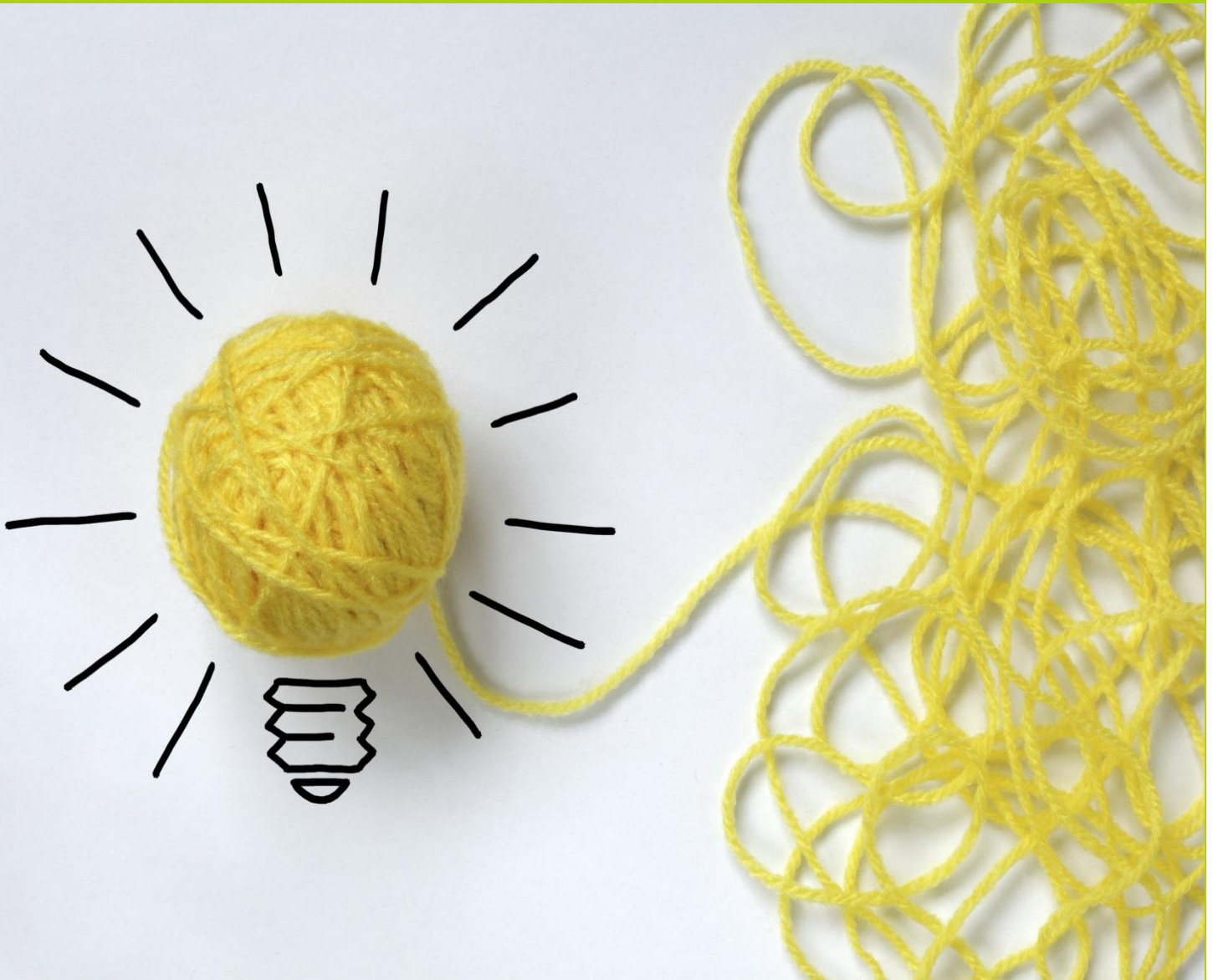




Making Sense of New Approaches to Business Risk & Opportunity Assessment

Integrating Ecosystem Services into Investor Due Diligence & Corporate Management

September 2014



About This Paper

This working paper was written by Sissel Waage. It is based on research, including a literature review, survey, expert interviews, as well as input from thought and practice leaders during a 2013 roundtable convened by BSR's Ecosystem Services Working Group. Details on research methods are provided in appendix 1.

This paper is part of a series produced by BSR's Ecosystem Services Working Group. The research methodology used for it is consistent with previous papers, as developed within the working group.

The purpose of this working paper is to help corporate decision-makers, particularly sustainability specialists, to better understand ecosystem services concepts and applications. These insights are particularly relevant to people engaged with environmental, social, and health impact assessments (ESHIA), as well as businesses that receive funding from banks that have signed the Equator Principles, which now considers ecosystem services within its due diligence review processes.

In terms of scope, this paper offers a snapshot of the state of practice related to applying ecosystem services concepts and approaches in companies, specifically within environmental and social impact assessments. This paper is not intended as a deep dive into the topic of integrating ecosystem services into ESHIAs; nor is it intended to provide a prescriptive plug-and-play approach to integrating ecosystem services into corporate decision-making processes.

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Executive Summary

Ecosystem Services

Ecosystem services are the benefits that functioning ecosystems provide to people.

Though seldom acknowledged, ecosystem services contribute to personal health, jobs, and safety.

The 2005 Millennium Ecosystem Assessment (MEA) organizes ecosystem services into four overarching categories:

- » **Provisioning services**, which are goods or products produced by ecosystems (e.g., food, freshwater, wood, fiber, etc.)
- » **Regulating services**, which are natural processes regulated by ecosystems (e.g., regulations concerning climate, food, or disease; water purification; etc.)
- » **Cultural services**, which are nonmaterial benefits obtained from ecosystems (e.g., aesthetic, spiritual, educational, recreational, etc.)
- » **Supporting services**, which are functions that maintain all other services (e.g., nutrient cycling, soil formation, primary production, etc.)

Source: Millennium Ecosystem Assessment, www.unep.org/maweb.

If you were building a new home and walked through it during construction to review the construction crew's progress, would you simply count the doorknobs, or would you examine the hinges too, and test whether or not the doors opened easily? You would, of course, ensure that the hardware was present *and* functioning as it should.

Business infrastructure is no different. From buildings to roads, rails, canals, and harbors, we expect components to be in place *and* functioning—so that raw materials and goods can move from manufacturing sites to customers. Both the public and private sectors make investments build and maintain infrastructure.

Do we similarly assess and invest in the structure and function of natural (or green) infrastructure? Do we know what impacts business has on natural infrastructure and whether these impacts are undercutting the functioning of natural systems?

Even though a relatively small group of companies currently consider their impacts and dependencies on ecosystem services, such an approach has become part of international best practice. The reason is simple. Since January 2012, leading financial services and lending institutions—such as the World Bank Group's International Finance Corporation (IFC) and the [Equator Banks](#)—now require that preapproval due diligence consider corporate impacts on ecosystem services, within the [IFC's Performance Standard 6](#) and the Equator Principles.

In addition, the issue is gaining the attention of governments around the world; 68 countries have explicitly named ecosystem services as an issue on which they are working and in some cases are formulating policies to address—as detailed in a recent [BSR report](#) on the public sector uptake of ecosystem services concepts and approaches.

The private sector is also engaging with these issues. For example, 47 multinational companies have explicitly named ecosystem services an issue that they are either exploring or working on, with some even integrating it into their corporate policy, as laid out in a recent [BSR report](#). These corporate activities cover a broad range. Some companies have crafted corporate policies of “no net impact” or “net positive impact” on ecosystems or ecosystem services. Other firms are placing monetary values on natural capital and ecosystem services. Still others are embedding ecosystem services into corporate management systems. The takeaway is that companies are now considering a broader range of environmental issues, including those related to the functioning of ecological systems.

