Michael Soulé, American biologist and eminent conservationist, passed away on 17 June 2020. He was 84 years old. Often referred to as the “Father of Conservation Biology”, Soulé is best remembered for throwing the spotlight on the ‘biological diversity crisis’, co-founding the Society for Conservation Biology, and establishing the legitimacy of conservation biology as an applied scientific discipline. With equal emphasis on science-based conservation approaches and the human dimensions of conservation, Soulé almost single-handedly changed the way scientists (and laypeople) viewed biological conservation and the scope of environmental studies. That this occurred at a time when referring to values or norms was seen as anathema to the practice of science makes this no mean achievement.

Soulé’s work and his personal beliefs were deeply influenced by the chaparral canyon landscape of San Diego, where he grew up, and later spend a great deal of time doing fieldwork and conducting observations on animal populations. He completed his undergraduate degree from San Diego State College and joined Stanford University to do his PhD. His doctoral thesis on the population phenetics of the side-blotched lizards was the first step in a long academic career that expanded from a relatively narrow interest in evolutionary biology to include population genetics, island biogeography, biodiversity conservation, and human ethics. His early research on a range of animal taxa that included birds, insects, reptiles, and mammals and in widely different locations like Mexico, Africa, the Adriatic, West Indies, California, and Colorado gave him deep insights into the impacts of habitat

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Soulé’s vision of how conservation science must function in the real world led him to develop the scientific principles on which the field of conservation biology is based. These principles are laid out in his 1985 paper ‘What is Conservation Biology?’ and comprise functional and normative postulates that provide a robust framework to guide action strategies to conserve species. For example, Soulé emphasized that species are interdependent and play unique ecological roles within an ecosystem. Hence, it is important to focus conservation efforts on all species in a community, and not just a few. Yet, it must be recognized that some species play the role of keystone species in a community, and their loss or reduction can result in many long-term impacts on other species in the community. Again, large and rare species face a greater threat of extinction than others, and hence isolated nature reserves may not suffice as an appropriate conservation strategy for such species. In addition to these functional postulates that should guide conservation policies, Soulé also stressed the need to develop appropriate attitudes that should serve as the basis for conservation strategies. He argued that biotic diversity has intrinsic value and that the ethics of conservation demand that species must be conserved not for utilitarian reasons, but for themselves, for the simple reason that they exist. Anthropogenic management of natural habitats that results in the extinction of some native species and the proliferation of other exotic species for aesthetic reasons has a price that not only affects the ecosystem but also human well-being.

Apart from these foundational principles of conservation biology, Soulé is also acclaimed for championing two of the more celebrated strategies in conservation science, namely, rewilding and continental conservation.
brated strategies in conservation science, namely, rewilding and continental conservation. Soulé pushed for conservation efforts on large spatial scales for four reasons: (i) the species-area curve theory suggests that the larger the habitat, the more species it will harbour, (ii) larger areas more successfully manage the impacts of natural disturbance events like flood or fire, (iii) wide-ranging and rare species require large areas to achieve stability in population levels, and (iv) the presence of native keystone species, particularly large carnivores, are essential for the ecological regulation of most ecosystems and such species require large areas for survival. Hence an important strategy for effective biodiversity conservation worldwide would be to ensure large core protected forest areas that are connected to other similar forest patches and thereby provide free and unrestricted movement to wildlife across the landscape.

