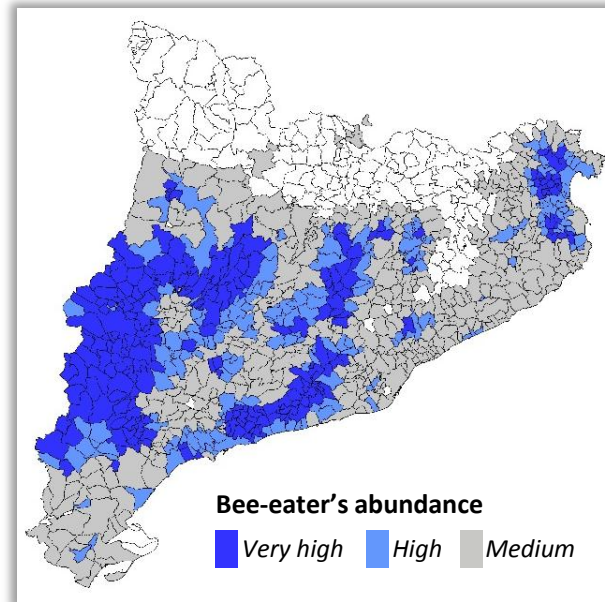


Valuing biodiversity spatial data in Catalonia

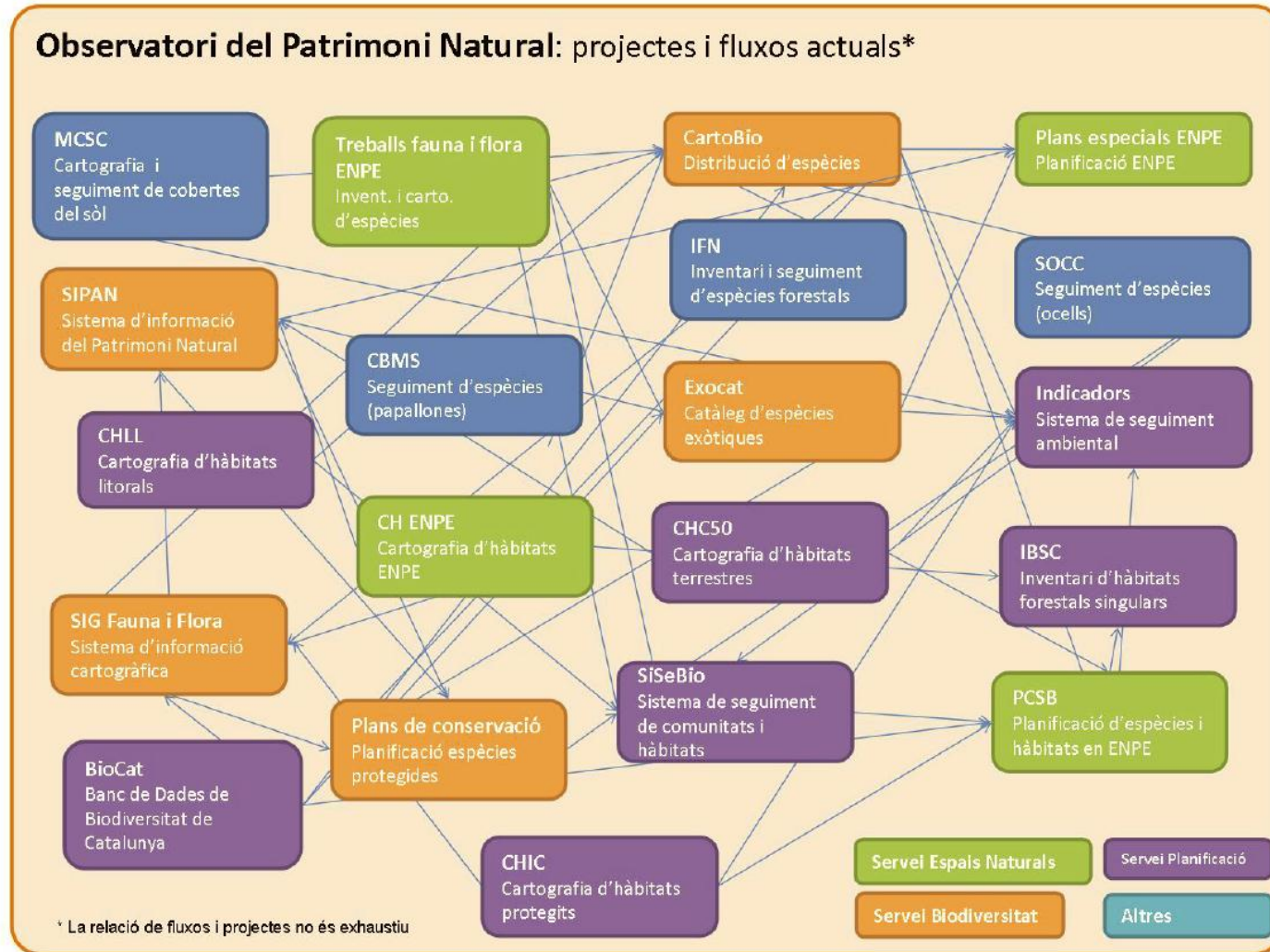
from raw data to decisions



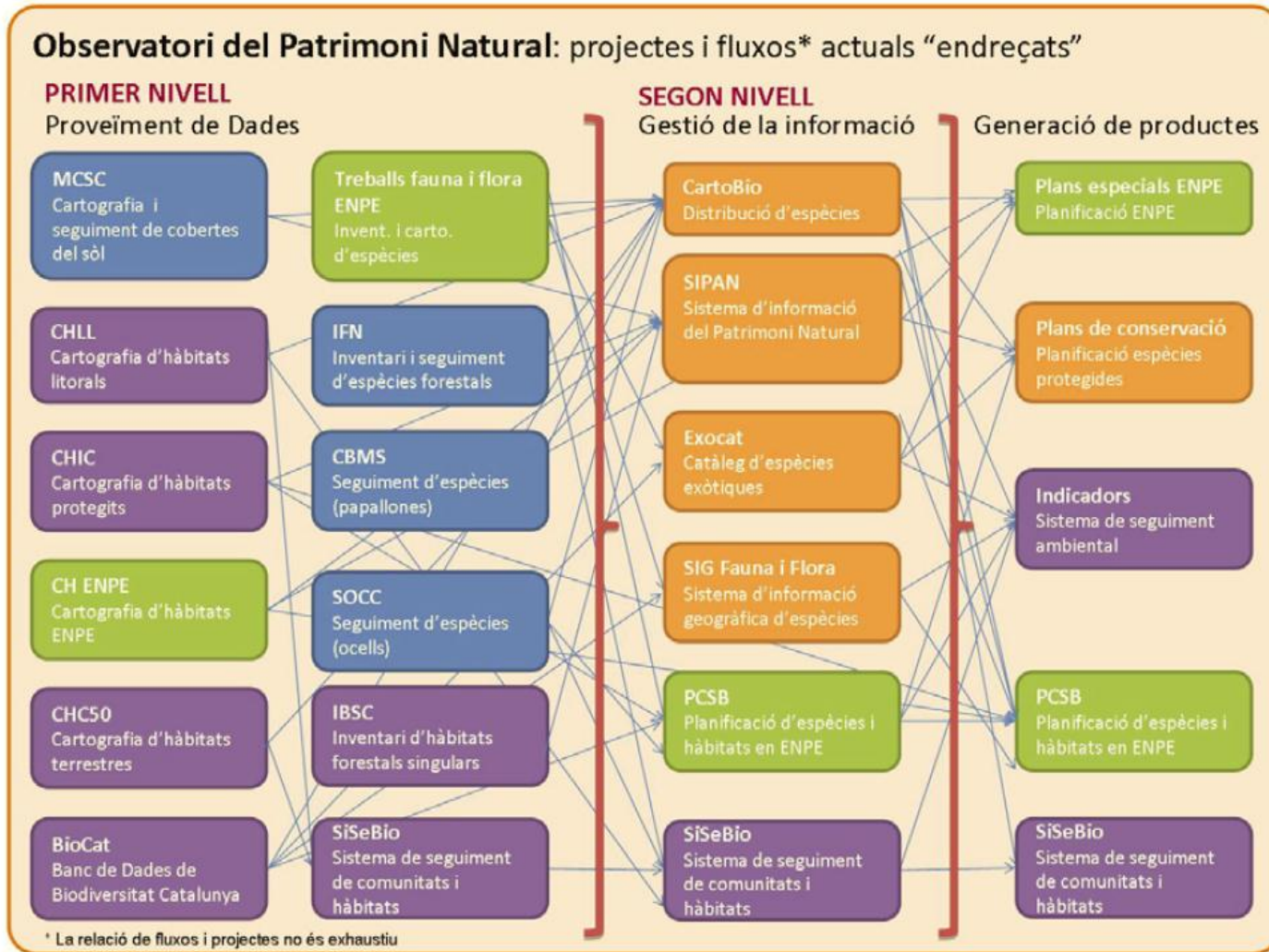
DANI VILLERO, GERARD BOTA, NÚRIA POU & LLUÍS BROTONS
Forest Sciences Centre of Catalonia

