Boffa Miskell

APPENDIX 1: NATURE-BASED SOLUTIONS

TECHNICAL SPECIFICATION

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INTRODUCTION

The interest in Nature-based Solutions (NbS), particularly in addressing major challenges emerging from climate change, is growing in New Zealand and worldwide. This is evident in the growing number of investments in NbS development, and the inclusion of NbS in national strategies and international policy agreements, emphasising their importance in addressing the dual climate change and biodiversity crises.

Over the last decade, NbS have gained momentum internationally in research, policy, and practice, with greater recognition of the benefits these approaches can deliver to biodiversity and human wellbeing whilst addressing major societal challenges. NbS have become prominent through inclusion in the Ramsar Convention, UNFCCC, UNCCD (through COP 28) and the Convention on Biological Diversity – in particular the inclusion of two NbS targets in the Kunming – Montreal Global Biodiversity Framework. Nationally, NbS have become visible through inclusion as goals within Te Mana o Te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020, and actions within New Zealand's National Adaptation Plan and Emissions Reduction Plan.

The purpose of this '*Nature-based Solution Technical Specification'* is to help achieve well-functioning and high quality NbS in New Zealand that are well integrated into environments. The specification has been developed in alignment with global standards and international agreements related to NbS to ensure solutions designed and implemented within New Zealand reflect existing best practices and facilitate reporting to relevant international agreements (i.e., the Kunming – Montreal Global Biodiversity Framework).

Two key outcomes are achieved within this specification:

- **Nature-based Solution Definition:** While internationally, agreement has been reached regarding the definition of NbS, nationally, a variety of definitions exist within strategy documents to-date creating ongoing misunderstandings and misinterpretations of NbS by decision-makers and stakeholders. Coherence and alignment of NbS definition on a global scale allows greater oversight and accountability of NbS use and benefits. Additionally, definition alignment supports the reduction of financing barriers of NbS.
- **Nature-based Solution Standards:** Without adherence to robust planning and implementation standards for NbS projects, significant maladaptation or unintended consequences may exist for local communities, mana whenua, national economies, and the resilience of indigenous biodiversity. NbS Standards, fit for New Zealand's unique environment, ensures NbS can be designed and implemented to address the specific requirements of local communities whilst delivering co-benefits.

Figure 1: Nature-based Solutions values - IUCN Global Standard for Nature-based Solutions 2020

DEFINITION

Nature-based Solutions are defined as **'actions to protect, sustainably manage, and restore natural and modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits.'**

- The global definition of Nature-based Solutions was formally agreed by governments at the United Nations Environment Assembly (UNEA) March 2022 (UNEA Resolution 5.5). The definition builds upon the International Union for Conservation of Nature (IUCN) definition of Nature-based Solutions, previously adopted at the 2016 World Conservation Congress and Member's Assembly.

- According to the IUCN, the social, economic, and environmental challenges that Nature-based Solutions can address include ensuring food security, water security, social and economic development, human health, climate change adaptation, and climate change mitigation.

- To differentiate a Nature-based Solution action from a conservation initiative, a Nature-based Solution that addresses biodiversity loss and ecosystem degradation should also address an additional societal challenge.

STANDARDS

The **'IUCN Global Standard for Nature-based Solutions, first edition'** is the most prominent global framework available to support the implementation of Nature-based Solutions. The Global Standard was adopted by 128 state and subnational members at the 2021 World Conservation Congress.

- The 'IUCN Global Standard for Nature-based Solutions' provides a common basis of understanding for Nature-based Solutions and provides a robust framework for Nature-based Solution intervention design, assessment, and implementation at scale.

- The 'IUCN Global Standard for Nature-based Solutions' is adaptable to the local, regional, and national social and ecological contexts, and focuses on achieving environmental, social, and economic goals in an integrated manner.

- The 'IUCN Global Standard for Nature-based Solutions' align with the UNEA definition for Nature-based Solutions, are assessed as a suitable operational framework for global implementation.

FUNCTIONAL CRITERIA & PERFORMANCE INDICATORS

Based on the '**IUCN Global Standard for Nature-based Solutions, first edition'**, the proceeding functional criteria for NbS and the performance indicators outline the standard NbS should seek to align with to ensure rigorous planning and monitoring has been conducted throughout the design and implementation of NbS.

- The Criteria and Performance indicators largely align with the IUCN Global Standards, with language and terminology adapted where appropriate to reflect New Zealand's context.

