

Proposal for Chapter Two of the Technical Document
(Project output No. 2)

Matching information to needs

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Contents

1	Introduction	3
2	Focus of the workshop	4
3	Information needs: What do we need the information for?	5
4	The information we have, is it fit-for-use based on our requirements?	6
5	Information needed to respond to the obligations contained in the regulations, strategic documents and policies	14
6	Innovation opportunities: new tools for the capture and understanding of the information.....	20

1 Introduction

This document summarises the main contributions made at the international participatory workshop held on 15th June in the Basque Country with the participation of 33 people (see annex) from the 6 regions represented in the project.

The workshop was organised by the Basque Government in collaboration with Innobasque (Basque Innovation Agency), to continue the process launched at regional level in Wallonia in February 2017, the first phase of the learning process focused on the identification of data needs for decision makers.

2 Focus of the workshop

The 1st BID-REX workshop focused on the subject of information needs for decision-making and strengths and weaknesses in this area were identified.

In the second workshop we analysed **how information can help to satisfy the needs identified and whether the information we currently generate meets those needs or not**. The discussion started from the basis of weaknesses and strengths and proposals for improvement identified in the first workshop.

Key stakeholder representatives exchanged experiences and views of how biodiversity and environmental information is generated in different contexts ranging from citizen science platforms to research environments. How information is collected, maintained and validated was explored and successful experiences documented and structured to serve as a basis for new developments in other regions.

3 Information needs: What do we need the information for?

Public authorities need the best available evidence with which to answer a set of specific questions:

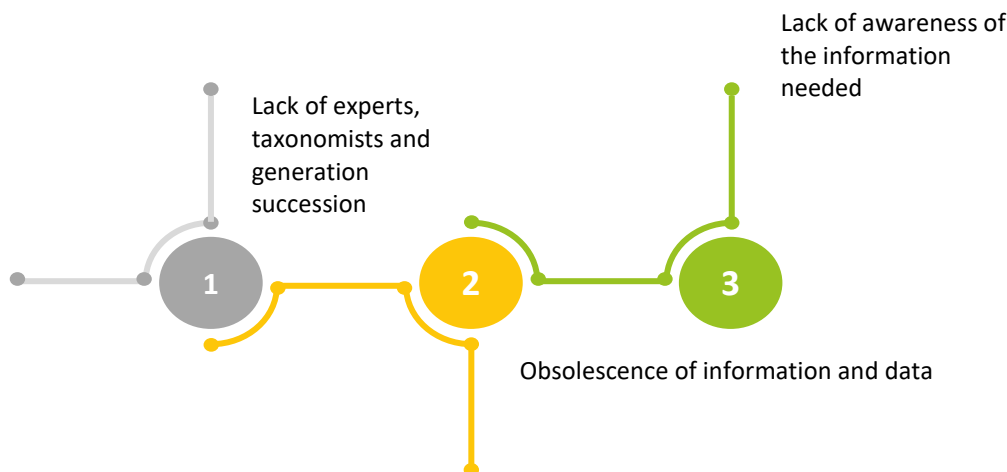
- Evaluating policies and the fulfilment of goals established in strategic documents and regulations.
- Understanding of the links between biodiversity (species/habitats) and the condition of the ecosystem (vitality, resilience and productivity) and between the condition of the ecosystem and its capacity to deliver ecosystem services.
- Understanding past and potential future change in a key thematic or sectoral field.

Society must internalize this knowledge and understand why it is necessary for their well-being the protection of nature and its services.

4 The information we have, is it fit-for-use based on our requirements?

KEY MESSAGE:

The first step to get fit-for-use information is to work on some of the main **obstacles** to obtain quality information.



1

Lack of experts, taxonomists and generation succession

The participants agreed on the idea that to solve the lack of expertise and generation succession, we need to give new value to their work and to ecology, making it more visible and interesting. Administration should raise interest in ecology and popularize ecosystem services and their importance for people.

In addition to this, more European funds should be invested for monitoring territories to engage experts by establishing new relations to involve more citizens and to increase professionalism. Training and mentoring programmes should be implemented to boost knowledge sharing and to raise confidence among younger experts. The budget is often a constraining element preventing the achievement of a higher level of professionalism as there are difficulties to hire experts even if they are well known.

2

Obsolescence of information and data

As it was mentioned before, one of the main obstacles to periodical updates of data are the budgetary constraints. Therefore, planning and prioritizing is key because once the indicators are chosen, it makes it easier to follow/survey species periodically. Criteria setting and metadata producing, together with a proposed allocation of a 0,05% of public budget to renew data and databases, are two complementary routes that add to the same shared goal.

Moreover, a more participatory approach is needed to strengthen the system; to create platforms and tools to share information and knowledge, and improve the networking between scientists, administrations and amateurs is essential.

3

Lack of awareness of the information needed

Often, even if stakeholders and administration know each other and work together, there is a lack of awareness of what information is needed by administrations for decision making.

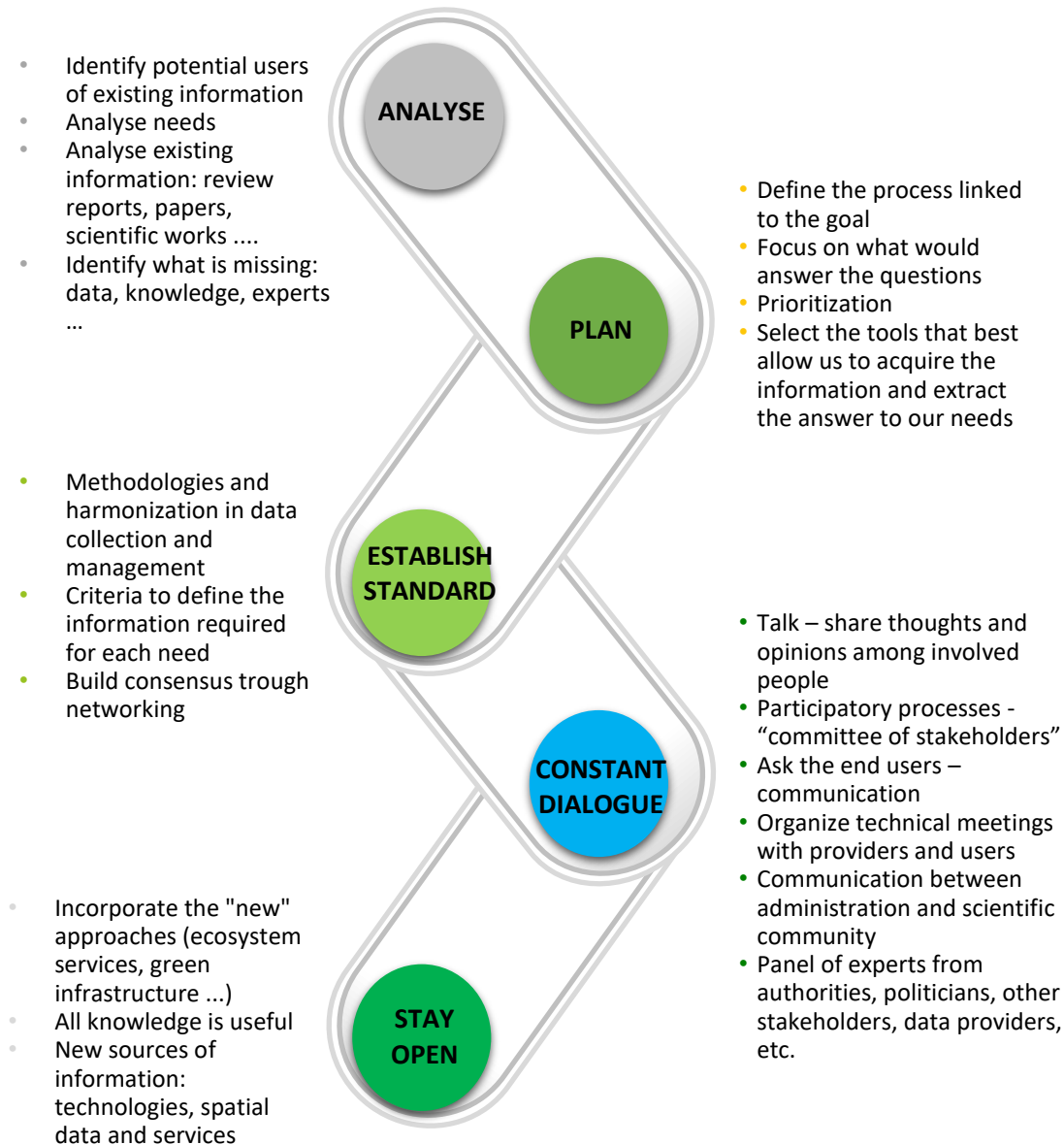
Improving the communication among different actors is fundamental, and to do it, periodical meetings could be organized to encourage administrations (especially local administration) and principal institutions to develop plans for acquiring and sharing territorial information. Another option is to create systems to establish links between scientific institutions and administrations, and to facilitate a more participatory approach of decision making.

