BID-REX
Interreg Europe

European Union
European Regional
Development Fund

EUSKO JAURLARITZA GOBIERNO VASCO

innobasque
berrikuntzaren euskal agentzia
agencia vasca de la innovación

GUIDE FOR THE DESIGN OF SPECIES MONITORING PROGRAMMES

Date February 2021

Authors Goizalde Atxutegi (Innobasque)
Gotzon Bernaola (Innobasque)
Marta Iturribarria (Gobierno Vasco)
Marta Rozas (Gobierno Vasco)

BID-REX - FROM BIODIVERSITY DATA TO DECISIONS: ENHANCING NATURAL VALUE THROUGH IMPROVED REGIONAL DEVELOPMENT POLICIES

This Guide is one of the actions programmed to implement Axis 5, "Citizen Science", of Action Plan of the Basque Country of the Interreg Europe BID-REX project. This project aims to design monitoring programs well oriented to conservation objectives, with rigorous but accessible protocols so that the efforts made by thousands of volunteers are oriented towards the objectives of conservation of the natural heritage of the Basque Country.

CONTENT

WHY A GUIDE FOR THE DESIGN OF SPECIES MONITORING PROGRAMS?

Data is the best raw material we have to make good decisions. Decisions that, from a shared perspective and action, allow us to conserve and promote the protection of biodiversity.

Public administrations cannot and should not be the only stakeholder involved in data collection, but they should provide criteria, guidelines and protocols so that data collection is more efficient, the quality of the information is guaranteed and information from different sources can be used in an integrated manner.

In the Basque Country, we have many volunteers who altruistically collect data on the presence/absence of species of flora and fauna in nature. However, sometimes this effort does not have the desired impact because it is not linked to specific conservation objectives: there are more observations in the most comfortable or accessible places, on days with better weather conditions or on vacations and weekends, and of species that are easier to see or more emblematic. This leads to a lack of key data for decision making in more inaccessible or remote places or for species with nocturnal habits, less attractive or more difficult to identify or locate.

Monitoring programs are not just surveys or measurements that are repeated over time using a standardized procedure. To make the leap from surveillance to monitoring, programs need targets or predetermined values to guide what the findings should be. For example, daily measurements of rainfall are a type of surveillance; they do not imply monitoring if there are no reference values.

In our case, it is more appropriate to define monitoring programs as ***the collection and analysis of repeated observations or measurements to assess changes in the conservation status of species, and progress towards achieving established conservation and management objectives.***

The data collected by volunteers should be complemented with the data collected by the rest of the agents so that our knowledge of the natural heritage of the Basque Country is as complete as possible. The integration of all the data is only possible if we work in a coordinated manner, using the same criteria and objectives, in a collaborative framework in which each contribution is important.

Individuals, associations and non-profit organizations, universities, companies, technology centres and administrations are all part of ***a value chain that generates knowledge for decision-making***. Public-private collaboration is essential to protect biodiversity.

