Compendium of guidance for capturing, managing and using biodiversity-related data and information

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Convention on Biological Diversity

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Office for the Environment FOEN

Ympäristöministeriö
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Ministry of the Environment

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Introduction and target audience

This compendium of guidance provides details of information sources for capturing, managing, using, and sharing data, *all in the context of biodiversity and ecosystem services*. The primary aim of this document is to assist the staff of national governments and non-governmental organisations who are responsible for the capture, management and use of data and information with respect to the biodiversity-related conventions. This compendium in particular aims to support efforts towards improving the coordination of data and information systems to help governments maximise cost effectiveness when reporting on different biodiversity-related conventions. It is anticipated that users of this guidance would have a semi-technical background and be familiar with typical environmental issues and terms. They may be familiar with capturing, managing and using data and information, but also with considering how these processes can be improved. Increased access to such guidance was called for in decision XIII/24 of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) in key action (d) of activity B/1 in the table in Annex II. As a next step, it is intended to make this document a living document and therefore to update it when additional material becomes available and to make the identified guidance material available as interactive resources online.

Methodology

A first draft compendium of guidance was developed through a desk study, and complemented by consultation with organisations who responded to a request for feedback on the draft methodology and scope of this report. The organisations approached for feedback all produce guidance on how to capture, manage and use data and information relevant to the implementation of biodiversity-related conventions at the national level. Such organisations include:

- International organisations and programmes working with data and/or information, often in support of countries, such as: UN Environment, IUCN (International Union for Conservation of Nature), UN REDD (UN Programme on Reducing Emissions from Deforestation and Forest Degradation), GBIF (Global Biodiversity Information Facility), UN Statistics Division and GEO BON (Group on Earth Observations Biodiversity Observation Network)
- National organisations producing and/or using guidance, such as: UK Environmental Information Data Centre, UK National Biodiversity Network, SANBI (South African National Biodiversity Institute), Alexander von Humboldt Institute (Colombia), CONABIO (National Commission for the Knowledge and Use of Biodiversity, Mexico) and WII (Wildlife Institute of India)

During the initial consultation phase, materials for inclusion in the compendium of guidance were identified based on the guidance provided through key criteria in CBD COP decision XIII/24 for *"enhancing management of and avoiding duplication related to information and knowledge, national reporting and indicators",* with a focus on *"collaboration in the management of information and knowledge and alignment in national data gathering, reporting, monitoring and indicators"*. The draft was also made available for discussion with participants in the margins of the twenty-first meeting of the Subsidiary Body on Scientific, Technical and Technological Advice to the CBD in December 2017 in Montreal.

A revised draft was made available for peer review during January and February 2018 to a selected group of peer reviewers via a dedicated website. This included partners identified and consulted in the first round of consultation well as representatives of the secretariats of the biodiversity-related conventions.

Structure of the document

The identified guidance covers a number of different topics; some guidance is generic, covering several issues such as data management and monitoring, whereas other guidance is more specific (e.g. related to species or protected areas). This overlap made it difficult to identify a single category for each document that could be used as a structure to present the sources. For ease, the annotated list was firstly organised by the five main sections that are part of the components and activities of a general information system:

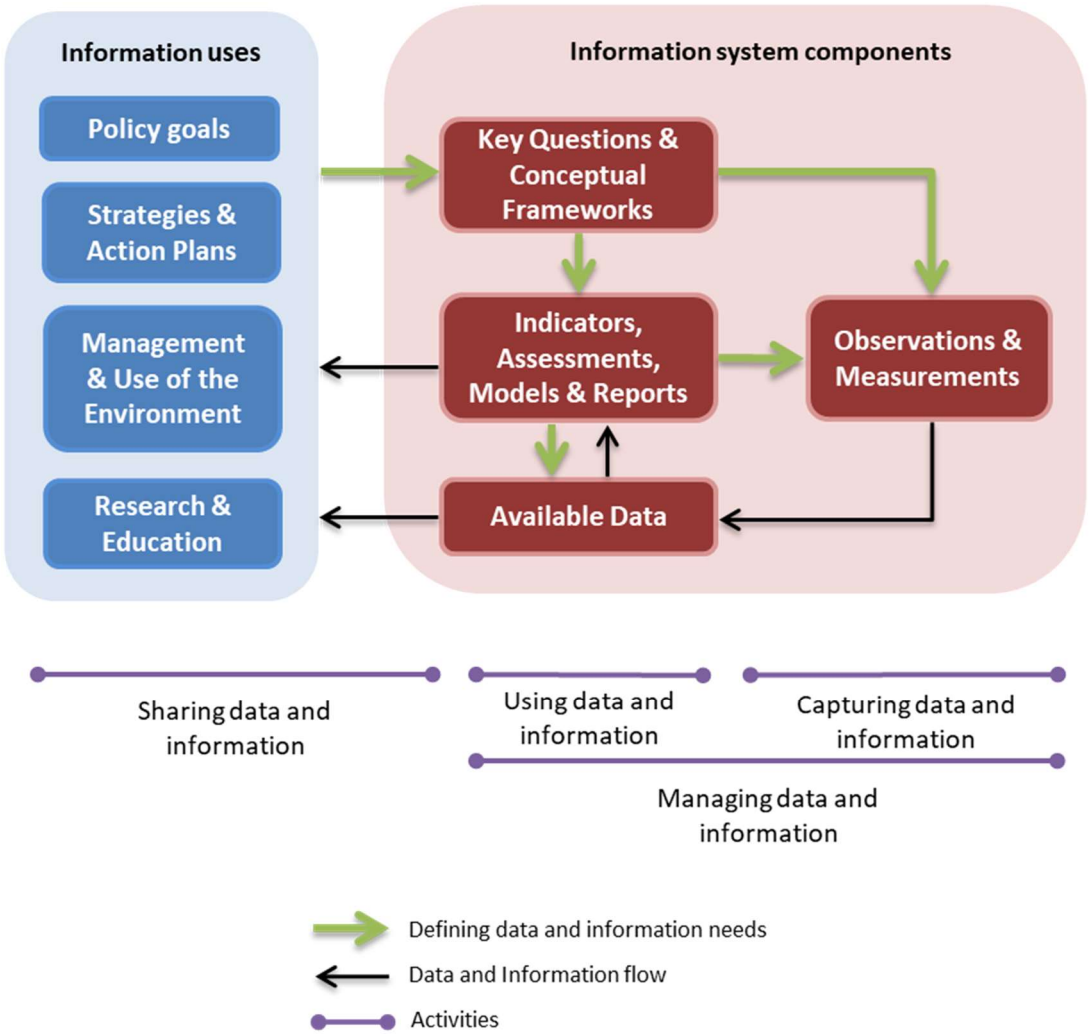
Defining data and information needs, and system design to address these needs
Capturing data and information, and combining data and information from multiple sources
Managing data and information, and building data networks
Sharing data and information, developing and communicating outputs
Using data and information, through indicators, assessments and analysis

UN Environment World Conservation Monitoring Centre (UNEP-WCMC) has produced a framework for an information system (Figure 1), that was drawn upon[1]. The guidance documents were organised and presented according to their primary and secondary purposes. This annotated list is included in the next section entitled "Overview of guidance for defining (data needs), capturing, managing, sharing, and using data" (table 1).

To allow users to easily filter the documents by use, the guidance documents were subsequently labelled under different themes for more specific use, e.g. species, spatial data, monitoring (see Annex 1).

