EcoMetrics

MEASURING AND VALUING THE IMPACT OF NATURE-BASED SOLUTIONS

INTRODUCTION

Investing in nature-based solutions creates value. In today's society, nature-based solutions are offering a wide variety of superior environmental, economic and social value compared to the "grey infrastructure" alternatives. A key distinguishing factor about this value and benefit creation is the direct impact on a wide range of stakeholders. EcoMetrics LLC recognizes the importance of these benefits associated with nature-based solutions; and the methodology can quantify and value those benefits.

Nature-based solutions stand out because they utilize ecosystem services, natural assets, and natural capital, along with their resulting socio-economic effects. These solutions, which involve preserving, conserving, and restoring natural environments, introduce the idea of benefits tied to ecosystem services. An ecosystem service is essentially any positive effect or advantage that nature offers to society, occurring either directly or indirectly across various categories.

Quantifying the advantages of nature-based solutions strengthens investment justifications and provides essential data for reporting and communication. Businesses, markets, and communities struggle to create compelling business cases that enable decision-makers to incorporate these solutions and compare environmental, financial, and social results across various choices. External stakeholders, especially investors, also face this challenge as they desire a balance sheet approach to environmental and social reporting. Frequently involved parties, including the public, residents, government bodies, NGOs, and conservation groups, expect environmental and social value metrics to be based on robustly gathered and analyzed data that can be independently verified.

WHAT IS ECOMETRICS?

EcoMetrics is a fully documented, third-party verified, and audit-ready assessment methodology supported by a cloud-based computational platform. It identifies, quantifies, and values in monetary terms the complete environmental, social, and economic value of a project or activity. The methodology emphasizes both process and results, utilizing stakeholder input and site analysis. This necessitates thorough stakeholder engagement and an on-site understanding of the project's environmental, social, and economic consequences.

THREE KEY PURPOSES OF ANALYSIS RESULTS

FINANCIAL
Supporting business case development and return on investment calculations. This includes informing valuation of credits in trading markets.

COMMUNICATIONS & REPORTING
Facilitating internal and external reporting (both formal and informal) and communication efforts regarding project impact.

SCENARIO PLANNING & ASSESSMENT
Enabling the comparison of value generated across various scenarios for evaluation.

STANDARD & PROTOCOL ALIGNMENT

- **ISEAL**
- **Social Value International's (SVI) Social Return on Investment Methodology**
- **Ecosystem Service Quantification and Valuation Principles and Methods**
- **Reporting Protocols and Standards** (IFRS, GRI, CDP, SDGs, etc.)

It is also adaptable and can be aligned with other standards and protocols as applicable, including:

- Alliance for Water Stewardship Water Stewardship Standard
- Carbon, Community, and Biodiversity (CCB) Standards
- Volumetric Water Benefit Accounting
- Water Quality Benefit Accounting
- Various Carbon Market Registries (Verra, CAR, Gold Standard, etc.)

BENEFIT VALUATION: THE HEART OF ECOMETRICS

EcoMetrics employs the principles of (ISEAL), Social Value International's (SVI) Social Return on Investment (SROI) principles and different valuation methods in ecosystem services and natural assets to perform the outcome quantification and valuation process.

The International Social and Environmental Accreditation and Labeling (ISEAL) Alliance's principles "help organizations developing standards and similar sustainability tools to understand which attributes of their system are critical to the credibility of their approach, and why this matters for improving sustainability performance and delivering impacts."

The SROI methodology is reflected in the Social Value International's (SVI) principles and protocols. The SROI methodology is a framework for evaluating the broader concept of social value, defined as change experienced by people and organizations. Both the ISEAL and SVI principles, with their strong emphasis on stakeholder engagement, guarantee that stakeholders have a significant input in evaluations, increasing the likelihood of their support for the findings.

