

## OVERLINE

# Protected area targets post-2020

## Outcome-based targets are needed to achieve biodiversity goals.

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In 2010, Parties to the Convention on Biological Diversity (CBD) adopted the Strategic Plan for Biodiversity 2011–2020, and its 20 Aichi Biodiversity Targets, to catalyze national and international conservation efforts and reverse negative biodiversity trends. With the plan nearing an end, and attention turning toward a post-2020 biodiversity framework, it is timely to assess the strengths, weaknesses, and effectiveness of the Aichi Targets. Target 11, concerned with establishing effective and representative networks of protected areas (PAs) by 2020, has attracted considerable interest, due to widespread recognition of the pivotal role that appropriately situated and well-managed PAs have in conserving biodiversity (1). Substantial advances have been made toward the areal components of Aichi Target 11, with the PA estate increasing by 2.3% on land and 5.4% in the oceans since 2010, and now covering 15% of land and inland freshwater globally and 7% of the oceans (2). However, species population abundance within and outside PAs continues to decline (1), the placement and resourcing of the majority of PAs has been poor (1, 3, 4) and over half of PAs established prior to 1992 have suffered increasing human pressure (5). We discuss four problems with Aichi Target 11 that have contributed to its limited achievement and propose a formulation for a target for site-based conservation beyond 2020 aimed at overcoming them.

### PERVERSE PERCENTAGES

Aichi Target 11 calls for effective conservation of 17% of land and inland waters and 10% of coastal and marine areas, and many countries have used these numbers as the sole basis for describing their progress, instead of reporting the biodiversity impacts of conservation areas. While some have argued that percentage targets have motivated countries to designate more PAs, there is no evidence for this. In fact, the rate of designation and total extent of additional PAs between 2010 and 2014, after establishment of the Aichi Targets, was half that in the previous five years (3). Focus on the percentage coverage of PAs generates perverse outcomes (6), with many new PAs being established in locations that are disproportionately unimportant for biodiversity (3). This pattern of protection of remote areas, often very large but not immediately threatened and with little conservation value, extends to the oceans (7). Continuing to protect areas of low opportunity costs for human uses, especially agriculture, in order to cover 17% of land, will have negligible biodiversity benefits (1, 3, 8). By contrast, if PAs were strategically sited to protect underrepresented threatened species, 30 times more species could be adequately represented with the same extent of PAs (8).

Moreover, thousands of PAs, many of which are important for conservation (1), have been downsized or degazetted (no longer protected by law or formal agreement) (9). Targets that are set around total percentage area legitimize such downsizing and degazettement if an equal amount of less important area for conservation is protected elsewhere. Finally, percentage area targets disregard the quality of what is being represented, with degraded ecosystems given the same value as those that are still functionally intact (and therefore more valuable from a conservation perspective).

### WHAT COUNTS AS PROTECTED?

Many PAs are inadequately managed or resourced (1), do not abate any of the threats to their biodiversity (5), and as such are simply 'paper parks' that do not meet the PA definition "managed for the long-term conservation of nature". Such areas are currently given equal value to those PAs that are well-

sited and well-managed, which inflates the progress nations are apparently making towards Aichi Target 11.

To improve outcomes and avoid designation of "paper-parks", Aichi Target 11 requires PAs to be "effectively and equitably managed". A large database of information relating to Protected Area Management Effectiveness (PAME) now exists, and PAME scores appear to be increasing over time (10). However, they are marginally correlated with biodiversity outcomes, measured as animal population trends (11). This is not surprising: PAME metrics are not measures of biodiversity outcomes (status/trends) but rather inputs (staff, equipment) and outputs (law enforcement, type of management) (12). This suggests that current management effectiveness metrics are not a good surrogate for biodiversity outcomes, and that the desired biodiversity outcome should be an integral part of a site-based conservation target, with associated indicators.