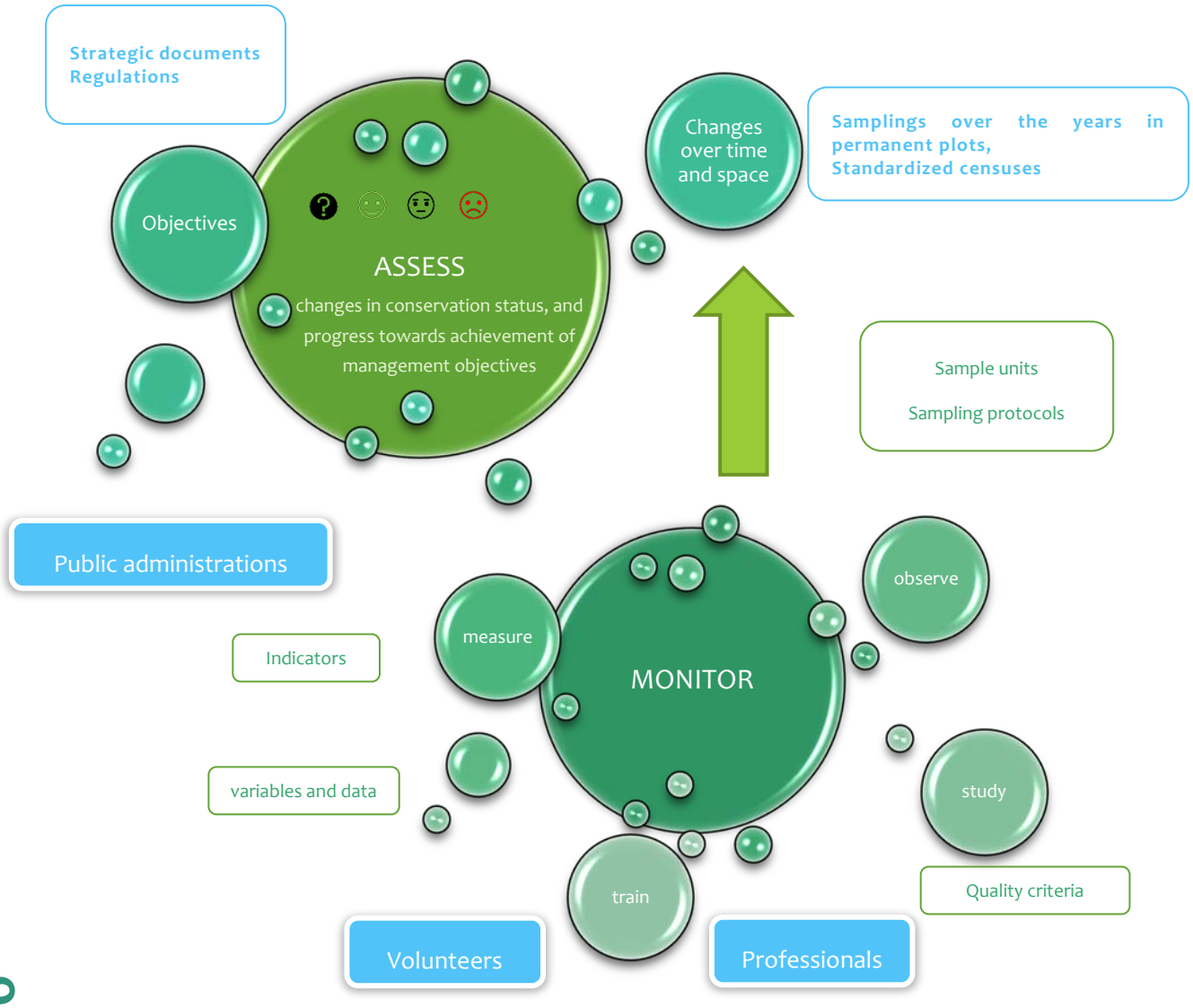
WHAT IS THE PURPOSE OF THIS GUIDE?

This guide is a tool for the design of monitoring programs that will allow public administrations:

- Evaluate changes in the conservation status of the wild species of greatest concern.
- Assess progress towards the achievement of conservation and management objectives.

The target audience of the Guide are:

- Public administrations (City Councils, other local entities, Provincial Councils and the Basque Government). The Guide provides them with a common tool to assess the quality of the species monitoring programs that they must or want to finance (through subsidies or public contracts).
- Entities and people who actively work in the collection of primary biodiversity data (volunteers and professionals). The Guide is a tool to help design better species monitoring programs, more oriented to the needs of the Basque Country.