DAVID CAMPS & PAU SAINZ DE LA MAZA
Government of Catalonia

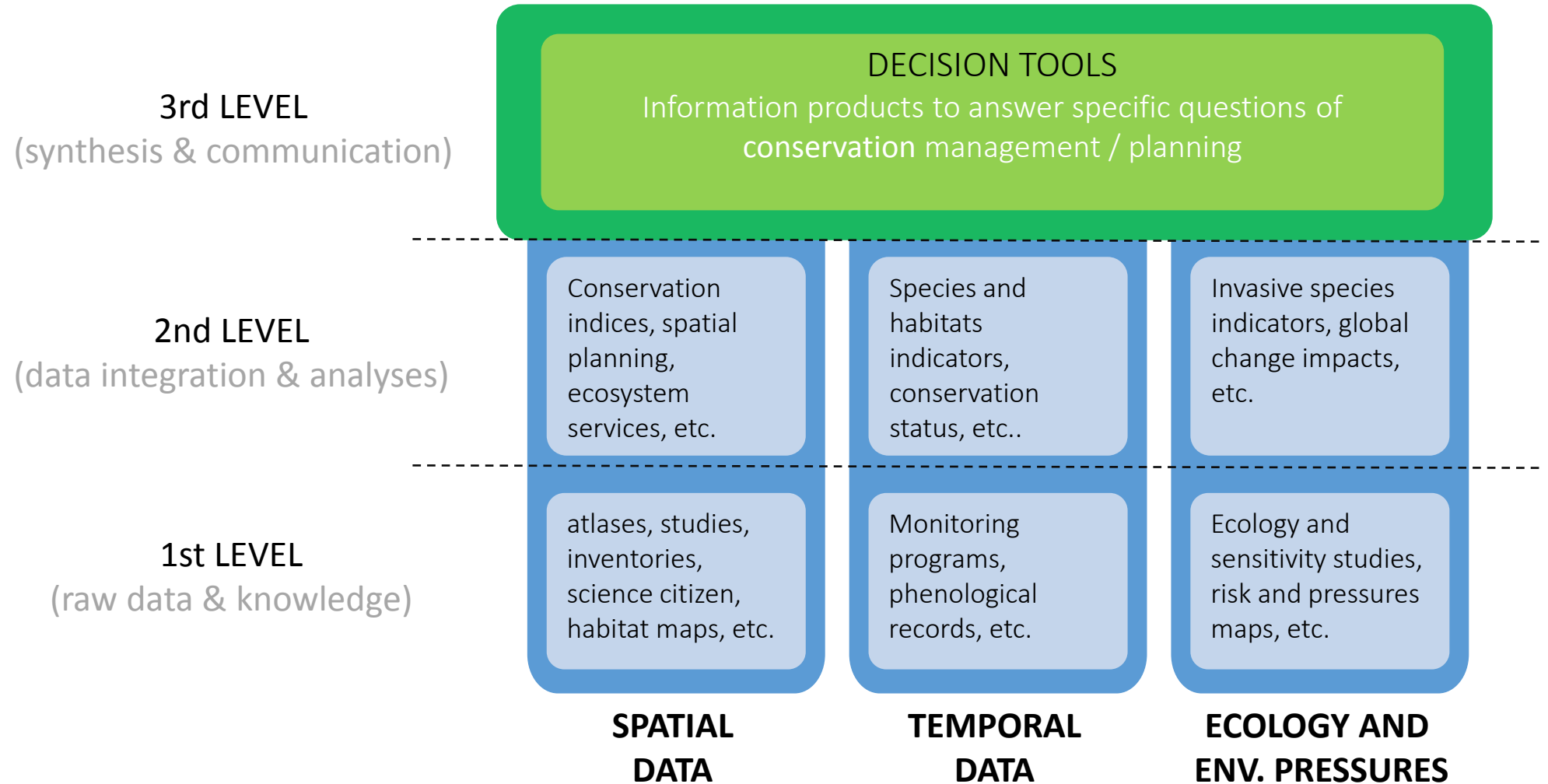
BIODIVERSITY INFORMATION ASSESSMENT



BIODIVERSITY INFORMATION ASSESSMENT



CONCEPTUAL FRAMEWORK



CONCEPTUAL FRAMEWORK



2nd LEVEL
(data integration & analyses)



DECISION TOOLS
Information products to answer specific questions of conservation management / planning

Conservation indices, spatial planning, ecosystem services, etc.

Species and habitats indicators, conservation status, etc..

Invasive species indicators, global change impacts, etc.

atlases, studies, inventories, science citizen, habitat maps, etc.

Monitoring programs, phenological records, etc.

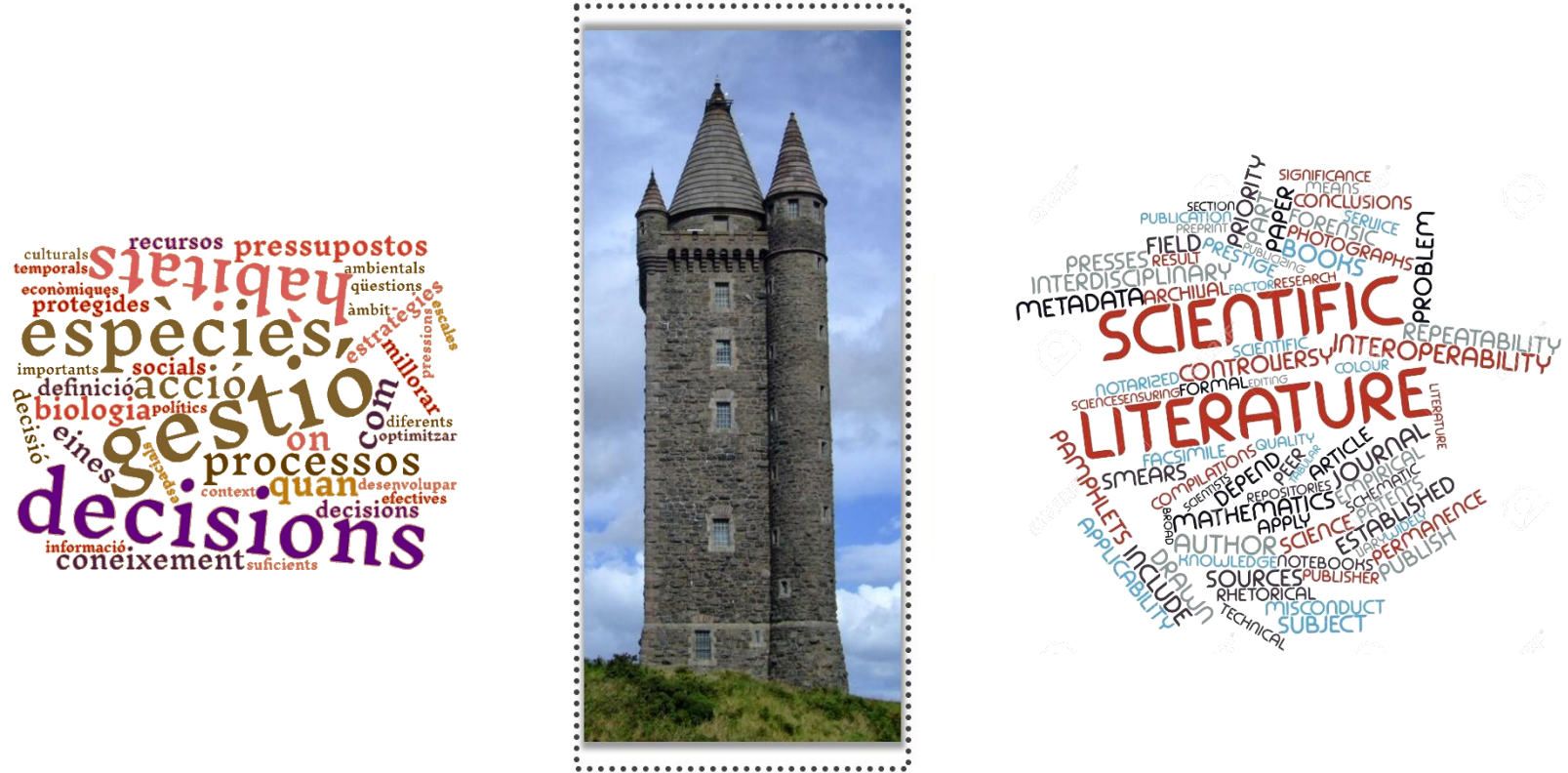
Ecology and sensitivity studies, risk and pressures maps, etc.