[1] https://wcmc.io/BD_info_systems_guidance

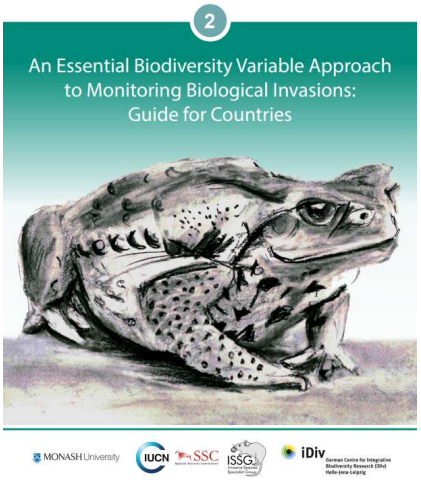
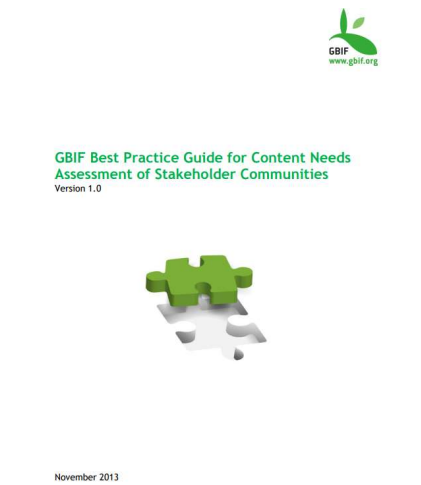
Figure 1: ***Framework for components and activities of an environmental information system.***
Source: Adapted from UNEP-WCMC.

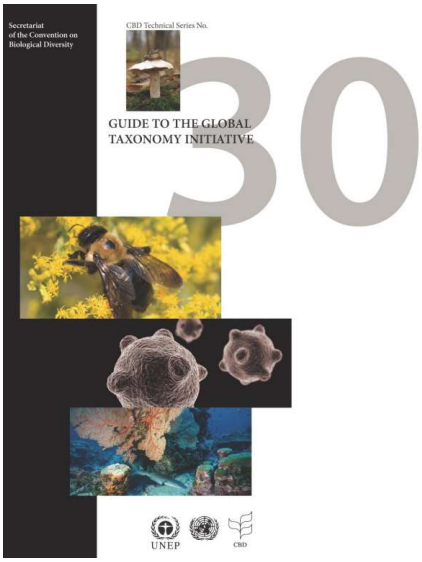
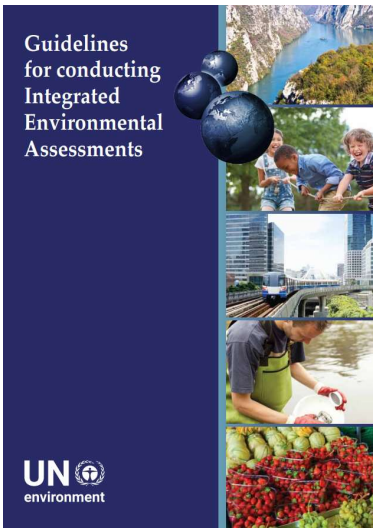
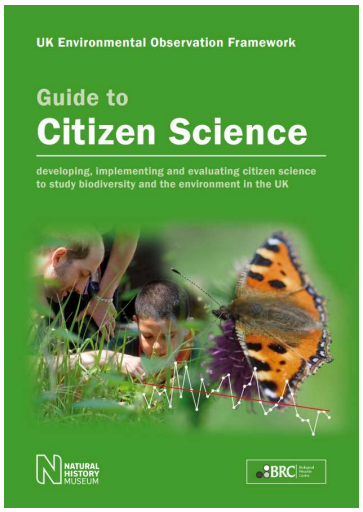


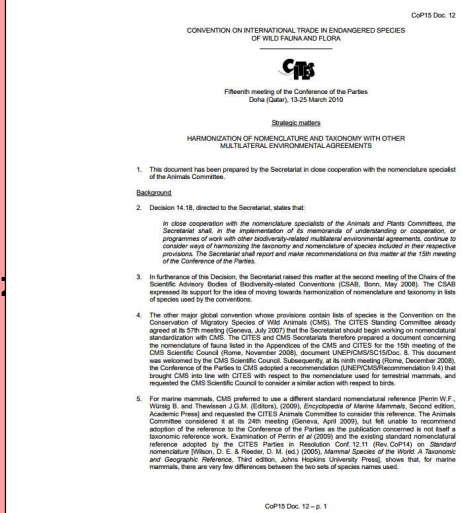
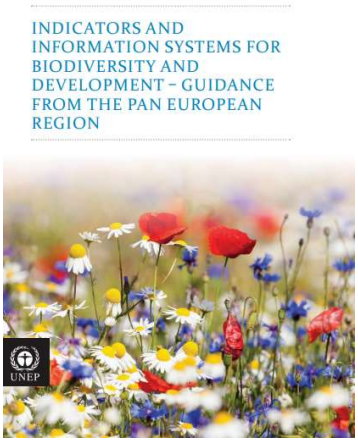
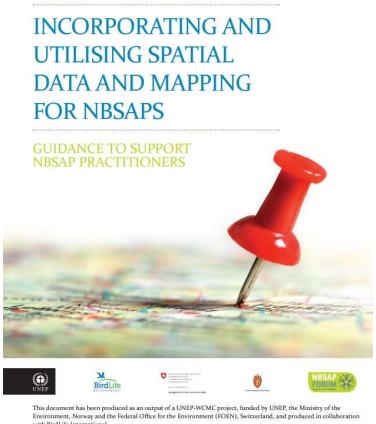
Overview of guidance for defining (data needs), capturing, managing, sharing, and using biodiversity-related data and information

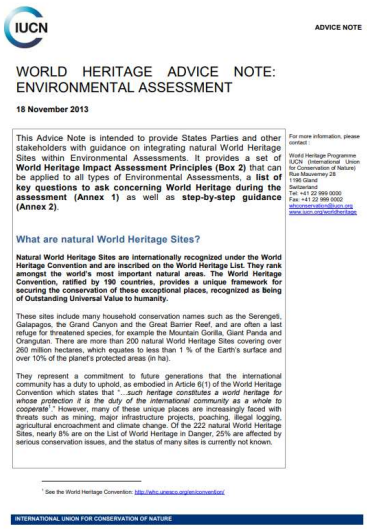
The following table provides information on guidance documents by their primary use (i.e. defining data and information needs, capturing data and information, managing data and information, sharing data and information, or using data and information). In many documents, it is difficult to separate the use into primary and secondary categories – in these cases the best fit has been adopted. A full description is shown in Annex 1. Further analysis of each guidance document, showing their strengths and weaknesses, and examples of where the guidance documents can be used, can be developed as part of any further work.

Table 1: ***Guidance documents for defining data needs and information, managing data and information, capturing data and information, sharing data and information and using data and information, with title, year of publication, notes and source.***

DEFINING DATA AND INFORMATION NEEDS		**An essential biodiversity variable approach to monitoring biological invasions: Guide for countries (2015)** *Outlines how the use of essential variables for invasion monitoring, along with a modular approach to country development of observation and monitoring systems for biological invasions* http://www.geobon.org/Downloads/reports/GEOBON/2015/MonitoringBiologicalInvasions.pdf
DEFINING DATA AND INFORMATION		**GBIF Best Practice Guide for Content Needs Assessment of Stakeholder communities (2013)** *Guidance to conduct a user needs assessment* https://www.gbif.org/resource/80890

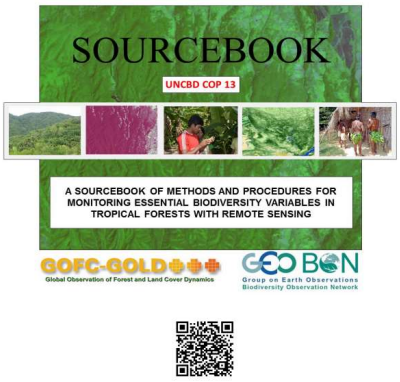
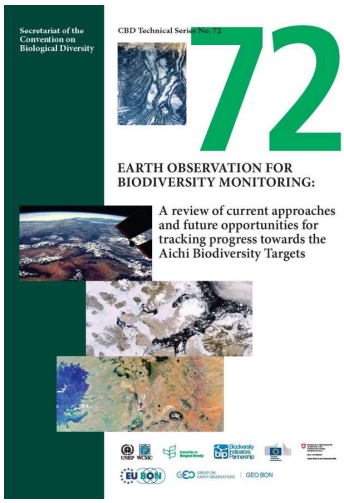
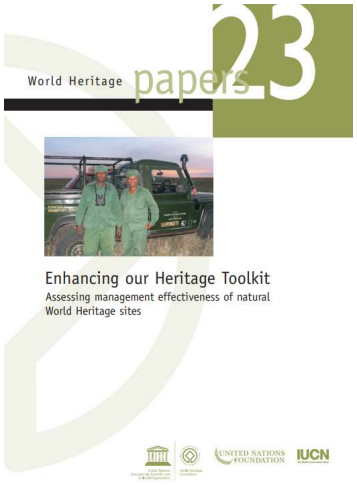
DEFINING DATA AND INFORMATION		**Guide to the Global Taxonomy Initiative (2008)** *Guidance for stakeholders to describe purpose and rationale, programme of work of the GTI (e.g. public awareness and education, capacity-building and needs assessment). Provide assistance for activities mandated by the GTI* https://www.cbd.int/doc/publications/cbd-ts-30.pdf
DEFINING DATA AND INFORMATION		**Guidelines for conducting integrated environmental assessments (2014)** *Guidance for planning, conducting and evaluating environmental assessments* https://wedocs.unep.org/bitstream/handle/20.500.11822/16775/IEA_Guidelines_Living_Document_v2.pdf?sequence=1&isAllowed=y
DEFINING DATA AND INFORMATION NEEDS		**Guide to citizen science (2012)** D*eveloping, implementing and evaluating citizen science to study biodiversity and the environment in the UK* http://www.nhm.ac.uk/content/dam/nhmwww/take-part/Citizenscience/citizen-science-guide.pdf