As the private sector increasingly considers the structure and function of natural systems—and the flow of ecosystem services, key questions around how to assess impacts remain. Most notable are the questions that this working paper focuses on, including:

- » How do you assess ecosystem services impacts and dependencies in business decision-making processes?
- » Are there rigorous, feasible methods that will result in relevant insights on business risk and opportunity?
- » Do these methods mesh with existing corporate methods for conducting impact assessments or assessing risk (such as those based on reputational risk, creditworthiness, or other forms of risk at the project level through the enterprise level)?

- » What is the emerging state of practice in applying these methods and conducting an assessment of a company’s (or facility’s) impacts and dependencies on ecosystem services?

To help businesses apply ecosystem services concepts, a growing set of analytical tools and approaches have emerged over the past several years. For example, methods for enterprise-level risk review include the Natural Value Initiative’s (NVI) Ecosystem Services Benchmark (ESB), which asks whether key processes are in place. Additional methods exist to identify key ecosystem services impact areas, such as the World Resource Institute’s (WRI) Corporate Ecosystem Services Review (ESR), as well as dozens of other tools, analytical methods, and databases relevant for more granular assessment of corporate ecosystem services impacts, as detailed in a [BSR report](#) published earlier this year.

This proliferation of methods presents businesspeople with the question of which analytical approach to apply and why they should choose one over another. In response to this often confusing state, this working paper offers a snapshot of the emerging state of business practice on how companies can assess their impacts and dependencies on ecosystem services.

This paper is *not* a step-by-step, plug-and-play, exhaustive guide. Rather, it presents an overview of the current components used to conduct corporate ecosystem services impact and dependency assessments.

As such, we intend to spark conversations within companies on how to understand the concepts and integrate ecosystem services assessments into their existing work on environmental and social impact assessments, as well as corporate risk review.

We focus on various components of undertaking an ecosystem services assessment because many companies already have detailed risk assessment protocols—and few are seeking more new processes. Adding new components to existing processes tends to have more appeal for many businesspeople. It is also more practical given the wide range of issues and contexts across industries, companies, and project types.

Finally, this paper is based on research, a literature review, expert interviews, a survey of thought and practice leaders, and input from such leaders during a BSR roundtable convened in October 2013. (Please see appendix 1 for details on research methods.)

Based on this research, the emerging state of practice is around a structured process that aligns with that typically used for ESIA’s, as illustrated in figure 1.

Figure 1. Phased Process Steps for Assessing Ecosystem Services Impacts and Dependencies within a Project Context



Specifically, the components that leading practitioners highlighted, through BSR's research process, as key to ecosystem services assessment processes include:

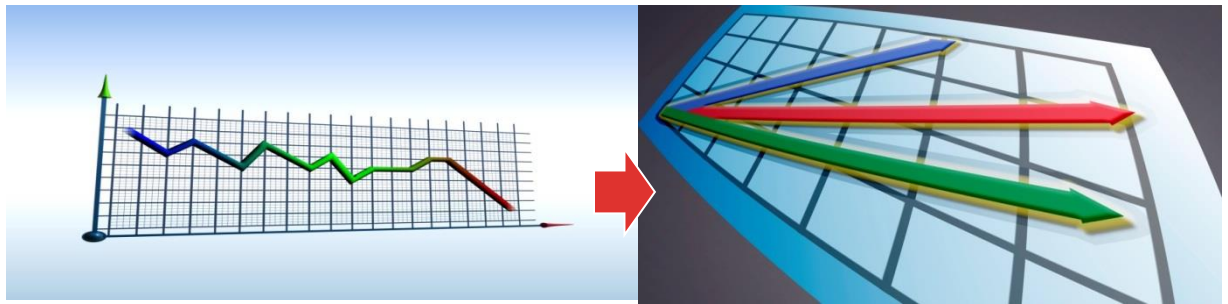
- » **Screen** to determine whether a detailed ecosystem services impact and dependencies assessment needs to be conducted, typically using trigger questions, general rules of thumb, and guidelines.
- » **Scope** to ensure that the assessment focuses on the most relevant issues and also generates insights into trade-offs associated with ecosystem dynamics and ecosystem services in environmental, social, and economic contexts.
- » **Gather baseline data**, collect new data in the field, and/or obtain existing data from third-party sources, which relate to present and potential future scenarios of ecosystem structure and function and could in turn affect the flow of ecosystem services.
- » **Assess corporate impacts and dependencies on ecosystem services over time**, including reviewing the relative importance and/or ranking of impacts and dependencies for various ecosystem services beneficiaries.
- » **Develop mitigation and management plans, including monitoring, as well as an implementation plan** and an operationalization budget for personnel with the appropriate skills or training.

As with any snapshot of an emerging area of practice, the components of ecosystem services assessments will likely continue to evolve. Therefore, our intent in issuing this paper is to present thought and practice leaders with a basis upon which they can build over the coming months and years as more business leaders and investors seek to understand, avoid, decrease, and/or explore offsets of their impacts and dependencies on ecosystem services.

Introduction

A quiet, but potentially significant, shift is under way in how we understand business risk and opportunity. No longer perceived as peripheral, environmental, social, and governance risk is becoming integral to assessing business prospects over time.

If these dynamics continue to gain momentum, then corporate leaders will have to assess how their business systems affect *both* societal and ecological systems and take action to avoid and mitigate these adverse impacts.



This transition is akin to shifting away from counting doorknobs in a new house to testing whether the doors open and shut smoothly.

Focusing on both the components *and* functioning of the overall system represents a shift from current corporate practice. It is not simply about emitting fewer greenhouse gases or producing less waste, but about operating within system boundaries that enable those systems (both social and environmental) to continue functioning.

Companies typically track the downward direction of issue-specific performance indicators, such as carbon emissions, water usage, human rights violations, worker issues, and numerous other environmental, social, and governance (ESG) issues. This approach of considering individual corporate performance issues in parallel is shifting.

With increasing demands on natural resources around the world, there is a growing need to consider trade-offs among total user demands and total resource availability. In this emerging new context, companies are likely to see increased demand for information on their use levels as well as both present and projected future state of supply *and* demand of key natural resource flows.

This broadening of corporate environmental and social assessment is emerging following decades of research and work. For example, in 1997 [Nature's Services: Societal Dependence on Natural Ecosystems](#) compiled the work of leading ecologists who urged us to focus on the functioning of natural systems, rather than their structure alone. The 2005 Millennium Ecosystem Assessment ([MEA](#))—

which incorporated the work of almost 1,300 scientists from around the world in a global assessment of the current state of ecosystems and their services— showed that the majority was in decline. In 2010, The Economics of Ecosystems and Biodiversity ([TEEB](#)) laid out the need for policy and a business response to halt ecosystem decline. The establishment of the Intergovernmental Platform on Biodiversity and Ecosystem Services ([IPBES](#)) signaled that scientific concern was becoming institutionalized within the global issue arena.

Investor concern about what can be dubbed “[ecosystem malfunction risk](#)” became clear with the inclusion of these issues within the World Bank Group’s International Finance Corporation (IFC) Performance Standards in January 2012. Specifically, in the financial services sector, these developments are the most notable:

- » **The IFC** requires consideration of ecosystem services in five of its Social and Environmental Sustainability [Performance Standards](#) as part of due diligence.
- » **Eighty Equator Principles** financial institutions align with the IFC standards, with training for financial analysts on ecosystem services by the secretariat.
- » **Forty-one financial institutions and the global Association of Chartered Certified Accountants** have signed the [Natural Capital Declaration](#) to “demonstrate [their] commitment to the eventual integration of natural capital considerations into private sector reporting, accounting and decision-making, with standardization of measurement and disclosure of natural capital use by the private sector.”