- The criteria provide measures to ensure all values and qualities are considered throughout NbS design and maladaptation and unintended consequences are mitigated, however this standard acknowledges that not all criteria will be achieved in all cases due to scale of projects and available resources.

CRITERION 1 NATURE-BASED SOLUTIONS EFFECTIVELY ADDRESS SOCIETAL CHALLENGES

Guidance: The purpose of Criterion 1 is to ensure that the NbS is designed as a response to societal challenges that has been identified as a priority by those who are or will be directly affected by the challenges. All stakeholders, especially mana whenua, land holders, and beneficiaries of the NbS, must be involved in the decision-making process used for identifying the priority challenges

CRITERIA 1 PERFORMANCE INDICATORS

Indicator 1.1 The most pressing societal challenges for mana whenua, land holders, and beneficiaries are prioritised

Guidance: The NbS intervention must address clearly specified challenges that have significant and demonstrable impacts on society. Identification of the most pressing societal challenges is best informed by a transparent and inclusive consultation process, as opinions may differ between external stakeholders and local populations and vice versa

Indicator 1.2 The societal challenges addressed are clearly understood and documented

Guidance: Establishing a clear understanding and rationale of the challenges to be addressed, and ensuring these are documented, is important for future accountability and optimising those strategies to contribute to human well-being outcomes. An NbS often yields multiple societal benefits, such as job creation or increased flow of ecosystem services, and the societal challenges these additional benefits address should also be documented.

Indicator 1.3 Human well-being outcomes arising from the NbS are identified, benchmarked, and periodically assessed

Guidance: NbS must deliver tangible and substantive benefits to human well-being. Specific, measurable, attainable, realistic, and timely (SMART) targets should be used as appropriate, as they are important for accountability and informing adaptive management

CRITERION 2 DESIGN OF NATURE-BASED SOLUTIONS IS INFORMED BY SCALE

Guidance: The purpose of this Criterion is to encourage NbS designs that recognise the complexity and uncertainty that occur in living dynamic land/seascapes. Scale applies not only to the biophysical or geographic perspective but also to the influence of economic systems, policy frameworks and the importance of cultural perspectives. Understanding the interactions which affect attributes like cultural values, laws, soils, forests, and water are important in this regard, as they are relevant to the assessment of the risk of undesirable change, or the probability of creating desirable change. NbS design seeks to maintain the productive capacity of ecosystems as well as the production of benefits necessary for human well-being (e.g., food production).

CRITERIA 2 PERFORMANCE INDICATORS

Indicator 2.1 The design of the NbS recognises and responds to interactions between the economy, society, and ecosystems

Guidance: The success of an NbS will be determined not only by the quality of the technical intervention but, critically, how well the interactions between people, the economy and the ecosystem are understood and responded to. For the solutions to be durable and sustainable, the design of NbS requires a “systems” framing that acknowledges and addresses these types of interactions and builds them into the decision-making process

Indicator 2.2 The design of the NbS is integrated with other complementary interventions and seeks synergies across sectors

Guidance: NbS will seek to work with and compliment other types of interventions, such as engineering projects, information technology, financial instruments, etc. Such complementary actions will inherently require the identification of synergies across different sectors according to the specifics and context of each situation

Indicator 2.3 The design of the NbS incorporates risk identification and risk management beyond the intervention site

Guidance: NbS has the potential to either positively or negatively impact, or be impacted by, stakeholders, interests, and ecosystems outside the immediate intervention area. For the solution to be durable and sustainable, such types of interactions both within and around the intervention area need to be understood and accounted for in the decision-making processes. Appropriate risk management options should be incorporated into the intervention design

CRITERION 3 NBS RESULT IN A NET GAIN TO BIODIVERSITY AND ECOSYSTEM INTEGRITY

Guidance: NbS are derived as goods and services from ecosystems, therefore strongly depend on the health of an ecosystem. Biodiversity loss and ecosystem change can have significant impacts on the functioning and integrity of the system. Therefore, NbS design and implementation must avoid undermining the integrity of the system and instead, proactively seek to enhance the functionality and connectivity of the ecosystem. Doing so can also ensure the long-term resilience and durability of the NbS

CRITERIA 3 PERFORMANCE INDICATORS

Indicator 3.1 The NbS actions directly respond to evidence-based assessment of the current state of the ecosystem and prevailing drivers of degradation and loss

Guidance: To develop a solution using nature, one must have a well-founded understanding of the current state of the ecosystems concerned. The baseline assessment needs to be broad enough to characterise ecological state, drivers for ecosystem loss and options for net improvements, making use of both local knowledge and scientific understanding where possible.

