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Investigating environmental determinants and individual variation of the migration phenology in wild Atlantic salmon (*Salmo salar*)

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➤ Investigating environmental determinants and individual variation of the migration phenology in wild Atlantic salmon (*Salmo salar*)

➔ Focus on the observation process

Edel Lheureux

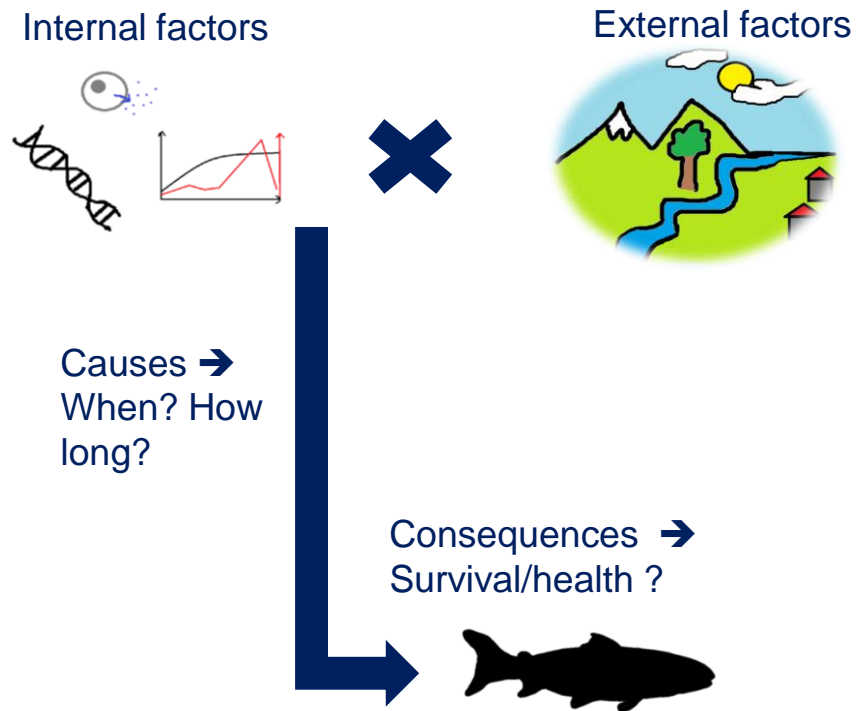
Direction : Buoro Mathieu-Prévost Etienne

2021-2024



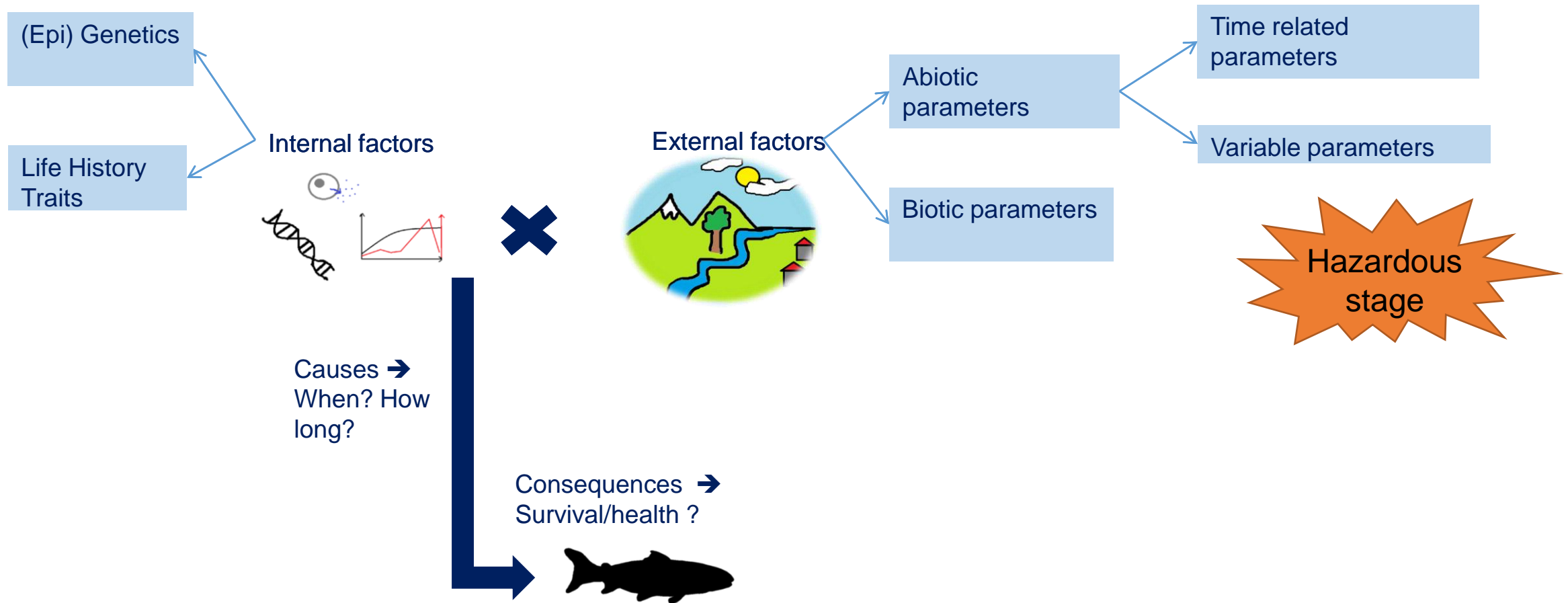
➤ Migration phenology :

