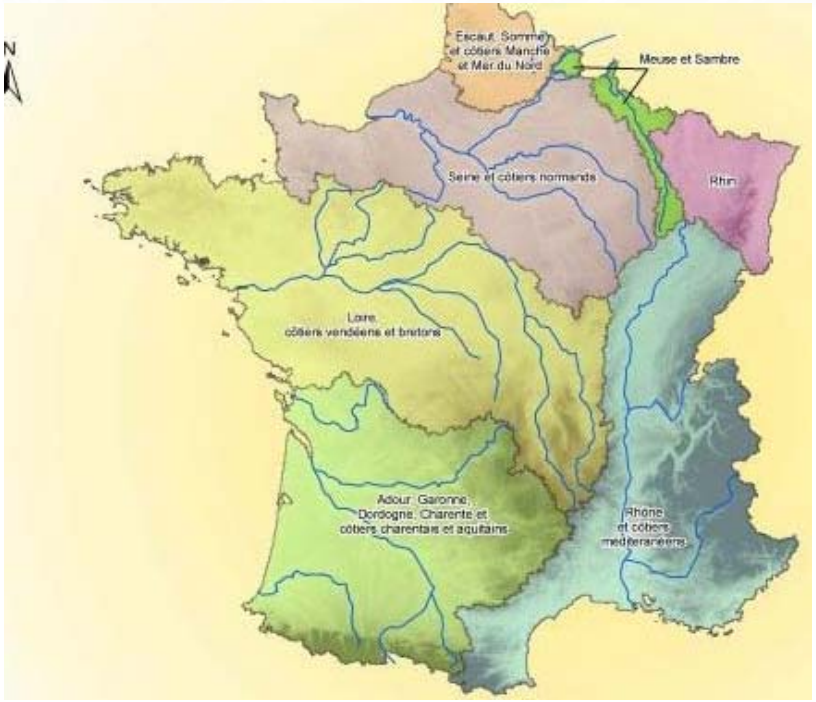


Fig. 5. Implementation of regulation 1100/2007 in France.



The French hydrographic basins

Cited from: http://www.onema.fr/IMG/EV/EV/plus/Eel-plaq_anguille.pdf

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Main actions proposed in the national EMP of France

Country	Stocking	Anthropogenic mortality		
	Amount of glass eel/year	Commercial fishery	Recreational fishery	Hydropower /pumping stations
FRANCE	3.82 tons some data n.a	−30%	−30%	n.a

EIFAC/ICES WGEEL
Report 2009

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Measures implemented for each type of fishing activity in France

Commercial fishing

- limitations in the number of commercial fishermen and/or vessels,
- limitations in the volumes of eels caught and/or,
- a reduction in fishing efforts (durations or technical measures).