Private sector engagement with ecosystem services issues beyond the financial services sector is also now measurable. For example, according to PricewaterhouseCoopers ([PwC](#)) research, 18 percent of the Fortune 100 included biodiversity or ecosystems in their full annual report, and 27 percent of 1,100 global CEOs said they were concerned or extremely concerned about the impact of biodiversity losses. Many companies with significant impacts on land or water have corporate biodiversity or even ecosystem services policies, such as in the energy industry (EDP), extractives (Rio Tinto), and agriculture (Nestle), as well as companies that rely on biodiversity, such as pharmaceuticals (GSK). (Additional companies and details are listed in a [recent BSR report](#)).

Overall, BSR has [documented](#) that 47 large global companies now publicly discuss their efforts regarding ecosystem services, which include:

- » Assessing analytical approaches to ecosystem services (including biodiversity) and how they are different from current practices
- » Testing new ecosystem services analytical tools and data collection methods to assess what value they can add
- » Determining how relevant tools and questions mesh with existing corporate processes
- » Training staff
- » Integrating ecosystem services formally in corporate metrics, processes, and protocols, as well as into corporate policies in some cases

Governments around the world are also looking at ecosystem services issues, as evidenced by the growing number of task forces, policies, and other public sector initiatives that explicitly mention ecosystem services. Specific activities in individual countries around the world are summarized below and detailed in a [BSR report](#).

The question is no longer *whether* activity related to ecosystem services is under way, but *what* is the current state of play in terms of corporate application. And, perhaps even more importantly as a starting point for businesspeople: How does a company begin to assess its impacts and dependencies on ecosystem services?

This working paper lays out helpful insights on the current state of practice. It is not intended to be an exhaustive, checklist-based guide. Rather, we are issuing it to spark conversations based on emerging thought and practice leadership related to integrating ecosystem services assessment approaches into existing corporate practices and protocols.

Emerging State of Practice

*“One cannot manage change.
One can only be ahead of it.”*

—Peter Drucker, *Management Challenges for the 21st Century*, 1999

“I think the concept of ecosystem services will be fully embedded within environmental and social impact assessments (ESIAs) in the next 5 to 10 years. I think the terminology may change to move away from ecosystem services—which I think many practitioners and stakeholders find cumbersome and difficult to fully grasp and quantify—to more explicitly refer to the services themselves (such as water, food, and pollination).”

—*Technical consultant at BSR’s 2013 Roundtable*

“The ecosystem services analytical approach and communication of results needs to be simplified and streamlined for clients, including corporations and governments. Ecosystem services remains a difficult issue for clients to understand and embrace since impacts are not always direct and clear. As such, we are finding that clients are primarily driven to commission ecosystem services assessments when they are required to do so by regulation or lender requirements.”

—*Technical consultant at BSR’s 2013 Roundtable*

“[A number of] social scientists [that] I know feel they have been applying the IFC PS 6 definition of ecosystem services for decades as a component of social impact assessment and livelihoods protection.”

—*Technical consultant in BSR’s 2013 survey*

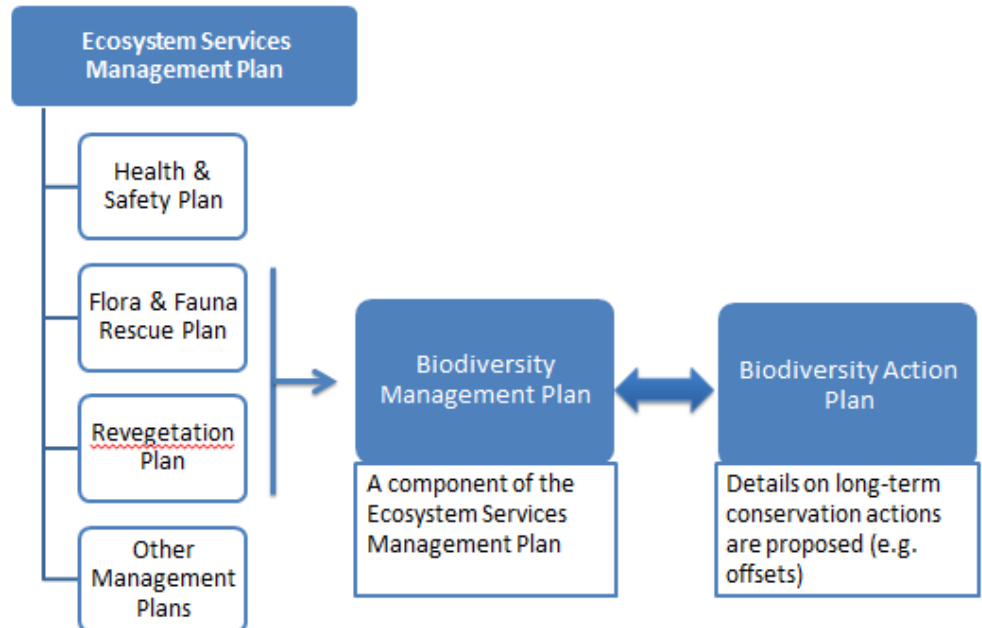
The international best practice on financial due diligence changed on January 1, 2012, when the World Bank Group’s IFC Performance Standards expanded to include consideration of impacts and dependencies on ecosystem services. This change is not only significant in terms of expanding the scope of due diligence; it also represents new territory for financial analysts.

Companies seeking IFC funds are now required to conduct a systematic review to identify priority ecosystem services, which are:

- a) ecosystem services on which the project will likely have an impact and thus result in adverse impacts on local communities, and/or
- b) ecosystem services on which the project is directly dependent for its operations (e.g., reliable flows of water).

Financial services analyst training on these issues recommends that the initial due diligence review include spatial data and landscape mapping to determine the scope of both due diligence and the environmental and social impact assessment (ESIA). The specific plans that are recommended for inclusion in loan documents are laid out in figure 2, as relayed to BSR by an organization conducting trainings on emerging new practices related to ecosystem services.

Figure 2. Illustrative New Environmental Plans



Implementation of this expanded approach to due diligence requires transdisciplinary teams, including ecologists, social and cultural specialists, and anthropologists. The broadened frame and set of skills for assessing immediate and future impacts is an essential step in determining project and enterprise risk, as well as ecologically and regionally appropriate mitigation options associated with project impacts.

On a pragmatic level, the question is how best to integrate ecosystem services assessment approaches into existing environmental and social (including health) impact assessment (ESIA) protocols, given the widespread (and often required) use of ESIA. Not surprisingly, consultants are being hired to conduct the first ecosystem services assessments, either due to lender requirements or corporate commitments to staying at the leading edge of international best practice.

The consolidation of the discussions by leading practitioners at BSR's 2013 Roundtable suggests that the current emerging practice draws heavily on Ecosystem Services Review for Impact Assessment ([ESR for IA](#)) approach, developed by the WRI.

Initial reviews of the ESR for IA's pilot applications are generally positive (albeit on a limited set of retrospective cases). As one technical consultant who has been involved with these applications observed:

"When we did case studies of applying ecosystem services assessments in EIAs, they all showed that issues came up that had not been captured using existing methods—sometimes significant issues. This was a surprise.

I think this finding is because an ecosystem services assessment approach picks up specific dependencies and perceived risks that people tend to discount today.

