our planet

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BIODIVERSITY

Our Life

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* All dollar ($) amounts refer to US dollars.
Cover Photo: © Valerie Giles/thebiggerpicture
Shed scorpion skin. The exoskeleton of arthropods protects and supports the animal´s internal organs and musculature. Periodically, arthropods must go through the process of ecdysis, molting their exoskeleton to accommodate growth of the body.

ALSO

Be diverse

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The loss of biodiversity has alarming implications for the persistence of humankind, indeed for the survival of life on Earth. Protected areas are the cornerstone of most policy proposals to maintain biodiversity, yet their effectiveness is intensely debated. Furthermore, when the variety of biological life is so rich, interconnected, and diverse, it seems peculiarly shortsighted and inflexible to adopt one single approach to conservation.

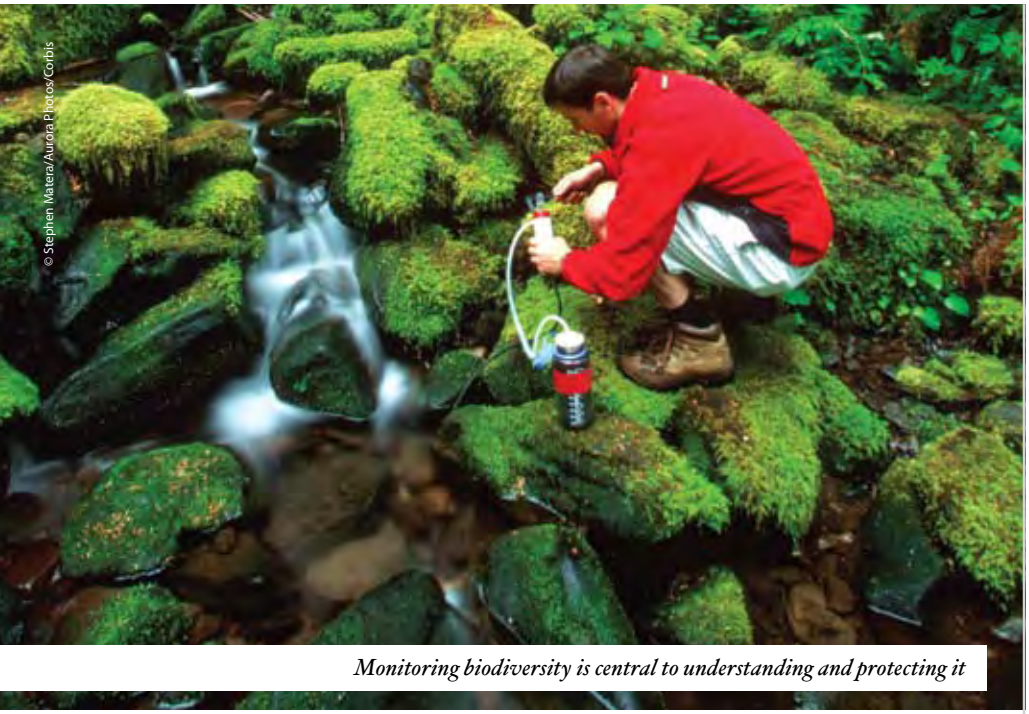
Protected areas are now very extensive: more than 220,000 parks cover over 13 per cent of Earth's land. Studies have shown that most have been generally successful at ensuring that large-scale clearings of habitats do not occur within their boundaries. Yet considerable human threats still exist for many of them, particularly those in vulnerable locations with dense human settlements. Park managers face continuing challenges of poaching, illegal harvesting of forest products, and encroachment. Government-managed parks have also been criticized for being costly, inefficient, and exclusivist in their approach, tending to view indigenous tribes and local communities with suspicion and distrust, and ignoring and discounting the traditional institutions and approaches that they may have developed to coexist with nature.

It is also problematic to expect that government preserves will work for all species and habitats, across all environments, geographies and cultures, and across multiple, interconnected scales of space and time. So carefully examining different institutional approaches developed by groups at diverse scales to manage their natural resources can suggest policies for future conservation management.

"We strongly propose that we need a diversity of institutions to cope with the diversity of biological entities and niches."

Garrett Hardin, author of the seminal article on the "tragedy of the commons" in the late 1960s, held that all forms of commonly managed property would inevitably be degraded over time. But we have found, on the contrary, that under appropriate conditions many people do organize effectively to protect natural environments. Some institutions, such as in Switzerland, have recorded histories of persistence over centuries. Others, such as in Nepal, have been successful at maintaining forests even in conditions of extreme conflict and armed violence. Developing shared norms and rules that are considered legitimate and fair is crucial for achieving effective management of common property. Local groups in different environments and cultures have developed an incredible variety

Forests teem with plant and animal life



Monitoring biodiversity is central to understanding and protecting it

of ways to do this using their considerable indigenous knowledge. Yet, many analysts tend to discount this variety.

We strongly propose that we need a diversity of institutions to cope with the diversity of biological entities and niches.

By institutions, we mean the rules used by participants in a variety of settings as they pursue diverse goals. In a field hockey game, for example, diverse institutions are involved. One is the set of rules that the teams use for their game: in a professional match, these will be different from those used by a group of teenagers playing on a neighbourhood field. There will also be referees to observe the play and enforce the rules. Then the rules of a hockey league relate to how many referees are assigned, the signals they should use and the penalties they can impose. The observers sitting in the stadium must follow yet another set of rules, related to who pays for which kind of ticket and how young a person must be to get in for free. So even something as simple as a hockey game has a set of nested institutions related to what happens on the field, in the locker room, in the stadium, and even in the traffic lanes leading to it.

When policy analysts recommend that the "best solution" for preserving biodiversity is the creation of a government agency, they usually expect that such a unit will develop one set of rules even if its jurisdiction is very large and contains diverse ecologies. The challenge is to enable small, medium and larger organizations to develop rules specific to particular ecological settings rather than trying to impose one set for a large domain.

Many policymakers still presume that local users of a resource are incapable of making responsible decisions related to its use. When people do not have long-term stakes in the ecological outcomes for a particular region, it is indeed more likely that they will pursue maximum-harvesting strategies for economic returns rather than the sustainability of a local ecology. Taking away local authority to make some of the rules for the uses of an ecological resource actually reduces the likelihood that individuals will perceive a long-term interest and so may exacerbate the problem of overuse. Careful studies have shown that a core factor affecting the sustainability of forests is whether local users monitor who uses the forest and report illegal harvesting: this is a surprise to many policy analysts and scholars schooled in the Garrett Hardin presumption that users are always trapped in tragic overuse.

Finding ways of dealing with specific mixes of organisms in a particular biophysical realm is extremely important, and so is establishing mechanisms for oversight. Nesting smaller units in larger ones can increase the probability of long-term protection. Small to medium-scale institutions may be fitted to a specific biological niche, while agencies operating at larger scales can gather scientific information and provide back-up for areas where local participants do not take on the responsibility for protecting biodiversity.

Ecologists have learned that the existence of a diversity of interconnections among a multiplicity of animals and plants does not indicate disorder, but instead points to the flexibility and adaptive resilience of ecosystems. It is important to develop a similarly widespread appreciation of institutional diversity, rather than presuming it is always disorganized and ineffective. Given the variety of life, we must appreciate that no panaceas exist. Multiple and flexible approaches need to exist that can fit local circumstances and adapt to changes in resource conditions and threats to them over time, if long-term sustainability of biodiversity is to be achieved.