The time at which the individual onsets its migration from an habitat to another



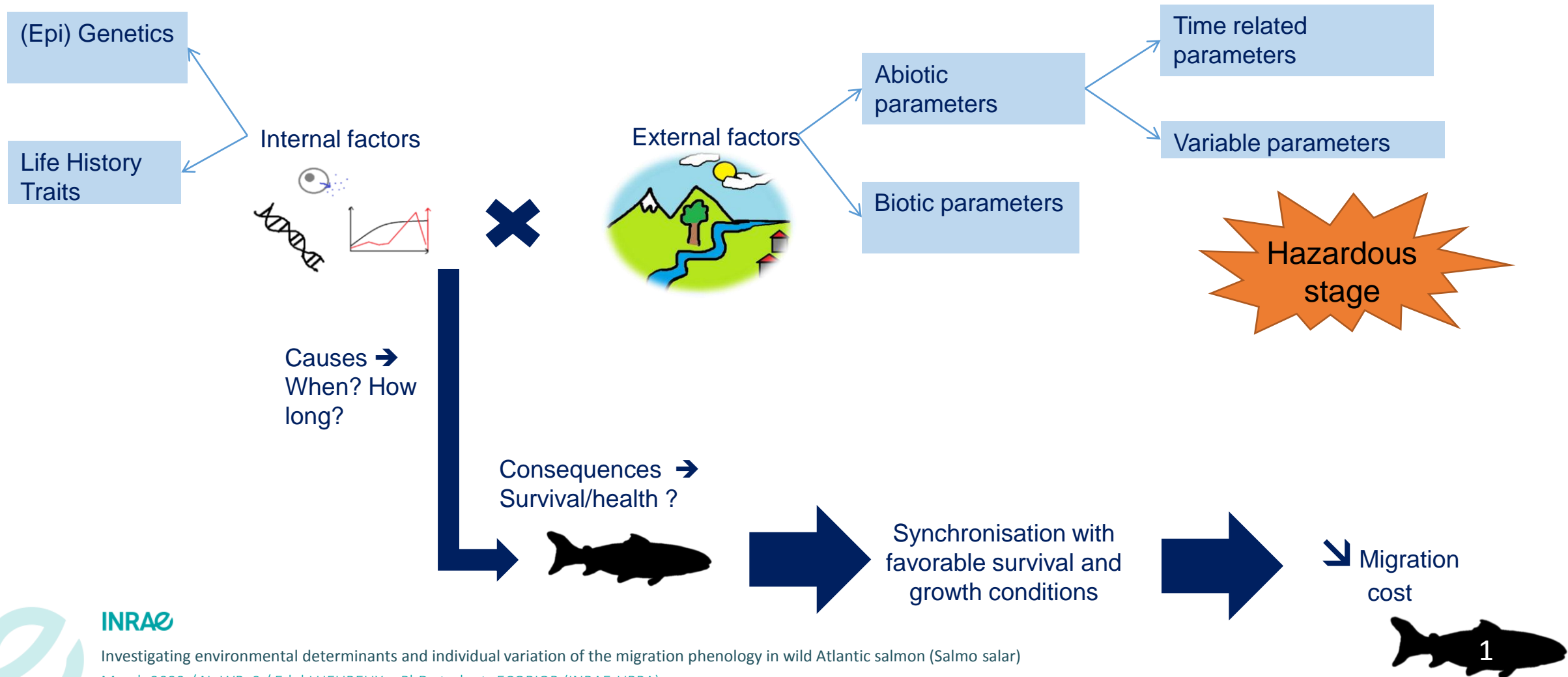
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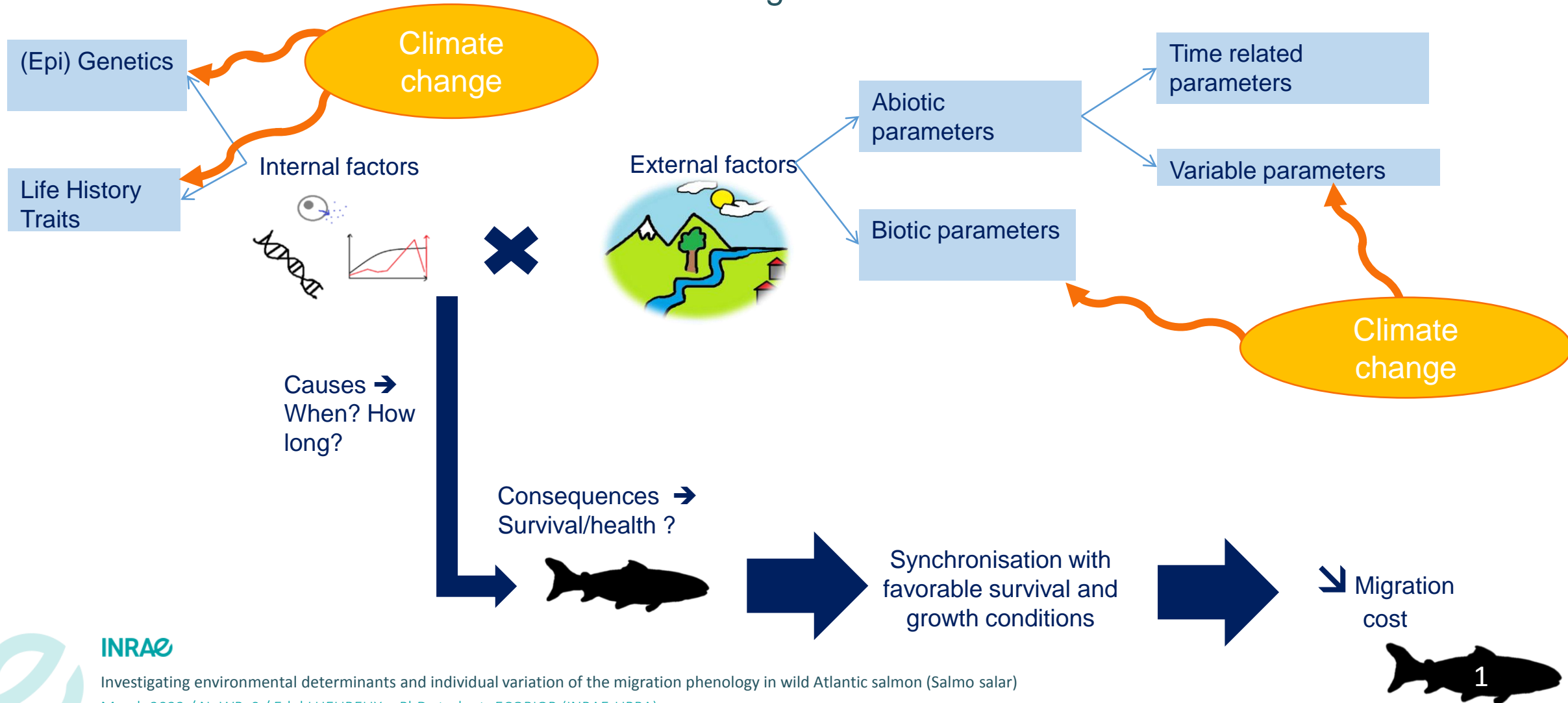
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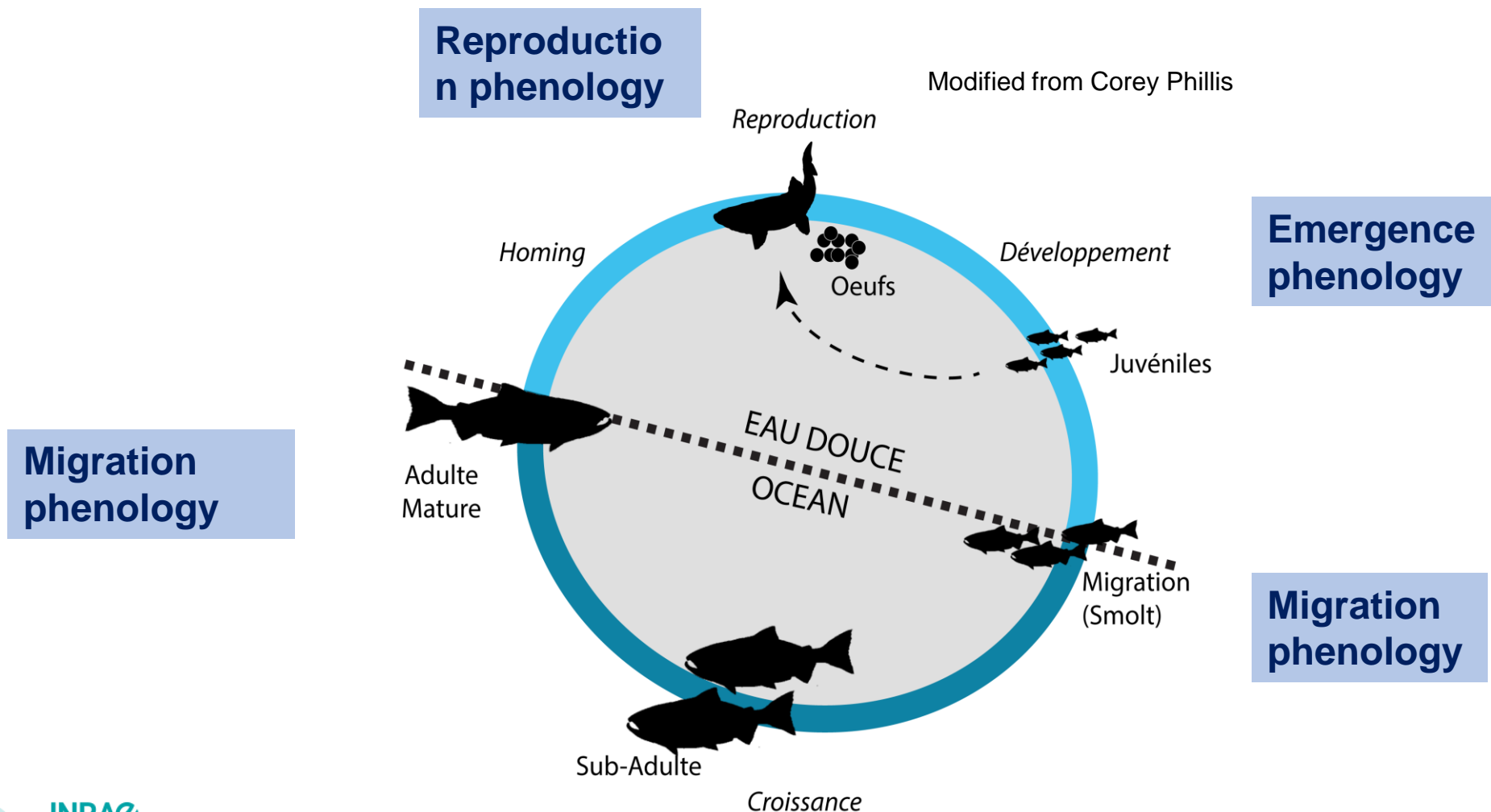


➤ Migration phenology :

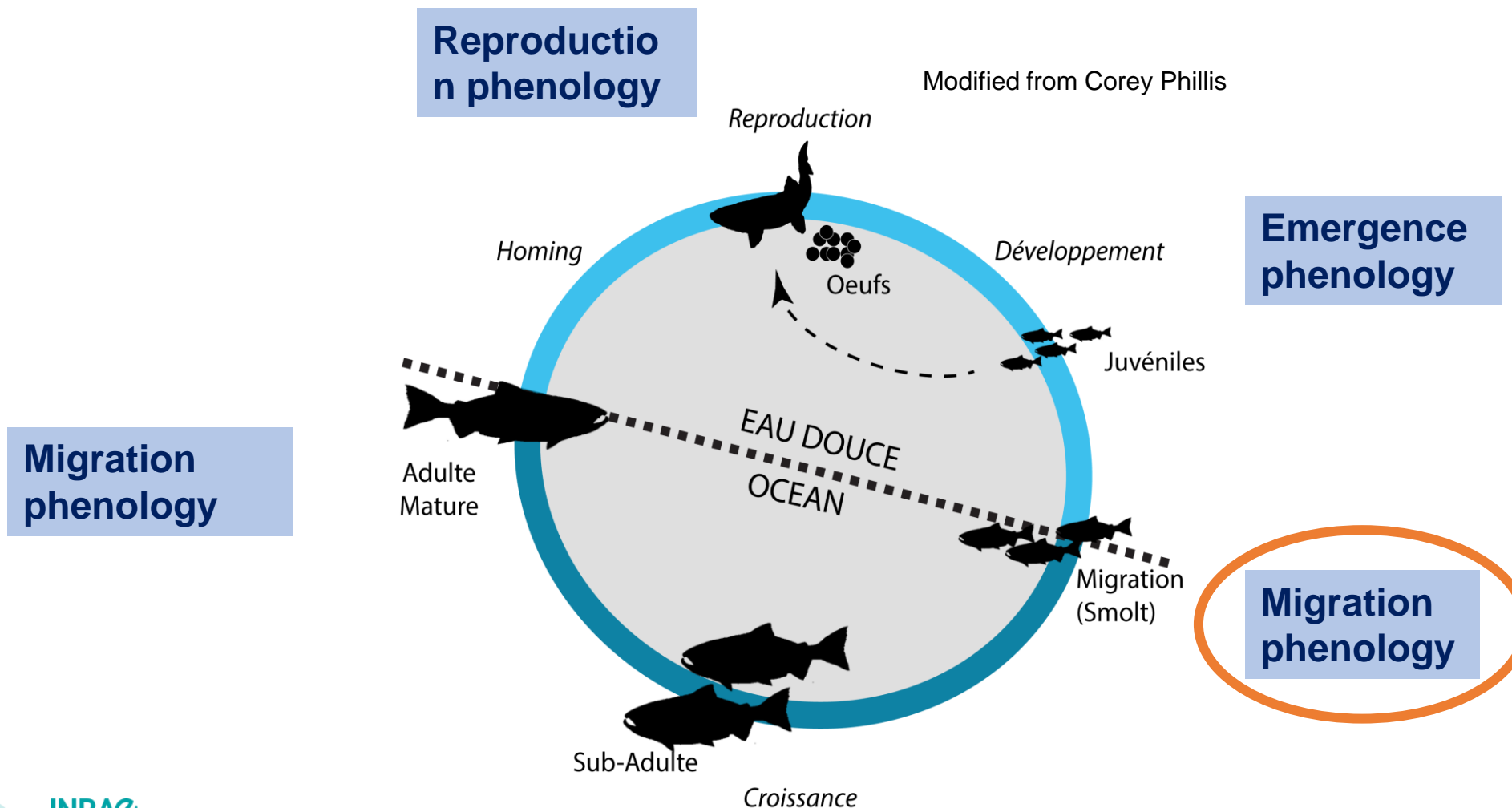
The time at which the individual onsets its migration from an habitat to another



> Focus on the salmon phenology



> Focus on the salmon phenology



> Problematic

How the individual variation and the environmental factors influence the phenology of migration ?