For example, if you design your study area to exclude a reservoir that local people perceive may be at risk from pollution, then you better demonstrate that [this bounding of the analysis maps to stakeholder concerns and] resources are not at risk. An ecosystem services assessment will include this kind of work."

Other analysts asserted, at BSR's 2013 Roundtable, that the ESR for IA process "works nicely in scoping and identifying prioritized ecosystem services." Yet, there are challenges. For example, one 2013 BSR roundtable participant asserted, "Once you start identifying indicators and get spatially specific, it can be more challenging and require more specialized skills and data."

To fully understand ecosystem services impacts and dependencies, it is essential to draw upon an expanded set of data and collect information relative to the current ESIA, such as data related to:

- » the present and projected future state of a given ecosystem and
- » the other ecosystem services beneficiaries or user groups and their circumstances, particularly in terms of benefits gained from ecosystem services, as well as
- » what these users value (though not necessarily in monetary terms), what alternatives exist, and how they are perceived.

Obtaining some of this information will likely require more in-depth social assessment and ecological work than may be typically done in ESIA processes—particularly in terms of data on ecosystem services supply and consideration of a wider range (across geography and time) of beneficiaries.

The most time and cost-efficient approach will likely be to convene multidisciplinary teams to integrate data collection early in the process, with special attention to inclusion of ecosystem services assessment issues within both environmental and social data gathering and stakeholder engagement.

"I don't think that looking at ecosystem services risk is very complicated. You can use, and adapt, the process that we follow at a site to consider risks and environmental programs, and ask how these are connected, or have gaps, from an ecosystem services perspective. The key part of the process is with teams on the ground to get buy-in and develop robust approaches, rather than guidance . . . We're moving away from writing technical guidance because there is a disconnect between the text and the action . . ."

—Corporate representative at BSR's 2013 Roundtable

"There is complexity involved in ecosystem services because it is about people's needs, interests, and preferences. Specifically, the issue is how you value and assess these things, particularly in relation to each other, and how you consider trade-offs. It is also how do you deal with what seems like an ethical problem that you're trading ecosystem benefits for some other types of benefit, with implications for future generations."

—Consultant at BSR's 2013 Roundtable

BSR’s 2013 Roundtable discussion suggests that an overall process for an ecosystem services assessment is emerging; it has been adapted from generalized ESHIAs and draws upon the [WRI’s ESR for IA](#) process (illustrated in figure 3):

Figure 3. Phased Process Steps for Assessing Ecosystem Services Impacts and Dependencies within a Project Context



“One thing we haven’t talked about is context-based metrics [that highlight how] we’ve already overstepped the planetary boundary. What would metrics and targets look like to shift the ecosystem services usage back within the [ecological] limits? If we only look at the micro- [site] level issues, then we will lose the macro context in terms of the risk.”
—Investor information analyst at BSR’s 2013 Ecosystem Services Roundtable

“Do we have the tools and indicators to measure and assess changes in regulating ecosystem services? How do we actually measure, and address, these impacts on processes to enable ongoing regulation of ecosystem structure, function, and flow of services?”
—Corporate representative at BSR’s 2013 Roundtable

The phases are described in more detail below, with a focus on issues that were discussed in the survey and roundtable. (This approach means that each stage focuses on different issues, depending on what thought and practice leaders felt was appropriate).

The suggested practices described below for the various phases have been drawn from research conducted prior to the roundtable as well as from brainstorming at the roundtable. The nature of this process was such that recommendations are by no means comprehensive and were not exhaustively reviewed, refined, or fully agreed upon by all the experts who participated in the roundtable.

With those caveats, the recommended components for undertaking an ecosystem services assessment process include five phases.

Phase 1: Screen

This phase ideally occurs at the project concept phase. It should also ideally be undertaken by both corporate strategists and both regional as well as subject matter specialists (such as environmental experts) with the objective of providing information to determine whether there is a need for a detailed ecosystem services assessment, ideally through the use of trigger questions, general rules of thumb, or guidelines.

Illustrative tasks in this phase could include:

- » **Start with a list of key ecosystem services**, based on the [MEA](#) list of ecosystem services, as incorporated the WRI’s [ESR](#) and [ESR for IA](#) and/or the U.S. Environmental Protection Agency’s (U.S. EPA) “Final Ecosystem Goods and Services” ([FEES](#)), among other lists of ecosystem services that are included in analytical tools, such as those summarized in a [recent BSR report](#).
- » **Assess the near-term uses of, and demands on, ecosystem services across a watershed or landscape**—defining the area for assessment based on the site’s ecological attributes—of both the **corporate project** and **other human user groups** (also known as ‘ecosystem services beneficiaries’).
- » **Analyze how corporate activities could affect the flow of ecosystem services over time**, particularly those that the project depends upon and/or that other humans use or rely upon.

- » **Review the mid- to long-term projections of how demand and “supply” (or the flow) of ecosystem services could change over time**, due to a range of factors, including project impacts interacting with other factors (e.g., use rates, cumulative effects, climate change, shifts in rainfall patterns, etc.)
- » **Prioritize key ecosystem services**, in terms of the corporate project as well as stakeholder or ecosystem service beneficiaries’ dependencies and concerns, using the approach described in WRI’s ESR or [ESR for IA](#).
- » **Brainstorm potential alternatives to the project’s design, siting, or approach that could avoid or mitigate impacts on ecosystem services.**

Ideally, this phase is launched at the preinvestment stage (before committing to a project) to identify key high-risk issues that could affect a company’s decision about whether to move forward with it. For example, this phase should assess whether project water needs will be affected by water scarcity driven by social and environmental factors (including constraints).

Throughout this phase, as well as the entire process, corporate project leaders should encourage project members to think critically and remind them that screening can be internal (assuming that the company is not required to share its findings). In addition, the overall process should ideally be structured as an iteration, with teams drawing upon feedback from successive phases to update and refine their findings. Project teams should have cross-disciplinary discussions to identify which players the assessment process will involve, including local experts with specialized knowledge and/or local contacts, as well as international stakeholders concerned about the area.

Overall, many technical consultants at BSR’s 2013 Roundtable agreed that WRI’s [ESR](#) and [ESR for IA](#) are reliable starting points for screening for ecosystem sensitivities and services. In addition, the [ESR for IA](#) parameter list enables users to consider:

1. the human uses of and dependencies on ecosystem services;
2. the project’s ecosystem services uses, impacts, and dependencies;
3. the area of the project’s influence, plus other impacts within this area (with which to consider cumulative effects);
4. project alternatives (e.g., siting, design, etc.); and
5. opportunities for investing in ecosystem restoration and/or maintenance of ecosystem services.

The risk of missing important details early on in the process should be continually considered and scrutinized. For example, one roundtable participant asserted:

“Perhaps you misunderstood on the first look what ecosystem services are present in the area and/or what key dynamics exist between these services which could affect availability and flows.”

Therefore, companies would ideally cycle through the process again and engage with people who are knowledgeable about local conditions as well as relevant specialists (e.g., social, economic, cultural, environmental, etc.) early on.

Finally, approaches to screening and subsequent ESIA’s will differ in cases where a company can choose from among several sites versus being restricted to a fixed location. In addition, some companies have internal protocols that combine the screening and scoping phases, and they start stakeholder consultation as

well as engagement during screening. These elements may shift the process for companies that need to adhere to their internal requirements.