Indicator 3.2 Clear and measurable biodiversity conservation outcomes are identified, benchmarked, and periodically assessed

Guidance: In order to inform the design, monitoring, and assessment of an NbS, targets for enhancing key biodiversity values should be established. For each NbS, the type of target may differ; for example, the target could be the percentage of ecosystem area restored or the return of a keystone species.

Indicator 3.3 Monitoring includes periodic assessments of unintended adverse consequences on nature arising from the NbS

Guidance: Ecosystems are complex with interdependent components and processes. There will always be a level of uncertainty in how they will react to specific interventions or other external changes. Therefore, NbS should be designed and monitored to minimise and mitigate unanticipated risks that might undermine the ecological foundations of the solution itself

Indicator 3.4 Opportunities to enhance ecosystem integrity and connectivity are identified and incorporated into the NbS strategy

Guidance: Utilising NbS can provide an opportunity to enhance biodiversity conservation and ecosystem management efforts in ways that other types of intervention, in isolation (such as engineering), will not be able to achieve. If solutions are to be implemented close to natural ecosystems that are managed explicitly for conservation outcomes, the NbS should be designed to enable greater ecosystem connectivity. Furthermore, they could be designed to re-introduce lost components of an existing ecosystem, for example, by deliberately choosing formerly existing species of vegetation when restoring

CRITERION 4 NBS ARE ECONOMICALLY VIABLE

Guidance: The return on investment, the efficiency and effectiveness of the intervention, and equity in the distribution of benefits and costs are key determinants of success for an NbS. This Criterion requires that sufficient consideration is given to the economic viability of the intervention, both at the design stage and through monitoring the implementation. If the economic feasibility is not adequately addressed, NbS run the risk of being short-term projects, where, after closing, the solution and benefits provided cease to exist, potentially leaving the landscape and communities worse off than before

CRITERIA 4 PERFORMANCE INDICATORS

Indicator 4.1 The direct and indirect benefits and costs associated with the NbS, who pays and who benefits, are identified, and documented

Guidance: Identification and documentation of the main benefits derived, including their direct and indirect, financial and non-financial elements are key components for assessing the economic feasibility of the intervention, over time. This information should be differentiated according to who receives the benefits and who bears the costs

Indicator 4.2 Cost-effectiveness is considered to support the choice of NbS

Guidance: Investing heavily in upfront costs without considering the longer-term economic and financial sustainability can negatively impact the intervention's viability. A cost-effectiveness study not only enables an examination of the upfront and recurring costs against the anticipated longer-term benefits of the proposed intervention(s) over time but also allows key (or hidden) assumptions to be made explicit, tested and verified

Indicator 4.3 The effectiveness of the NbS design is justified against available alternative solutions

Guidance: A key attribute of an NbS is that it is capable of addressing at least one societal challenge in a manner that is both economically viable and efficient. This means that the cost-effectiveness and affordability of the solution must be tested against viable alternatives. Alternative solutions may include a different nature-based solution (for example watershed catchment management rather than floodplain management), a different combination of conventional and nature-based solutions, or substitution of the nature-based solution entirely with a more conventional approach such as engineered infrastructure

Indicator 4.4 NbS design considers a portfolio of resourcing options and actions to support regulatory compliance

Guidance: The fact that NbS simultaneously offers multiple benefits to different stakeholders may place limits on some sources of financing, thereby undermining the interventions long-term viability. For example, private investors may not wish to bear the cost of delivering public goods or public authorities may be reluctant to cover costs for benefits that will accrue privately. This may require a resourcing package that integrates a range of financial mechanisms. Sources of investment can include public sector grants, incentives and low interest loans, private-sector loans and equity, blended public-private partnerships as well as philanthropic and voluntary contributions or combinations of the above, reflecting an equitable distribution of both the risks and returns

CRITERION 5 NBS ARE BASED ON INCLUSIVE, TRANSPARENT, AND EMPOWERING GOVERNANCE PROCESSES

Guidance: This criterion requires that NbS acknowledge, involve, and respond to the concerns of a variety of stakeholders, especially mana whenua and land holders. Good governance arrangements are proven to not only reduce an intervention's sustainability risks, but also to enhance its social 'license to operate'. At a minimum, NbS must adhere to and align with the prevailing legal and regulatory provisions, being clear on where legal responsibilities and liabilities lie. However, as often is the case with natural resources, basic compliance will need to be complemented with ancillary mechanisms that actively engage and empower mana whenua and local communities.