SPATIAL DATA

TEMPORAL DATA

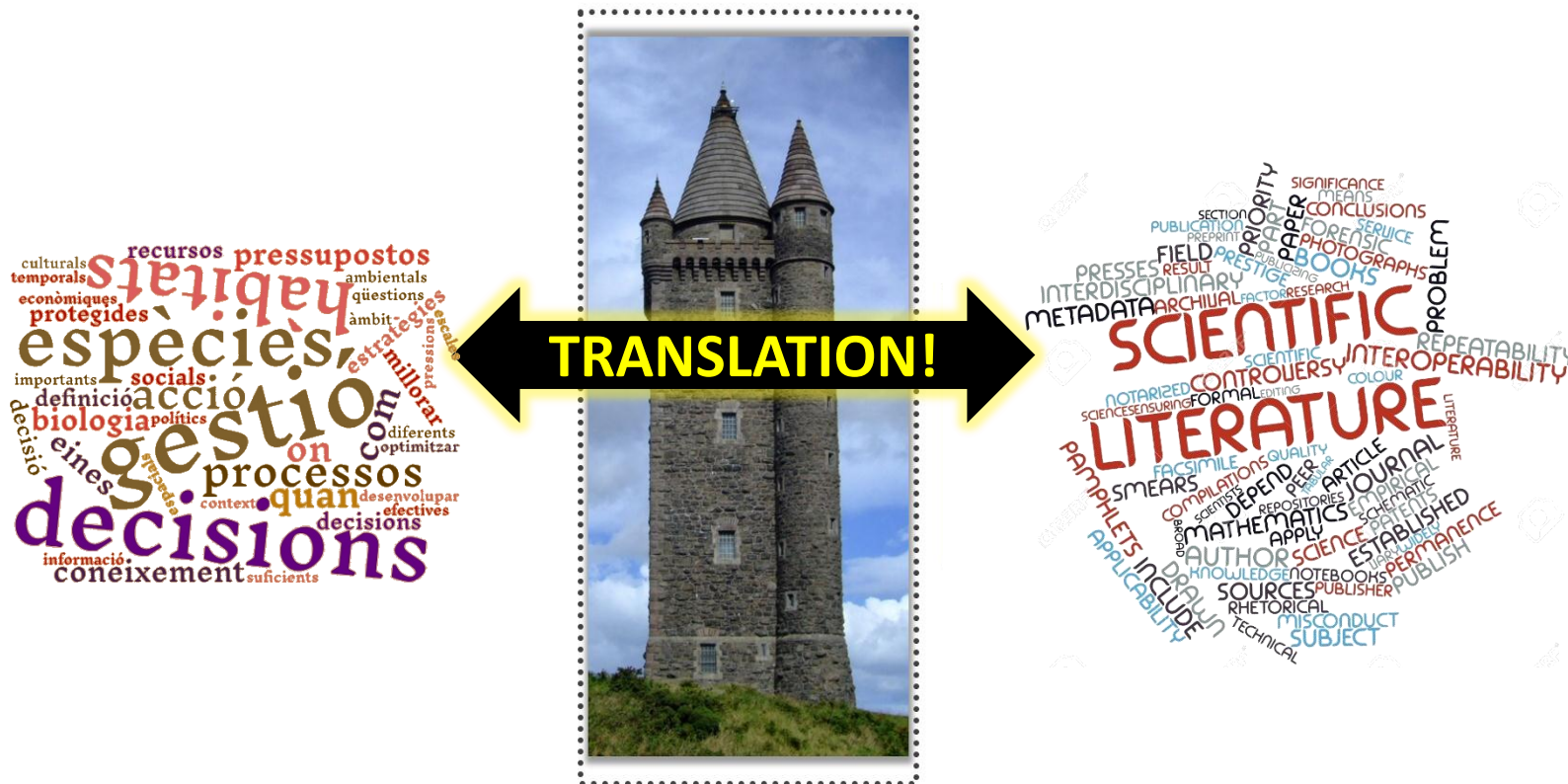
ECOLOGY AND ENV. PRESSURES

KNOWLEDGE-ACTION BOUNDARY



Implementation difficulties rooted in the **different languages used in science and conservation.**

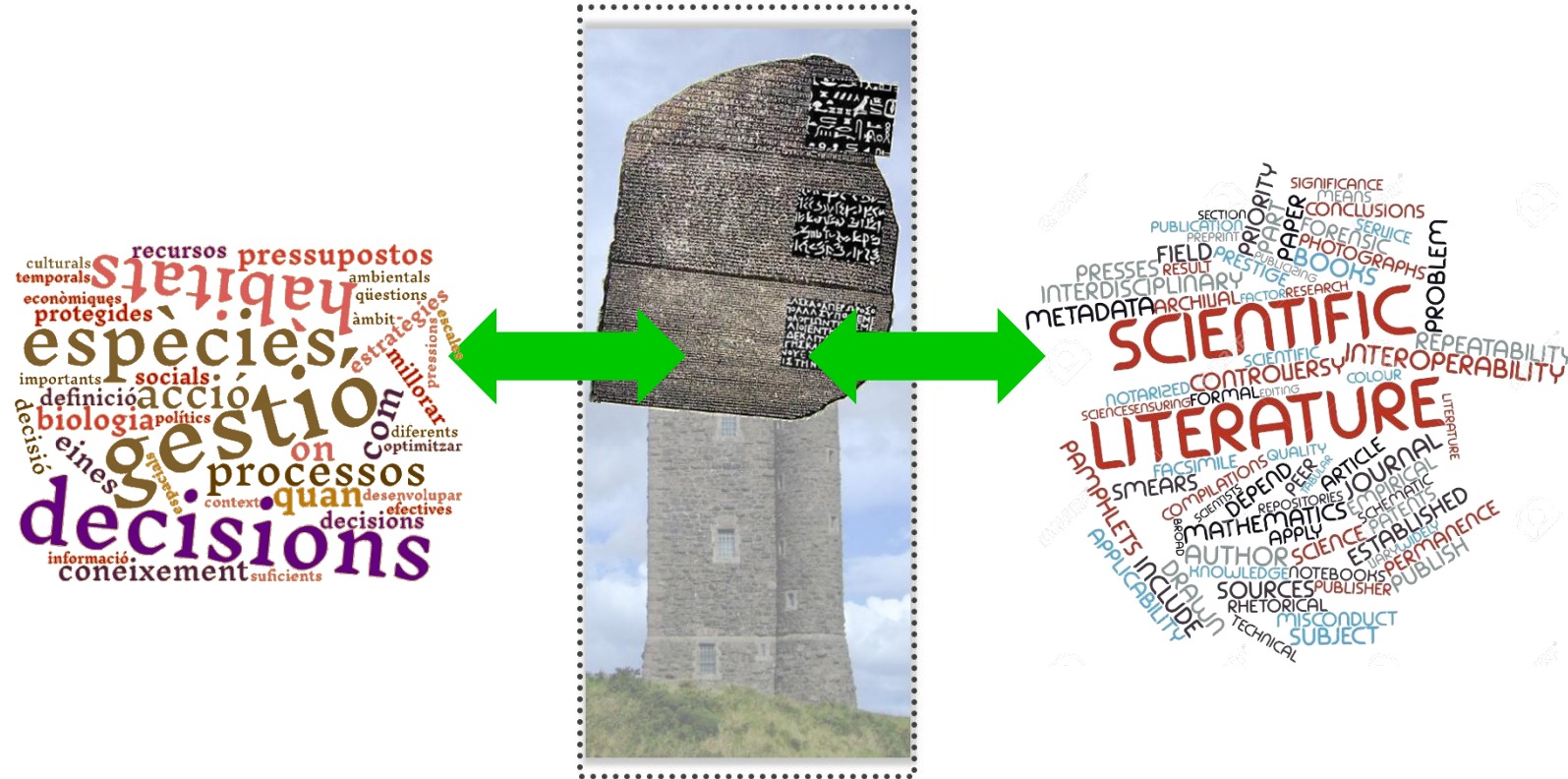
KNOWLEDGE-ACTION BOUNDARY



Implementation difficulties rooted in the different languages used in science and conservation.

"Translators" needed to facilitate information flows between research and decision makers.

