



Eco4Biz

**Ecosystem services and biodiversity tools
to support business decision-making**

Version 1
April 2013



WBCSD would like to thank BSR for its contributions on the framework for categorizing today's ecosystem services tools, based on its tracking of ecosystem services tools since 2007.

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Contents



-  *Global*
-  *Landscape*
-  *Product*

Primary focus on:

-  *Ecosystem services*
(e.g. provisioning, regulating and cultural services)
-  *Biodiversity*
(e.g. species, protected areas)

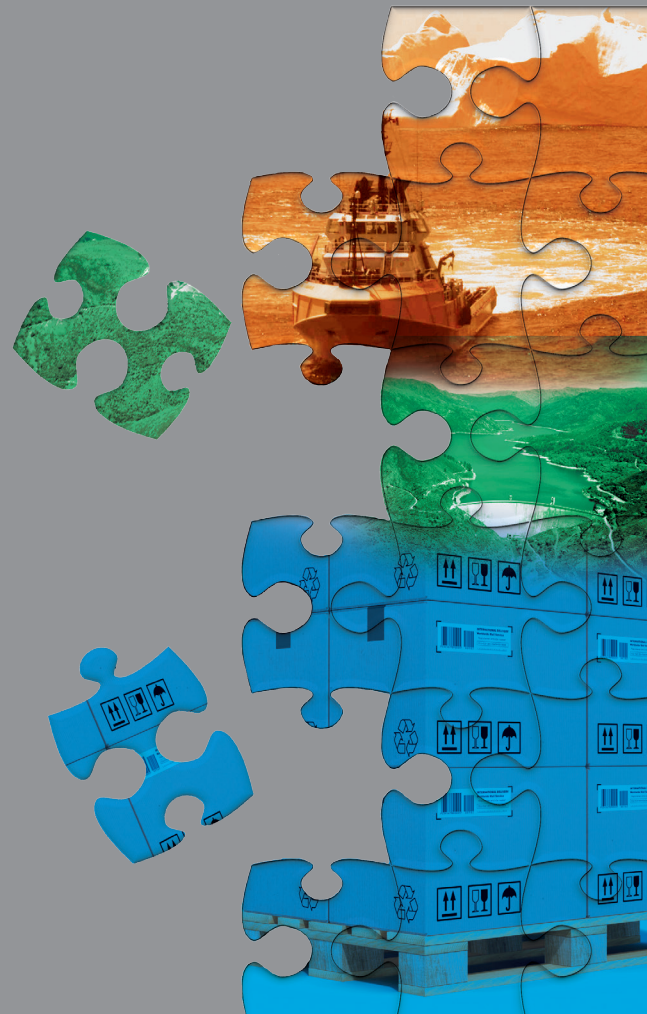
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“Companies have well-developed toolkits for many tasks they face. Yet some challenges – like how to measure and value ecosystem services and biodiversity – are still quite novel. Tools to tackle these are often unfamiliar and still being developed. So we’ve put together this guide to help companies sift through an emerging family of tools to help them assess and ultimately manage their impacts and dependencies on natural capital. I strongly encourage all companies to use, or at least try out, some of these tools. It will help them be better-informed during tough conversations around how to practically account for – and report on – natural capital in a consistent way.”

Peter Bakker, President, WBCSD

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PART 1: Introducing Eco4Biz

What gets measured gets managed

We have heard this adage over and over, yet it still remains relevant to business today. There is one realm, however, where measurement isn't keeping up with management's needs: Nature.

All businesses impact and depend on nature. Nature provides goods and services that are often referred to as ecosystem services. Measuring and assessing these services in order to understand, and uncover some potentially unseen, business risks and opportunities is critical. It can improve decision-making, stabilize supply chains, save costs, capture new revenue streams and inform strategy. It can help prepare for increasingly stringent public policies and regulation, which are starting to include the value of nature. Tools and approaches are emerging, both within companies' existing processes (such as using Life Cycle Assessment and Impact Assessment), as well as through external initiatives.

As we increasingly understand and account for natural capital, so should this information be reflected in corporate measurement, management, and ultimately, reporting. But knowing what to measure, manage and report is far from straight-forward. Without commonly accepted standards and frameworks in place, some companies are reluctant to take action. Others are committed to finding a common toolkit and are welcoming a new era of corporate measurement, management and disclosure, as has been highlighted by BSR.

Building on its 15+ years of experience working with leading companies and key stakeholders, WBCSD is actively working to change the "rules of the game" of corporate measurement, management and reporting on sustainability. Keys to success will ultimately include a robust body of private experience, on which best practice can be based, as well as future work on a standardized approach for natural capital assessment, valuation and accounting. Neither exists yet, but Eco4Biz shows that some pieces of the puzzle are already emerging.

Eco4Biz should be seen as a complementary piece to other initiatives that exist, such as BSR's **ongoing tracking and comparative review of ecosystem services tools**, the **TEEB for Business Coalition** and the **Environmental Profit and Loss (E P&L) Consortium (known as The B Team)**, to name but a few.

Purpose

Eco4Biz provides a **structured overview of existing tools and approaches** that are publicly available. The aim is to help companies make better-informed decisions about which tool they could apply when assessing and managing their ecosystem impacts and dependencies, in order to ultimately lower risk, and enable companies to be more competitive over time.

Eco4Biz clusters tools around two questions corporate managers might ask themselves:

- At what scale would you like to carry out an assessment, i.e. global, landscape (including individual site and portfolio of sites), or product level?
- What outputs would best support your decision-making, e.g. a map (including supporting reports), a quantitative value, or a score showing priority areas?

We have also indicated whether each tool is more focused on **biodiversity or ecosystem services** assessment.

In addition, Eco4Biz could ultimately help tool developers understand how to increase their reach and impact, by better understanding how their tool relates to others, and could be adapted or linked to each other. Such tool developer coordination could significantly encourage and accelerate the development of a common toolkit.

Finally, we hope that Eco4Biz will encourage companies to broaden their assessment beyond traditional environmental management to include ecosystem services and biodiversity. We urge companies to road-test, or simply try out, some of these tools, to start to build a stronger set of practical examples of where using such tools can help business decision-making.

Scope

The tools featured in the main section of Eco4Biz are:

- a. **Practical** tools, including checklists, guidelines and assessments.
- b. Tools that refer broadly to **ecosystems and biodiversity**.
- c. **Tools that can be used by any company irrespective of industrial sector, geographic location or size**.
- d. **Publicly available** tools, whether there is an associated fee to use them or not.
- e. **Currently available** tools.

Please note that:

- Eco4Biz is an information-source, and WBCSD has not “approved” these tools by including them.
- In order to keep the scope manageable, standards and certifications schemes have not been included. The only ones that have been, provided are technical guides or methodologies that are readily available, and could be helpful for company self-assessment, regardless of whether or not the company goes through the actual certification process.
- Also, tools that are currently being developed or finalized are not included. However, there are many in the pipeline, and these could potentially be very valuable in the near future. Short descriptions of these are included in BSR’s “**Measuring and Managing Corporate Performance in an Era of Expanded Disclosure: A Review of the Emerging Domain of Ecosystem Services Tools**” (January 2013).
- Some other valuable tools are only applicable to a certain industrial sector or geographic area, or cover a specific ecosystem service. These are described more succinctly at the end of the document.

- Finally, proprietary tools that are part of a consultancy package and customized or commercialized for each client are not included. However, these can be extremely effective and have been tested by companies, such as **EcoMetrix** and the **Biodiversity Check**.

How Eco4Biz was developed

Eco4Biz was developed through an open and transparent process that involved WBCSD member and non-member companies, NGOs, academic institutes, tools developers and other business organizations. A company Task Force and a stakeholder Advisory Committee were established to agree on the purpose, scope and list of tools to be included. Participants in the process – either as contributors from the beginning, or reviewers of this document – are listed in the “Acknowledgements” box.

Do you know of other tools that should be included in Eco4Biz?

Do you have any suggestions, comments or corrections to this version?

If so, please write to ecosystems@wbcsd.org so that we can include these in the next version.

Many thanks!

The first exercise was to ensure that there was a need for this Eco4Biz, and we reviewed existing efforts to list and categorize tools and approaches. These have been extremely helpful, and include extremely valuable efforts by, in particular:

- BSR’s ongoing work to track and assess emerging ecosystem services tools, specifically including the 2013 “**Measuring and Managing Corporate Performance in an Era of Expanded Disclosure: A Review of the Emerging Domain of Ecosystem Services Tools**”
- IFC’s 2012 **Annotated Bibliography in the Guidance Note 6 “Biodiversity Conservation and Sustainable Management of Living Natural Resources”**

- TEEB 2010 report for business (annex 7.1)
- CBD's online Tools and Mechanisms webpage
- ERM's 2011 "Putting a Price on Nature"
- EBM online Tools database
- IAIA's list of relevant reports
- Alexandra Aubertin's master's thesis for IUCN NL Committee
- Conservation International
- Corporate Eco Forum
- IUCN National Committee of The Netherlands, that is developing a report entitled "Biodiversity & Ecosystem tools for the private sector" (to be released in 2013)

WBCSD members wanted to take a step further and explore whether it would be possible to develop a decision-tree to help navigate through existing tools, that they could "pick up and try out, or use".

Eco4Biz went out for review to a wide audience from the end of December 2012 to early February 2013. BSR's 2013 report was published in January 2013, and provides helpful categories of tools. In order to provide a common decision-tree and



Water, water everywhere

Companies are increasingly recognizing that water is critical for their business. Just as Eco4Biz reviews ecosystem-related tools, "Water4Biz" provides an overview of water tools and initiatives. Regularly updated since 2009, this online guide has been specifically designed to help businesses manage water more sustainably.

attempt to reduce potential confusion, WBCSD and BSR worked together to integrate BSR's categories into the Eco4Biz decision-tree, during Eco4Biz' review process. This collaboration is what is presented in this document.

Eco4Biz is a living document that will be updated regularly to include new tools and updates.

Each tool is presented in a one-page fact sheet which has been reviewed by the tool developer. Tool developers have been asked to verify the categorization of the tools. If any inaccuracies remain, please contact Eva Zabey for input on corrections in future versions at: zabey@wbcسد.org

Tools that work well together are highlighted using this symbol:



Beware of the dreaded acronym!

There are lots of acronyms in Eco4Biz, and we really are very sorry about it. But do not fear, there is a section at the end with all of them (for organizations and tools)



Linking to social capital

The scope of Eco4Biz is limited to natural capital, but social capital (including issues around livelihoods, poverty alleviation, health, etc.) must be considered alongside any assessment of ecosystems and/or biodiversity. We suggest using the following WBCSD tools:

- **Measuring Impact Framework (2008)**, which helps companies understand the business contribution to society.
- **Measuring socio-economic impact: A guide for business (2013)**, which looks at why, and how, a company can measure its socio-economic impact. It also provides an overview of the resources and tools available to business.

PART 2: Selecting and presenting the main tools

Which tool could I use?

The following decision-tree aims to provide guidance on which tool might best suit your needs. It does not reflect every element of each tool, but is supposed to help the reader sift through the tools more effectively.

We invite you to first think about the scale of assessment you would need, and then what sort of outputs you would prefer. Also, tools have been identified as primarily focusing on either ecosystem services (e.g. provisioning, regulating and cultural services), or biodiversity (e.g. species, protected areas), although some tools address elements of both.

1. Scale

At what scale would you like to carry out an assessment?

- **Global:** These tools provide information on where priority areas (e.g. biodiversity hotspots) are, in relation to operations around the world, as well as tools that are designed for a company-wide, high-level assessment that can also include the supply chain.
- **Landscape** (including individual site and portfolio of sites): These tools provide area-specific information on the supply or value of ecosystem services, as well as tools that are designed for a local assessment (e.g. a site and its surrounding area).
- **Product:** These tools provide guidance using a product or service as the starting point.

*If you just don't know where to start,
we suggest you use the:*

Corporate Ecosystem Services Review (ESR)

*as a starting point to begin exploration
of what ecosystem services are, and what
impacts, as well as dependencies, your
company has on them.*

2. Outputs

What outputs would best support your decision-making?

- **Map (including supporting reports):** Tools that generate a geographic map, e.g. based on a modeling program including background datasets.
- **Quantify/value:** Tools that quantify and/or value a company's impact and/or dependence on nature, and include tools that focus on monetary valuation.
- **Check/score:** Tools that provide guidance in the form of checklists, or internal ranking or scoring, to allow companies to prioritize areas of activity.



1 At what *scale* would you like to carry out an assessment

2 What *outputs* would best

Check/score

AT A GLOBAL SCALE?




AT A LANDSCAPE SCALE?




AT A PRODUCT LEVEL?



Primary focus on:

 Ecosystem services (e.g. provisioning, regulating and cultural services)

 Biodiversity (e.g. species, protected areas)

Biodiv., Accountability Framework



Corporate Biodiversity Mgmt Handbook



Biodiversity in GWT



LIFE Methodology



ESR for IA



BROA



ESR



Business & Biodiversity Checklist



Measuring and monitoring at site



IBIS



support your decision-making?

Quantify/value

SERVES



CEV



Map

NBM



IBAT



Biodiversity in GWT



ARIES



Co\$ting Nature



InVEST



LEFT



MIMES



NatureServe Vista



Measuring and monitoring at site





Eco-LCA



Data Basin





| | |
|--|---|
| Scope |   |
| Type | Map & Quantify/value |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What is the supply, demand, delivery and value of ecosystem services in the landscape? |

Purpose and objectives

- Allows users to model, map and quantify ecosystem service delivery between source and use locations.
- Focuses on service delivery: Who are the beneficiaries? Where are they located?
- Distinguishes between possible and actual ecosystem service delivery, highlighting efficiency of use and solutions for mediating supply – demand imbalances.
- Well-suited for baseline studies and scenario assessment for different future climate, land use and land cover conditions.



beyond the state of the art to address value, efficiency and equity, in both ecosystem service provision and distribution.

- Global models will likely be available later in 2013.

Target users

Policy-makers, NGOs, companies and consultants

Requirements and other tips (expertise, software, data, etc.)