Phase 2: Scope

The intent of this phase is to ensure that the assessment is focused on the most important issues and generates insights about trade-offs relevant to understanding particular ecosystem dynamics and ecosystem services flows within environmental, social, and economic contexts. By the end of the scoping phase, the team should be able to write terms of reference for baseline data collection with benefits of insights about:

- » critical ecosystem services issues;
- » high-level identification of the likelihood and magnitude of potential project impacts;
- » a more detailed understanding of risks for the company (e.g., to influence project designs);
- » the project's dependencies on ecosystem services; and
- » early identification of potential ecosystem services opportunities.

This phase's tasks will ideally begin with visits to the proposed project site to gather information and gain a high-level validation of screening results related to the ecosystem services presence, use, and priority, along with more detailed field information.

This work will likely require collaboration with local specialists and also start the process of local community stakeholder engagement and stakeholder expectation management, if these have not already begun. Discussions with local stakeholders should include considering how ecosystem services are valued—which could be qualitative, ordinal ranking, or even (though not necessarily) monetary—as well as which ecosystem services are priorities.

Throughout this process, analysts could continue to clarify the project's *area of influence* and possible substitutions or replacements for specific ecosystem services.

Team members could consider these questions during their field visits to validate the findings of the screening phase:

- » How are people using the natural resources?
- » How do these uses relate to the flow of ecosystems services?
- » How do beneficiaries of ecosystem services value them (either qualitatively or quantitatively)?
- » Are there options for replacing or substituting ecosystem services?
- » What are the ecosystems' vulnerabilities?
- » Could the project (and/or the project in combination with a range of other cumulative effects) alter the flow of ecosystem services? If so, how?
- » Are there opportunities for positively affecting the flow of ecosystem services (e.g., through ecological restoration, etc.)? If so, are there other benefits that could be accrued by restoring local ecosystems (e.g., carbon offsets through REDD+ projects)?

The ideal approach is to embed ecosystem services parameters and experts within existing processes. For example, social assessment approaches—such as household surveys, Rapid Rural Appraisal ([RRA](#)), Participatory Rural Appraisal ([PRA](#)), social impact assessment process (such as that recommended by the

[CCBA](#)), and others—can include both biodiversity and ecosystem services experts and/or questions that enable the team members to assess how various beneficiaries currently use and *value* ecosystem services benefits (valuation in any form, not necessarily financial effects). In addition, it can be useful and cost-effective to also draw upon remote sensing data and geographic information systems (GIS), if they are available and credible.

Throughout the process, team members should explore the *area of project influence* and likelihood and magnitude of effects on the flow of ecosystem services by asking questions, such as:

- » What risks does the project present to the ongoing flow of ecosystem services? Across what area of a landscape or seascape?
- » Are there project design alternatives?
- » Are there ecosystem restoration investments that could avoid or mitigate issues and risks?

The default approach is WRI's ESR (or the slightly modified ESR for IA). In addition, during BSR's 2013 roundtable, practitioners noted a range of other approaches and resources to consider, including the World Business Council for Sustainable Development's (WBCSD) Guide to Corporate Ecosystem Valuation ([CEV](#)); NVI's [ESB](#); IPIECA's Ecosystem Services checklist for the oil and gas industry, as well as others listed in [BSR's report on ecosystem services tools](#). It is also noteworthy that the Natural Capital Coalition is funding the development of a [Natural Capital Protocol](#), due for completion by December 2015, which may be useful as a "an open source, global multistakeholder framework for understanding, measuring, and valuing the impacts and dependencies on the natural environment, as well as the risks and opportunities presented for businesses when natural capital is accounted for in business decision-making."

Considering the foregoing questions, within an appropriate analytical approach for the business context, should contribute to greater clarity about:

- » the flow of information about ecosystem services;
- » beneficiaries of ecosystem services;
- » an evaluated list of priorities related to potential project impacts and dependencies on ecosystem services (assessed in terms of management control; size of impact; the dependency of the project, company, and/or beneficiaries; replicability; and spatial alternatives), and
- » considerations calibrated for different project phases (e.g., siting, operations, etc.)

Phase 3: Gather Baseline Data

As discussed earlier, embedding ecosystem services parameters and experts into existing (primary) data gathering processes is ideal. For example, existing social assessment approaches could include both ecosystem services experts and relevant questions to assess how various beneficiaries currently use and value ecosystem services benefits (in any way, not necessarily financial effects). In addition, ecological assessments could consider a broader array of watershed and ecosystem dynamics to assess how the flow of ecosystem services could change over time. Remote sensing data and/or GIS models can be drawn upon, if they are available and credible. Table 1 offers a list of potential ecosystem services relevant data sets and resources that can also be drawn upon.

Table 1. Potential Ecosystem Services Data Sets and Resources

Name <i>(in alphabetical order)</i>	Target Audience and Ideal Application	Description	Developer
Data Basin	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: Spatial analysis of ecosystems</p>	<p>“Data Basin is a free system that connects you with spatial data sets, nontechnical tools, and a network of scientists and practitioners. You can explore and download a vast library of data sets, connect to external data sources, upload and publish your own data sets, connect to experts, create working groups, and produce customized maps that can be easily shared.”</p>	Conservation Biology Institute (CBI)
Digital Observatory for Protected Areas (DOPA) Explorer	<p>Target audience: Protected area managers, policy makers, and scientists</p> <p>Ideal application: Data collection for protected areas</p>	<p>“DOPA Explorer (beta) is a first web-based assessment tool where global data sets, including 9,000 protected areas covering almost 90 percent of the global protected surface, have been processed automatically to generate a set of indicators on ecosystems, climate, phenology, species, ecosystem services, and pressures. DOPA Explorer can help identify the protected areas with the most unique ecosystems and species and assess the pressures they are exposed to because of human development. Ecological data derived from near real-time earth observations are also made available.”</p>	Institute for Environment and Sustainability (IES)
Earth Observation (EO) Services for Ecosystem Valuation	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: As a data source for valuations based on the benefits-transfer method</p>	<p>“The EO Services for Ecosystem Valuation project seeks to demonstrate the value of EO-based information products for the emerging sector of ecosystem services valuation.”</p>	European Space Agency (ESA)

<p>Ecosystem Goods and Services Production Function Library</p> <p><i>(under development)</i></p>	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: Assessing ecosystem services</p>	<p>“EPA scientists are developing production functions for ecosystem services and benefits for numerous areas in the United States. These production functions are being catalogued so that this information will be easily accessible for [the] EPA, other agencies, NGOs, and others interested in considering the ecosystem services trade-offs associated with changes in environmental conditions or decision alternatives. This work will result in a searchable database, the Ecosystem Goods and Services Production Function Library, that provides the best available information about how to estimate the distribution and value of ecosystem services, including how they might change under alternative future scenarios.”</p>	<p>U.S. Environmental Protection Agency (EPA)</p>
<p>Ecosystem Service Indicators Database (ESID)</p>	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: To identify relevant ecosystem services indicators</p>	<p>“The Ecosystem Service Indicators Database [ESID] was created to make ecosystem services metrics and indicators readily available for use in policy dialogues and decisions, in ecosystem assessments, and in natural resource management decisions. ESID is an online searchable database where users can find—and contribute—indicators that have been used to apply ecosystem services approaches or hold promise for doing so. Indicator descriptions and other supporting information about how the indicator has been or could be applied are also provided.”</p>	<p>World Resources Institute (WRI)</p>
<p>Ecosystem Services Valuation Database</p>	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: Ecosystem services valuation</p>	<p>As part of The Economics of Ecosystems and Biodiversity report, researchers developed the Ecosystem Services Valuation Database, which has continued to be maintained and now contains more than 1,350 data-points from 300-plus case studies.</p>	<p>The Economics of Ecosystems and Biodiversity (TEEB)</p>