KEY MESSAGE:

Once these obstacles are overcome, it is essential to establish what information is **relevant** for each need.

This means defining procedures and quality criteria, closely aligned with planning, and to determine the responsibilities to develop each task. But it is also important to know what information is available, considering different sources and information routes. And above all, it means understanding what the information system needs and what for. Because when the goal is clear it is easier to build a system that may help to get the information we need with the resources and inputs we already have.

Below are some of the main aspects identified to make the information relevant for each need and use:



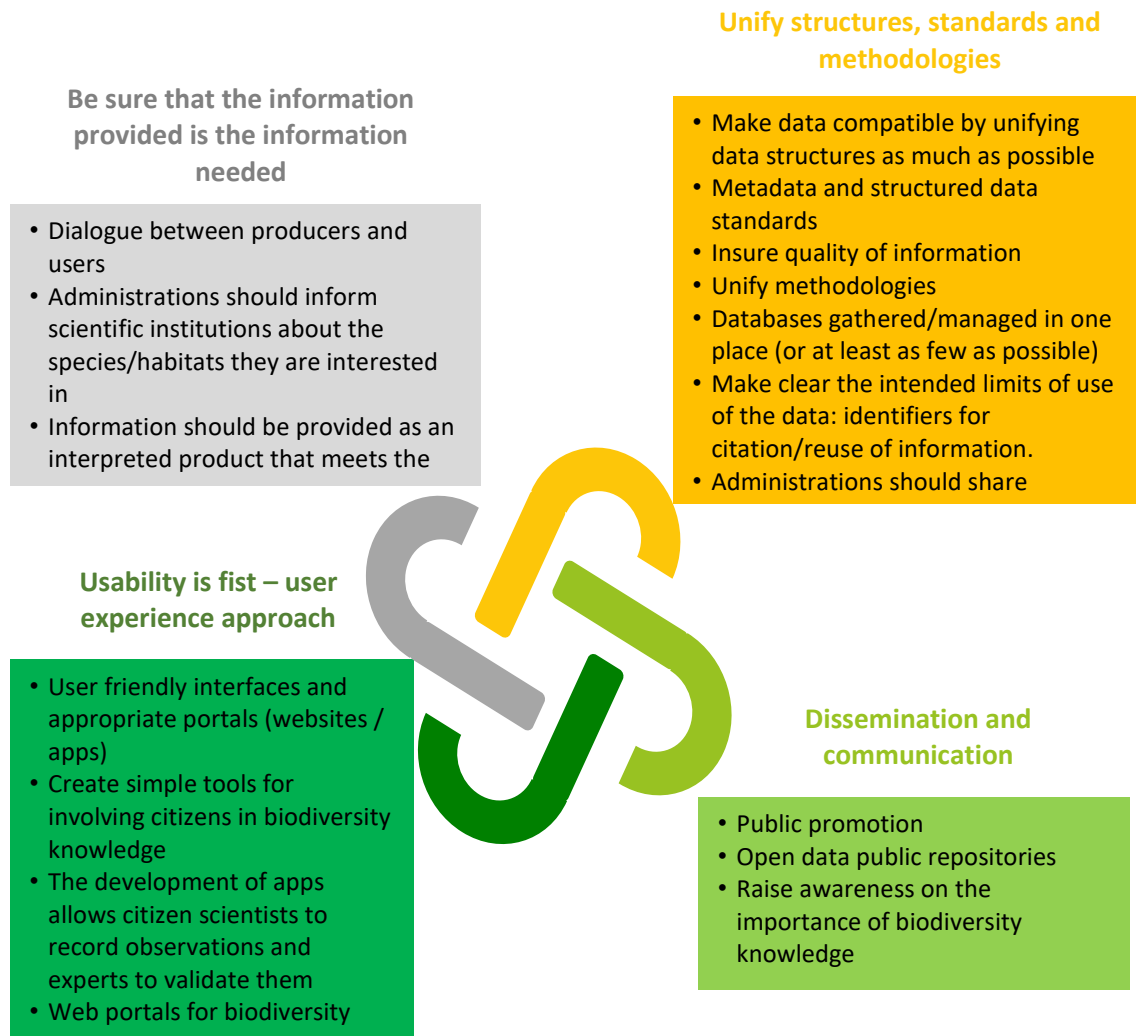
KEY MESSAGE:

Even if we know what the relevant information is, the real challenge is to obtain and use it in a more **efficient** manner.

Consequently, we need to identify and have access to key people, entities, activities and projects that generate potentially useful information for decision making (*who produces the information and where is it?*)

WHO?	HOW?	WHERE?
Projects – experts, leaders and managers <i>E.g.: “Life”, “Interreg”</i>	Informal communications	Sectoral datasets (administration, institutes): forestry, water management, fishery
Volunteers: <ul style="list-style-type: none">• Experts• Amateurs• Citizens <i>E.g.: Ornithologists, Naturalistic associations, Fishermen, hunters, professional figures, experts from forestry, water management, land managers...</i>	Networking: workshops, roundtables	Research centres Field notes Books
	Formal communication: official procedures, register of entities, enquiries / public consultation	People Private recordings Internal database
	Clusters of biodiversity	Projects web sites, portals NGO – Bird life
	Scientific publication	
Universities, research and scientific institutions	Departments: as a way to access the information and knowledge that is in the universities	Computers (Database + portals) Publications
	Environmental studies and publications	Internal database Environmental agencies and institutions
	Networking	
	Formal communication	
Government	Organization chart: to know the areas of responsibility of each one	Computers (Database + portals)
Private consultants	Register of entities	Reports

