



# BID-REX: How is biodiversity data used in decision-making processes at a regional scale across Europe?

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Contents

- Summary ..... 2
- Acronyms ..... 3
- Introduction..... 5
- Methodology ..... 6
- Survey Demographic..... 7
- Results ..... 8
  - 1. Use of biodiversity data ..... 8
  - 2. Use of data tools..... 10
  - 3. Data perceptions..... 11
  - 4. Data needs ..... 13
  - 5. European Regional Development Fund ..... 15
- Concluding Summary ..... 17
- Annexes..... 18
  - Annex 1: European stakeholder survey ..... 18
  - Annex 2: Results from European stakeholder survey ..... 25

# Summary

This survey sought to gain insight and understanding into the biodiversity information needs of decision makers across Europe. It was distributed to 305 representatives of European institutions and organisations involved in the collection, use and interpretation of biodiversity data at a European, national or regional scale.

The survey revealed the following high-level results:

- **Nearly all respondents (97%) use biodiversity-related data in some capacity, and many associate themselves as data users (72%). A large number (69%) of respondents stated that biodiversity-related data is critical for carrying out their work, and much (81%) of this data is spatial.**
- **The most important source of biodiversity data to respondents was reported to be national government providers (81%).**
- **Mapping was perceived to be the greatest strength (92%) in relation to current data use, and decision-making the greatest weakness (47%).**
- **Respondents indicated that they work mostly (84%) at the national scale, and that the data used to inform decision-making processes is mostly (88%) applicable at this scale also.**
- **The majority of respondents agreed that the use of data in decision-making processes does, or would, improve their acceptance and credibility (93%), and that having more complete datasets would improve the data landscape to meet users' needs (69%).**

# Acronyms

BISE: Biodiversity Information System for Europe

CBD SBSTTA: Convention on Biological Diversity Subsidiary Body on Scientific, Technical and Technological Advice

CORINE: Co-ORDinated INformation on the Environment

dBASE: A database management system

EAFRD: European Agricultural Fund for Rural Development

EASIN: European Alien Species Information Network

eCognition: Land cover mapping software

EEA: European Environment Agency

EIONET: European Environment Information and Observation Network

EMFF: European Maritime and Fisheries Fund

EMODnet: European Marine Observation and Data Network

ERDF: European Regional Development Fund

ESDAC: European Soil Data Centre

ESF: European Social Fund

ESP: Ecosystem Services Partnership

ESTIMAP: Ecosystem Services Mapping tool

EU BON: European Biodiversity Observation Network

EU: European Union

EUNIS: European Nature Information System

EurOBIS: European Ocean Biogeographic Information System

Eurostat: European Union Statistical Office

GBIF: Global Biodiversity Information Facility

GEO BON: Group on Earth Observation Biodiversity Observation Network

GIS: Geographical Information System

H2020: Horizon 2020

HELCOM: Helsinki Commission

IBAT: Integrated Biodiversity Assessment Tool

INSPIRE: Infrastructure for Spatial Information in Europe

InVEST: Integrated Valuation of Ecosystem Services and Trade-offs

JRC: Joint Research Centre

MySQL: An open source database using Structured Query Language

NASA FIRMS: National Aeronautics and Space Administration Fire Information for Resource Management System

PECBMS: Pan-European Common Bird Monitoring Scheme

SQL Server: A database developed by Microsoft using Structured Query Language

SWOS: Satellite-based Wetland Observation Service

UK: United Kingdom

UNEP-WCMC: UN Environment World Conservation Monitoring Centre

WFS: Web Feature Service

WMS: Web Mapping Service

WoRMS: World Register of Marine Species

# Introduction

This European-wide survey was conducted as part of the Interreg Europe BID-REX project (<https://www.interregeurope.eu/bid-rex/>). It sought to gain insight and understanding into the biodiversity information needs of decision makers operating throughout Europe. The focus was on decision-making at a regional (sub-national) level, and therefore primary recipients were also asked to distribute the survey to their national contacts that use, or have potential to use, biodiversity data at this scale. 'Use' in this context included, but was not limited to, data collation, interpretation, management, and presentation.

The theme of the survey was the accessibility and availability of robust and structured biodiversity data, and gaining insight and understanding of how biodiversity information is used in decision-making processes. Ultimately, it is anticipated that the survey results will contribute to other project findings and outputs to support the development of better biodiversity data system across Europe.

Additional consideration in the survey was given to the use of biodiversity information in decision-making processes related to the management (including allocation) of European Regional Development Funds (ERDF). The improvement in the management and allocation of these EU funds is a central objective of Interreg Europe projects.

This survey and its results build on previous BID-REX surveys conducted by the Service public de Wallonie, prior to the first thematic workshop of the project that took place in February 2017.

# Methodology

The survey was sent to 305<sup>1</sup> representatives of European institutions and organisations involved in the collection, interpretation, and use of biodiversity data at different spatial scales across Europe. The respondent list was built up through mining contacts from the following sources:

- Deliverable 7.4. Strategies and business plan for regional and global biodiversity information infrastructures. Building the European Biodiversity Observation Network (EU BON) (Despot-Belmonte K, 2017).
- EU national data coordinators for EU Nature Directives (Article 12- Birds & 17- Habitats)
- UNEP-WCMC network contacts
- The MEDCIS (<http://medcis.eu/about/>) project
- The ODYSSEA (<http://odysseaplatform.eu/>) project
- BID-REX project key contacts

There was a four-week window (2<sup>nd</sup> – 29<sup>th</sup> March 2018) during which the survey was open to respondents. During this period the survey elicited 37 responses; a response rate of 14%.

Respondents were asked a series of questions relating to biodiversity data surrounding five major themes: 1) use of data; 2) use of data tools; 3) data perceptions; 4) data needs; and 5) biodiversity information and the management (including allocation) of funding (e.g. European Regional Development Funds (ERDF)). The full survey can be seen in Annex 1.

The use of the term 'data' in the survey and its findings refers specifically to biodiversity data. And biodiversity data, in this context, is taken to refer to any information relating to species, habitat types, and sites of interest, as well as related products used within biodiversity indicators and assessments<sup>2</sup>.

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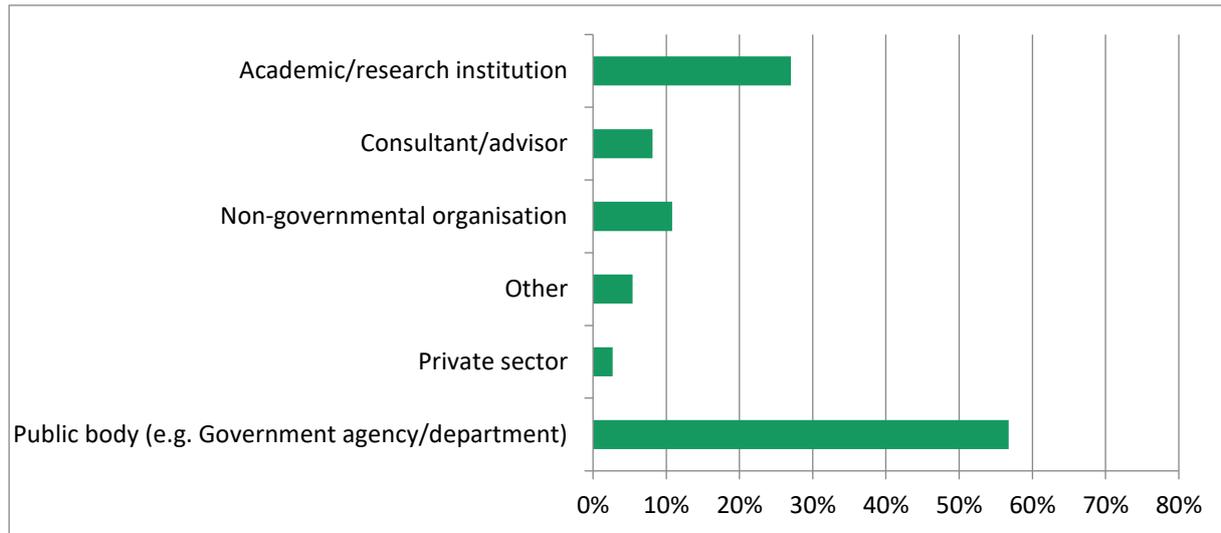
<sup>1</sup>Included within this figure were 40 undeliverable messages occurring as a result of out of date contact details, i.e. people that have moved on from positions for which contact details were held. Effectively therefore, there were only 265 recipients.

<sup>2</sup> <https://www.eea.europa.eu/themes/biodiversity/about-data-centre>

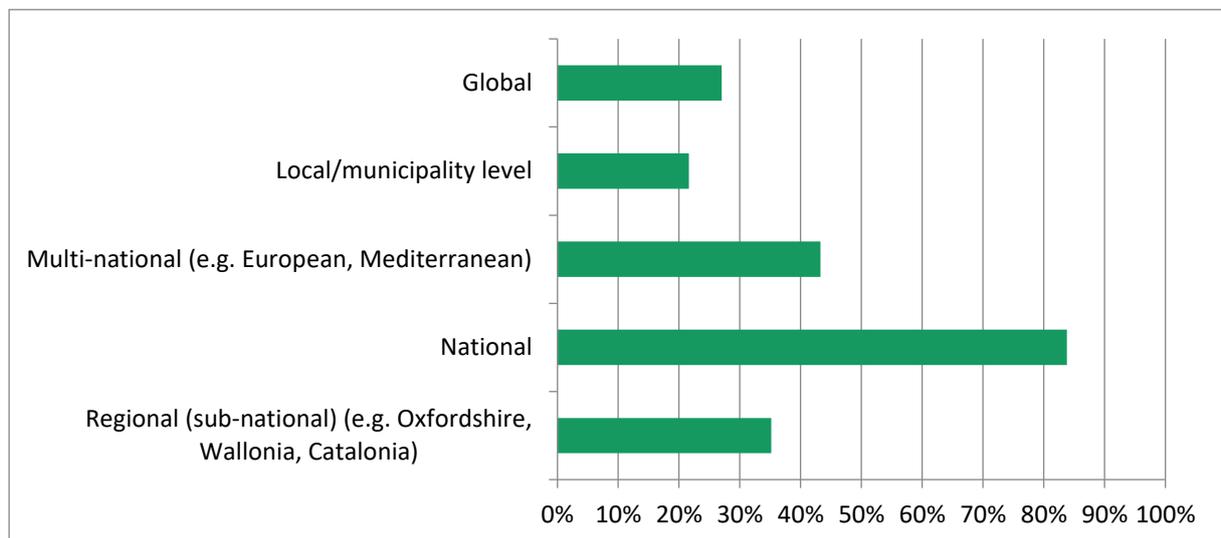
# Survey Demographic

Of the 37 responses, 28 different organisations were identified, and 17 countries across Europe were specified. Respondents mostly identified themselves as members of public body organisations (57%), with good representation (27%) from academic/research institutions also (Figure 1).

More than 84% of respondents stated that they work at the national scale, however, only 41% exclusively (Figure 2).



**Figure 1:** Breakdown of organisation types detailed by survey respondents.



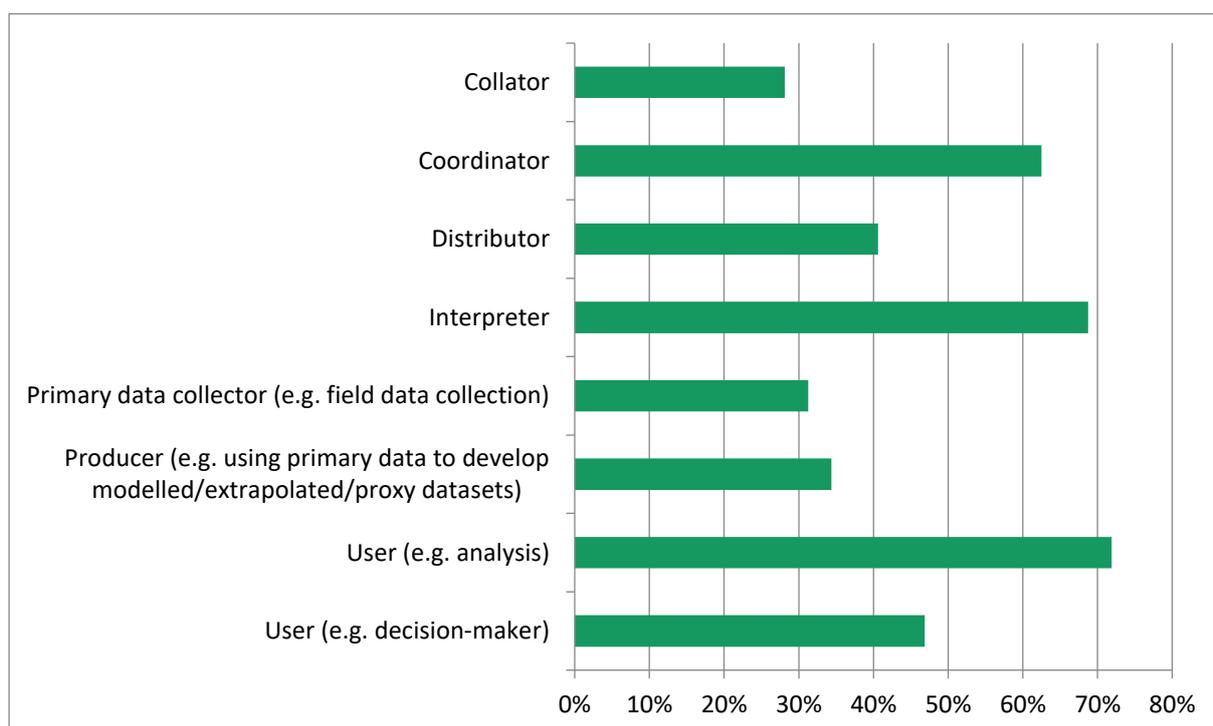
**Figure 2:** Geographic scale at which survey respondents indicated that they work at.

# Results

Full results of all<sup>3</sup> survey questions can be seen in Annex 2.

## 1. Use of biodiversity data

Almost all (97%) survey respondents reported that they use or handle data in some capacity. Data use amongst the majority (69%) of respondents' forms part of their daily or weekly actions; many (69%) considering its use to be critical to their work. The way in which respondents' classed their interactions with data was most frequently described as 'users' (72%), 'interpreters' (69%), or coordinators (63%) (Figure 3).

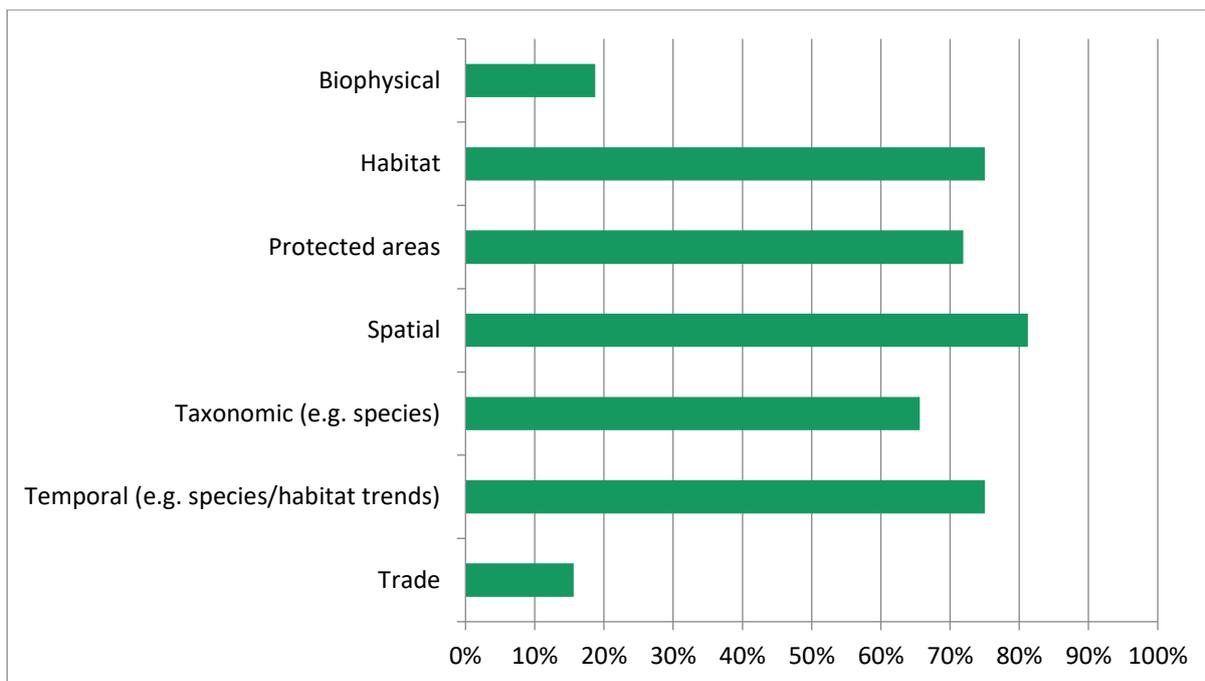


**Figure 3:** Classification of respondents' interactions and roles regarding data use.

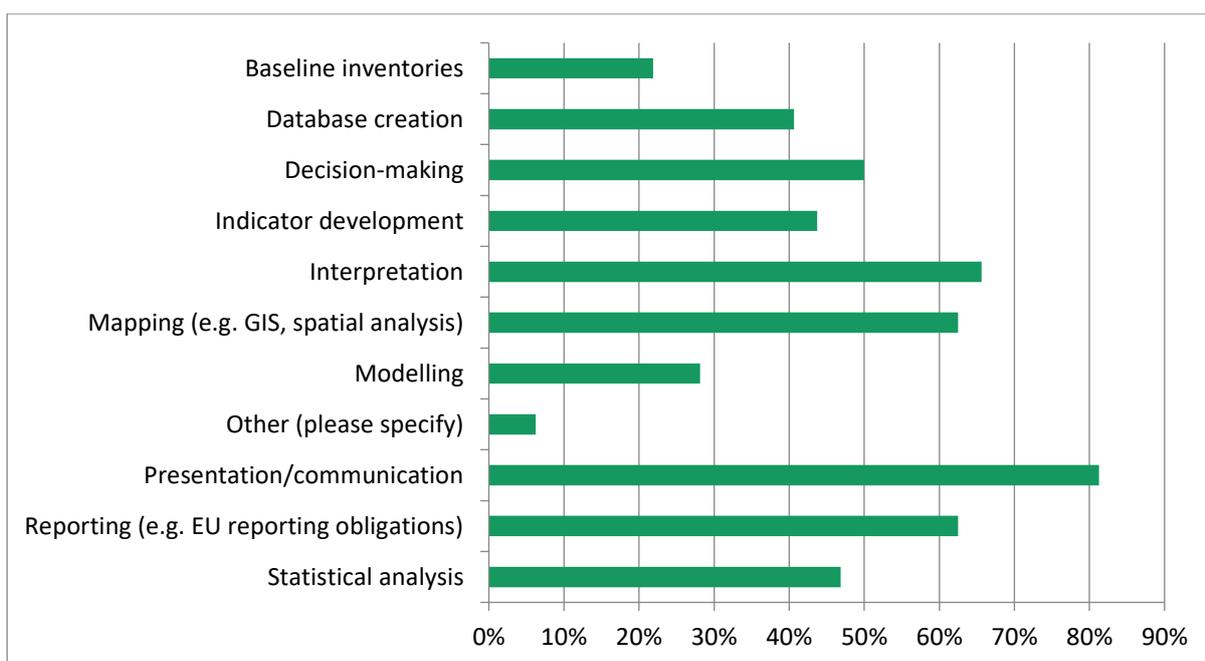
Regarding the types of data used, habitat, spatial, temporal, and protected areas data were each selected by more than 70% of respondents (Figure 4), whereas, biophysical and trade data were the least selected options (both less than 20%). The majority (80%) of respondents stated that they use these data for presentation or communication purposes; with high numbers (>60%) indicating that they also use data for mapping (e.g. GIS, spatial analysis), reporting (e.g. EU reporting obligations), or interpretation (Figure 5).

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<sup>3</sup> Excluding Q. 4 which asked for respondents' contact details.