- User data not required, but may be necessary to achieve desired accuracy standards beyond publically available global, coarse resolution datasets available in the online version.
- Online graphic user interface (GUI) designed to be accessible to users without extensive time or training.
- Additional training or collaboration with developers may be required for customized applications (e.g., when designing context-specific models, adding user data, developing new ecosystem service models).
- The GUI available through the Internet, works best with Firefox, Chrome, or Safari, but not Microsoft Internet Explorer.
- Familiarity with geographic information systems (GIS) allows user to extend data analysis and produce custom-designed maps based on model results.

Tool type and results

- A modeling platform that is fully customizable to address a broad range of physical, social and economic contexts.
- An open source, web-accessible technology capable of selecting, assembling and running models to quantify, and map flows of ecosystem services.
- A dynamic, multi-paradigm, integrated modeling approach which provides a powerful new way to visualize, value, and manage the ecosystems on which biodiversity, the economy, and human well-being depend.
- Considers ecosystem services from the viewpoint of beneficiaries, while distinguishing among accrued, potential and theoretical ecosystem service values.
- Accounts for data-related uncertainties through probabilistic modeling of ecosystem service supply and demand. Uncertainty is computed throughout the process to enable accuracy assessment of final results.
- Explicitly accounts for the spatial and temporal dynamics of ecosystem service transport.
- Supports dynamic trade-off analysis.
- Model output includes a set of maps describing ecosystem service supply, demand and delivery. Aggregate indicators extend

Examples of company users



ARIES has primarily been used by non-business entities (see http://www.ariesonline.org/case_studies.html). There have been corporate applications, none of which are publicly available.

Sponsoring organization and developers

UNEP-WCMC, United States National Science Foundation, Basque Centre for Climate Change (BC3), University of Vermont, Conservation International, Earth Economics, Instituto di Ecologia INECOL

Website and contact: www.ariesonline.org/; info@ariesonline.org



| | |
|---------------------------------|---|
| Scope |   |
| Type | Map & Check/score |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | How many, and which, of my sites are located in a biodiversity hotspot? |

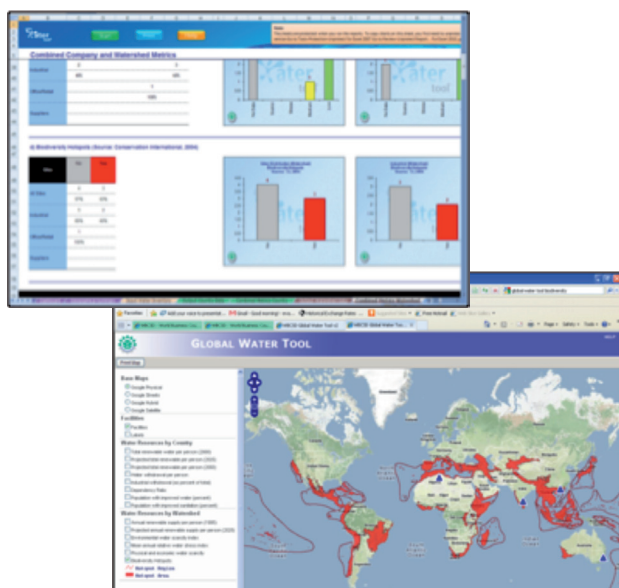
Purpose and objectives

- This Excel-based tool helps carry out a quick, first macro-level assessment of company sites to know how many, and which ones, are in a biodiversity hotspot.
- As a special layer of the WBCSD's Global Water Tool (GWT), the purpose is to help companies manage biodiversity-related risks by understanding the local context.

Tool type and results

The tool is a freely downloadable Excel file that is stored on the user's computer. The user enters coordinates of its sites (or the addresses of its sites that the tool automatically converts into coordinates using Google Earth). Hundreds of sites can be entered, and then the tool provides answers to:

- *How many* of your sites are in a biodiversity hotspot (in a chart),
- *Which* sites are in a biodiversity hotspot (in the Excel sheet),
- *Where* are all your sites on a biodiversity hotspot map (using the mapping function).



Target users

Business managers from any industrial sector that operates in at least 10 countries

Requirements and other tips (expertise, software, data, etc.)

- No expertise or data is required to use the tool. The **GWT Excel file is freely downloadable**. The Biodiversity layer is contained within the GWT itself, and a **2-page explanatory note is available too**.
- The biodiversity hotspot additional data layer aims to prioritize sites that have a higher chance of being within ecosystems of interest and should be looked at in more detail by subsequent assessment. The developers warn to not consider the results as final or comprehensive local biodiversity management guidance. They suggest using finer scale information relevant to specific locations for a more detailed assessment and planning.

Examples of company users

- **eni** tested the biodiversity hotspot layer of the GWT to understand the interaction between its activities and biodiversity hotspots worldwide, and combined it with a more detailed tool (such as IBAT) for site assessments.


Sponsoring organization and developers

WBCSD and IPIECA with insights from Conservation International, UNEP-WCMC, IUCN and IBAT. The development of the original GWT (2007 and updated since) was led by CH2M HILL and over 20 WBCSD members. The addition of the Biodiversity layer was initiated and supported by IPIECA.

Website and contact: www.wbcd.org/web/watertool.htm; Eva Zabey: zabey@wbcd.org

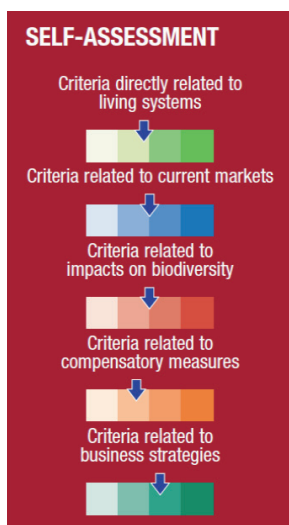
Biodiversity Accountability Framework & Biodiversity Interdependence Indicator (BBII)

2008, reprint 2010

| | |
|--|---|
| Scope |  |
| Type | Check/score |
| Used/road-tested by company | Yes |
| Cost | Free (analysis grid for members only) |
| Main question this tool answers | What is my company's overall interdependence with biodiversity? |

Purpose and objectives

- The Biodiversity Accountability Framework is a self-assessment framework to present and understand the perception which each business, business association and local government has of its own interdependence with biodiversity.
- The accompanying Business and Biodiversity Interdependence Indicator (BBII) is a multi-criteria analytical tool.



- The criteria include those that are 1) directly related to living systems, 2) related to current markets, 3) related to impacts on biodiversity, 4) related to compensatory measures (offset measures) and 5) related to business strategies (the company's strategic positioning).

Target users

Business managers from any sector

Requirements and other tips (expertise, software, data, etc.)

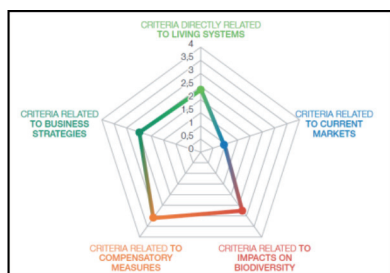
- The PDF is freely downloadable, and data needs to be included by the user.
- The analysis grid that facilitates the consolidation of input to produce the charts is only accessible to Orée members.

Examples of company users

- EDF – Électricité de France (energy):** The BBII road-testing re-confirmed that EDF relies heavily on water for thermal, nuclear power and for hydropower, and highlighted elements of industrial ecology.
- Veolia Environnement (water, environment, energy, transport):** Having worked on biodiversity since 2004, Veolia considered the BBII as a way to raise awareness on the water services and biodiversity interdependence and provide a more structured approach through all of its organizational level.

Tool type and results

- The 380-page manual is available in PDF, and provides a structured approach to weighing priority areas of interdependence on ecosystems, as well as about 15 case studies of companies testing the BBII.
- The BBII consists of 23 criteria that create a composite indicator which characterizes the interactions between biodiversity and businesses. The BBII accompanying analysis grid produces a spider diagram summary. For each criterion the analysis offers four options. The business has to select one of these options by checking a box, and must also explain the response.




Sponsoring organization and developers

Orée

Website and contact: www.oree.org/en/presentation-of-the-guide-biodiversity.html,
Information: oree@oree.org

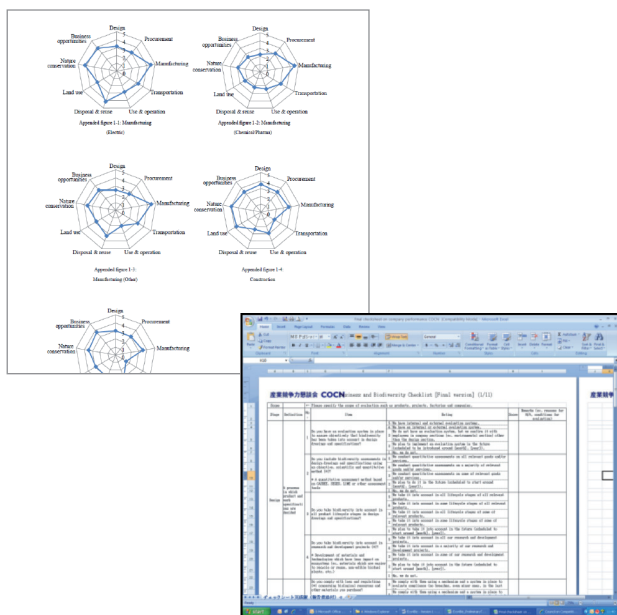
Business and Biodiversity Checklist

2012, available in Japanese and English

| | |
|---------------------------------|---|
| Scope |  |
| Type | Check/score |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What are my company's main strengths and weaknesses related to biodiversity? |

Purpose and objectives

- To evaluate strengths and weaknesses related to biodiversity conservation for products and services, business activities, factories, or a whole company, and to push for continuous improvement through a PDCA (Plan-Do-Check-Act) cycle.
- The checklist was developed by companies of various sectors to evaluate activities according to nine stages: Six of them relate to product or service lifecycle (design, procurement, manufacturing, transportation, use/operation, and disposal/reuse); the remaining three stages consist of land use, conservation, and business opportunities. Each stage has several items to be considered, with ratings from 1 to 5, depending on the level of biodiversity consciousness, 5 being the highest score.
- The overall purpose of the checklist is to reduce risks and improve competitiveness.



Tool type and results

The tool is an Excel file with a checklist with ratings that provides a report of areas of strengths and weaknesses regarding corporate biodiversity consciousness (product, company, factory, etc.). The checklist allows for flexibility in terms of possible customization for a company or business sectors.

Target users

Companies of various sectors

Requirements and other tips (expertise, software, data, etc.)

- The tool is freely available.
- No data input is required.
- No specific expertise or software is required.
- The report is Microsoft Word and the checklist is Microsoft Excel file.

Examples of company users

- The checklist has been tested by 23 companies of various sectors: electricity/electronic, chemical/pharmaceutical, other manufacturers, construction, service.
- Hitachi:** After road-testing the tool, an in-depth use of the tool helped identify what was working today, as well as areas to improve in the future. This prompted a group-wide education initiative, and the results of the checklist will be integrated into the company's future action plan and self-evaluation.

Sponsoring organization and developers



- Council on Competitiveness-Nippon (COCN).

Website and contact: <http://cocn.jp/en/index.html>, Secretariat: cocn.office.aj@hitachi.com.

Note: Please search for "7. Task Force Project & Study Team 10) Business and Biodiversity Study Group" on the above website.

Biodiversity Risk & Opportunity Assessment (BROA)

2007, publicly available 2012

| | |
|---------------------------------|---|
| Scope |   |
| Type | Check/score |
| Used/road-tested by company | Yes |
| Cost | Free |
| Main question this tool answers | What are my impacts and dependencies on biodiversity – and related risks and opportunities – in the landscape where I operate? |

Purpose and objectives

- Identify the impacts and dependencies of business operations on biodiversity, using a landscape approach.
- Assess and prioritize the risks and opportunities arising from those impacts and dependencies.
- Produce action and monitoring plans to address the identified risks and opportunities.

Tool type and results

The tool is a freely downloadable Excel file that is stored on the user's computer. A detailed guidance document takes the user through the tool step by step. Checklists are provided at each stage. The information includes:

- Handbook and Excel spreadsheets that guide stakeholder engagement, field-based assessments, and prioritization of risks and opportunities.
- Action and monitoring plans for prioritized risks and opportunities.

Target users

Business managers and companies that have operations and supply chains in important landscapes, e.g. agricultural landscapes.

Requirements and other tips (expertise, software, data etc.)

- Tool and support material freely available.
- Training available, but no in-house specialist skills required.
- User required to compile existing information about biodiversity, land-use, other stakeholders, map area of operation etc. in target landscape.
- Collaboration with a 'Conservation Partner' (environmental NGO, university department, consultancy) is recommended, to bring conservation expertise and to facilitate company engagement with broader range of stakeholders.

Examples of company users

British American Tobacco implemented BROA in 20 countries between 2007 and 2010 and will repeat the process with the updated tool in the same countries by 2015. Other companies using the tool include **ITC India**. The tool has been tested and used by companies with agricultural supply chains; however, it is relevant to any landscape and can be used as a site level assessment tool.

Sponsoring organization and developers



The British American Tobacco Biodiversity Partnership: British American Tobacco, Earthwatch Institute, Fauna & Flora International, Tropical Biology Association.

Website and contact: www.batbiodiversity.org, bat_bp@batbiodiversity.org



Co\$ting Nature

Version 1 2009, Version 2 2011. Updated frequently.

| | |
|--|--|
| Scope |   |
| Type | Map & Quantify/value |
| Used/road-tested by company | No |
| Cost | Free for commercial use, but users (who access the system using a different URL) have to provide some of their own datasets. In the non-commercial use version, all of the required data is provided for free. |
| Main question this tool answers | How will ecosystem service provision change under different land management scenarios? |

Purpose and objectives

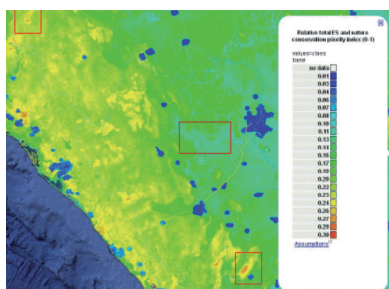
Co\$ting Nature is a web-based tool for analyzing the ecosystem services provided by natural environments, identifying the beneficiaries of these services and assessing the impacts of human interventions such as land use change upon them.