While the topic of species extinction and conservation had been debated earlier and discussed at length, Soulé’s genius lay in what his peers and colleagues refer to as his capacity for ‘big ideas’. Previous to Soulé, conservation efforts focussed primarily on “saving individual species or protecting relatively discrete, small patches of biodiversity”. Soulé, in contrast, argued vigorously for ‘large-scale conservation’ and connectivity across landscapes. In their seminal 1999 paper ‘Conserving nature at regional and continental scales—a scientific program for North America’, Soulé and Terborgh persuasively present their case for ‘large, interconnected core protected areas’ and the very urgent need to move from the localized conservation of ‘islandlike wildlands’ to ‘ecological restoration on unprecedented scales’. Soulé’s success lay in establishing the scientific rationale behind the need for large conservation reserves. While there had been calls for the ‘great wilderness’ earlier, it was based on aesthetic and moral appeals. Soulé, in contrast, buttressed his arguments with compelling scientific evidence that showed that the disappearance of large carnivores precipitates loss in animal and plant diversity within ecosystems. This idea is explored in greater detail in the Soulé and Terboogh co-edited 1999 volume Continental Conservation: Sci-
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Soulé was not only an influential thinker and speaker, he was also a prolific writer who authored more than 170 papers and 10 books. His four books on the then-new discipline of conservation biology—*Conservation Biology: An Evolutionary-Ecological Perspective* (1980), co-edited with Bruce Wilcox; *Conservation and Evolution* (1981), co-edited with Sir Otto Frankel; *Conservation Biology: The Science of Scarcity and Diversity* (1986); and *Viable Populations for Conservation* (1987)—are classics in the true sense that delineate the scope, multidisciplinarity and applications of the ‘crisis discipline’. He also taught at several institutions, chiefly the University of California at San Diego and later Santa Cruz and the University of Michigan, where he mentored a whole generation of conservation biologists, who went on to

*scientific Foundations of Regional Reserve Networks*. Today large-scale or regional biodiversity conservation is such an essential aspect of conservation biology that it may be difficult to appreciate the paradigm shift that Soulé brought about in our thinking about ecological conservation.

Directly influenced by his beliefs regarding the need to focus on continental conservation and build corridors for wildlife movement, was the rewilding project that Soulé began in collaboration with Reed Noss, Doug Tompkins, Dave Foreman, and other colleagues in 1991. Called the ‘North American Wilderness Recovery Strategy’, or more simply, ‘The Wildlands Network’, this project aimed to restore and reconnect all the wild areas across North America. Rewilding refers to the restoration of wilderness patches in a way that involves minimal human management and results in a self-sustaining and stable ecosystem. Soulé saw rewilding as a form of benign human intervention that should not replace biodiversity protection but instead should be employed in tandem with the latter, in places where large carnivores have been extirpated due to hunting or other anthropogenic impacts.

Rewilding is an international movement now and so central to mainstream conservation thinking that it is often forgotten that Soulé was responsible for pushing it into the limelight as a critical ecosystem restoration strategy.
influence the field in very important ways.

Soulé’s primary legacy is the recognition that biodiversity conservation cannot function in isolation and that biological science must be integrated with inputs from policy and economics for successful outcomes in the real world. In the first issue of the journal *Conservation Biology*, published in May 1987, Soulé wrote movingly about his vision for the new conservation movement and how the goals of the new Society for Conservation Biology not only include investigating animal population dynamics and evaluating techniques for restoring biological diversity but also “integration of this knowledge and technology with the complementary human activities, from agriculture to anthropology.” Although Soulé emphasised the importance of studying the social causes of habitat destruction and understanding how human affiliation for nature can be promoted, he was vehemently against replacing the nature protection goals of conservation with human benefit and profit. He was very critical of utilitarian conservation strategies and the proposition that economic incentives can encourage people to conserve forest habitats or wildlife species and strongly believed that only a sense of affection for or connection to the environment can succeed in conserving it. In a compelling editorial in the journal *Conservation Biology* in 2013, Soulé wrote that “There is no evidence for the proposition that people are kinder to nature when they are more affluent” and that as this conservation movement, proposes to be “economic growth-based or humanitarian movement, it does not deserve to be labelled conservation”.

In recognition of his contributions to the field of biodiversity conservation, Soulé was honoured with several awards, notably the Archie Carr Medal in 1997, the National Wildlife Federation’s National Conservation Achievement Award for Science in 1998, the Zoological Society of San Diego’s Conservation Medal in 2007, and the Edward O. Wilson Biodiversity Technology Pioneer Award in 2009. He also received a Guggenheim Fellowship, was a Fellow of the American Academy of Arts and Sciences, and was named as one of the 100 Champions of Conservation of
the 20th Century by Audubon Magazine. But perhaps the most fitting honour for this giant in science is that for ages to come, every time the phrase conservation biology is mentioned, Michael Soulé will be remembered.

Suggested Reading