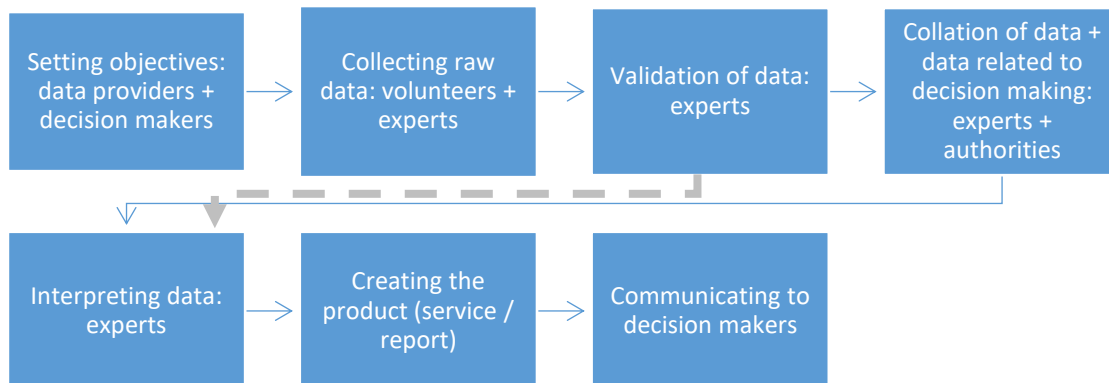
Technology could play a key role in guaranteeing and facilitating access to information, as information could be more efficiently obtained using new technology, or even new ways to combine existing information could be developed through technology. But **how can we facilitate access to, and use of, information?**



KEY MESSAGE:

In the decision making process, the way we **manage** information is as important as obtaining it. Available information should be directly/easily useable in decision making processes but several steps should be taken to guarantee an effective process

Steps to make information more useable for decision making



KEY MESSAGE:

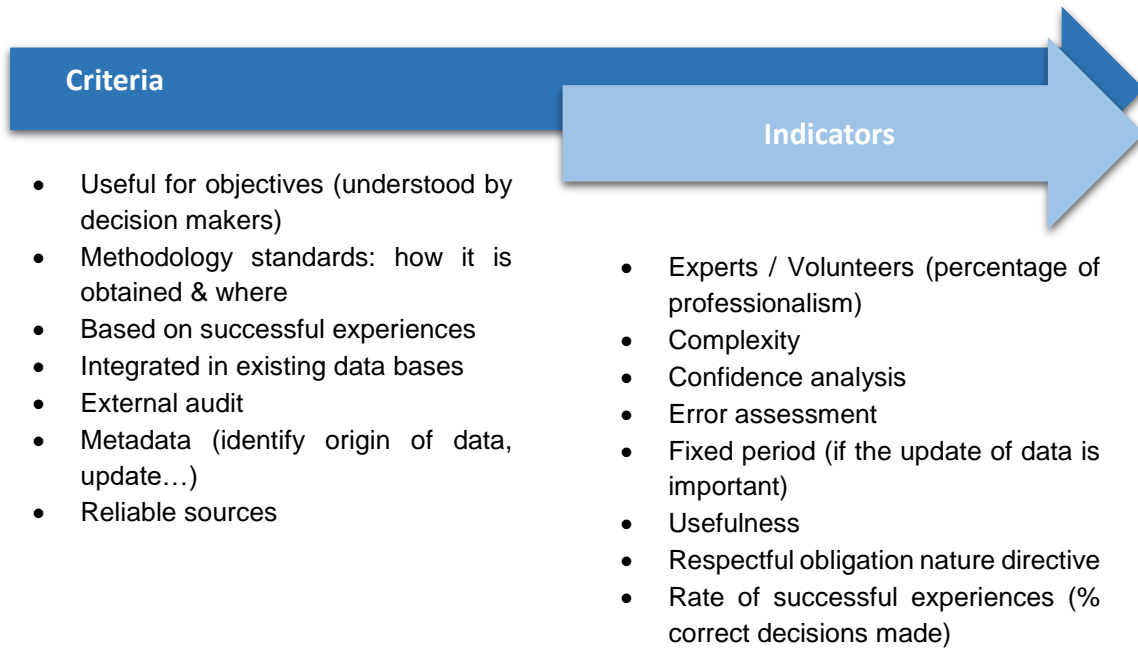
Another important consideration in the decision making process is how the **quality** of information used can be evaluated.

This means that some **criteria and indicators should be defined** to prevent decision making processes being based on partial or incorrect information.

In summary, the participants agreed that **to guarantee a consistent decision making process** four basic principles should be considered: the **reliability** of the data-provider (based on good previous experiences or benchmarking); data **quality** (with a special focus on metadata); the **standards** on both data and methodology; and, the **correlation with the needs**.

As shown in the diagram below, to ensure good quality of information, it is essential to work on a basic criteria framework that will help us to establish a set of indicators:

HOW CAN WE EVALUATE THE QUALITY OF INFORMATION?

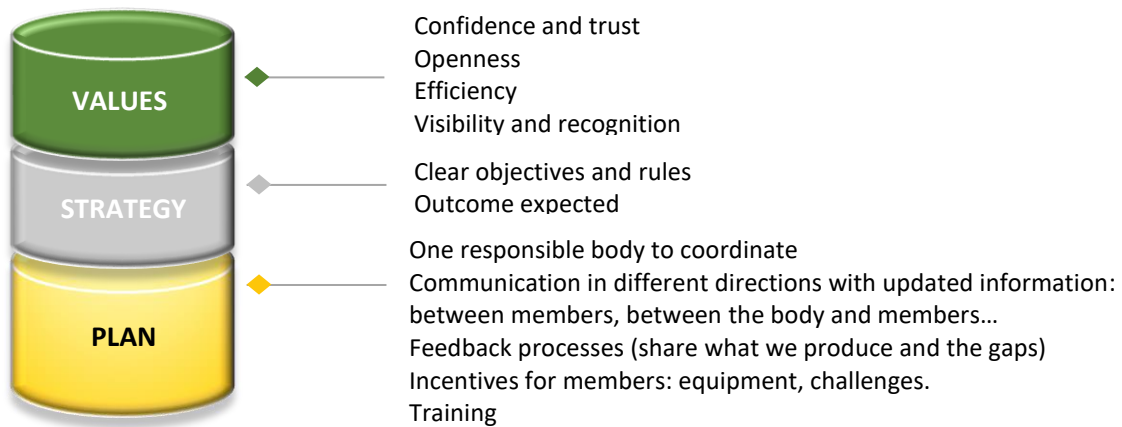


KEY MESSAGE:

A regional scale **network** can be a useful tool for regional governments to inform their decision making processes.

A public and private network can provide a strong support mechanism for public administration to join forces and resources. But **managing such networks can be very challenging** if there is no a common goal, or if cooperative and trustful relations are not built.

The participants agreed that **sharing values, strategy and an implementation plan** is essential to manage a regional scale network:



GOOD PRACTICE:

The cartography of habitats in Catalonia at different scales is a useful tool for making decisions in nature conservation: to know the distribution of, and the area occupied by, the different habitats present in a territory, to improve land management, to generate reports for monitoring habitats and their conservation status and to assess the evolution of habitats through time.

<http://www.ub.edu/geoveg/en/semhaveg.php>

https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/1-2-BID-REX_Bilbao2017_Estelallla.pdf

5 Information needed to respond to the obligations contained in the regulations, strategic documents and policies

KEY MESSAGE:

There are some problems associated with **compiling** data and information that should be solved to improve the access and identification of the information needed.

The participants discussed what solutions or recommendations could be proposed to overcome some of these problems:

1. The relationship between 'researchers' (biodiversity data creators/supplier) and 'regional governments' needs to evolve, for the benefit of biodiversity.