**Figure 4:** Types of biodiversity data used by respondents.

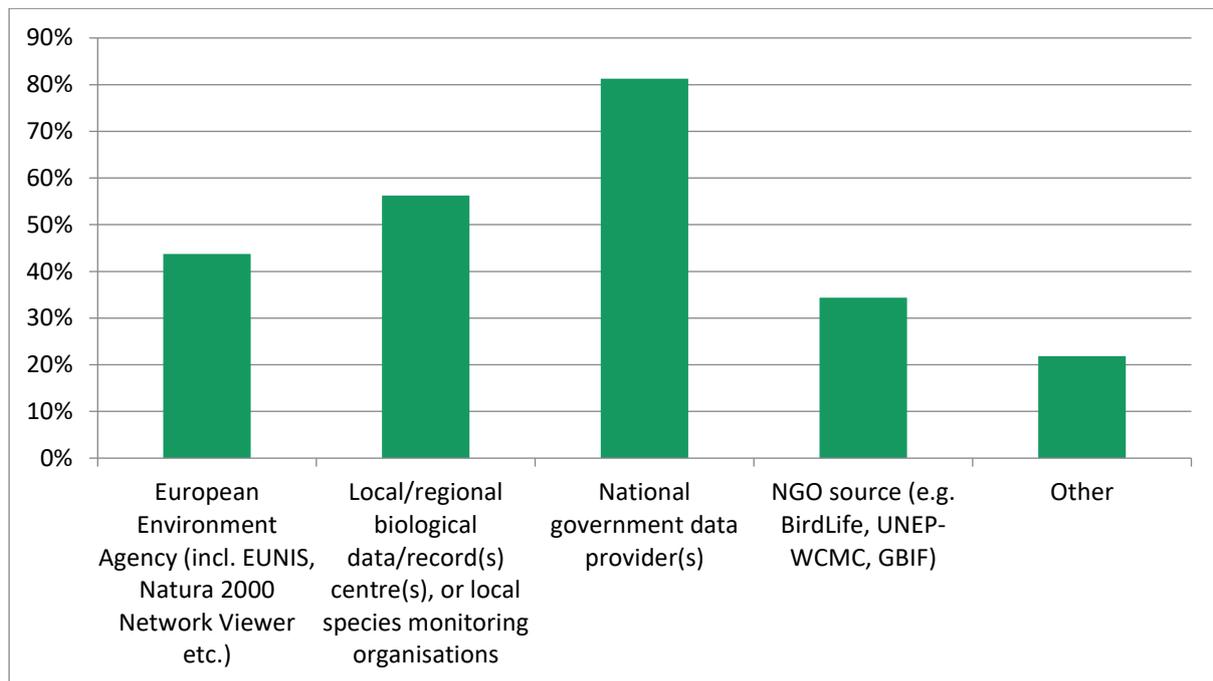


**Figure 5:** Different applications and uses of data.

With regards to the level at which decision-making is informed, the majority (88%) of respondents use data to inform decisions at the national level (Figure A11). Data are also commonly used to inform decisions at the regional (sub-national) level (50%) and at the multi-national level (e.g. European, Mediterranean) (44%).

The data being applied by the respondents is most commonly sourced from national government data providers (81%) or local/regional biological data or records centres (including local species monitoring organisations) (56%) (Figure 6). Some specific data

sources were also identified by individual respondents; these included EMODnet<sup>4</sup>, regional monitoring authorities, autonomous monitoring networks, and research institutions.



**Figure 6:** Sources from which respondents obtain data.

With regards to the use of secondary data, over half (56%) of respondents do not do anything to counter biases (Figure A13). Those that do, referenced the use of methods such as working with metadata, cross-checking with experts, verifying data at a local level, and integrating multiple datasets.

Three-quarters of respondents indicated that they are able to influence the way in which data is collected or collated in order to suit their needs. Often this is down to the fact that respondents design or coordinate research or monitoring projects themselves, and are therefore able to input into project design and coordination, and the methods of data collection. Other influencing avenues included involvement in research commissions, providing suggestions to national government data providers or directly to experts collecting data in the field, or providing funding for specific data collection schemes.

Monitoring, policy development (both 59%), and evaluation (75%) were found to be the predominant stages at which respondents use data to inform decision-making processes.

## 2. Use of data tools

Most respondents use data management or decision-support tools to aid visualisation, analysis or interpretation of data.

Half of the respondents use freely available data from other regions and countries which they access through shared data portals. Those highlighted include: EMODnet, BISE, EUNIS,

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<sup>4</sup> European Marine Observation and Data Network (<http://www.emodnet.eu/>); a network of organisations supported by EU's integrated maritime policy to observe the sea, process data, and make information freely available as interoperable data layers and data products.

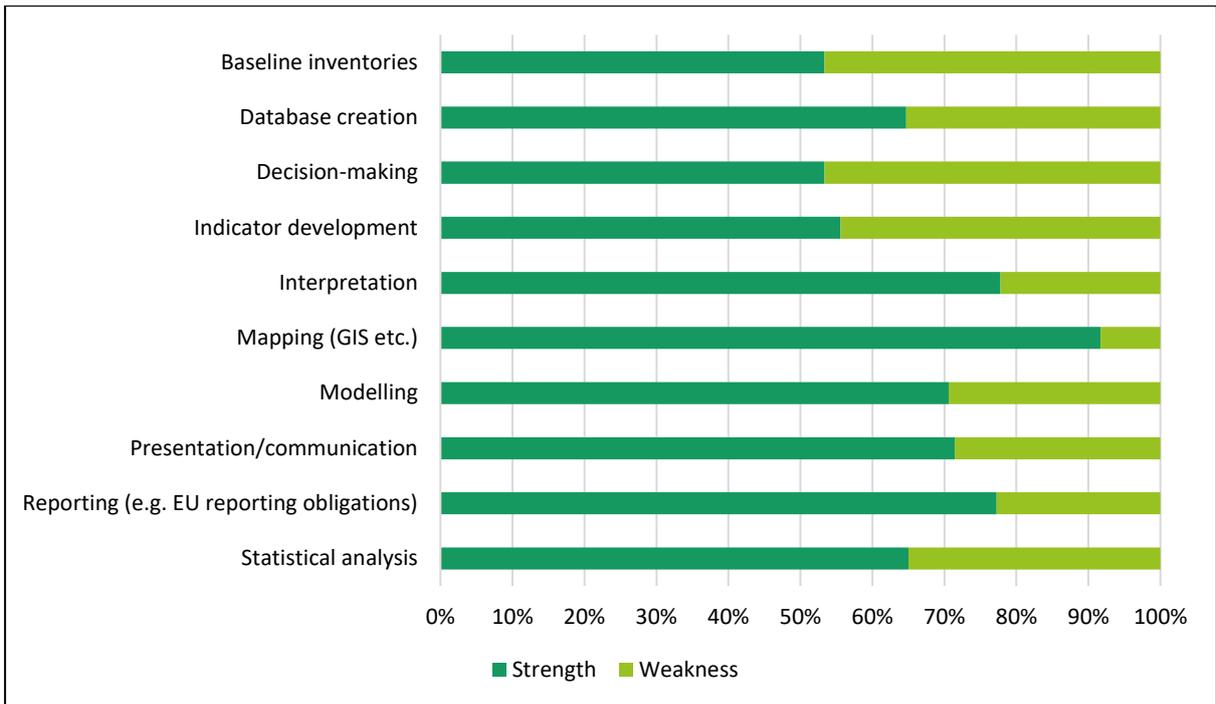
Copernicus, EIONET, ESDAC, Eurostat, PECBMS, and data made freely available through the EEA, such as data from Article 12 (Birds Directive) and 17 (Habitats Directive) reporting. Lack of involvement in international projects, and lack of applicability of the available data to respondents' areas of work were cited as some of the reasons that these resources are not further exploited.

Nearly half (47%) of respondents stated that they provide data to shared data portals which, in turn, supply open source data to other users. Some respondents report providing data solely to national data portals, and others to Europe-specific portals, such as EMODnet, EIONET, EuroBIS, and EuroBirdPortal. Some respondents also provide data to global-scale data management and data provision systems; for example GBIF, Global Forest Watch, Global Fishing Watch, IBAT and NASA FIRMS.

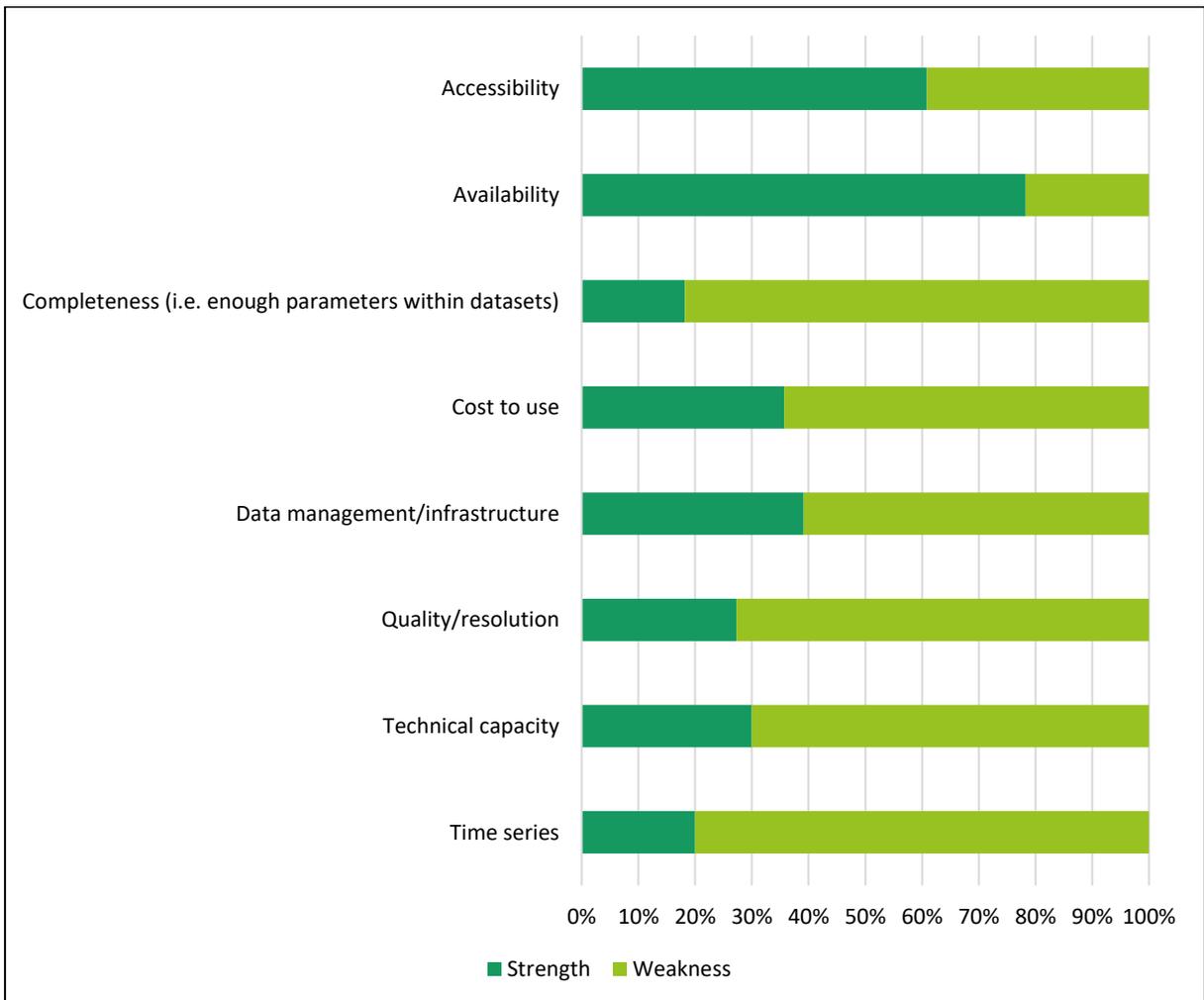
Few respondents (17%) considered that the currently-available suite of information-sharing or decision-support tools suit their needs. One specific reason given for the inadequacy of these tools, was that some do not share the analytical data that they produce. Other reasons are in relation to the actual data made available through these tools; including: much data is still in analogue format; metadata is not of satisfactory quality; data is at an insufficient scale to study impacts on particular habitats; and, there are gaps in data availability. Data harmonisation is a recurring theme. For example: between datasets and tools; between those who manage and store data; between EU and non-EU countries; and, across natural borders.

### 3. Data perceptions

Mapping, interpretation, reporting, presentation and communication, and modelling (each >70%) were identified as strengths in terms of data use at the scales within which respondents work. These strengths were qualified by respondents identifying data completeness (i.e. enough parameters within datasets), time series, and quality/resolution as being of particular benefit. Weaknesses identified included decision-making, indicator development, and baseline inventories (each >40%). Reasons cited for these weaknesses included (lack of) data availability, accessibility, and data management/infrastructure problems (Figures 7 & 8).



**Figure 7:** Number of respondents identifying specific strengths and weaknesses in terms of data use at the scale within which they work, and reasons.



**Figure 8:** Number of respondents identifying reasons behind strengths and weaknesses in terms of data use at the scale within which they work.

In order to gain an understanding about examples of Europe-specific best practice relating to data management, accessibility, or availability, respondents were asked to describe case studies they were aware of. Answers included: the Natura 2000 database, EIONET, CORINE, EMODnet, SWOS, EEA data portal, Birds and Habitats Directives reporting databases, HELCOM database, and Copernicus.

Almost all (93%) participants considered that the use of data in their decision-making processes does, or would, improve the acceptance and credibility of the outcomes and actions.

When asked to provide examples of the impact of using data in decision-making processes, justifications included:

- The integration of protected species or habitats distribution data in **land use planning** within Europe.
- Identification of suitable **locations for marine activities**, such as aquaculture within Marine Spatial Planning.
- User-friendly geoportals including thematic data that can be used for nature conservation, e.g. the identification of **protected areas**, and spatial planning at a local and regional level.
- Influence of data in the **development of national and EU-level biodiversity strategies**.
- Use of **natural capital data** to demonstrate the value of biodiversity to human health and well-being.
- Discussions around, and changes to, national and international **protected species and habitats lists** and maps.
- Natura 2000 data has played an important role in developing better-informed, prioritised, and funded **habitat management plans**.
- Habitat distribution data feeding into decisions regarding the allocation of **EU Rural Support Payments**.

#### 4. Data needs

Poor availability or accessibility of data were identified as the most frequent (46%) reasons for the limited use of data within decision-making processes (Figure 9). Generally speaking, survey respondents indicated that whilst they collate and handle data, they are not involved in decision- or policy-making, only via supporting these processes.

Various issues around data presentation and packaging were raised as being potential challenges and obstacles to data uptake and use in decision-making. Raw datasets alone are not convincing within political debates. But the technical capacity to understand and interpret ecosystem service and natural capital models, is not always available. As such, in order to demonstrate the benefits from biodiversity to decision makers, effective interpretation and presentation methods are needed.

Other reasons that were raised for the limited application of data in decision-making included lack of dataset interoperability between countries, and insufficient new and up-to-date data.

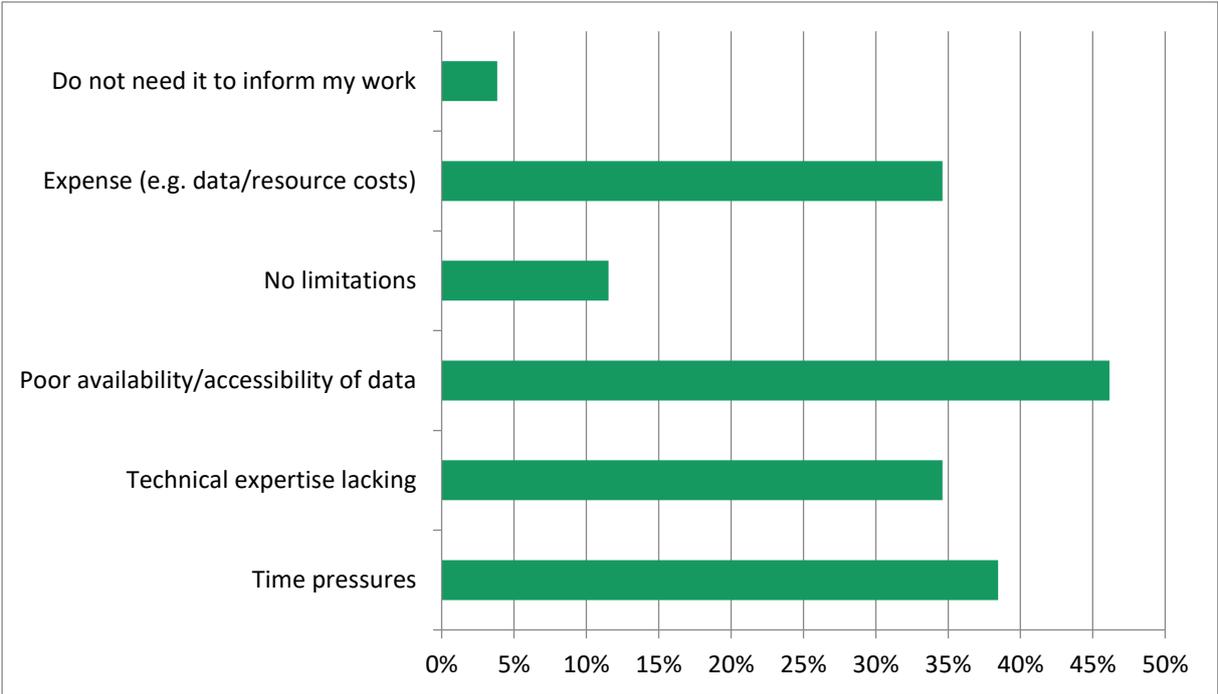


Figure 9: Limitations to the use of data within decision-making processes.

When asked about how to improve the data landscape to better suit users’ needs, ‘more complete datasets’ (i.e. parameters) was selected by many (69%) respondents. Other frequently selected answers included ‘improved integration/compatibility of datasets from different sources to inform specific decisions’, and ‘improved ability to provide reliable and specific results from data analysis that directly inform the decision-making process’ (both 54%) (Figure 10).