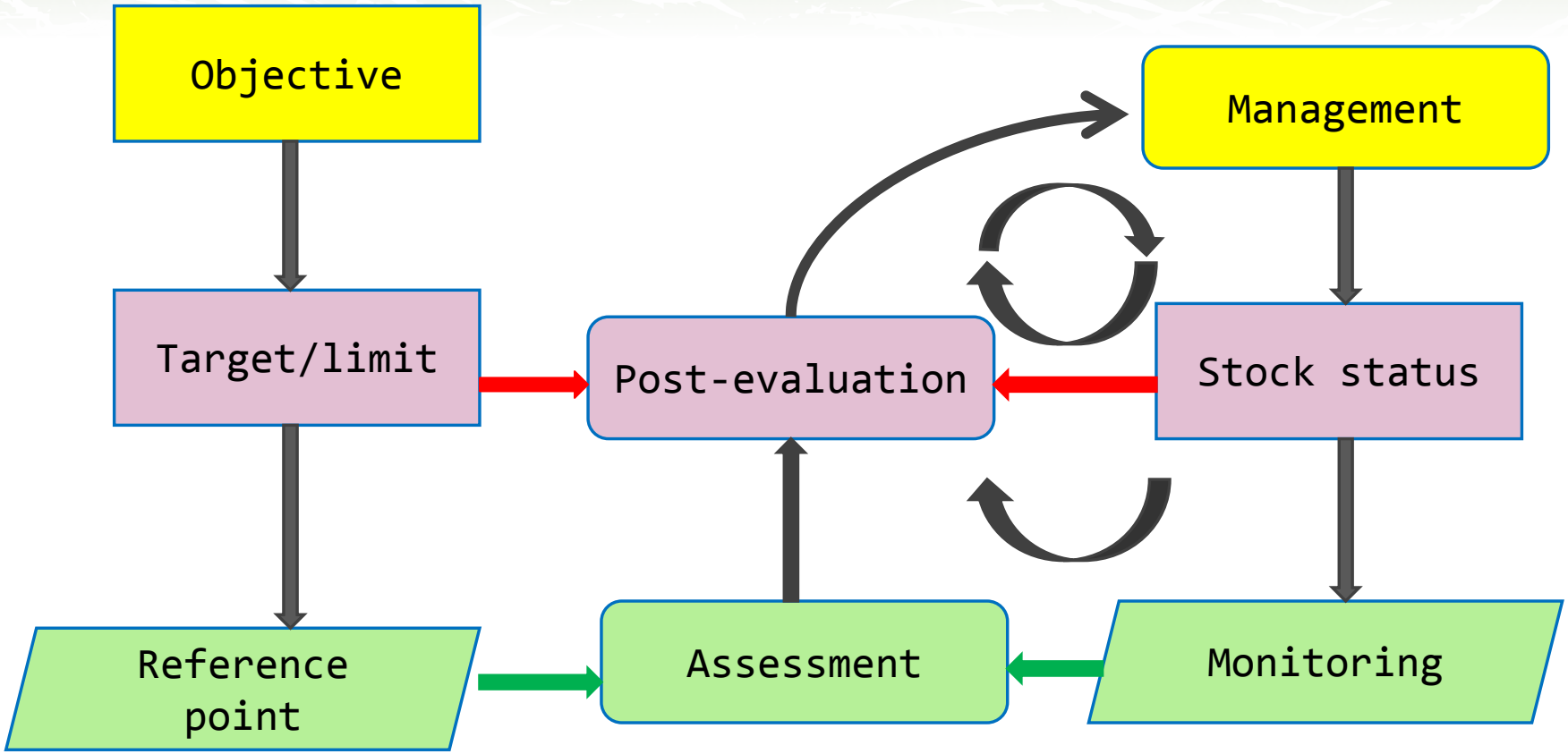
Recreational fishing

The overall strategy is to reduce fishing specifically targeting eels, particularly with special equipment.

Fishing of glass eels and using eels as bait will be forbidden.

post-evaluation

Following the eel management plans, national reports from member States on their implementation practices are expected in 2012 and then the first post-evaluation of the regulation is expected.



A conceptual view on the post evaluation process and the role of stock assessment. (after ICES SGIPEE Report 2011)

Estimates need to post-evaluate the efficacy of management plan

Situation	Mortality	Biomass		
		Recent recruitment		Pristine recruitment
		Rlow		Rhigh
No anthropogenic impacts	A_0=0	*Bbest*		B_0
Target/limit on impacts	*Alim*			*Blim*
After management measures	Apost	Bpost	>	*Blim*

Data need for stock assessment

- ◎ Landing time-series data :