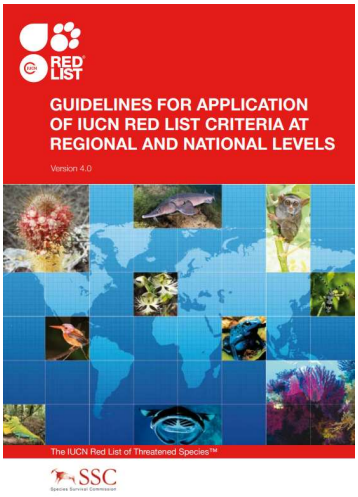
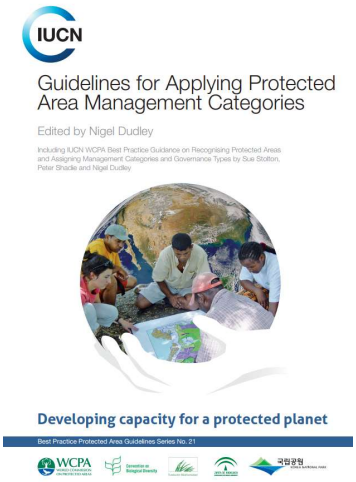
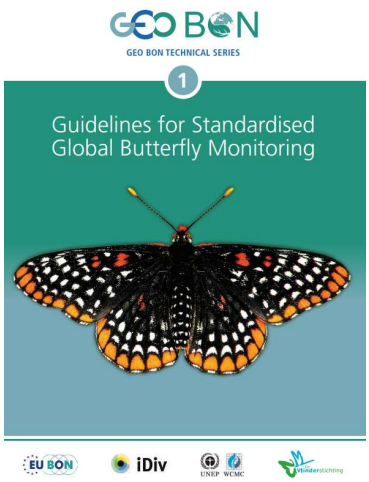
DEFINING DATA AND INFORMATION	 CoP15 Doc. 12 CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA Fifteenth meeting of the Conference of the Parties Doha (Qatar), 13-25 March 2010 Strategic matters HARMONIZATION OF NOMENCLATURE AND TAXONOMY WITH OTHER MULTILATERAL ENVIRONMENTAL AGREEMENTS 1. This document has been prepared by the Secretariat in close cooperation with the nomenclature specialist of the Animals Committee. Background 2. Decision 14.18, directed to the Secretariat, states that: *In close cooperation with the nomenclature specialists of the Animals and Plants Committees, the Secretariat shall, in the implementation of its memoranda of understanding or cooperation, or programmes of work with other biodiversity-related multilateral environmental agreements, continue to consider ways of harmonizing the taxonomy and nomenclature of species included in their respective provisions. The Secretariat shall report and make recommendations on this matter at the 15th meeting of the Conference of the Parties.* 3. In furtherance of this Decision, the Secretariat raised this matter at the second meeting of the Chairs of the Scientific Advisory Bodies of Biodiversity-related Conventions (CSAB, Bonn, May 2008). The CSAB expressed its support for the idea of moving towards harmonization of nomenclature and taxonomy in lists of species used by the conventions. 4. The other major global convention whose provisions contain lists of species is the Convention on the Conservation of Migratory Species of Wild Animals (CMS). The CITES Standing Committee already agreed at its 57th meeting (Geneva, July 2007) that the Secretariat should begin working on nomenclatural standardization with CMS. The CITES and CMS Secretariats therefore prepared a document concerning the nomenclature of fauna listed in the Appendices of the CMS and CITES for the 15th meeting of the CMS Scientific Council (Rome, November 2008), document UNEP/CMS/SC15/Doc. 8. This document was welcomed by the CMS Scientific Council. Subsequently, at its ninth meeting (Rome, December 2008), the Conference of the Parties to CMS adopted a recommendation (UNEP/CMS/Recommendation 9.4) that brought CMS into line with CITES with respect to the nomenclature used for terrestrial mammals, and requested the CMS Scientific Council to consider a similar action with respect to birds. 5. For marine mammals, CMS preferred to use a different standard nomenclatural reference [Perrin W.F., Würsig B. and Thewissen J.G.M. (Editors), (2008), *Encyclopedia of Marine Mammals*, Second edition, Academic Press] and requested the CITES Animals Committee to consider this reference. The Animals Committee considered it at its 24th meeting (Geneva, April 2009), but felt unable to recommend adoption of the reference to the Conference of the Parties as the publication concerned is not itself a taxonomic reference work. Examination of Perrin *et al* (2009) and the existing standard nomenclatural reference adopted by the CITES Parties in Resolution Conf. 12.11 (Rev. CoP14) on *Standard nomenclature* [Wilson, D. E. & Reeder, D. M. (ed.) (2005), *Mammal Species of the World. A Taxonomic and Geographic Reference*, Third edition, Johns Hopkins University Press], shows that, for marine mammals, there are very few differences between the two sets of species names used. CoP15 Doc. 12 – p. 1	**Harmonisation of nomenclature and taxonomy with other multilateral environmental agreements (2010)** *Strategic note on harmonisation of nomenclature and taxonomy* https://cites.org/sites/default/files/eng/cop/15/doc/E15-12.pdf
DEFINING DATA AND INFORMATION	 INDICATORS AND INFORMATION SYSTEMS FOR BIODIVERSITY AND DEVELOPMENT – GUIDANCE FROM THE PAN EUROPEAN REGION UNEP	**Indicators and Information Systems for biodiversity and development – guidance from the Pan Europe Region (2017)** *Aims to help government staff responsible for biodiversity and sustainable development to have effective indicators and information systems for their work* https://wcmc.io/BD_info_systems_guidance
DEFINING DATA AND INFORMATION	 INCORPORATING AND UTILISING SPATIAL DATA AND MAPPING FOR NBSAPS GUIDANCE TO SUPPORT NBSAP PRACTITIONERS This document has been produced as an output of a UNEP-WCMC project, funded by UNEP, the Ministry of the Environment, Norway and the Federal Office for the Environment (FOEN), Switzerland, and produced in collaboration with BirdLife International.	**Incorporating and using spatial data and mapping for NBSAPs (2014)** *Guidance including NPSAP revision steps and points of entry for incorporating spatial data; details of different approaches; national examples of good practices; sources for further information* http://wcmc.io/ec93