It calculates a baseline for current ecosystem service provision and allows a series of interventions (policy options) or scenarios of change to be used to understand their impacts on ecosystem service delivery.

The system processes and manages data, analyzes & helps visualize the results of models. It supports decision-making, in particular for conservation and restoration planning, hazard assessment and resilience planning, as well as coastal and watershed land use planning.

Tool type and results

The software calculates the spatial distribution of ecosystem services for water, carbon, hazard mitigation and tourism services and combines these with maps of conservation priority, threatened biodiversity and endemism, to understand the spatial distribution of critical ecosystems. These data are combined with analysis of current human pressures and future threats on ecosystems and their services, in order to visually assess conservation priority and thus environmental risks of development.



Target users

Conservation and development NGOs, policy analysts, agriculture and industry (e.g. extractives), education and academic research.

Requirements and other tips (expertise, software, data, etc.)

- Available for free on-line. User manual and training slides available on-line.
- All data supplied globally at 1km and 1hectare spatial resolution for national and site scale work respectively. Users can upload their own data if they have better.
- Basic understanding of ecosystem services necessary.
- GIS analysis, if downloading data for further analysis.

Examples of company users

The tool has been used experimentally by a number of companies, but no public summaries are available. Public version restricted to non-commercial use because of licenses associated with some of input datasets. Commercial-use version available, in which these datasets are omitted or supplied by the user.


Sponsoring organization and developers

King's College London (models), AmbioTEK (software), UNEP-WCMC (applications)

Website and contact: www.policysupport.org/costingnature, Mark Mulligan: mark.mulligan@kcl.ac.uk

Corporate Biodiversity Management Handbook (& Checklists)

2010, available in English and German

| | |
|---------------------------------|---|
| Scope |  |
| Type | Check/score |
| Used/road-tested by company | No |
| Cost | Free |
| Main question this tool answers | What should I include in a corporate biodiversity management plan? |

Purpose and objectives

The handbook introduces the subject, defines specific “Fields of Action”, examines the “Impact Factors” businesses should be aware of, and helps to create a business case for biodiversity, while offering specific tips on how to operationalize corporate biodiversity management. Supported with tips, facts and information and backed up with best-practice examples from companies across the globe.

It aims to offer businesses a practical tool to comprehensively and directly implement a biodiversity management plan by dealing with the topic of business and biodiversity from a corporate perspective.

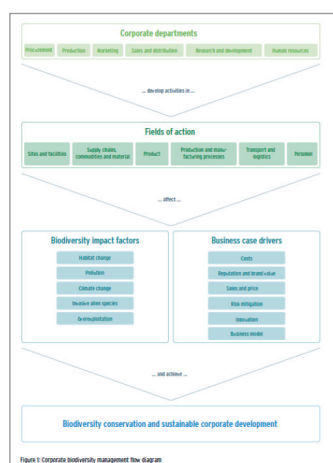
Tool type and results

Handbook (60-page PDF) including checklists that can be completed with multiple-choice questions on-line and then printed, or sent to the Business & Biodiversity team directly.

The results depend on the key issues identified using the handbook and checklists.

Target users

Business managers



Requirements and other tips (expertise, software, data, etc.)

- Available for free on-line.
- An understanding of business process and function.

Examples of company users

A wide range of case studies about companies including biodiversity in their strategy are listed: <http://www.business-and-biodiversity.de/en/handbook/best-practice-examples.html#c4795>, but no use of the tool by a company has been documented to date.

Sponsoring organization and developers

Collaborating organizations: Secretariat of the Convention on Biological Diversity (CBD), GIZ – Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, CNI – Confederação Nacional da Indústria, German Global Compact Network, European Business and Biodiversity Campaign and Nippon Keidanren

Developed by: Centre for Sustainable Management at Leuphana University, B.A.U.M. (Bundesdeutscher Arbeitskreis für Umweltbewusstes Management)



Website and contact: www.business-and-biodiversity.de/en/handbook/, Carolin Bossmeyer: carolin.bossmeyer@business-and-biodiversity.de

Corporate Ecosystem Services Review (ESR)

2008 (version 2.0 released in 2012), available in English, Chinese, Spanish, French, Japanese, Portuguese



Ideal 1st step
before CEV

| | |
|--|---|
| Scope |   |
| Type | Check/score |
| Used/road-tested by company | Yes |
| Cost | Free |
| Main question this tool answers | What ecosystem services do I depend and impact on, and how can related risks and opportunities be incorporated in my strategy? |

Purpose and objectives

To help managers develop strategies to address risks and opportunities arising from a company's impact and dependence on ecosystem services.

Tool type and results

The ESR is presented in a PDF handbook, with a 5-step process, including a structured sequence of questions and an Excel spreadsheet. It also provides a framework for strategy development, case studies, further information, PowerPoint presentations and references.

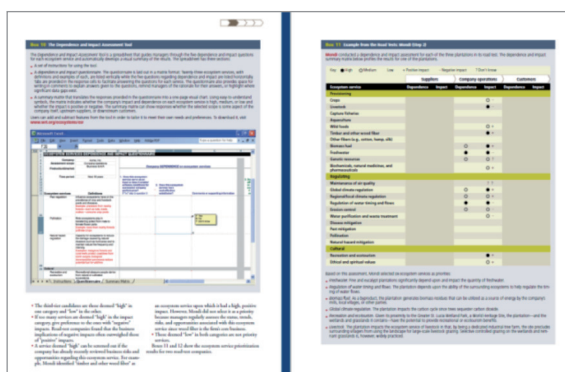
The detail of an ESR depends on the purpose of the exercise, and the user will typically run through the list of priority ecosystem services, identify possible business risks and opportunities, and prioritize a set of strategies.

Target users

Business managers from any business sector.

Requirements and other tips (expertise, software, data, etc.)

- The ESR (35-page PDF and the Excel spreadsheet) is freely available on-line.
- Data needs to be inputted by the user based on, for example, internal knowledge, NGO input, published research, expert input, external reports, resources and tools.





Examples of company users

- The ESR has been used by over 300 companies, including Lafarge, Cemex, Mondi, Syngenta and Yves Rocher.
- **Syngenta (agri-business):** used ESR in a growing market for the company: small farms in south India. The ESR helped the company identify risks its customers face due to ecosystem degradation; for example, lower yields due to a decline in the ability of natural predators to contain pest outbreaks, and reduced soil fertility, due to poor farm management practices. In turn, the ESR helped Syngenta find opportunities to offer new products and services that mitigate these risks.
- **Mondi (pulp and paper):** conducted ESR on three of their tree plantations in South Africa. The ESR highlighted methods the company could use to increase its supply of freshwater, while improving the surrounding environment, strengthening its relationship with local communities, and reducing operational costs. Mondi used the ESR findings to help develop a 3-year strategic work plan.

Sponsoring organization and developers

World Resources Institute (WRI), WBCSD, Meridian Institute

Website and contact: www.wri.org/publication/corporate-ecosystem-services-review, Suzanne Ozment: sozment@wri.org and Eva Zabey: zabey@wbcsd.org

| | |
|---------------------------------|---|
| Scope |   |
| Type | Map |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What is the biological, physical and socioeconomic situation where we operate? |

Purpose and objectives

Data Basin is an on-line information platform that empowers users to apply spatial datasets and analytical tools to address conservation challenges. Individuals and organizations can explore and download a vast library of datasets, upload their own data, create complete conservation analyses and publish maps – either as individuals or through dedicated working groups.

Tool type and results

This analytical tool is constructed to help natural resource planners and conservation practitioners apply spatial information to address conservation questions and challenges.

- Data Basin contains over 7000 public biological, physical and socioeconomic datasets for use in conservation and development planning. Another 3000+ datasets are being used in the systems by private working groups.
- Specific datasets can be brought together to create customized maps that can be visualized, formatted, saved, and shared using existing Data Basin tools. Datasets and maps can be uploaded, and maps made from any dataset within the system can be easily customized by users. These datasets and maps can be kept private, shared with groups, or published for everyone for use and download. Groups often work together to develop these spatial products with provided drawing and commenting tools.
- Specialized analytical and reporting tools are available, or can be developed, to support specific work processes. Many tools have been created to support regional and site level risk and impact assessment.
- Data Basin also provides social networking support. Users can search profiles to find data providers, potential collaborators or interested audiences.

Target users

Data Basin is designed for people who need to use up-to-date spatial datasets with conservation analysis methods and reporting tools to advance their daily work. Specific applications have been developed to support environmental risk assessments of regional and site level development initiatives in the infrastructure, energy, extraction and agricultural sectors.

Requirements and other tips (expertise, software, data, etc.)

- The use of the basic functions of the system has no cost to the user.
- No technical skills are required to use this tool. Data Basin was built to provide powerful spatial visualization, analysis and reporting capability for non-GIS professionals.
- Users can use the 7,000+ datasets currently available in Data Basin, or can upload their own files. All spatial files are ESRI Shapefile, ArcGrid, ESRI File Geodatabase, and NetCDF. Spreadsheet data with locations will be supported in the very near future.
- A modern web-browser, such as Chrome, Firefox, Safari, or Internet Explorer 9+.

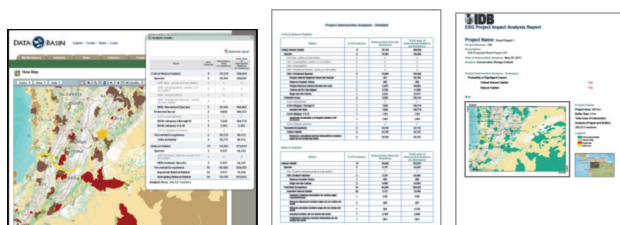
Examples of company users

There are currently over 5,000 registered Data Basin users, including corporations. To date, Data Basin has been brought into service for the environmental and social impact assessment by the Multi-National Development Bank community, with the strongest use by the **InterAmerican Development Bank (IDB)**. Numerous infrastructure and energy development corporations have also used this tool for project planning activities in North and Latin America.

Sponsoring organization and developer


Conservation Biology Institute

Website and contact: www.databasin.org,
Dennis Grossman: denny@consbio.org



Ecologically Based Life-Cycle Assessment (Eco LCA)

2009

| | |
|---------------------------------|---|
| Scope |  |
| Type | Quantify/value |
| Used/road-tested by company | Yes |
| Cost | Free |
| Main question this tool answers | How can I quantify the role of natural resources in Life Cycle Assessment? |

Purpose and objectives

Eco LCA is an on-line tool that provides accounting system software that quantifies the role of natural resources in Life Cycle Assessment (LCA). It complements other LCA tools by taking into account a broad range of ecosystem services.

Tool type and results

Web-based software package

Target users

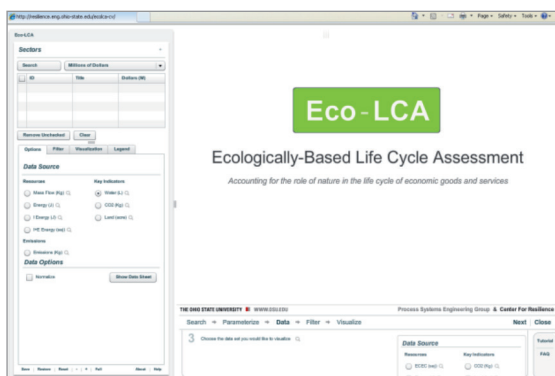
Not specifically for business, but can help anyone seeking to understand environmental impacts of products.

Requirements and other tips (expertise, software, data, etc.)

- Free on-line tool.
- Knowledge of company products or services.
- Knowledge of traditional LCA is an advantage.

Examples of company users

- **Cook Composites and Polymers (CCP) (composites):** To road-test the WBCSD's Guide to Corporate Ecosystem Valuation (CEV), CCP worked with the US Business Council for Sustainable Development (US BCSD) and the Center for Resilience (CfR) to understand and quantify the financial and ecosystem benefits associated with ecological storm water management. Options considered included designing and implementing a constructed wetland for storm water management.
- **Houston By-Products Synergy (process):** The US Business Council for Sustainable Development (US BCSD), the WBCSD's US regional partner, has designed and implemented a process called By-Product Synergy. As part of its CEV road test, the study used Eco-LCA to quantify physical ecosystem benefits, realized through the process of matching undervalued or waste materials from one company with the needs of another.




Sponsoring organization and developers

Ohio State University's Center for Resilience

Website and contact: www.resilience.osu.edu,
Eco LCA Team: ecolca.osu@gmail.com

Ecosystem Services Review in Impact Assessment (ESR for IA) 2013

| | |
|--|--|
| Scope |  |
| Type | Check/score |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What are the impacts and dependencies of a project on ecosystem services, and how can I align these with my impact assessment? |

Purpose and objectives

The ESR for IA has two purposes:

- To identify measures to mitigate project impact on ecosystems that affect the livelihoods, health, safety or cultural heritage of the people benefiting from these ecosystems.
- To provide measures to manage project operations dependence on ecosystem services to achieve planned performance.

Tool type and results

The ESR for IA includes six steps to incorporate ecosystem services during the Environmental and Social Impact Assessment (ESIA) scoping, baseline and impact analysis, and mitigation stages.

The results of the ESR for IA include:

- Identification of priority ecosystem services for consideration in further stages of ESIA.
- Identification of stakeholders to engage around priority ecosystem services.
- Assessment of project impact and dependence on priority ecosystem services.
- Measures to mitigate project impact and manage project dependence on priority ecosystem services.

Target users

Environmental and social practitioners assessing the impacts of a project

Requirements and other tips (expertise, software, data, etc.)

- The overall framework is available online. In 2013, a series of spreadsheets and a technical guidance document will also be available.
- The users need to be experts in impact assessment and have access to expertise in stakeholder engagement.