CRITERIA FOR THE DESIGN OF MONITORING PROGRAMS

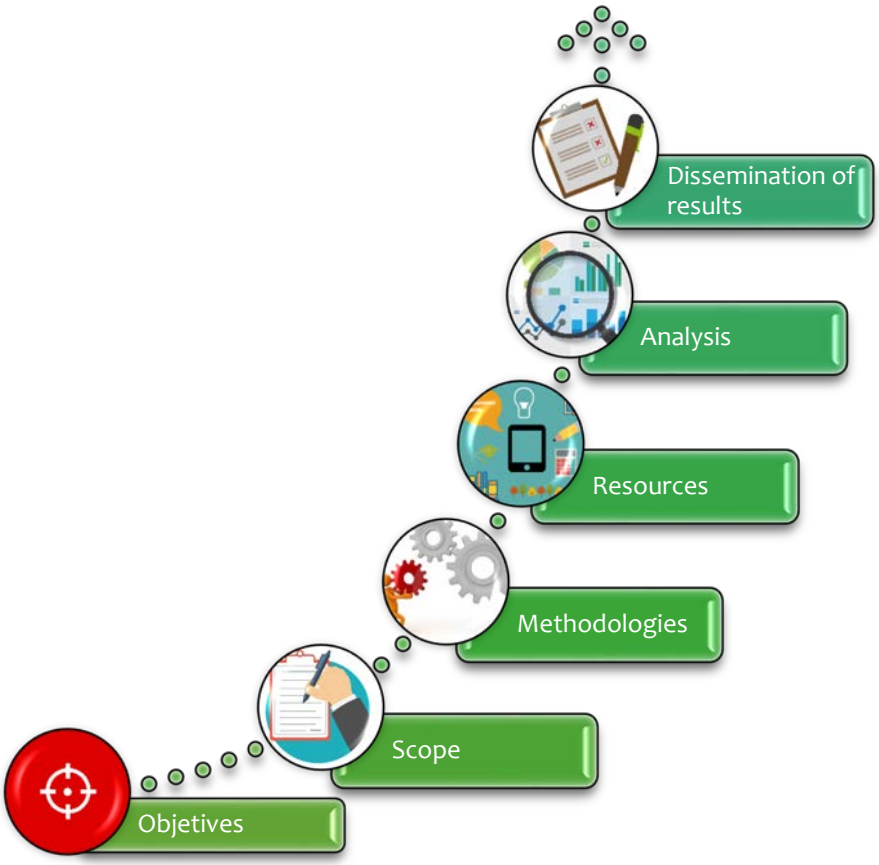
The monitoring programs covered in this Guide collect records of occurrences with standardized protocols for measuring and observing biodiversity, with a measure of species abundance in the sample. They correspond to sampling over years in permanent plots or standardized censuses, such as vegetation transects, bird censuses, and marine or freshwater sampling. They not only document attributes of a species in context (metadata), but also include sufficient detail to determine the composition of a community or relative abundance of species at different points in time.

When designing a monitoring scheme, three main questions need to be considered: why monitor, what to monitor, and how to monitor. It is important to address the first question to define monitoring objectives. The second question leads to the identification of which biodiversity variables should be monitored. Finally, the third question leads to the evaluation of different (often taxon-specific) sampling schemes and methods. This is a process that must be done very carefully, as once a monitoring system is established, changing it can, in some cases, invalidate all previous monitoring efforts.

Elements for good planning

The basis for achieving good results is to carry out a good planning of the work to be done. The elements that we must consider in the design of a monitoring program are:

- OBJECTIVES of the monitoring program
- SCOPE: What is to be sampled? Species to be monitored.
- METHODOLOGIES
    - Where is to be sampled? Location of the sampling units
    - How many sampling units? Representativeness of the studied species
    - When and how to sample? Sampling protocols and field visits.
    - What data will be recorded?
    - What risks are we likely to encounter? Contingency plan
- RESOURCES
    - People
    - Education and training
    - Instruments for data collection and processing
    - Economic cost
- ANALYSIS of distribution and population trends, with respect to the conservation objectives.
- DISSEMINATION OF RESULTS



SPECIES TO BE MONITORED

The first thing to consider is which species, species, or groups of species we want to study. To do so, we must take into account the species of interest, at European, state or regional level. The monitoring of these species is the one that contributes the most to the management of the conservation objectives we have as a system. Therefore, the monitoring of any other species must be duly justified.

Species must be named according to the Standard List of wild species present in Spain and the Basque Nature Information System.

TARGET TAXONS

- List of Wild Species under Special Protection Regime and in the Spanish Catalogue of Threatened Species.
- Annexes II, IV and V of the Habitats Directive 92/43/EEC.
- Annexes I and II of the Birds Directive 2009/147/EEC.
- Basque Catalogue of Threatened Species
- Spanish Catalog of Invasive Alien Species

OBJECTIVES OF THE MONITORING PROGRAMME

What do we want to know with the monitoring programme? The rest of the elements of the monitoring programme depend on how we answer this question. We cannot lose sight of our objective at any point in the design, implementation and evaluation of the monitoring programme.

The objectives must be based on a value proposition, on how the objectives of each monitoring programme contribute to the strategic objectives of the Basque Country in terms of nature conservation. We need to explain what we are doing the monitoring programme for, and how it adds to or builds on what is already there or what we already do. We also need to reflect on this with a clear understanding that we can add value in both "what we do" and "how we do it".