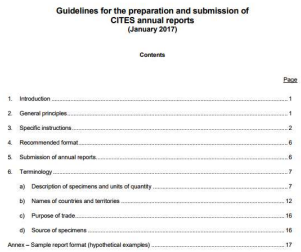
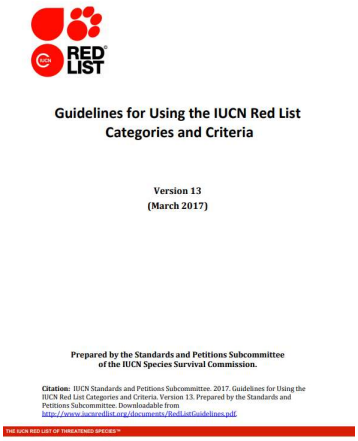
DEFINING DATA AND INFORMATION NEEDS		**Info Brief 5: Summaries of Information: How to demonstrate REDD+ [1]safeguards are being addressed and respected (2016)** *Offers guidance to countries moving towards REDD+ implementation on the possible contents of summaries of safeguards information to be submitted to the UNFCCC[2]. The brief responds to, and elaborates on, UNFCCC guidance on summaries of information, drawing on country approaches to safeguards developed since safeguards for REDD+ were adopted by the convention in 2010* http://www.unredd.net/documents/global-programme-191/safeguards-multiple-benefits-297/15299-info-brief-summaries-of-information-1-en.html
DEFINING DATA AND INFORMATION		**World Heritage advice note: Environmental assessment (2013)** *Guidance for conducting environmental assessments affecting World Heritage Sites* https://cmsdata.iucn.org/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf

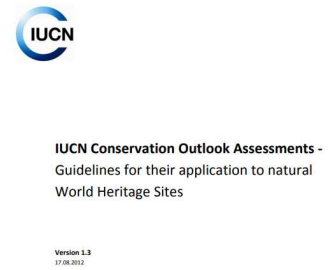
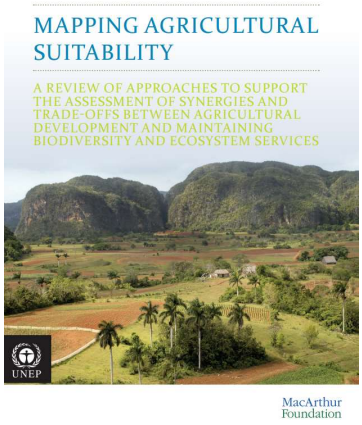
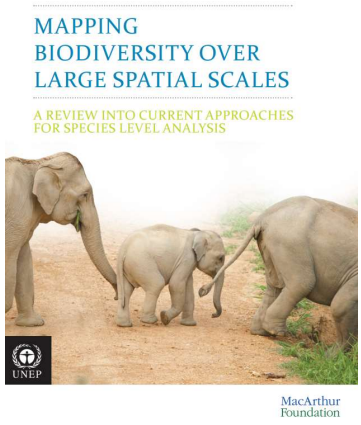
[1] REDD+ Reducing emissions from deforestation and forest degradation.

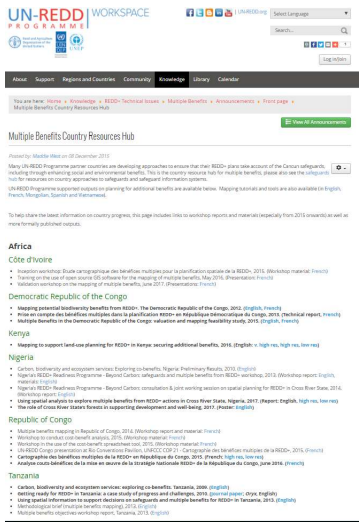
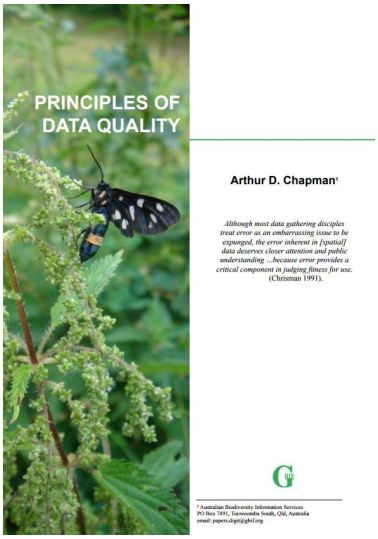
[2] UNFCC United Nations Framework Convention on Climate Change.

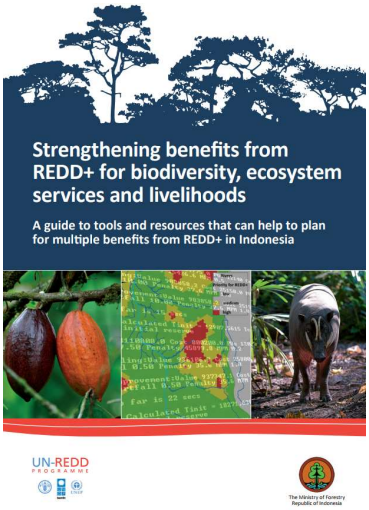
CAPTURING DATA AND INFORMATION		**A Sourcebook of methods and procedures for monitoring essential biodiversity variables in tropical forests with remote sensing (2017)** *Guidance to harmonise, promote and share best operational monitoring practices.* http://elib.dlr.de/112267/1/BiodiversitySourcebook.pdf
CAPTURING DATA AND INFORMATION		**Earth observation for biodiversity monitoring (2014)** *A review of current approaches and future opportunities for tracking progress towards the Aichi Biodiversity Targets* https://www.cbd.int/doc/publications/cbd-ts-72-en.pdf
CAPTURING DATA AND INFORMATION		**Enhancing our Heritage Toolkit (2008)** *Assessing management effectiveness of natural World Heritage sites* http://whc.unesco.org/en/series/23/

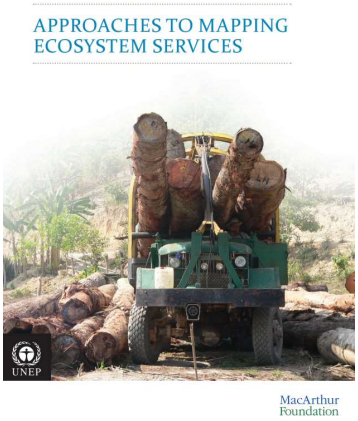
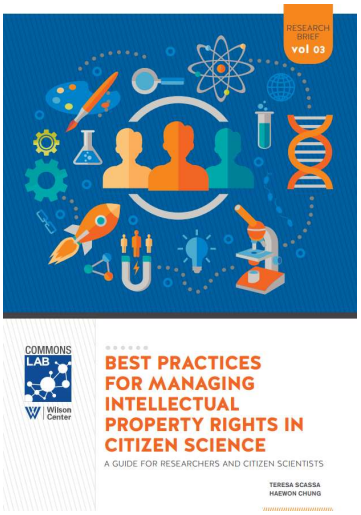
CAPTURING DATA AND INFORMATION		**Guidelines for application of IUCN Red List criteria at regional and national levels (2012)** *3 step approach: 1) deciding which taxa and populations to assess, 2) applying criteria to population to determine preliminary extinction risk within the area, 3) apply guidelines to population to determine final extinction risk* https://portals.iucn.org/library/node/10336
CAPTURING DATA AND INFORMATION		**Guidelines for applying protected area management categories including IUCN WCPA best practice guidance on recognising protected areas and assigning management categories and governance types (2013)** *Guidance on global best practices* https://portals.iucn.org/library/node/30018
CAPTURING DATA AND INFORMATION		**Guidelines for standardised global butterfly monitoring (2015)** *International guidelines to aid monitoring protocol and design* http://www.geobon.org/Downloads/reports/GEOBON/2015/Global%20Butterfly%20Monitoring_Web.pdf