Examples of company users

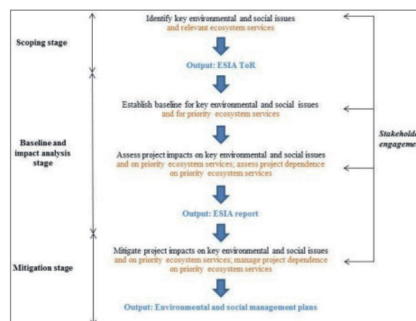
The ESR for IA was road-tested by social and environmental practitioners on completed project environmental and social impact assessments (ESIAs). Implementation on ongoing ESIA is currently taking place. Background on which companies have road-tested it, and details of their experience using the tool, will be made available in 2013.

Sponsoring organization and developers


World Resources Institute (WRI)

Website and contact: <http://www.wri.org/publication/ecosystem-services-review-for-impact-assessment>, Florence Landsberg: Florence.landsberg@wri.org

| Step | Question | Yes | No | Partial | Not applicable |
|------------------------------------|--|-----|----|---------|----------------|
| Scoping stage | Identify key environmental and social issues and relevant ecosystem services | Y | N | P | NA |
| | Establish baseline for key environmental and social issues and for priority ecosystem services | Y | N | P | NA |
| | Assess project impacts on key environmental and social issues and on priority ecosystem services, assess project dependence on priority ecosystem services | Y | N | P | NA |
| Baseline and impact analysis stage | Mitigate project impacts on key environmental and social issues and on priority ecosystem services, manage project dependence on priority ecosystem services | Y | N | P | NA |
| | Identify key environmental and social issues and relevant ecosystem services | Y | N | P | NA |
| | Establish baseline for key environmental and social issues and for priority ecosystem services | Y | N | P | NA |
| Mitigation stage | Assess project impacts on key environmental and social issues and on priority ecosystem services, assess project dependence on priority ecosystem services | Y | N | P | NA |
| | Mitigate project impacts on key environmental and social issues and on priority ecosystem services, manage project dependence on priority ecosystem services | Y | N | P | NA |
| | Identify key environmental and social issues and relevant ecosystem services | Y | N | P | NA |





| | |
|---------------------------------|--|
| Scope |  |
| Type | Quantify/value |
| Used/road-tested by company | Yes |
| Cost | Free |
| Main question this tool answers | How can I carry out ecosystem valuation in a business context, using a step-by-step process? |

Purpose and objectives

CEV aims to provide a framework for business to incorporate ecosystem values in decision-making. The two parts of the guide consist of (i) screening to help companies establish if a CEV is necessary (ii) a process to illustrate how to undertake a CEV. CEV also helps navigate through the jargon around ecosystem valuation.

Tool type and results

- The PDF guide is accompanied by two technical papers called “ **A: Selected Ecosystem Valuation Concepts and Issues**” and “**B: Selection & Application of Ecosystem Valuation Techniques for CEV**”
- Results depend on the purpose of the ecosystem valuation exercise and can include qualitative, quantitative and monetary assessments. These can be used to inform a decision on which scenario to choose, or to quantify the total benefits and costs of ecosystem services.
- CEV will be complemented in September 2013 by a more specific guidance on water valuation: “Business guide to water valuation: An introduction to concepts and techniques”.

Target users

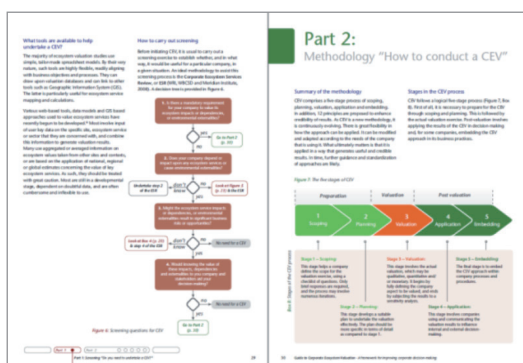
Business managers from any business sector

Requirements and other tips (expertise, software, data, etc.)

- Freely available 70-page PDF on-line (no software required).
- Knowledge of company process, products/ services impacts on biodiversity.
- Environmental economist is needed to carry out the valuation itself (to crunch the numbers).

Examples of company users

- 14 companies road tested the CEV features from a wide range of companies from different sectors and geographies. See: <http://www.wbcsd.org/work-program/ecosystems/cev/roadtesters.aspx>
- **Holcim (cement/aggregates):** CEV was used to better inform the rehabilitation plan for a proposed extension to a sand and gravel mine, as part of the UK permitting process. The study examined the value of ecosystem services including wildlife habitat, flood control, recreation and carbon sequestration, generated for local communities and the wider region under several alternative restoration scenarios, including restoring agricultural land and establishing a mix of wetlands and an artificial lake.
- **AkzoNobel – Eka Chemicals (chemicals for pulp and paper industry):** The study compared the societal costs of atmospheric emissions for three alternative chemicals used in paper production. Benefits transfer was used to assess the value of externalities caused by greenhouse gases, SO₂, NO_x, VOC, dust and ammonia released in the life cycle from cradle to delivery at paper mill.





Sponsoring organization and developers

WBCSD, with ERM, IUCN, PwC and WRI

Website and contact: www.wbcsd.org/web/cev.htm, Eva Zabey: zabey@wbcsd.org



| | |
|--|--|
| Scope |   |
| Type | Map |
| Used/road-tested by company | Yes |
| Cost | US\$500 p.a. to US\$25,000 |
| Main question this tool answers | How can I screen for biodiversity risks and opportunities at a site or across a portfolio of sites, and better plan for and manage my project to take into account these biodiversity related risks and opportunities? |

Purpose and objectives

IBAT provides a basic risk screening on biodiversity. It draws together information on globally recognized biodiversity information including threatened species, Key Biodiversity Areas (priority sites for conservation) and Legally Protected Areas. Through an interactive mapping tool, decision-makers are able to easily access and use this up-to-date information to identify biodiversity risks and opportunities within a project boundary.

IBAT helps businesses incorporate biodiversity considerations into key project planning and management decisions, e.g. screening potential investments, siting an operation in a given region, developing action plans to manage for biodiversity impact, assessing risks associated with potential sourcing regions and reporting on corporate biodiversity performance.

Tool type and results

Data are presented in spatial and tabular formats, and with simple mapping functionality. IBAT links to more detailed information and includes on-the-fly reports, option to manage your own catalogue of sites and outputs to support specific user needs.

Target users

Decision-makers in businesses, especially those involved with risk management, identification of critical habitat and decision-makers in businesses, especially those involved with risk management, identification of critical habitat and safeguards, ISO 14000 certification and ongoing audit, GRI reporting and CSR teams interested in understanding the biodiversity values at, or near to, their areas of operation. This can include managers who use the data at all planning stages of the site.

Requirements and other tips (expertise, software, data, etc.)

- Data on biodiversity issues already included in tool, and drawn from a number of key

information sources, including IUCN Red List of threatened species and the World Database on Protected Areas.

- This initial assessment is a desktop exercise and should be supplemented by further literature review, spatial analyses, local expert advice and stakeholder consultation during each stage of the project life cycle.
- Companies following the mitigation hierarchy will benefit from access to information applicable to “avoidance” and identification of potential offsetting opportunities.
- Subscription fee varies depending on the annual revenue of a company, with a tiered payment system ranging from US\$500 p.a. to US\$25,000. Subscription ensures access to up-to-date conservation datasets, with funds beyond operational costs being invested in improving the underlying datasets.

Examples of company users


More than 35 companies are subscribing to IBAT, drawn from a diversity of sectors, including mining, oil & gas, finance, agri-business and manufacturing. The WBCSD’s **Cement Sustainability Initiative (CSI)** biodiversity team tried out IBAT in 2012: Holcim, Lafarge, Heidelberg, Titan, and also Votorantim, and developed a guidance note for future cement companies looking to use the tool.

- **eni** uses IBAT as a first level of screening in the systematic integration of biodiversity considerations into its oil and gas operations worldwide.
- **Vedanta** found the IBAT really useful, as it provides a first macro-level assessment of biodiversity risks associated with the site.

Sponsoring organization and developers: BirdLife International, Conservation International, IUCN, UNEP-WCMC

Website and contact: www.ibatforbusiness.org, Martin Sneary: martin.sneary@iucn.org

Integral Biodiversity Impact Assessment System (IBIS) 2000

| | |
|--|---|
| Scope |  |
| Type | Check/score |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What might be the impact of my products on biodiversity? |

Purpose and objectives

IBIS is a basic risk-screening biodiversity-focused method that tries to predict the impact of products on biodiversity. IBIS:

- Compares the biodiversity impact of different products.
- Indicates whether the biodiversity impact of a certain product is acceptable.
- Assesses the main issues causing biodiversity impact, and thus improves production circumstances or compensating measures elsewhere.

Tool type and results

An assessment of impacts of products on biodiversity, derived from decision-trees and scoring systems.

Target users

Procurement officers, marketers and decision-makers involved in production processes

Requirements and other tips (expertise, software, data, etc.)

- Freely available 110-page PDF on-line.
- Data will help inform responses to assessment, but are not mandatory input.
- Knowledge of company process, products/ services impacts on biodiversity.
- No software required. The method is available as PDF, but CREM suggests IBIS must be 'custom-made' for specific products and services.

Examples of company users

CREM customized IBIS for salmon and salmon production, tourist activities, outdoor sports, and cocoa, but no use of the tool by a company has been documented to date.

Sponsoring organization and developers

CREM (consultancy, research and training organization)

Website and contact

http://www.crem.nl/files/upload/documents/downloads/file/IBIS_Methodology_report_98_309.pdf; Information: office@crem.nl



| <p>Table 3.4 gives an example</p> <p>Table 3.4. Example of assessment of the total score for potential negative impact</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameters for potential negative impact</th> <th rowspan="2">Weighting factor (1-10)</th> <th colspan="4">Degree of potential impact</th> <th rowspan="2">Score (1-40)</th> </tr> <tr> <th>low</th> <th>medium</th> <th>high</th> <th>very high</th> </tr> </thead> <tbody> <tr> <td>How is the extent of the impact of raw material extraction and transportation?</td> <td>3</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>6</td> </tr> <tr> <td>How is the extent of the impact of waste management?</td> <td>1.5</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2.8</td> </tr> <tr> <td>How is the extent of the impact of land use?</td> <td>1.5</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2.8</td> </tr> <tr> <td>How is the extent of the impact of biodiversity?</td> <td>1.5</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2.8</td> </tr> <tr> <td>How is the extent of the impact of emissions of acids and other substances?</td> <td>1.5</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2.8</td> </tr> <tr> <td>How is the extent of the impact of any other emissions?</td> <td>1.5</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2.8</td> </tr> <tr> <td>Total score</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>18.8</td> </tr> </tbody> </table> <p>The total score in this example would be 18.8, meaning that the negative impact of the production on biodiversity for this product is medium (see table 3.3).</p> <p>Positive Impact Again, weighting factors are given, whereby the total sum has to be 10. Further, the same calculations must be carried out, with the exception that the score for high impact will be included. This leads to the following scores for the overall potential positive impact assessment:</p> <p>Table 3.5. Scores corresponding with the extent of overall positive impact</p> <table border="1"> <thead> <tr> <th>Total impact score (1-40)</th> <th>Overall positive impact</th> </tr> </thead> <tbody> <tr> <td>30 - 40</td> <td>Highly positive</td> </tr> <tr> <td>20 - 30</td> <td>Low impact</td> </tr> <tr> <td>10 - 20</td> <td>Medium impact</td> </tr> <tr> <td>0 - 10</td> <td>Highly negative</td> </tr> </tbody> </table> <p>The class intervals of the total impact score are not of equal size. The intervals are chosen in such a way that when one parameter scores 'medium impact', the overall assessment will at least be low impact. If the majority score of equal size, a product could score 'medium' on one of the parameters and still have a 'highly positive' as the end score. This would not be desirable. Therefore, the upper limit of the 'highly positive' impact</p> | Parameters for potential negative impact | Weighting factor (1-10) | Degree of potential impact | | | | Score (1-40) | low | medium | high | very high | How is the extent of the impact of raw material extraction and transportation? | 3 | 1 | 2 | 3 | 4 | 6 | How is the extent of the impact of waste management? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | How is the extent of the impact of land use? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | How is the extent of the impact of biodiversity? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | How is the extent of the impact of emissions of acids and other substances? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | How is the extent of the impact of any other emissions? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | Total score | | | | | | 18.8 | Total impact score (1-40) | Overall positive impact | 30 - 40 | Highly positive | 20 - 30 | Low impact | 10 - 20 | Medium impact | 0 - 10 | Highly negative | <p>overall is determined by the total score obtained for one parameter that a medium potential impact (the other parameters have a low impact) score. The other three parameters are determined by calculating the score for the worst of all parameters in a certain class (e.g. low) except for one parameter that scores one class higher (medium) than the other parameters.</p> <p>Score for positive impact: there is also a maximum score of 10. The maximum total score is in this case 40. Each parameter that has no potential positive impact will still score 1 point. Because the sum of the weighting factor should always be 10, the total maximum score will always be 10 (10 x 1 for no impact) and the total maximum score will always be 40 (10 x 4 for high impact).</p> <p>Table 3.5. Example of assessment of the total score for potential positive impact</p> <table border="1"> <thead> <tr> <th rowspan="2">Parameters for potential positive impact</th> <th rowspan="2">Weighting factor (1-10)</th> <th colspan="4">Degree of potential impact</th> <th rowspan="2">Score (1-40)</th> </tr> <tr> <th>low</th> <th>medium</th> <th>high</th> <th>very high</th> </tr> </thead> <tbody> <tr> <td>How is the extent of the impact of raw material extraction and transportation?</td> <td>4</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>4</td> </tr> <tr> <td>How is the extent of the impact of waste management?</td> <td>2</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2</td> </tr> <tr> <td>How is the extent of the impact of land use?</td> <td>2</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2</td> </tr> <tr> <td>How is the extent of the impact of biodiversity?</td> <td>2</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2</td> </tr> <tr> <td>How is the extent of the impact of emissions of acids and other substances?</td> <td>2</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2</td> </tr> <tr> <td>How is the extent of the impact of any other emissions?</td> <td>2</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>2</td> </tr> <tr> <td>Total score</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>24</td> </tr> </tbody> </table> <p>The total score in this example would be 24, meaning that the positive impact of the production on biodiversity for this product is medium (see table 3.3).</p> <p>3.2.4. Assessment of overall impact</p> <p>In order to determine the overall impact of the product, the negative impact will have to be added to the positive impact. In the example the extent of the negative impact is calculated according to the extent of the positive impact. Using the positive impact as a comparison factor, the following descriptions are made:</p> <ul style="list-style-type: none"> • If one of the parameters for negative impact scores high, the overall assessment of the product will also be 'high-negative impact'. This will not be combined with a possible positive impact. • If the overall negative impact assessment is based on further calculations of a high based on a high impact score on only one parameter, this may be combined by a high positive impact. | Parameters for potential positive impact | Weighting factor (1-10) | Degree of potential impact | | | | Score (1-40) | low | medium | high | very high | How is the extent of the impact of raw material extraction and transportation? | 4 | 1 | 2 | 3 | 4 | 4 | How is the extent of the impact of waste management? | 2 | 1 | 2 | 3 | 4 | 2 | How is the extent of the impact of land use? | 2 | 1 | 2 | 3 | 4 | 2 | How is the extent of the impact of biodiversity? | 2 | 1 | 2 | 3 | 4 | 2 | How is the extent of the impact of emissions of acids and other substances? | 2 | 1 | 2 | 3 | 4 | 2 | How is the extent of the impact of any other emissions? | 2 | 1 | 2 | 3 | 4 | 2 | Total score | | | | | | 24 |
|---|--|----------------------------|----------------------------|----------------------------|-----------|--------------|--------------|--------------|--------|------|-----------|--|---|---|---|---|---|---|--|-----|---|---|---|---|-----|--|-----|---|---|---|---|-----|--|-----|---|---|---|---|-----|---|-----|---|---|---|---|-----|---|-----|---|---|---|---|-----|--------------------|--|--|--|--|--|-------------|---------------------------|-------------------------|---------|-----------------|---------|------------|---------|---------------|--------|-----------------|--|--|-------------------------|----------------------------|--|--|--|--------------|-----|--------|------|-----------|--|---|---|---|---|---|---|--|---|---|---|---|---|---|--|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------------|--|--|--|--|--|-----------|
| Parameters for potential negative impact | | | Weighting factor (1-10) | Degree of potential impact | | | | Score (1-40) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | low | medium | | high | very high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of raw material extraction and transportation? | 3 | 1 | 2 | 3 | 4 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of waste management? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of land use? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of biodiversity? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of emissions of acids and other substances? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of any other emissions? | 1.5 | 1 | 2 | 3 | 4 | 2.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total score | | | | | | 18.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total impact score (1-40) | Overall positive impact | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 - 40 | Highly positive | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 - 30 | Low impact | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 - 20 | Medium impact | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 - 10 | Highly negative | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parameters for potential positive impact | Weighting factor (1-10) | Degree of potential impact | | | | Score (1-40) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | low | medium | high | very high | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of raw material extraction and transportation? | 4 | 1 | 2 | 3 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of waste management? | 2 | 1 | 2 | 3 | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of land use? | 2 | 1 | 2 | 3 | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of biodiversity? | 2 | 1 | 2 | 3 | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of emissions of acids and other substances? | 2 | 1 | 2 | 3 | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| How is the extent of the impact of any other emissions? | 2 | 1 | 2 | 3 | 4 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total score | | | | | | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Integrated Valuation of Environmental Services and Tradeoffs (InVEST)