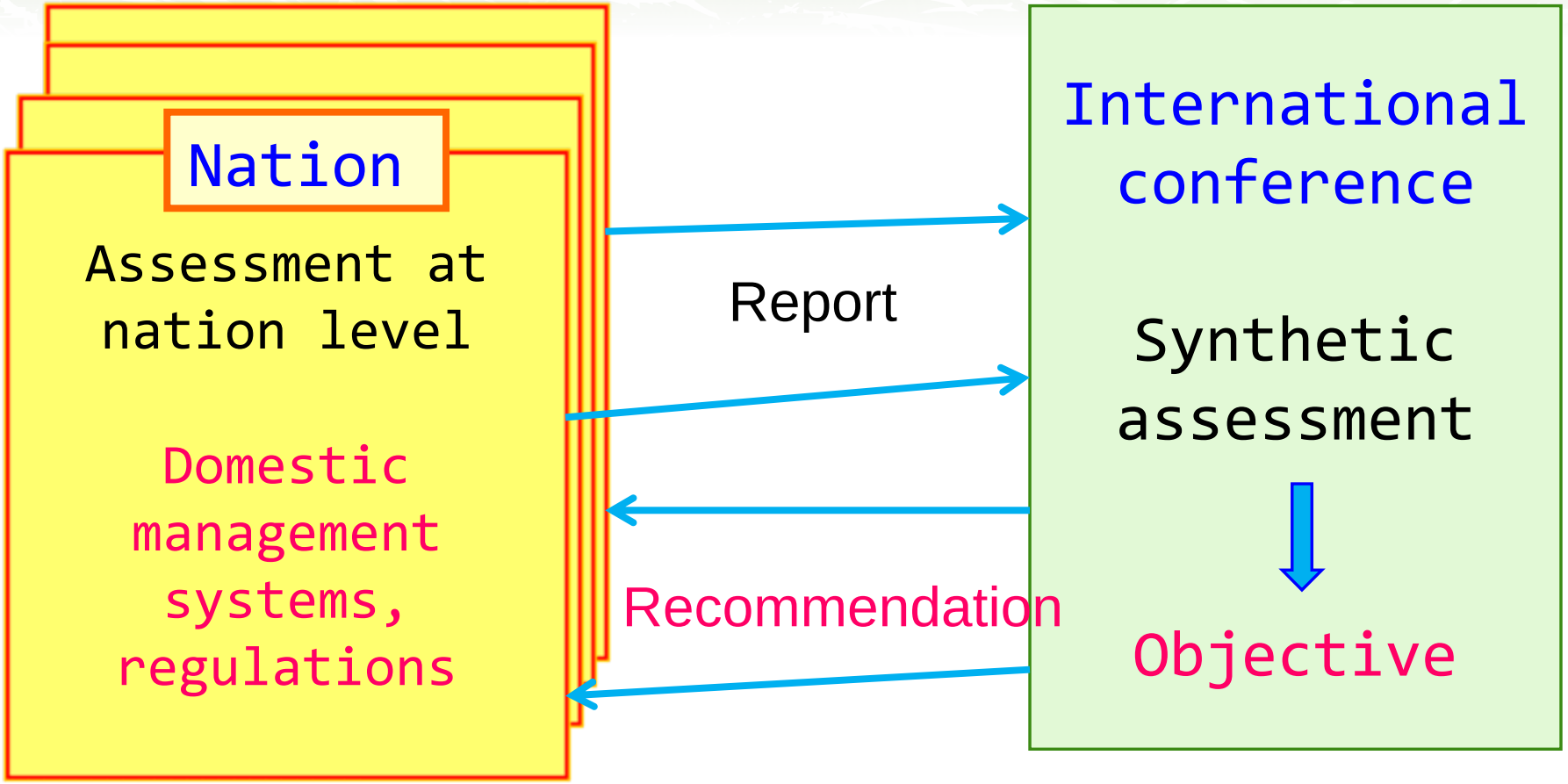
  Glass eel, yellow eel, silver eel

- ◎ Fishing effort, other anthropogenic impac
- ◎ Recruitment-series

  Glass eel, yellow eel

- ◎ Silver eel escapement
- ◎ Biological sampling for length, age, sex and maturity
- ◎ etc.

An image on the management scheme of Japanese eel based on the European management scheme



We hope that this workshop will be a clue of an international cooperation on Japanese eel stock management

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Thank you very much !