> Objectives



Assessing the biological processes of interest : smoltification & migration



To identify the proximate factors involved in the biological & observation processes

> Data

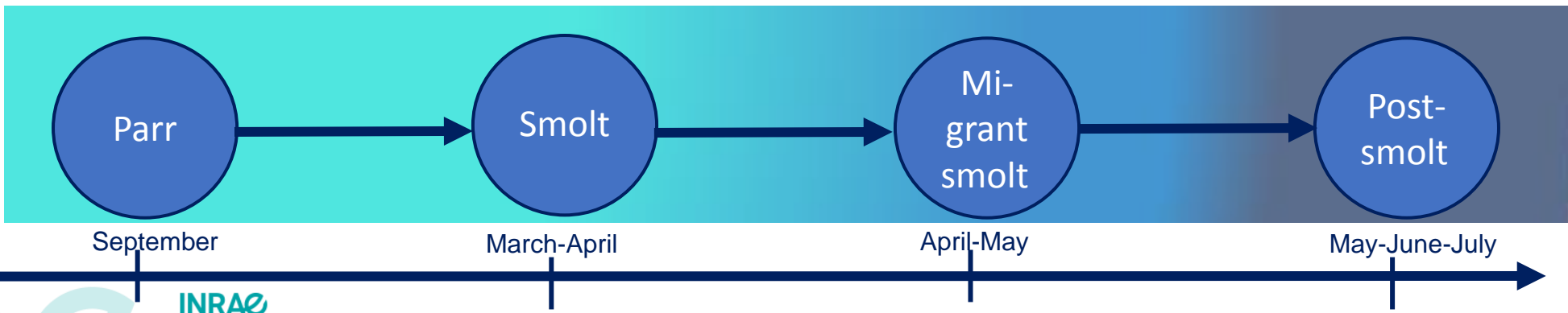
Scorff location (Source: Ore DiaPFC)



Location : Scorff river (Brittany, France)



Tagging/recapture since 2005



Investigating environmental determinants and individual variation of the migration phenology in wild Atlantic salmon (*Salmo salar*)
March 2022 / NoWPas / Edel LHEUREUX – PhD student- ECOBIOP (INRAE-UPPA)



> Data

Scorff location (Source: Ore DiaPFC)



 Location : Scorff river (Brittany,France)

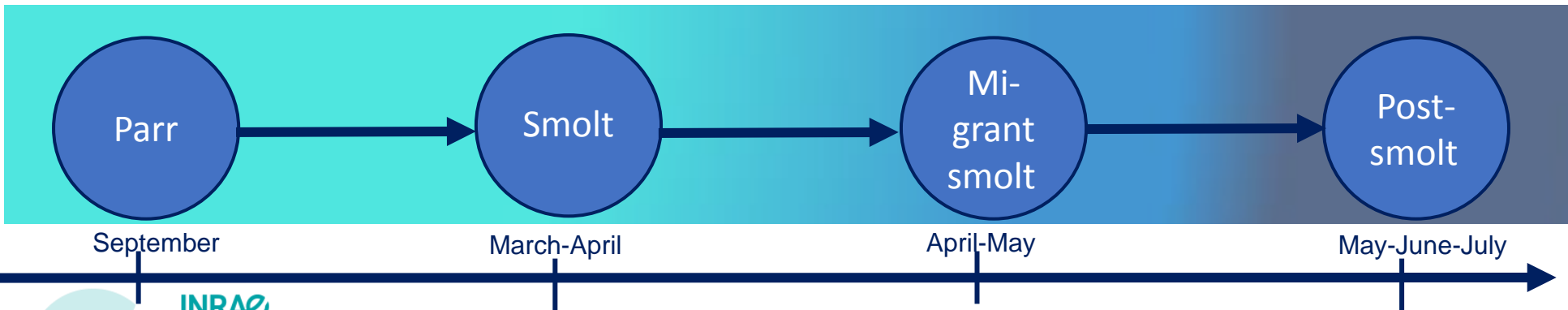
 Tagging/recapture since 2005



Electric fishing (Sources photo: INRAE-Ecobiop-U3E)



Tagging of the parr, (Sources photo: INRAE-Ecobiop-U3E)



INRAE

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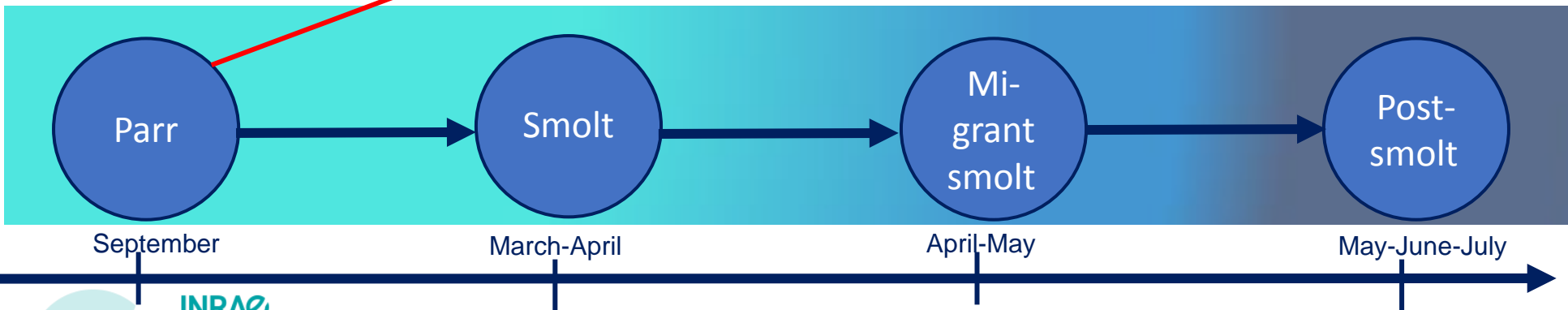
Weight , length, parr localisation



Electric fishing (Sources photo: INRAE-Ecobiop-U3E)



Tagging of the parr, (Sources photo: INRAE-Ecobiop-U3E)



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> Data

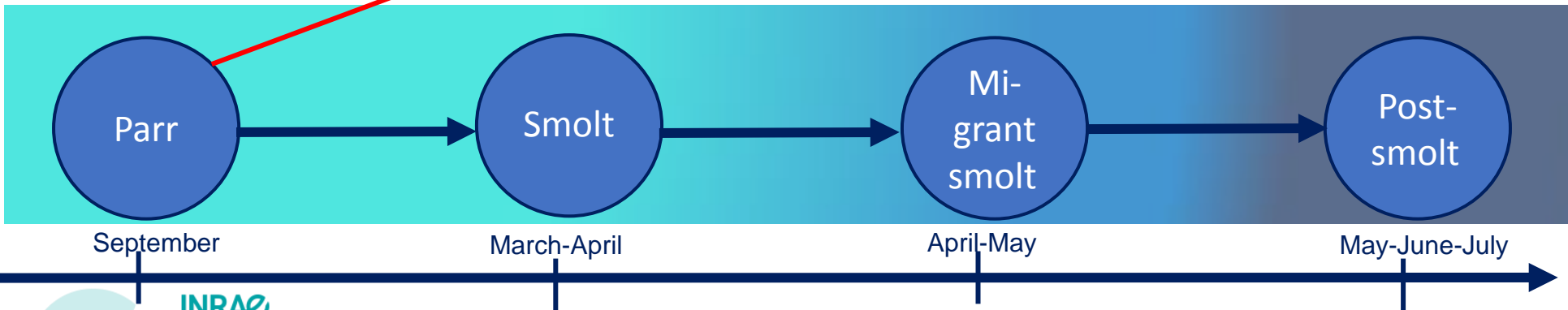


Princes trap (Source: Ore DiaPFC)



Leslé trap (Source: Ore DiaPFC)

Weight , length, parr localisation



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> Data



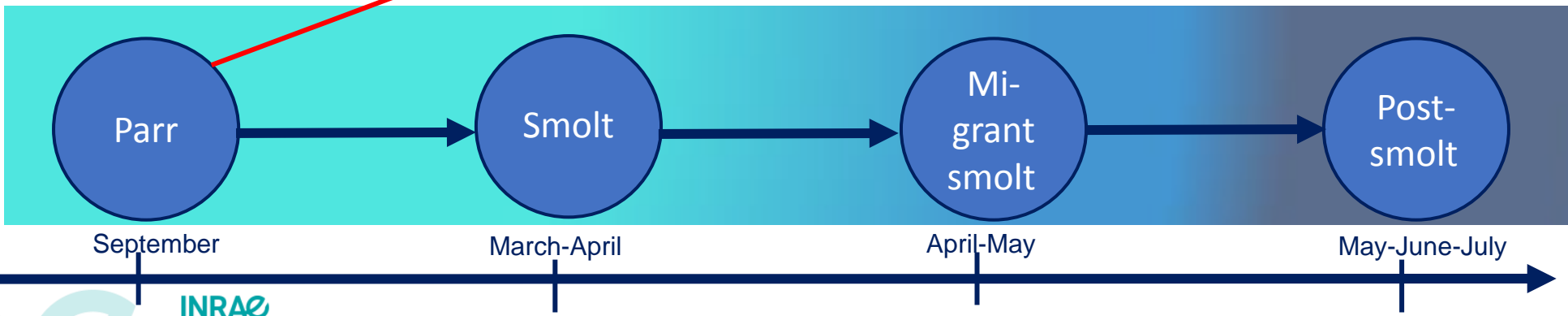
Princes trap (Source: Ore DiaPFC)



Leslé trap (Source: Ore DiaPFC)

+ Tagging !