2006, Version 2.4.4 was released in October 2012



Ideal 2nd step after SERVES

| | |
|--|---|
| Scope |   |
| Type | Map and Quantify/value |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What, and where, is the value of ecosystem services supply, use and value on a site? |

Purpose and objectives

- InVEST quantifies nature's benefits in both biophysical terms, such as water flows, and economic terms, such as avoided cost or net present value.
- InVEST models are process-based, and therefore can capture change in ecosystem services value. These models produce maps that depict the ecosystem service returns of alternative business decisions and help companies manage trade-offs in operations, investments and management. InVEST can be used for basic risk screening, or for scenario planning and sensitivity analysis.

Tool type and results

InVEST creates maps of ecosystem services supply, use and value and associated tables reporting outputs in biophysical and economic units.

Target users

Government agencies, non-profit organizations and corporations

Requirements and other tips (expertise, software, data, etc.)

- Free, open-access tool that is downloaded from the website (need 3 GB of available space).
- Tier 1 models are designed to run on globally available data.
- InVEST is most effectively used within a decision-making process that starts with stakeholder consultations.

- InVEST does not require knowledge of Python programming, but it does require basic to intermediate skills in working with GIS data in a GIS tool such as ArcGIS, QGIS, gvSIG, etc.
- Recent enhancements to the software in the 2.4.0 release allowed users to run many of the InVEST models in a standalone environment that can interact with any GIS tool. InVEST models not ported to this new platform still exist in the ArcGIS ArcToolBox environment. The ArcGIS requirement will be removed with the InVEST 3.0.0 release scheduled for summer 2013. Note that the InVEST models remaining in ArcGIS require ESRI's ArcGIS software with an ArcInfo level license to run the hydrology modules.

Examples of company users

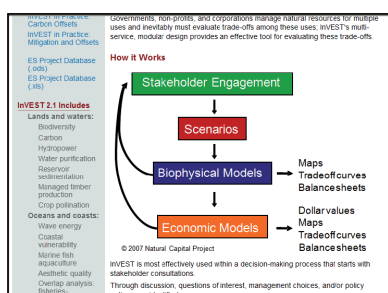
- **Lafarge (cement):** As part of their CEV road-test, Lafarge North America teamed up with WWF and the WRI to understand their risks and opportunities related to ecosystem services at one of their active quarry sites, Presque Isle Quarry in Michigan. InVEST was used to map and value two ecosystem services that were salient to Lafarge's operations: erosion control and water purification. InVEST showed areas where the natural land cover plays an instrumental role in retaining sediment and the monetary value this service provides by avoiding dredging costs. It also identified areas where vegetation could be grown, to reduce potential erosion into the lake.

Sponsoring organization and developers

The Natural Capital Project (NatCap) -Stanford Woods Institute for the Environment, World Wildlife Fund, The Nature Conservancy, Institute on the Environment at the University of Minnesota


Website and contact:

http://naturalcapitalproject.org/pubs/Web_BusinessBrochure.pdf, Emily McKenzie:
Emily.McKenzie@WWFUS.ORG



LIFE Methodology

2011, Version 1.0 was released in August 2011, available in English and Portuguese

| | |
|--|---|
| Scope |  |
| Type | Check/score |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What are my company's direct and indirect impacts on biodiversity, and what should my associated priority biodiversity conservation actions be? |

Purpose and objectives

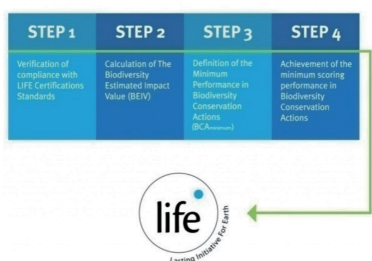
- The LIFE Methodology helps companies develop effective and voluntary biodiversity conservation actions.
- The freely-available self-assessment methodology proposes an evaluation of a company's impacts on biodiversity and subsequent mitigation and/or compensation measures through an array of concrete biodiversity conservation actions.
- The methodology is the backbone of LIFE Certification, but can be used for self-assessment purposes, without going through the certification process.

Tool type and results

The organization's impact on biodiversity is evaluated based on direct and indirect aspects related to biodiversity and ecosystem services (water, energy, greenhouse gases, waste and occupied area). The estimated impact is considered alongside the organization's gross revenue, leading to a "minimum performance of conservation actions".

The LIFE Methodology is comprised of three technical documents:

- LIFE Technical Guide 01: assesses the organization's impact on biodiversity based on the quantity and severity of five environmental aspects: (i) water consumption; (ii) energy consumption; (iii) greenhouse gas emissions; (iv) waste production; (v) occupied areas.
- LIFE Technical Guide 02: establishes a hierarchy that guides companies to invest resources in priority and efficient biodiversity conservation actions.



- LIFE Certification Standards: the Standards are built upon a set of principles and criteria, and provide a qualitative approach to the internal environmental management.

Target users

Public or private organizations of any size and sector, located in any country.

Requirements and other tips (expertise, software, data, etc.)

- The documents are freely available on-line.
- LIFE Key is a complementary software that allows a self-assessment of the organization's management according to LIFE Methodology.

Examples of company users

Ten pilot audits have been carried out: POSIGRAF (Printing and Publishing – 1 site), O Boticário (Cosmetics – 1 site), MAGISTRAL (Packaging – 1 site), GAIA-SILVA-GAEDE & ASSOCIADOS (Attorney Office – 1 site), ITAIPU BINACIONAL (Energy – 1 site), MPX (Energy – 1 site), PETROBRAS (Oil – 4 sites).

- **Boticário** believes that LIFE is an innovative tool for business to invest in biodiversity conservation.
- **PETROBRAS** considers the LIFE Methodology may represent an opportunity to improve environmental performance. The road-test helped expand the company's vision regarding biodiversity, contributing to increased awareness and improved results.



Sponsoring organization and developers

AVINA Foundation, BOTICÁRIO Group Foundation FOR NATURE PROTECTION; POSIGRAF-, spvs (Society for Wildlife Research and Environmental Education), O Boticário, MPX, ITAIPU BINACIONAL, CONESTOGA-ROVERS & ASSOCIATES, PETROBRAS

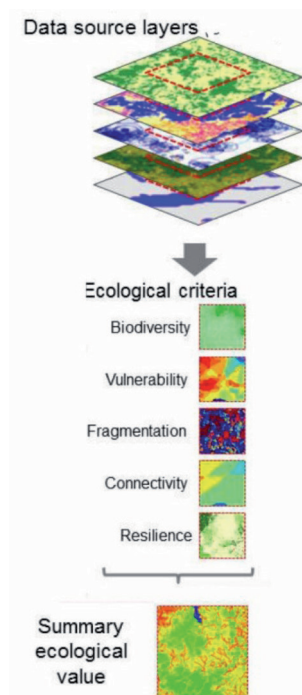
Website and contact: <http://institutolife.org/en/certificacao-life/documentos/>, Maria Alice Alexandre: maria.alice@institutolife.org

Local Ecological Footprinting Tool (LEFT)

2013

| | |
|--|---|
| Scope |   |
| Type | Map and Quantify/value |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | £750 for business use (pay-per-use); free for academics and non-commercial use |
| Main question this tool answers | Where can we damage? i.e. which parts of the landscape carry the highest ecological risk if damaged. |

Purpose and objectives



LEFT is a web-based decision support tool originally developed to aid extractive industries in evaluating the pattern of relative ecological risk across a landscape. It aims to inform planning of facility placement so that environmental impact is minimized. Input is minimal – either the latitude/longitude of a site and/or a shape file/GPS location of a concession area. Once the details are entered of a given area, a colored map and report are produced, detailing

ecological scores every 300m within this area. The tool works for any region in the world and output takes a few minutes to generate. Five variables are used to determine the ecological risk of a landscape, namely: biodiversity, threatened species, connectivity, resilience and fragmentation. Calculation of these variables across the landscape is determined using a combination of globally available databases (11 databases are remotely accessed) and modeling. Results are aggregated to produce

a set of maps which are sent to the user as a customized PDF report and a zip file of GIS data. The PDF contains maps displaying a map for each variable across the selected area (e.g. resilience, connectivity, biodiversity, vulnerability and threaten species) and a single summary map of relative ecological risk, to highlight areas within the selected area that carries the highest ecological risk if developed.

Tool type and results

LEFT is a very easy to use, automatic web-based mapping tool. LEFT produces a PDF report containing 11 maps and a detailed explanation of the analysis process. Additionally, all the mapped data is also provided as geotiffs in a zip file for specialist users to use in GIS software.

Target users

Businesses, academic users, NGOs

Requirements and other tips (expertise, software, data, etc.)

- No specialist software or GIS expertise is necessary – it is a ‘stand-alone’ tool and the output (the maps and report etc.) are self-explanatory in this respect.
- Input takes seconds (just need to draw/select landscape for analyses using GoogleEarth-type interface).
- All analyses are secure and confidential.

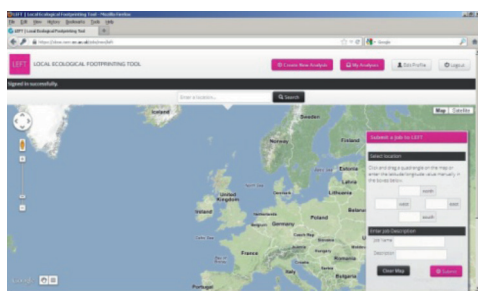
Examples of company users

Statoil, other oil companies, large retail companies, other extractive industries

Sponsoring organization and developers



Biodiversity Institute University of Oxford, Department of Computer Science University of Oxford, Statoil

Website and contact: www.biodiversity.ox.ac.uk/left, Kathy Willis: kathy.willis@zoo.ox.ac.uk



Measuring and monitoring ecosystem services at the site scale

2011

| | |
|--|---|
| Scope |   |
| Type | Check/score and Quantify/value |
| Used/road-tested by company | No |
| Cost | Free |
| Main question this tool answers | Can I carry out a rapid assessment of ecosystem services at a site, to highlight key issues and to know if more detailed studies would be helpful? |

Purpose and objectives

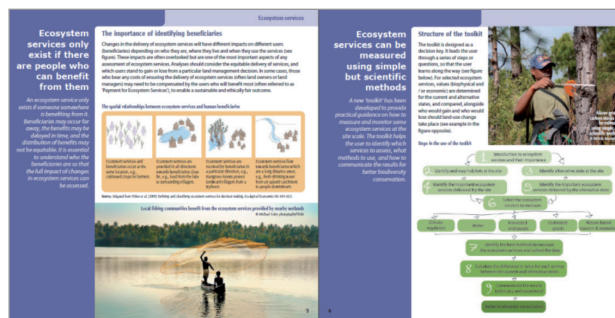
This explanatory guide presents a methodological approach to help measure ecosystem services at the site scale, following a framework which is accessible to non-experts. It explains some key concepts, including the need to consider a 'plausible alternative state' to measure differences resulting from changes in land management and use, the issues around focusing solely on economic valuation and the importance of identifying and taking into account services important to different beneficiaries.