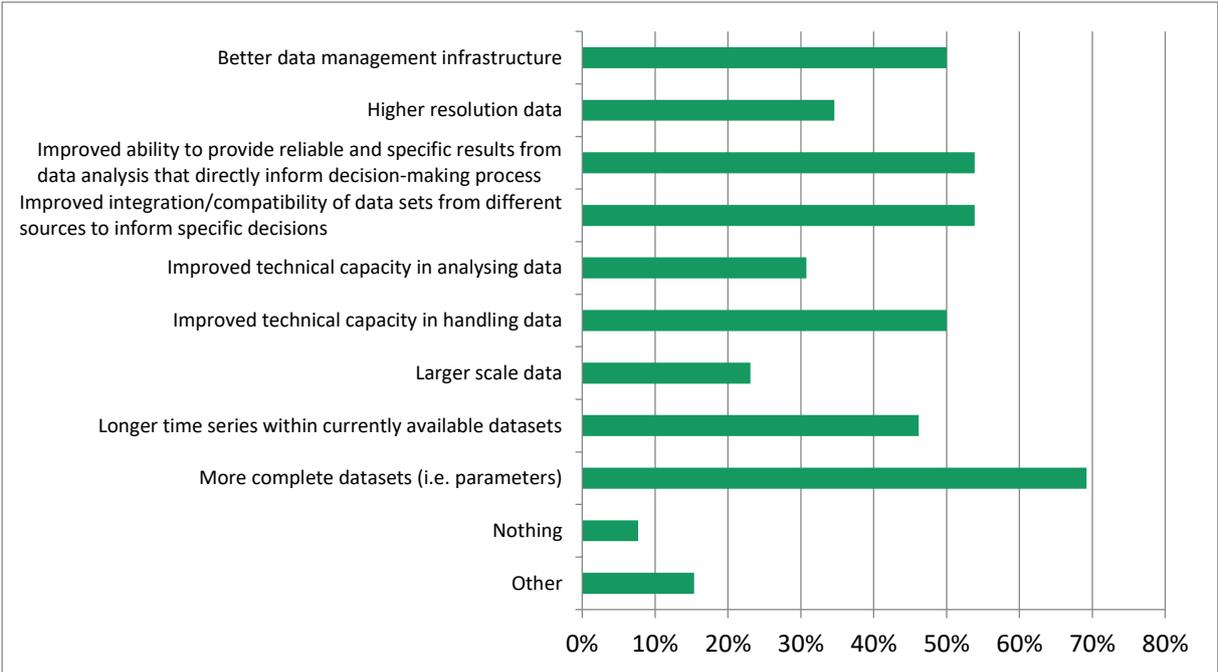
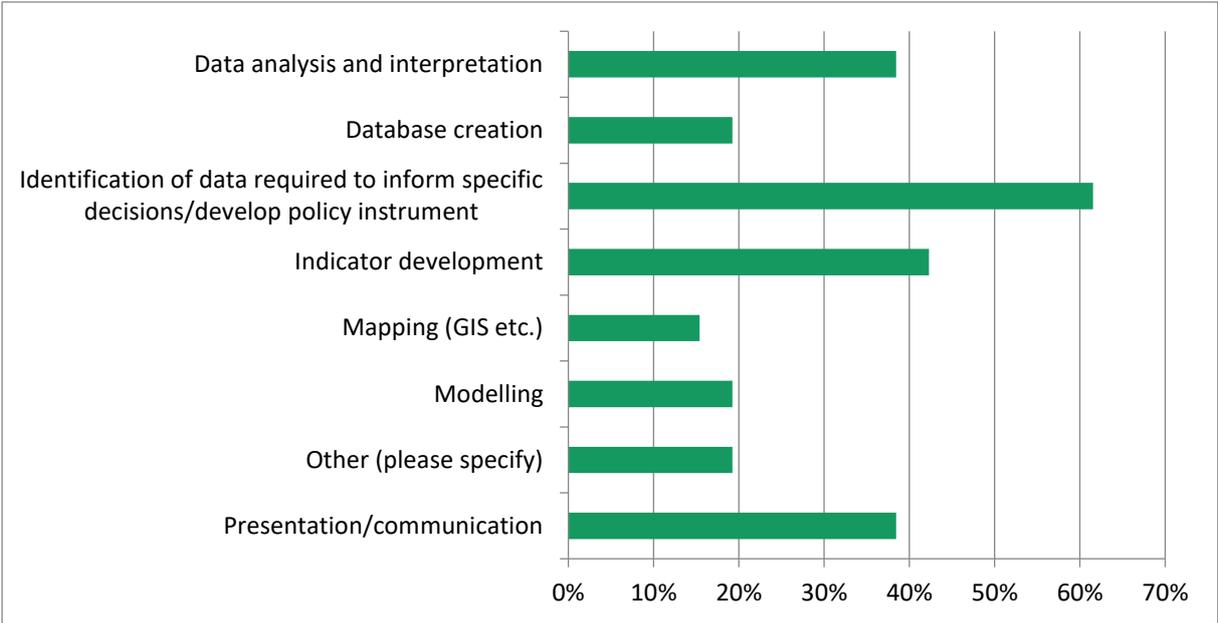


Figure 10: Respondent selections of improvements for the data landscape to better suit their needs.

The ‘identification of data required to inform specific decisions/develop policy instruments’ was selected as the most frequently selected (62%) technical capacity gap limiting the use of data in decision-making processes (Figure 11).



**Figure 11:** Technical capacity gaps limiting the use of data in decision-making processes at the scale within which respondents work.

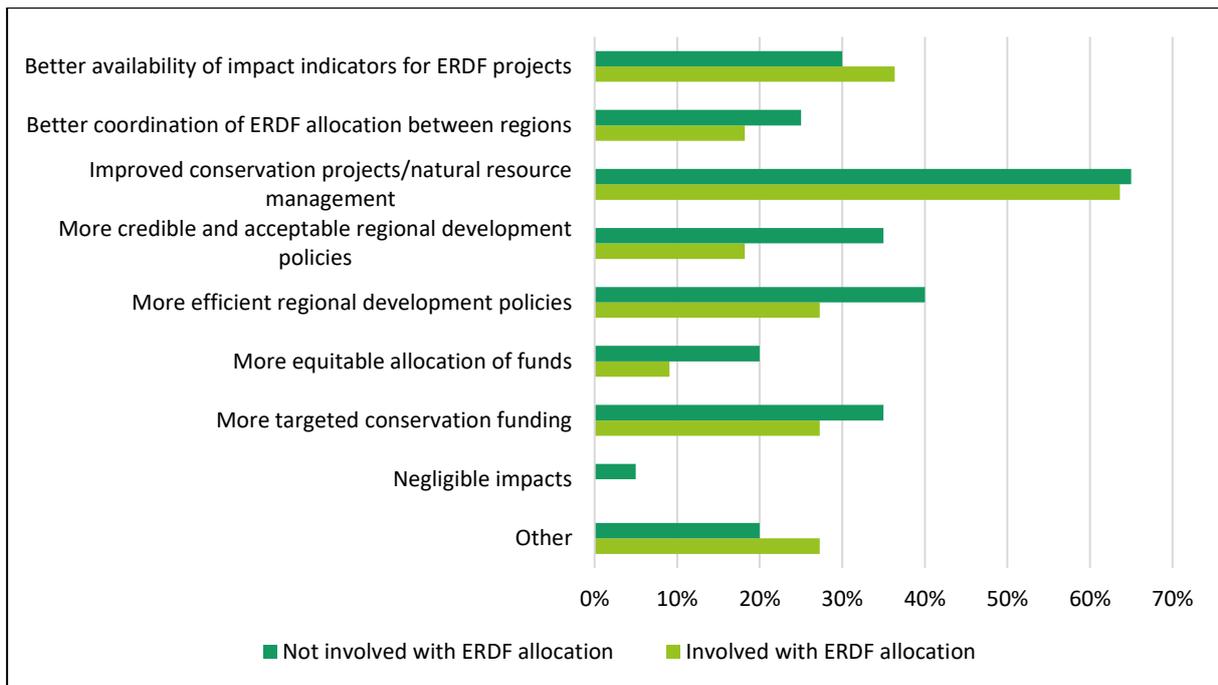
Data providers considered that ‘improved completeness, resolution and time series of datasets’ (38%), ‘a better match between data and policy-related decision-making’, and ‘improved accessibility/availability of data’ might increase the uptake of their services (both 35%) (Figure A28).

### 5. European Regional Development Fund

Respondents not directly involved in ERDF allocation considered that data is insufficiently incorporated into the decision-making process (35%), and that it does not have a sufficient impact on ERDF funding allocation (40%) (Figure A29). The majority (65%) of these respondents considered that, by increasing data use in ERDF allocation processes, improvements in conservation projects and natural resource management would be realised in their regions (Figure A30).

Where respondents identified themselves as being actively involved in ERDF allocation, they selected ‘habitat’ (54%), ‘protected areas’ (46%), and ‘taxonomic/species’ (38%) data as the most frequent types used to assist in the prioritisation of natural resource conservation projects (Figure A31).

The majority (64%) of these respondents agreed with the views of those not involved in ERDF allocation, that the use of data in ERDF allocations would improve conservation projects and natural resource management (Figure A32) (views of both groups combined in Figure 12).



**Figure 12:** Comparison of respondents' perspectives with regard to the effect(s) of the increased use of data on ERDF allocation.

Finally, respondents were asked to submit examples of indicators that are used to monitor the progress and impact of projects relating to natural resource conservation; 10 respondents provided details of such projects from their regions. These included:

- Length of restored water bodies (good or very good conservation status)
- Article 12 or 17 reporting results (and related ongoing monitoring programs)
- Field and forest bird indexes
- Output indicator of the WetMainAreas Balkan-Mediterranean Interreg project "surface area of habitats supported in order to attain a better conservation status". Implemented as a basic data source for preserving wetland ecosystems as valuable landscape elements for improving the conservation effectiveness of protected networks (NATURA 2000, Emerald).

# Concluding Summary

The survey elicited responses which provided a good representation from across Europe and from a range of organisations. The majority, however, were from the public sector.

Overall, the survey was well-targeted, with only one participant reporting that they did not use or handle data in any capacity. Most of the remainder deemed data to be critical to their work. Over half of all respondents reported using data on a daily basis.

Few respondents identified themselves as primary data collectors. Predominantly they were more often involved in data coordination, interpretation, and/or analysis.

The most common scale at which respondents work, and at which data-informed decision-making takes place, was found to be at the national scale.

Clear strengths in terms of data use, of those working at the national scale, included mapping and reporting. Reasons given for strengths in data use at this scale included data availability and accessibility; weaknesses included data quality/resolution and completeness (i.e. enough parameters within datasets).

The only other scale at which clear patterns of strengths and weaknesses were observable are at the multi-national level (most likely due to the sparsity of respondents representing data use at smaller and larger scales). Strengths in terms of data use at the multi-national scale included modelling and mapping. Data availability was given as the most popular reason for data use strengths. Whereas weaknesses identified included data management infrastructure and completeness of datasets.

Evaluation, monitoring, and policy development were the most frequently cited stages of the decision-making process within which data is employed.

Some discrepancies were identified in terms of the strengths and weaknesses of data use, and more specifically, data use within decision-making across Europe. Data availability was cited as a strength behind data use at all scales, particularly at the national scale. However, with regards to data use in decision-making (Figure 9), respondents most frequently cited poor availability and accessibility as the limiting factor behind data use in decision-making processes.

In some areas of decision-making it was made clear that data is plentiful, but there were also clearly areas where improvements can be made. For example, when asked to identify technical capacity gaps limiting the use of data in decision-making processes, 'identification of data required to inform specific decisions/develop policy instruments' was the most commonly selected. Without the ability to identify what data is required to inform decision-making, and therefore, access and use it, will remain limited.

Regarding the ERDF, it was found that the biggest difference in perspective between those involved in its allocation and those not involved, is with regard to how respondents think the use of data would bring about effects in developing more credible and acceptable regional development policies. Of those not involved with ERDF allocation, 35% considered that it would have an effect, but only 18% of those involved in ERDF allocation shared this opinion.

# Annexes

## Annex 1: European stakeholder survey

**BID-REX survey:** How is biodiversity data used in decision-making processes at a regional (sub-national) scale across Europe?

*This is a European-wide survey aimed at gaining insight and understanding into the biodiversity information needs of decision makers. The focus is on decision-making at a regional (sub-national) level, and therefore primary recipients have been asked to distribute to their national contacts that may use, or have potential to use, biodiversity data at this scale. 'Use' in this context includes data collation, interpretation, management, presentation etc.*

*The theme of the survey is the accessibility and availability of robust and structured biodiversity data, with an underlying objective of understanding how biodiversity information is used in decision-making processes. This seeks to support the development of a better data infrastructure across Europe.*

*Additional consideration is given to the use of biodiversity information in decision-making processes related to the management (including allocation) of European Regional Development Funds (ERDF), as the improvement in the management of these EU funds is a main objective of Interreg Europe projects.*

*In summary, there are 6 sections: A. Description of respondent, B. Use of data, C. Use of data tools, D. Data perceptions, E. Data needs, F. European Regional Development Fund. The survey should take 15-20 minutes.*

*Note to user: Whenever the word 'data' is used, this refers specifically to biodiversity data. Biodiversity data is defined as any information relating to ecosystems, habitats and species, as well as their distribution over space and/or time.*

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### A. DESCRIPTION OF RESPONDENT

1. Name of organisation?
2. What are your main roles and responsibilities within this organisation?
3. Which country and region, if applicable (e.g. Oxfordshire, Wallonia, Catalonia), do you work in?
4. We may want to carry out some follow-up interviews with particular respondents. If you were amenable to this, we would be grateful if you could share your name and email address.
5. Define the organisation that you are representing?
  - Public body (e.g. Government agency/department)
  - Academic/research institution
  - Non-governmental organisation
  - Consultant/advisor
  - Private sector

- Other (please specify)
6. At what scale do you work? (can tick more than one)
- Global
  - Multi-national (e.g. European, Mediterranean etc.)
  - National
  - Regional (sub-national) (e.g. Oxfordshire, Wallonia, Catalonia etc.)
  - Local/municipality level
  - Other (please specify)
7. Are you directly involved in the management or allocation of European Regional Development Funds or other European Funds linked to nature conservation (e.g. LIFE, EARDF)?
- Yes (please specify)
  - No

#### B. USE OF BIODIVERSITY DATA

8. Do you use/handle data in any capacity?
- Yes
  - No
9. How frequently do you use data?
- Daily
  - Weekly
  - Monthly
  - Several times per year
  - Once a year
  - Less than once a year
10. How necessary is data in order for you to carry out your work?
- Critical
  - Important
  - Useful
  - Dispensable/unnecessary
11. With regards to data, how would you describe yourself? (can tick more than one)
- Primary data collector (e.g. field data collection)
  - Producer (e.g. using primary data to develop modelled/extrapolated/proxy datasets)
  - Collator
  - Coordinator
  - Interpreter
  - Distributor
  - User (i.e. analysis)
  - User (i.e. decision maker)Other (please specify)
  - Other (please specify)
12. What type of data do you work with? (can tick more than one)
- Habitat
  - Spatial

- Temporal (e.g. species trends)
  - Taxonomic (e.g. species)
  - Biophysical
  - Protected areas
  - Trade
  - Other (please specify)
13. What do you do with the data? (can tick more than one)
- Mapping (e.g. GIS, spatial analysis etc.)
  - Baseline inventories
  - Reporting (specifically EU reporting obligations)
  - Database creation
  - Statistical analysis
  - Indicator development
  - Modelling
  - Interpretation
  - Presentation/communication
  - Decision-making
  - Other (please specify)
14. At what scale are you using data to inform decisions?
- Global
  - Multi-national (e.g. European, Mediterranean etc.)
  - National
  - Regional (sub-national) (e.g. Oxfordshire, Wallonia, Catalonia etc.)
  - Local/municipality level
  - Other (please specify)
15. From where do you source most of your data? (can tick up to three)
- Local/regional biological data/records centre(s) or local species monitoring organisations
  - National government data provider(s)
  - European Environment Agency (incl. EUNIS, Nature 2000 Network Viewer, etc.)
  - NGO source (e.g. BirdLife, UNEP-WCMC, GBIF)
  - Other (please specify)
16. Do you do anything to counter biases you might find within any secondary-use data you use? (e.g. Use multiple datasets etc.)
- Yes (if so, please specify)
  - No
17. Do you have any influence on the way this data is collected/collated in order to suit your needs?
- Yes (please specify)
  - No
18. Do you use data to inform decision-making, and if so, at what stage of the process do you use it? (please tick all that apply)
- I do not use data in decision-making

- Targeting
- Scoping
- Monitoring
- Evaluation
- Policy
- Programme
- Other (please specify)

19. Do you bring data together from multiple sources, if yes please give details on the integration process you employ (e.g. name of software)?

- Yes (please specify)
- No

### C. USE OF DATA TOOLS

20. Do you use data management/decision-support tools to aid visualisation, analysis, or interpretation of data (e.g. INSPIRE/Nature 2000 Network Viewer/locally developed tool(s) etc.)?

- Yes (please specify)
- No

21. Do you use any freely available/shared data from other regions/European countries through shared data portals?

- Yes (please specify)
- No (please give reasons for not using these datasets e.g. unaware of its existence/data available is not relevant to my field of work)

22. Do you provide data to any shared data portal(s) (e.g. GBIF, EuroBirdPortal) offering open source data to other users?

- Yes (please specify)
- No

23. Do you use or contribute to any discussion forums regarding data use/data for decision-making?

- Yes (please specify/give details of how they benefit you)
- No

24. Do you think the currently available suite of information-sharing/decision-support tools are adequate/suit your needs?

- Yes
- Not sufficiently aware of tools available
- No (please specify any improvements that you would like to see)

### D. DATA PERCEPTIONS

25. What do you perceive as strength(s)/weakness(es) in terms of current data use at the scale at which you work? (can tick more than one box)

- Mapping (GIS etc.)
- Baseline inventories
- Reporting (e.g. EU reporting obligations)

- Database creation
  - Statistical analysis
  - Indicator development
  - Presentation/communication
  - Modelling
  - Other (please specify)
26. Reasons for strengths/weaknesses of current data use at the scale at which you work?  
(can tick more than one box)
- Availability
  - Accessibility
  - Data management/infrastructure
  - Quality/resolution
  - Completeness (i.e. enough parameters within datasets)
  - Time series
  - Technical capacity
  - Cost to use
  - Other (please specify)
27. Please give a short description of any Europe-specific case studies of best practices in data management/accessibility/availability that you are aware of? (e.g. cross-border data sharing, freely available data management infrastructure software, local/regional/national records centre etc.) (short paragraph answer)
28. Do you think the use of data in your decision-making processes does, or would, improve the acceptance and credibility of decision-making processes?
- Yes
  - No
29. Please give details of any examples of the impacts the use of data has had in any decision-making processes in your region that you have been involved in or are aware of (short paragraph answer):

#### E. DATA NEEDS

30. What limitations are there to the use of data within your decision-making processes?  
(can tick more than one)
- Do not need it to inform my work
  - Poor availability/accessibility of data
  - Expense (e.g. data/resource costs)
  - Time pressures
  - Technical expertise lacking
  - Other (please specify)
31. What would improve the data landscape at the scale within which you work to better suit your needs? (can tick more than one)
- Better data management infrastructure
  - Higher resolution data
  - More complete datasets (parameters)

- Larger scale data
- Longer time series within currently available datasets
- Improved technical capacity in handling data
- Improved technical capacity in analysing data
- Improved integration/compatibility of datasets from different sources to inform specific decisions
- Improved ability to provide reliable and specific results from data analysis that directly inform decision-making process
- Nothing
- Other (please specify)

32. Please identify any technical capacity gaps that may be limiting the use of data in decision-making processes at the scale at which you work (Can tick more than one):

- Identification of data required to inform specific decisions/ develop policy instrument
- Mapping (GIS etc.)
- Database creation
- Data analysis and interpretation
- Indicator development
- Presentation/communication
- Modelling
- Other (please specify)

33. If you are a data provider, what do you think might increase the uptake of this service? (can tick more than one)

- I do not provide data
- Improved accessibility/availability for users
- Improved completeness/resolution/time series of current datasets
- A better match between the data and policy-related decision-making
- Open-source
- Subsidised costs
- No improvements can be made
- Other (please specify)

