

REVIEW SUMMARY

CONSERVATION

Landscapes that work for biodiversity and people

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BACKGROUND: Biodiversity is under siege, with greatly enhanced rates of local and global extinction and the decline of once-abundant species. Current rates of human-induced climate change and land use forecast the Anthropocene as one of the most devastating epochs for life on earth. How do we handle the Anthropocene's triple challenge of preventing biodiversity loss, mitigating and adapting to climate change, and sustainably providing resources for a growing human population? The answer is in how we manage Earth's "working lands"; that is, farms, forests, and rangelands. These lands must be managed both to complement the biodiversity conservation goals of protected areas and to maintain the diverse communities of organisms, from microbes to mammals, that contribute to producing food, materials, clean water, and healthy soils; sequestering greenhouse gases; and buffering extreme weather events, functions that are essential for all life on Earth.

ADVANCES: Protected areas are the cornerstone of biodiversity conservation. Although the total area of protected regions needs to be increased, parks will nonetheless continue to lose species if these areas are isolated from one another by inhospitable land uses and are faced with a rapidly changing climate. Further, many species, such as those that migrate, remain unprotected as they occupy lands outside

of parks for all or portions of their life cycles. Lastly, protected-area effectiveness is greatly influenced by surrounding land management. "Working lands conservation" aims to support biodiversity while providing goods and services for humanity over the long term, assuring sustainability and resilience. By managing lands surrounding parks favorably, working lands can buffer protected areas from threats and connect them to one another. This approach complements protected areas by providing accessory habitats and resources for some species while facilitating dispersal and climate change adaptation for others. Further, by maintaining the biodiversity that supplies critical ecosystem services within working lands, these approaches ensure that the production of food, fiber, fuel, and timber can be sustained over the long run and be more resilient to extreme events, such as floods, droughts, hurricanes, and pest and disease outbreaks, which are becoming more frequent with climate change. A variety of biodiversity-based land management techniques can be used in working lands, including agroforestry, silvopasture, diversified farming, and ecosystem-based forest management, to ensure sustainable production of food and fiber.

OUTLOOK: The underlying principle of biodiversity-based management of working lands has been practiced since ancient times. Today, these systems have largely been replaced

by unsustainable resource extraction, rather than serving as models that could be adapted to modern conditions. Although various regulatory, voluntary, and financial tools exist to promote sustainable land management, many barriers prevent individuals, communities, and corporations from adopting biodiversity-based practices, including deeply entrenched policy and market conditions that favor industrialized or extractive models of land use. Thus, uptake

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of these approaches has been patchy and slow and is not yet sufficient to create change at the temporal and spatial scales needed to face the triple Anthropocene threat.

Biodiversity-based land management practices are knowledge- rather than technology-intensive. They are well adapted to empower local communities to manage their natural resources. One of the most exciting emerging trends is community-driven initiatives to manage working landscapes for conservation and sustainability. By linking up through grassroots organizations, social movements, and public-private partnerships, these initiatives can scale up to create collective impact and can demand changes in government policies to facilitate the conservation of working lands. Scientists and conservation practitioners can support these initiatives by engaging with the public, listening to alternative ways of knowing, and cocreating landscapes that work for biodiversity and people. ■



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Strawberry production in Central Coast, California. On the left, a homogeneous landscape of strawberry monoculture, including organic fields, supports fewer wild species than a diversified, organic farm (right) in the same region, which includes a small field of strawberry, surrounded by orchards, hedgerows, diverse vegetable crops, and natural habitats. The monoculture landscape creates barriers to wildlife dispersal, whereas the diversified landscape is more permeable.