The approach helps users with limited capacity (technical knowledge, time) and resources (money, people)) to measure ecosystem services. It provides scientifically robust information on ecosystem services – a first step which can guide practitioners on whether more detailed studies would be useful. It helps decision-makers appreciate the true value of nature, and the consequences of destruction and degradation of natural habitats.

Tool type and results

- The framework is presented in a 12-page PDF as an introduction to the approach.
- It provides assessments of ecosystem services at sites, and a way of assessing how these would change if the sites were altered.
- It indicates how different groups of beneficiaries will be impacted as a result of any change in land use and ecosystem service delivery.

Watch out for a more comprehensive "Toolkit for Ecosystem Service Site-based Assessments (TESSA)" that will leverage this guide and provide a step-by-step process to assess multiple services at a site and the impacts of change on people. To be launched later in 2013.



Target users

Organizations working in the field of conservation, though could be used by anyone wishing to understand the impacts of activities on ecosystem services.

Requirements and other tips (expertise, software, data, etc.)

- The PDF is available on-line.
- Data needs to be inputted by the user based on, for example, field studies, internal knowledge, published research, expert input, external reports, resources and tools.

Examples of company users



No use of the tool by a company has been documented to date, though this is being explored through RSPB corporate partners

Sponsoring organization and developers

Cambridge Conservation Initiative (CCI) and Birdlife International, along with UNEP-WCMC, RSPB and others

Website and contact: www.unep-wcmc.org/a-toolkit-for-measuring-ecosystem-services-at-the-site-scale-is-released_751.html, Kelvin Peh and Jenny Birch: kelvin.peh@gmail.com; Jenny.Birch@birdlife.org



| | |
|---------------------------------|---|
| Scope |   |
| Type | Map and quantify/value |
| Used/road-tested by company | No |
| Cost | Free |
| Main question this tool answers | What is value of ecosystem services in a range of land management and land use scenarios? |

Purpose and objectives

- MIMES is a multi-scale, integrated suite of models that assesses the true value of ecosystem services under various land management and land use scenarios.
- The goal of MIMES is to highlight the value of ecosystem services and to aid decision-makers in making more informed decisions about their management.
- MIMES provides economic arguments for land use managers to approach conservation of ecosystems as a form of economic development. The model facilitates quantitative measures of ecosystem service effects on human well-being.

Tool type and results

MIMES is a systems modeling approach that helps scenario planning and sensitivity analysis, and provides quantitative and monetary results, based on integrated data in the tool.

Target users

Land use managers, researchers

Requirements and other tips (expertise, software, data, etc.)

- MIMES is freely available through a downloadable ZIP file. It is also necessary to download Simile, the visual modeling software.
- The models use input data from GIS sources, time series, etc. to simulate ecosystem components under different scenarios defined by stakeholder input.
- Models can be developed in a cross-disciplinary charette or workshop approach.
- Technical expertise is required to run the data models.

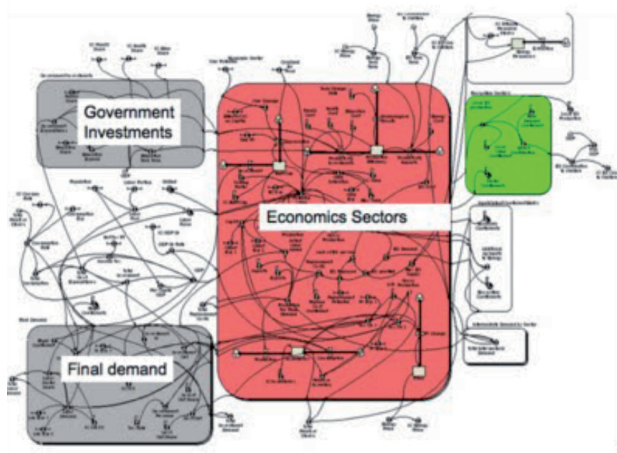
Examples of company users



No use of the tool by a company has been documented to date

Sponsoring organization and developers

Gund Institute, Accounting For Desirable Futures LLC

Website and contact: www.affordablefutures.com/services/mimes, Dr. Roelof Boumans: rboumans@affordablefutures.com



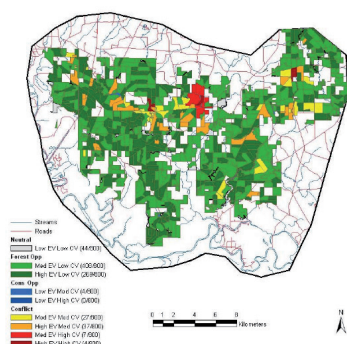
| | |
|---------------------------------|---|
| Scope |   |
| Type | Map and quantify/value |
| Used/road-tested by company | Yes |
| Cost | Free |
| Main question this tool answers | What will happen to resources under different scenarios and where are opportunities for mitigation of impacts? |

Purpose and objectives

- The aim of the tool is to enable users to evaluate, create, implement, and monitor land use and resource management scenarios designed to achieve conservation, use, and management goals within existing economic, social, and political contexts.
- Vista is a conservation planning support tool that incorporates science, expert opinion, community values, and GIS. It is a multi-objective tool to develop balanced scenarios for implementation. Specific examples of application sectors include conservation and restoration planning; coastal zone management and watershed use; hazard assessment and resilience planning; transportation and land use planning; multi-use public land management, etc.
- The comprehensive cumulative effects assessment module is based on scenarios that can include all uses, management practices, and stressors such as invasive species, fire, noise, climate change, etc.

Tool type and results

- Vista is a conservation planning support tool, operating as an extension to the GIS software package, ArcView. It provides various functions for data and expert knowledge integration and management, analyses and exploration, impact assessment, and mitigation planning. It works with a number of other useful software tools to incorporate land use, economics, and ecological and geophysical modeling.



- Vista produces maps of land use scenarios that reflect impacts relative to conservation goals, e.g. it can highlight areas of conflict between “conservation elements” (e.g. threatened species) and land use.

Target users

Broadly applicable to conservation, land use, and resource planning.

Requirements and other tips (expertise, software, data, etc.)

- Vista is offered as a free download for unlimited use, complete with extensive integrated help manuals (datasets are included in the tool).
- Basic GIS skills are required; ArcGIS with Spatial Analyst is needed.
- Discipline experts are required to provide defensible knowledge to the database.
- Data exists globally to apply Vista for basic coarse scale planning, or can accept nearly any user- provided data for fine scale planning.
- Manual integration with many other useful modeling and planning tools has been demonstrated.
- NatureServe can provide full training, technical support, and consulting services.

Examples of company users

Potlatch Corporation (forest products): Vista was used to identify species and ecological systems; to calculate the total conservation value of each forest stand under different scenarios; to rank forest stands by their conservation value; to compare the timber production and conservation values of each forest stand, in order to identify forest stands that are appropriate for timber production and forest stands that should be conserved.


Sponsoring organization and developers

NatureServe

Website and contact: www.natureserve.org/vista, Patrick Crist: patrick_crist@natureserve.org

Normative Biodiversity Metric (NBM)

2011, updated 2012

| | |
|--|---|
| Scope |  |
| Type | Map |
| Used/road-tested by company | Yes (no summaries publicly available) |
| Cost | Free |
| Main question this tool answers | What is the biodiversity significance (pristineness) of the land my company owns? |

Purpose and objectives

The NBM methodology assesses the land a company owns with a measure of ecosystem pristineness, combined with a measure of endangered species presence. These variables give each piece of land a score. Businesses report on changes to the biodiversity score on their owned land annually.

Key terms

Pristineness, endangered species, score, mapping

Tool type and results

An 8-page PDF provides guidance on how to attribute the pristineness classes which inform the biodiversity accounting process, and there is an on-line global 'normative biodiversity metric' map. This map gives an approximate indication of the biodiversity significance of different areas globally based on the NBM methodology, combining species data with pristineness data.

Target users

Business

Requirements and other tips (expertise, software, data, etc.)

- On-line access to the map (freely available).
- Information on the company and local use and management of the land comes from the user.

Examples of company users

Celestial Green Ventures use the NBM to track the biodiversity performance of their REDD+ projects.

Sponsoring organization and developers

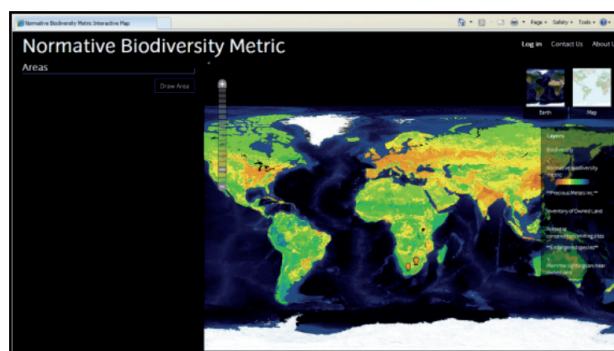
Ecometrica

Website and contact: <http://nbm.ourecosystem.com/interface/>, David Jarrett: david.jarrett@ecometrica.com

Table 1: Pristineness classes for normative biodiversity metric assessment

| Tropical Rainforest Eco-Region | | |
|--------------------------------|--|--|
| Class | Generic Descriptor | Land cover |
| 5 – Pristine | Land is inaccessible and remote. Ecosystems and indigenous species virtually unaffected by human activity. | Tropical rainforest Areas of primary rainforest where there are only small indigenous communities present. The forest is inaccessible to loggers or commercial hunters, or tourists. The indigenous communities may use forest resources, but species populations are stable. |
| 4 – Minimal use | Original habitat and species distributions mostly intact; however, the area is subject to minor human impact on ecosystem functions. For example, well preserved national parks and nature reserves. | Disturbed rainforest Areas of primary rainforest which have been impacted on in relatively minor ways by human activity. Hunting, harvesting of non-timber forest products, evidence of selective logging, or high levels of tourist activity in the area. |
| 3 – Impacted | Areas which retain original land cover, but degraded such that many indigenous species are not present. | Rainforest fragments In vicinity of roads and towns, strips of original forest remaining, but cut-off from main areas of habitat. Degraded rainforest Areas subject to high levels of hunting, such that many species and ecological functions are absent. |
| 2 – converted* | Areas which have been converted to a different type of land cover, but retain some diversity of vegetation. Gardens, pastures, grazing areas, low-intensity farmlands for example. | Low secondary vegetation Secondary vegetation such as scrub thicket, brush which occurs when the original rainforest is removed/burnt/destroyed and the soil does not recover its potential for re-growth of the rainforest. Grazing grasslands Former rainforest land now used for grazing. These grasslands may provide useful environmental functions such as maintaining water regimes and soil stability, but only provide habitat for generalist species. |
| 1 – Monoculture* | High intensity production of one crop which causes the homogenisation of large areas of landscape, or areas of heavily manicured vegetation. | Intensive agriculture Intensive agriculture areas, normally soybean production in the Amazon. These areas do not provide natural habitat for any species. Other monoculture plantations common in converted Amazon land include eucalyptus, sugar cane and corn. |
| 0 – Artificial* | Areas which have been developed, built-up areas, or areas where no vegetation remains. | Roads Tarmac roads which have been constructed through the rainforest. Active mines Open-cast mines currently in operation. |

*These classes of pristineness will have many more types of man-made land covers – these are some common examples.




Simple Effective Resource for Valuing Ecosystem Services (SERVES)

2006, public preview release June 2012



Ideal 2nd step before ARIES, InVEST or MIMES

| | |
|--|---|
| Scope |  |
| Type | Quantify/value |
| Used/road-tested by company | No |
| Cost | Free for users who contribute substantially to the service to encourage community engagement and broad adoption, but will have a low-cost sliding-fee for other users |
| Main question this tool answers | What is the economic value of a specific area's ecosystem services that I can use in decision-making? |

Purpose and objectives

SERVES is a subscription-based, self-service natural capital appraisal tool for natural resource managers, to rapidly and preliminarily estimate the value of a specific area's ecosystem services, using benefit-transfer methodology. SERVES outputs are used for developing natural capital financing mechanisms, informing policy at the basin/watershed/project scales.

Tool type and results

SERVES is a step-by-step web tool, designed to significantly lower cost and time barriers to rapid ecosystem service valuation. The user is asked to identify the study area on a map or in a list of geographies, and provide the number of acres in each land cover type. They are then walked through study selection process based and calculation parameters, such as the discount rates they would like used. The result is an MS Excel workbook which contains a detailed breakdown of monetary value by ecosystem service and by land cover type for the selected areas. Additionally, a detailed bibliography and caveats of use is provided. SERVES includes acreage, currency and inflation converters.

Target users

Private and public natural resource land managers, landscape architects, civic planners, appraisers, environmental engineering firms, sustainability policy, and program officers, consultants

Requirements and other tips (expertise, software, data, etc.)

- Requires internet browser on Mac, PC or mobile device; no software is downloaded.
- Designed to be a low-cost method to obtain initial valuation data; being designed for backend extensibility to support project advancement with MIMES, ARIES and InVEST.
- SERVES is one part of a suite of evaluation tools called EVT (Ecosystem Valuation Toolkit) which includes both free and for-fee services. SERVES will be free to users who contribute substantially to the service, to encourage community engagement and broad adoption, but will have a low-cost sliding-fee for other users.
- Custom reporting for Environmental Impact Assessment (EIS), Benefit-Cost Analysis (BCA) or natural capital accounting available through the development team.

| | Agricultural | | Forest | | Lakes/Rivers | | Saltwater Wetland | | Temperate | | Wetland | |
|--|----------------|------------------------------------|---------------|---------------|-------------------|--|-------------------|--------------------------------|----------------|----------------|-------------------|---------------------------------------|
| | Low | High | Low | High | Low | High | Low | High | Low | High | Low | High |
| Aesthetic and Recreational | \$29.15 | \$79.15 | \$0.18 | \$0.18 | \$6,215.89 | \$6,215.89 | | | | | | |
| Cultural and Spiritual | | | | | | | \$231.31 | \$462.63 | | | | |
| Gas and Climate Regulation | | | | | | | | | \$39.08 | \$59.62 | | |
| Habitat Refugium and Nursery | | | | | | \$5.87 | \$734.74 | | | | | |
| Water Regulation | | | | | | | | | | | \$2,389.30 | \$7,395.13 |
| Total by Cover Type | \$29.25 | \$79.25 | \$0.18 | \$0.18 | \$6,215.89 | \$6,215.89 | 237.18 | \$1,197.37 | \$39.08 | \$59.62 | \$2,389.30 | \$7,395.13 |
| Annualized values by acre (\$/acre/year) | | Annualized values (\$/year) | | | | Asset values per acre (\$/acre) | | Total asset values (\$) | | | | |
| View totals only for: <input type="text" value="default"/> | | | | | | | | | | | | |
| Click here to view with rows & columns switched | | | | | | | | | | | | |
| select export format: <input type="text" value="Microsoft Excel"/> | | | | | | | | | | | | <input type="button" value="Export"/> |

Examples of company users

No use of the tool by a company has been documented to date.