KNOWLEDGE-ACTION BOUNDARY



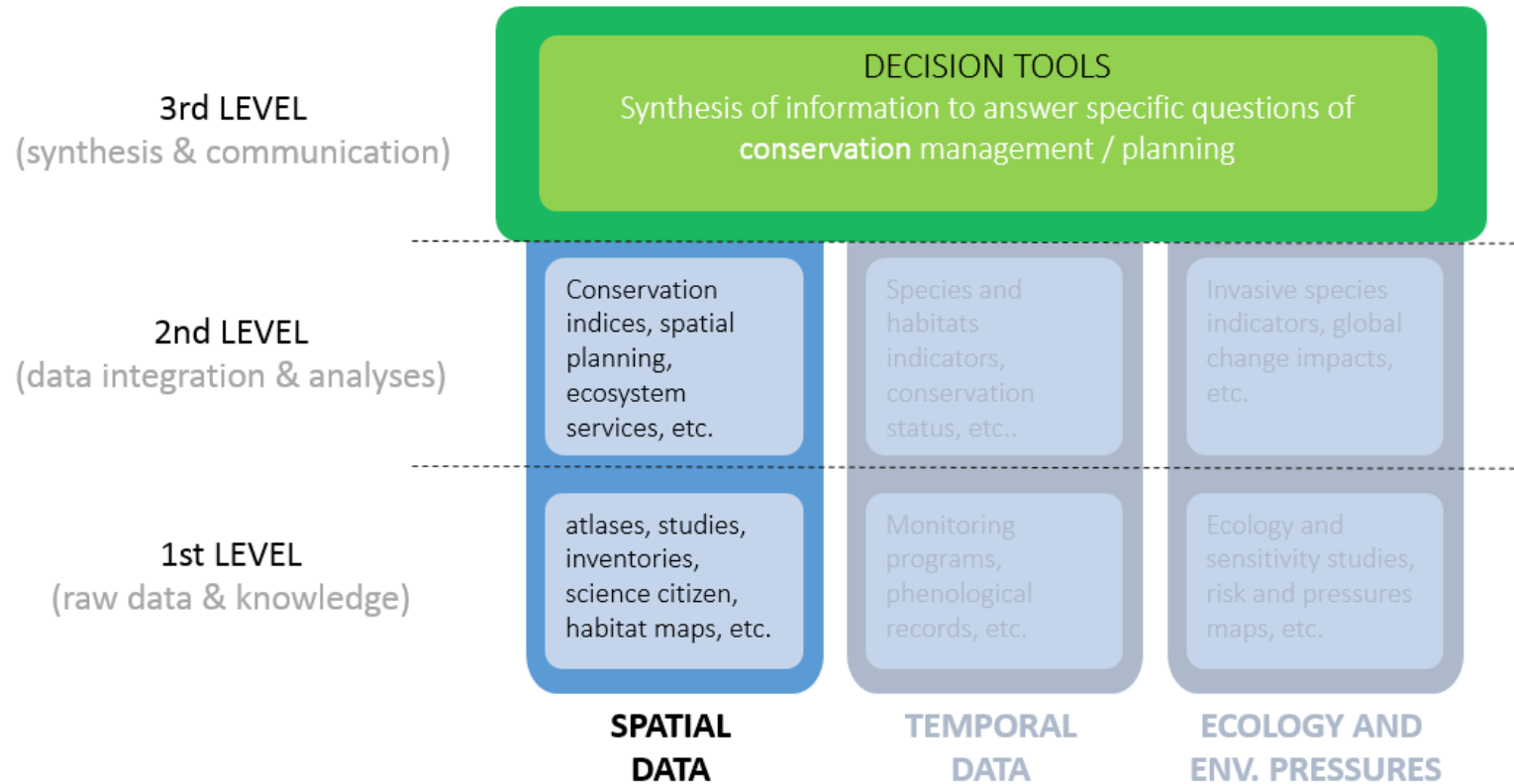
Implementation difficulties rooted in the **different languages used in science and conservation.**

“Translators” needed to facilitate information flows between research and decision makers.

Spatial products offer an opportunity to translate the research to the issues arising from the context of conservation.

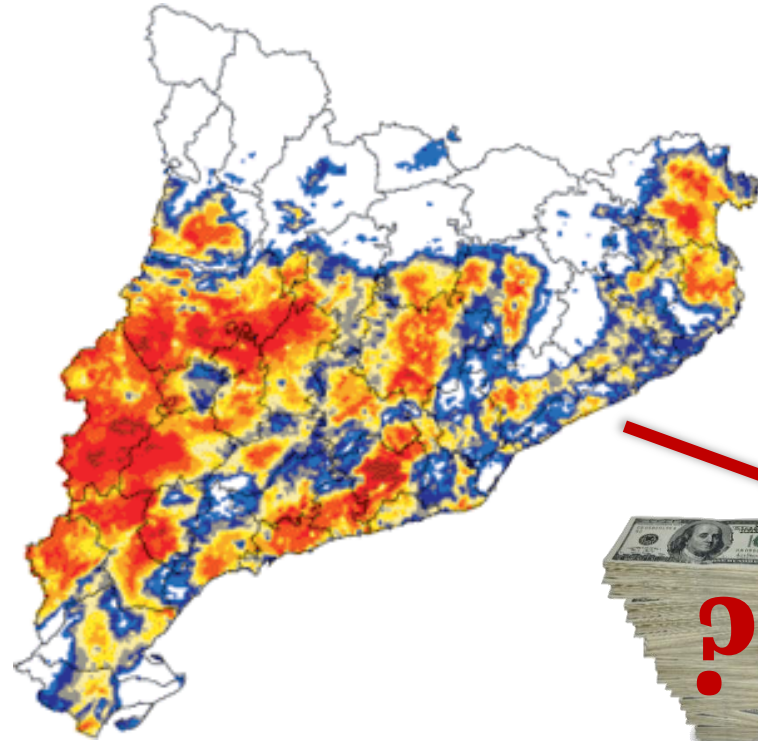
MAPPING PRIORITY SPECIES

- » Project promoted in 2007 by the Wildlife Agency, to **support spatial data analysis** of priority species to **enhance conservation management actions**.



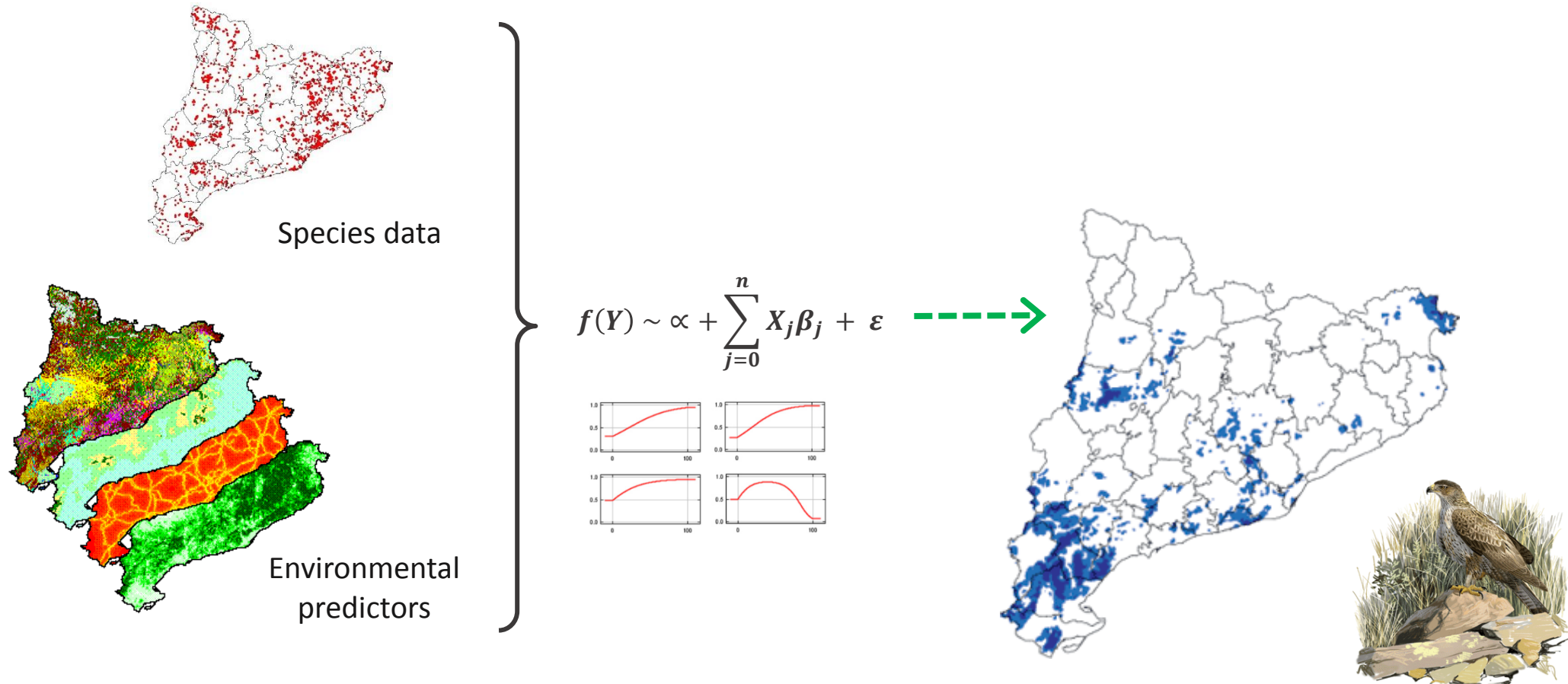
MAPPING PRIORITY SPECIES

- » Project promoted in 2007 by the Wildlife Agency, to support spatial data analysis of priority species to enhance conservation management actions.
- » Opportunity to develop a **translation scheme** for SDMs in decision-making processes.