<i>What is the problem?</i>	<ul style="list-style-type: none"> • Researchers need to work on scientific questions that have the potential to be published in peer-reviewed journals. • Regional governments have questions that need answers, but these questions are not attractive to researchers.
<i>What is the possible solution?</i>	<ul style="list-style-type: none"> • Showcase, to researchers (and others), the positive impact of their work (i.e. the "real life" positive impact on biodiversity). Any initiative to celebrate the positive impact of "low level" / "applied" research on biodiversity will be welcome. • Solution: influence researchers to work on certain "unattractive" questions via funding criteria. • Positive impact on biodiversity may not be measured in the form of journal citations. There is an opportunity to promote a complementary citation index in which connecting academic research with real needs is valued.

2. The funding bodies need to prioritise projects (e.g. data generation) that will achieve a positive impact on biodiversity.

<i>What is the problem?</i>	<ul style="list-style-type: none"> • Some habitats and species are easier to map/report on (e.g. Natura 2000) than others (e.g. if the habitat is very small and mixed with other habitats). • In addition to this, some habitats are difficult to map when the definition and criteria are not clear (e.g. distinction between calcareous grassland and Juniper shrub).
<i>What is the possible solution?</i>	<ul style="list-style-type: none"> • Regional governments should be involved in project selection, to identify a clear/useful focus of projects to be funded. • Projects with high positive impact on biodiversity should be prioritised by involving territories, identifying focus areas for funding and collaborating

with private agents. It is important to have a vision for funding focused on positive impacts on biodiversity.

3. Some agencies that are not focused on biodiversity (e.g. water agencies, agriculture bodies) have data on biodiversity or on pressures and threats to biodiversity that could be useful for decision making processes.

<i>What is the problem?</i>	<ul style="list-style-type: none"> Biodiversity data are held by agencies that do not have a primary focus on biodiversity, and these data are not easily accessible.
<i>What is the possible solution?</i>	<ul style="list-style-type: none"> Make agreements, founded by regions, with these agencies (e.g. agri-environmental agreements).

4. Data need to be up to date, as far as possible, to detect trends and significant changes.

<i>What is the problem?</i>	<ul style="list-style-type: none"> Budgets are limited when it comes to updating data; however these data are key to detecting trends and change.
<i>What is the possible solution?</i>	<ul style="list-style-type: none"> Focus on first level indicators, as they are not expensive. Work on the scope, size and diversity of the baseline indicators and make them available and ready for use.

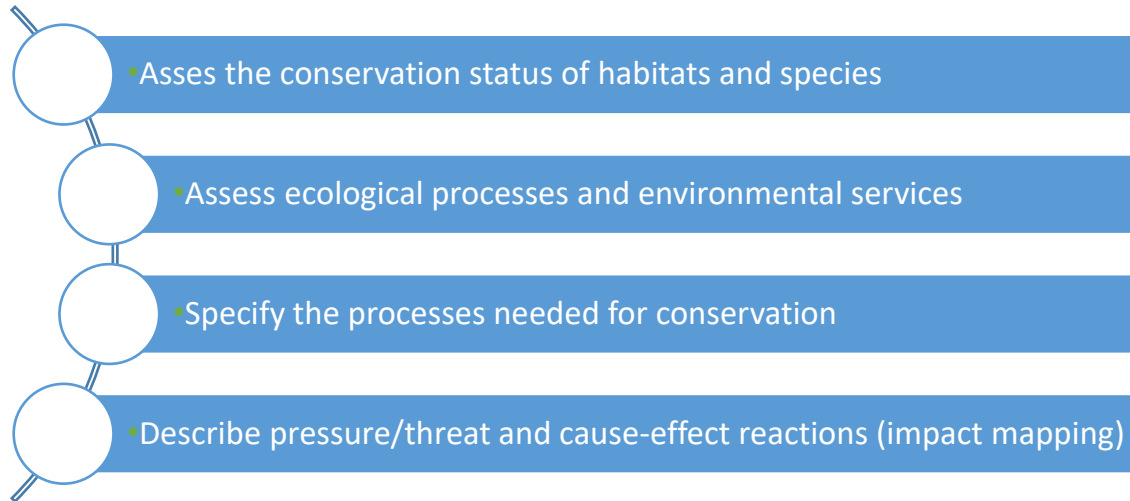
In addition to this, there are **three key elements to consider** when policy makers decide upon the allocation of public resources to get a more efficient and effective system:



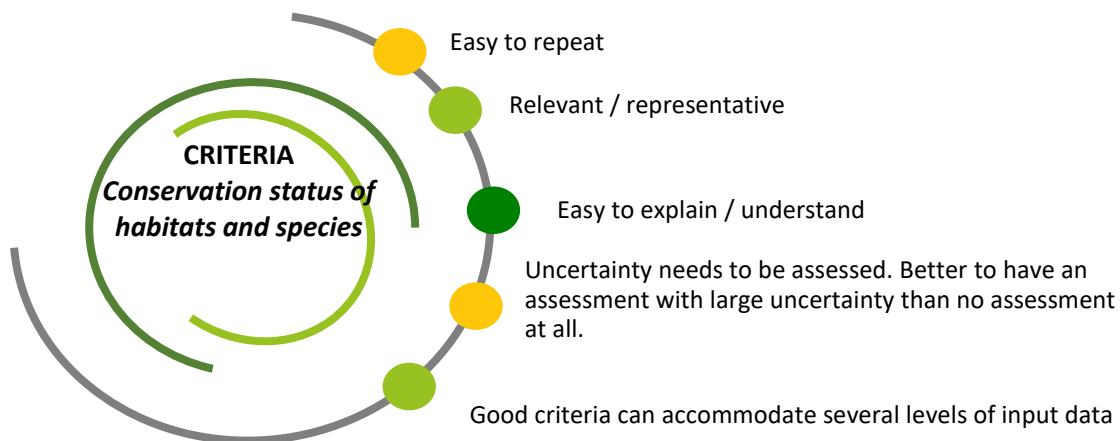
KEY MESSAGE:

Once we have overcome the barriers to access and identify the information needed, the next step to developing a solid process for decision making is to develop a set of **criteria** to assess this information.

The participants discussed what criteria should be used to:

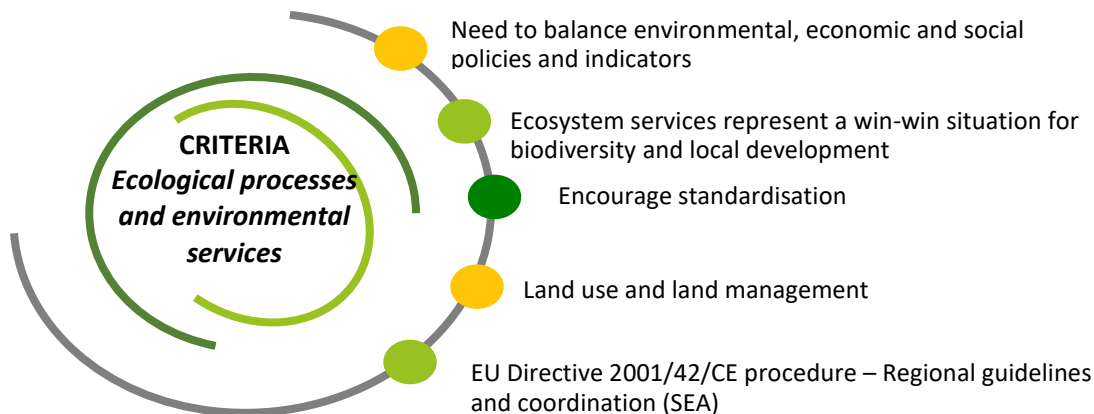


The assessment of conservation status of habitats and species should adapt to the available data if necessary. It is also important to consider physical and natural processes, and to standardise criteria at different scales (although this can be a challenge). Conservation status should be defined looking at condition, distribution, population / demographic, and status and trends / changes. Where negative or concerning trends are identified, these should be monitored.