Sponsoring organization and developers

Earth Economics, Gordon and Betty Moore Foundation, The Bullitt Foundation

Website and contact:

www.esvaluation.org, General inquiries: evt@eartheconomics.org. Senior Software Program Manager: Corinne Cooley ccooley@eartheconomics.org

PART 3: Tools for specific uses

The tools below do **not** provide a comprehensive and exhaustive list, as many other tools exist. If helpful tools exist that could be shared in Eco4Biz, please write to ecosystems@wbcsd.org and it will be considered for the next version.

Also, many other tools are included in lists maintained by others, such as the EBM online **Tools database** and IFC's 2012 **Annotated Bibliography in the Guidance Note 6 "Biodiversity Conservation and Sustainable Management of Living Natural Resources"**.

SECTOR-SPECIFIC TOOLS

Agriculture

GAIA Biodiversity Yardstick

- **Developer:** CLM (independent consultancy)
- **Overview:** Freely available high-level assessment of farm practices and on-farm biodiversity. The tool is still in development and is being created for farmers and is now being tested by a Dutch dairy company, a food processing company and a farmers' union. The biodiversity yardstick consists of 40 questions that cover: crop and animal varieties; general management applied with biodiversity benefits; productive areas under targeted nature management; area and management of non-productive elements in the field (water courses, hedgerows, etc); on the farmyard, and management of natural reserves.
- **Company examples:** none publicly available.
- **Website:** <http://gaia-biodiversity-yardstick.eu/>

Nutrient Tracking Tool (NTT) – US only

- **Developer:** US Department of Agriculture
- **Overview:** Tool compares agricultural management systems to calculate a change in nitrogen, phosphorous, sediment loss potential, and crop yield. Agricultural producers and land managers can enter a baseline management system and an alternative conservation management system and produce a report showing the nitrogen, phosphorous, sediment loss potential, and crop yield difference between the two systems.

- **Company examples:** none publicly available.
- **Website:** <http://nn.tarleton.edu/NTTWebARS/>

Cement

Biodiversity Management System: proposal for the integrated management of biodiversity at Holcim sites

- **Developer:** IUCN-Holcim Independent Expert Panel.
- **Overview:** Guidance document on how to establish and implement a Biodiversity Management System (BMS) for Holcim's worldwide operations, in order to integrate biodiversity considerations into policy, strategic and operational processes.
- **Company examples:** Holcim, publicly available.
- **Website:** http://cmsdata.iucn.org/downloads/biodiversity_management_system___final.pdf

Guidelines on Quarry Rehabilitation

- **Developer:** Cement Sustainability Initiative (CSI) of WBCSD
- **Overview:** Freely available, high-level guidelines and recommendations on how to successfully rehabilitate a quarry.
- **Company examples:** Many case studies demonstrating each section in the guide are available anonymously.
- **Website:** <http://www.wbcsdcement.org/index.php/key-issues/biodiversity>

Promotion of biodiversity at the mineral extraction sites of HeidelbergCement

- **Developer:** HeidelbergCement
- **Overview:** Guideline that manifests the basic parameters for the promotion of biodiversity at mineral extraction sites and aims at defining consistent standards for restoration and renaturation. This guideline is to be effective at the company's locations in Europe. Its worldwide implementation is currently being prepared.
- **Company examples:** HeidelbergCement, and it is publicly available.

- **Website:** http://www.heidelbergcement.com/NR/rdonlyres/8C349C89-1D09-4AC5-AF89-1CB86F27D2B4/0/HC_Biodiversitaet_E.pdf

Working with nature: Biodiversity Guidance for Lafarge sites

- **Developers:** WWF International and other members of Lafarge's International Biodiversity Expert Panel and Lafarge employees.
- **Overview:** How to facilitate the protection, restoration and enhancement of biodiversity across all Lafarge sites worldwide (including quarries, plants and offices). It is aimed primarily at business unit and site managers, as well as any local employee teams dealing with biodiversity issues.
- **Company examples:** Lafarge, and it is publicly available.
- **Website:** http://www.lafarge.com/11082012-publication_sustainable_development-Lafarge_Biodiversity_Guidance-uk.pdf

Energy sources

Renewable energy: Greening Blue Energy

- **Developer:** IUCN, E.ON, Swedish International Development Cooperation Agency.
- **Overview:** Overview of key biodiversity issues, to include in impact assessment of renewable infrastructure, with the aim to improve the environmental performance of off shore renewable energy projects. The guidance supports best practice biodiversity considerations and provides a generic framework for key issues to consider, and is illustrated by specific examples, where relevant.
- **Company examples:** none publicly available.
- **Website:** <http://data.iucn.org/dbtw-wpd/edocs/2010-014.pdf>

Biofuels: Guidelines on biofuels and invasive species

- **Developer:** IUCN
- **Overview:** Guidelines aim to highlight the risks of biological invasion by species

introduced for biofuels production and to provide constructive recommendations on how to prevent the introduction, establishment and spread of invasive species resulting from biofuel developments. It supports the selection of the appropriate feedstock for biofuel production.

- **Company examples:** none publicly available.
- **Website:** <http://data.iucn.org/dbtw-wpd/edocs/2009-057.pdf>

Bioenergy: Implementing sustainable bioenergy production : a compilation of tools and approaches

- **Developer:** IUCN
- **Overview:** Compilation of example principles, frameworks and tools already in use in the conservation community which may be applied to bioenergy production, to identify and reduce environmental, as well as socio-economic risks, and promote opportunities.
- **Company examples:** none publicly available.
- **Website:** <http://data.iucn.org/dbtw-wpd/edocs/2008-057.pdf>

Oil & gas: Ecosystem services guidance: Biodiversity and ecosystem services guide and checklists

- **Developers:** IPIECA and OGP
- **Overview:** The aim of this guide is threefold. Firstly, it explains the relationship between biodiversity, ecosystem services and the oil and gas industry. Secondly, it provides a set of checklists to help identify the main ecosystem service dependencies and impacts of oil and gas developments. Thirdly, it highlights key associated risks and opportunities for oil and gas companies, and provides guidance on potential measures for managing them.
- **Company examples:** 3 short anonymous case studies are available in the guide. **eni** e&p division uses this tool for site-level identification, assessment and management of operational dependencies and potential impacts on biodiversity and ecosystems services.
- **Website:** <http://www.ipieca.org/publication/ecosystem-services-guidance-biodiversity-and-ecosystem-services-guide>

Finance

Ecosystem Services Benchmark (ESB)

- **Developers:** Natural Value Initiative, incl. FFI
- **Overview:** ESB is a finance-sector evaluation toolkit and benchmark methodology for assessing biodiversity and ecosystem services-related risks and opportunities in the food, beverage and tobacco sectors, as well as pharmaceutical and extractive industries. NVI has adapted the Ecosystem Services Benchmark for application to the pharmaceutical sector and the extractive sectors.
- **Company examples:** ESB was tested on 31 companies in the food, beverage and tobacco sectors in the UK, Brazil, U.S. Australia, Switzerland, Malaysia, the Netherlands and France.
- **Website:** <http://www.naturalvalueinitiative.org/content/003/303.php>

Biodiversity Principles for the Finance Industry

- **Developers:** VfU (Verein für Umweltmanagement and Nachhaltigkeit in Finanzinstituten) with Centre for Sustainability Management (CSM) at the Leuphana University Lüneburg (Germany) and other contributors.
- **Overview:** The principles serve as a guide for business companies within the financial services and insurance sectors, helping them to develop individual strategies and to integrate the conservation of biodiversity into their business practices and offering a recommended course of action. They help individual companies further specify and implement specific biodiversity management strategies.
- The VfU Biodiversity Principle for the finance sector is accompanied by “**Guidelines for Assessing Biodiversity-Related Risks and Opportunities in the Financial Sector**”.
- **Company example:** none publicly available.
- **Website:** <http://www.vfu.de/default.asp?Menu=1&News=79>

Sustainable Forest Finance Toolkit

- **Developers:** PwC and WBCSD
- **Overview:** The toolkit is designed to support the financial sector in sustainable financing of industries impacting forests. It is composed of stand-alone modules, easily tailored to banks’ needs and integrated into existing procedures, and it is aligned to industry standards and best practices in the financial and forestry, paper and packaging industries. It is publicly available and includes succinct resources providing background to the key risks and issues related to the forest-based sector. Finally, it incorporates detailed input from some of the world’s leading commercial banks, forest companies, certification bodies and NGOs.
- **Company examples:** none publicly available.
- **Website:** <http://www.pwc.co.uk/sustainability-climate-change/issues/forest-finance-home.jhtml>

Green Infrastructure Accounting Guide

- **Developers:** Earth Economics and Duke University, with financial support of the U.S. Water Environment Research Foundation.
- **Overview:** The Green Infrastructure Accounting Guide provides a stepwise methodology for natural capital accounting, with a focus on public and private drinking water, stormwater, and wastewater utility operating environments. The Guide provides an accounting methodology for both natural capital (e.g. forests, wetlands, rain gardens) and associated ecosystem services (e.g. water quality, flood protection, carbon sequestration) that can be integrated with conventional government financial statements. The Guide was developed with input from water utility finance officers and natural resource managers, auditors, academics and accounting standards-setters.
- **Company examples:** The Green Infrastructure Accounting Guide was initially pilot tested between 2012-2013 with three utilities in the United States: Clean Water Services (Oregon), City of Asheville Water Resources Department (North Carolina), and City of Raleigh Public Utilities Department (North Carolina). The

second phase of pilot testing will begin with an expanded set of utilities in mid-2013.

- **Website:** <http://www.werf.org/a/k/Search/ResearchProfile.aspx?ReportID=INFR6R12>

Forest products

HCV (High Conservation Value) Resource Network

- **Developers:** ProForest for the WWF-Ikea Co-operation on Forest Projects.
- **Overview:** The HCV process is a practical tool for forest certification, land-use planning, and decision-making for responsible purchasing and investment, and conservation advocacy. It helps identify, assess and manage areas of high conservation value and provides guidance on interpreting and understanding the values themselves, analyzing threats, devising appropriate management and monitoring. HCV provides users with guidance on how to (i) identify, (ii) manage, and (iii) monitor sites of high conservation value.
- **Company examples:** none publicly available.
- **Website:** <http://www.hcvnetwork.org/resources/global-hcv-toolkits>

Sustainable Forest Finance Toolkit

(see under Finance)

Sustainable Procurement of Wood and Paper-based Products

- **Developers:** WRI and WBSCD
- **Overview:** This guide and resource kit is designed to help corporate managers make informed choices, understand and find the best advice on how to purchase forest-based products, whether for paper for printing or packaging, wood in construction, or as office furniture. The guide provides an overview of the context of forests and their management; identifies the most critical issues underpinning procurement; consolidates a wide selection of effective tools, initiatives and additional resources; explains the maze of terms which often stand in the way of effective action and communication between suppliers and buyers and improves transparency throughout the supply chain of wood and paper-based

products. The third edition was released in December 2012, which incorporates the most up-to-date developments on the legality of forest products, the latest advances in technological and data-management systems to trace and control forest product supply chains, and an expanded overview of the social implications of sourcing forest-based products. By providing clear information on existing approaches to procurement, the guide is intended to help customers frame and formulate their own procurement policies. The full guide, and more, is available online and is available in English, Spanish and Chinese.

- **Company examples:** MeadWestvaco hands out the guide (or introductory guide) to their clients to educate them about forest/paper products; Taylor Guitars and Disney uses it as a reference and source of information on certification, traceability, etc.
- **Website:** <http://www.sustainableforestproducts.org/>

Mining

Good Practice Guidance for Mining and Biodiversity

- **Developer:** International Council on Mining and Metals (ICMM).
- **Overview:** The Good Practice Guidance for Mining and Biodiversity was published as part of an extensive dialogue between ICMM and IUCN, which was set up to explore different aspects of biodiversity conservation in the mining and metals sector. The guide provides an informative, accessible and highly practical reference source on biodiversity which can be used by mining companies at all stages of their operations, from initial exploration, to mine closure planning and implementation. Released in 2006, the 150-page PDF is available in English, French, Spanish, Portuguese and Chinese.
- **Company examples:** Company examples are included in the guidance document, e.g. Rio Tinto, BHP Billiton.
- **Website:** <http://www.icmm.com/page/1182/good-practice-guidance-for-mining-and-biodiversity>

Tourism

Biodiversity Principles for siting and design of hotels and resorts

- **Developer:** IUCN
- **Overview:** Five key biodiversity principles that a hotel developer should follow, so that biodiversity and associated social impacts can be better addressed in hotel and resort development. Note that other related documentation is available on IUCN's website related to specific locations.
- **Company examples:** none publicly available.
- **Website:** <http://data.iucn.org/dbtw-wpd/edocs/2012-013.pdf>

ISSUE-SPECIFIC TOOLS

Biodiversity offsets

Business and Biodiversity Offsets Program (BBOP)

- **Developers:** Forest Trends and Wildlife Conservation Society, with Executive Committee and Advisory Group of more than 75 different companies, financial institutions, government agencies, civil society organizations and service providers.
- **Overview:** Provides a set of principles, guidance and a standard for best practice biodiversity offsets through on-the-ground pilot project experiences.
- **Company examples:** **Anglo Platinum** pilot tested the BBOP methodology to calculate biodiversity losses and potential gains, using the 'habitat hectares' method when considering the expansion of an existing mine. Suggested offset activities included a wildlife reserve with re-stocking of indigenous ungulate component, improved protection, active range management and rehabilitation. **Rio Tinto** pilot tested the tool to achieve and quantify the company's strategy of "Net positive impact" on biodiversity. It included the advice of a panel of experts and partners such as IUCN.