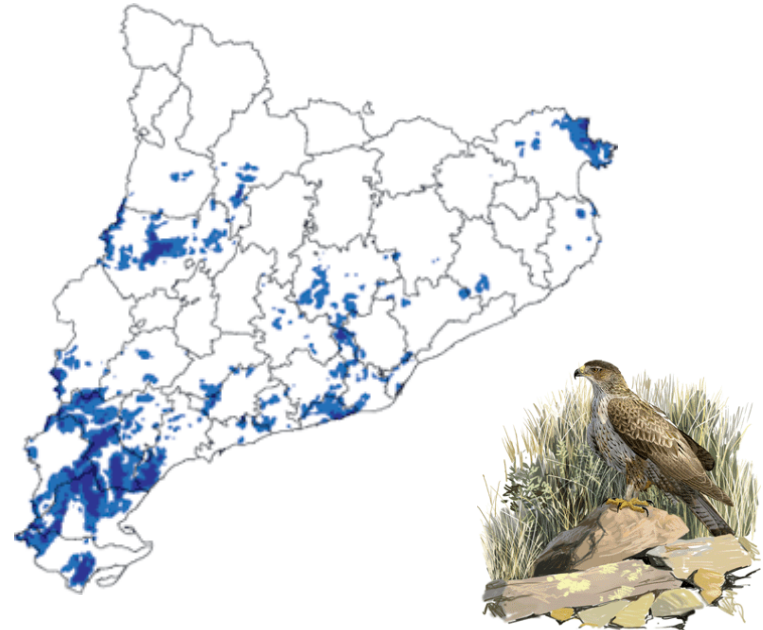
SPECIES DISTRIBUTION MODELS

- ★ Consistent tools to analyze the **relationships between species and the environment.**



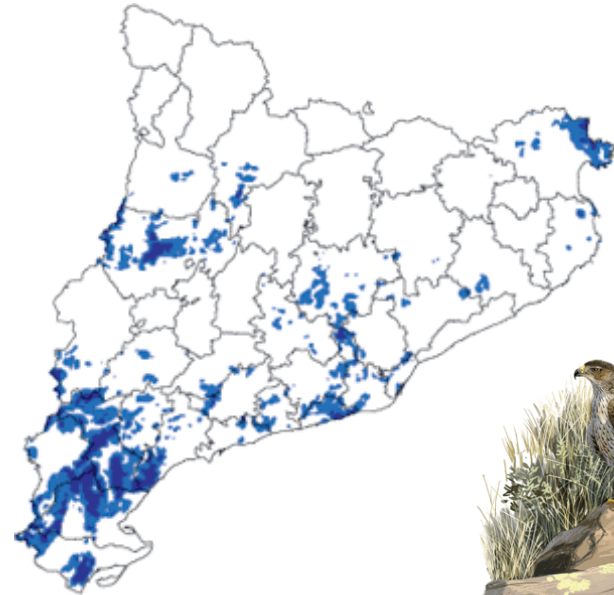
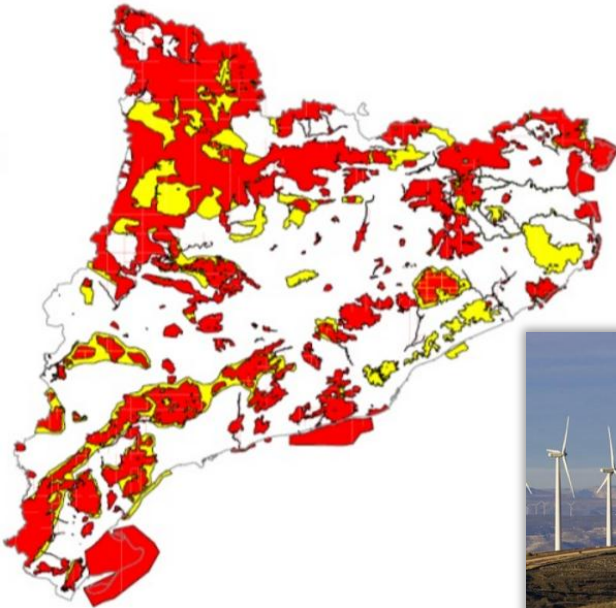
SPECIES DISTRIBUTION MODELS

- ★ Consistent tools to analyze the relationships between species and the environment.
- ★ Allow to answer the question "**where to act?**", even lacking important biological information.



SPECIES DISTRIBUTION MODELS

- ★ Consistent tools to analyze the relationships between species and the environment.
- ★ Allow to answer the question "where to act?", even lacking important biological information.
- ★ Results expressed in a **spatially explicit language**, very close to that used in conservation planning.



SPECIES DISTRIBUTION MODELS

- ★ Great potential to inform decision-making processes.