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VALUATION PRINCIPLES

ISEAL PRINCIPLES

Sustainability Impacts
Demonstrates a clear purpose to drive positive social, environmental, and economic impacts and to eliminate or remediate negative impacts

Collaboration
Works with others to create change

Value Creation
Creates value that fairly rewards the effort and resources that it takes for users to participate in the system

Measurable Progress
Demonstrates the difference it is making

Stakeholder Engagement
Empowers stakeholders to participate in decisions and hold the system into account
Involves a balanced and diverse group of stakeholders in decisions that will affect them

Transparency
Earns trust by being open and honest

Impartiality
Identifies and avoids or mitigates conflicts of interest throughout its governance and operations

Reliability
Provides trustworthy assessments of users' performance

Truthfulness
Substantiates its claims and has communications that can be trusted

Continual Improvement
Regularly reviews its objectives, its strategies, and the performance of its tools and system

SVI PRINCIPLES

Involve Stakeholders
Inform what gets measured and how this is measured by involving stakeholders

Understand What Changes
Articulate how change is created and evaluate this through evidence gathered, recognizing positive and negative changes as well as those that are intended and unintended

Value Things That Matter
Use financial proxies in order that the value of all outcomes can be recognized including those that are not traded in markets but are affected by activities

Only Include That Which is Material
Determine what information and evidence must be included in the accounts to give a true and fair picture, such that stakeholders can draw reasonable conclusions about impact

Do Not Over-Claim
Only claim the value that organizations are responsible for creating

Be Transparent
Demonstrate the basis on which the analysis may be considered accurate and honest, and show that it will be reported to and discussed with stakeholders

Verify the Result
Ensure appropriate independent assurance

Be Responsive
Pursue optimum value based on decision making that is timely and supported by appropriate accounting and reporting

While ecosystem services are commonly categorized by service type (e.g., regulating, supporting, provisional, or informational), EcoMetrics LLC structures outcomes by stakeholder to align with the ISEAL and SVI principles.

This approach ensures that stakeholder perspectives are central to the assessment, although the outcomes can be organized in any way that supports the project's aims.

Environmental and nature-based solutions projects differ from typical SROI projects. Their benefits primarily involve changes to the environment and natural ecosystems, subsequently benefiting various stakeholders. However, applying the SROI methodology to these environmental projects presents distinct challenges.

Traditionally, SROI has been used by community organizations focused on social welfare programs with clearly defined investment and benefit periods (Social Ventures Australia Consulting, 2011). In contrast, the benefits of nature-based environmental solutions are often not immediately obvious to stakeholders. For instance, while carbon, nitrogen, and phosphorus offset credits directly benefit funders and partners, the broader environmental value of these elements for other stakeholders and society is typically not identified as an outcome through stakeholder engagement.

EcoMetrics LLC strives to solve this challenge by integrating the two concepts.

Nature-based solutions offer substantial environmental and societal advantages.

Clearly articulating these benefits is crucial for acknowledging their significance, respecting the value they generate, and building a stronger argument for their protection, enhancement, and the necessary investments. This is not about assigning a monetary value to nature itself, but rather about understanding the worth of the goods and services it provides. This understanding allows for a logical comparison with more artificial and sometimes environmentally detrimental alternatives for providing the same goods and services.

EcoMetrics LLC understands that the widespread adoption, usability, and comparability of SROI analysis techniques and reporting formats are essential for achieving this outcome. By integrating the ISEAL Principles and the SVI Principles with ecosystem-based strategies under the EcoMetrics™ framework, we are taking a significant step towards providing a "balance sheet" approach to the analysis. This approach fosters a shared understanding and common language among the organization, its financial investors, and the public.

EcoMetrics LLC assesses value through both market-based factors (economic value/cost for project sponsors) and non-market factors (environmental, social, and economic value/cost for other stakeholders). This valuation involves a thorough, evidence-based analysis of changes for all relevant stakeholders, acknowledging both positive and negative, intended and unintended consequences. In the context of SROI, valuation refers to the monetary value stakeholders place on one potential outcome compared to another. Applying SROI principles to these valuations necessitates financial proxies (monetary amounts per unit of outcome) because many identified outcomes are not easily quantifiable using standard accounting methods.

EcoMetrics LLC research integrates scientific data on objective impacts into the SROI evaluation to comprehensively measure the effects of proposed options. This data directly corresponds to stakeholder-defined outcomes and quantifies the value of environmental, economic, and social changes. While "social value" refers to the incorporation of stakeholder input, it's recognized that stakeholders are also influenced by environmental and economic outcomes. The SROI methodology translates these social values into financial equivalents, enabling all stakeholders to assess the cost-benefit of potential environmental actions. This valuation of outcomes clarifies the internalized financial and externalized societal benefits of investing in nature-based solutions.

A STAKEHOLDER-CENTRIC APPROACH

EcoMetrics employs a stakeholder-centric method for identifying benefits and evaluating and forecasting value creation. This approach is fundamental in both the ISEAL principles and the SVI principles.