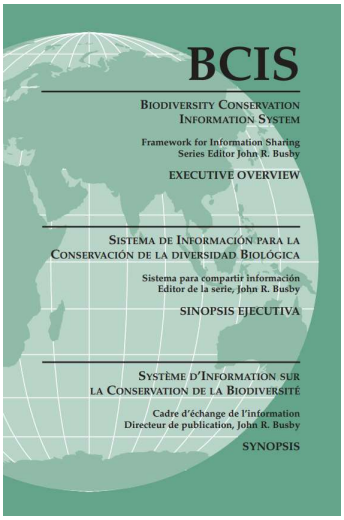
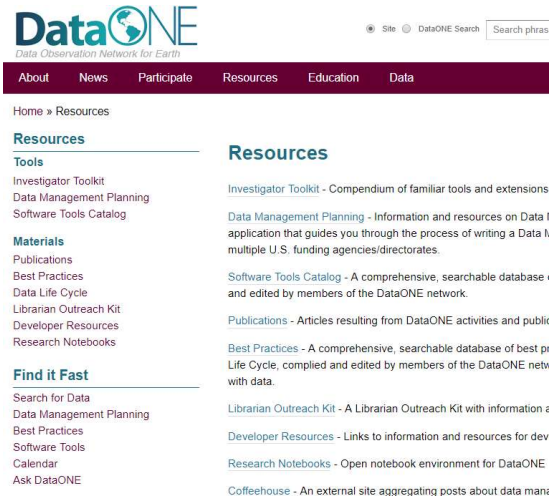
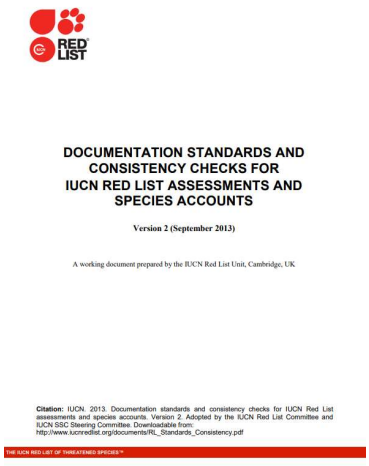
CAPTURING DATA AND INFORMATION		**Guidelines for the preparation and submission of CITES annual reports (2017)** *Guidance on annual reporting of CITES* https://cites.org/sites/default/files/notif/E-Notif-2017-006-A.pdf
CAPTURING DATA AND INFORMATION		**Guidelines for using the IUCN Red List categories and criteria (2017)** *Provides an explicit, objective framework for the classification of the broadest range of species according to their extinction risk* http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf
CAPTURING DATA AND INFORMATION		**Improving wildlife data quality: Guidance on data verification, validation and their application in biological recording (2011)** *Guidance on biological recording to aid collection, verification and validation* https://nbn.org.uk/wp-content/uploads/2016/02/NBN-Imp-Wildlife-Data-Quality-web.pdf

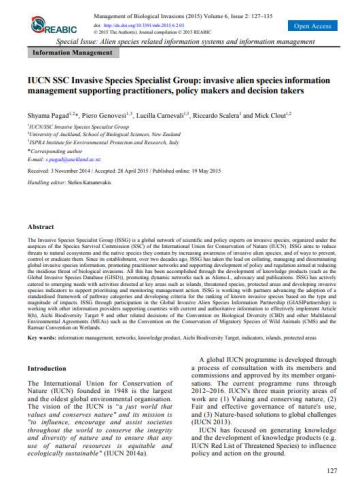
CAPTURING DATA AND INFORMATION		**IUCN Conservation Outlook Assessments (2012)** *Guidelines for their application to natural World Heritage Sites* https://www.iucn.org/sites/dev/files/import/downloads/guidelines_iucn_conservation_outlook_assessments_08_12.pdf
CAPTURING DATA AND INFORMATION		**Mapping agricultural suitability (2016)** *A review of approaches to support the assessment of synergies and trade-offs between agricultural development and maintaining biodiversity and ecosystem services* https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/795/original/Agricultural_Suitability_Mapping_2016_WEB.pdf
CAPTURING DATA AND INFORMATION		**Mapping biodiversity over large spatial scales (2016)** *A review of current approaches and future opportunities for tracking progress towards the Aichi Biodiversity Targets* https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/796/original/Biodiversity_Mapping_2016_WEB.pdf

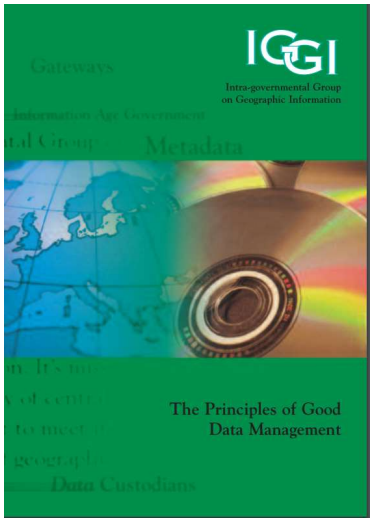
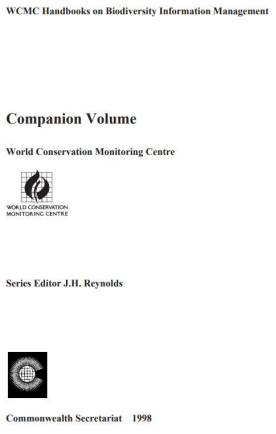
CAPTURING DATA AND INFORMATION		**Multiple Benefits Country Resources Hub (2015)** *Many UN-REDD Programme partner countries are developing approaches to ensure that their REDD+ plans take account of the Cancun safeguards, including through enhancing social and environmental benefits. This is the country resource hub for multiple benefits* http://bit.ly/mbs-redd
CAPTURING DATA AND INFORMATION		**Principles of data quality (2005)** *Overview on data collection (spatial, taxonomic), managing, using and sharing.* https://www.gbif.org/document/80509/principles-of-data-quality
CAPTURING DATA AND INFORMATION		**Safeguards Country Resources Hub (2017)** *Portal for sharing latest information on country progress on safeguard information systems* http://bit.ly/sgdshub

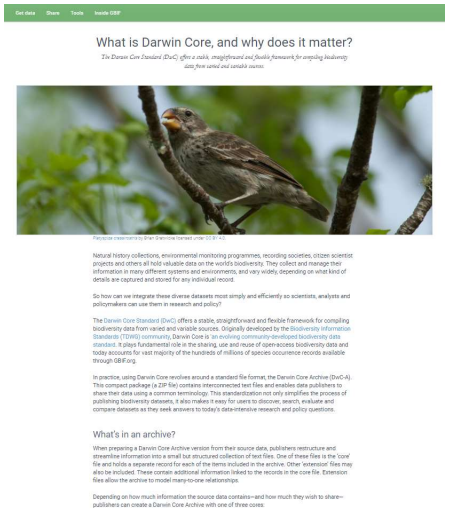
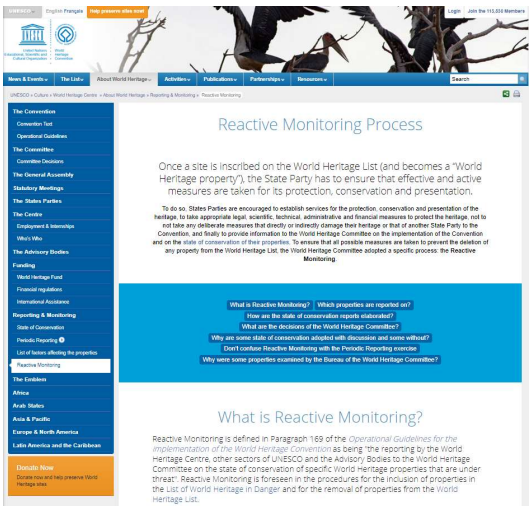
CAPTURING DATA AND INFORMATION		**Strengthening benefits from REDD+ for biodiversity, ecosystem services and livelihoods (2012)** *Guide to tools and resources that can help to plan for multiple benefits from REDD+ in Indonesia* http://old.unep-wcmc.org/medialibrary/2013/07/29/ab427bdb/Tools%20Guidance%202013%20complete%20low%20res.pdf
CAPTURING DATA AND INFORMATION		**The Conservation Handbook (2000)** *Overview of assessing biodiversity, assessing priorities, collecting data and research techniques* https://www.researchgate.net/publication/303115304_The_Conservation_Handbook
CAPTURING DATA AND INFORMATION		**World Database on Protected Areas. User Manual 1.5 (2017)** *Provides information and guidance about the data held within the WDPA* http://pp-import-production.s3.amazonaws.com/WDPA_Manual_1_5.pdf