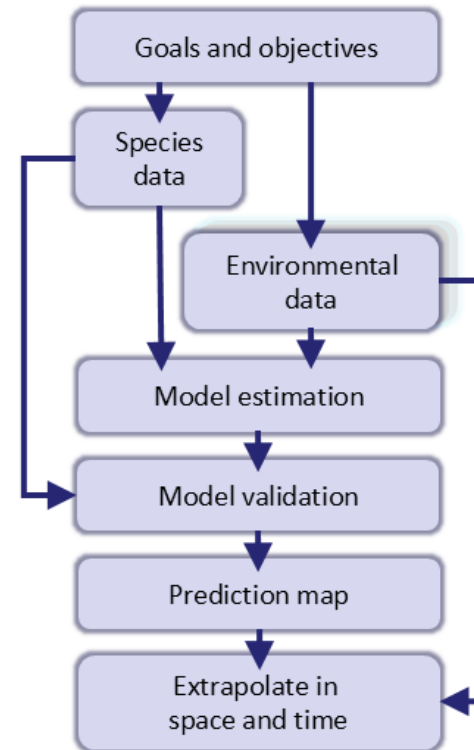
CONSERVATION PRACTICE

Decision-making process

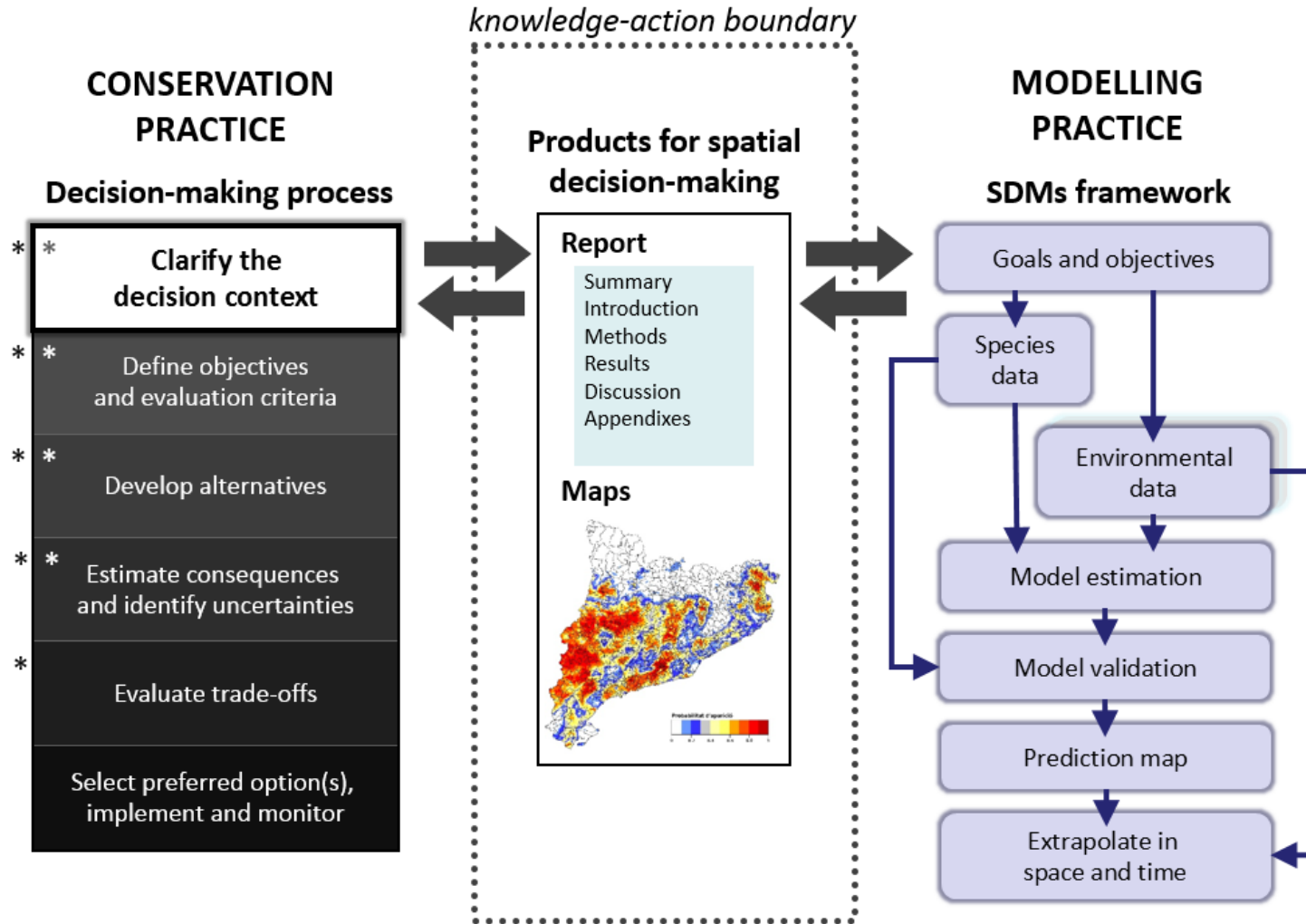


MODELLING PRACTICE

SDMs framework



TRANSLATION SCHEME



BROWN BEAR RISK ASSESSMENT

CONSERVATION TARGET

Reintroduction program to save the species from extinction in the Pyrenees.



BROWN BEAR RISK ASSESSMENT

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Reintroduction program to save the species from extinction in the Pyrenees.

Compensation measures to prevent conflicts between brown bear and livestock (electrified fences, dogs to safeguard herds, supporting farming in high mountain).



BROWN BEAR RISK ASSESSMENT

CONSERVATION TARGET

Reintroduction program to save the species from extinction in the Pyrenees.



Compensation measures to prevent conflicts between brown bear and livestock (electrified fences, dogs to safeguard herds, supporting farming in high mountain).

Monitoring program to analyze key areas for brown bears.



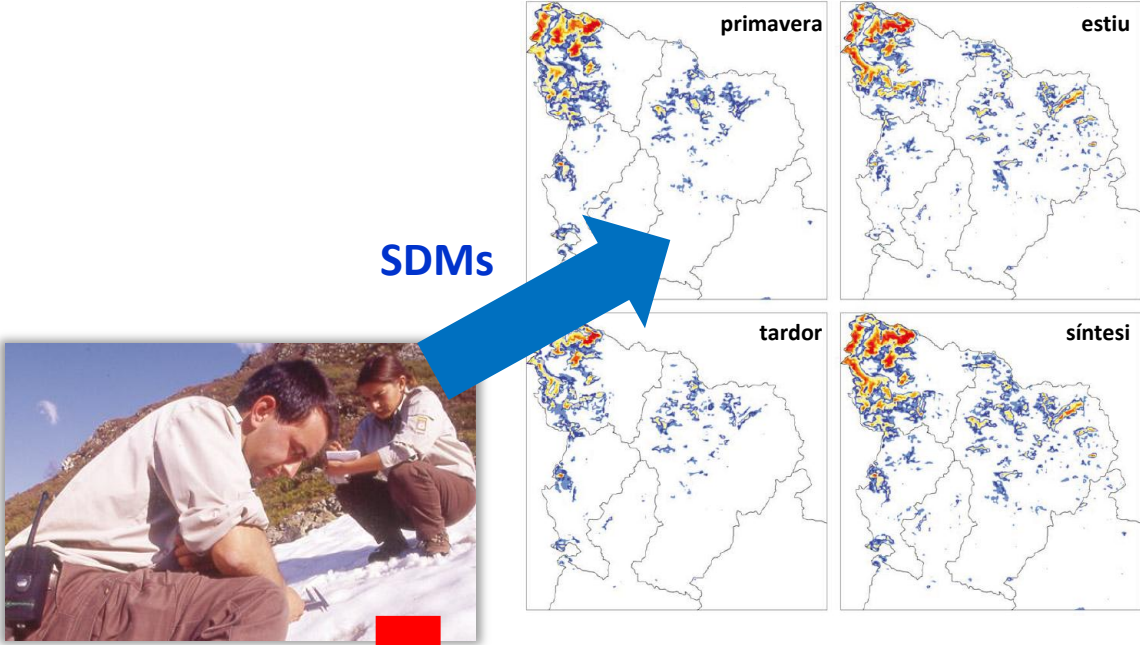
BROWN BEAR RISK ASSESSMENT

DECISION CONTEXT

- ✘ **Aims** precise assessment of the brown bear attack risk.
- ✘ **Limitations** urgent need of action and partial information (telemetry) from the introduced brown bears.
- ✘ **Stakeholders** Wildlife agency, local farmer clusters and administrations, specie experts and researchers.



BROWN BEAR RISK ASSESSMENT



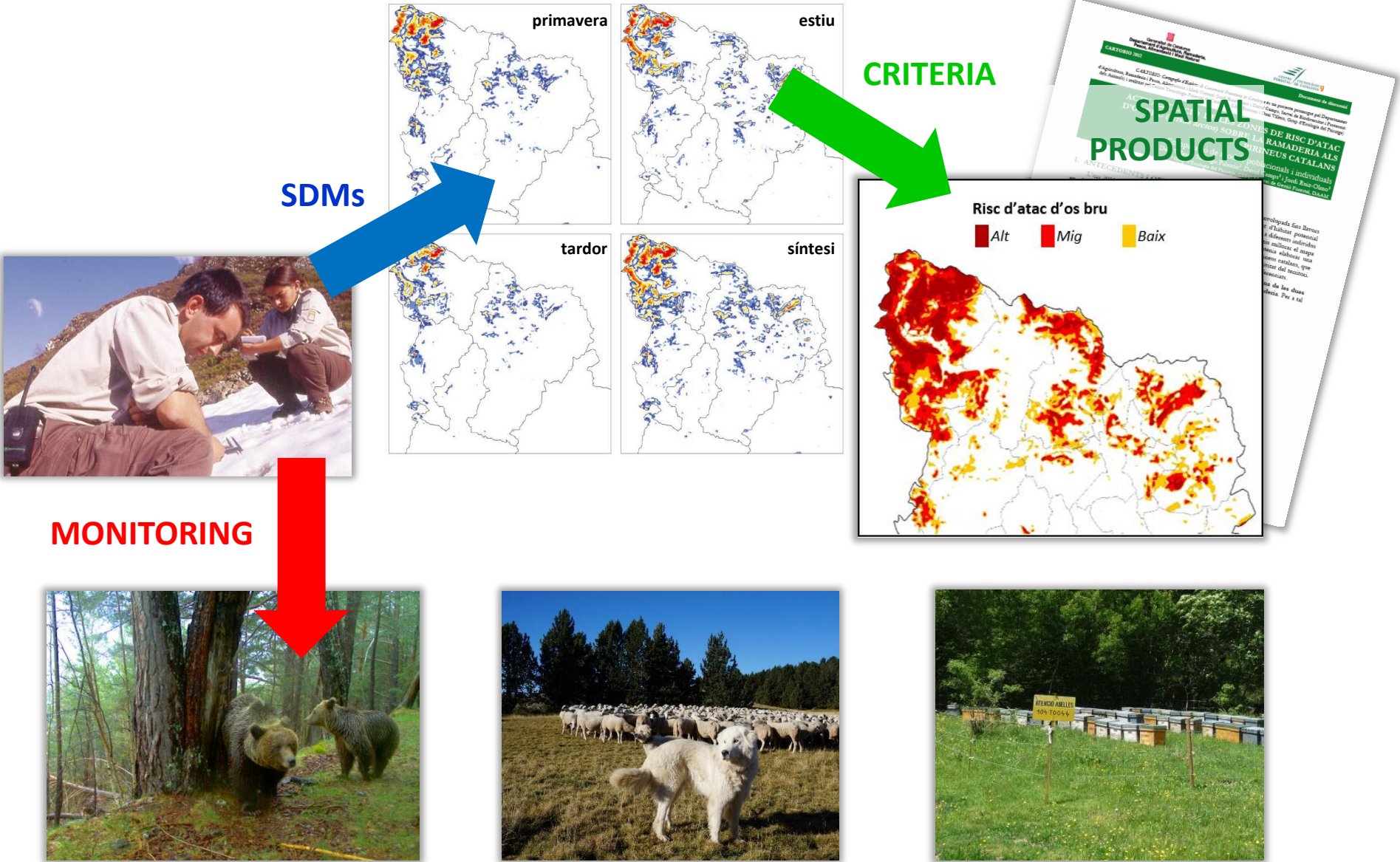
MODEL BUILDING

- ☒ Telemetry data from 5 bears
- ☒ Seasonal models.
- ☒ Species experts involvement