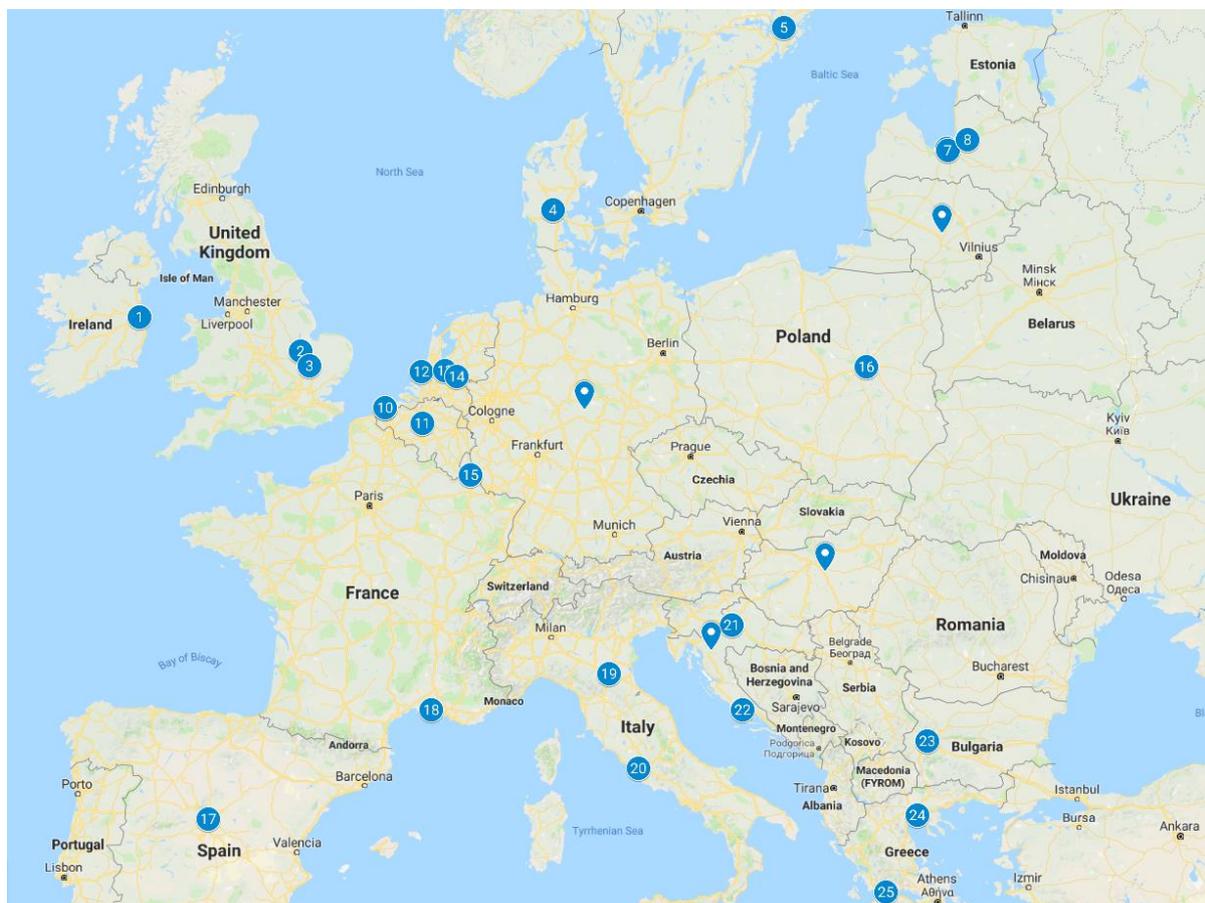
F. EUROPEAN REGIONAL DEVELOPMENT FUND (please answer questions 30 & 31 if you are NOT directly involved with ERDF allocation, please answer questions 32- 34 if you ARE) (doesn't require responses)

34. How would you assess the incorporation of data into decision-making processes related to regional development policies? (please tick all that apply)

- Insufficient incorporation
- Sufficient incorporation
- Directly impacts ERDF allocation
- Does not have sufficient impact on ERDF funding allocation
- Other (e.g. any particular parts of decision-making that could benefit from improved incorporation of data)

35. What effect(s) would the increased use of data have on ERDF allocation within your region? (you can tick more than one)
- Negligible impacts
  - More efficient regional development policies
  - More credible and acceptable regional development policies
  - Improved conservation projects/natural resource management
  - More targeted conservation funding
  - More equitable allocation of funds
  - Better coordination of ERDF allocation between regions
  - Better availability of impact indicators for the ERDF projects
  - Other (please specify)
36. What type of data do you use to prioritise natural resource conservation projects for the allocation of European Regional Development Funds? (can tick more than one)
- I do not use any data
  - Habitat
  - Spatial
  - Temporal (e.g. species trends)
  - Taxonomic (e.g. species)
  - Biophysical parameters
  - Protected areas
  - Trade
  - Other (please specify)
37. What effect does, or would, the use of data have on the allocation of European Regional Development Funds? (can tick more than one)
- Negligible impacts
  - More efficient regional development policies
  - More credible and acceptable regional development policies
  - Improved conservation projects/natural resource management
  - More targeted conservation funding
  - More equitable allocation of funds
  - Better coordination of ERDF allocation between regions
  - Better availability of impact indicators for the ERDF projects
  - Other
38. Regarding any projects that you are aware of, relating to natural resource conservation, please give information on any indicators (including their data source(s)) that are, or might be, used to monitor the project's progress and impact? (short paragraph response)

## Annex 2: Results from European stakeholder survey



Respondent organisations	
1	National Parks & Wildlife Service
2	Joint Nature Conservation Committee (JNCC)
3	UN Environment World Conservation Monitoring Centre
4	Naturstyrelsen
5	Brockmann Geomatics Sweden AB
6	Latvian Institute of Aquatic Ecology
7	Ministry of Environmental Protection and Regional Development of the Republic of Latvia
8	Dabas aizsardzības pārvalde
9	VLIZ
10	EMODnet Secretariat

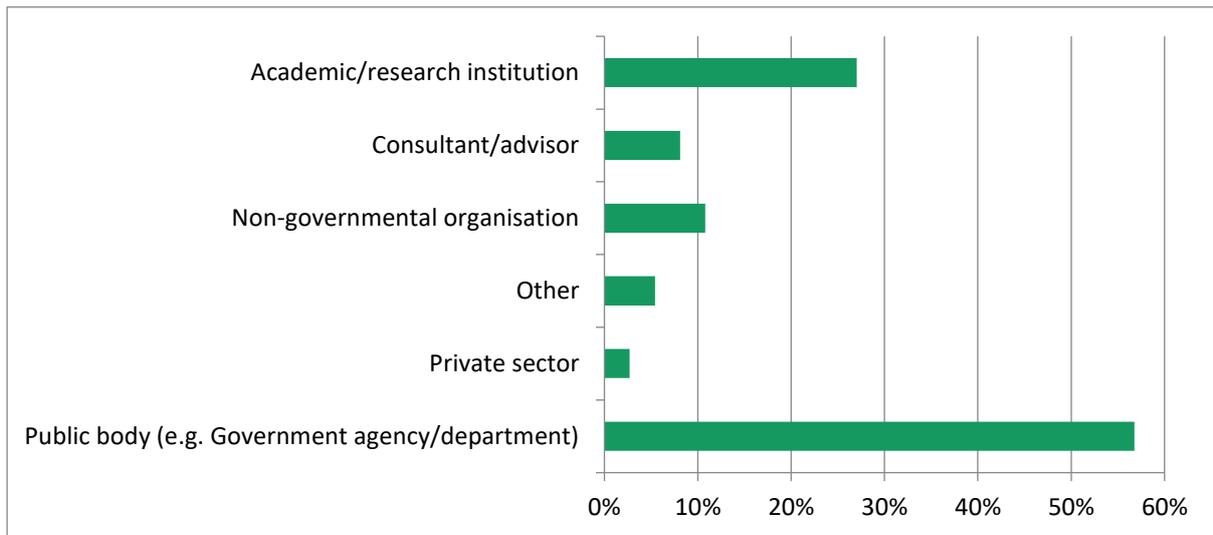
11	Agency of Nature & Forests, Belgium
12	Ministry of Agriculture, Nature and Food Quality, The Netherlands
13	National Institute for Public Health and Environment
14	Butterfly Conservation
15	Ministère du Développement Durable et des Infrastructures
16	Centrum UNEP/GRID-Warszawa, Zakład Narodowej Fundacji Ochrony Środowiska
17	Fundación Biodiversidad
18	Tower Du Valat
19	Alma Mater Studiorum - Università di Bologna
20	Ministry of Environment, Land and Sea
21	Croatian Agency for Environment and Nature (CAEN)
22	Institut za oceanografiju i ribarstvo
23	University of Forestry
24	Greek Biotope-Wetland Centre (EKBY)
25	Department of Biology, University of Patras
Respondent countries (with unspecified organisation)	
Hungary	
Germany	
Lithuania	
Croatia	

**Figure A1:** Map (and legend detailing organisation names where provided) showing distribution of respondents by country (Q.1: Name of organisation & Q.3: Which country and region, if applicable (e.g. Oxfordshire, Wallonia, Catalonia), do you work in?)

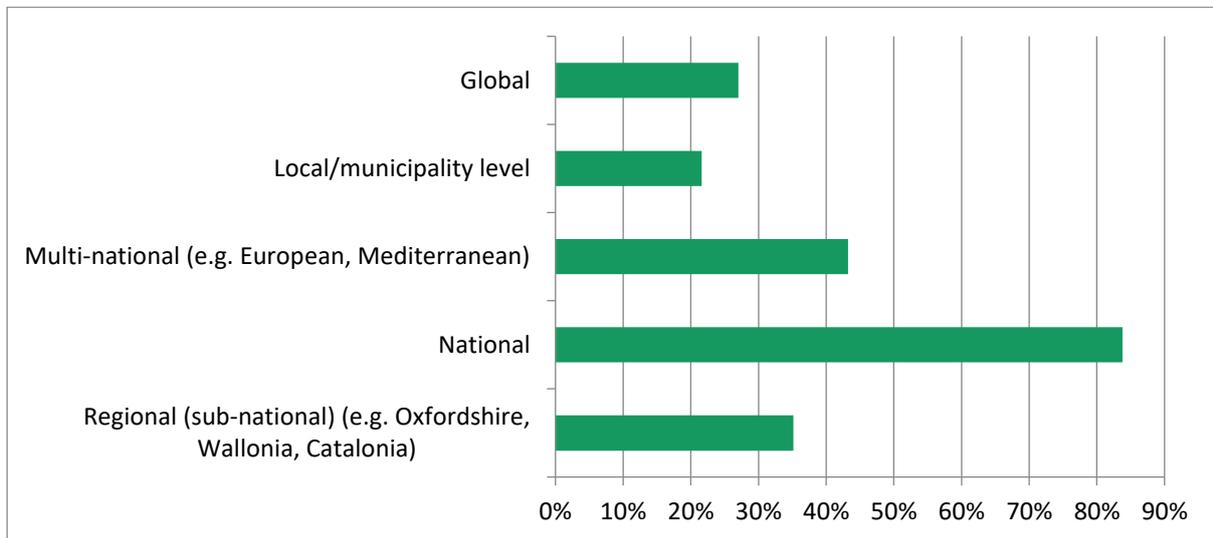
**Table A1:** Q.2: What are your main roles and responsibilities within this organisation?

Responses
Nature protection
Conduct R&D activities, create and maintain favourable conditions for research, elaborating national assessments and providing information for reporting (HD, BD, WFD, MSFD) in relation to marine biodiversity and MPAs, Project leader and coordinator of research projects related to biodiversity, indicator development, non-indigenous species and Ballast Water Convention

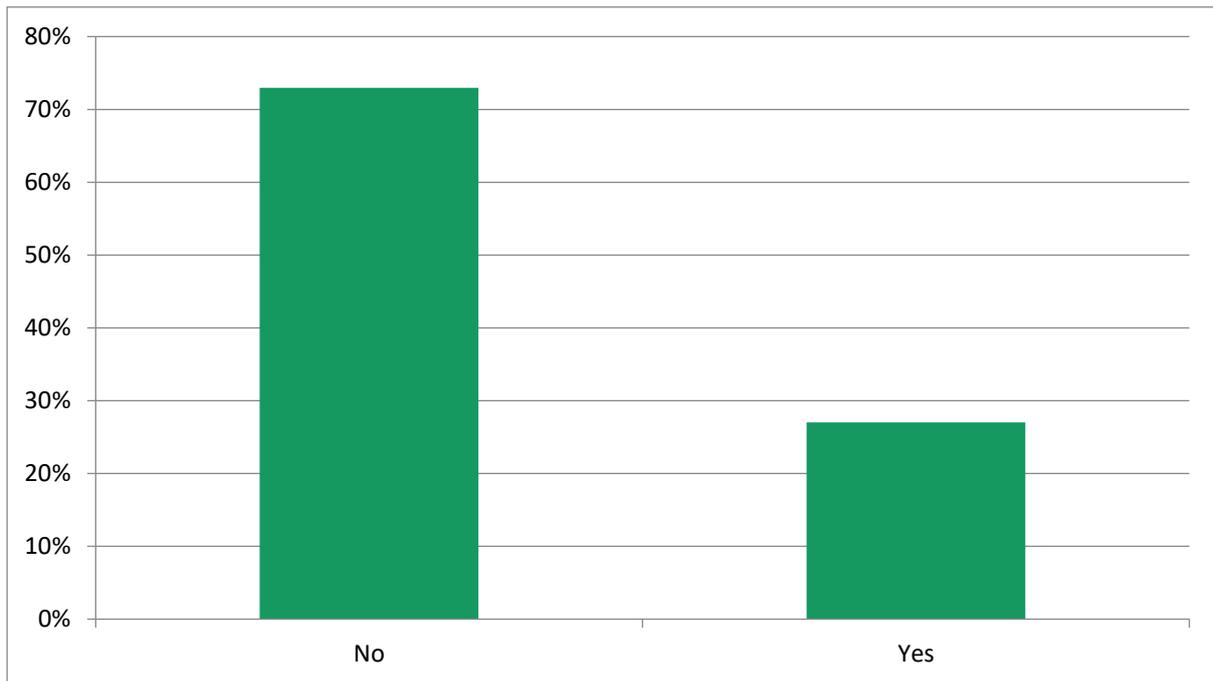
Researcher
Biodiversity informatics, data governance, reporting
Team leader, project manager
Chief Environmental Specialist
National Biodiversity Strategy
Forester at local forest district
Senior researcher
Coordinating the Mediterranean Wetland Observatory
Inventorisation; monitoring and assessing the state of nature; preparing expert base proposals for the protection of natural values; conserving parts of nature; establishing the conditions for nature protection; managing protected areas and the use of natural resources; developing expert base proposals for the assessment of acceptability of interventions in nature; reporting on the state of nature; participation in the implementation of international agreements on nature protection and organizing and implementing educational and promotional activities in nature protection.
Project manager
The Nature Conservation Agency ensures implementation of unified nature protection policy in Latvia. Main functions of Nature Conservation Agency: Management of all protected areas in Latvia; nature protection planning management and promotion of the plans; scientific research management in protected areas; carry out the cooperation with local authorities, tourism entrepreneurs, non-governmental organisations and education institutions to promote nature conservation;
Professor in silviculture
Official in the Nature Protection Directorate
Professor
I am a policy coordinator for a team which deals with species protection (national and international), as part of the Department on Nature and Biodiversity
Project officer at EMODnet Secretariat
Project manager, remote sensing application development
Inventory, monitoring and status assessment of species, habitats and ecosystems
Policy Officer Natura 2000
Issue expert
IOF is conducting a number of applied research activities, such as involving new species in aquaculture technologies, fish stock size assessment, evaluations of influence of fish and shellfish farms on the ecosystem, ecological impact assessment studies.
Project leader
Policy making, communication with citizens.
Head of Section "Inventory of Natural Areas"
Project coordinator of the Atlas Natural Capital
Head of Science and Biodiversity
Senior Ornithologist
Data Manager



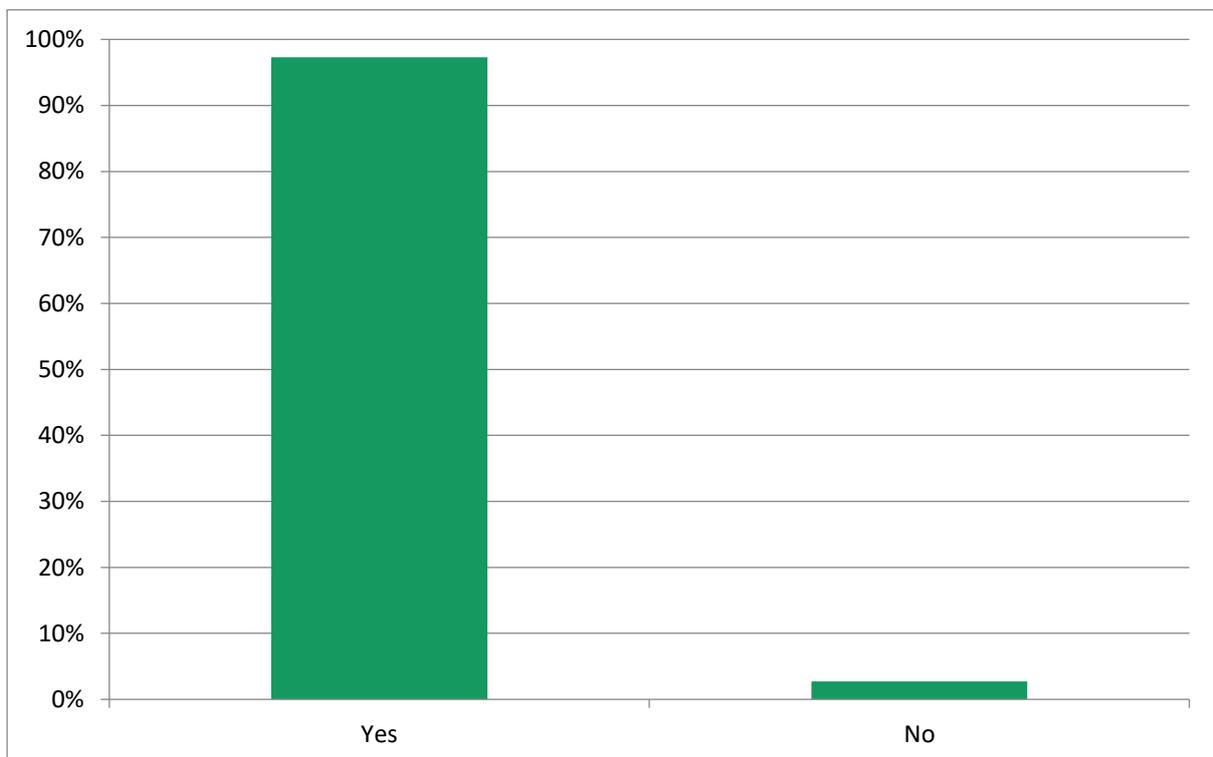
**Figure A2: Q.5: Define the organisation that you are representing?**



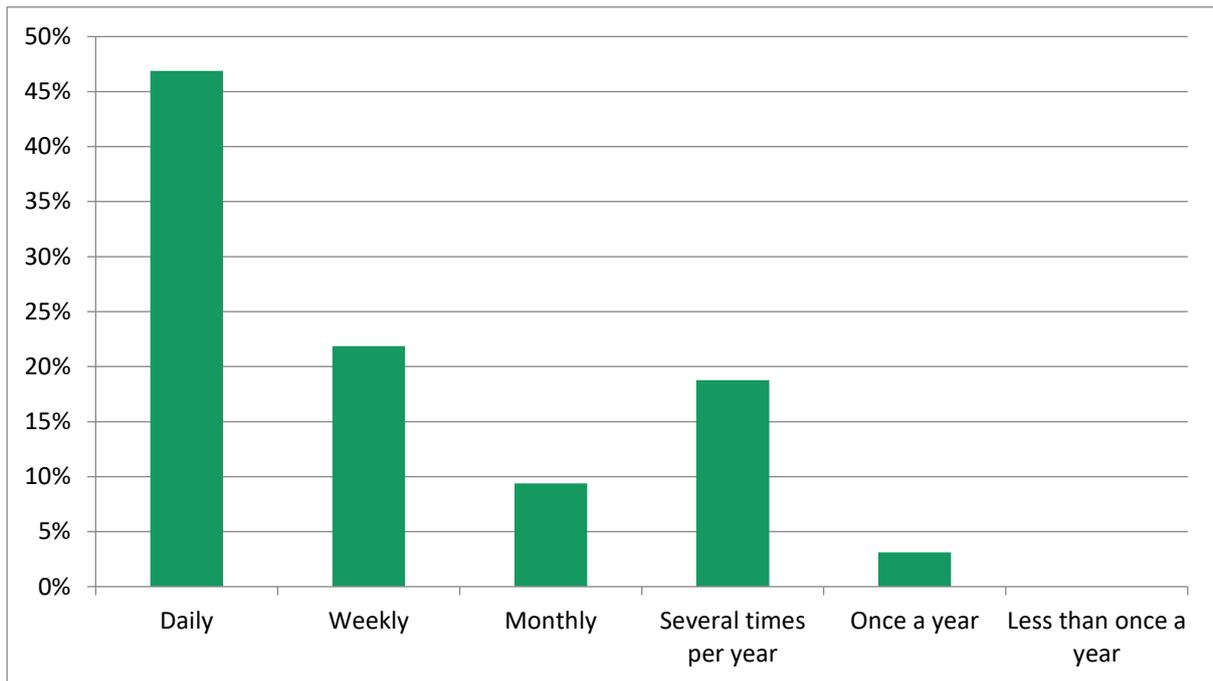
**Figure A3: Q.6: At what scale do you work?**



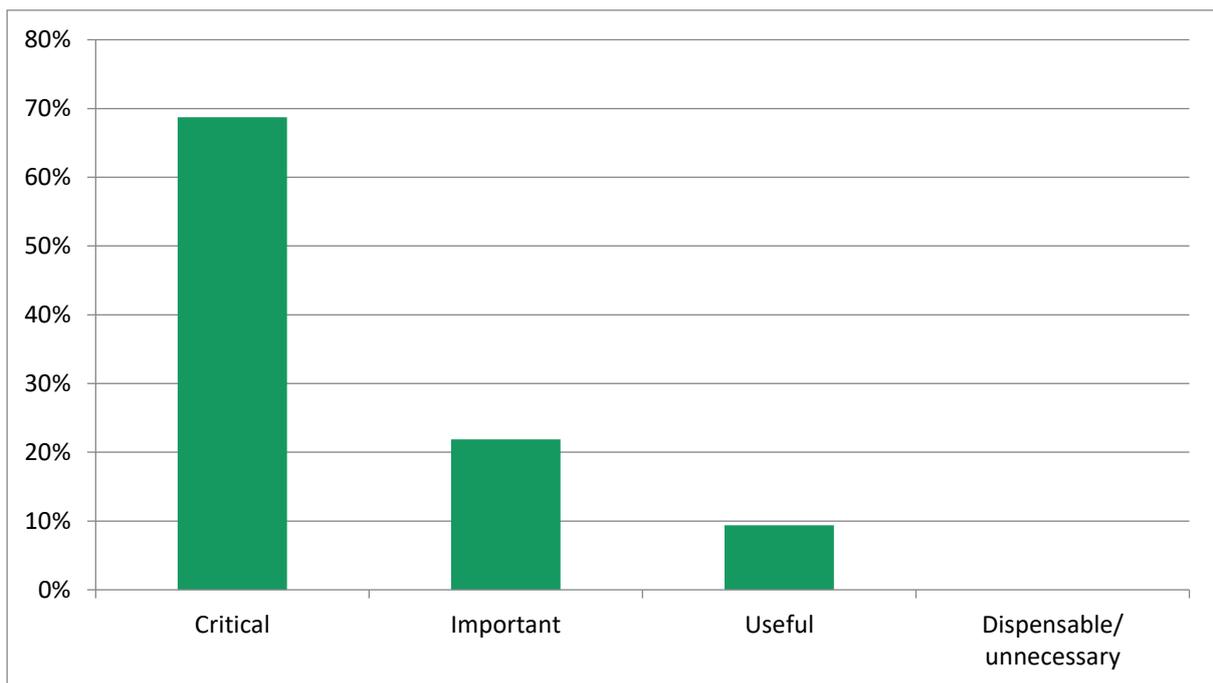
**Figure A4:** Q.7: Are you directly involved in the management or allocation of European Regional Development Funds or other European Funds linked to nature conservation (e.g. LIFE, ERDF)?