While SROI analyses can be conducted without explicit stakeholder involvement, this can lead to a significant divergence between predicted and actual impacts of an intervention. To avoid this, practicing quality stakeholder engagement emphasizes the integration of stakeholder perspectives throughout the evaluation, including the design phase.

EcoMetrics LLC prioritizes stakeholder input in its evaluation design through the creation of a Theory of Change and a Value Map. The Theory of Change outlines the anticipated sequence of events resulting from an investment. The Value Map illustrates how stakeholders respond to this value chain in relation to their specific interests. It connects stakeholder objectives with inputs (e.g., investment), outputs (e.g., trees planted), and outcomes (e.g., increased income through employment). This approach ensures that the evaluation reflects a diverse range of stakeholder views on the potential results of natural capital or green infrastructure investments.

The approach promotes stakeholder involvement in the collection and analysis of both the qualitative and quantitative data that informs initial forecast reports and subsequent assessments. Stakeholder involvement ensures that the views of all groups affected by a project are represented in the analysis. It also ensures that estimates of the overall value produced by a project are tempered by stakeholder perspectives on the materiality of any forecasted or assessed outcome.

Stakeholder feedback, when compared with other data such as actual vs. projected turnover, facilitates ongoing learning and enhancement. **Recognizing that nature-based solutions develop over time, with increasing benefits, EcoMetrics LLC provides users with the necessary information for making adjustments during project implementation, ultimately leading to better outcomes.**

For a nature-based solutions project, the following are examples of some of the stakeholder groups that could be incorporated into the EcoMetrics Value Map's design.

ENVIRONMENT

Unique to EcoMetrics™, the environment is treated as a key stakeholder whose place at the table is represented by the scientific community and the direct, on-the-ground assessments and published research it has produced to validate and quantify the benefits of a project to present and future generations.

PROJECT LEAD ORGANIZATION

The leading organization is also a key stakeholder as it is invested in the success of the project. This makes its perspective particularly important, since it is responsible for the development of the Theory of Change and the Value Map. In some analyses, their view may be the only one represented in project design and outcome assessment. In EcoMetrics™ the project lead is only one stakeholder group among many.

FUNDERS

Whether or not they are also the project lead, funders may earn internalized market returns (economic value) because of a natural capital or green infrastructure investment. They also stand to benefit economically from an enhanced social license to operate within the communities they serve, along with improvements in staff retention and reported well-being due to the organization's enhanced standing among employees and shareholders. These returns are all captured in EcoMetrics™, through a multi-stakeholder-centric approach.

COMMUNITY AT LARGE

The community adjacent to the project site benefits from improved ecosystem services, which provide direct social benefits, such as improved water and air quality, but may also deliver such economic co-benefits as improved recreational opportunities, tourism, and property values.

GOVERNMENT(S)