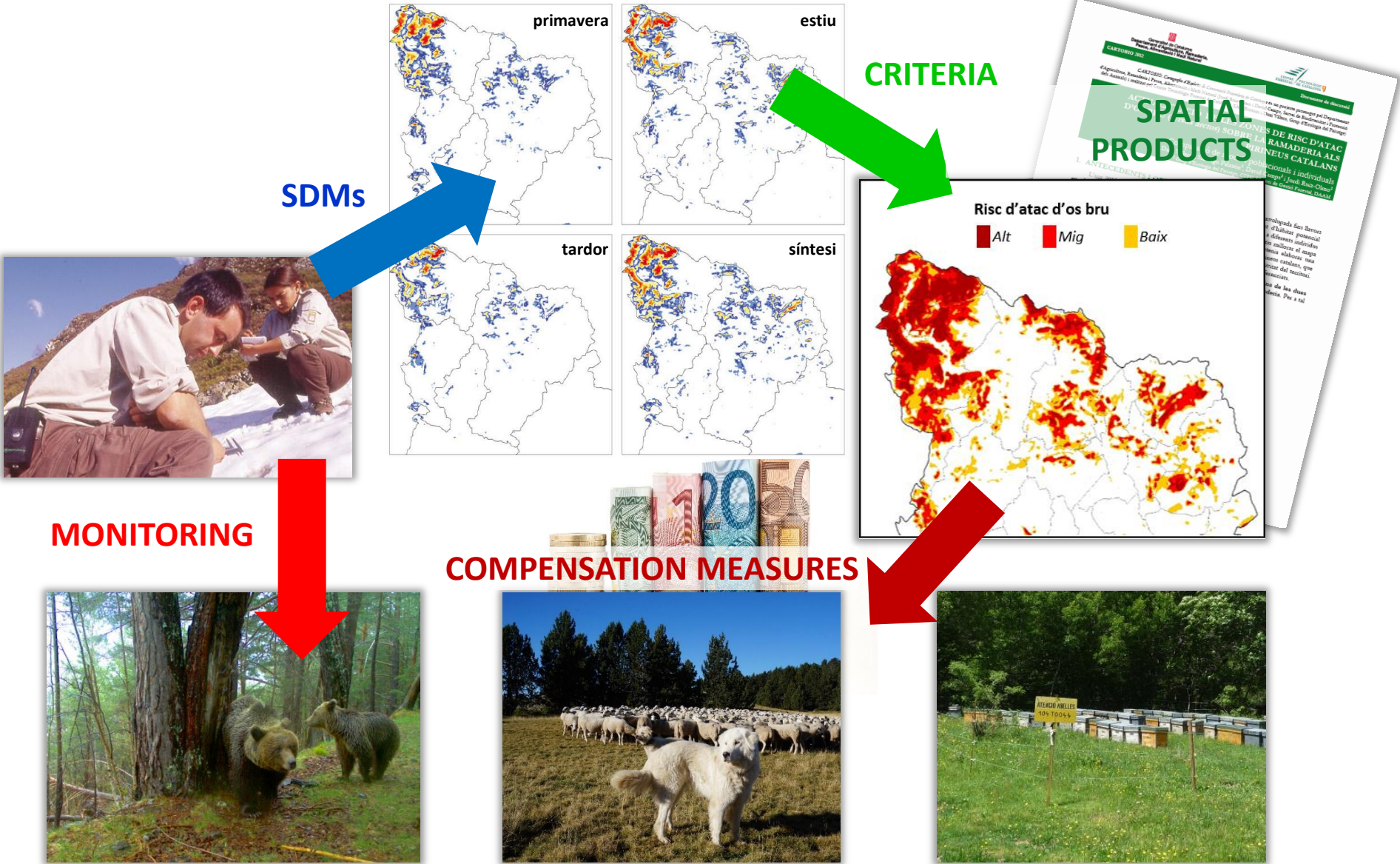
MONITORING



BROWN BEAR RISK ASSESSMENT



BROWN BEAR RISK ASSESSMENT



LESSONS LEARNED



Decision context

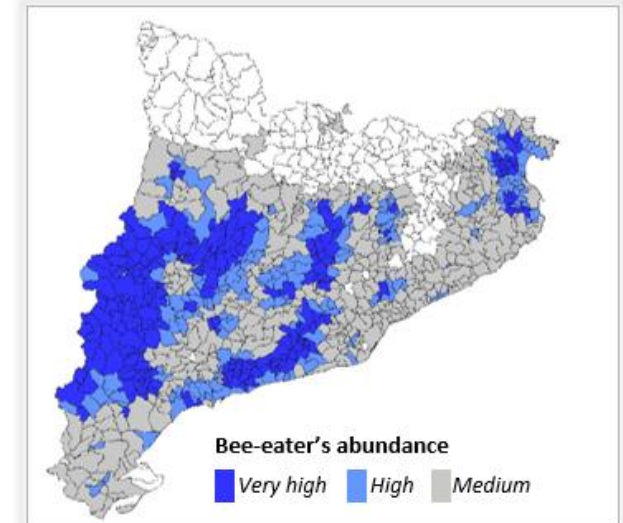
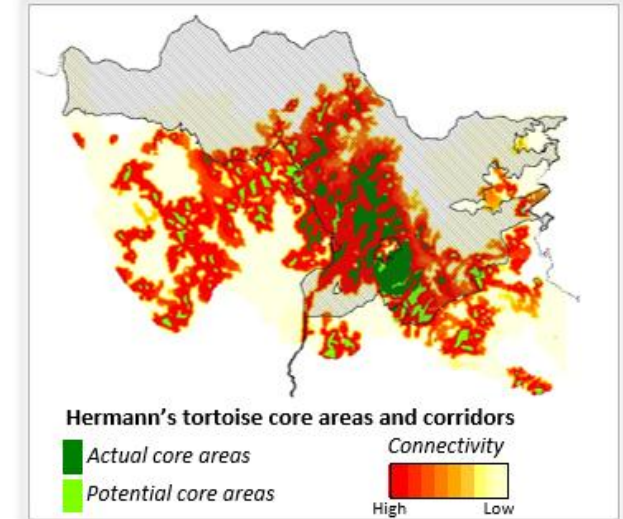
- Match particular decision targets with pertinent and accurate model objectives.
- Ensure the feasibility of the model considering the limitations drawn by the decision context (e.g. time or budget constraints, poor species knowledge, etc.)
- Clearly identify specific information requirements from the decision-making process.
- Recognise key roles of other stakeholders, and involve species experts in model development.

Modelling framework

- Do not deviate from the model objectives informing the decision process.
- Mobilize relevant available species and environmental information, and engage species experts to interpret adequately available species datasets and relevant environmental predictors.
- Use contrasted methods with clear and transparent assumptions to increase understanding and trust from decision makers and other stakeholders.
- Strengthen credibility with a multifaceted model validation based on statistical model-performance measures and expert based criteria, bearing in mind the intended application of the model.