Weight , length, parr localisation



INRAE



> Data



Princes trap (Source: Ore DiaPFC)



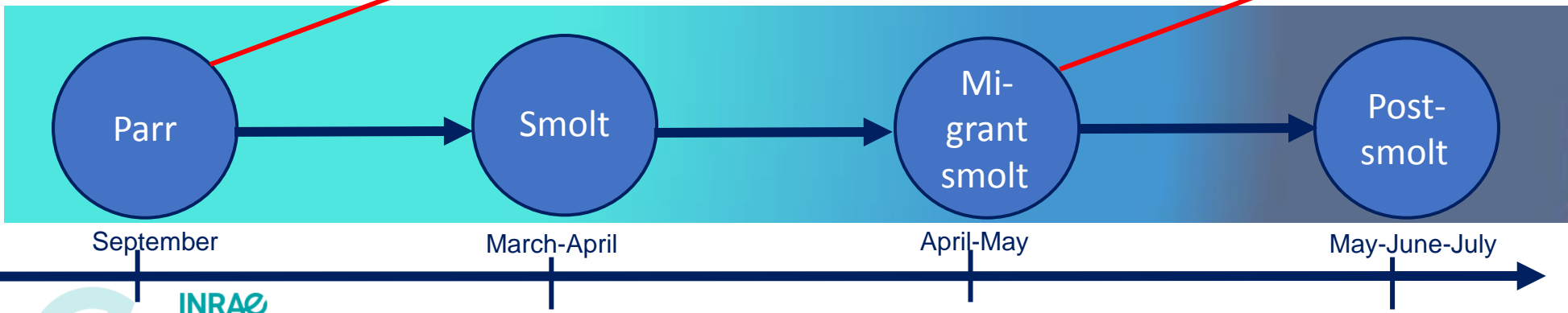
+ Tagging !



Leslé trap (Source: Ore DiaPFC)

Weight , length, parr localisation


Weight , length, date of migration



INRAE



> Data

 Daily water temperature, water flow and photoperiod



Princes trap (Source: Ore DiaPFC)



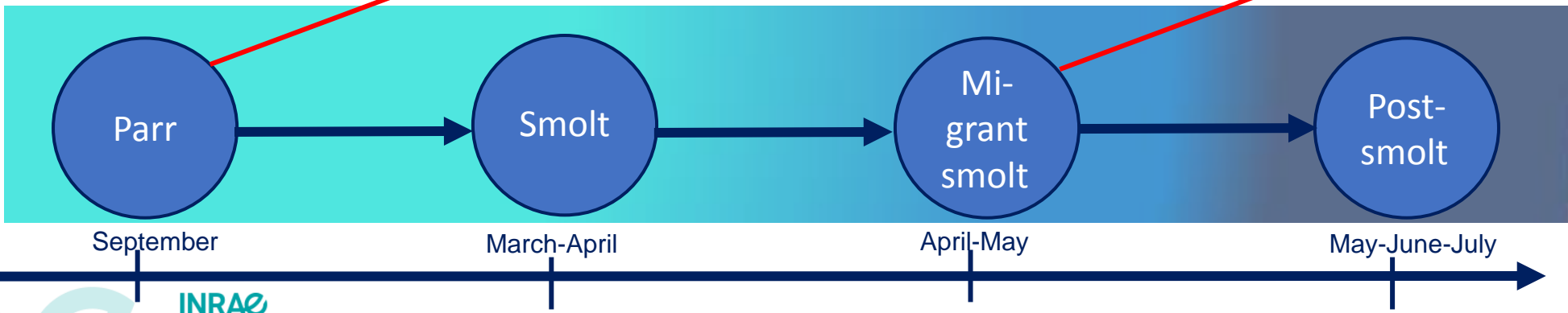
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Leslé trap (Source: Ore DiaPFC)