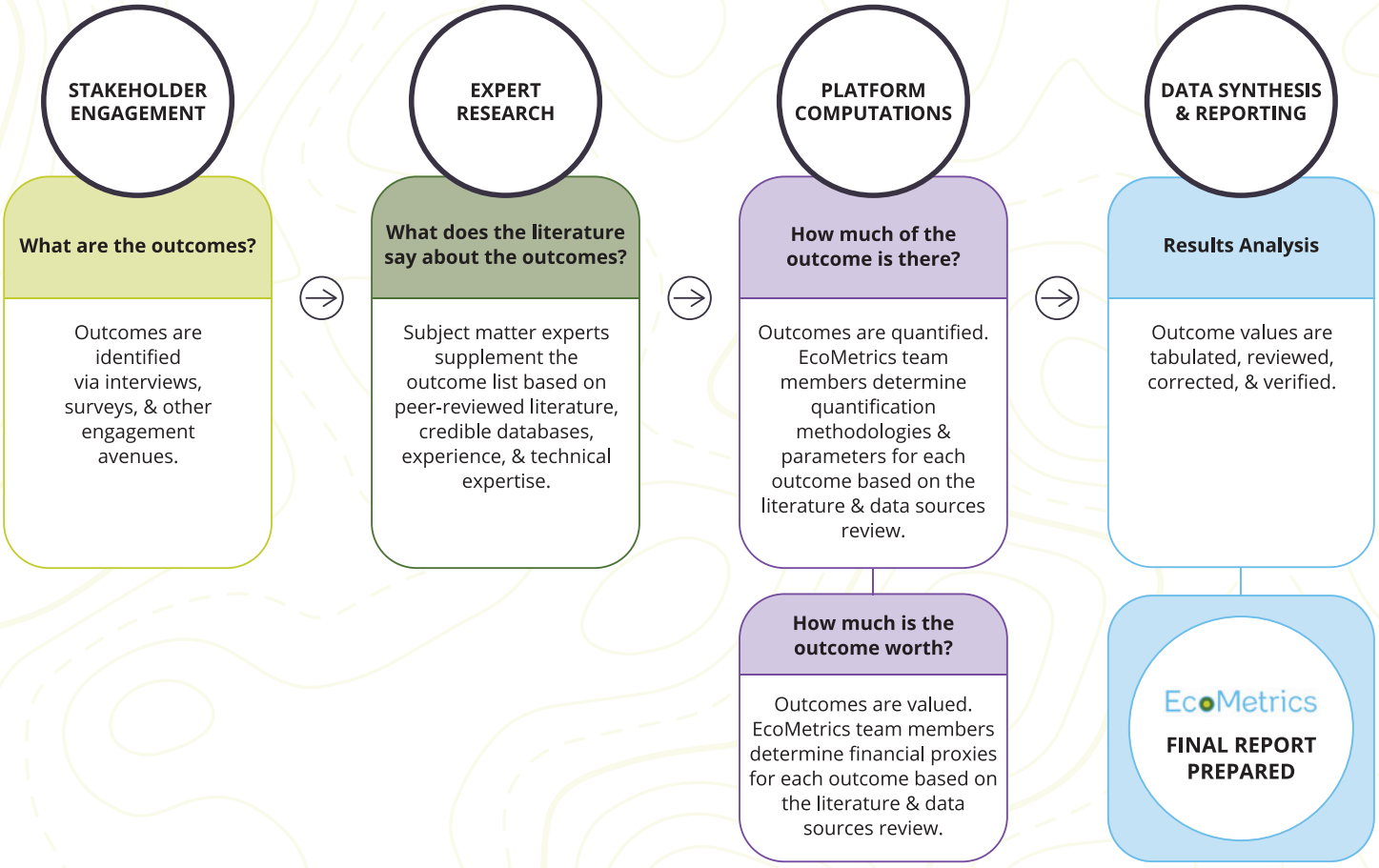
This stakeholder group may benefit economically from the greater environmental resilience that natural capital and green infrastructure investments confer on surrounding communities, which leads to potential cost savings and improved regional resilience. EcoMetrics™ allows governments to quantitatively communicate the value of investing taxpayer dollars.

CONSERVATION ORGANIZATIONS

Conservation organizations benefit from the advancement of their organizational objectives to secure improved habitat and enhanced ecosystem benefits for the broader ecological region.

THE ECOMETRICS METHODOLOGY

The EcoMetrics™ methodology identifies, quantifies, and values (in monetary terms) the environmental, economic, and social outcomes associated with a project or activity, specifically nature-based solutions. To do this, EcoMetrics LLC works by developing an understanding of the activity or project being analyzed, how it meets its objectives, and how it works with its stakeholders. The EcoMetrics™ methodology generally consists of six stages:



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ANALYSIS PROCESS

THERE ARE TWO TYPES OF ECOMETRICS™ ANALYSIS:

FORECAST

Designed to understand and predict the desired impact and outcomes of an activity for significant stakeholders. Forecast analyses are especially useful in the planning stages of an activity. They can help show how investment can maximize social impact and are also useful for identifying what should be measured once the project is implemented (SROI Network, 2012).

EVALUATIVE

Conducted to set the baseline and/or retrospectively to validate a forecast or baseline SROI to understand if the impact sought was achieved. Evaluative analyses are helpful in assessing current conditions and determining the actual performance of a project underway.

EcoMetrics™ can be used for either forecasting, evaluating, or over time, both ways on a given project. Typically, the evaluative approach is used to establish baseline conditions against which forecasts can be compared.

IDENTIFYING OUTCOMES

A crucial element of the outcome identification step is developing an impact map based on the input from stakeholder engagement. This map illustrates the impact value chain for each stakeholder, connecting their goals to the invested inputs, the resulting outputs, and ultimately the achieved outcomes (e.g., increased biodiversity from restored acres). Defining this impact pathway helps to avoid exaggerated claims and ensures all relevant stakeholders are considered in the analysis.