Products for spatial decision-making

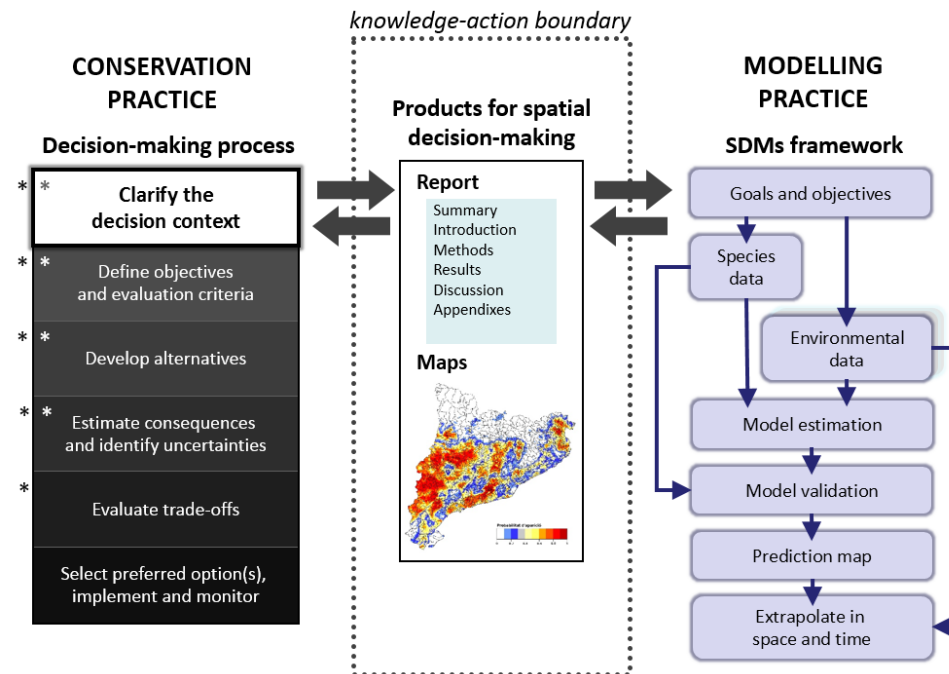
- Describe the modelling framework with clear and accessible/plain language using and adapting good practices from standard protocols (e.g. TRACE).
- Identify uncertainties from biological data, environmental predictors, modelling methods using both statistical criteria and ecological realism.
- Clearly communicate limitations of modelling outcomes, and derive recommendations aimed at the intended use of the spatial products.
- Align spatial products to specific information requirements by categorizing model outputs into binary or ranked priority maps (e.g. identification of species core areas) and perform complementary analyses (e.g. corridor analyses).
- Deliver comprehensive and informative reports embedded with digital maps in standard file formats.



TRANSLATION SCHEME: SUMMARY

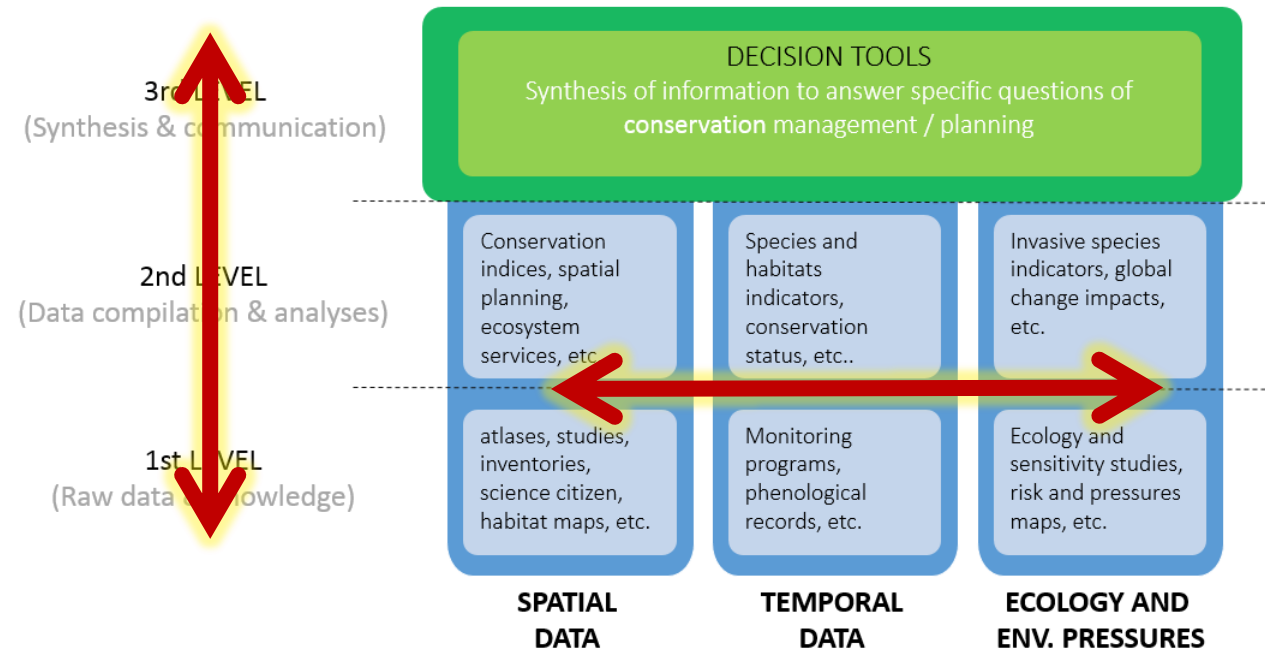
Effective SDM implementation in decision-making processes have to meet two necessary conditions:

- » **Adjust SDM objectives** to questions posed from particular conservation problems.
- » Promote utilization of SDM outcomes through **active communication** and **clear, valuable and useful information products** matching specific needs of information arising from the decision context.



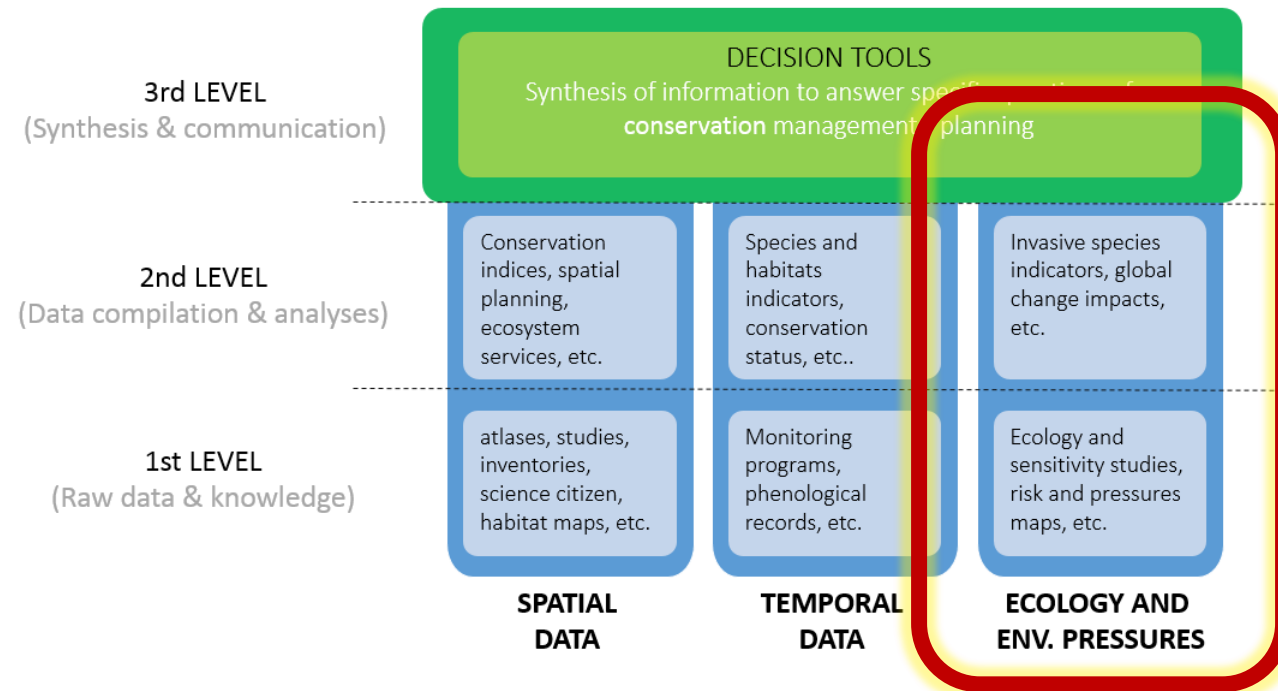
BUT THERE'S STILL MUCH WORK TO DO...

- » Previous conditions are also sufficient for an effective knowledge-transfer from **other scientific developments** to inform and improve conservation practice.
- » **Improve** vertical (and horizontal) **data flows** in the context of the biodiversity information framework.



BUT THERE'S STILL MUCH WORK TO DO...

- » Previous conditions are also sufficient for an effective knowledge-transfer from **other scientific developments** to inform and improve conservation practice.
- » **Improve** vertical (and horizontal) **data flows** in the context of the biodiversity information framework
- » **Identify gaps** of relevant information.



Valuing biodiversity spatial data in Catalonia

from raw data to decisions

Many thanks!
Eskerrik asko!

dani.villero@ctfc.cat