Ecosystem Valuation Toolkit	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: Ecosystem services valuation</p>	<p>“The Ecosystem Valuation Toolkit offers the world’s first global ecosystem services values-exchange platform with a comprehensive library of bibliographic information on published and gray literature, primarily ecosystem service valuation studies.”</p> <p>A component of the Ecosystem Valuation Toolkit, SERVES (Simple and Effective Resource for Valuing Ecosystem Services) is “a subscription-based, self-service natural capital appraisal tool for natural resource managers to estimate the value of a specific area’s ecosystem services.” SERVES aims to be the world’s first global values exchange platform allowing ecosystem services researchers to see and comment on each other’s work.</p>	Earth Economics
Geographic Ecosystem Monitoring and Assessment Service (G-ECO-MON)	<p>Target audience: Land managers, policy analysts, and scientists</p> <p>Ideal application: Remote data collection</p>	<p>“The Geographic Ecosystem Monitoring and Assessment Service (G-ECO-MON) project aims to extend the use of Earth Observation–based information for multiple applications. These could include impact assessments, supply chain management, ecosystem management, payments for ecosystem services, natural wealth accounting, emergency management, or public policy. Demonstration studies are under way; these seek to highlight the efficacy of using remote sensing to measure and monitor ecosystem services.”</p>	European Space Agency (ESA)
Global Map of Human Impacts to Marine Ecosystems	<p>Target audience: Marine managers, policy analysts, and scientists</p> <p>Ideal application: Identifying human impacts on marine ecosystems</p>	<p>“The goal of the research presented here is to estimate and visualize, for the first time, the global impact humans are having on the ocean’s ecosystems.”</p>	National Center for Ecological Analysis and Synthesis (NCEAS)

Global Socioeconomic Monitoring Initiative for Coastal Management	<p>Target audience: Marine managers and scientists</p> <p>Ideal application: Data for community-based socioeconomic monitoring</p>	<p>“The Global Socioeconomic Monitoring Initiative for Coastal Management (SocMon) works through regional and local partners to facilitate community-based socioeconomic monitoring. Household- and community-level data are collected to inform dependence on coral reef resources, perceptions of resource conditions, threats to marine and coastal resources, and support for marine management strategies, such as marine protected areas. To date, over 60 assessments have been completed in 30 countries.”</p>	National Oceanic and Atmospheric Administration (NOAA) and The WorldFish Center
Marine Ecosystem Services Partnership Valuation Library	<p>Target audience: Marine managers, policy analysts, and scientists</p> <p>Ideal application: Valuing marine ecosystems</p>	<p>“The Marine Ecosystem Services Partnership is a virtual center for information and communication on the human uses of marine ecosystems around the world. [We offer an] extensive database of valuation studies.”</p>	Marine Ecosystem Services Partnership (MESP)

Additional data sets can be found in tables 7 and 8 of [BSR's report](#) on ecosystem services tools and data sets.

Phase 4: Assess Impacts and Dependencies on Ecosystem Services over Time

The WRI [ESR for IA](#) is a commonly cited resource in this phase, though practice is very much still emerging. At this point in time, key questions raised by thought and practice leaders include:

- » Could total user demands on ecosystem services change, both in the near future as well as looking forward? If so, what, why, when, how, and with what amount(s) and implications?
- » Could the availability of key ecosystem services change? If so, how, why, and when?
- » What risks, opportunities, and trade-offs exist within these distinct scenarios of how the issues may play out over time?

The result of this phase will be understanding how a company or project affects ecosystem services. We expect more work and examples for this phase to be forthcoming in the years ahead.

Phase 5: Develop Mitigation and Management Plans

The development of mitigation and management plans is detailed and governed by laws in some countries, as well as corporate processes and protocols. Given the range of contexts and specifics associated with these tasks, the thought leaders assembled by BSR during the 2013 Roundtable felt that context-specific guidance needed to be followed, that is, calibrated to a particular country or region of operation, as well as the industry and company.

Additional, ecosystem services-related key questions, to be answered at appropriate levels within the company, could include:

- » What are our plans to mitigate and manage these ecosystem services impacts?
- » Can we innovate to exclude dependencies?
- » What will we measure? How often? With what granularity?
- » Will we place monetary values on anything? Or simply quantitative measures?
- » What will we report? With what periodicity?

This phase is likely to raise these questions:

- » Are some of these impacts already being mitigated by other corporate investments in an area that may be considered more social than environmental, but should count positively toward ecosystem services work (e.g., on sustainable livelihoods, sanitation, etc.)?
- » What is the delta between current corporate work and that which would be informed by an ecosystem services approach?

In summary, an emerging body of work across all of these areas is laid out below.

Table 2. Summary of Emerging Practice Related to Applying an Ecosystem Services Assessment Approach

Phase	Emerging Ecosystem Services Practice	Illustrative Cases and Resources
<p>Screen to decide whether an in-depth biodiversity and ecosystem services (BES) assessment is needed.</p>	<p><i>Background training</i></p> <ul style="list-style-type: none"> • WBCSD's Business Ecosystems Training (BET) <p><i>Structured analytical approach</i></p> <ul style="list-style-type: none"> • WRI's Corporate Ecosystem Services Review (ESR) • WRI's ESR for Impact Assessment (ESR for IA) <p><i>List of ecosystem services metrics</i></p> <ul style="list-style-type: none"> • WRI's ESR and ESR for IA • U.S. EPA's Final Ecosystem Goods and Services Classification System (FEGS-CS) <p><i>Informational resources</i></p> <ul style="list-style-type: none"> • Google Earth • UN Environment Programme (UNEP) World Conservation Monitoring Centre (WCMC) world atlas • International Union for Conservation of Nature (IUCN) databases (including on threatened ecosystems) • Integrated Biodiversity Assessment Tool (IBAT) • Integrated Valuation of Environmental 	<ul style="list-style-type: none"> • Simandou SEIA • Weda Bay Impact Assessment

	<p>Services Tradeoffs (InVEST)</p> <ul style="list-style-type: none"> • IPIECA's Biodiversity and Ecosystem Services Guide • World Bank and IFC data and projects • Sources of proxy ecosystem services information about human use (e.g., agriculture maps) • Economic Intelligence Units (EIU) • Lonely Planet guides 	
<p>Scope the overall boundaries of an in-depth BES assessment, and select the specific metrics and indicators that will be measured.</p>	<ul style="list-style-type: none"> • WRI's ESR in Impact Assessment (IA) • IPIECA's Biodiversity and Ecosystem Services Guide • Integrated Valuation of Environmental Services Tradeoffs (InVEST) • UNEP's WCMC world atlas series 	
<p>Gather baseline data, which could draw upon existing databases, GIS-enabled models, field data collection (of both ecological parameters, as well as socioeconomic and cultural parameters).</p>	<p><i>For baseline data</i></p> <ul style="list-style-type: none"> • Stakeholder engagement • Socioeconomic research methods (e.g., household surveys, PRA, RRA, etc.) • EcoMetrix (Ecosystem Services Field Assessment Method or Protocol) <p><i>For projecting into the future</i></p> <ul style="list-style-type: none"> • Demographic projections for adjacent communities • Livelihood and land use change projections for adjacent communities, particularly in light of climate change • Climate change projections that may affect agricultural options, water demands, etc. of adjacent communities • Projected rainfall (under climate change) to assess projected recharge rates of underground aquifers 	<ul style="list-style-type: none"> • U.K. government's work on ecosystem services • Integrated Biodiversity Assessment Tool (IBAT) • WRI's Aqueduct • WWF Arctic Mapping Tool ArkGIS • WWF's Tracking Protected Area Downgrading, Downsizing, and Degazettement (PADD Tracker) • Co\$ting Nature • Business & Biodiversity Offset Partnership (BBOF) Guidelines and Case Studies
<p>Assess impacts and dependencies on ecosystem services at present and over time (including identification and evaluation)</p>	<p><i>GIS-enabled tools</i></p> <ul style="list-style-type: none"> • Artificial Intelligence for Ecosystem Services (ARIES) • Co\$ting Nature • InVEST <p><i>Financial valuation</i></p> <ul style="list-style-type: none"> • WBCSD's Corporate Ecosystem Valuation 	

Craft mitigation and management plans and implement them.	<ul style="list-style-type: none">• Internal environmental and engineering expertise• Impact investing to source innovations that decrease or eliminate impacts	
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Challenges & Obstacles

Even as this new area of work on ecosystem services impact and dependency assessment emerges, many questions remain.