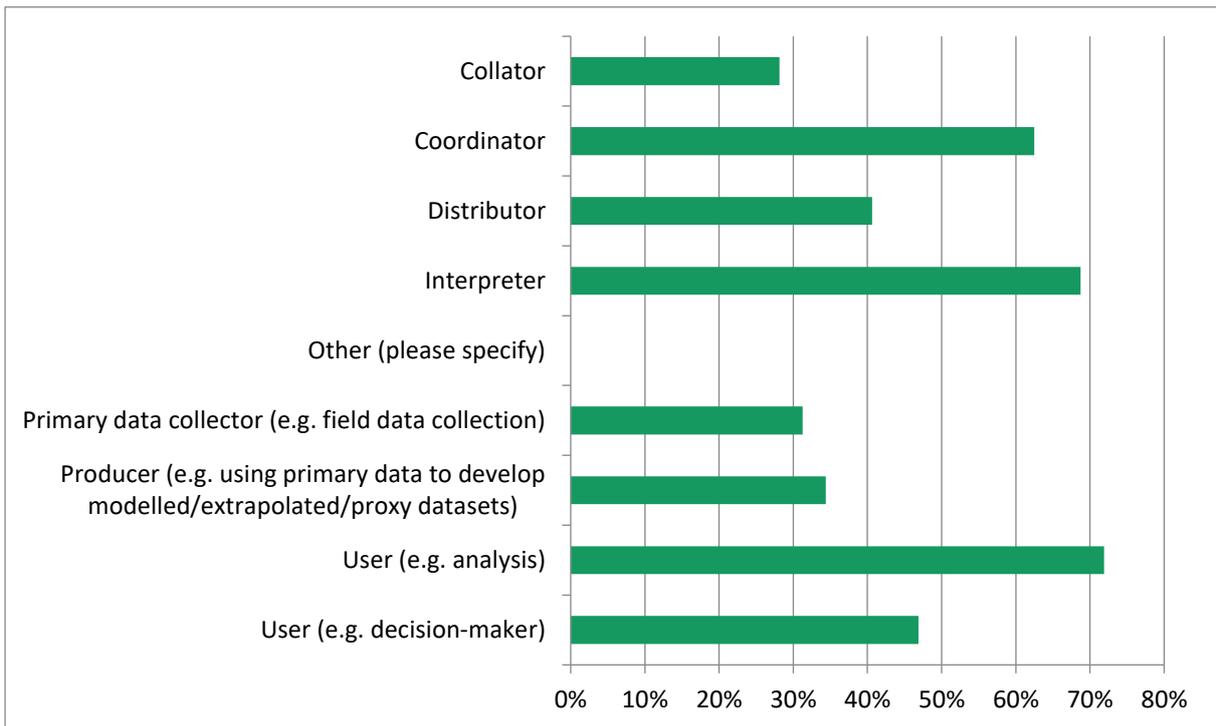
**Figure A5:** Q.8: Do you use/handle data in any capacity?



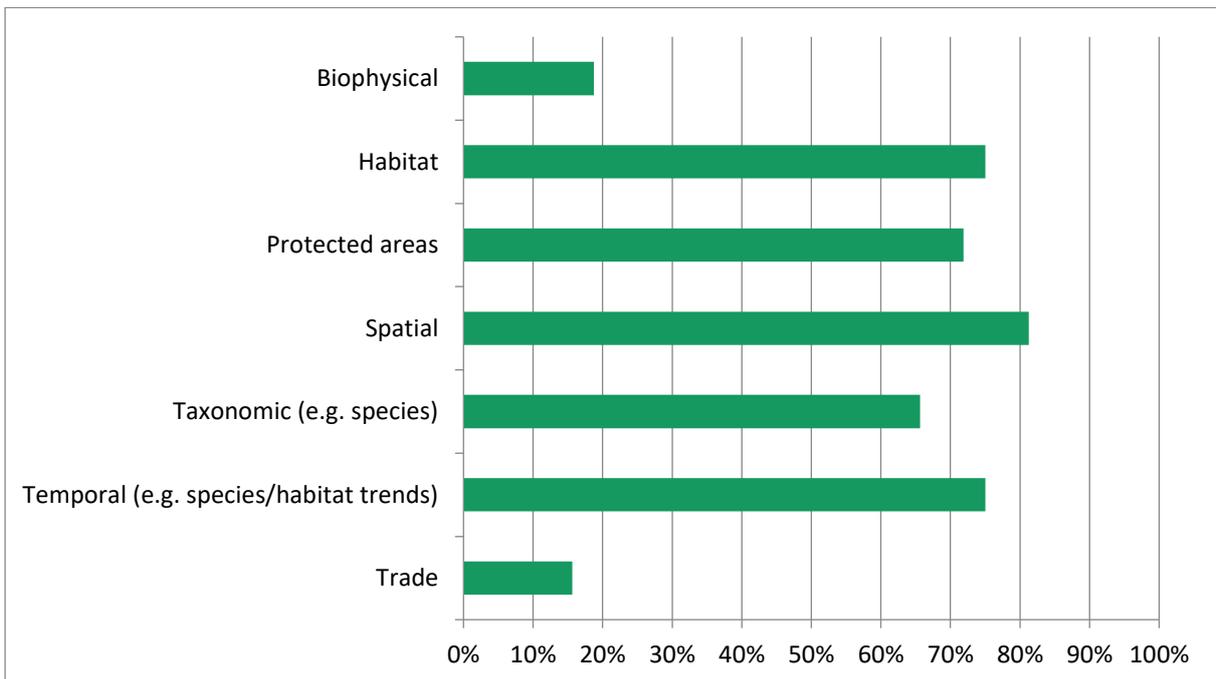
**Figure A6:** Q.9: How frequently do you use data?



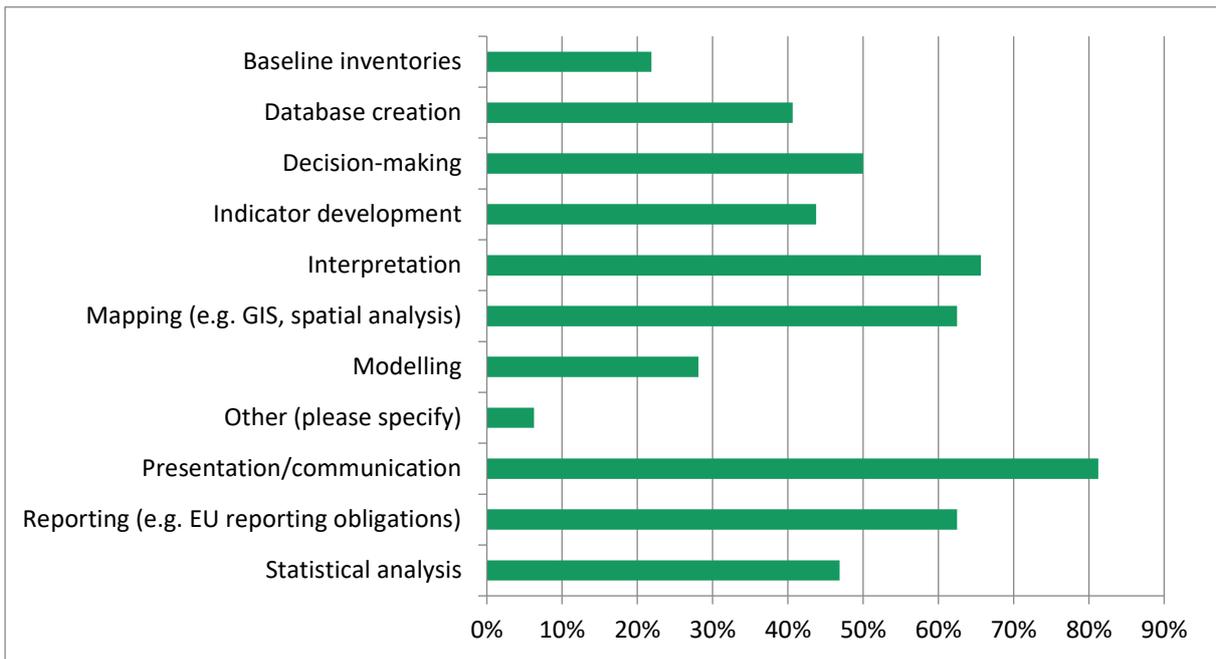
**Figure A7:** Q.10: How necessary is data in order for you to carry out your work?



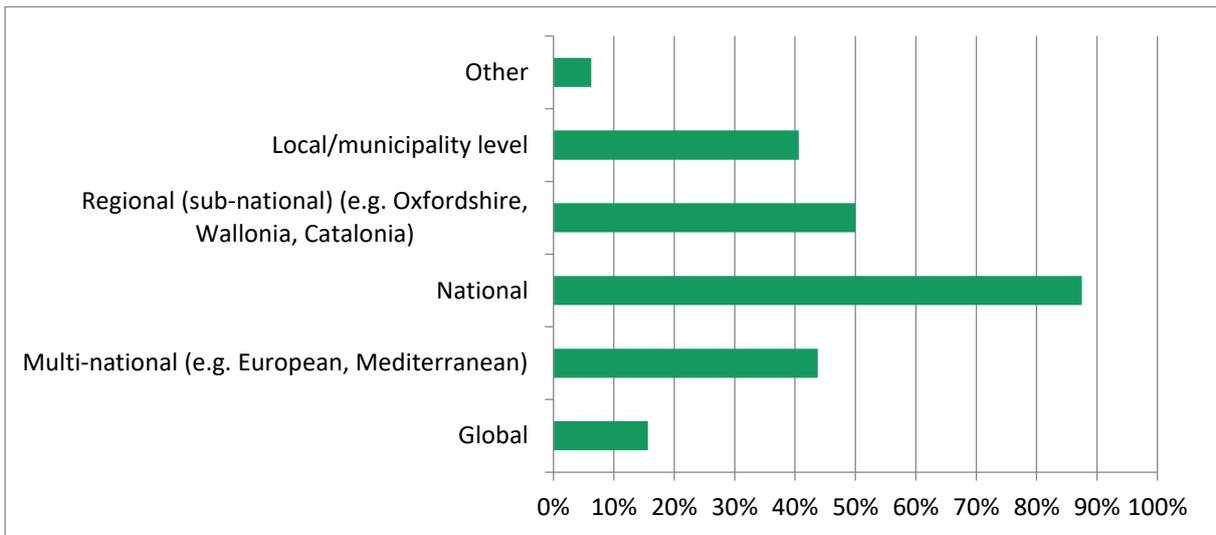
**Figure A8: Q.11: With regards to data, how would you describe yourself?**



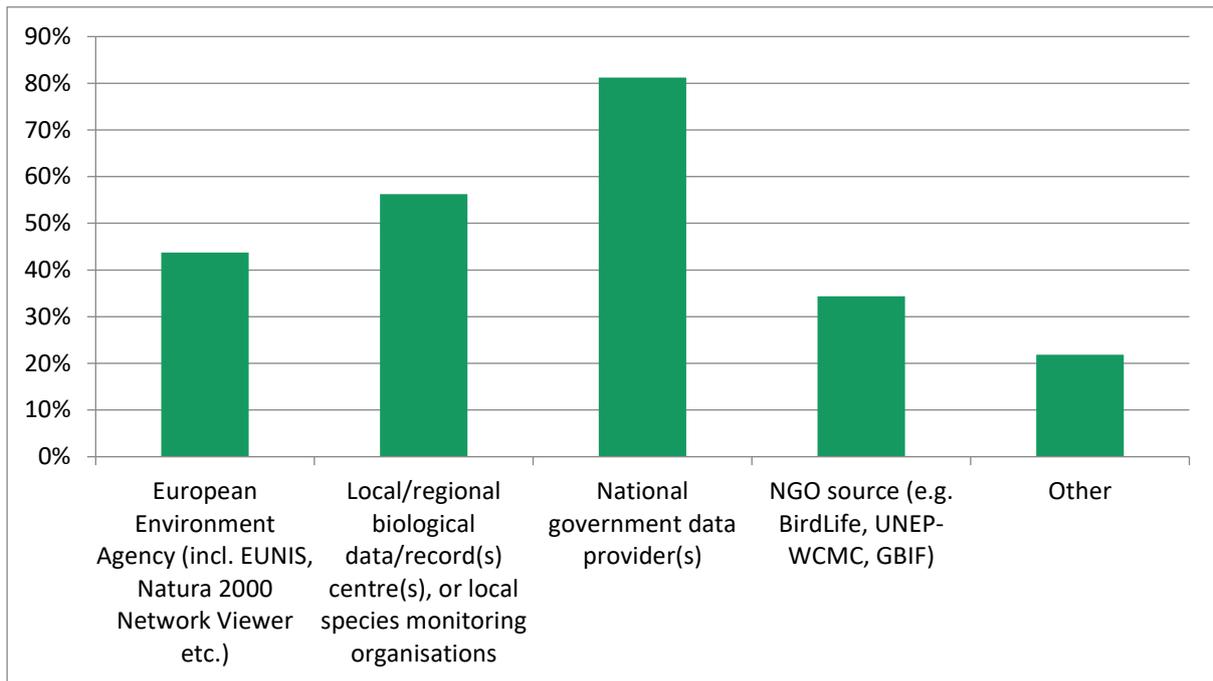
**Figure A9: Q.12: What type of data do you work with?**



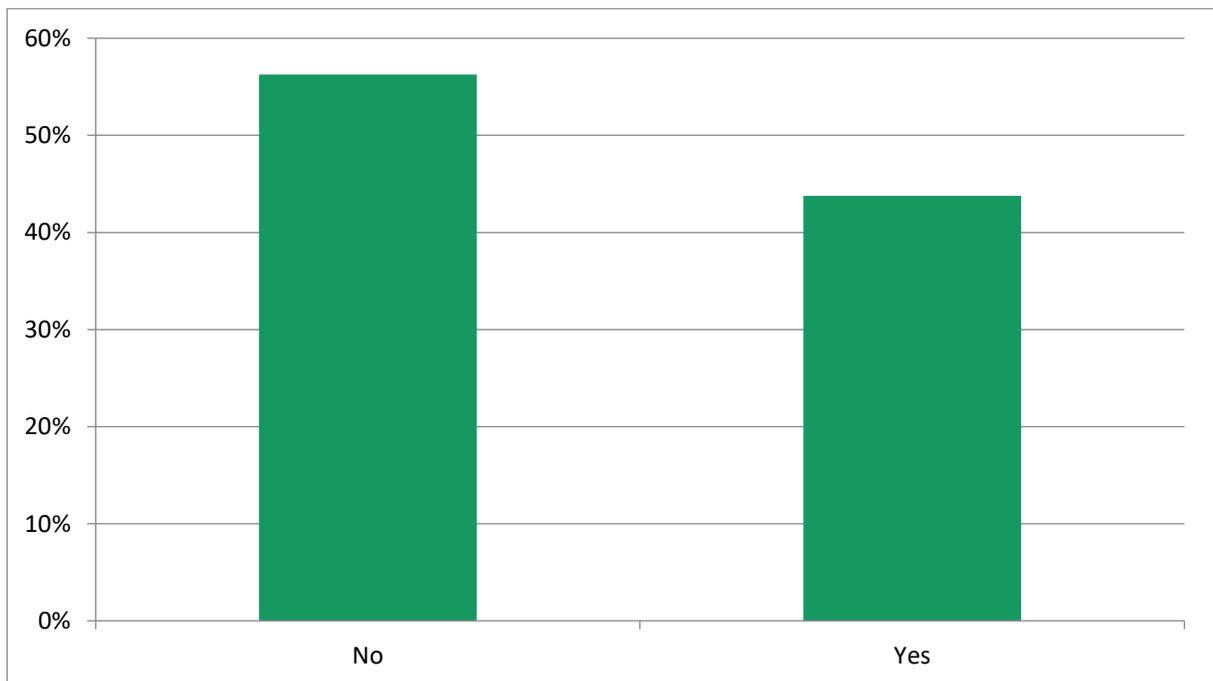
**Figure A10:** Q.13: What do you do with the data?