Weight , length, parr localisation

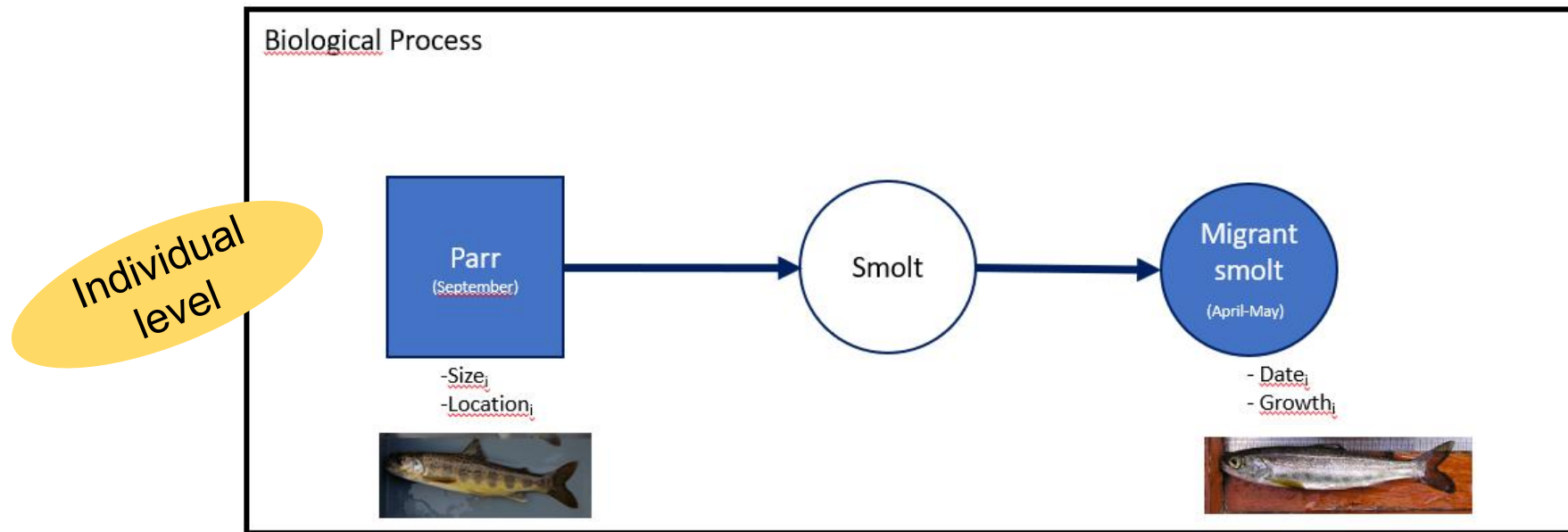
Weight , length, date of migration



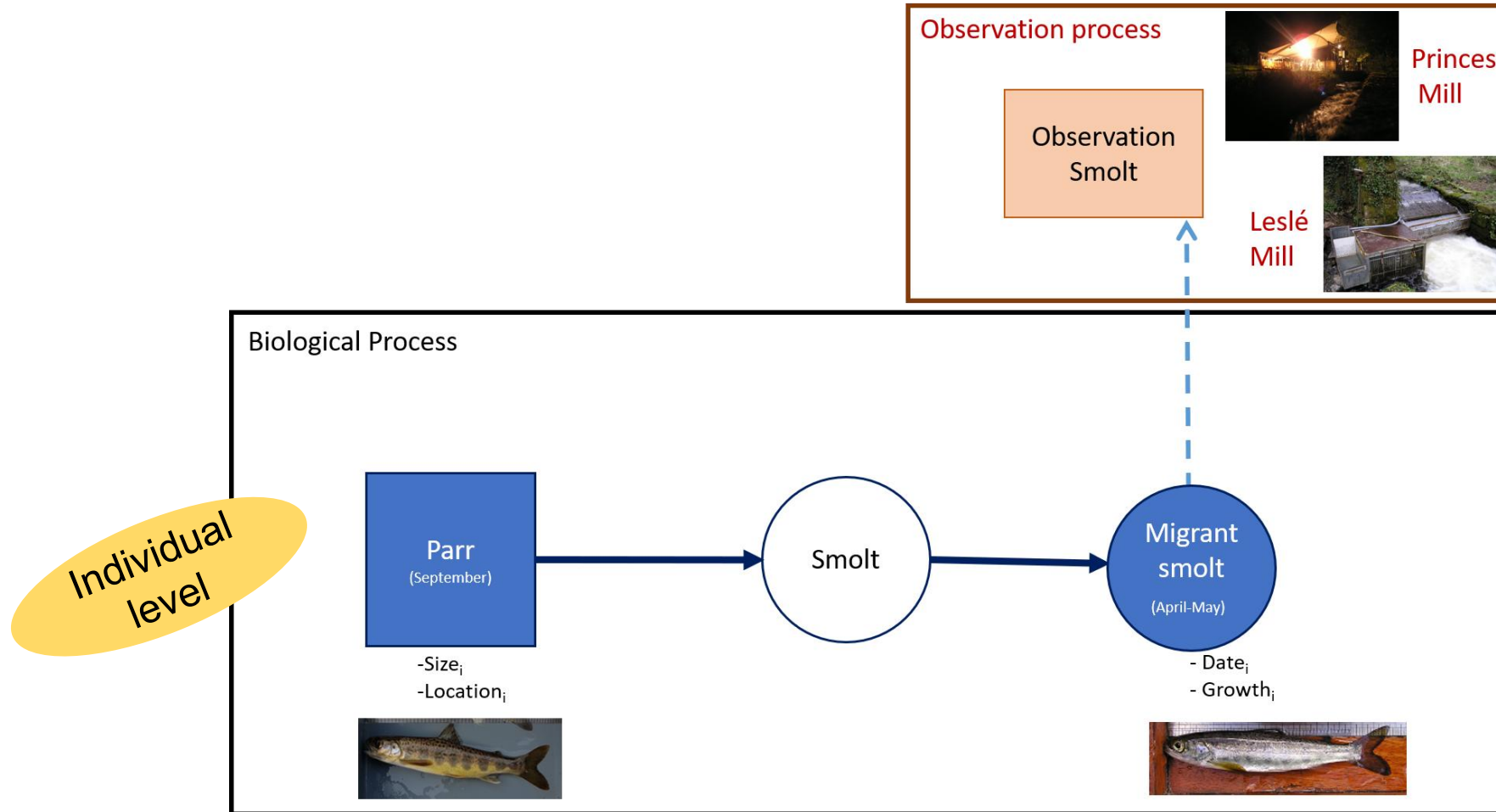
INRAE



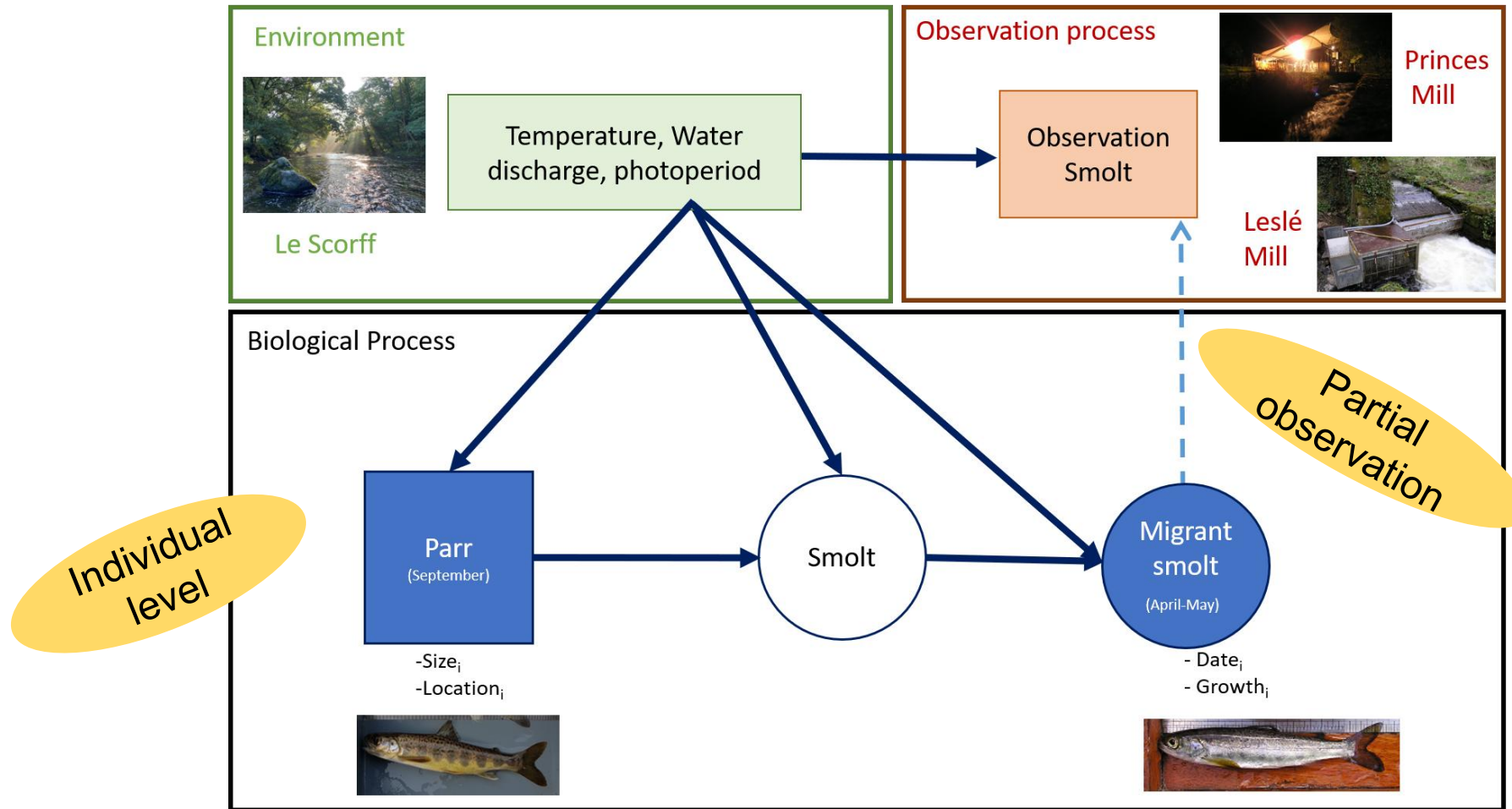
➤ II.1. The model: different processus = multi-state model



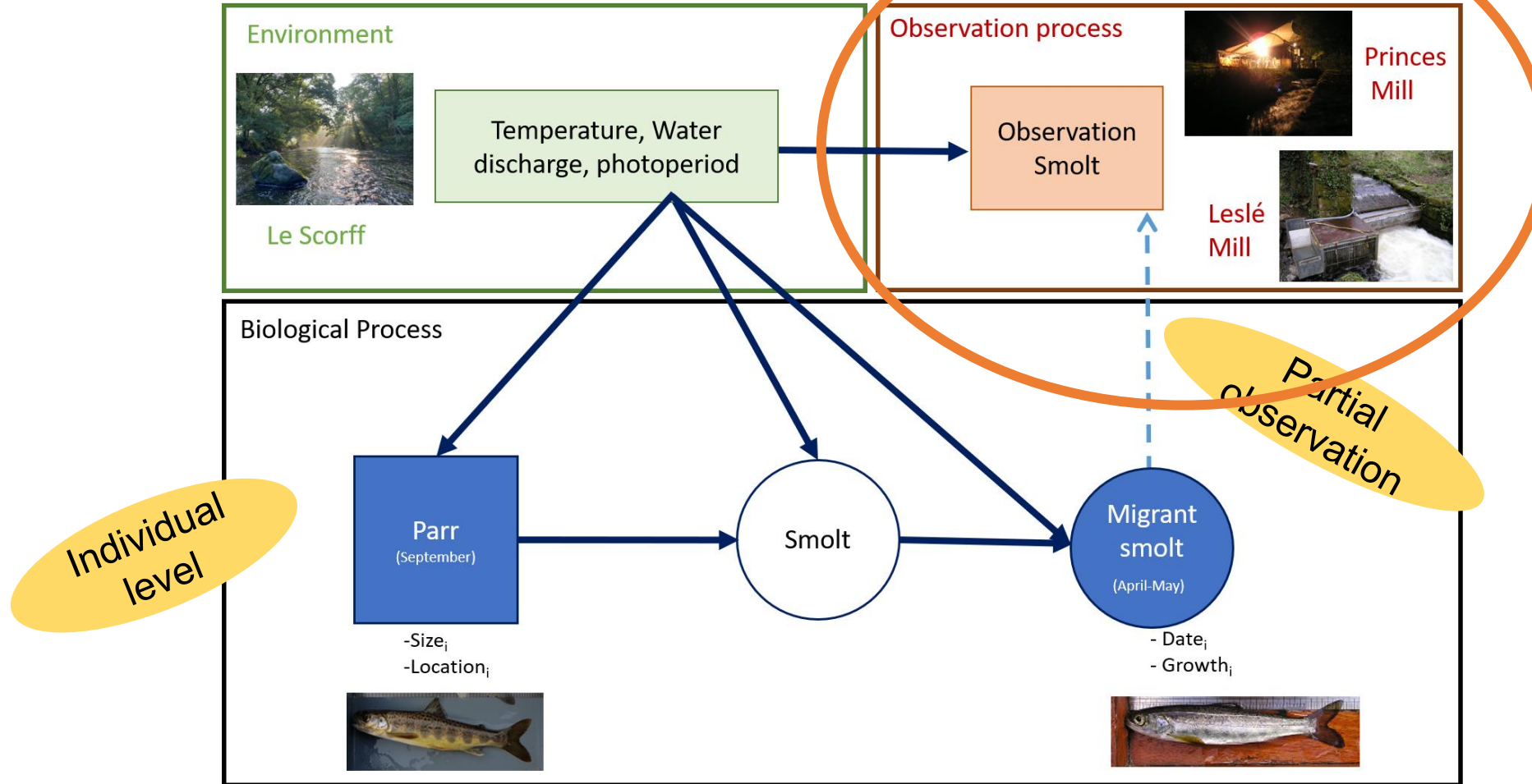
> II.1. The model: different processus = multi-state model