CRITERIA 5 PERFORMANCE INDICATORS

Indicator 5.1 Participation is based on mutual respect and equality, regardless of gender, age, or social status, upholds the right of mana whenua, and uphold the principles of the Treaty of Waitangi

Guidance: In order that governance arrangements function effectively, all affected stakeholders need to be equipped with the right information at the right time and the inputs they provide need to be meaningfully addressed. In doing so, a conscious effort is required to ensure that traditionally excluded groups are actively brought into the process in a manner that upholds their dignity and encourages their participation.

Indicator 5.2 Stakeholders who are directly and indirectly affected by the NbS have been identified and involved in all processes of the NbS intervention

Guidance: Stakeholder mapping and analysis identifies those who may be directly and indirectly, positively, or negatively, affected by the NbS. This allows the intervention to afford opportunities to affected stakeholders to engage with and participate in the design and implementation, advocate clearly to uphold their own rights and interests, and where necessary, prevent further marginalisation

Indicator 5.3 Decision-making processes document and respond to the rights and interests of all participating and affected stakeholders

Guidance: It is important that transparent and accessible documentation records key steps in NbS decision-making procedures. This helps enhance accountability and provides a strong basis for recourse in the case of any disputes or disagreements. Specific attention should be paid to noting which stakeholders where involved in decision-making and the role they played. This is particularly important where extreme inequity persists so that processes can be adapted to encourage meaningful and effective participation

Indicator 5.4 Where the scale of the NbS extends beyond jurisdictional boundaries, mechanisms are established to enable joint decision-making of the stakeholder in the affected jurisdictions

Guidance: Ecosystems do not follow political and administrative borders. Where appropriate, transboundary cooperation agreements between relevant authorities underpin NbS planning and implementation across frontiers to help ensure coherency and consistency of approach and desired outcomes

CRITERION 6 NBS EQUITABLY BALANCE TRADE-OFFS BETWEEN ACHIEVEMENT OF THEIR PRIMARY GOAL(S) AND THE CONTINUED PROVISION OF MULTIPLE BENEFITS

Guidance: Trade-offs in land and natural resource management is inevitable. Ecosystems provide a wealth of different benefits and not everyone values each of them in the same way. While trade-offs cannot be avoided, they can be effectively and equitably managed. This Criterion requires that NbS proponents acknowledge these trade-offs and follow a fair, transparent, and inclusive process to balance and manage them over both time and geographic space.

CRITERIA 6 PERFORMANCE INDICATORS

Indicator 6.1 The potential costs and benefits of associated trade-offs of the NbS intervention are explicitly acknowledged and inform safeguards and any appropriate corrective actions

Guidance: All trades-off are accompanied with an associated set of costs and benefits which may be subject to change over the entire NbS lifecycle. A key function of NbS safeguards is to ensure that necessary trade-offs do not negatively impact the most disadvantaged elements of society or, equally, that they are denied access to the intervention's benefits. It is therefore important that the costs and benefits of trade-off arrangements are fully understood, widely shared among affected stakeholders, and periodically revisited

Indicator 6.2 The rights, usage of and access to land and resources, along with the responsibilities of different stakeholders, are acknowledged and respected

Guidance: The legal and customary rights to access, use and control management over land and natural resources, particularly of vulnerable and marginalised groups, needs to be respected and upheld. Rights, use and responsibilities of stakeholder groups in relation to the NbS should be analysed and assessed, using appropriate tools and by building upon the outcomes of stakeholder analysis or mapping. This is particularly important when working in partnership with mana whenua where the principles of the Treaty of Waitangi must be upheld

Indicator 6.3 The established safeguards are periodically reviewed to ensure that mutually agreed trade-off limits are respected and do not destabilise the entire NbS

Guidance: Where risk is unavoidable, safeguards must be in place and periodically reviewed to anticipate and avoid adverse consequences of interventions, especially considering that inequity in trade-offs may change over time and that not all stakeholders may be equally affected. Therefore, NbS design and strategy needs to be explicit about whose benefits and whose costs will be addressed, including when and how this will be reviewed

CRITERION 7 NBS ARE MANAGED ADAPTIVELY, BASED ON EVIDENCE

Guidance: This Criterion requires that NbS implementation plans include provisions to enable adaptive management as a response to uncertainty and as an option to effectively harness ecosystem resilience. A degree of uncertainty is inherent when managing most ecosystems due to their complex, dynamic and self-organising nature. This also means that ecosystems have greater resilience which confers a wider range of options to respond to unanticipated social, economic or climate events. The foundation of adaptive management is the evidence-base provided by regular monitoring and evaluation, drawing on scientific understanding as well as indigenous, traditional, and local knowledge. By proactively adopting an adaptive management approach, the NbS can continue to be relevant through the lifecycle of the intervention and the risk of redundancy and stranded investments minimised.