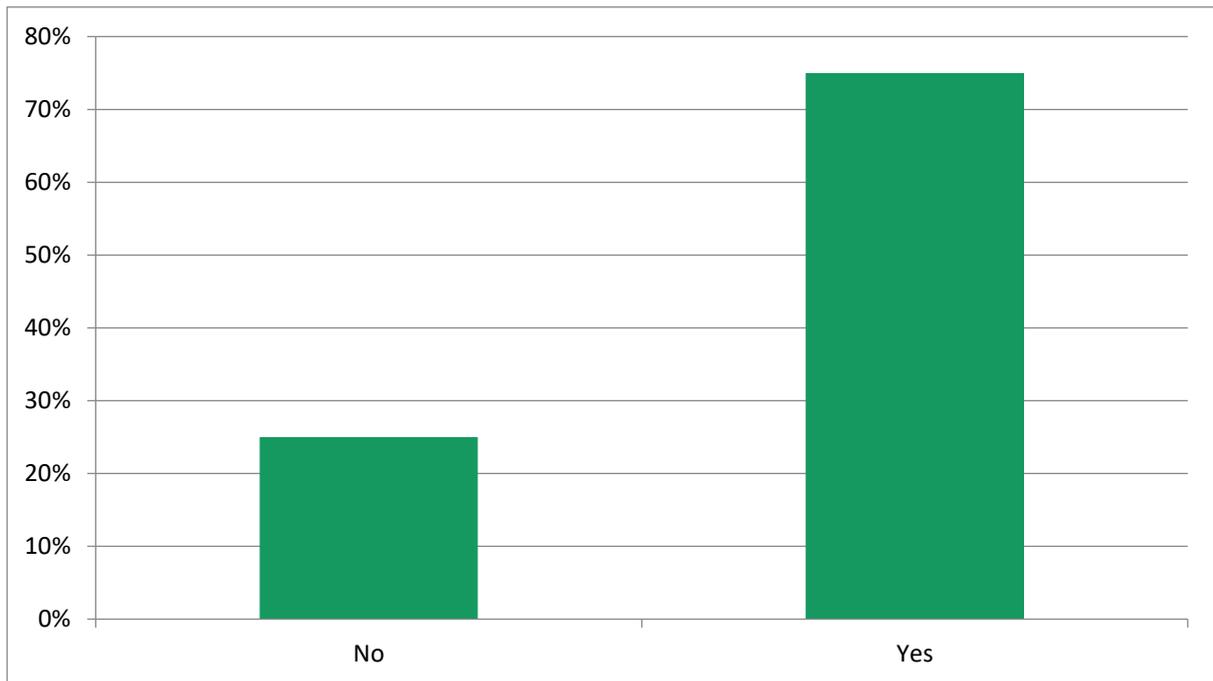
**Figure A11:** Q.14: At what scale do you use data to inform decision-making?



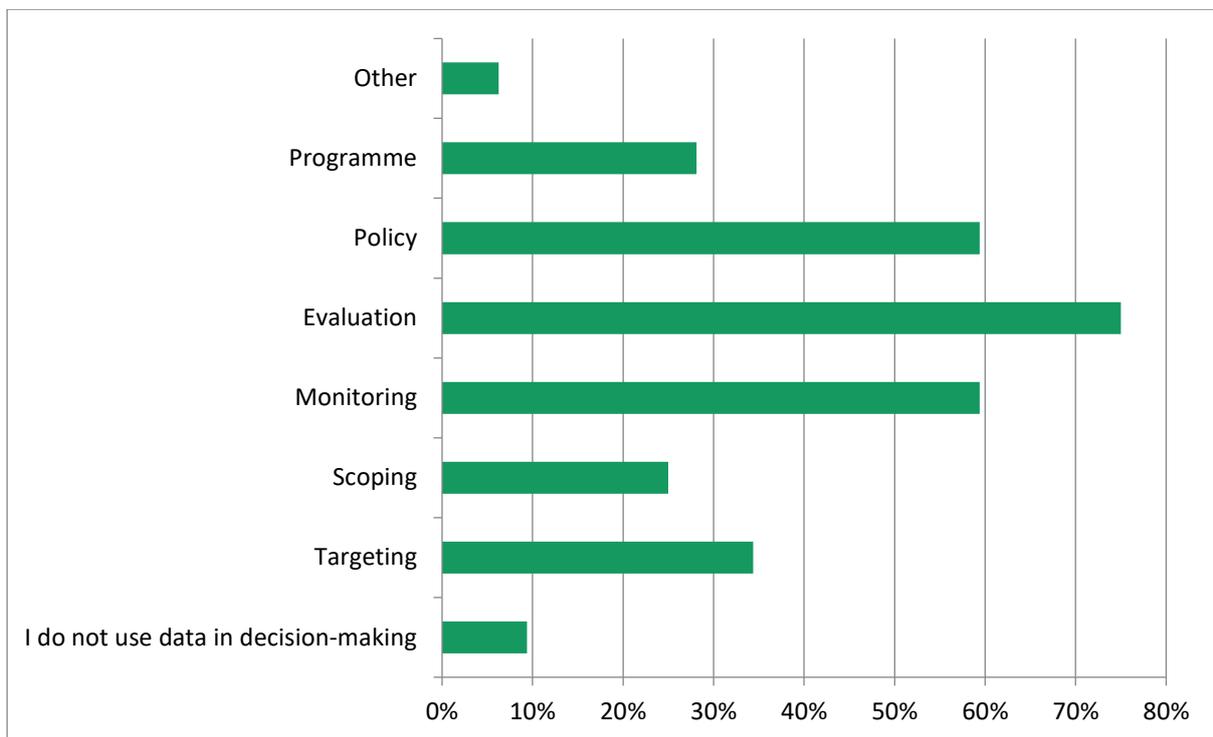
**Figure A12:** Q.15: From where do you source most of your data?



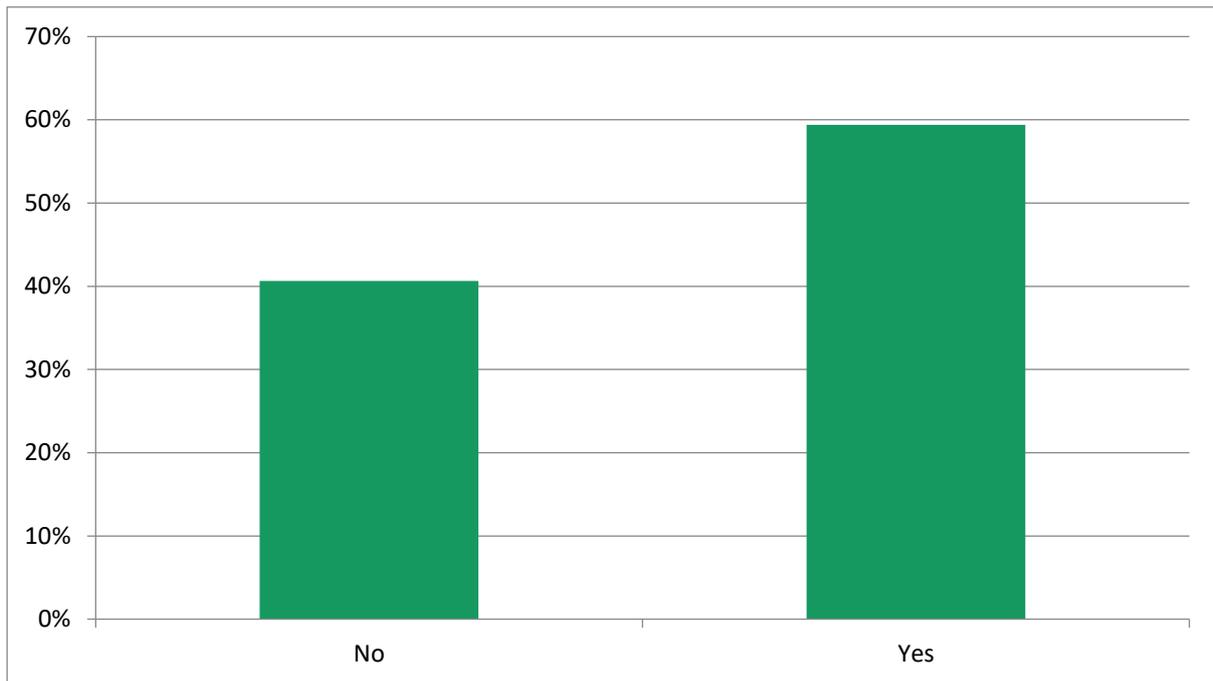
**Figure A13:** Q.16: Do you do anything to counter biases you might find within any secondary-use data you might use (e.g. integrate multiple datasets)?



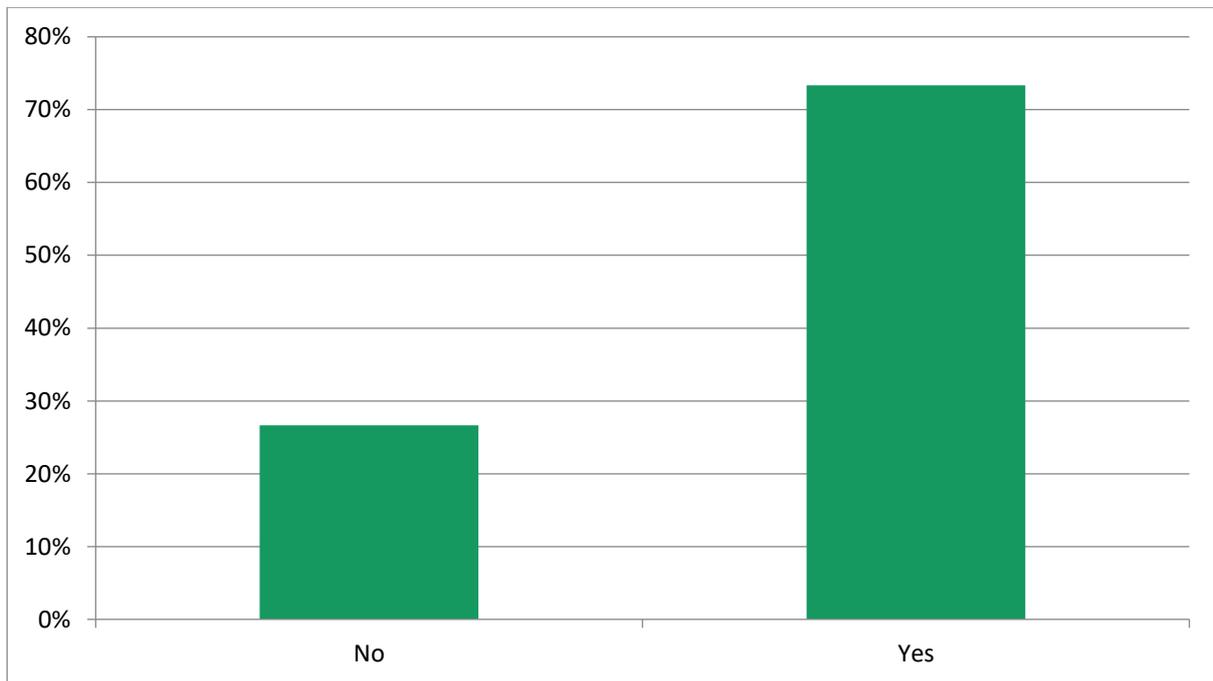
**Figure A14:** Q.17: Do you have any influence on the way this data is collected/collated in order to suit your needs?



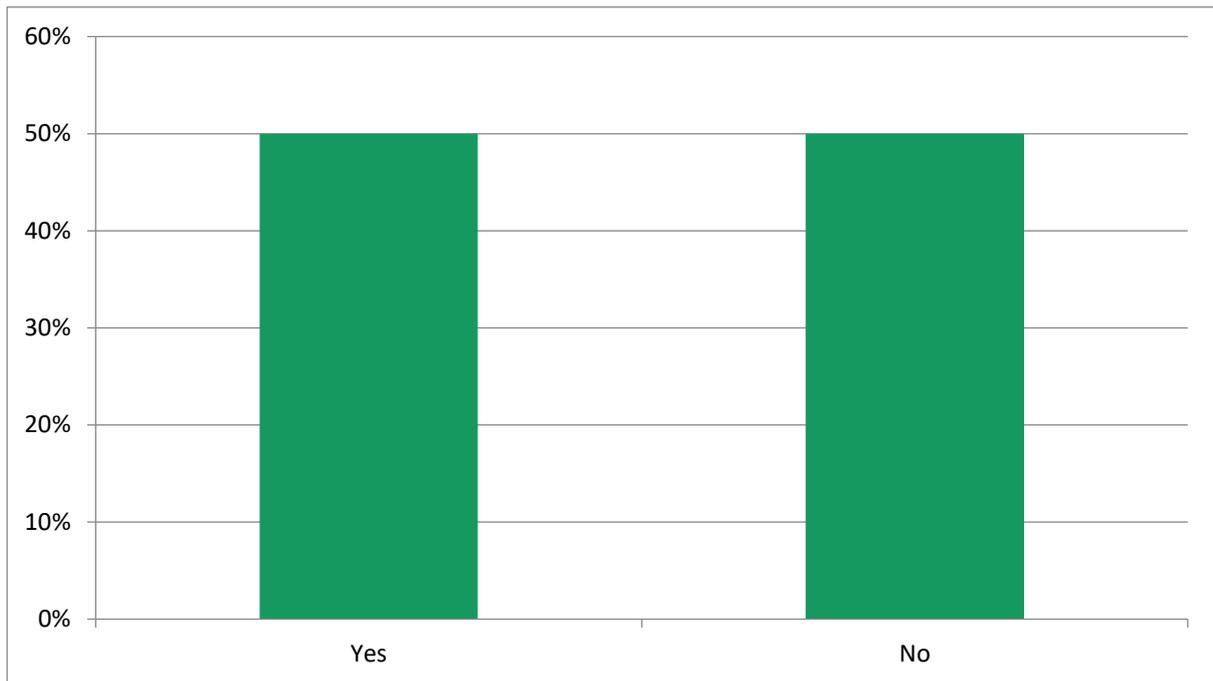
**Figure A15:** Q.18: Do you use data to inform decision-making, and if so, at what stage of the process do you use it?



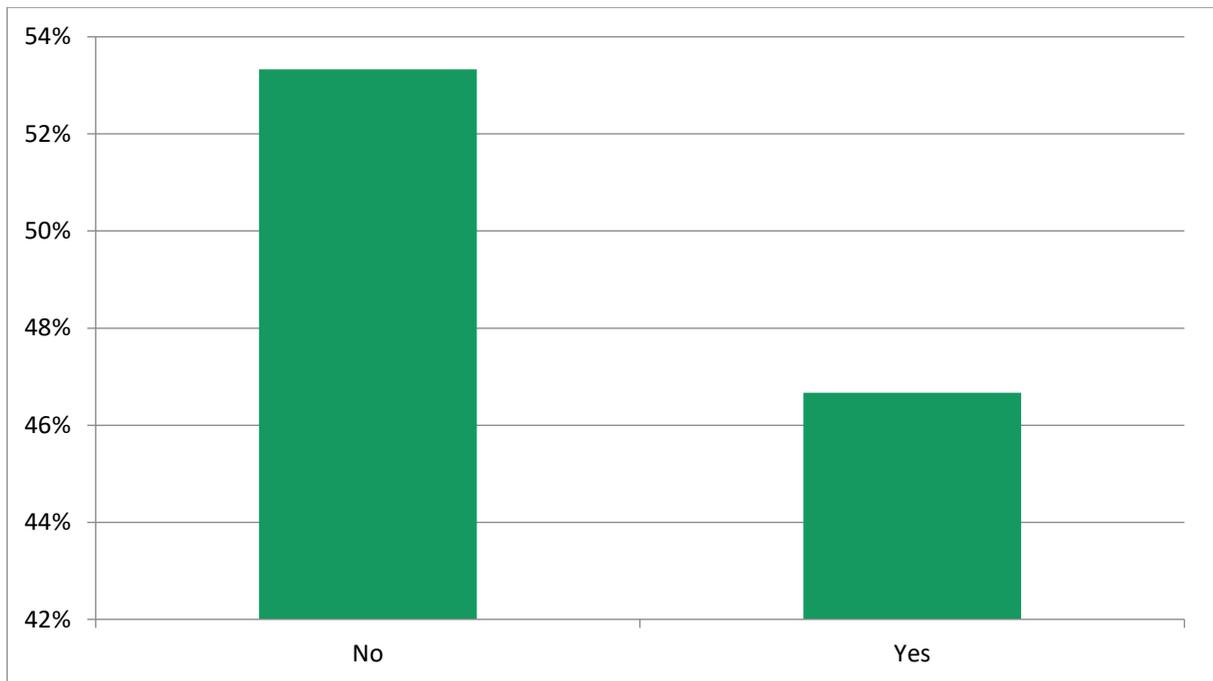
**Figure A16:** Q.19: Do you bring data together from multiple sources? If yes, please give details on the integration process you employ (e.g. name of software)



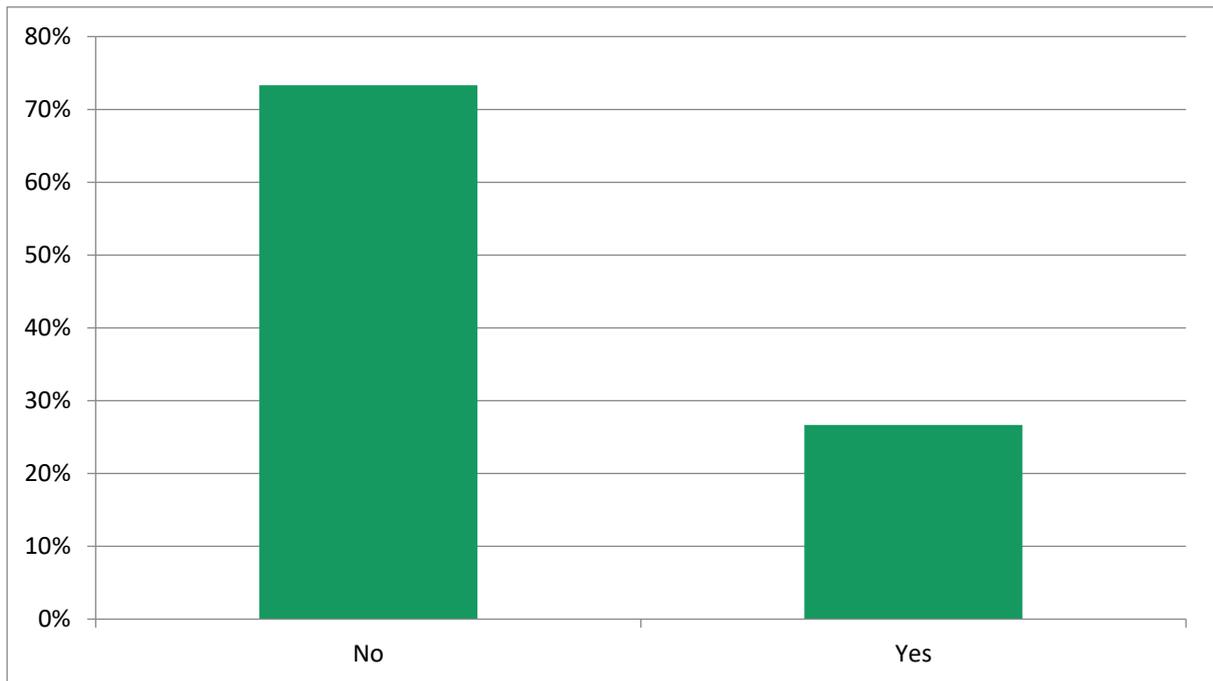
**Figure A17:** Q.20: Do you use data management/decision-support tools to aid visualisation, analysis or interpretation of data (e.g. INSPIRE, Natura 2000 Network Viewer, locally developed tools)?



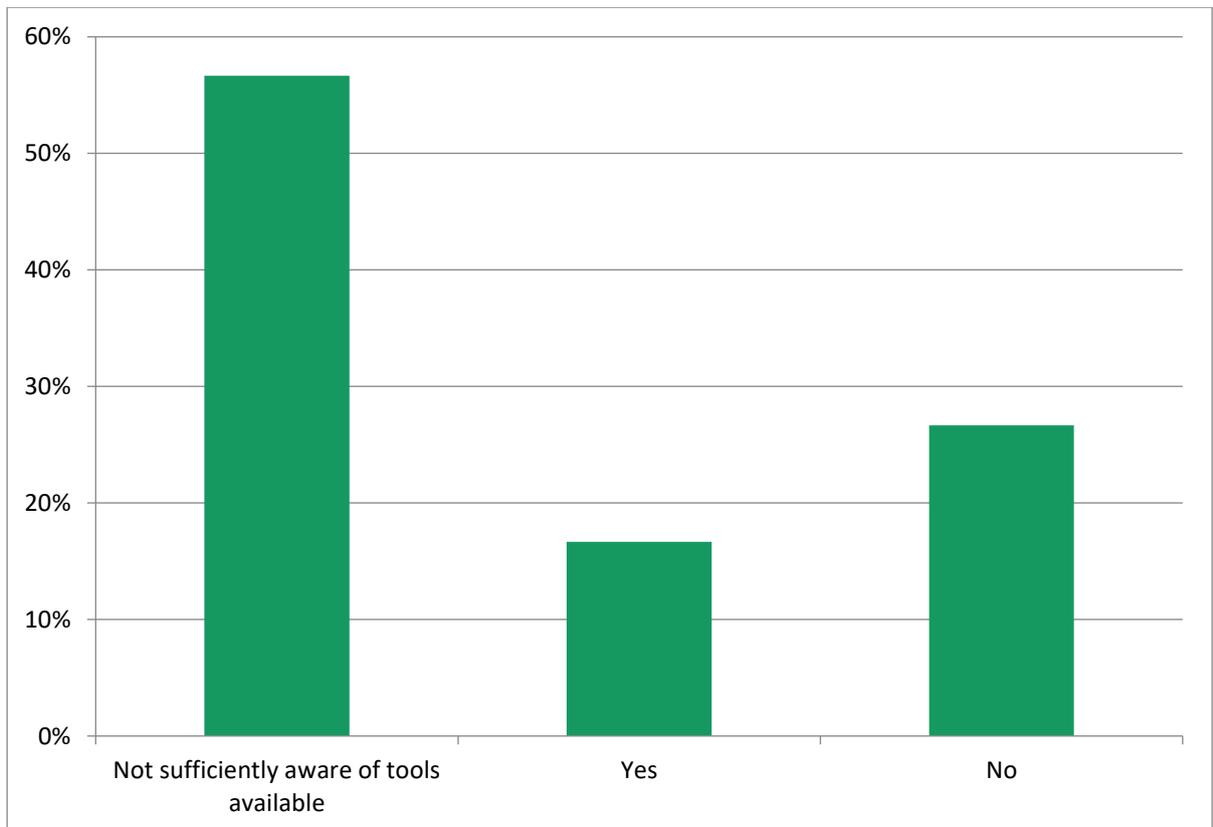
**Figure A18:** Q.21: Do you use any freely available data from other regions/European countries through shared data portals?



