

*“Indicators are a way of seeing the big picture by looking at a small piece of it”  
(Environment Canada, 2001).*

*The Foundation for Research on Biodiversity (FRB, Paris) has been commissioned by the French Ministry of Ecology (MEDDE) to conduct a scientific assessment of the indicators of the National Strategy for Biodiversity (see Glossary for links to documents). These indicators are now presented on the webpage of the National Observatory of Biodiversity (<http://indicateurs-biodiversite.naturefrance.fr/>), underpinned by a database called i-BD<sup>2</sup> which allows regular updating and improvement. This platform will evolve in time with more indicators being added, so it is important that it relies on sound and rigorous work at all stages. As this website is open-access, it is also important to minimize risks of misunderstanding, misinterpretation or misuse of indicators by making transparent and explicit all aspects of each indicator.*

*The scientific assessment addresses scientific/technical aspects of each indicator like the concepts underlying its creation, the elements used to assess its precision, sensitivity, robustness... Each indicator has its limitations and must be used with caution, but it can also be improved or used together with other indicators when it is not providing all the insurance of reliability. This assessment also wants to provide information/recommendations about such options.*

*The quality of the scientific assessment required from FRB is maximized via several means:*

- *A methodical approach: with an priori peer-reviewed protocol (the evaluation grid)*
- *An independent evaluation: assessments are made by several evaluators for each indicator, and evaluators act independently of each other. If major discrepancies between evaluations are observed, we ask for the opinion of an extra expert, and/or organize a meeting to reach consensus or conclusion. (the approach used here is equivalent to a peer-review exercise for the publication of a scientific article in a journal)*
- *Replication and upgradability of the evaluation is possible thanks to the standardized evaluation grid and traceability of decisions*
- *A knowledge-based approach: the evaluation grid is asking for evidence of statements (bibliography at least) whilst also giving room to expert opinion, both being complementary. Rapid evaluations (this indicator is « good », « reliable », « incomplete ») ask the reader to trust a judgment made by anonymous experts. Here, the evaluation grid aims to allow each reader to make his/her own judgment by explaining him/her why and how those opinions have emerged.*
- *Clear communication: we are strongly encouraging evaluators to report in a clear, simple and jargon-free language in order to convey an effective message.*

*Information about the mission can be found at [http://www.fondationbiodiversite.fr/les-programmes-frb/evaluation-scientifique-des-indicateurs\(French\)](http://www.fondationbiodiversite.fr/les-programmes-frb/evaluation-scientifique-des-indicateurs(French)) (translation into English expected by the autumn)*

## LIST OF ACRONYMS & USEFUL LINKS

**BIP** Biodiversity Indicators Partnership <http://www.bipnational.net/Default.aspx>  
**CBD** Convention for Biological diversity, indicators <http://www.cbd.int/indicators/intro.shtml>  
**DPSIR** Drivers-Pressure-State-Impact-Response;  
[http://enviro.lclark.edu:8002/rid=1145949501662\\_742777852\\_522/DPSIR%20Overview.pdf](http://enviro.lclark.edu:8002/rid=1145949501662_742777852_522/DPSIR%20Overview.pdf)  
**ONB** French Observatory for Biodiversity  
*in English* <http://www.developpement-durable.gouv.fr/IMG/ONB%20en%20anglais.pdf>  
*in French* <http://www.developpement-durable.gouv.fr/ONB-Observatoire-National-de-la.html>  
**SEBI**: Streamlining European Biodiversity Indicators <http://biodiversity.europa.eu/topics/sebi-indicators/>  
**SNB**: French (National) Strategy for Biodiversity  
*in English* [http://www.developpement-durable.gouv.fr/IMG/pdf/1\\_bis\\_-\\_French\\_National\\_Biodiversity\\_Strategy\\_-\\_May\\_2011.pdf](http://www.developpement-durable.gouv.fr/IMG/pdf/1_bis_-_French_National_Biodiversity_Strategy_-_May_2011.pdf)  
*in French* [http://www.developpement-durable.gouv.fr/IMG/SNB\\_2011-2020WEB\(2\).pdf](http://www.developpement-durable.gouv.fr/IMG/SNB_2011-2020WEB(2).pdf)

## GUIDELINES TO EVALUATORS:

Many thanks for having accepted to evaluate one or several indicators. Please use the template grid provided to you as an Excel file composed of 13 spreadsheets.

One file will be created for each indicator as referenced by ONB (we will provide help with this).

If you are assessing an Index (made of several indicators), create one file, but duplicate sheet #7 as often as you need to evaluate each indicator composing the index.

You will see that we are asking you to cite references. This can be peer-reviewed papers, thesis, or grey literature. Sometimes (often?) there will be nothing published to your knowledge. Please note that it does not mean the indicator is poorly founded, it can be a strong indicator in term of policy relevance and be methodologically sound. This will just highlight that some research may be needed.

### ***Citing references:***

Please cite references in the various tables of the evaluation grid as you would do in a publication (for instance Albert et al. 1992) and establish a list of references that you will send as a separate document (YOURNAME\_references.doc or .pdf or .enl if EndNote) when sending back your comments. You can also cite references as numbers (e.g. [14]), and send a list of references mentioning which number refers to which publication, if easier for you.