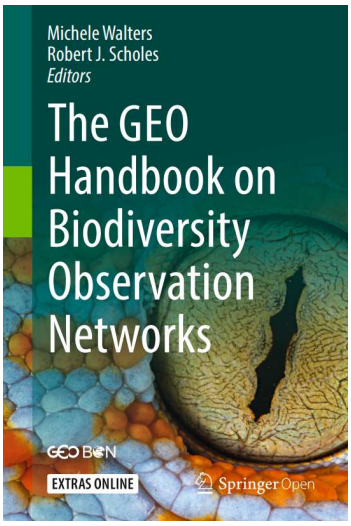
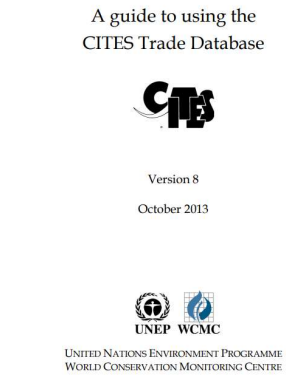
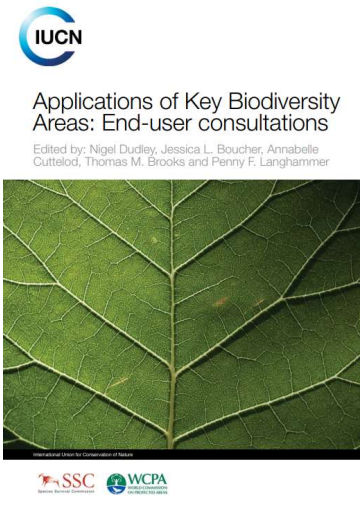
MANAGING DATA AND INFORMATION		**Biodiversity information management and reporting guidelines for South-East Europe (2017)** https://balkangreenenergynews.com/wp-content/uploads/2018/03/BIMR_ENG_publication_Final-Preview.pdf
MANAGING DATA AND INFORMATION		**Approaches to mapping ecosystem services (2016)** *Overview of conceptual models and frameworks for mapping ecosystem services* https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/801/original/Ecosystems_Services_Mapping_2016_WEB.pdf
MANAGING DATA AND INFORMATION		**Best practices for managing intellectual property rights in citizen science (2015)** *Guidance on project design and planning* https://www.wilsoncenter.org/sites/default/files/research_brief_guide_for_researchers.pdf

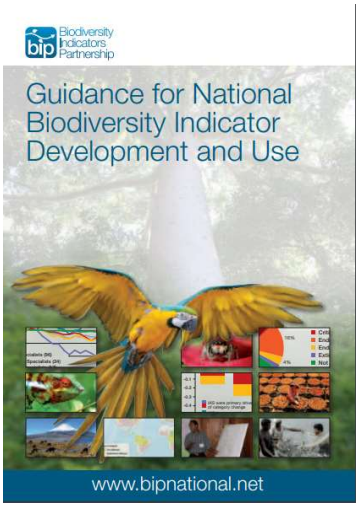
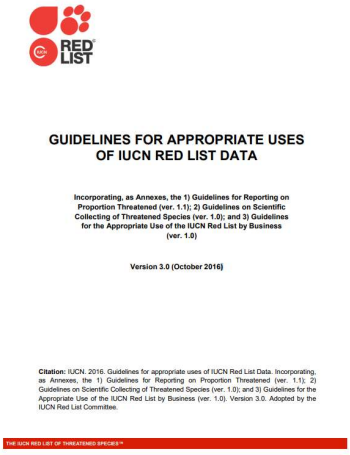
MANAGING DATA AND INFORMATION		**Biodiversity Conservation Information System (2000)** *Guidance on data management, custodianship, sharing data, using data & tools* https://www.unep-wcmc.org/resources-and-data/bcis-framework-for-information-sharing
MANAGING DATA AND INFORMATION		**Data Observation Network for Earth (DataONE)** *A comprehensive, searchable database of best practices for data management and use across the whole Data Life Cycle.* https://www.dataone.org/resources
MANAGING DATA AND INFORMATION		**Documentation standards and consistency checks for IUCN Red List assessments and species accounts (2013)** *Provides detailed instructions for documenting species accounts held in the IUCN Species Information Service* http://cmsdocs.s3.amazonaws.com/keydocuments/RL_Standards_Consistency.pdf

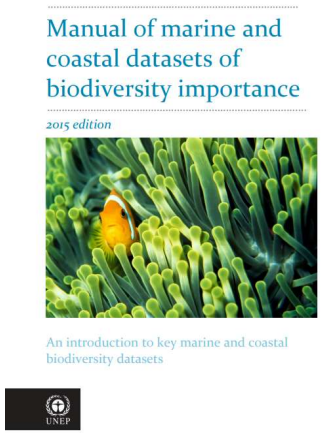
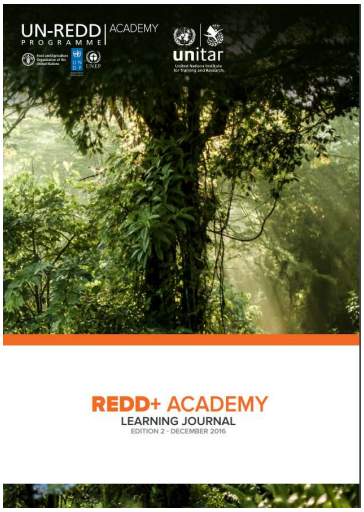
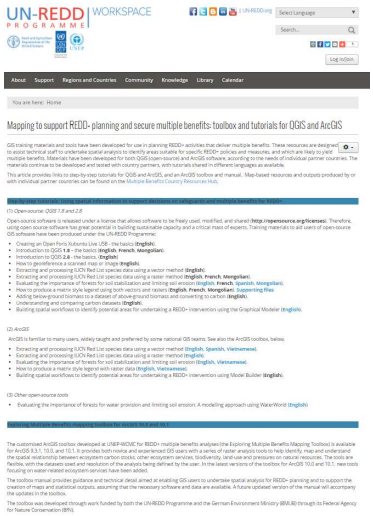
MANAGING DATA AND INFORMATION		**IUCN SSC Invasive Species Specialist Group: Information Management (2015)** *Invasive alien species information management supporting practitioners, policy makers and decision takers* http://www.reabic.net/journals/mbi/2015/2/MBI_2015_Pagad_etal.pdf
MANAGING DATA AND INFORMATION		**Protected Area Governance and Management (2015)** *Overview of managing protected areas* https://portals.iucn.org/library/node/45127
MANAGING DATA AND INFORMATION		**The event core: moving beyond presence-only data (2016)** *The Darwin Core plays a fundamental role in sharing, use and reuse of open-access biodiversity data.* http://www.geobon.org/Downloads/brochures/2016/The%20EventCore-brochure-2016.pdf

MANAGING DATA AND INFORMATION		**The principles of good data and information management (2012)** *Short description on 5 key principles for data management* http://www.ukeof.org.uk/documents/ukeof-advice-note-1
MANAGING DATA AND INFORMATION		**The principles of good data management (2005)** *General guidance on the management of data for those responsible for geographic information.* https://www.gov.uk/government/publications/the-principles-of-good-data-management
MANAGING DATA AND INFORMATION		**WCMC Handbooks on Biodiversity Information Management (1998)** *Guidance on formulating policies, strategies and action plans, designating priorities, QA procedures and data standards, analysis, custodianship and communication* https://www.unep-wcmc.org/resources-and-data/handbooks-on-biodiversity-information-management

MANAGING DATA AND INFORMATION		**What is Darwin Core, and why does it matter? (2016)** *The Darwin Core Standard offers a stable, straightforward and flexible framework for compiling biodiversity data from varied and variable sources* https://www.gbif.org/darwin-core
SHARING DATA AND INFORMATION		**Good practice in data and service sharing (2013)** *Examples of good practice in data and service sharing from various countries* https://inspire.ec.europa.eu/documents/good-practice-data-and-service-sharing
SHARING DATA AND INFORMATION		**Reactive Monitoring Process (2018)** *Guidance on Reactive Monitoring* http://whc.unesco.org/en/reactive-monitoring/#1

SHARING DATA AND INFORMATION		**The GEO handbook on biodiversity observation networks (2017)** *An open-access guidance handbook on a range of topics relating to biodiversity data* https://link.springer.com/content/pdf/10.1007%2F978-3-319-27288-7.pdf
USING DATA AND INFORMATION		**A guide to using the CITES Trade Database (2013)** *Guidelines on how to use the CITES online Trade Database and its constituent data* https://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf
USING DATA AND INFORMATION		**Applications of key biodiversity areas: end-user consultations (2014)** *Summary of existing and potential end-users of the Key Biodiversity Area standard* https://portals.iucn.org/library/node/44911