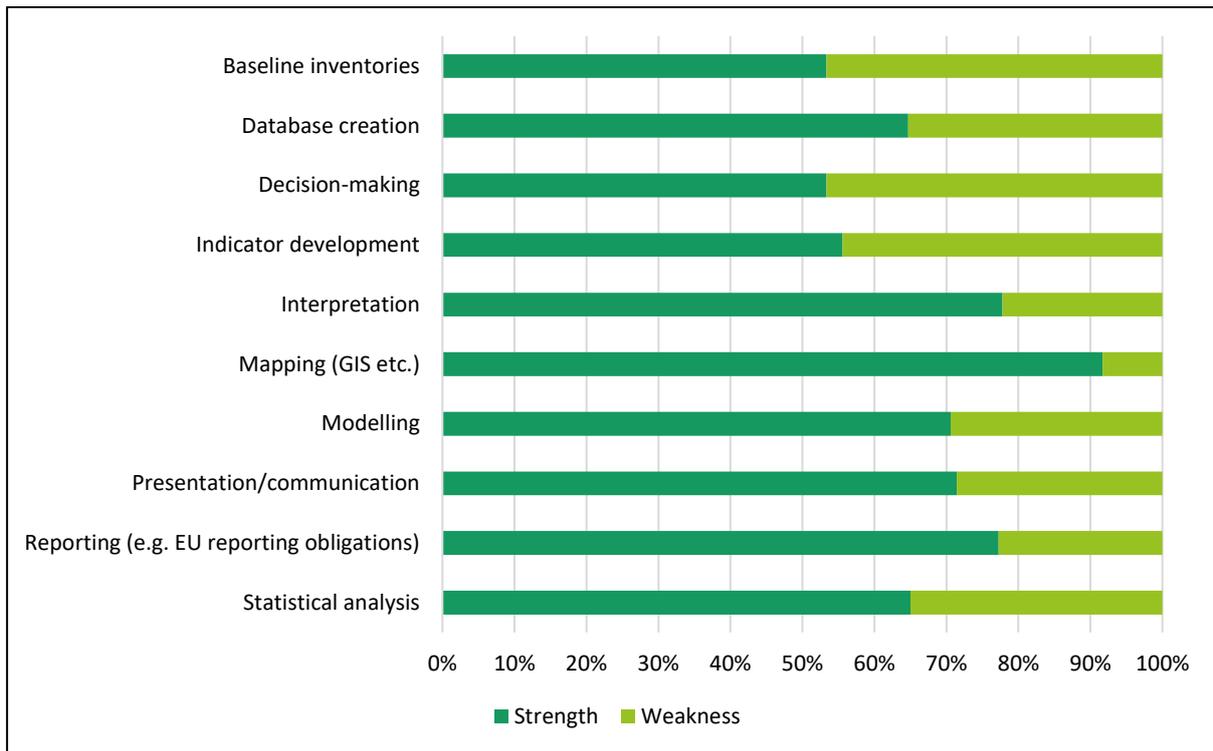
**Figure A19:** Q.22: Do you provide data to any shared data portal(s) (e.g. GBIF, EuroBirdPortal) offering open source data to other users?



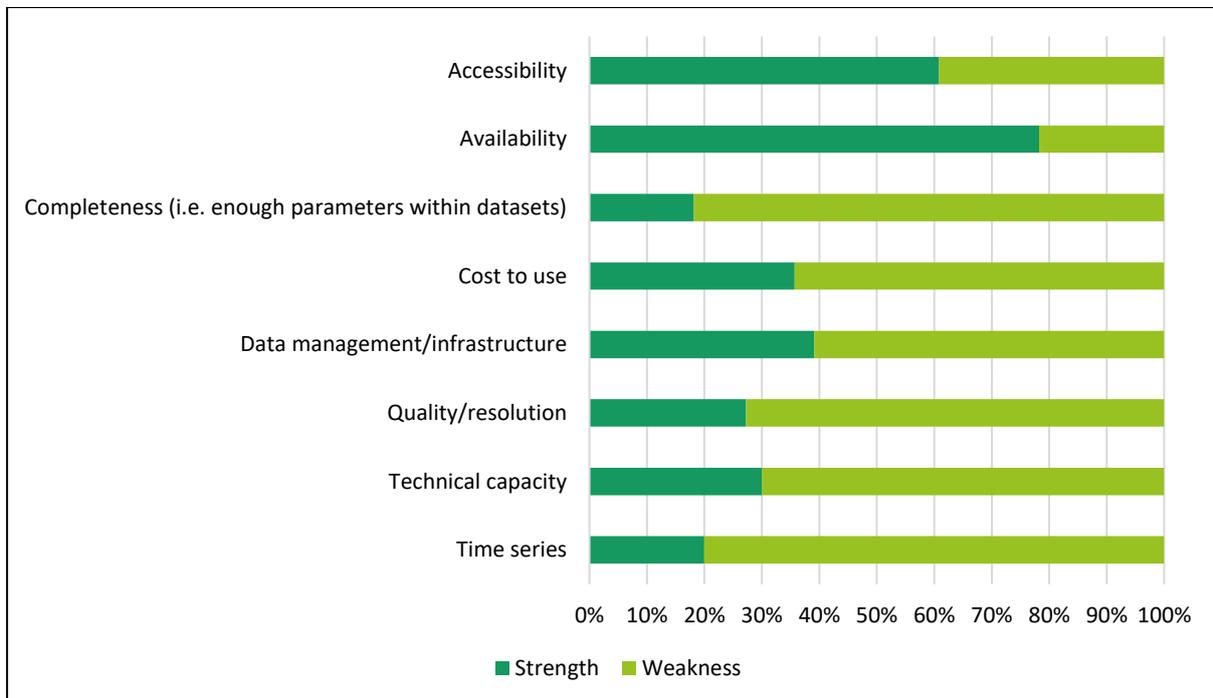
**Figure A20:** Q.23: Do you use or contribute to any discussion forums regarding data use/data for decision-making?



**Figure A21:** Q.24: Do you think the currently available suite of information-sharing/decision-support tools are adequate/suit your needs?



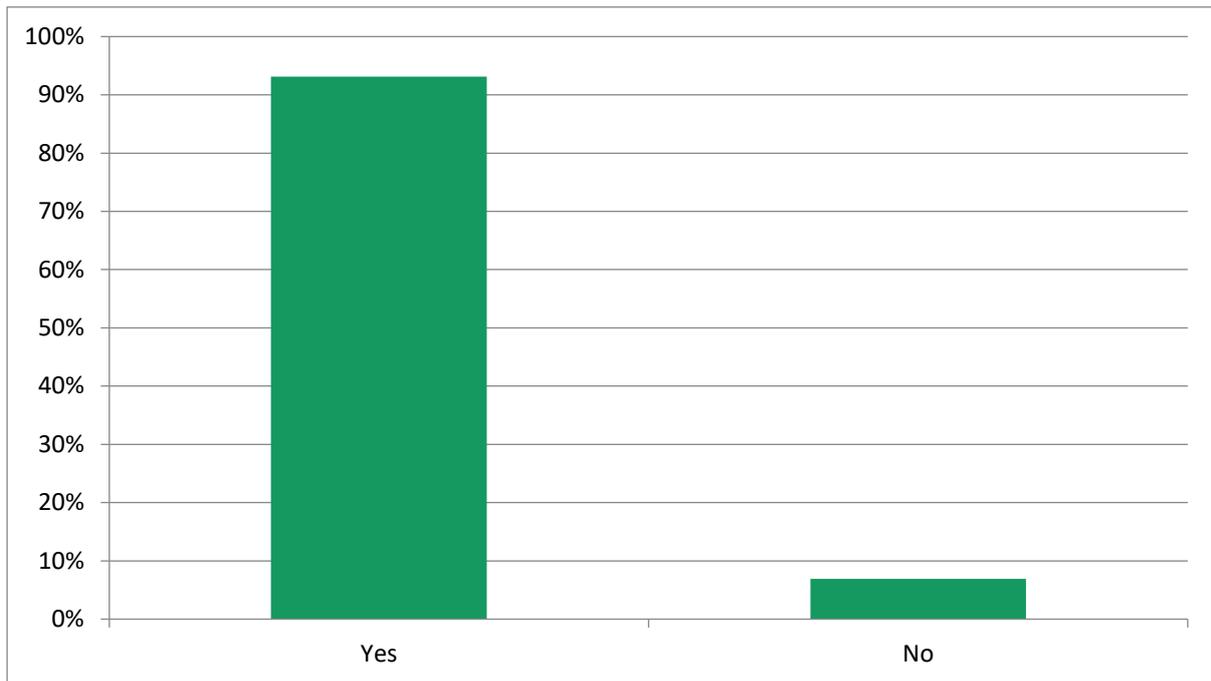
**Figure A22:** Q.25: What do you perceive as strength(s)/weakness(es) in terms of current data use at the scale at which you work?



**Figure A23:** Q.26: Reasons for strengths/weaknesses of current data use at the scale at which you work?

**Table A2:** Q.27: Please give a short description of any Europe-specific case studies of best practices in data management/accessibility/availability that you are aware of (e.g. cross-border data sharing, freely available data management infrastructure software, local/regional/national records centre).

Responses
HELCOM database
Natura 2000, National Biodiversity Data Centre (Ireland)
EEA, UNEP Live, National geoportal/s, COPERNICUS
Database of protected areas
Eionet: The European environment information and observation network (Eionet) aims to provide timely and quality-assured data, information and expertise for assessing both the state of the environment in Europe and the pressures and driving forces acting upon it. This enables policy makers to decide on appropriate measures for protecting the environment at national and European level and to monitor the effectiveness of existing policies and measures (source: <a href="https://www.eionet.europa.eu/">https://www.eionet.europa.eu/</a> ).
CLC, CLC+, Local component layers
MOTIVE (Models for Adaptive Forest Management) FP7 project
Monitoring and reporting ex art. 17 Habitat Directive, strength collaboration between Ministry of the environment, Regions, ISPRA and scientific societies
Corine
EMODnet is building a single entry point to marine data, including marine biodiversity data for Europe
SWOS, Globwetland Africa, GeoWetlands, EEA, ESA
It is not really "data" (but according to MDIAR beyond): portals with national reports of Member States: <a href="http://bd.eionet.europa.eu/article17/reports2012/">http://bd.eionet.europa.eu/article17/reports2012/</a> and <a href="http://bd.eionet.europa.eu/activities/Reporting/Article_12/Reports_2013">http://bd.eionet.europa.eu/activities/Reporting/Article_12/Reports_2013</a>
Natura 2000 viewer
GEO wetlands community portal, implemented within SWOS HORIZON 2020 project. <a href="http://portal.swos-service.eu/mapviewer/detail/1.html">http://portal.swos-service.eu/mapviewer/detail/1.html</a> <a href="http://www.atlasnaturalcapital.nl">www.atlasnaturalcapital.nl</a>
INPSIRE is a good example of creating data standards (though they can lose users in how technical the documents are). The Natura 2000 database, Articles 12 and 17 reporting obligations and their databases, Emerald database.

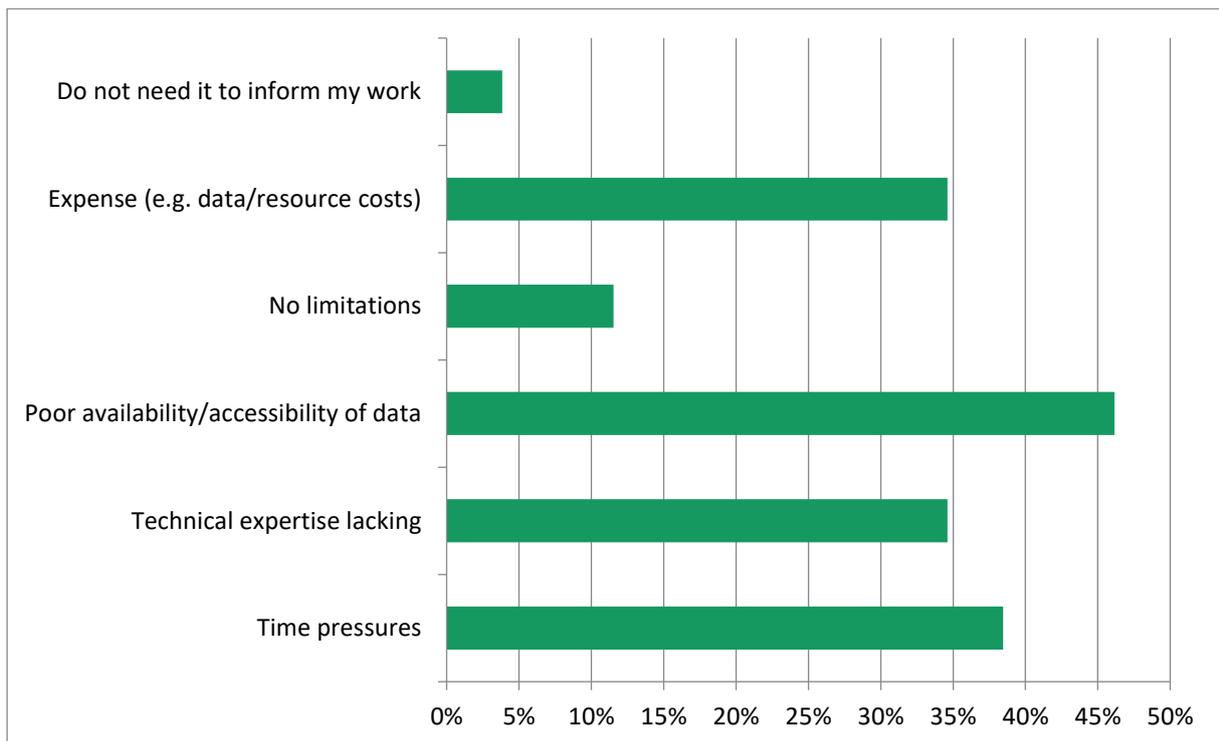


**Figure A24:** Q.28: Do you think the use of data in your decision-making processes does, or would, improve the acceptance and credibility of decision-making processes?

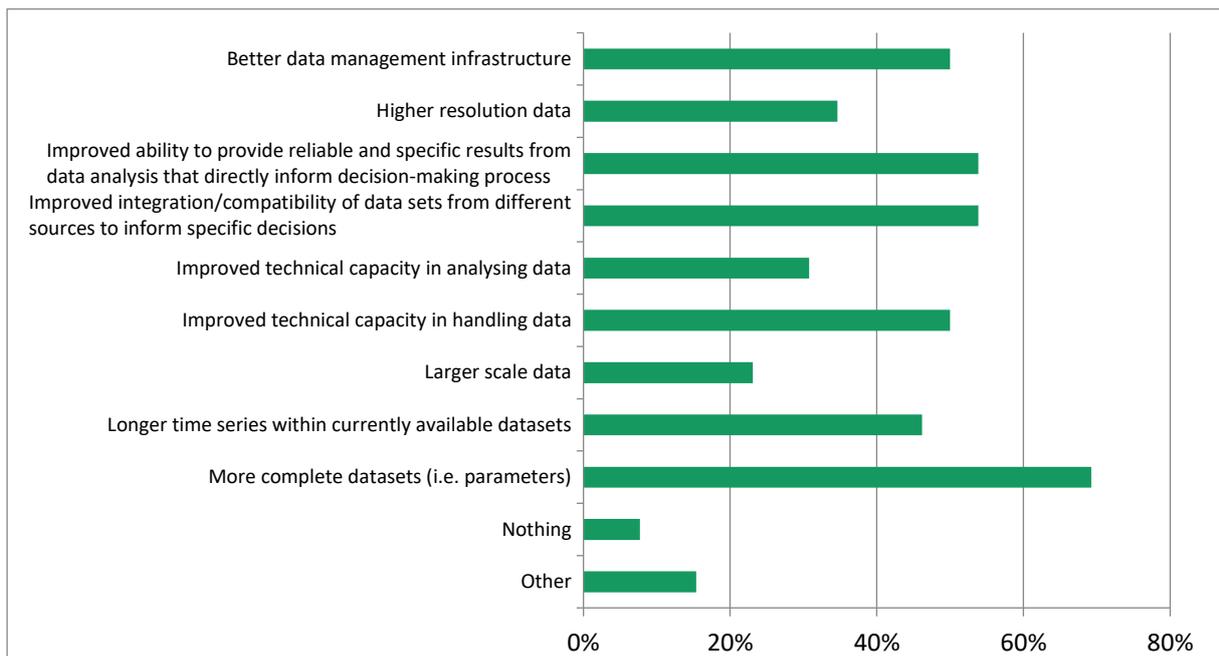
**Table A3:** Q 29: Please give details of any examples of the impacts the use of data has had in any decision-making processes in your region that you have been involved with, or are aware of.

Responses
The data about protected species/habitats distribution use for planning the use of land or making decisions relating other economic activities and etc.
Allocation of different territories in relation with Maritime Spatial Planning (for example, potential place for aquaculture)
Use of user-friendly geoportals with thematic data installed which can be used for nature conservation and spatial planning at the local and regional level.
Identification of SPA's and national protected areas; Municipality development plans
Make Biodiversity Strategy of Greece, a State Law
Ministry for environment protection and energy provided money to obtain the habitat mapping of non-forest habitats in the republic of Croatia. I was a technical assistant of the ministry responsible for checking the quality of the result. After the production of the map, based on data collected in the field we suggested the changes which should be done in the list of Croatian habitats in general and the protected once and base on this suggestion new order is published
EU Rural Support Payments for permanent and ecological grasslands depend on spatial and ecological information about EU grassland habitat.
Introducing a requirement to leave a certain amount of dead wood in forests
I don't know a specific example; in general we use this kind of data in policy discussions and decisions on all kinds of subjects, including red Lists for certain species groups
<a href="http://www.emodnet.eu/operational-zooplankton-data-service-long-term-monitoring-programme">http://www.emodnet.eu/operational-zooplankton-data-service-long-term-monitoring-programme</a>
National funds have been directed towards preservation and restoration works because of Natura 2000 highlight of needs for habitat protection to preserve biodiversity.