CRITERIA 7 PERFORMANCE INDICATORS

Indicator 7.1 A NbS strategy is established and used as a basis for regular monitoring and evaluation of the intervention

Guidance: An NbS strategy, at its most basic, includes the reasoning behind the NbS, a precise articulation of the intended outcomes and clear understanding of how these should be achieved through the actions taken. It should be informed by the prevailing economic, social, and ecological conditions, and clearly state the assumptions as to whether and how they are expected to change

Indicator 7.2 A monitoring and evaluation plan is developed and implemented throughout the intervention lifecycle

Guidance: A monitoring and evaluation plan is a key requirement to understand whether the NbS strategy effectively delivers the intended outcomes and, thereby addressing the societal challenge; and, whether risks or unexpected impacts mean a change in strategy or action is required. Where NbS have synergies with other interventions or approaches, these should be included in the monitoring and evaluation plan. Observed and sustained deviations from the key elements of the NBS strategy should trigger an adaptive management response

Indicator 7.3 A framework that enables adaptive management is applied throughout the intervention lifecycle

Guidance: Learning based on evidence should drive NbS management. Furthermore, iterative learning is essential in informing adaptive management actions, in order to respond to the factors influencing NbS interventions. For this Criterion, indicators 7.1 and 7.2 provide a continuous feedback loop to learn and adapt the NbS intervention.

CRITERION 8 NBS ARE SUSTAINABLE AND MAINSTREAMED WITHIN AN APPROPRIATE JURISDICTIONAL CONTEXT

Guidance: This Criterion requires that NbS interventions are designed and managed with a view to long-term sustainability and that they take account of work with and align with sector, national, and other policy frameworks. There are various approaches to mainstreaming NbS; however, all rely on strategic communications and outreach. Audiences to consider include mana whenua, individuals (e.g. the public, academics), and institutions (e.g. local and central government bodies, businesses, and non-government organisations)

CRITERIA 8 PERFORMANCE INDICATORS

Indicator 8.1 The NbS design, implementation and lessons learnt are shared to trigger transformative change

Guidance: Transformative change can be characterised by scaling up (policy or programme mainstreaming), scaling out (expansion at the geographical or sectoral level) or replication of the NbS. Consequently, it is important that the process of design and implementation captures, documents, and makes available lessons learnt to individuals and stakeholders interested in replicating the process. This includes decision makers, investors and other NbS users from the public and private sectors

Indicator 8.2 The NbS is informed by the facilitating policy and regulation frameworks to support its uptake and mainstreaming

Guidance: The implementation of NbS is subject to a range of pre-existing policies, laws, and sectoral regulations, some of which may not be consistent or mutually reinforcing. In some situations, inconsistent policies and regulations may limit the effective rollout of NBS or, worse, actually contribute to the loss of important ecosystem functions over time. In such situations, it is important to a) be aware of policy, regulatory and legal limitations, and b) work with local and/or national decision makers as well as other key stakeholders, to highlight such obstacles and identify effective responses or other enabling solutions

Indicator 8.3 Where relevant, the NbS contributes to national and global targets for human well-being, climate change, biodiversity, and human rights, including the United Nations Declaration on the Rights of Indigenous Peoples

Guidance: NbS can make significant contributions to national economic, social and conservation targets and help achieve national commitments to international processes on climate change, human rights, human development, and biodiversity. Making these linkages explicit, documenting and communicating them, help further reinforce the profile and role of NbS nationally, secure broad-based and durable political commitment as well as societal support, thereby enhancing the long-term sustainability of the intervention

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Boffa Miskell is a leading New Zealand environmental consultancy with nine offices throughout Aotearoa. We work with a wide range of local, international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, Te Hīhiri (cultural advisory), engagement, transport advisory, climate change, graphics, and mapping. Over the past five decades we have built a reputation for creativity, professionalism, innovation, and excellence by understanding each project's interconnections with the wider environmental, social, cultural, and economic context.

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