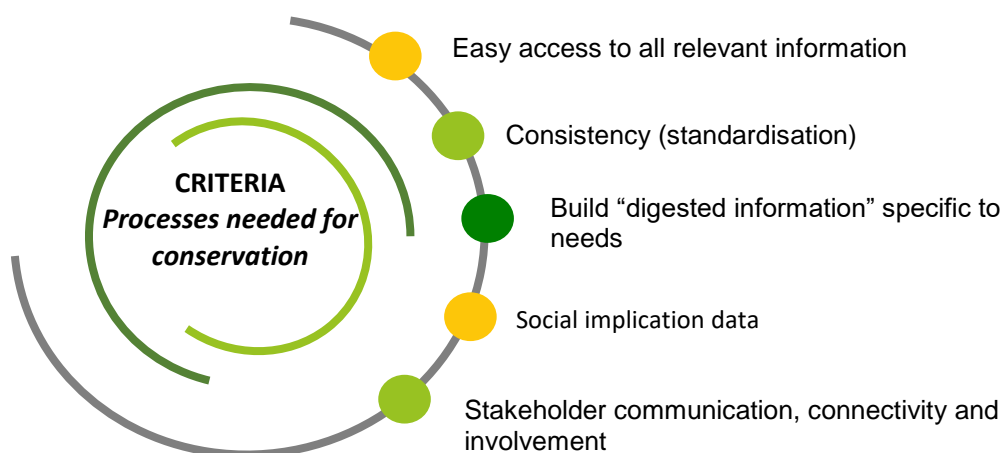


Ecological processes and environmental services need to identify “win-win” situations between biodiversity and ecosystem services. To achieve these “win-win” situations other elements should be considered: land-uses (surface areas, locations) and not habitats, management of land-use units (e.g. fertiliser use, coppicing vs large cuts in forests), etc.

But we should not manage land just with a focus on ecosystem services (e.g. we cannot simply have forests everywhere because they are a good carbon sink) and we need to consider that it is often the agencies that do not have a primary focus on biodiversity (e.g. forestry departments) that are the ones managing the land. This is the reason why we need to consider different ecosystem services (e.g. carbon sequestration, flood defence, coastal protection, tourism, etc.) and keep in mind that their value will depend on stakeholder views, and on the region and its economy.

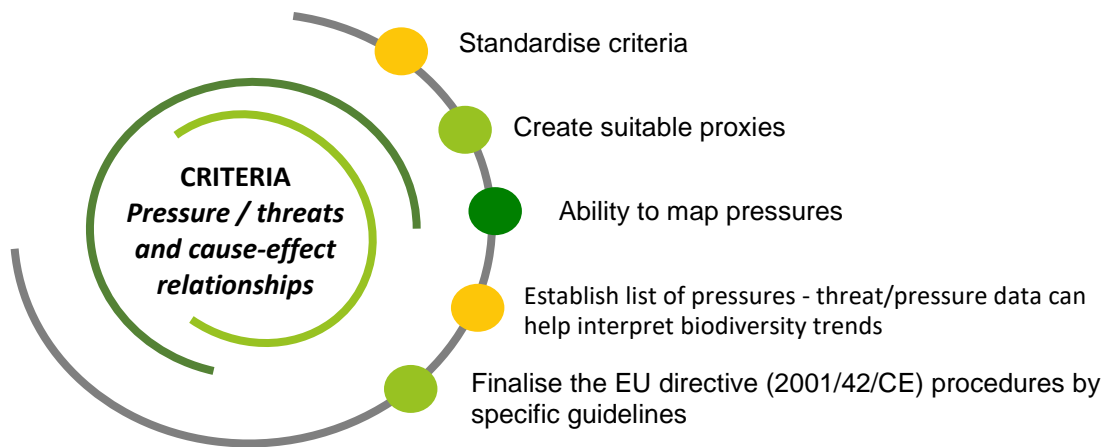


In terms of criteria assessment, it is essential to specify the processes needed for conservation to go a step further. Because in this case, there is a need for information based on the specific needs of defined habitats or species and therefore, this decision should be based on co-created information to get a real impact for management needs and opportunities.



The criteria that we need to establish to **describe pressure / threat and cause-effect relationships (impact mapping)** was certainly the topic that generated the most discussion. Participants agreed that it is important to establish the sensitivity of species to various pressures, though direct relations are rare (complex situations, usually non-linear relationships). The need to list and map pressures, threats and their drivers was highlighted, considering that drivers can be opportunities as well as threats (e.g. fire can kill tall trees, but it can also “open” forests for other species to develop).

Moreover, it was mentioned that reporting processes need data on biodiversity and pressures/threats, yet it is not clear who is collecting pressure/threats data, and how these data can be accessed. It is mostly likely the case that a cross-sectoral approach is required as it is likely that these data are collected by agencies not primarily focused on biodiversity.



GOOD PRACTICE:

BioGeoNet, the monitoring of agroenvironmental scheme in Wallonia, managed by the non-profit association Natagriwal, is a good practice of data management and sharing to support farmers for the implementation of Agroenvironmental Schemes (AES) and to support land-owners for the ecological restoration of their N2000 lands.

<https://www.biogeonet.ulg.ac.be>

https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/2-4-BID-REX_piqueray.pdf

Often, the **evaluation and impact criteria are the most difficult to establish** but they are essential as they end the evaluation circle giving sense and significance to the measurement efforts made before. The participants focused on three main questions; their answers are summarised as follows:

How can we adapt data and information needs in accordance with scale (regional, biogeographical, for protected sites, etc).

- Biogeographic assessments (e.g. mountain habitats) are usually restricted to the boundaries of countries, and it is unclear whether the assessments get aggregated across countries (the example of Alpine species and habitat assessments across several countries with Alpine ecosystems).
- Data are not always needed for assessments – sometimes expert input is sufficient.
- Data (dis)aggregation is done but we need to be careful with the information loops.
- Need to anticipate upcoming policy indicators by looking at the work of the European Environment Agency (EEA) – the EEA will tend to propose indicators that can be aggregated across countries.
- The most powerful information is usually in the form of temporal trends.
- Different questions will require data in different scales. There is high potential for new tools to upgrade the scale of decision.
- In this sense, bias recording is needed to get information on less charismatic or accessible species and sites and to avoid false "rarity" (some species are less detectable and therefore less recorded).

How can we use information on biodiversity to improve public funding systems, particularly ERDF funds?

- Based on improved knowledge on biodiversity, public funds are given to projects that prioritise biodiversity as well as societal needs.
- Participate in the ERDF operational plan.
- Favour synergies between different funding streams. Need to make useful connections between projects funded by public funds, even if the primary aim of the project is not related to biodiversity.
- Make useful connections between projects funded by public funds.
- Ensure that ERDF-funded projects, as well as others, can access biodiversity-related information. Participation in the ERDF regional operational plan is essential.