The EcoMetrics™ methodology integrates both the ISEAL Principles and the SVI Principles by developing an understanding of the activity being analyzed, how it meets its objectives, and how it works with its stakeholders. The methodology identifies the expected outcomes in part by answering five key questions (as adapted from SVI):

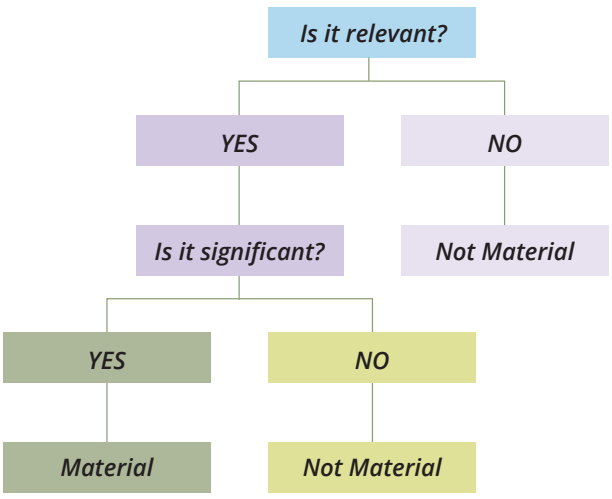
KEY QUESTIONS ADDRESSED IN AN ECOMETRICS METHODOLOGY

QUESTION	DEFINITION
What changes?	Taking account of all the people, organizations, and environments affected significantly
How does it change?	Focusing on all the important positive and negative changes that take place, not just what was intended
How do we know?	Gathering evidence to go beyond individual opinion
Were these changes due to the project?	Taking account of all the other influences that might have changed things for the better (or worse)
How important are the changes?	Understanding the relative value of the outcomes to all the people, organizations, and environments affected

The EcoMetrics LLC team subject matter experts supplement the outcomes list based on their knowledge of what can be expected based on project type and physical setting. This step is done because it is possible the stakeholders may not be aware or have the expertise to identify all possible outcomes. Through the stakeholder engagement process, EcoMetrics LLC evaluates the significance for each outcome and for each stakeholder based on quantity, duration, value, and causality.

A Theory of Change is developed to describe impacts and expected outcomes, which relates inputs, outputs, and outcomes. The Theory of Change is reflected in a Value Map, which shows how project inputs (funding, human resources, etc.) translate to outputs and outcomes, which are the impacts or what changes because of the action. These are then validated, refined, and measured for each stakeholder group. EcoMetrics LLC then determines if an outcome is material using the process depicted in the figure. All material outcomes go on to be quantified and valued.

DETERMINING MATERIALITY THROUGH RELEVANCE AND SIGNIFICANCE



QUANTIFYING OUTCOMES

Once identified, EcoMetrics quantifies the outcome to determine how much of the outcome there is. Quantification methods are specific to each outcome and may vary from project to project. For example, water quality improvement can be quantified as nutrient runoff avoided, or nutrient retention. The equations for quantification are entered onto the cloud-based computational platform. All sources of information that help to define the quantification methodologies are cited in the report.

VALUING OUTCOMES

EcoMetrics LLC values outcomes by categorizing them as avoided costs, increased value, risk mitigation, or replacement costs. To determine value, the benefit transfer method is used, seeking the most similar, well-researched, and documented scenario with existing value indicators. The precision of this estimation for the specific situation depends on the quality of the data available. Financial proxies are then used to assign value to these outcomes. The equations for valuation and financial proxies of value per unit outcome are entered onto the cloud-based computation platform. All sources of information that help to define the quantification methodologies are cited in the report.

To avoid inflated claims, stakeholder-derived discount factors are applied, and finally, a sensitivity analysis is conducted to present a realistic range of potential results.

Four discount factors—deadweight (Would it have happened anyway?), attribution (Did something else contribute?), displacement (Are there offsetting negative changes?), and drop-off (Does the impact persist?)—are applied in the evaluation. Deadweight is key for EcoMetrics' "Cost of Inaction" analysis, which compares the cost/benefit of not investing in natural capital or green infrastructure for the organization and stakeholders.

EcoMetrics LLC places a particular emphasis on risk assessment. It considers the probability of external factors, such as severe weather, potentially negating the anticipated benefits. This is a crucial element in evaluating any potential investment in nature-based solutions. The methodology quantifies risk through both the application of four discount factors and a thorough sensitivity analysis.