A simple way to know if we have well defined the main objective of our project is to use the SMART technique. This involves analysing whether the objective we have set in the project meets the following characteristics:

S*PECIFIC*	*An objective has to be specific enough so that we know what we want to do, and we can assess at the end of the project whether we want to obtain it or not. For example, objectives such as "improving the information available on X" or "developing simple visualizations about Y" would not be objectives specific enough to be able to assess their achievement (or not) through our project. Concrete as much as possible.*
M*EASURABLE*	*A good objective should allow us to measure whether we are approaching that new state. Sometimes it will be easy to quantify it (move from one number to another, increase or decrease by a certain percentage, do something for the first time, perform a specific number of actions ...), but sometimes not so much (when we measure behavioural changes, impact on the awareness...). Even so, we must find a way that approximates us to measure what we do.*
A*SSIGNABLE*	*It is about thinking in an ambitious way, but without going over A good definition of objectives leads us to weigh up the effort and cost needed to achieve them, what we have and what we need to achieve them, from whom we need the collaboration of... It is about reflecting on what means we will put into the project to make it happen. For example, verb forms are often used in gerund (offering, investing ...) or expressions such as "to be able to ..." "through ..." in the definition of objectives.*
R*EALISTIC*	*The objective of the project should provide us with information on why it is important to develop it. The relevance of an objective refers to the potential interest for your target audience (how your project helps you) or for your organization (in what adds to your role as a biodiversity stakeholder).*
T*IME-RELATED*	*Finally, a well-defined objective must be defined considering how much time we have to achieve it. It must be based on a realistic and reasonable calculation between what you want to achieve, and the time needed for it.*

METHODOLOGIES

The following aspects should be specified:

- Where, when and how it is to be sampled, how many sampling units, arguing the reasons for its selection.
- What variables are to be studied and what data are to be recorded.
- What risks we may encounter and what alternatives we foresee.

WHAT A MONITORING PROGRAMME SHOULD NOT DO

- Attempt to describe the general ecology of a site or measure things that may be of interest but are not priority objectives.
- Design a complex research study, to test a hypothesis or to establish why something is happening. You may only need to do more detailed and rigorous research when the assessment indicators are going wrong and you need to know the causes.

Using international schemes and guidelines allows data derived from a regional monitoring programme to be used on a global scale.

In addition, the use of standards with controlled vocabularies reduces ambiguity caused by different ways of recording data by different people. Therefore, most of the information derived from a monitoring programme should be incorporated in a standardized way, which is structured as follows:

- Data set. Information referring to the monitoring programme itself.
- Sampling units (locations)
- Events
- Occurrences (presence/absence data of the monitored species) recorded in each event.

The Basque Nature Information System uses the Darwin Core and Plinian Core standards, developed and promoted by the international organization TDWG (Biodiversity Information Standards) and used by the GBIF network to facilitate the exchange of information on biological diversity. Many of these fields have controlled vocabularies (dictionaries).

In addition, the Basque Nature Information System uses dictionaries related to the information obligations of the Habitats and Birds Directives.

- Fields used in the Basque Country Nature Information System - Biological and Geological Diversity - Euskadi.eus
- Standardised Excel for data collection in monitoring programmes (XLSX, 44 KB)

Datasets

Each monitoring programme should have a name that briefly describes it (datasetName). The nature of the data (basisOfRecord), should also be recorded, usually whether the observations have been made by a person or a machine, or whether there has been a collection of specimens for a herbarium or a faunal collection (preserved specimen).

In addition to the standardized information recorded in the dataset, there may be other complementary information on the monitoring programme. In this case, the dataset shall only indicate that this information exists through the informationWithheld field. This additional information may or may not be published, but it is interesting to indicate that it exists and the possible restrictions of use and ways to access it.

In some cases, it may not be desirable to make the data public in its original form, and less specific or complete data may be shared (e.g., for the protection of particularly sensitive species). This should also be indicated in the dataset, through the dataGeneralizations field.

The sampling protocol used in the monitoring programme should also be described in general terms with the samplingProtocol field. It is always best to opt for a standardized methodology or one that has at least been used successfully in other regions.

It is recommended to mention the extent of the observation record. Assuming the location is recorded as a coordinate, the extent is the distance from that point to the furthest point where collections or observations have been made at that location. Indicating the extent may be important when activities have been carried out over a small range, along a transect or in an area.