> II.2. The model: different processus = environmental factors



> II.3. Focus on the observation process

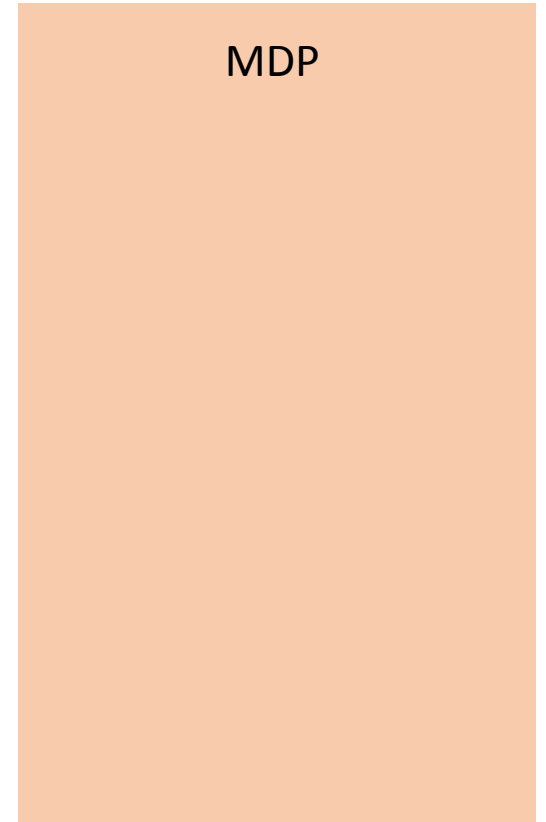
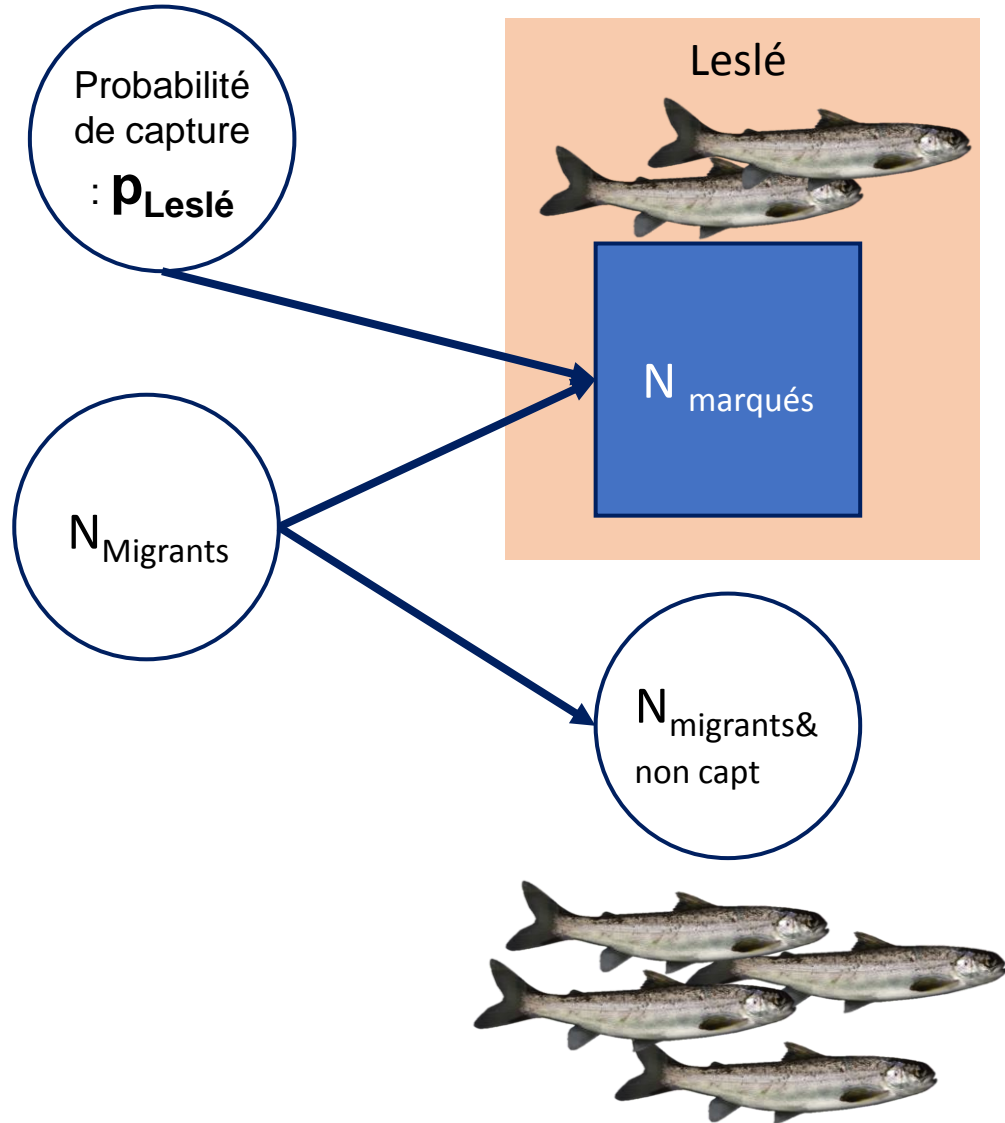