REPORTING

Once all outcomes are identified, quantified, and valued, the results are provided as a report. **The reports contain project background, parameters used, citations and source of information, and overview of the stakeholder engagement methodology.** Reports are ready for audit—fully documented, internally consistent, transparent, reproducible, supported with credible citations and references.

ECOMETRICS IN ACTION: A CASE STUDY

THE PROJECT: FORESTED WETLANDS RESTORATION SALVADOR WILDLIFE MANAGEMENT AREA, LOUISIANA

Restore the Earth Foundation (REF) began a bald cypress reforestation project in the Lake Maurepas and Lake Salvador areas of the Louisiana coast, west and southwest of New Orleans. The actual project consists of a total of nearly 26,000 acres in segments of four Wildlife Management Areas (WMA) operated by the Louisiana Department of Wildlife and Fisheries (LDWF). The areas are adjacent to Lakes Maurepas (Joyce, Manchac and Maurepas WMAs) and Lake Salvador (Salvador WMA).

THE STAKEHOLDERS

The Environment	Funders, Investors
Sponsors	Adjacent Properties
Region	Local Economy (Services)
Communities Near and Around the Site	Public at Large
Beneficiaries of Ecosystem Services	Federal, State, and Local Government
Civic Organizations, School Districts	

CASE STUDY RESULTS

By applying the EcoMetrics methodology to this project, the following benefits were identified, quantified, and valued.

THE OUTCOMES

- Carbon sequestered
- Improved soil formation and nutrient cycling
- Erosion control and sediment retention
- Increased natural surface water treatment capacity
- Nutrient uptake and retention
- Social license to operate (via enhanced reputation; positive impact on communities)
- Sea level rise coastal protection and storm surge for adjacent communities
- Ecosystem enhancement for habitat refuge
- Habitat enhancement for hunting, fishing, birdwatching, general recreation, and cultural uses
- Educational and employment (direct and indirect) opportunities
- Sense of community pride
- Educational programs

DISTRIBUTION OF VALUE BY OUTCOME

- 26,000 acres historic cypress restoration creates 5,600,000 mt CO_2e offsets
- 8.5 billion gallons/yr water stored
- 550 tons/yr of Nitrogen and Phosphorus retained
- Cost for implementation: $130 million (2022)
- Delivers ~$15.4 billion in market (ROI) & non-market (SROI) value created over 40 years
- $1 investment returns $110 in SROI/ROI
- Provides for Integrated Reporting on a Financial Balance Sheet

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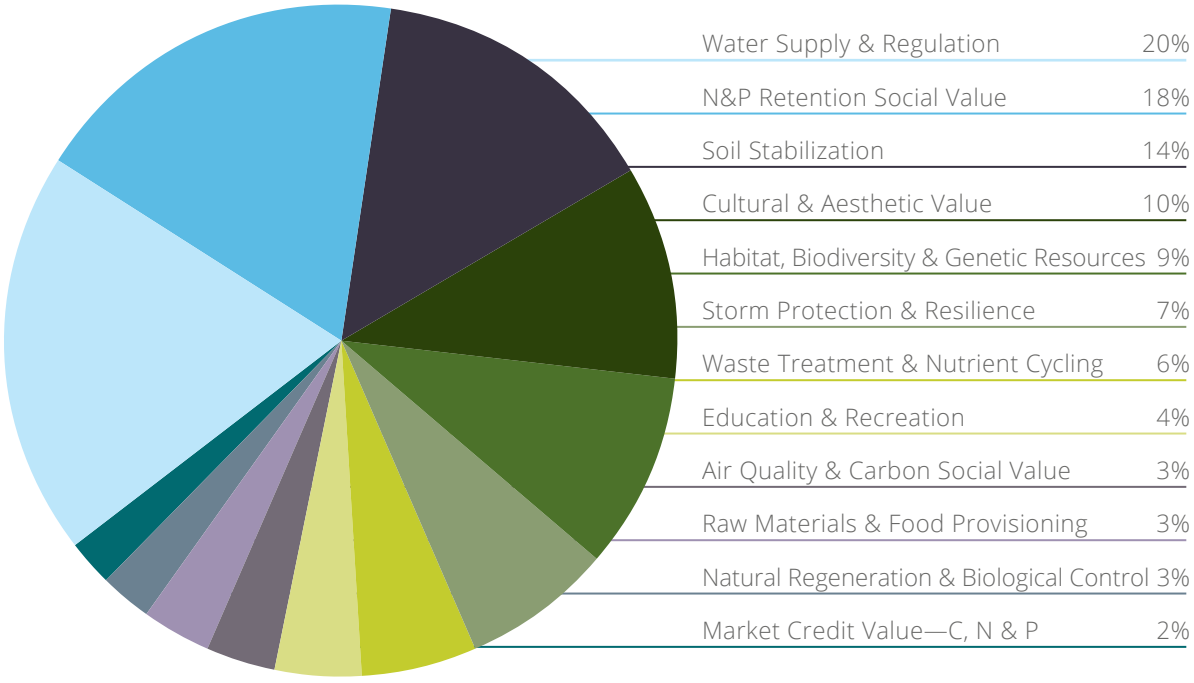