The offset consisted of on- and off-site conservation of littoral forest, plus a range of livelihood initiatives. Other case studies available for review here: http://www.forest-trends.org/documents/files/doc_3123.pdf

- **Website:** <http://bbop.forest-trends.org/>

Emissions

The Greenhouse Gas Protocol (GHG Protocol)

- **Developers:** World Resources Institute (WRI) and WBCSD
- **Overview:** It is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. It provides the accounting framework for nearly every GHG standard and program in the world – from the International Standards Organization to The Climate Registry – as well as hundreds of GHG inventories prepared by individual companies.
- **Company examples:** Since the publication of the first edition of The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Corporate Standard) in 2001, more than 1,000 businesses and organizations worldwide have developed their GHG inventories using the GHG Protocol. For example, **Royal Philips Electronics** of the Netherlands has used the GHG Protocol (GHGP) to calculate its operational carbon footprint since its first publication in 2007. Using the GHGP, Philips semi-annually reports progress in achieving its target of 25% carbon footprint reduction by 2012 from 2007, both to internal as well as external stakeholders. Applying this most widely used international standard has been a crucial step in developing a successful GHG management strategy for Philips, which contributed to achieving leadership positions in the Carbon Disclosure Project and the Dow Jones Sustainability for a number of consecutive years.
- **Website:** <http://www.ghgprotocol.org/>

Water

Water for Business – initiatives guiding sustainable water management in the private sector

- **Developer:** WBCSD
- **Overview:** WBCSD has led the “mapping” of water tools and initiatives which companies can use or engage with to help them manage water more sustainably. The latest release (version 3) was carried out in collaboration with SustainAbility and IUCN. The inspiration to develop Eco4Biz was derived from Water for Business (Water4Biz). Many companies have informed WBCSD of the value of this “guide to the guides.”
- **Company examples:** Several companies have provided anecdotal feedback concerning the helpfulness of this guide.
- **Website:** <http://www.wbcscd.org/waterforbusiness3.aspx>

Tools available to business to quantify and reduce the impacts of their water use

- **Developer:** DEFRA
- **Overview:** A series of research documents that aim to: identify the different scenarios in which businesses might look to understand and quantify the impacts of, and risks relating to, their water use. It maps the different methodologies, tools, guidance, initiatives, and standards (hereafter collectively called ‘tools,’ but referring to all of the above) that tackle the issue of corporate and supply chain water impacts of business and their efforts to reduce them.
- **Company examples:** none publicly available.
- **Website:** <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=17962>

Regional tools

Japan: Toolkit for Sustainable business site management

- **Developers:** JBIB (Japan Business Initiative for Biodiversity) Sustainable Land-use Working Group members, co-working with Tohoku University.
- **Overview:** The biodiversity-focused toolkit evaluates and monitors how the land use of business sites contributes to biodiversity conservation. It includes: a textbook – Guideline for sustainable business sites, a MS Excel file – Land Use Score Card and a Monitoring Sheet. The tool kit is aimed towards companies in order to manage their lands in a PDCA (Plan-Do-Check-Act) cycle to minimize land development impacts, as well as biodiversity conservation and maintenance of ecosystem services provided from the site. Available in the seminars held by JBIB Sustainable Land-use Working Group. Seminar fee 15,000 yen.
- **Company examples:** Several leading companies in Japan, e.g. JSR, Osaka Gas, Mitsubishi Estate, Panasonic, Ajinomoto, Takenaka Corporation, Shimizu Corporation and Mitsui Sumitomo Insurance. Some of their activities are presented on their websites.
- **Website:** <http://www.blunc.org/>

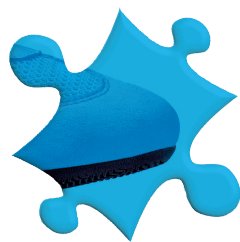
USA: LandScope America

- **Developers:** NatureServe, in partnership with National Geographic, the natural heritage network, and dozens of other national and state partners.
- **Overview:** This free, publicly available website seeks to increase the pace and effectiveness of land conservation, in part, through a nationwide map viewer, that provides easy access to authoritative maps on conservation priorities, protected areas, threats, plants and animals, ecosystems, recreation, and energy. LandScope provides business users online access to more than 200 data layers of reliable, scientifically sound information to aid in evaluation of lands across the United States for their conservation value.

- **Company example:** ExxonMobil staff access authoritative scientific data to assess which lands hold high conservation value. LandScope provides details on the ecological values of a site, including the habitat types and a list of the federally protected and imperiled species known to occur in the surrounding watershed, with direct links to comprehensive species and ecosystem reports from the NatureServe Explorer database.
- **Website:** www.landscape.org

USA and Canada: NatureServe Surveyor

- **Developers:** NatureServe
- **Overview:** An easy-to-use web application that compares a selected area on the interactive map against the NatureServe network's federated data and informs as to whether an endangered, threatened, or other at-risk species is known to occur in that area. Each survey returns its own report that can be printed, saved, and included in project documents. The size of the project area determines the amount of information the survey returns – the larger the area, the more detailed the information obtained about the plants and animals known within it. It is also possible to access NatureServe Surveyor as a web service to seamlessly integrate survey results into individual applications.
- **Company example:** No company examples to date, but it has been used by U.S. Environmental Protection Agency, U.S. Army Corps of Engineers.
- **Website:** <https://surveyor.natureserve.org/>



PART 4: Data, Glossary and References

Selection of data sources

Please also refer to data sources listed in BSR's "Measuring and Managing Corporate Performance in an Era of Expanded Disclosure: A Review of the Emerging Domain of Ecosystem Services Tools" (January 2013).

A to Z Areas of Biodiversity Importance

The A to Z is a glossary of various important systems to assign and protect areas for biodiversity conservation. It is designed to be a useful reference to all sectors, especially to help business decision-making to avoid and minimize impacts on biodiversity from commercial operations, by providing relevant information about these areas of biodiversity importance.

The guide contains detailed information for a number of recognized systems, to prioritize and protect areas of biodiversity importance that fall into two main categories: areas under protected area frameworks that are supported by national or sub-national institutions, as well as international conventions and programs, and global prioritization schemes, that are developed by academic and conservation organizations.

UNEP-WCMC produced this guide in partnership with ICMM, IPIECA, European Investment Bank (EIB), Inter-American Development bank (IDB) and European Bank for Reconstruction and Development (EBRD).

<http://www.biodiversitya-z.org/>

UNEP-WCMC also produces a number tools, resources and applications that can be helpful as well:

<http://www.unep-wcmc.org/>

Data Portal of the Global Biodiversity Information Facility (GBIF)

The Data Portal of the Global Biodiversity Information Facility (GBIF) is an international organization that is working to make the world's biodiversity data accessible everywhere in the world. GBIF and its many partners work to mobilize the data, and to improve search mechanisms, data and metadata standards, web services, and the other components of an internet-based information infrastructure for biodiversity. GBIF makes available data that are shared by hundreds of data publishers from around the world.

<http://data.gbif.org/>

IUCN Red List of Threatened Species

The IUCN Red List of Threatened Species™ is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species. The goal of the IUCN Red List is to provide information and analyses on the status, trends and threats to species, in order to inform and catalyze action for biodiversity conservation. *Version 2012.2* is freely-available on the website.

www.iucnredlist.org

Ecosystem Valuation Toolkit (EVT) Researcher's Library

The EVT Researcher's Library is a research community web-based platform to upload new valuation research, review, transcribe, comment, validate and rank the utility of published and unpublished ecosystem services studies. The Researcher's Library also provides access to the world's largest published valuation data and literature from natural and social sciences, the EVT Repository, comprised

of 44,000 worldwide geo-tagged bibliographic records of peer-reviewed ecosystem service and natural capital articles.

Consolidated tool for researching and conducting gaps analysis of ecosystem service peer-reviewed and gray literature studies by spatial designation (country, region, GIS polygon), biome, ecosystem service and/or valuation methodology, to produce annotated bibliographies, with research community comments, for use in benefit-transfer, or other applications.

www.esvaluation.org

Glossary

Biodiversity: Is the variability among living organisms within species, between species, and between ecosystems.

Biodiversity offsets: *“Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate prevention and mitigation measures have been implemented”. There are numerous approaches to what are broadly termed ‘biodiversity offsets’; some with strict and complex criteria, others based on simple quantity metrics (e.g. area of land or number of breeding pairs)”.*¹

Cultural services: The nonmaterial (social and cultural) benefits obtained from ecosystems, such as recreation, spiritual values, and aesthetic enjoyment.²

Ecosystem: A dynamic complex of plant, animal, and micro-organism communities and their nonliving environment interacting as a functional unit. Examples of ecosystems include deserts, coral reefs, wetlands, rain forests, boreal forests, grasslands, urban parks, and cultivated farmlands. Ecosystems can be relatively undisturbed by people, such as virgin rain forests, or can be modified by human activity, such as farms.³

Ecosystem dependency: A company depends on an ecosystem service if that service functions as an input, or if it enables, enhances, or influences environmental conditions required for successful corporate performance.⁴

Ecosystem impact: A company impacts an ecosystem service if the company affects the quantity or quality of the service.⁵

Ecosystem services: sometimes called “environmental services” or “ecological services” – these are the benefits that people obtain from ecosystems. Examples include freshwater, timber, climate regulation, protection from natural hazards, erosion control and recreation.⁶

Externality: A consequence of an action that affects someone other than the agent undertaking that action and for which the agent is neither compensated nor penalized through the markets. Externalities can be positive or negative.⁷

GIS: A geographic information system (GIS) lets us visualize, question, analyze, interpret, and understand data, to reveal relationships, patterns, and trends.⁸

Intrinsic values: Ecosystem valuation will never be able to put a monetary value on the non-anthropocentric component of 'intrinsic values', which relate to the 'right' for plants and animals to exist. It is important that intrinsic values are acknowledged as another element of the environment that cannot be 'valued' monetarily.⁹

Mitigation hierarchy: This is a set of steps taken to reduce and alleviate residual environmental harm as much as possible, through mitigation, reduction, restoration, and avoidance. Offsetting and compensation are the last two steps of the hierarchy when all other steps have been taken.¹⁰

Natural capital: Natural capital is the **value** of **nature** to people, society, businesses and the economy. It is the **stocks** of physical and biological **resources** and the **capacity** of ecosystems to provide a **flow** of **services** that contribute to human wellbeing and sustainable development.¹¹

Non-use values: The value of ecosystems, regardless of their current or future use, for cultural, spiritual, aesthetic, heritage and biodiversity reasons.¹²

Option values: This is the 'premium' placed on maintaining a pool of habitats, species and genetic resources for future possible uses, some of which may not be known now.¹²

Rehabilitation: Sites must be restored to a state where biodiversity values are equal to, or higher than, the originally disturbed habitat.¹³

Sustainable procurement: Is the process by which organizations buy supplies and services, taking into consideration the best value for money and the environmental and social aspects that the product/service has over its whole life cycle.¹⁴

Value: The material or monetary worth of something (e.g. prints seldom rise in value), value may also be non-monetary e.g. existence value (this can, however, be articulated through the application of environmental economic techniques).¹⁵

Acronyms

| | |
|------------|---|
| ARIES: | ARTificial Intelligence for Ecosystem Services |
| BBOP: | Business and Biodiversity Offsets Program |
| BC3: | Basque Centre for Climate Change |
| BROA: | Biodiversity Risk and Opportunity Assessment |
| BSR: | Business for Social Responsibility |
| ESR: | Corporate Ecosystem Services Review |
| CBD: | UN Convention on Biological Diversity |
| CCI: | Cambridge Conservation Initiative |
| CEV: | Corporate Ecosystem Valuation |
| CI: | Conservation International |
| EE: | Earth Economics |
| EVT: | Ecosystem Valuation Toolkit |
| IAIA: | International Association for Impact Assessment |
| IBAT: | Integrated Biodiversity Assessment Tool |
| IBIS: | Integral Biodiversity Impact Assessment System |
| ICMM: | International Council on Mining and Metals |
| IFC: | International Finance Corporation – World Bank Group |
| InVEST: | Integrated Valuation of Environmental Services and Tradeoffs |
| IPIECA: | International Petroleum Industry Environmental Conservation Association |
| IUCN: | International Union for Conservation of Nature |
| LCA: | Life Cycle Assessment |
| LEFT: | Local Ecological Footprinting Tool |
| MIMES: | Multi-scale Integrated Models of Ecosystem Services |
| NBM: | Normative Biodiversity Metric |
| PDCA: | Plan-Do-Check-Act cycle of continuous improvement |
| RSPB: | Royal Society for the Protection of Birds |
| SERVES: | Simple Effective Resource for Valuing Ecosystem Services |
| TNC: | The Nature Conservancy |
| UNEP-WCMC: | United Nations Environment Programme – World Conservation Monitoring Centre |
| WRI: | World Resources Institute |
| WBCSD: | World Business Council for Sustainable Development |

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Endnotes

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|---|---------------------------------|----|--|
| 1 | BBOP | 9 | WBCSD |
| 2 | Millennium Ecosystem Assessment | 10 | BBOP |
| 3 | WRI, WBCSD, Meridian Institute | 11 | WBCSD – working definition |
| 4 | WRI, WBCSD, Meridian Institute | 12 | WBCSD |
| 5 | WRI, WBCSD, Meridian Institute | 13 | WBCSD |
| 6 | Millennium Ecosystem Assessment | 14 | BBOP |
| 7 | Millennium Ecosystem Assessment | 15 | Environmentally and Socially Responsible Procurement Working Group |
| 8 | ESRI | | |

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