What indicators should we use to measure the degree of implementation and effectiveness of the measures and actions? How can we measure the evolution of the distribution and conservation status of habitats and species? How can we assess the effectiveness of public funding?

- Despite huge amounts of data collected by citizen-scientists, there remains large gaps that need to be filled, especially if there is a legal (or other) requirement to do so.
- Not all the biodiversity information can come from citizen-scientists, due to the many biases these data suffer (e.g. less charismatic species are missed, and so are the species living in less scenic locations; species hard to detect are often missed thereby creating false rarity).
- It may be that citizen-science monitoring effort should be influenced/framed around data needs (e.g. target less monitored areas). There is a need to match the growth of citizen science with information requirements at regional level.
- Warranty the corner stone of data providing systems, create artefacts due to recorder efforts (coastal communities vs. further inland) and monitoring - control of obligations.

6 Innovation opportunities: new tools for the capture and understanding of the information

In this block participants identified and analysed the impact of new data sources and new tools to manage information. In addition to this, they were asked to design processes and mechanisms to make them more useful for policy making.

GOOD PRACTICE:

The Ornitho.eus project is a good practice of data recording from citizen science and its subsequent use in decision making. With this project, benefits are obtained both for public administrations and for volunteers, such as coordination of monitoring programs, networking promotion, basic statistics and indicators, early warning systems and cooperation at larger spatial scales. The information from Ornitho.eus is incorporated into the Nature Information System of the Basque Country.

<http://ornitho.eus/>

https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/3-1-ornitho_BidRex.pdf

KEY MESSAGE:

Even if many new data sources have been developed during the last years, some of them are still **not used** to their full potential. Moreover, occasionally users and policy makers are not aware of the weaknesses and strengths of each source, so some information is lost.

GOOD PRACTICE:

Species distribution models are used in Catalonia for valuing biodiversity. The case of brown bear risk assessment has been used in the reintroduction program to save the species from extinction in the Pyrenees, setting compensation measures to prevent conflicts between brown bear and livestock and in the monitoring program to analyze key areas for brown bears.

[https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/3-2-BID-REX_DaniVillero%20\(1\).pdf](https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/3-2-BID-REX_DaniVillero%20(1).pdf)

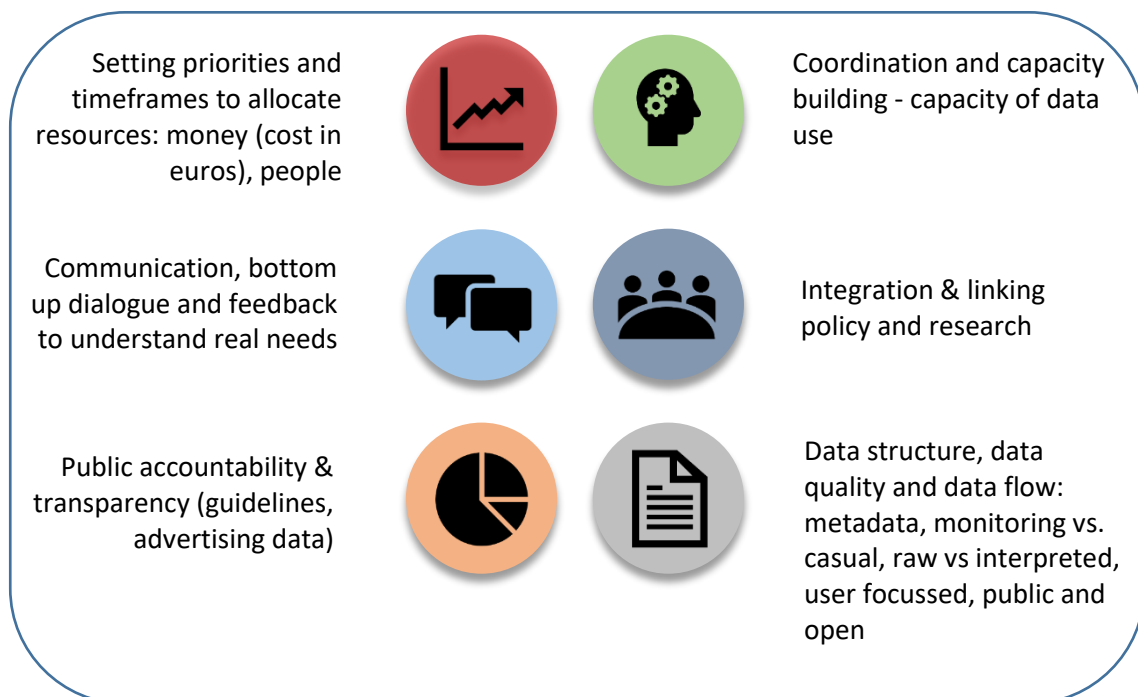
Participants were asked to list as **many raw data sources as possible**, and afterwards to agree on **opportunities and threats** associated with each source. In the following table, there is a structured summary of the information collected:

OPPORTUNITIES	DATA SOURCE	THREATS
Should be lots of data	Agricultural direct payment	Need lots of control Lack of data accessibility
Internationally consistent comparable data Defined network (long-term)	Framework directives (WFD, MSFD)	Expensive Defined network – can't be changed
Good for species with low detectability	Trail cans	Low coverage
Adds context Free	Non – biodiversity data – visitor counts	Who has it? Capacity / methodology
Fills spatial gaps Target sampling No need for full survey – coverage	Predictive models	Uncertainty / False certainty Explaining the limitations to users
Scale	Crowdsourcing	Needs good promotion Validation / verification Difficult to keep long-term interest
Cryptic species Precise, sure	DNA	Expensive Technically difficult
Lots of data Cheap & Open New participants	Geotagged photos Social media: Flickr, Facebook	Needs validation / verification Quality of photo Lack of ID features & structure / methodology
Cheap	Satellite imagery	Resolution (spatial). Processing. Verification – sampling bias to general
Temporal resolution	NDVI (vegetation index)	Spatial resolution
Available (freely, online, fast) Resolution Replicable Standard format	Aerial photos LIDAR	Cost
More affordable cost	Drones – UAV	License Engagement can require effort Repeatability
Value for money	Citizen science	
Big datasets	Monitoring Programmes	Engagement can require effort
Easily communicable results (e.g. charismatic animals, species)	Camera traps	Costly (equipment + processing)
2 ^o / 3 ^o users = cheap	Private consultants	Costly – maybe for primary user
Big datasets Sampling effort lower	eDNA	Costly – no reference standards for every species & Difficult to interpret
Real time up to date & Big datasets	Acoustic monitoring	Equipment cost