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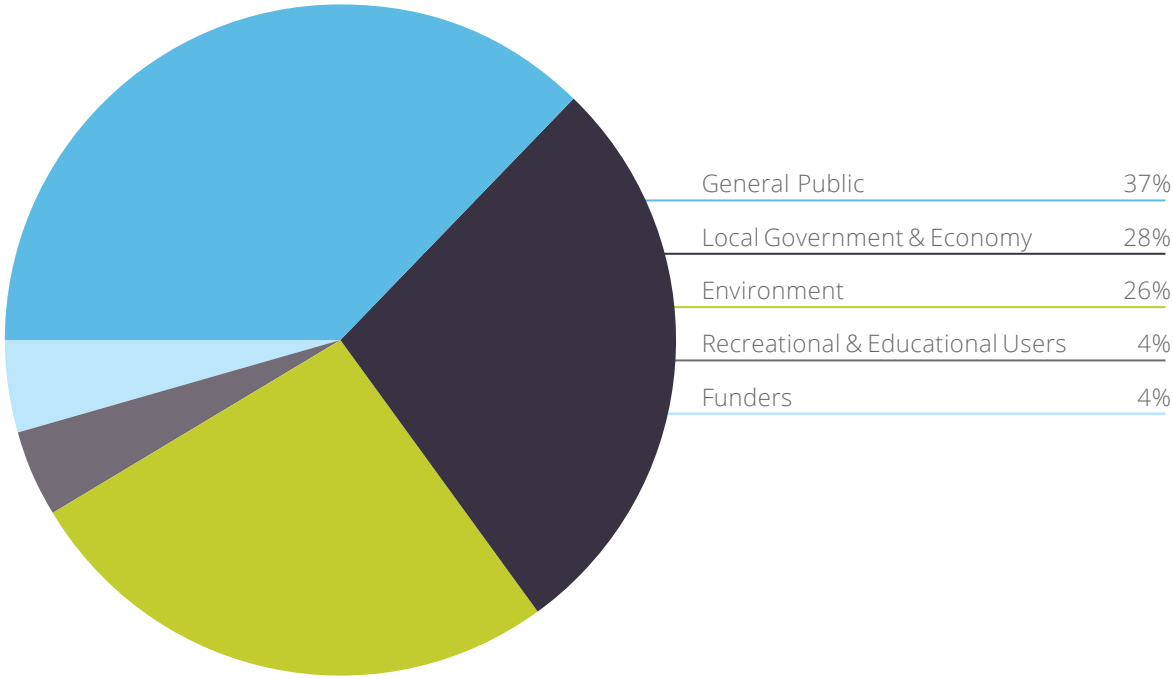

MAKING THE BUSINESS CASE WITH ECOMETRICS VALUATIONS

Nature-based solutions offer substantial environmental, economic, and societal advantages.

Articulating these benefits is crucial for: recognizing their significance, respecting the value they generate, and building a stronger argument for their protection, enhancement, and the necessary investments. This is not about assigning a monetary value to nature itself, but rather about appreciating the value of the goods and services it provides. This understanding allows for a logical comparison with more artificial means of providing those same goods and services.

The ability for an organization to know the value they are creating also allows for the business case for investment to be stronger and allows for determination on Return on Investment. Ironically, nature-based solutions provide highly cost-effective outcomes with multiple benefits compared to built infrastructure, yet they are the most difficult to assess, quantify, and value.

EcoMetrics serves as the bridge between financial aspects and natural systems.

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