### **Sending back your comments:**

Please send back your evaluations to: [indicateurs@fondationbiodiversite.fr](mailto:indicateurs@fondationbiodiversite.fr). You will receive an acknowledgment of reception within 48hours

### **Contact, support, advice:**

Barbara Livoreil, Fondation pour la Recherche sur la Biodiversité, 195 rue Saint Jacques, 75005 Paris, France

[barbara.livoreil@fondationbiodiversite.fr](mailto:barbara.livoreil@fondationbiodiversite.fr)

Tel : +00 33 (0) 180 05 89 54

## GLOSSARY

- **Causality:** a change in one parameter induces a change in the other because one parameter is responsible for the change in the other, either directly or indirectly (via one or several intermediates).
- **Correlation** (positive or negative): reciprocal link between two parameters, whose value will change in relationship to each other without evidence of causality.
- **DPSIR:**
  - **Drivers (or driving forces):** are causes of the Pressures. It often results from needs. For instance, a need for food, for entertainment, for profit, for freedom, can trigger action/decision will put a Pressure on the environment. This includes broader categories such as the way of life, religions, psychology...
  - **Pressures:** are the consequence of the Drivers when put into action. For instance, human activities exert various types of pressure on the environment to meet needs for food and shelter
  - **States:** a state indicator in the context of environmental **indicators** is an indicator that expresses an actual resource condition, usually based on direct field measurement. (<http://stats.oecd.org/glossary/search.asp>). It is a combination of physical, chemical and biological conditions.
  - **Impacts:** those are the consequences of the changes observed in the physical, chemical or biological state of the environment, which may affect health, economy, ecosystems, and so on.
  - **Responses:** is the response through policies (public and private), collective or individual behavior that is envisaged to act in return on the Drivers, Pressure, State and Impact. Those different responses may act in synergy or oppose each other.
- **Ecosystem services:** some examples are given below. More details can be found in the Millennium Ecosystem Assessment (MEA). 2005. Ecosystems and Human Well-Being: Synthesis. Island Press, Washington. 155pp
  - Provisioning services:* food (including seafood and game), crops, wild foods, and spices, water, minerals (including diatomite), pharmaceuticals, biochemicals, and industrial products, energy (hydropower, biomass fuels)...
  - Regulating services:* carbon sequestration and climate regulation, waste decomposition and detoxification, purification of water and air, crop pollination, pest and disease control...
  - Supporting services:* nutrient dispersal and cycling, seed dispersal, Primary production
  - Cultural services:* cultural, intellectual and spiritual inspiration, recreational experiences (including ecotourism), scientific discovery...
- **Index or or composite indicator:** A composite indicator is formed when individual indicators are compiled into a single index, on the basis of an underlying model of the multi-dimensional concept that is being measured. (OECD, 2004, "The OECD-JRC Handbook on Practices for Developing Composite Indicators" <http://stats.oecd.org/glossary/detail.asp?ID=6278>). An index can take various forms. **In this assessment, we will consider that a composite indicator or index is acknowledged as such if**
  - It combines indicators with the same unit of measurement (e.g. °C) but measured with different methods (e.g. °C externally /°C internally, Glacier's melting speed measured in cm/Year but either by direct measurement or remote sensing)
  - It combines indicators with different units and different methodologies (e.g. Living Planet Index). Its value is often unit-less. This combination can be obtained by calculation with or without weighting, in which case a mathematical equation is available.
  -

Some indicators or indices are based on assumptions triggering choice. You can identify some IF/OR/THEN pattern in its construction. For instance, IF a species's area of distribution decreases by more

than X% AND/OR IF the number of individual is less than Y, THEN the “indicator” takes the value “Endangered”) (Red List Index). In this example it is an index because it aggregates values with different units, but such construction can be found in simple indicators. Contact us if you have **any doubt about the status (indicator or index) of what you are evaluating.**

- **Individual or simple indicator:** it is a parameter whose value is considered to inform about a broader phenomenon. For instance, body temperature informs about possible infectious disease, and exceeding 40°C (threshold) puts the person’s life at risk. It is often a direct measurement (number of individuals, proportion of people answering yes to a survey, temperature...)

### Scientific criteria

There are many different terms used in the literature and many different meanings. During the conduct of this evaluation we will use the following semantic and definitions:

- **Fiability:** the indicator always change in the same direction as the phenomenon it describes
- **Precision:** an indicator is precise when it measures with low uncertainty/variability the parameter used to describe the phenomenon. A high expected precision will normally require finely-tuned tools and it is assumed that not using these tools will trigger a lower precision (high variability when repeating measurements). The confidence interval in repeated measurements of the phenomenon at T time is narrow.
- **Sensitivity/responsiveness:** The value of the indicator changes proportionally to the change in the phenomenon it describes. Ability of the indicator to discriminate among situations that are truly different. When composite, it changes when at least one of its component changes. It detects quickly any change in the phenomenon. It is adapted to the level of detection we want to achieve for the phenomenon. *It also requires that the measurements are made at appropriate intervals, compatible with the frequency of change in the value of the indicator. The sensitivity of a composite indicator will be assessed by conducting sensitivity tests where the various simple indicators vary and the impact on results is calculated, in order to estimate the respective result of the variation of each simple indicator on the value of the composite indicator, and eventually remove one of the simple indicator when not influencing the outcome.*
- **Robustness and susceptibility to bias:** the measurement or calculation of the indicator remains viable even when it is measured in very different conditions. The indicator cannot be affected by biases and variables not taken into account in its calculation. The value of a robust simple indicator is not (or little) influenced by imprecise or biased data, variability of instruments used to collect data, missing data, mistakes, or confounding variables:<sup>1</sup>. This may imply to test data for normality, for the impact of missing data, the choice of weighting options, the choice of aggregation method (calculation).

No indicator or index is perfect and they all have some assets and weaknesses. Here the challenge is to highlight all these aspects and as often as possible, suggest ways to correct them (if possible). Transparency is the goal of this evaluation. When an indicator is not good enough, it could be replaced or complemented with other indicators. This also needs to be highlighted.

---

<sup>1</sup> variable affecting the relationship between two other variables A and B, triggering a bias in the analysis of the link between A and B. Searching for and taking into account confounding variable is a major goal of any scientific study.