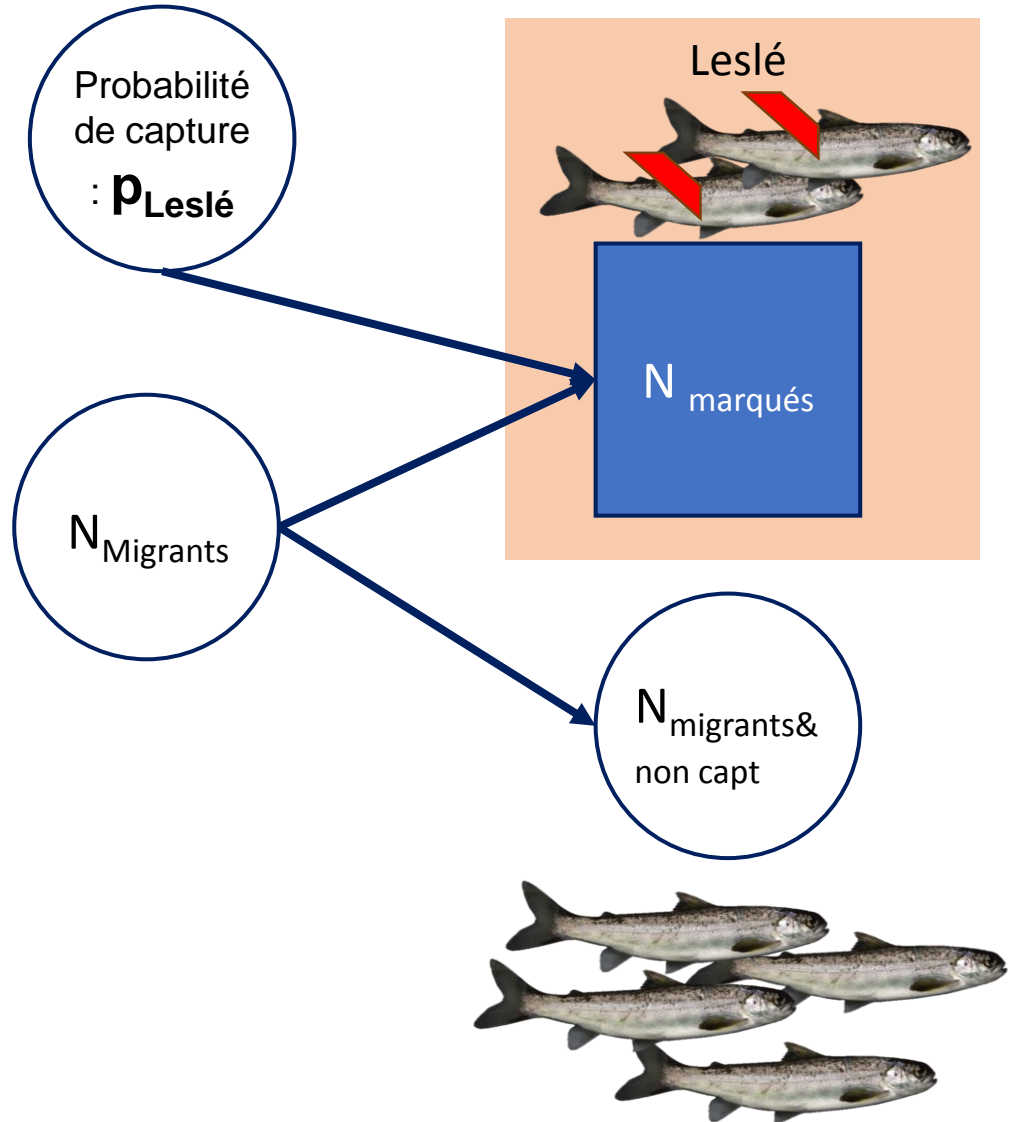
Leslé

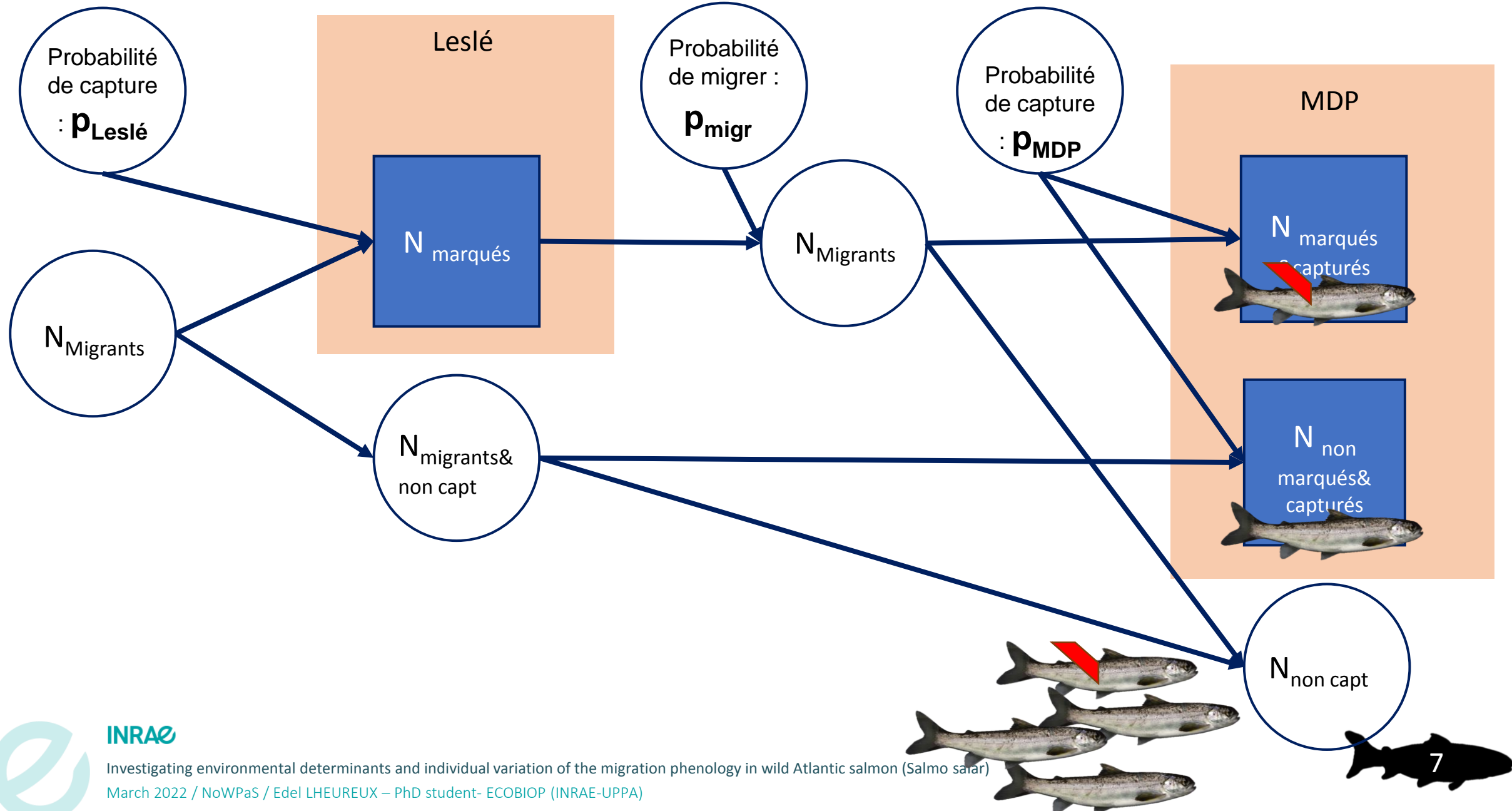
MDP

N_{Migrants}





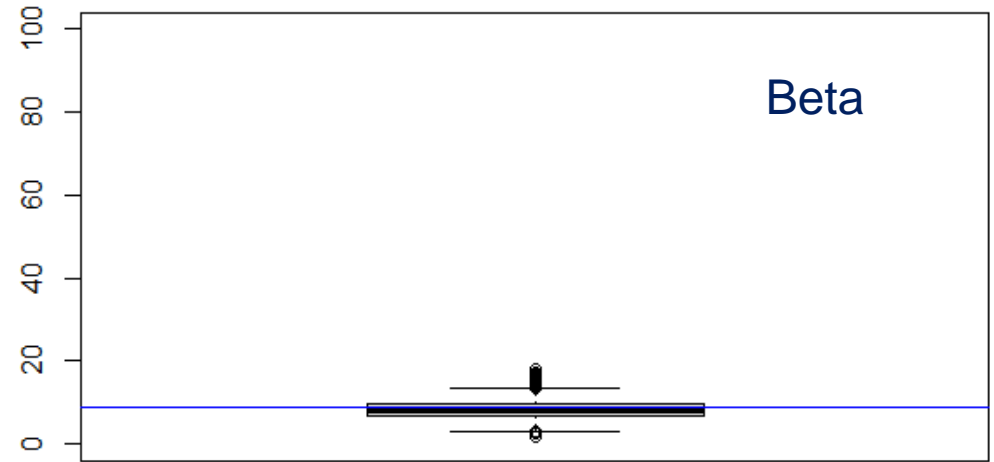
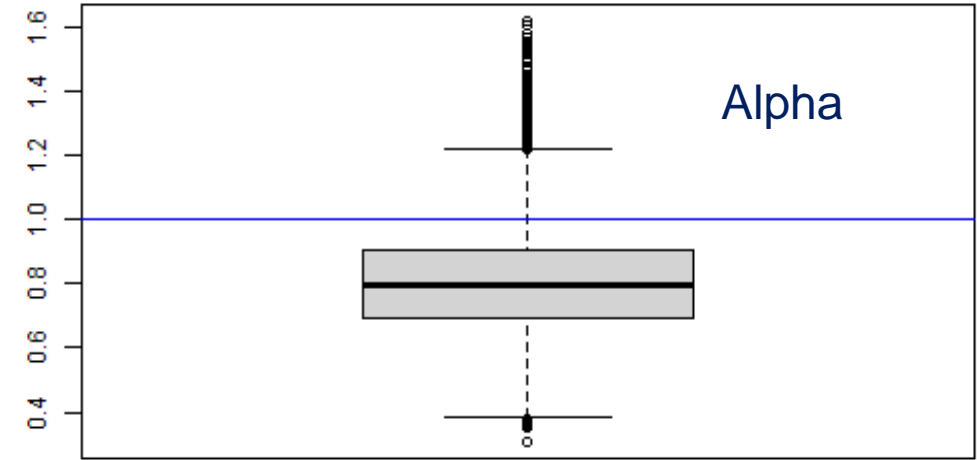
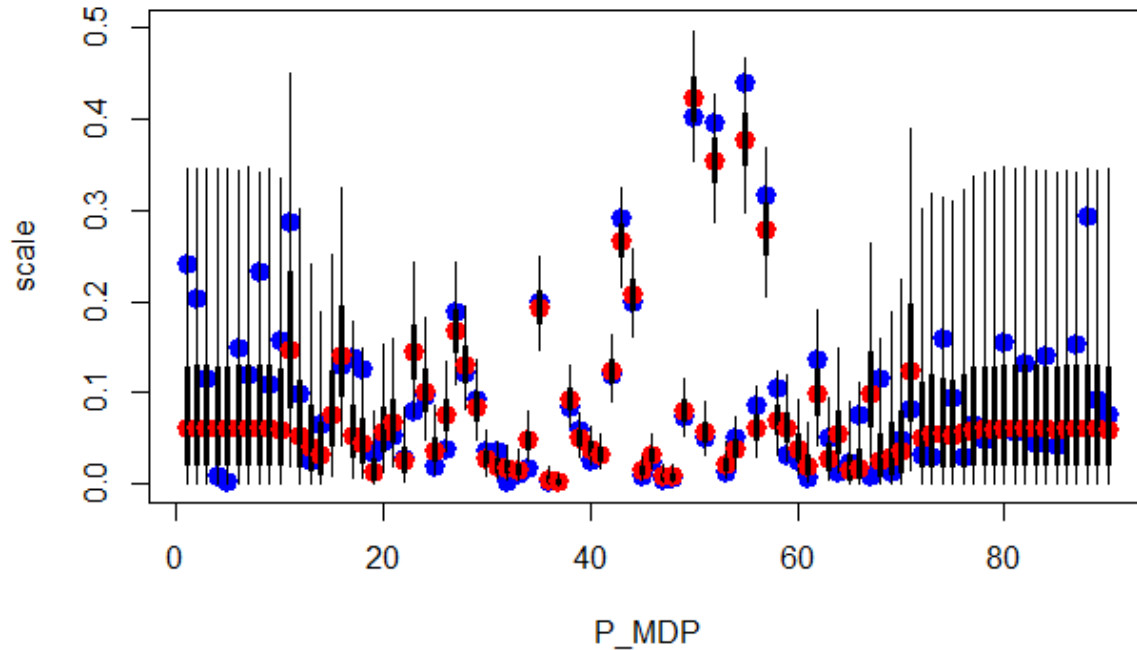




➤ II.3. Focus on the observation process

Results (simulated data)