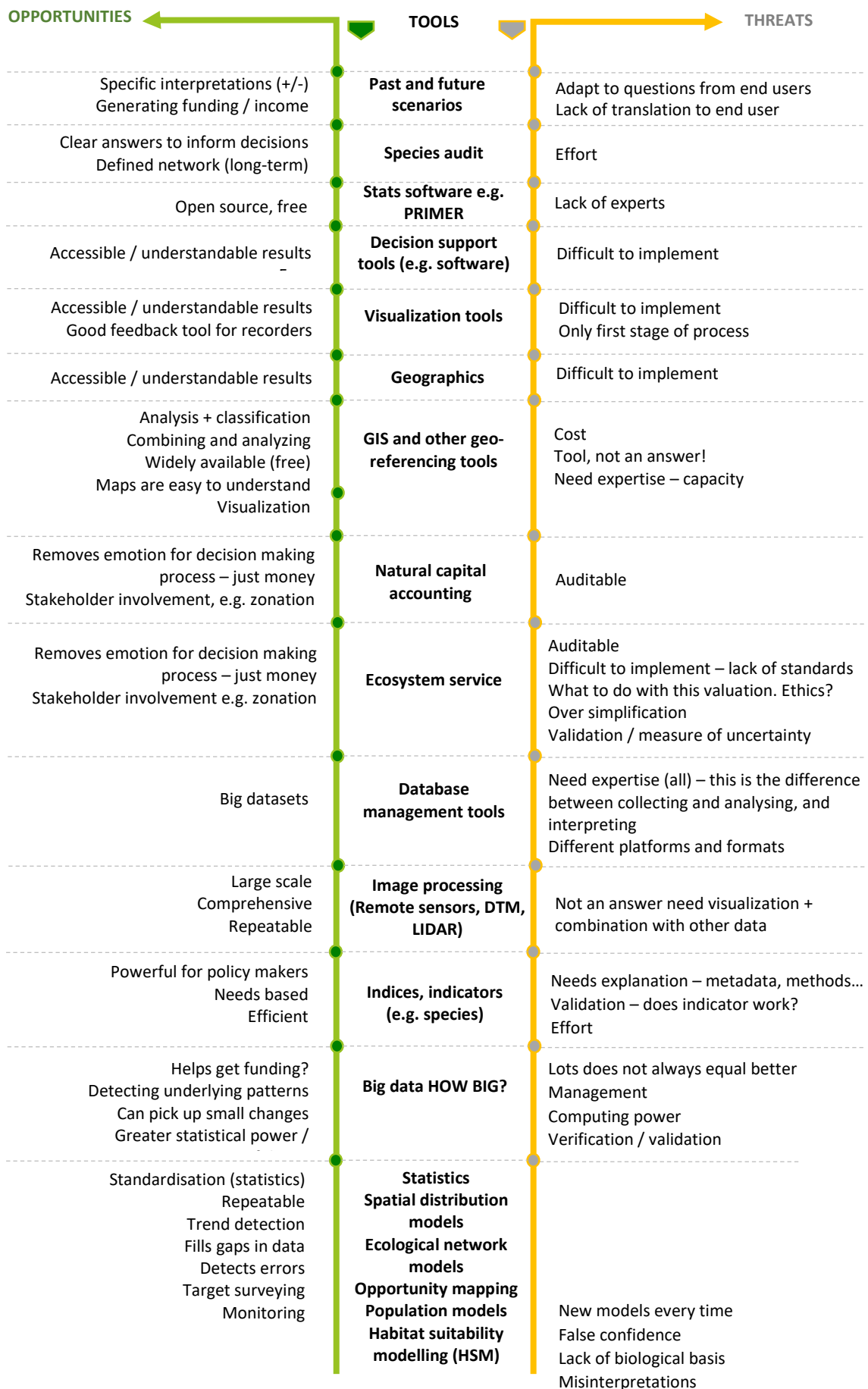
KEY MESSAGE:

After considering opportunities and threats of each data source, and to guarantee an effective use, it is essential to work on how we can combine and respond to the needs and interests of both the **research and management** perspectives.

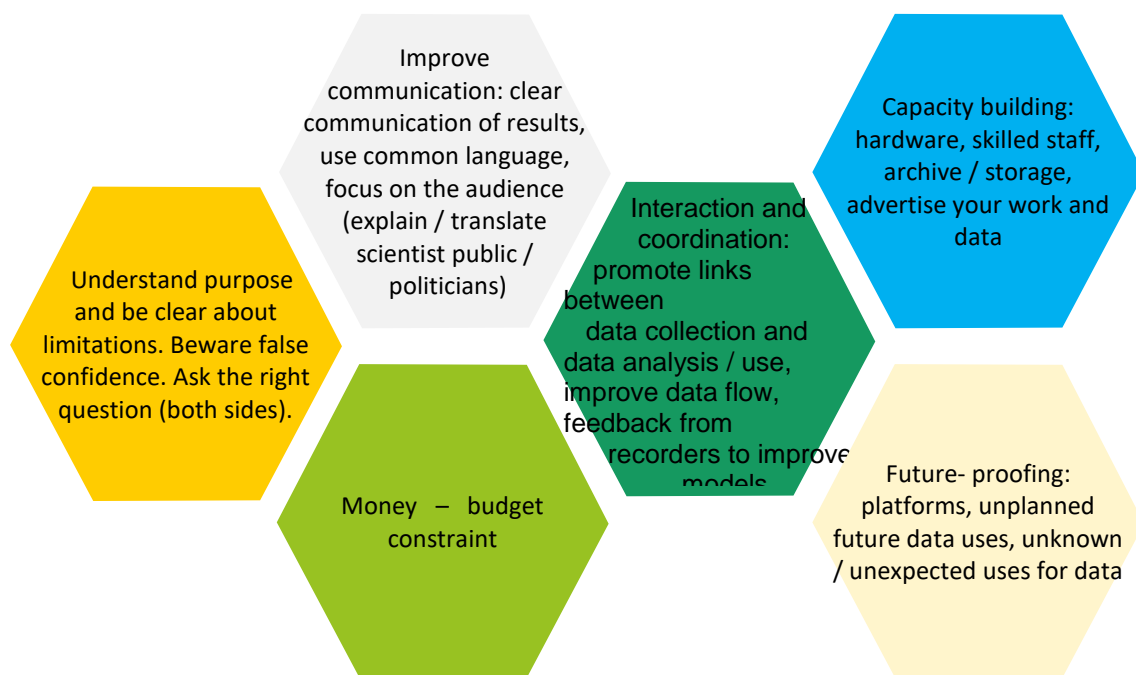
These are the **key elements** that should be considered to fulfil both:



As mentioned previously, regarding data sources, **there are new predictive and data processing and interpreting tools that could help with getting the information needed for decision making process.** The opportunities and threats of each tool should be considered carefully to address the interest and needs of the stakeholders involved in the process. Especially from the public administration point of view, budget, proportionality or scale, are the key issues to balance the choice amongst them. In the following table, **there is a list of the opportunities and threats** related to the processing and interpreting tools listed in the workshop:



Once participants had defined the opportunities and threats of each tool, they remarked, as with the data sources, that we need to understand the needs and interest of the whole value chain (researchers, users, policy makers...) to decide which tool is the most effective for what purpose and which audiences. This is the reason why **some previous work should be done before focusing on the tool itself**. This work is related with the process of designing accurate, user friendly and efficient tools. If this design is done in a participatory form (including different perspectives), we will get better answers and will be ready to find future needs and responds (as we will have a more proactive process in terms of competences and understanding of needs):



GOOD PRACTICE:

The Biodiversity Audit Approach conducted by the University of East Anglia in the UK identifies the species present in an area, but it is also a good tool to define integrated 'Management Guilds' based on traits and ecological requirements, to set favourable condition monitoring, evidence-base for management and ERDF - Cost-effective for priority biodiversity.

https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/3-3-BDAudit_PDolman_Bilbao_14062017.pdf

After analysing different sources and tools, participants were asked to **propose ways in which these tools could be useful for different stakeholders** (researcher, policy makers, citizens...). Bearing in mind the opportunities and threats listed before, participants worked in two groups to develop different concept maps.