### REPRESENTATIVE OF WHAT?

Target 11 requires the PA network at all scales from national to global to be ecologically representative, with recommendations that ecoregions, which contain characteristic, geographically distinct assemblages of natural communities and species, are the appropriate level of representativeness. While ecoregion representation within PAs increased from 1954 to 2013 (13), species representation increased much less (3). Increasing ecoregional representation does not equate to increasing species representation because ecoregions are too broad to capture variability in species composition and endemism (4), as well as other core elements of biodiversity as defined by the CBD, such as genetic variation and ecological and evolutionary processes. To be truly representative, site-based conservation targets should encompass all elements of biodiversity.

### DO NATIONAL TARGETS ADD UP?

The Strategic Plan was designed to be a flexible framework allowing nations to determine their own implementation actions and ambition based on the local needs and opportunities. However, a common challenge for all international agreements is interpreting targets at the national or sub-national

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1 level and allocating responsibilities to meet  
2 global targets. This was especially difficult  
3 for elements of Target 11 related to repre-  
4 sentation, coverage of important biodiver-  
5 sity areas, and connectivity, for which a uni-  
6 versal percentage across nations would have  
7 been inappropriate in light of the unequal  
8 distribution of biodiversity and of area-  
9 based conservation needed to protect it.

10 A comparison of national interpretations  
11 of Target 11 with the amount of additional  
12 PAs needed in order to meet particular com-  
13 ponents of the target found that 35 of 79 na-  
14 tional PA commitments were insufficient to  
15 meet a subset of target components (4). This,  
16 we argue, is due to the difficulty in partition-  
17 ing the global ambition of Aichi Target 11 at  
18 the national level. Targets and indicators  
19 need to be scalable across biogeographic and  
20 administrative levels, and should be explic-  
21 itly quantified at the national scale so that na-  
22 tional ambitions and contributions can be  
23 summed to assess the total global ambition  
24 and achievement.

#### 25 **A NEW PROTECTED AREA TARGET**

26 These four shortcomings of Aichi Target 11  
27 may have contributed to global biodiversity  
28 loss, by shifting attention away from effective  
29 protection of sites of global significance  
30 for conservation, which continue to be  
31 threatened. To overcome these shortcom-  
32 ings, we propose an alternative approach for  
33 a post-2020 PA target based on outcomes:  
34 "The value of all sites of global significance  
35 for biodiversity, including key biodiversity  
36 areas, is documented, retained and restored  
37 through protected areas and other effective  
38 area-based conservation measures". By bio-  
39 diversity value we mean all biodiversity ele-  
40 ments (populations, ecosystems, ecological  
41 processes), for which a site has been identi-  
42 fied as being of global biodiversity signifi-  
43 cance, which we argue should be kept in fa-  
44 vorable conservation status (FCS).

45 Sites are individual units of land or sea  
46 that can be managed individually by particu-  
47 lar authorities or entities, for example, indi-  
48 vidual PAs, or community-managed re-  
49 serves. Manageability depends on the  
50 specific socio-economic context of the area,  
51 such that in some regions even relatively  
52 large areas may be manageable (e.g. sites im-  
53 portant for their ecological integrity but cur-  
54 rently not immediately threatened by hu-  
55 man activities).

56 This target focuses explicitly on the spe-  
57 cific locations (areas delineated as actual or  
58 potentially manageable units) that have  
59 been identified as important for the persis-  
60 tence of biodiversity. A global standard for

defining such key biodiversity areas (KBAs)  
was recently published (14). The standard  
specifies how sites can qualify as KBAs under  
quantitative criteria relating to threatened  
species and ecosystems, geographically re-  
stricted species and ecosystems, ecological  
integrity, biological processes (e.g. aggrega-  
tions), and irreplaceability. It can be applied  
through national processes to all macro-  
scopic taxonomic groups and ecosystems.