First and foremost, in considering risks associated with project financing, banks rely on ESIA's. Yet, the assessment findings are often presented in ways that make it challenging for many financial analysts to interpret and understand their significance, which in turn makes it less likely that they will act on these findings. Many financial analysts perceive ecosystem services issues as immaterial, and therefore, they are unlikely to raise significant concerns about risk, which exacerbates the tendency to disregard what are often viewed as impenetrable scientific reports.

In addition, numerous company environmental specialists who participated in BSR's 2013 Roundtable pointed out that the focus on ESIA's is intrinsically problematic. One corporate participant observed that ESIA's are mandated and therefore widely used. However, this individual also asserted that the methodology is a "dinosaur" and has not evolved to integrate scientific thinking around ecosystem services or how to consider these new risks.

Further complicating the issue is the reality that ESIA's are often done late in project planning and execution, which creates immense pressure to complete the assessment so that the project can move forward—rather than being used to assess *whether* it should move forward.

Where external project financing is involved (such as through IFC or private banks), this rub point is further amplified by the pressures placed on environmental and social teams to accelerate their work so that loan papers can be signed and the project can move forward. Unless the ESIA is used to inform project siting and design—to amplify positive impacts and avoid negative impacts as much as is feasible—then it is fruitless to invest significant time into refining the assessment approach.

The collision of (1) project financing steps, (2) project design and mitigation steps, and (3) project milestones is challenging; the team faces incentives to move forward quickly, even at the risk of incomplete or deficient environmental and social impact analysis and avoidance. Many people are aware of this undesirable situation, and initiatives, such as the Cross-Sector Biodiversity Initiative, are actively seeking to propose ways to address the issue.

Other industry participants at BSR's 2013 Roundtable pointed out that in many cases companies have few degrees of freedom in where they locate their projects, due to legal agreements that do not take into account the presence of, or potential for impacts on, ecosystem services. Therefore, some people within the industry believe it would be more appropriate for banks to work with national governments to develop country-specific strategies that define an ecosystem services plan, rather than focusing at a site level. Others at BSR's 2013 Roundtable countered that weak governance in numerous countries will likely require action to identify areas of ecosystem services concerns at multiple levels.

Finally, many noted that once the ecosystem services assessment has been completed and the project goes into operations, it is essential to keep the original cross-disciplinary ecosystem services assessment team engaged. Putting implementation of assessment findings in the hands of a single functional specialist—whether local community affairs staff or environmental staff—may result in misguided advice or even perverse recommendations (such as offering better fishing gear to a local fishing community, which could provide important

"We're under enormous time pressure in developing EIAs in general, as well as ones that consider biodiversity and ecosystem services—because the loan is driving everything . . ."

—*Technical consultant at BSR's 2013 Roundtable*

"All of these dynamics highlight the need for a really good adaptive management process. You can predict the impacts in an ESHIA and develop a management plan, but then the impacts don't occur or others do which are unexpected . . ."

Therefore, a key focus for the future is to drive this process toward adaptive management or issues over the long term."

—*Technical consultant at BSR's 2013 Roundtable*

"The challenge of conducting ecosystem services assessments is the cause-effect relationships that need to be understood, and the need to get more baseline data. Within the context of an EIA, you don't have the time to do the science you need. I've been in lots of projects where we highlight there is a potentially important water regulating services issue, but you need to do a two-year research study to ascertain the true cause-effect relationships—so it is left out [given time and budget pressures]."

—*Technical consultant at BSR's 2013 Roundtable*

short-term benefits, but may exacerbate the overall mid- to long-term viability of fish stock (and therefore fishing) in the area.

In addition, projects often have impacts on operations that the original ESIA did not anticipate. Therefore, it is essential to have robust indicators for impacts as well as ways to assess changes in baseline environmental and social conditions. Such approaches can ensure that teams gather data over time and feed it into the mitigation and management plans in order to adapt them as work proceeds.

In recognition of many of these challenges, preliminary responses are being developed, as outlined below.

Table 3: Illustrative Current Challenges with ESIA and Ecosystem Services Responses

<i>Challenge?</i>	<i>Responses Under Way?</i>
ESIAs do not currently enable integration of biodiversity and ecosystem services factors , nor was the tool developed to be able to do so.	<ul style="list-style-type: none"> WRI worked with consultants to develop a methodology for integrating ecosystem services into environmental impact assessment (ESR in EIA).
Finance teams have incentives to move forward projects , even if it means moving forward without a complete (or thorough) environmental and social assessment, as well as consideration of ecosystem services impacts and dependencies.	<ul style="list-style-type: none"> The Equator Banks' Secretariat offers training on "Biodiversity [and Ecosystem Services] for Banks" with a focus on the recommended process for conducting due diligence on these issues. Materials on the business case for considering natural capital, biodiversity, and ecosystem services risk are emerging from a range of players, such as BSR, the Natural Capital Coalition, the B Team, the Corporate EcoForum, TEEB for Business, The Nature Conservancy (TNC), WBCSD, WWF, and other organizations
Financing does not always rely on project-based lending (or even external sources of capital) , and, therefore, many project do not touch any entity requiring due diligence process on biodiversity and ecosystem services.	<ul style="list-style-type: none"> Materials on the business case for considering ecosystem services business risk and opportunity, such as from BSR, the Natural Capital Coalition, the B Team, the Corporate EcoForum, TEEB for Business, The Nature Conservancy (TNC), WBCSD, WWF, and other organizations

Broader Context in the Financial Services Sector

“As a bank involved in corporate finance, my question is: Where can I assess aggregate ecosystem services risks of the global operations of a company? How do I anticipate the ecosystem services risks for a decision?”

Only about a quarter of our companies are listed companies. The rest are exposed to NGO campaigns and media, and this is how we hear about it . . .

We don't have historical information about what has gone wrong [in terms of ecosystem services flows and biodiversity impacts] and what the risks have been with a particular client.”

—Financial services representative at BSR's 2013 Roundtable

“It would be great to review why ecosystem services risks are repeatedly being missed and are causing problems at the site level.

In my experience, it is often related to lack of assessment of cumulative effects, the tendency of ecosystem services to fall between the cracks of the social and environmental teams.

The reality is that ecosystem services is complex, and when things get complex, I think it goes beyond tools and checklists.

We need a process-based approach to have the right teams and people together.”

—Technical consultant at BSR's 2013 Roundtable

Even as more companies gain experience applying ecosystem services assessments, mainstream investors and financial services sector players do not yet value it as a material issue. Instead, the entry point into environmental issues—which is commonly seen as adequate—is through energy, climate change, and/or water.

Yet, given current trends, the financial services sector will likely need to reassess in the near future its perception of risk in light of ecosystem services issues.