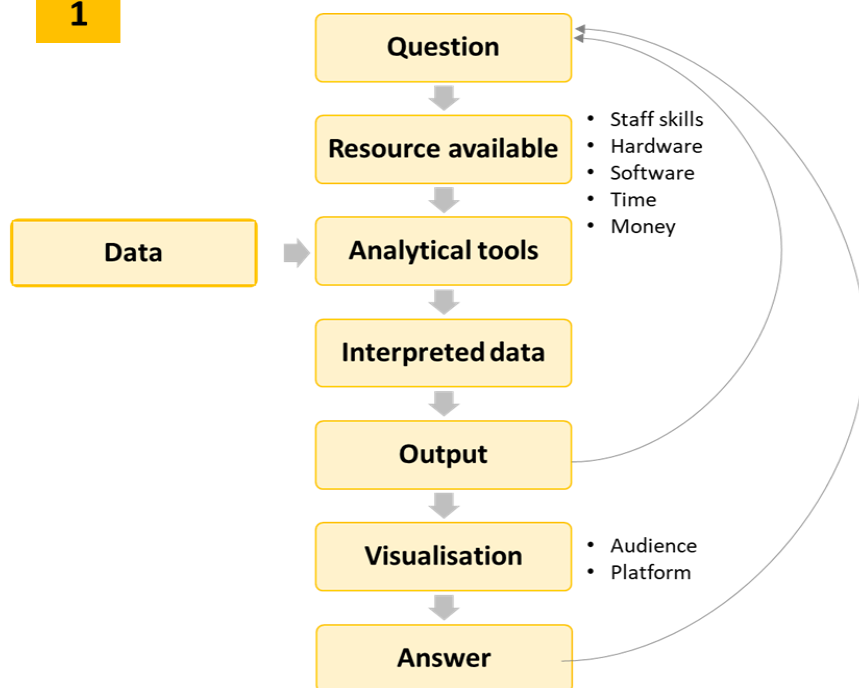
Two types of maps are presented below. The first two maps defined the processes and mechanism behind an effective use of data gathering tools. The next two refer to predictive and data processing and interpreting tools. Nevertheless, even though the participants worked in groups, **there are some similarities that should be highlighted before analysing the maps individually.**

HOW TO MAKE MORE USEFUL DATA GATHERING TOOLS? CONCEPT MAPS

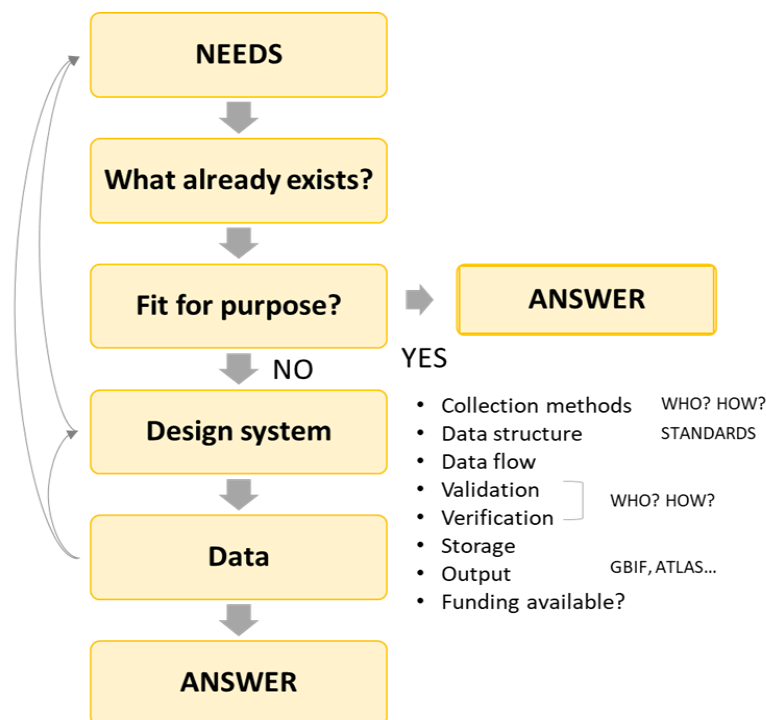
Data gathering tools

- ☐ Keep in mind what the real question is from the beginning to the end
- ☐ Look for the information that already exists, do not reinvent the wheel
- ☐ The cycle must be adjusted and repeated until the information is fit-for-use
- ☐ Focus on the audience; adapt the results accordingly and make them visual

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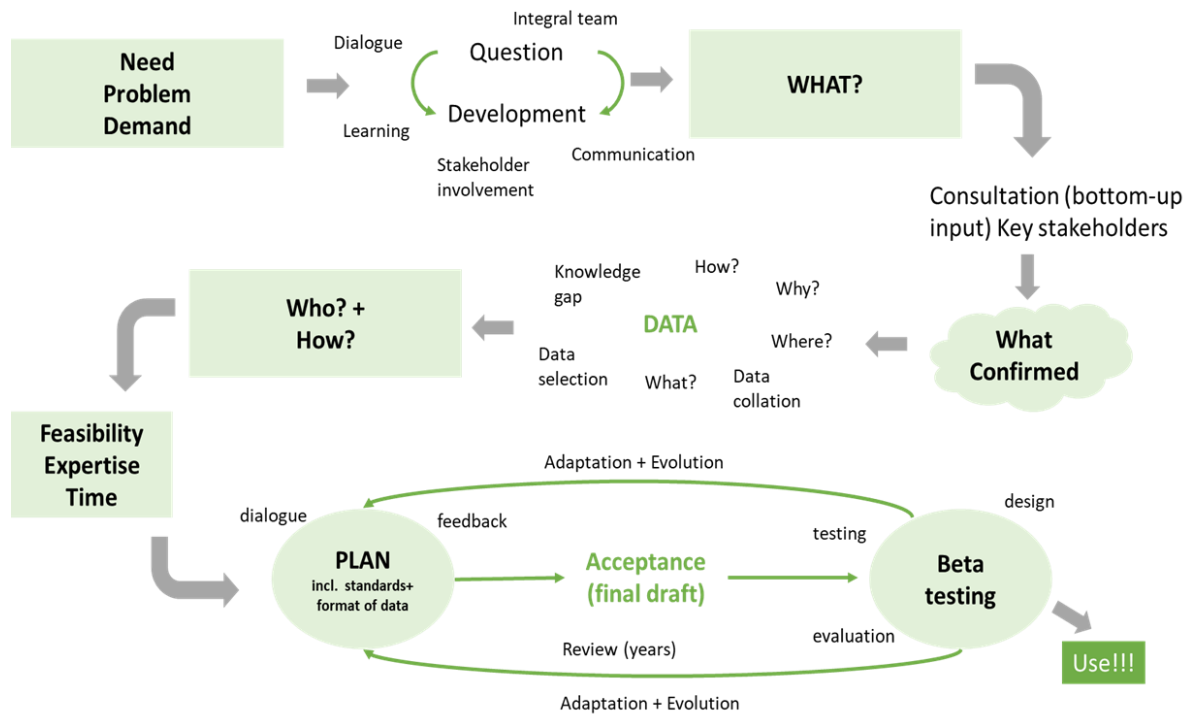


HOW TO MAKE MORE USEFUL PREDICTIVE AND DATA PROCESSING AND INTERPRETING TOOLS? CONCEPT MAPS

Predictive and data processing and interpreting tools

- Analyse and interrogate the original question as much as necessary
- Interpretation is key: adapt language, get feedback, improve dialogue
- Test and evaluate the the outputs you get - make the tool as usable a possible by customising it
- Select and prioritize the data you get and the steps you make

1



2