While over 15,000 KBAs have been docu-  
mented to date, sites have not been compre-  
hensively identified for all taxa and ecosys-  
tems. Filling these gaps is a high priority for  
the coming decade. Given this, and the recog-  
nition that further application of the stand-  
ard may reveal that modifications are neces-  
sary to identify sites of global significance to  
biodiversity comprehensively, our proposal  
is not restricted to KBAs and encourages ef-  
fective conservation of all sites of docu-  
mented global significance for biodiversity.  
These could include sites systematically  
identified for their global biodiversity im-  
portance under national and international  
legislation and conventions, for instance,  
Ecologically or Biologically Significant Ma-  
rine Areas (ESBAs) that have been identified  
at the site scale, Natura 2000 sites in the EU,  
natural and mixed World Heritage Sites  
listed under the World Heritage Convention,  
and Wetlands of International Importance  
identified under the Ramsar Convention, or  
sites of high ecological integrity and high bi-  
odiversity importance with a quantitative ra-  
tional for their biodiversity significance.

The biodiversity value to be retained or  
restored (if lost since the time of designation)  
is, by definition, known and specific to the  
area as it is defined by the criteria invoked to  
identify the area as important for biodiver-  
sity. This facilitates the assessment of pro-  
gress towards the proposed area-based con-  
servation target. For instance, in all Natura  
2000 sites, habitats and species of European  
Community Importance should be moni-  
tored and maintained in FCS as defined by  
the EU Habitats Directive. Guidelines to de-  
fine habitats and species in FCS provide a  
consistent monitoring and reporting frame-  
work that could be replicated globally.

#### 61 **MONITORING AND REPORTING**

62 The proposed target calls for systematic  
63 monitoring across all important sites to de-  
64 termine if the current management regime is  
65 effective in retaining or restoring a site's bi-  
66 odiversity value. To some degree this can be  
67 achieved through remote sensing (e.g. using  
68 trends in tree cover to assess deforestation  
69 and evaluate impacts on forest-dependent

species), while large networks of camera  
traps, acoustic sensors, and other remote  
sensing tools can monitor occupancy, abun-  
dance, vegetation extent, structural composi-  
tion and intactness, and threats to species  
and ecosystems. Such methods can be com-  
plemented by systematic in situ monitoring  
approaches applicable across large networks  
of sites. Reference values, systematic moni-  
toring, and regularly updated status reports  
exist for several networks of areas of biodi-  
versity importance (e.g. for Natura 2000  
sites in the EU), and there are historical data  
to establish baseline and trends.

A potential challenge lies in identifying  
appropriate indicators of progress towards  
this target, noting that a given site could hold  
multiple biodiversity elements defining its  
global importance that are trending in oppo-  
site directions. We propose two metrics to  
track progress towards achieving biodiver-  
sity outcomes: the mean distance from the  
reference value for each element (measured,  
e.g., using population abundance or habitat  
extent and condition) and the proportion of  
elements below reference value. These indi-  
cators can be reported at multiple geo-  
graphic scales, and aggregated taxonomi-  
cally or by other ecological units, e.g.  
ecoregions, functional groups, etc. The target  
is achieved for a given site, country, ecore-  
gion or globally, where all biodiversity ele-  
ments are at least at their reference value in  
the network of conservation areas.

In addition, we propose a third metric to  
track progress toward the identification of  
sites of global significance: Percentage of tax-  
onomic classes and ecosystem types for  
which KBAs and other sites of global biodi-  
versity significance have been identified  
comprehensively.

The target and indicators laid out here  
are only concerned with outcomes, not im-  
pacts (commonly defined as the difference in  
outcomes with and without a PA). This is an  
important distinction that simplifies moni-  
toring and reporting, as measuring the coun-  
terfactual world without protection requires  
experimental or quasi-experimental design  
that may discourage or delay adoption of im-  
pact-related targets and indicators without  
providing added benefits to biodiversity  
compared to an outcome-related target.  
However, conservation actions taken within  
or outside the network of sites of global sig-  
nificance should be, as much as possible, de-  
signed to maximize impacts.