- Données simulées
- Estimés

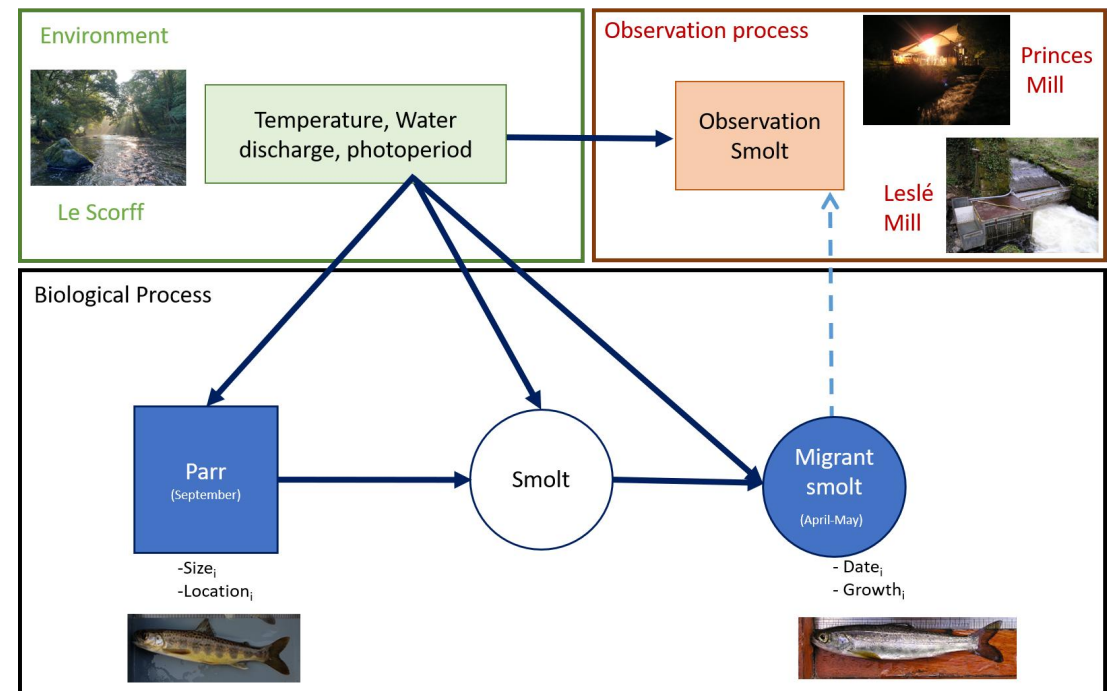


Paramètre proba de migration

➤ III. The model = perspectives:



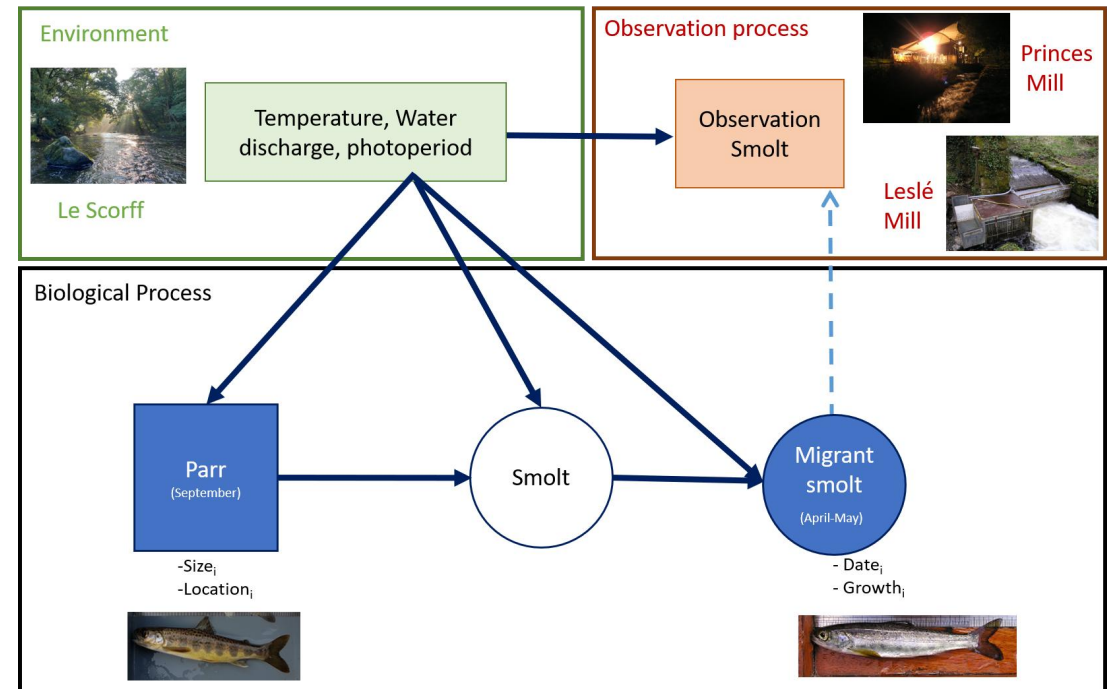
Complexifier le modèle d'observation : ajouter l'efficacité de capture au Leslé



➤ III. The model = perspectives:

 Complexifier le modèle d'observation : ajouter l'efficacité de capture au Leslé


 Intégration des processus biologiques



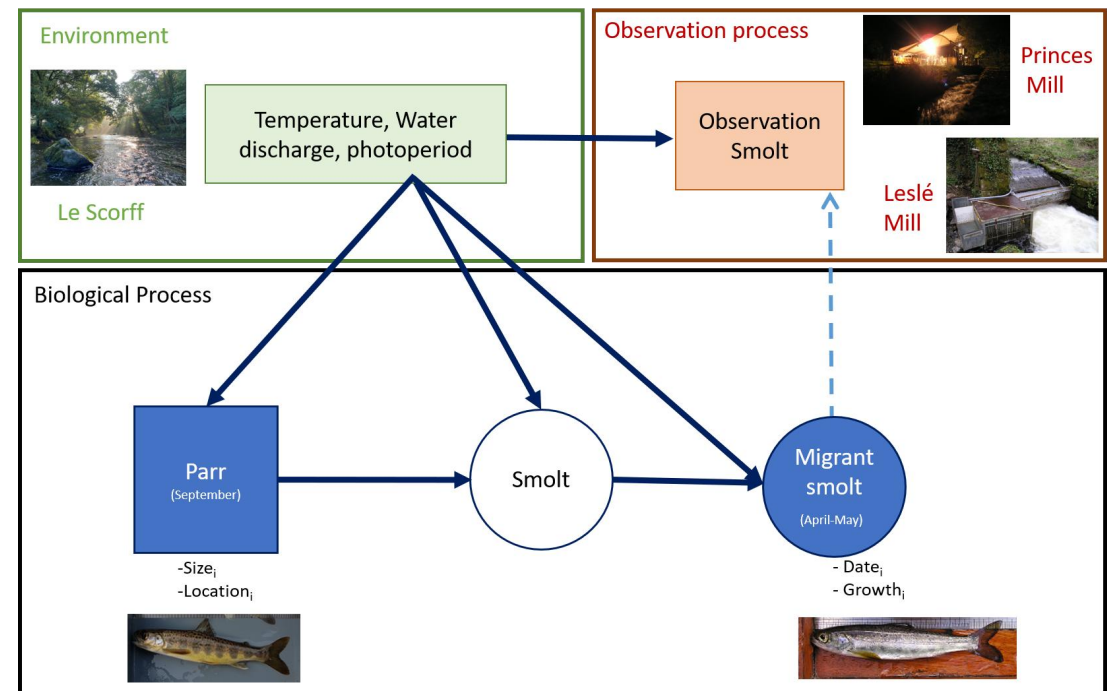
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 Intégration des processus biologiques

 Intégration de covariables (débit, température...)


 Risque de confusion !



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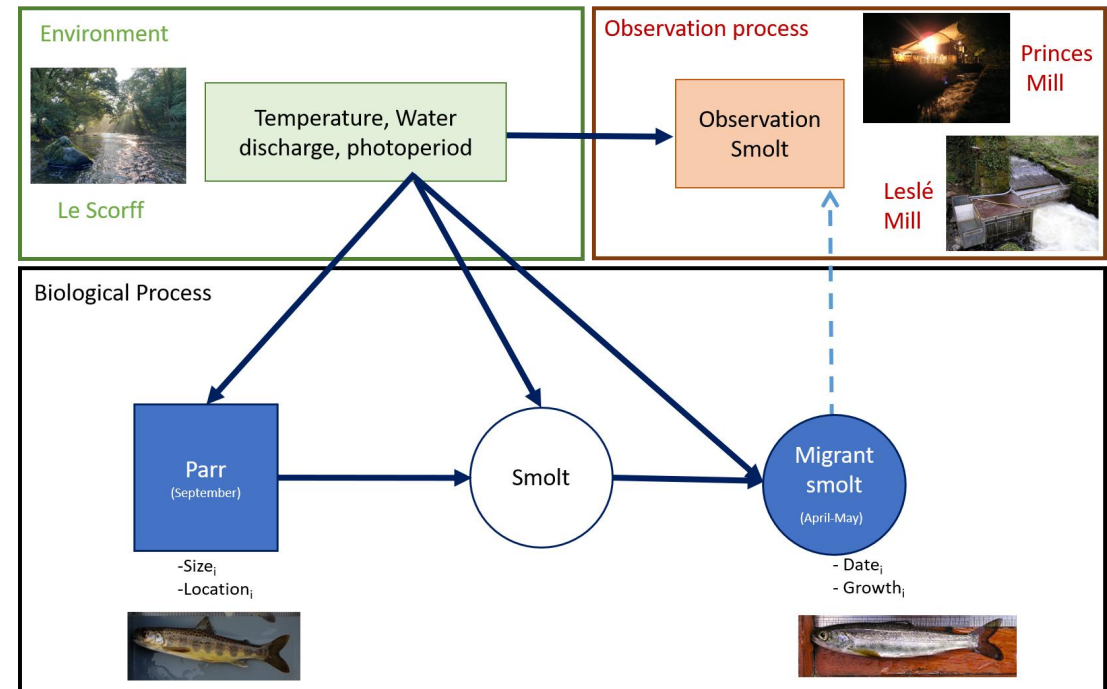
 Complexifier le modèle d'observation : ajouter l'efficacité de capture au Leslé

 Intégration des processus biologiques

 Intégration de covariables (débit, température...)

 Risque de confusion !

 Ajuster sur les vraies données



Thanks for your attention



Any questions?

