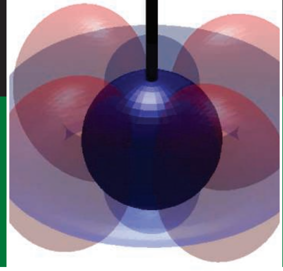

LETTERS

edited by Jennifer Sills

Biodiversity: Broaden the Search

IN THEIR POLICY FORUM "PROTECTED AREAS AND EFFECTIVE BIODIVERSITY CONSERVATION" (15 November 2013, p. 803), S. Le Saout *et al*. have provided a useful analysis to identify protected areas of global importance for the conservation of amphibians, nonmarine mammals, and birds. Indeed, reserve-specific identification of priority species is crucial to reach global biodiversity targets, such as Aichi Biodiversity Target 12 (to prevent the extinction of threatened species by 2020 and improve their status). However, as the current analysis only includes a small fraction of biodiversity (1.2% of the described species), it is obvious that this approach needs to be broadened.

Isolated invertebrate. Teide National Park, a UNESCO World Heritage Site, maintains 95% of the population of the Cañadas Sand Grasshopper (*Sphingonotus willemsei*).

Single protected areas may easily hold 100% of the global populations of plant or invertebrate species. It is likely that these isolated populations will turn out to be the real priority species, using the distribution overlap criterion. However, as a complete assessment of all invertebrate species is not feasible, they will remain ignored in such global prioritization approaches. It thus remains the responsibility of protected area authorities to (i) commence species inventories for a broad set of taxa; (ii) identify priority species based on the percentage overlap of their distribution with the reserve (population size overlap would be even better, but it is unfortunately not attainable); and (iii) implement monitoring and management strategies for these species.

The implementation of such prioritizations could be encouraged by making them mandatory for categorization as a World Heritage Site under the World Heritage Centre's "criterion (x)" (which declares that "Outstanding Universal Value" is met if a site contains the most important habitats for biodiversity conservation) or by providing incentives (such as green-listing reserves). If the global identification of potential World Heritage Sites remains purely based on vertebrates, we may lose a major part of our natural heritage.

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Biodiversity: Ecuador Deters Protection Efforts

IN THEIR POLICY FORUMS, BOTH S. LE SAOUT *et al*. ("Protected areas and effective biodiversity conservation," 15 November 2013, p. 803) and N. Butt *et al*. ("Biodiversity risks from fossil fuel extraction," 25 October 2013, p. 425) identified protected areas in the Ecuadorian Amazon that need further protections and management. Because Ecuador has irreplaceable areas that overlap with fossil fuel reserves, an initiative launched by the Ecuadorian government in 2007 to keep its oil underground was considered historic and attracted worldwide support (*1*). Its recent cancellation by the Ecuadorian government on 16 August 2013 was followed by unexpectedly few bids from international corporations to extract oil (*2*). Amid great public opposition, government officials are moving forward with the selection of the best offer.

Unfortunately, in the process, the Ecuadorian government is disregarding, and even dismantling, environmental organizations that have voiced their opposition (*3*). The environmental and indigenous rights group Fundación Pachamama was shut down on 4 December 2013 after their alleged involvement in the physical harassment of oil executives during protests against the government-sponsored XI Oil Round. President Rafael Correa's administration characterized the protests as "threatening the security of the state" (*4*). The group rejected violent demonstrations and vowed to dispute the government's decision and to continue their efforts to defend the collective rights of indigenous people and the rights of nature as enacted in the Ecuadorian Constitution (*5*).

The history of environmental damage and displacement of indigenous groups associated with oil extraction in Ecuador demands that the international community keep a watchful eye on these events as they continue to unfold.

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Targeting Deforestation

IN THEIR POLICY FORUM "WHAT DOES ZERO deforestation mean?" (15 November 2013, p. 805), S. Brown and D. Zarin emphasize the need for clarity in setting targets for reduced deforestation. They argue that separate

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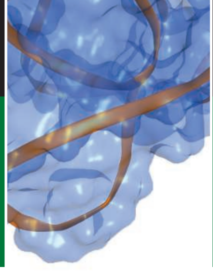

Many paths to life

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targets for gross deforestation and reforestation are preferable to targets for net deforestation. We agree.

In addition to the national, corporate, and nongovernmental targets tabulated by Brown and Zarin, the international community has agreed on a set of 20 time-bound Aichi Biodiversity Targets as part of the Strategic Plan for Biodiversity 2011–2020 (*1*). Target 5 calls for the rate of loss of all natural habitats, including forests, to be at least halved by 2020, and Target 15 calls for the restoration of at least 15% of degraded ecosystems by 2020, which will contribute to climate change mitigation and adaptation and to combating desertification. The Targets were adopted by the Convention on Biological Diversity at its 10th meeting in Nagoya Japan in October 2010 (*1*). They have subsequently been supported by other biodiversity conventions and the United Nations (*2*–*7*). Also in line with the approach recommended by Brown and Zarin, these global targets provide a framework for the establishment of national targets, taking into account national priorities and capacities with a view also of contributing to the global Aichi Biodiversity Targets.

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Urban Forests on the Front Line

IN THEIR REVIEW "THE CONSEQUENCE OF TREE pests and diseases for ecosystem services" (15 November 2013, p. 823), I. L. Boyd *et al*. discuss the effects of pests on forest ecosystem services. However, urban forests garnered little attention.

With increasing global trade, urban trees are among the first affected by newly introduced pests. Low tree diversity combined with low tree density in cities limits the potential for compensatory responses of ecosystems, unlike the model presented by Boyd *et al*. Decades ago, diseased elms were felled en masse in cities in eastern North America; many of the same cities are bracing yet again for extensive canopy loss, this time due to emerald ash borer (*1*). Boyd *et al*. suggest that cultural services are affected, but a more complete portfolio includes services important to city dwellers, such as air pollution removal and climate regulation (*2*, *3*).

As Boyd *et al*. suggest, planting more species and species selection will reduce losses to new tree pests. However, few species tolerate urban conditions, leading to overuse of those that do. Greater genetic diversity within species is particularly important to address enhanced pest risks in urban areas (*4*). Chemical treatments of urban trees can prolong their service life while also controlling pest spread (*1*). Outbreak-related tree removals cost millions. A greater investment in better infrastructure and soil [e.g., (*5*)] would be a cost-effective way to reduce stress and permit more species to be planted.

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Response

URBAN TREES MUST SUPPLY ECOSYSTEM SERvices that are out of proportion to their numbers, meaning that the initial impact of pests and diseases can be higher in urban environments, including gardens, parks, and street trees, than in areas with higher concentrations of trees (*1*). There are also fewer options to compensate for the loss of trees in urban environments (*2*, *3*). Consequently, Nock *et al*. argue that our model of the adaptive response of ecosystem services to the effects of infestation by tree pests and diseases does not adequately represent the limited capacity for response in urban environments.

We agree that over recent decades, a growing proportion of the commonly used tree species has exhibited increasing difficulties in coping with the conditions of urban sites. This negative trend and the challenges of climate change and pest and disease attacks have led to a search for a greater diversity of species and particularly for the selection of stress-tolerant species and genotypes (*2*, *4*). With appropriately focused research in tree genetics, silviculture, and future urban cultivation, we also see considerable capacity for adaptation in urban environments.

Focusing on urban trees is also important because they have the capacity to act as receptors and sentinels for newly introduced pests and diseases. They are often in closest contact with recent introductions, and they are easy to monitor. Experience has shown that early detection in urban environments can lead to effective management (*5*).

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Urban Forests on the Front Line

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