#### 70 **ONE SINGLE CURRENCY**

71 Unlike the current Aichi Target 11, achieve-

ment of this target is unlikely to have perverse outcomes (problem 1, above). For example, the target could not be met if countries fail to resource or secure PAs adequately, as it will expose 'paper parks' that are protected in name only and do not retain the biodiversity values for which they are important. It will also ensure that detrimental downsizing or degazettement of sites of significance for biodiversity influence the potential to achieve the target. Importantly, the target formulation is simple and less susceptible to misinterpretation. Our proposed indicators also address the issue of partial vs. complete coverage of important sites. The value of such sites is unlikely to be retained through protected or conserved areas that incompletely cover each site, incentivizing expansion of such areas to ensure the full value is retained.

The proposed target and indicator set is designed to motivate impact, while not being prescriptive about the specific policies and actions required (problem 2). Any form of governance or management that provides clearly defined, desired biodiversity outcomes and ongoing monitoring of biodiversity values may be appropriate.

PAs and Other Effective Area-Based Conservation Measures, (which deliver positive and sustained biodiversity outcomes, but unlike PAs, are not specifically managed for biodiversity objectives), can contribute to achievement of this target (through complementary networks and hence building on the existing Target 11), but their effectiveness must be documented and monitored rather than assumed. Similarly, unlike Target 11, our proposed target does not require specifying particular desirable characteristics of PAs such as spatial connectivity and social equity; to be effective, area-based approaches must inherently address these issues, but rather than focusing on the mechanisms, which are context-dependent, the target focuses on the outcomes.

This target recognizes the importance of quality of habitat and the need for representation to occur across all levels of biodiversity, from genes, to populations, species and ecosystems and large-scale ecological processes (problem 3). The target has one single currency, which is the biodiversity value across the network of important sites, where the value is identified and monitored for each individual site. Progress towards the target can therefore be assessed at any geographic and administrative level (problem 4). Trends in progress towards the target are driven by the loss, retention or restoration of this biodiversity value.

To achieve the goal of halting biodiversity loss, our proposed target will need to be complemented by others, in particular, addressing the retention of ecosystem extent and condition (as an inheritor to Target 5), of ecosystem services (as an inheritor to Target 14), and of climate change mitigation (as an inheritor to Target 15), which we suggest should undergo similar revision processes.

This target naturally links area-based conservation measures with biodiversity status and trends that they are meant to maintain and improve. It allows nations to act locally but frame their actions within a global biodiversity agenda. Our proposed target and indicators also allow nations to set national and regional targets aimed at the retention of biodiversity of importance at sub-global levels. Indeed, a broader alternative formulation could be "The value of sites of significance for biodiversity, including all key biodiversity areas of international importance is documented, retained and restored [...]". This would encourage buy-in by the widest possible set of countries and recognize that sites of international (but not necessarily global) importance play an important role in national conservation strategies and are already used by nations to assess progress in PA coverage under Sustainable Development Goal 15.

The evidence-base accumulated since the adoption of the 2010-2020 strategic plan suggests that specific, measurable, ambitious, realistic, unambiguous and scalable targets are more effective and associated with greater progress (15). We therefore expect that this target would galvanize greater and more effective and efficient efforts than previous area-based conservation targets or alternative proposals that are not based on conservation outcomes.