If the sample size is fixed it should be stated through the sampleSizeValue & sampleSizeUnit fields.

Locations (Sampling units)

The planning of data collection requires the selection of sites where sampling will be carried out over time, arguing why these locations have been selected and not others. The locations selected should cover the heterogeneity of environments covered by the species.

Sampling units are defined as the most specific locations where sampling is repeated over time. For example, if sampling is carried out every year in Aiako Harria but there are no permanent sites defined, the sampling unit will be Aiako Harria and will be identified by its Natura 2000 code (in this case, ES2120016). If permanent data collection stations (points, areas or transects) have been selected in Aiako Harria, the sampling units will be these and will be identified with a unique code (for example, ES2120016-01, ES2120016-02, ES2120016-03, ...).

In case the sampling is carried out with respect to UTM grids, the identification of the sampling units is done in a similar way. If the surveys are carried out on UTM 10x10 grids, but the same sites are not visited on each visit, the sampling unit is the grid and will be identified by its code (e.g., 30TWP90). In case permanent data collection stations (points, areas or transects) have been selected in the grid, the sampling units will be these and will be identified by a unique code (e.g., 30TWP90-01, 30TWP90-02, 30TWP90-03, ...).

The unique code identifying a sampling unit is recorded in the locationID field.

In case the sampling unit is a point, its longitude and latitude (angular coordinates) shall also be recorded. In case it is a polygon, the geometry shall be provided in shape or footprintWKT format. In addition, the possibility of marking in the field shall be evaluated to facilitate its identification during revisits over time.

It is also advisable to record the potential difficulties of access and particularities of the locations to be able to adequately plan the field visits.

Events

The planning of data collection also requires the planning of events: when to go to each location. To this end, the phenology of the species must be considered, if there are dependencies between the occurrence of the species and certain atmospheric variables (rainfall, temperature ...) or seasonal variables (flowering periods, migration ...).

Events are recorded with a specific date (day, month and year) and the sample unit visited, through the fields eventDate and locationID.

In addition, other data should be recorded for each event:

- eventTime
- samplingEffort
- wind, temperatura (%), cloudCover
- eventRemarks

In addition, it should be indicated whether monitoring is annual or, if populations are stable over time, more spaced monitoring can be carried out.

Occurrences

During each event, the presence/absence data of the monitored species are recorded in the scientificName and occurrenceStatus fields. It is important to record which species have not been in the occurrence (occurrenceStatus=absent) because, if at any time they have been cited at that location, the analysis of extensive time series could alert us to the disappearance, displacement of the species or erroneous citations in the past.

A unique identifier throughout the monitoring programme via the catalogNumber field identifies each occurrence record. For the generation of unique identifiers, the following coding can be applied: monitoring programme alias-year-autonumeric (e.g., sacre-2021-001, sacre-2021-002, sacre-2021-003 ...).

All relevant information should be collected as close as possible to the occurrence. In this way, if there are doubts about a record at a later stage (e.g., to verify that the species has been correctly identified), these data can be used for further checking:

- Persons/entities involved in data collection in the field: recordedBy.
- Data relating to the identification of the species: identifiedBy, dateIdentified, identificationVerificationStatus, identificationRemarks, identificationReferences
- Specific location of the occurrence: decimalLatitude, decimalLongitude, georeferenceRemarks, coordinateUncertaintyInMeters, municipality, locality, waterBody, island, minimumDepthInMeters, maximumDepthInMeters, minimumElevationInMeters, maximumElevationInMeters
- Images, audios or videos related to the occurrence: associatedMedia.
- Literature associated with the occurrence: associatedReferences
- Comments or annotations: occurrenceRemarks

In addition, the variables to be analysed should be selected:

SPECIES POPULATIONS

Abundance can be recorded through different fields, depending on the specificity of the data:

- individualCount. This is a numeric field, when the exact number of individuals in the occurrence is known.
- organismQuantity & organismQuantityType. When the number of individuals cannot be counted, a textual approximation is given and, for example, the range of population values in which it is found (1-5, 6-10, 11-50, 51-100, 101-250, 251-500, 501-1,000. 1,001-10,000, >10,000) is recorded. If population values are not known, but data on minimum and maximum quotas are available, these should be recorded with < (less than) or > (more than).