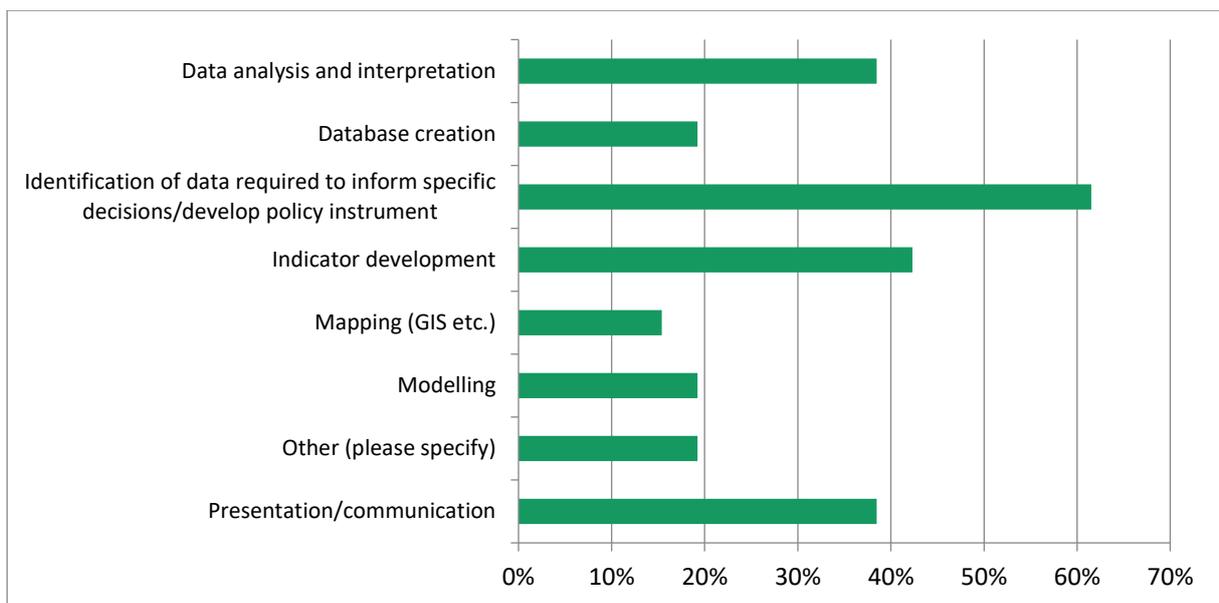
Designation of Natura 2000 sites, making of management plans for Natura 2000 sites
Natura 2000 information
Improvement of management plans of protected areas.
We are working on NBS in urban environment. We estimate the societal benefits in Euros. The results show the value of NBS for human health and well-being.
Analysis of Natura 2000 sites for Bio-geographical seminars led to creation of new sites. Analysis of Article 12 & 17 data informed the direction of EU biodiversity policy. Currently using the WDPA we track progress towards global biodiversity targets.



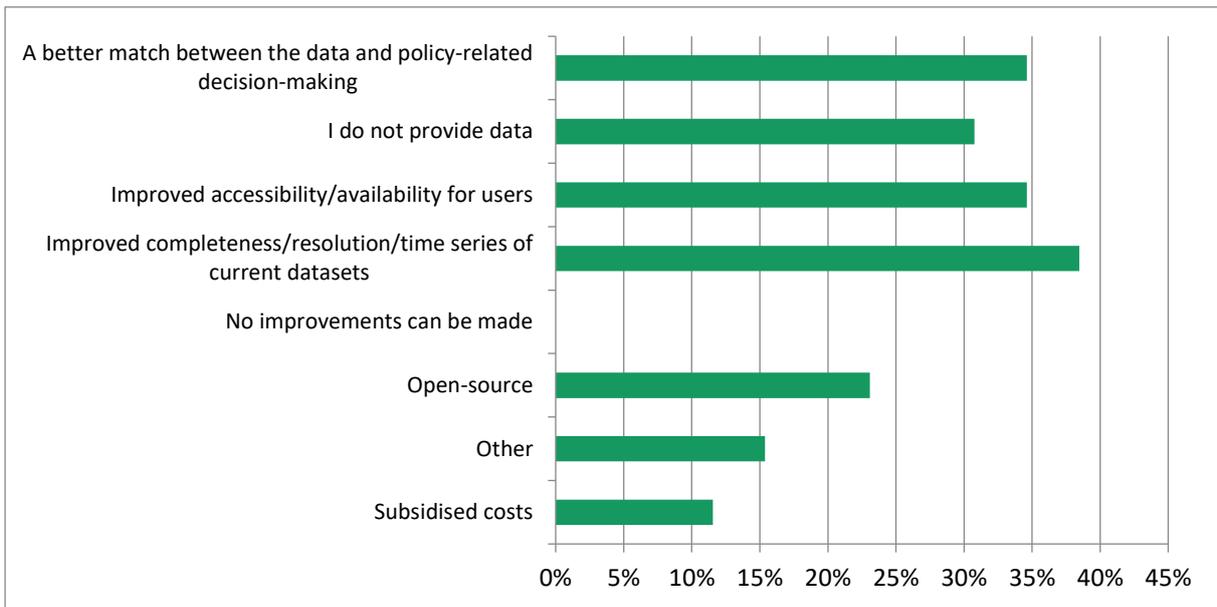
**Figure A25:** Q.30: What limitations are there to the use of data within your decision-making processes?



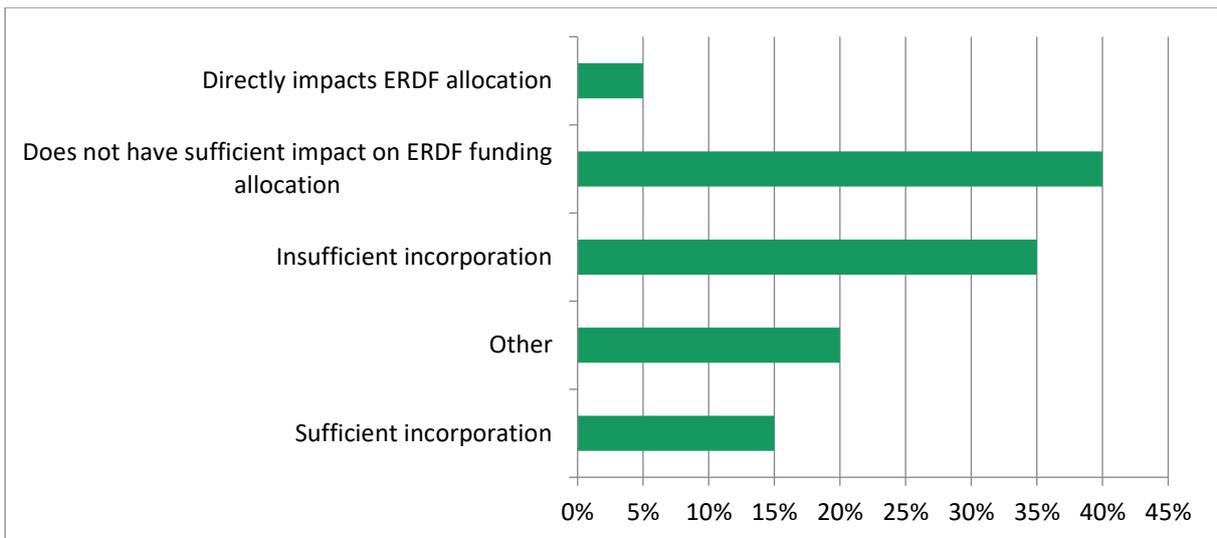
**Figure A26:** Q.31: What would improve the data landscape at the scale within which you work to better suit your needs?



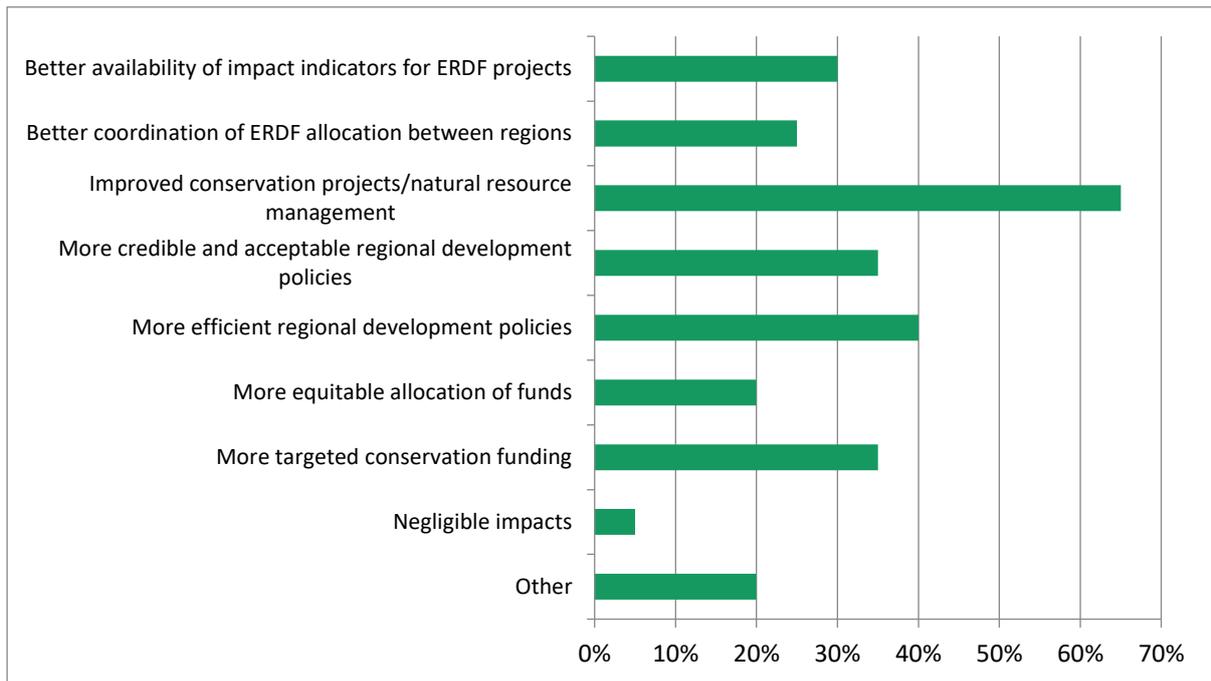
**Figure A27:** Q.32: Please identify any technical capacity gaps that may be limiting the use of data in decision-making processes at the scale at which you work?



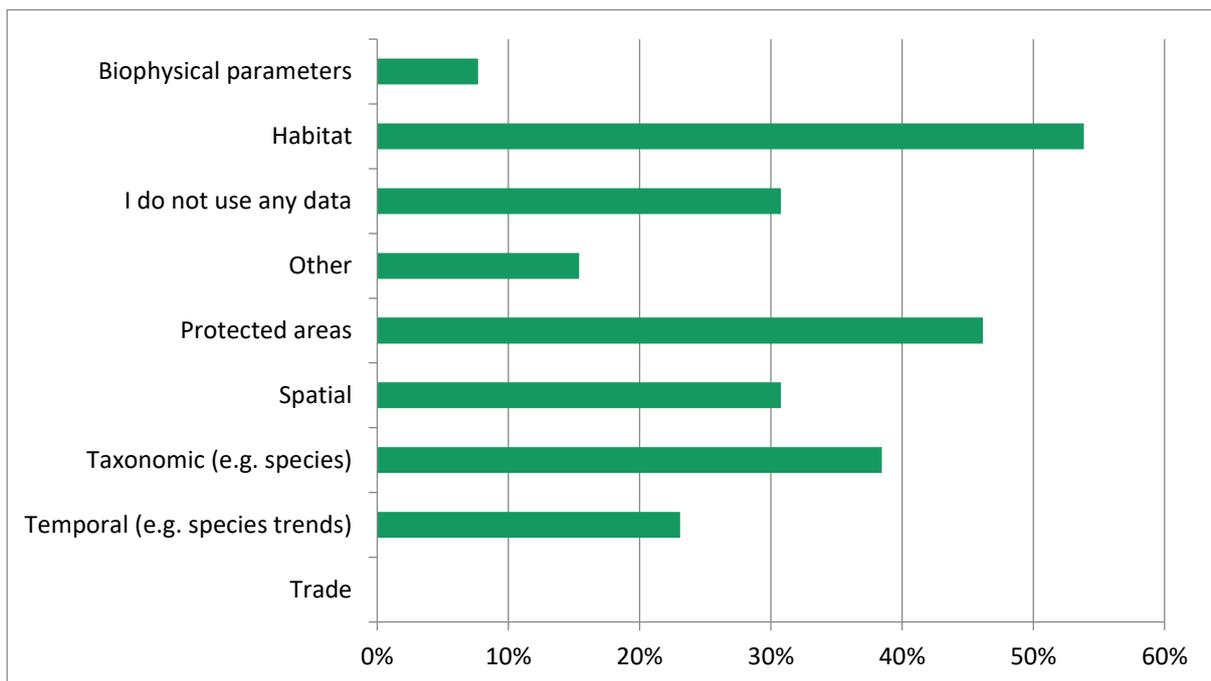
**Figure A28:** Q.33: If you are a data provider, what do you think might increase the uptake of this service?



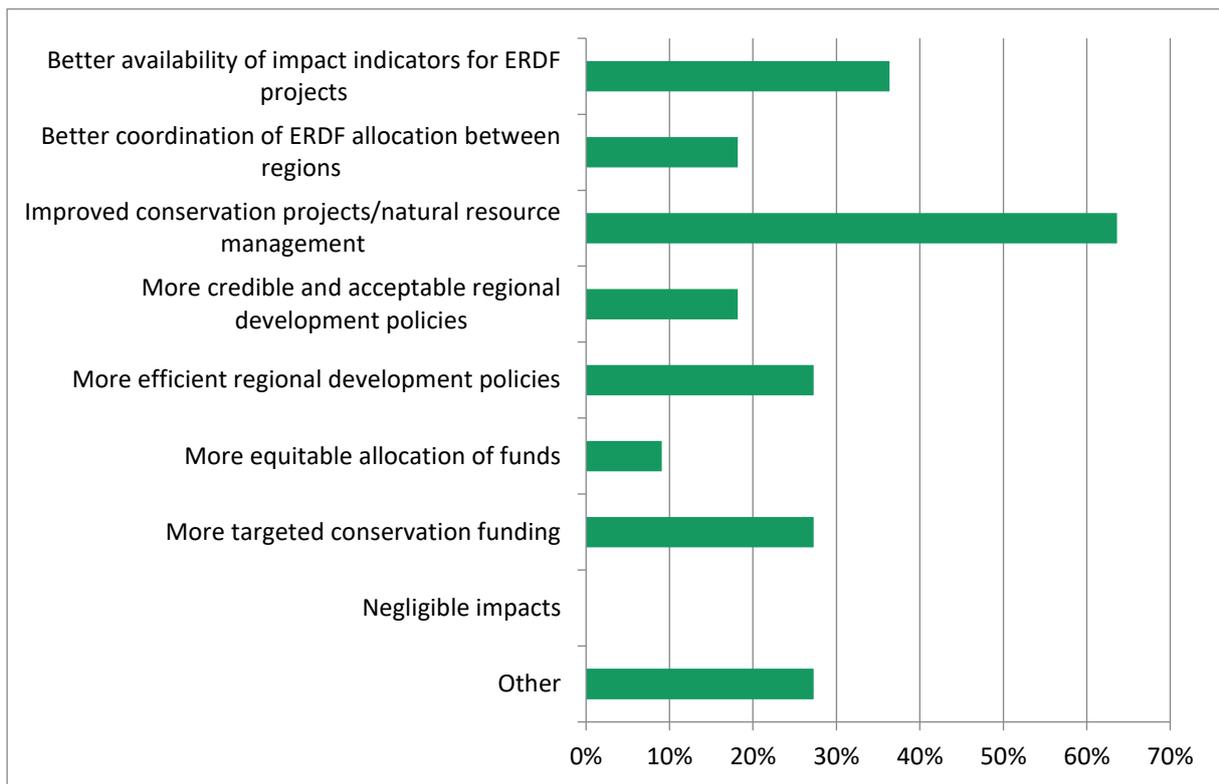
**Figure A29:** Q.34: How would you assess the incorporation of data into decision-making processes related to regional development policies? Please only answer if you are NOT directly involved with ERDF allocation.



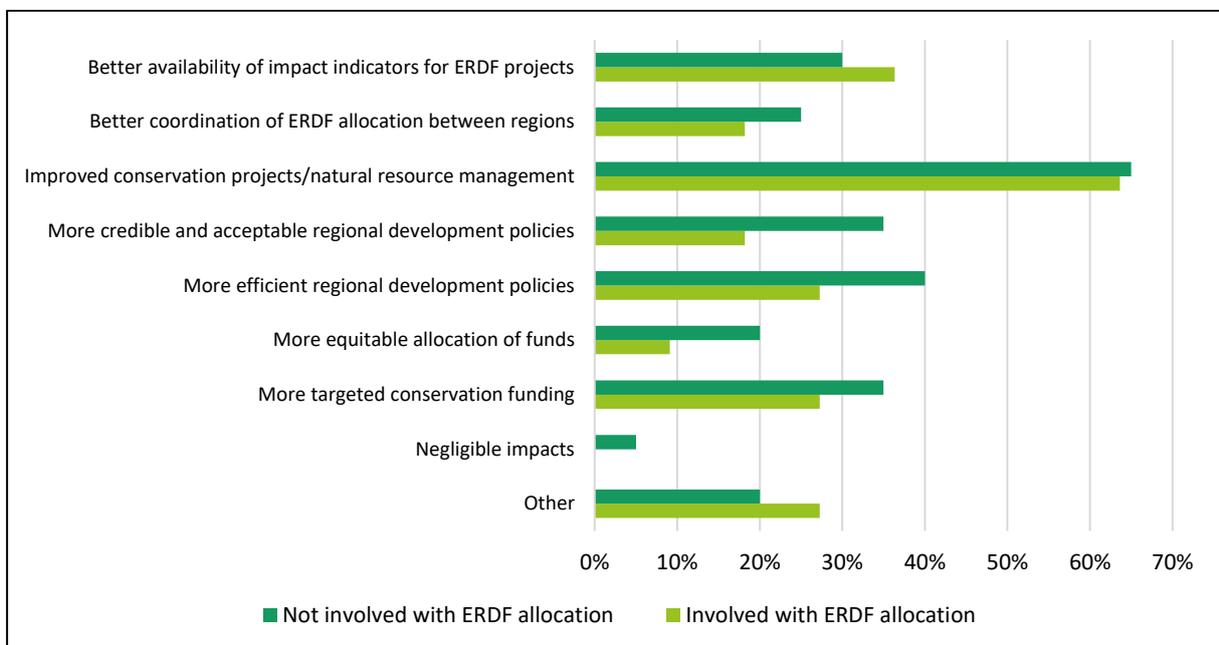
**Figure A30:** Q.35: What effect(s) would the increased use of data have on ERDF allocation within your region? Please only answer if you are NOT directly involved with ERDF allocation.



**Figure A31:** Q.36: What type of data do you use to prioritise natural resource conservation projects for the allocation of European Regional Development Funds? Please only answer if you ARE directly involved with ERDF allocation.



**Figure A32:** Q.37: What effect does, or would, the use of data have on the allocation of European Regional Development Funds? Please only answer if you ARE directly involved with ERDF allocation.



**Figure A33:** Comparison of respondents' perspectives with regard to the effect(s) of the increased use of data on ERDF allocation (Q.35 & Q.37).

**Table A4:** Q.38: Regarding any projects that you are aware of, relating to natural resource conservation, please give information on any indicators (including their data source(s)) that are, or might be, used to monitor the project's progress and impacts?

Responses
Long term habitat monitoring. Application of ecosystem service approach. Uptake of thematic data and their use in decision-making.
Length of restored water bodies (good or very good conservation status) Art. 17/12 reporting results (and related ongoing monitoring programs)
Number of citations
Field and forest bird indexes, as well as other specific indexes
METHODOLOGY for assessment and mapping of WOODLAND and FORESTS ecosystems condition and their services in Bulgaria
Any change indicators, e.g. status and trends
Output indicator of the WetMainAreas Balkan-Med INTERREG project "surface area of habitats supported in order to attain a better conservation status". The project is on progress; a GIS database of wetland areas of the 5 program countries (Albania, Bulgaria, Greece, FYROM, Cyprus) is being implemented as a basic data source for preserving wetland ecosystems as valuable landscape elements for improving the conservation effectiveness of protected networks (NATURA 2000, Emerald).
In the KerryLIFE project the principal indicators are the deliverables under the contract; also monitoring data on target rivers and pearl mussel populations