USING DATA AND INFORMATION		**Biodiversity Indicators Partnership guidance on developing indicators (2011)** *Provides an overview of the components and recommendations for selecting and using biodiversity indicator at different scales* www.bipindicators.net/resources/national-resources/guidance-for-national-biodiversity-indicator-development-and-use
USING DATA AND INFORMATION		**Global biodiversity change indicators (2015)** *Model-based integration of remote-sensing & in situ observations that enables dynamic updates and transparency at low cost* http://www.geobon.org/Downloads/brochures/2015/GBCI_Version1.2_low.pdf
USING DATA AND INFORMATION		**Guidelines for appropriate uses of IUCN Red List data (2016)** *Guidelines on the IUCN Red List categories and criteria, assessment process and uses* https://cmsdocs.s3.amazonaws.com/keydocuments/Guidelines_for_Appropriate_Uses_of_IUCN_Red_List_Data_ver3_rev1.pdf

USING DATA AND INFORMATION		**Manual of marine and coastal datasets of biodiversity importance (2015)** *Identification of 128 datasets, databases and data portals and factsheets. Discussion of challenges, gaps and limitations of coastal and marine data* http://wcmc.io/MarineDataManual
USING DATA AND INFORMATION		**REDD+ Academy Learning Journal Edition Two (2017)** *Training documents on a range of topics, providing introductory information and guidance* http://www.unredd.net/documents/global-programme-191/redd-academy-3509/redd-academy-learning-journals/english/14931-redd-academy-learnign-journalcomplete-english.html
USING DATA AND INFORMATION		**Step-by-step tutorials: Using spatial information to support decisions on safeguards and multiple benefits for REDD+ (2017)** *GIS training materials to assist technical staff to undertake spatial analyses.* http://bit.ly/GIStools-redd

Annex 1 Detailed information on guidance for defining (data needs), capturing, managing, sharing, and using biodiversity-related data

The table provides a detailed breakdown of each guidance document: displaying the title, annotated notes, categories (primary use shown in black, secondary uses shown in grey), themes and the source.

Title	Notes	Categories	Themes	Source
GBIF Best Practice Guide for Content Needs Assessment of Stakeholder communities	Guidance to conduct a user needs assessment	• Defining data needs • Capturing data • Managing data • Sharing data • Using data	General guidance	https://www.gbif.org/resource/80890
Biodiversity Conservation Information System	Guidance on data management, custodianship, sharing data, using data & tools	• Managing data • Defining data needs • Capturing data • Using data • Sharing data	General guidance	https://www.unep-wcmc.org/resources-and-data/bcis-framework-for-information-sharing
WCMC Handbooks on Biodiversity Information Management.	Guidance on formulating policies, strategies and action plans, designating priorities, QA procedures and data standards, analysis, custodianship and communication	• Managing data • Defining data needs • Using data • Sharing data	General guidance	https://www.unep-wcmc.org/resources-and-data/handbooks-on-biodiversity-information-management
Improving wildlife data quality: Guidance on data verification, validation and their application in biological recording	Guidance on biological recording to aid collection, verification and validation.	• Capturing data • Managing data • Sharing data	Species	https://nbn.org.uk/wp-content/uploads/2016/02/NBN-Imp-Wildlife-Data-Quality-web.pdf
The Conservation Handbook	Overview of assessing biodiversity, assessing priorities, collecting data and research techniques	• Capturing data • Managing data	Species, spatial data, monitoring	https://www.researchgate.net/publication/303115304_The_Conservation_Handbook
Data Observation Network for Earth (DataONE)	A comprehensive, searchable database of best practices for data management and use across the whole Data Life Cycle.	• Managing data • Defining data needs	General guidance	https://www.dataone.org/resources
The principles of good data management	General guidance on the management of data for those responsible for geographic information.	• Managing data	General guidance	https://www.gov.uk/government/publications/the-principles-of-good-data-management
The principles of good data and information management	Short description on 5 key principles for data management	• Managing data	General guidance	http://www.ukeof.org.uk/documents/ukeof-advice-note-1
Principles of data quality	Overview on data collection (spatial, taxonomic), managing, using and sharing.	• Capturing data • Managing data • Using data • Sharing data	General guidance	https://www.gbif.org/document/80509/principles-of-data-quality
Good practice in data and service sharing	Examples of good practice in data and service sharing from various countries	• Sharing data	General guidance	https://inspire.ec.europa.eu/documents/good-practice-data-and-service-sharing
Incorporating and using spatial data and mapping for NBSAPs	Guidance to aid incorporating spatial data in the production of NBSAPs	• Defining data needs • Capturing data • Managing data • Sharing data	Spatial data, mapping	http://wcmc.io/ec93
Earth observation for biodiversity monitoring	A review of current approaches and future opportunities for tracking progress towards the Aichi Biodiversity Targets	• Capturing data	Spatial data, monitoring, indicators	https://www.cbd.int/doc/publications/cbd-ts-72-en.pdf
Mapping biodiversity over large spatial scales	A review into current approaches for species level analysis	• Capturing data • Using data	Spatial data, mapping	https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/796/original/Biodiversity_Mapping_2016_WEB.pdf

Approaches to mapping ecosystem services	Overview of conceptual models and frameworks for mapping ecosystem services	• Managing data • Capturing data • Using data	Ecosystem services, spatial data, mapping	https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/801/original/Ecosystems_Services_Mapping_2016_WEB.pdf
A Sourcebook of methods and procedures for monitoring essential biodiversity variables in tropical forests with remote sensing	Guidance to harmonise, promote and share best operational monitoring practices.	• Capturing data • Defining data needs • Managing data • Sharing data • Using data	Spatial data, forests, monitoring, citizen science, EBV	http://elib.dlr.de/112267/1/BiodiversitySourcebook.pdf
Mapping agricultural suitability	A review of approaches to support the assessment of synergies and trade-offs between agricultural development and maintaining biodiversity and ecosystem services	• Capturing data • Using data	Spatial data, agriculture, mapping	https://www.unep-wcmc.org/system/comfy/cms/files/files/000/000/795/original/Agricultural_Suitability_Mapping_2016_WEB.pdf
Info Brief 5: Summaries of Information: How to demonstrate REDD+ safeguards are being addressed and respected	Offers guidance to countries moving towards REDD+ implementation on the possible contents of summaries of safeguards information to be submitted to the UNFCCC. The brief responds to, and elaborates on, UNFCCC guidance on summaries of information, drawing on country approaches to safeguards developed since safeguards for REDD+ were adopted by the convention in 2010	• Defining data needs	Forests, safeguards	http://www.unredd.net/documents/global-programme-191/safeguards-multiple-benefits-297/15299-info-brief-summaries-of-information-1-en.html
Step-by-step tutorials: Using spatial information to support decisions on safeguards and multiple benefits for REDD+	GIS training materials to assist technical staff to undertake spatial analyses.	• Using data	Forests, spatial data, safeguards	http://bit.ly/GIStools-redd
Multiple Benefits Country Resources Hub	Many UN-REDD Programme partner countries are developing approaches to ensure that their REDD+ plans take account of the Cancun safeguards, including through enhancing social and environmental benefits. This is the country resource hub for multiple benefits	• Capturing data • Defining data needs	Forests, safeguards	http://bit.ly/mbs-redd
Safeguards Country Resources Hub	Portal for sharing latest information on country progress on safeguard information systems	• Capturing data • Defining data needs	Forests, safeguards	http://bit.ly/sgdshub
REDD+ Academy Learning Journal Edition Two	Training documents on a range of topics, providing introductory information and guidance	• Using data • Defining data needs	Forests	http://www.unredd.net/documents/global-programme-191/redd-academy-3509/redd-academy-learning-journals/english/14931-redd-academy-learnign-journalcomplete-english.html
Strengthening benefits from REDD+ for biodiversity, ecosystem services and livelihoods	Guide to tools and resources that can help to plan for multiple benefits from REDD+ in Indonesia	• Capturing data	Forests, ecosystem services	http://old.unep-wcmc.org/medialibrary/2013/07/29/ab427bdb/Tools%20Guidance%202013%20complete%20low%20res.pdf
Guidelines for applying protected area management categories including IUCN WCPA best practice guidance on recognising protected areas and assigning management categories and governance types	Guidance on global best practices	• Capturing data • Defining data needs • Managing data • Sharing data • Using data	Protected areas	https://portals.iucn.org/library/node/30018
Protected Area Governance and Management	Overview of managing protected areas	• Managing data • Capturing data	Protected areas	http://press.anu.edu.au/publications/protected-area-governance-and-management/download

