**Supplementary Methods**

*See Supplementary Table 1 for the results of applying these Methods for all 169 Targets.*

**Defining Targets: *Dependent***

For the purposes of this work, “nature” is defined as the biosphere, atmosphere, and hydrosphere; minerals and insolation are excluded. A simple classification of Targets by nature-related keywords[[1]](#footnote-1) was found to be unreliable due to subjectivity in Target wording, so a team of four experts[[2]](#footnote-2) individually reviewed all 169 Targets to identify possible mechanisms by which nature may contribute to Target achievement, after which all results went through multiple rounds of collaborative revision. This procedure yielded the following five categories, for which reasoning (and citations, where relevant) are listed in Supplementary Material Table 1:

1. The text of the Target states that the Target’s objective is to protect or restore an aspect of nature.
2. The text of the Target states that achieving the Target requires the existence or use of a good or service provided by nature; i.e. the *dependence* on nature is “obvious” in the language of the Target.
3. The text of the Target does not state an explicit link to nature, but at least one nature-based pathway to Target achievement was identified from the literature; i.e. the *dependence* on nature is “unstated” but implicit – it will be leveraged only if the actor trying to achieve the Target is aware of the link.
4. There is no clearly identifiable dependency of the Target on nature.
5. There may be a nature-based pathway to Target achievement, but a clear example could not be found in the literature, or the text of the Target focuses on supporting societal institutions whose existence may have effects on protecting, restoring, or implicitly/explicitly using nature, but is at least one-step removed.

For this analysis we deem categories 1-3 as *dependent.* Identification of Targets that are implicitly *dependent* onnature (category 3) is especially important, as prioritizing nature-based solutions (NBS) may unlock potential for generating co-benefits and minimizing trade-offs in ways that might otherwise be undervalued or entirely missed. In Supplementary Table 1, we provide a brief justification for each category 3 *dependent* Target and supporting reference(s).

**Defining Targets: *Harm* and *Benefit***

Every Target was scored separately for its potential to either *harm* or *benefit* nature. As with the assessment of *dependence*, each of the four experts conducted their analysis independently, then all results were reviewed and revised collaboratively. Targets were evaluated for the possible environmental impacts of alternative implementation pathways (as determined by each expert), as well as on the possible consequences of Target achievement. Note that Targets could be categorized as both *benefit* and *harm* at the same time (see below). The full list of classifications and mechanisms can be found in Supplementary Material Table 1.

***Benefit*** scores are divided into three categories:

1. *Intended Benefit:* The Target’s stated purpose is to help nature. Any Target using the words “sustainable” or “restoration” in reference to nature is included, as are all Targets belonging to *dependent* category 1.
2. *Knock-on Benefit*: The stated purpose of the Target is something other than nature protection/restoration, but Target achievement could nevertheless lead to positive impacts on nature.
3. *No Benefit*: There is no obvious mechanism for Target achievement to directly or indirectly benefit nature.

***Harm*** scores are also divided into three categories:

1. *High risk*: While no Target’s stated purpose is to explicitly harm Nature, Targets in this category have a heavy emphasis on natural resource use or management, make no mention of sustainability, and historically have led to natural resource degradation in many contexts. Hence, they have a high risk of inadvertently causing environmental harm.
2. *Medium risk*: While the Target’s focus is on sustainable natural resource use (or is on something else entirely), there is a clear mechanism for net environmental harm to be an unintended outcome.
3. *Low risk*: There is no obvious mechanism for Target achievement to harm Nature.

*H1* Targets represent the greatest risk for undermining the broader sustainability agenda of the SDGs, but *H2* Targets also require careful implementation to avoid the potential for trade-offs. *B1* Targets are in accordance with what one would expect from a truly *sustainable* SDGframework, and *B2* Targets represent exciting opportunities to choose implementation pathways that may promote environmental benefits.

Targets with mixed scores of *B1:H2*, *B2:H1*, and *B2:H2* (no Target could receive an *H1:B1* score) highlight opportunities to choose pathways that leverage synergies and minimize tradeoffs for nature. With thoughtful implementation strategies, these mixed-score Targets may offer no-regrets opportunities to generate co-benefits across a wide range of *dependent* Targets. Though we take Targets containing the words “sustainable” and “restore” at face value as beneficial to nature, we acknowledge that humanity’s understanding of what is sustainable and how best to perform ecosystem restoration is still evolving, and there is a risk of making “sustainable” or “restoration” decisions now that may lead to suboptimal outcomes in the future (hence the *B1:H2* designation of these Targets).

Since the entire framework is called “the Sustainable Development Goals”, it could be argued that each Target within the framework is, by definition, intended to be sustainably implemented to achieve a sustainable outcome. However, countries, cities, and other implementers are, in reality, approaching achievement of the SDG framework piecemeal, focusing on the subset of Targets that seem most relevant or attainable in their particular contexts. This makes a Target-by-Target assessment approach even more essential, as piecemeal implementation strategies are vulnerable to undesired tradeoffs and missed opportunities.

**Indicators Analysis**

To identify nature-relevant indicators, we first performed a keyword search of all 252 official SDG indicators (number correct at time of analysis in late 2020) for nature-related text, following Zeng *et al.* (2020). We then manually reviewed the resulting indicator subset and used expert judgement to select only those that measured a physical aspect of the non-human environment (such as water quality). While Zeng *et al.* (2020) found 101 “nature-related” indicators, 22 of which “are correlated with at least one measure of environmental conditions”, no details were given for how this correlation was assessed or what the significance of this observation might be. Their analysis includes all indicators belonging to any Target classified as “nature-related” by Elder & Olsen (2019), regardless of the wording of the indicator itself. This led to the inclusion of indicators like “number of new HIV infections per 1,000 uninfected population, by sex and age (per 1,000 uninfected population)” in their tally. Such indicators that do not measure a physical aspect of the non-human environment were excluded from our assessment by the expert judgement review step, yielding a more nuanced count of nature-related indicators than has been generated by previous work.

**Caveats**

Since the Earth is effectively a closed system in an SDGs context, all Targets depend in some way on nature for their achievement and the achievement of all Targets will in some way affect nature. Though we consider a Target here to be *dependent* only if a Target-nature relationship could be derived clearly from the Target text or was implicit and a mechanism found in the published literature, this approach will underestimate the importance of nature to achieving the SDGs. It also misses out on other equally valid worldviews that treat, for example, sunlight as ‘part’ of nature (with attendant implications for the *dependence* of solar energy related Targets). While we have made every effort to be rigorous, systematic, and consistent in our methods, we acknowledge there is an unavoidable element of subjectivity in this analysis which leaves ample room for further discussion.

# **References**

Elder, M., & Olsen, S. H. (2019). The Design of Environmental Priorities in the SDGs. *Global Policy, 10*, 70-82.

Weitz, N., Carlsen, H., Nilsson, M., & Skanberg, K. (2018). Towards systemic and contextual priority setting for implementing the 2030 Agenda. *Sustainability Science, 13*(2), 531-548.

Zeng, Y., Maxwell, S., Runting, R. K., Venter, O., Watson, J. E. M., & Carrasco, L. R. (2020). Environmental destruction not avoided with the Sustainable Development Goals. *Nature Sustainability*, *3*, 795-798

1. Following Elder & Olsen 2019. [↑](#footnote-ref-1)
2. Adapted from method used in Weitz et al, 2017, in which each author individually assessed one quarter of all 122 SDG Target-Target interactions considered in the analysis, then all four authors collectively reviewed all results.
 [↑](#footnote-ref-2)