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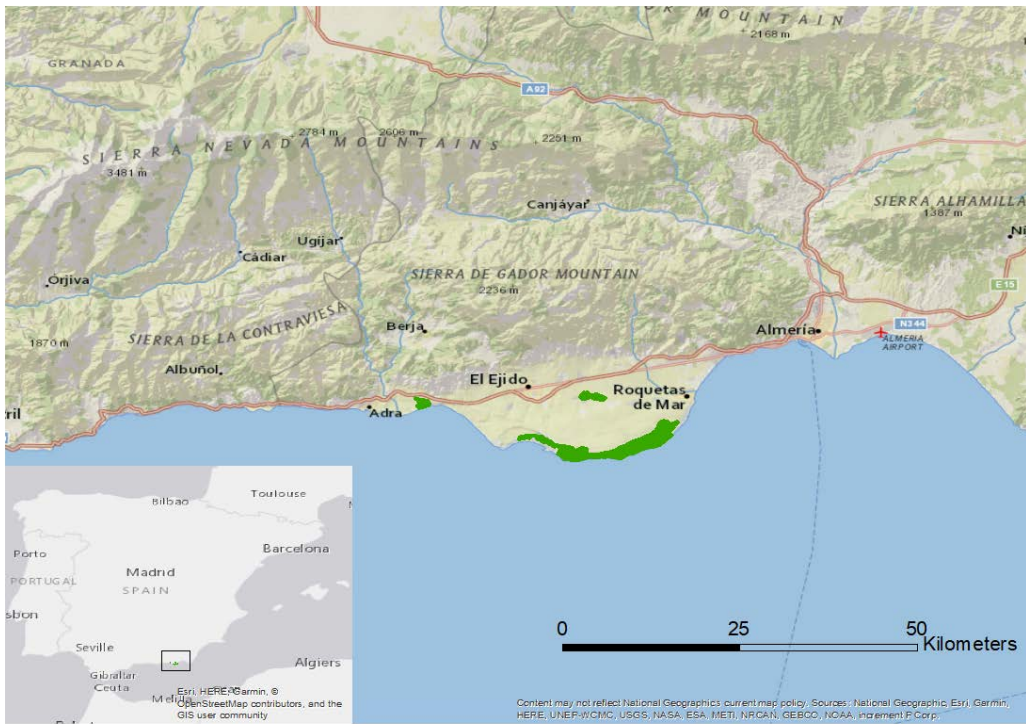
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#### FIGURE CAPTION.

Figure 1 An example of how the biodiversity value of a Key Biodiversity Area (the Wetlands of western Almería, Spain highlighted in green in the map), can be monitored over time. The site qualifies as a KBA because of its global significance for two bird species: Audouin's gull *Larus audouini* under KBA criterion D1a ( $\geq 1\%$  of the global population size supported during one or more key stages of its life cycle, in this case the non-breeding season) and white-headed duck *Oxyura leucocephala* (globally Endangered according to the IUCN Red List) under KBA criteria A1c ( $\geq 0.1\%$  of the global population and  $\geq 5$  reproductive units, i.e. pairs) and D1. Source <http://datazone.birdlife.org/site/factsheet/wetlands-of-western-almer%C3%ADa-iba-spain/details>. Photos: Ron Knight & Massimiliano Sticca, Flickr.

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Reference Population: c.2000 individuals (1995)

Current Population: 1700 individuals (-15%)

Reference Population: 61 breeding pairs (1996)

Current Population: 52 breeding pairs (-16%)

Proportion of features at reference level:  $0/2 = 0$  Mean distance from reference level = 15.5%.

**Figure 1** An example of how the biodiversity value of a Key Biodiversity Area (the Wetlands of western Almería, Spain, highlighted in green in the map), can be monitored over time. The site qualifies as a KBA because of its global significance for two bird species: Audouin's gull *Larus audouini* under KBA criterion D1a ( $\geq 1\%$  of the global population size supported during one or more key stages of its life cycle, in this case the non-breeding season) and white-headed duck *Oxyura leucocephala* (globally Endangered according to the IUCN Red List) under KBA criteria A1c ( $\geq 0.1\%$  of the global population and  $\geq 5$  reproductive units, i.e. pairs) and D1. Source <http://datazone.birdlife.org/site/factsheet/wetlands-of-western-almer%C3%ADa-iba-spain/details>. Photos: Ron Knight & Massimiliano Sticca, Flickr.