Guide to the Global Taxonomy Initiative	Guidance for stakeholders to describe purpose and rationale, programme of work of the GTI. Provide assistance for activities mandated by the GTI.	• Defining data needs	Taxonomy	https://www.cbd.int/doc/publications/cbd-ts-30.pdf
Guidelines for the preparation and submission of CITES annual reports	Guidance on annual reporting of CITES	• Capturing data • Sharing data	CITES, species	https://cites.org/sites/default/files/notif/E-Notif-2017-006-A.pdf
A guide to using the CITES Trade Database	Guidelines on how to use the CITES online Trade Database and its constituent data	• Using data	CITES, species	https://trade.cites.org/cites_trade_guidelines/en-CITES_Trade_Database_Guide.pdf
Harmonisation of nomenclature and taxonomy with other multilateral environmental agreements	Strategic note on harmonisation of nomenclature and taxonomy	• Defining data needs	Taxonomy	https://cites.org/sites/default/files/eng/cop/15/doc/E15-12.pdf
Guidelines for conducting integrated environmental assessments	Guidance for a range of Integrated Environmental Assessments, ranging from global to regional.	• Defining data needs • Capturing data	Assessments	https://wedocs.unep.org/bitstream/handle/20.500.11822/16775/IEA_Guidelines_Living_Document_v2.pdf?sequence=1&isAllowed=y
Guidelines for standardised global butterfly monitoring	International guidelines to aid monitoring protocol and design	• Capturing data • Defining data needs • Managing data • Sharing data • Using data	Species, monitoring	http://www.geobon.org/Downloads/reports/GEOBON/2015/Global%20Butterfly%20Monitoring_Web.pdf
Best practices for managing intellectual property rights in citizen science	Guidance on project design and planning	• Managing data • Capturing data	Citizen science	https://www.wilsoncenter.org/sites/default/files/research_brief_guide_for_researchers.pdf
Guide to citizen science	Developing, implementing and evaluating citizen science to study biodiversity and the environment in the UK	• Capturing data • Managing data • Using data • Sharing data	Citizen science	http://www.nhm.ac.uk/content/dam/nhmwww/take-part/Citizenscience/citizen-science-guide.pdf
An essential biodiversity variable approach to monitoring biological invasions: Guide for countries	Outlines how the use of essential variables for invasion monitoring, along with a modular approach to country development of observation and monitoring systems for biological invasions	• Defining data needs • Capturing data • Using data	Monitoring, citizen science, EBV	http://www.geobon.org/Downloads/reports/GEOBON/2015/MonitoringBiologicalInvasions.pdf
Global biodiversity change indicators	Model-based integration of remote-sensing & in situ observations that enables dynamic updates and transparency at low cost	• Using data	Spatial data, species, protected areas, indicators	http://www.geobon.org/Downloads/brochures/2015/GBCI_Version1.2_low.pdf
The event core: moving beyond presence-only data	The Darwin Core plays a fundamental role in sharing, use and reuse of open-access biodiversity data.	• Managing data • Sharing data • Capturing data	Species	http://www.geobon.org/Downloads/brochures/2016/The%20EventCore-brochure-2016.pdf
What is Darwin Core, and why does it matter?	The Darwin Core Standard offers a stable, straightforward and flexible framework for compiling biodiversity data from varied and variable sources	• Managing data • Sharing data • Capturing data • Using data	Species	https://www.gbif.org/darwin-core
The GEO handbook on biodiversity observation networks	Guidance on a range of topics relating to biodiversity data	• Sharing data	Ecosystem services, species, monitoring, citizen science, spatial data	https://link.springer.com/content/pdf/10.1007%2F978-3-319-27288-7.pdf
Camera-trapping for conservation: a guide to best-practices	Best-practice guidance on use of camera traps, designing a trap study and managing and processing camera trap data	• Capturing data • Using data • Managing data	Spatial data, monitoring	https://www.wwf.org.uk/conservationtechnology/documents/CameraTraps-WWF-guidelines.pdf
Passive acoustic monitoring in ecology and conservation	Provides guidance for acoustic sensor deployment, survey design and data analysis	• Capturing data • Using data	Spatial data, monitoring	https://www.wwf.org.uk/conservationtechnology/documents/Acousticmonitoring-WWF-guidelines.pdf

LiDAR for ecology and conservation	Guide discusses capabilities and application of LiDAR	• Using data	Spatial data, monitoring	https://www.wwf.org.uk/conservationtechnology/documents/Lidar-WWF-guidelines.pdf
Enhancing our Heritage Toolkit	Assessing management effectiveness of natural World Heritage Sites	• Capturing data	Monitoring, stakeholder engagement	http://whc.unesco.org/en/series/23/
Documentation standards and consistency checks for IUCN Red List assessments and species accounts	Provides detailed instructions for documenting species accounts held in the IUCN Species Information Service	• Managing data	Species	http://cmsdocs.s3.amazonaws.com/keydocuments/RL_Standards_Consistency.pdf
Guidelines for appropriate uses of IUCN Red List data	Guidelines on the IUCN Red List categories and criteria, assessment process and uses	• Using data	Species	https://cmsdocs.s3.amazonaws.com/keydocuments/Guidelines_for_Appropriate_Uses_of_IUCN_Red_List_Data_ver3_rev1.pdf
Applications of key biodiversity areas: end-user consultations	Summary of existing and potential end-users of the Key Biodiversity Area standard	• Using data	General guidance	https://portals.iucn.org/library/node/44911
World Heritage advice note	Guidance for conducting environmental assessments affecting World Heritage sites	• Defining data	Assessments	https://cmsdata.iucn.org/downloads/iucn_advice_note_environmental_assessment_18_11_13_iucn_template.pdf
Guidelines for using the IUCN Red List categories and criteria	Provides an explicit, objective framework for the classification of the broadest range of species according to their extinction risk	• Capturing data	Species, taxonomy	http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf
Guidelines for application of IUCN Red List criteria at regional and national levels	Guidelines for applying and classifying at different spatial scales	• Capturing data	Species, taxonomy	https://portals.iucn.org/library/node/10336
World Database on Protected Areas. User Manual 1.5	Provides information and guidance about the data held within the WDPA	• Capturing data	Protected areas	http://pp-import-production.s3.amazonaws.com/WDPA_Manual_1_5.pdf
IUCN Conservation Outlook Assessments	Guidelines for their application to natural World Heritage Sites	• Capturing data	Assessments	https://www.iucn.org/sites/dev/files/import/downloads/guidelines___iucn_conservation_outlook_assessments_08_12.pdf
IUCN SSC Invasive Species Specialist Group: Information Management	Invasive alien species information management supporting practitioners, policy makers and decision takers	• Managing data	Species	http://www.reabic.net/journals/mbi/2015/2/MBI_2015_Pagad_etal.pdf
Biodiversity Indicators Partnership guidance on developing indicators	Provides an overview of the components and recommendations for selecting and using biodiversity indicator at different scales	• Using data • Capturing data • Defining data	Indicators	www.bipindicators.net/resources/national-resources/guidance-for-national-biodiversity-indicator-development-and-use
Indicators and Information Systems for biodiversity and development – guidance from the Pan Europe Region	Aims to help government staff responsible for biodiversity and sustainable development to have effective indicators and information systems for their work	• Defining data • Managing data	General Guidance	https://wcmc.io/BD_info_systems_guidance
Manual of marine and coastal datasets of biodiversity importance	Identification of 128 datasets, databases and data portals and factsheets. Discussion of challenges, gaps and limitations of coastal and marine data.	• Using data	Species	http://wcmc.io/MarineDataManual
Biodiversity information management and reporting guidelines for South-East Europe	Focuses on South-East Europe key elements of biodiversity information management and reporting in line with requirements by the European Union and the Convention for Biological Diversity.	• Managing data • Capturing data • Using data • Sharing data • Defining data needs		