- abundanceCategory, to indicate an imprecise estimate of the population size (C = common, R = rare, V = very rare).
- Data quality is recorded using the dataQuality field: G = Good (e.g., accurate counts of individuals), M = Moderate (e.g., data based on partial information with some extrapolation), P = Poor (e.g., rough estimates, minimum quota), DD = Data Deficient (only abundance categories can be given).

The type of population according to its migratory behaviour is recorded using the populationType field: p = permanent, r = reproducing, c = concentration, w = wintering. In the case of non-migratory plants and species, "p=permanent" should be indicated.

In some cases, especially in Natura 2000 sites, the assessment of the status of a species in relation to the sampling unit can also be recorded using the following fields:

- populationEvaluation. Relative size and density of the population present at the site with respect to the Basque Country population: A: 100 % ≥ p > 15 %, B: 15 % ≥ p > 2 %, C: 2 % ≥ p > 0 %, D: Non-significant population. If a species is barely observable at the site, e.g. a vagrant species, it is not considered a significant population and should be recorded as D. If the representativeness of the site with respect to a population is listed in the category "D: Population not significant", nothing needs to be indicated in the other assessment criteria (the fields corresponding to the conservationEvaluation, isolationEvaluation and globalEvaluation criteria should be left blank).
- conservationEvaluation. Degree of conservation of the habitat elements relevant to the species concerned and possibility of restoration: A: Excellent conservation, B: Good conservation (well-conserved elements/elements in medium or partially degraded condition and easy restoration), C: Medium or reduced conservation.
- isolationEvaluation. Degree of isolation of the population at the site in relation to the natural range of the species: A: Population (almost) isolated, B: Population not isolated but outside its range, C: Population not isolated but integrated into its range.
- globalEvaluation. This criterion serves to assess the overall value of the site from the point of view of the conservation of the species. It is the result of all the previous criteria (populationEvaluation, conservationEvaluation, isolationEvaluation) and takes into account other characteristics of the site that may be relevant for the conservation of the species. Such characteristics may vary from species to species, but include human activities on or near the site that may influence the conservation status of the species: land management, site protection status, ecological relationships between habitat types and species, etc. It is recorded using the following categories: A: Excellent value, B: Good value, C: Significant value.

TRAITS OF THE SPECIES

This data is recorded through the following fields:

- sex
- lifeStage
- reproductiveCondition
- behavior
- establishmentMeans
- habitat

In the case of birds, the atlasCode is also recorded.

Quality criteria

Possible sources of error and unreliability of data need to be recognised. This can come from people, processes and systems, for example:

- Lack of relevant skills in data recorders/field collectors.
- Lack of appropriate referrals to specialists or experts when needed.
- Lack of accountability or unmethodical data collection, verification and reporting processes.
- Lack of technical skills in data management or lack of access to appropriate techniques or facilities.
- Mismatch between monitoring objectives and the application of recording methods, resulting in uneven or inadequate monitoring coverage.

In addition to the criteria described in the previous sections for improving data quality (mentioning the extent of observation recording, use of standards and controlled vocabularies, collection of all relevant information as close as possible to the occurrences, etc.), the following are some good practices to be considered:

- Providing written instructions on how data should be collected helps to make the data collected more homogeneous and of higher quality. These instructions should not only include technical aspects of data recording but should also take into account aspects such as codes of conduct, use of maps, forms, mobile applications or others.
- In the case of parcels or permanent transects, provide detailed instructions on how the marking has been carried out and how to relocate the markings. The instructions must be accompanied by graphic material (photographs and / or sketches), as well as GPS coordinates to facilitate exact relocation. It is recommended to use multiple marking

(with several methods), since in some environments and / or without previous experience it is difficult to know which marking method (spray, stakes, ...) will be effective, that is, which one will last longer in time[1].

- Provide identification keys for the species being monitored, indicating how to differentiate species well from others with similar phenotypic characteristics.
- Provide clear documentation of how data are collected and processed so that others can judge what has been done.
- Provide and disseminate clear guidance on which species/taxa are "critical" for identification and which are not. It should also establish the degree of competence (defined in terms of the identifier's level of skill) for which an identification is acceptable. For particular species that are especially difficult to identify, expert panels can be established to arbitrate potential discrepancies in judgement. In this case, clear requirements should also be specified as to when and how voucher specimens or other evidence should be collected and sent to the designated experts.
- Establish mechanisms to minimize foreseeable sampling errors, e.g. double census at specific times.