As the financial services sector increasingly understands “[ecosystem malfunction risk](#),” then the question will be *how* sector professionals can quickly and easily assess this risk for projects as well as enterprises. Looking forward, financial services sector analysts clearly have the opportunity to engage in a multicompany collaborative initiative and tailor a tool for the sector that is as easy to use as the [IBAT](#) is, for example.

A tailored tool will likely be needed given that leading sustainability information providers are not yet offering in-depth biodiversity and ecosystem services data. Such a tool would need to be kept up-to-date and also be easily accessible to financial analysts. They should be able to use this information to make connections among ecosystem services, projects, business enterprises, *and* financial returns—at specific sites as well as related to business models—in order to catalyze discussion of ecosystem services impacts and dependencies. In addition, it may be worthwhile for the financial services sector to consider performance bonds that incentivize best practices related to ecosystem services.

Tailored financial services tools will need to be scalable from a single site and aggregated across multiple sites. Yet, the challenge is that much of the IFC's and many private banks' current lending is institutional loans, and *not* designated for specific projects, as financial services representatives described at BSR's 2013 roundtable. It is often unclear where in the institution the loaned money is going. And absent site specifics, there is a lack of clarity around how to assess ecosystem services impacts in terms of financial market lending and in the context of a financial intermediary. Further, even when issues are identified, acting upon these concerns may be challenging depending on the level of influence, particularly when one entity may be a relatively small shareholder.

Insights from BSR's 2013 Roundtable on Applying Ecosystem Services Assessments

“We’re developing a BES policy, and the problem is implementing it in our current [internal financial services] assessment and screening . . . We don’t do project finance, so most of the assessment tools we’ve talked about don’t apply. And we won’t have access to ESAs. Therefore, we won’t have a sense of whether the company is deforesting a high conservation value forest, for example . . . And our sector specialists are not biodiversity specialists.

The challenge for me is how do I translate IFC’s Performance Standard 6 [which names biodiversity and ecosystem services] into some of the tools that are useful in assessing our risks—given that we have only a rough idea of where the money is going but not specifically, and yet we need to manage our reputational impacts. What I’m looking at are the questions of:

Where does biodiversity and ecosystem services have an impact on creditworthiness? How do I assess that?
Is the risk so high that I might not get a return on the loan? How do I know?”

—*Financial services sector representative, BSR’s 2013 Roundtable*

“The guidelines are clear.

For financial services institutions, it is the Ecosystem Services Benchmark.

For assessing corporate ecosystem services impacts and dependencies, it is WRI’s Corporate Ecosystem Services Review (ESR) and WRI’s ESR for IA.

For a more granular assessment, there are numerous other tools to select from as is appropriate.”

—*Technical specialist at BSR’s 2013 Roundtable*

**“What is the goal of ecosystem services?
Could we apply a no net loss to ecosystem services, and
see what it means needs to be done at the site?”**

—*Technical consultant at BSR’s 2013 Roundtable*

Looking Forward

Numerous key questions are worthy of tracking in the coming months and years, including:

- » Will lenders and the financial services sector become more exacting in understanding—and acting upon—adverse impacts and significant dependencies on ecosystem services?
- » Will significant regulation around ecosystem services emerge? If so, in what countries? With what details? With what implications on companies?
- » Will ecosystem services be explicitly included in corporate ranking metrics and reporting requests (such as the expansion beyond the forestry sector of the Dow Jones Sustainability Index review of ecosystem services impacts; in future Global Reporting Initiative (GRI) guidelines, future Carbon Disclosure Project (CDP) areas of inquiry, Integrated Reporting, and other entities)?

If any one or all of these developments occur—or other scenarios around the rapid uptake of ecosystem services begin to develop, as laid out in a [BSR working paper](#)—then businesspeople will need to quickly onboard assessment protocols associated with understanding their impacts and dependencies, such as those laid out in this working paper.

Overall, what will play out in the coming years with respect to ecosystem services is being decided through action and advocacy. The time for engagement is now.

Appendix 1: Research Design and Methods

This working paper is based on primary research, in the form of:

- » **Twenty-five written survey responses in the summer and fall of 2013** to questions about current activity and future uptake of ecosystem services concepts by private, public, NGO, multilateral, and academic representatives (for the specific questions, please see Appendix 5);
- » **Literature review**, including of publicly available corporate communications related to their actions on ecosystem services that has been undertaken since the inception of BSR's work on ecosystem services, in 2006, through present, and
- » **Insights from the 30 individuals who participated in BSR's ESWG roundtables held in October 2013**, which was governed by the Chatham House Rules, in which people speak as individuals instead of as representatives of their organizations and in which a coarse-grain explanation of a speaker (e.g., public sector employee, private sector employee, NGO representative, etc.) is used instead of an individual attribution.

The survey questions are listed in appendix 2.

This research is based on the publicly available information shared by companies. As a result, the list of corporate activity may *not* include all company action related to ecosystem services. A number of businesses are engaging with these issues, but are not yet discussing their work publicly.

It is essential to note that the internet research focused on ecosystem services and did *not* include companies that are active on biodiversity alone. It is also noteworthy that given the scope, budget, and time of this research, the documentation is in the form of direct quotes from corporate materials. Independent verification and validation of these assertions was not undertaken and lay beyond the scope of this particular research project.

Finally, the October 2013 roundtable discussion was convened by BSR's Ecosystem Services Working Group (ESWG) and designed as well as facilitated by the lead researcher. Agendas were crafted months in advance and shaped based on feedback from both BSR's ESWG's corporate members, as well as invitees from the public, private, NGO, multilateral, and academic sectors.

If you have questions about this report's research methods, please contact Sissel Waage at [swaage \(at\) bsr.org](mailto:swaage@bsr.org).

Appendix 2: 2013 Survey Questions

1. What is your current work on ecosystem services?
 - a. How do you expect this work and role to change (if at all) in the next 2 to 5 years, as well as looking forward 10 years?
 - b. What do you believe will be the key drivers to this changing role (or not)?

2. Does your organization currently apply, advise on, or offer training on integration of ecosystem services into decision-making processes?
 - a. If so, please provide details on:
 - i. Key definitions used?
 - ii. Brief overall description of what an ecosystem services approach would entail (in contrast to current corporate work, such as with impact assessments, etc.)?
 - iii. Key corporate application *domains* for ecosystem services concepts, tools, and approaches within existing business decision-making processes (such as due diligence processes, environmental impact assessment, lifecycle assessment, social investment, supply chain, procurement, reporting, risk analysis, remediation, surplus lands management, etc.)?
 - iv. Specific tools and/or approaches that you have adopted (or recommend) for particular applications (e.g., within distinct geographies, types of business decision-making processes, etc.)?

3. What specific indicators do you use—or recommend the use of—in assessing corporate impact and dependencies on ecosystem services?
 - a. Given these indicators, what do you use—or recommend the use of—in terms of sourcing or gathering baseline data (including databases)?
 - b. If possible, what are the approximate costs for specific data gathering methods or data sets?

4. What obstacles and challenges have you encountered in applying an ecosystem services analytical approach?
 - a. Have any of the following issues been a concern: managing stakeholder expectations—considering whether or not to explore biodiversity offsets, and/or the monetary valuation of ecosystem services? Other issues?

5. What are the current/emerging lessons learned in terms of integrating ecosystem services into decision-making processes?
 - a. What are the insights about potentially challenging issues, such as local community stakeholder expectation raising, interfacing with local value, the role of social scientists in integrating ecosystem services into impact assessment, and/or measures in social investment and social performance?

6. What do you see as potential opportunities for cross-sector engagement or collaboration on ecosystem services, both in general as well as to specifically address obstacles encountered to date?