LEVELS OF COMPETENCE

- Beginner: little experience, and with low levels of use of identification facilities or knowledge of methods; only common or easily identifiable species records acceptable without other evidence.
- Experienced: with good levels of field experience, possibly limited by geographical region or habitat types, but with access to adequate literature and facilities; records of most readily identifiable species acceptable.
- Expert: with wide and deep understanding of their particular groups, good access to relevant literature and facilities, usually networking with others in their field; most records accepted, except some taxa needing critical determination.
- Authority: a nationally or internationally recognized expert in the determination and taxonomy of a particular group, operating alongside extensive reference material and other authorities; definitive judgement on identifications, except where taxonomic disagreements might occur.

[1] It must be taken into account that the marking from one visit to another sometimes disappears and must be replaced. Having this information helps to prepare the fieldwork, avoiding surprises when arriving on the field.

RESOURCES

A resource is everything we need to organize and materialize the monitoring programme.

ECONOMIC RESOURCES

Own- or third-party funds that you can use for the

PROCESS RESOURCES

Methodologies, techniques or software that we will need throughout the project.

RELATIONS

All the social capital of our organization: partners, collaborators, social mass, customers, suppliers ... that can nurture us in the process.

SPACES

Facilities or places necessary to develop our activity.

EQUIPMENT

Instruments, devices and materials to perform a task.

PEOPLE / HUMAN CAPITAL

According to the size of the necessary equipment (how many people we need to involve and at what time), but also to the knowledge or know-how we need to add (qualification or profile).

People, human capital, are one of the most important resources. It is essential that the people who will be recording data in the field know how to do so. They must also have the necessary knowledge to use the equipment or materials needed for data capture.

Participants in a monitoring programme should be familiar with the general ecology and likely occurrence of the species being monitored and with the main sampling techniques. For this purpose, they should be provided with different training actions and/or supervision/mentoring by experts to help them to know the best times and seasons to carry out sampling and to identify the species.

TYPES OF TRAINING ACTIONS

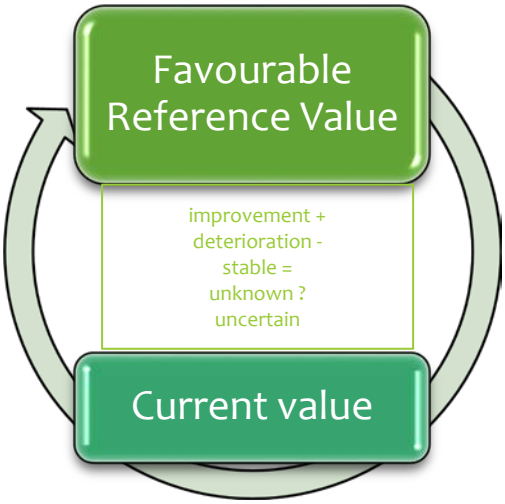
- COURSES
  - Cover specific topics and practical skills.
  - Key to ensuring that volunteers have access to experts to develop their knowledge and skills.
- FIELD EVENTS
  - Enhance knowledge of wildlife in the field.
  - Enable the development of social relationships with mentors and peers.
  - Are key to developing motivation and confidence.
- COLLECTIONS WORKSHOPS
  - Incorporate practical techniques for using collections and building personal reference collections.
  - Develop relationships with collection managers and the biological records community.
- PARTICIPATORY EVENTS (BIOBLITZ)
  - These are a good way to motivate volunteers to put their skills into practice and encourage self-learning.
  - They may include the taking of photos for identification resources.
- MENTORING
  - This is one of the most useful resources for developing skills and knowledge regarding species identification and recording, as well as allowing confidence to grow through verification of identifications.

It is desirable that training actions are integrated into training pathways, so that volunteers acquire assessable skills and the data collected is linked to the level of accredited competence.

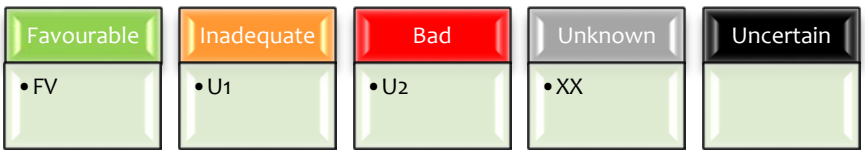
ANALYSIS

The analysis of the data series resulting from the monitoring programmes should include the calculation of some of the following variables:

- Current distribution and range. Range is the approximate area within which a species occurs. Its limits do not reflect in detail the localities or territory in which the species occurs permanently, but the area encompassing them, excluding areas of occasional occurrence and significant discontinuities or disjunctions.
- Evolution of distribution: changes, trends and their causes; favourable range of reference.
- Current population and its evolution: dynamics, trends and their causes; favourable reference population.
- Threats and pressures, including incidental kill, capture and harvest statistics. In the case of game or fish species, hunting or fishing statistics are also included.
- Habitat of the species: distribution, quality, extent, fragmentation, carrying capacity, potential habitat, threats, trends and their causes.
- Future prospects for the species.



- Assessment of conservation status. Conservation statuses are classified as favourable (FV), inadequate (U1), poor (u2), unknown (XX) and uncertain. Trends in current values relative to favourable baseline values are expressed as o = Stable, + = Increasing, - = Decreasing, x = Unknown..



Methodologies for assessing conservation status may consider the development of population viability analyses (PVA) for the species and/or populations being monitored, especially with a view to deriving extinction risk curves.

- Birds Directive reporting resources (europa.eu)
- Habitats Directive reporting resources (europa.eu)
- Guidelines for monitoring and assessing the conservation status of endangered and specially protected species

All necessary documentation for the calculation of the variables covered by the monitoring programme should be provided so that the methodology applied can be reproduced and the variables recalculated if necessary.

RESULTS

It is important to accompany the results of measures of uncertainty, through either confidence intervals or comments. It may also be important to record limitations detected during fieldwork and/or data analysis.

It must be possible to use the results of the monitoring programme in one of the following cases:

- To report, on a six-yearly basis, to the European Commission in relation to the report determined by Article 17.1 of Directive 92/43/EEC, on Habitats, as well as in relation to the report determined by Article 12 of Directive 2009/147/EEC, on Birds.
- To report on the evolution of the conservation status of endangered species in the Basque Country[2].
- To make proposals for the modification of the Basque Catalogue of Threatened Species[3].
- Notifying the early detection of the introduction or presence of invasive alien species[4].

[2] Article 9 of Royal Decree 139/2011, of 4 February, for the development of the List of Wildlife Species under Special Protection Regime and the Spanish Catalogue of Threatened Species.

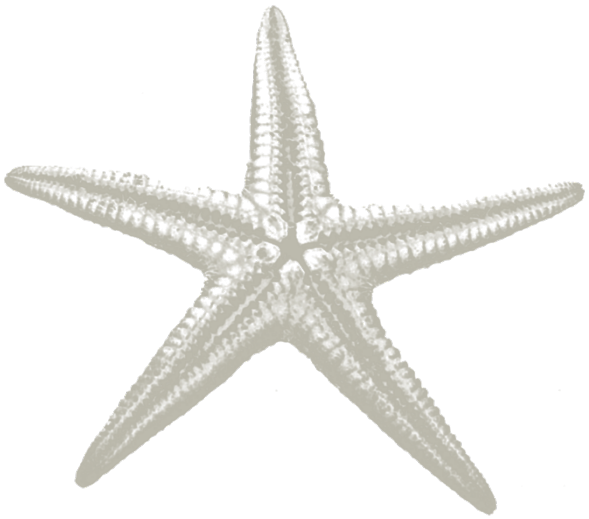
[3] Applying the Resolution of 6 March 2017, of the Directorate General for Environmental Quality and Assessment and the Natural Environment, which publishes the Agreement of the Council of Ministers of 24 February 2017, approving the guiding criteria for the inclusion of taxa and populations in the Spanish Catalogue of Threatened Species.

[4] Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.

Maps and indicators are very useful for disseminating results, as they provide a summary of the situation and trends in a visual and easily understandable way. Standardized summary sheets are also useful.

For example:

- Species distribution maps
- Indicators: conservation status and trends, indices of abundance, population size and evolution, range and distribution pattern, indices of biodiversity and ecosystem structure...
- Conservation status assessment sheets[5].



[5] The sample sheets are available on the website Cómo aportar información al Sistema de Información de la Naturaleza de Euskadi - Diversidad biológica y geológica - Euskadi.eus