

Integrating Ecological Sciences and Environmental Ethics into Biocultural Conservation in South American Temperate Sub-Antarctic Ecosystems

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I

This special issue of *Environmental Ethics* is based on the workshop “Integrating Ecological Sciences and Environmental Ethics: New Approaches to Understanding and Conserving Frontier Ecosystems,” held in the temperate sub-Antarctic region of southern Chile, in March 2007.¹ The workshop was jointly organized by the Department of Philosophy and Religion Studies of the University of North Texas (UNT) and the Institute of Ecology and Biodiversity (IEB-Chile), in collaboration with the Center for Environmental Philosophy, and followed a three-week field graduate course, “Conservation and Society: Biocultural Diversity and Environmental Ethics,” involving graduate students from the U.S. and Latin America. These events built on a decade of collaboration between UNT environmental philosophers and Chilean ecologists, and were followed by two symposia held subsequently at two annual meetings of the Ecological Society of America (2007 and 2008).²

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¹ The field course and workshop were held at Senda Darwin Biological Station, University of Magallanes, and the Institute of Ecology and Biodiversity (IEB), and included a navigation through the sub-Antarctic archipelagos. See <http://www.phil.unt.edu/chile/research/workshop2007/workshop.html>.

² Regarding the collaboration of UNT philosophers with U.S. and Chilean ecologists developing a transdisciplinary approach to integrating ecological sciences and environmental philosophy, see Max Oelschlaeger and Ricardo Rozzi, “El Nudo Gordiano Interdisciplinario: Un Desafío para la Sustentabilidad,” *Ambiente y Desarrollo* 14, no. 3 (1998): 71–81; Ricardo Rozzi, Eugene Hargrove, Juan J. Armesto, Steward T. A. Pickett, and John Silander, Jr., “Natural drift” as a Post-Modern Metaphor,”

the approach developed by researchers at the Omora Ethnobotanical Park in the Cape Horn Biosphere Reserve, who conduct programs on Amerindian ecological knowledge and practices, and their implications for environmental philosophy.

Ricardo Rozzi and collaborators describe a program of field education based on “direct encounters” with people, mosses, birds, and other organisms in their native habitats; a type of “face-to-face” encounter that liberates us from omnipresent economic rationality by discovering other worldviews and life forms. Through these field experiences, biocultural diversity ceases to be a just a concept and becomes an experience of re-encounters with actual human and non-human beings with whom we co-inhabit. Their singularities are ungraspable by universal disembodied thinking. Accordingly, the UNT-IEB ecology-philosophy program has undertaken an *in situ* biocultural conservation approach in temperate sub-Antarctic South America.

III

History is not linear; there are several biocultural histories, simultaneously taking place in different regions of the biosphere. To discover them requires field experiences of co-inhabitation. *In situ* experiences contribute to diversify the biotic and cultural picture, pluralizing environmental philosophy and ecological sciences. This favors hybridization of knowledges of different disciplines, different cultures, grounded in different ecosystems.

The UNT-IEB temperate sub-Antarctic program introduces a bioculturally contextual ethic. Specific biotic and socio-cultural contexts hold specific forms of ecological knowledge and relationships with nature, which are habitually ignored by dominant global discourses. In this special issue, we introduce an integration of environmental philosophy and ecological sciences, which is embedded in the biocultural diversity of temperate sub-Antarctic South America, a region whose enormously rich biological and cultural diversity have been largely overlooked. We not only disclose a biocultural diversity that enriches environmental philosophy and ecological sciences, and prevents broad generalizations, but more importantly we go beyond a case-study approach. The region and its inhabitants are not merely objects of study, but are partners in the search for a sustainable biosphere.

The efforts detailed in this volume—including the recent creation of a collaborative network of three long-term socio-ecological research sites across Chile, and the consolidation of an international field environmental philosophy, ecology, and biocultural conservation program—represent more than research in a remote area. Rather than writing or developing models about a specific case study, we are building a partnership coordinated by UNT and IEB, which offers alternatives to current global cultural and biological homogenization, by addressing multiple scales, from global to local, favoring the expression of diverse forms of ecological knowledge, languages, and practices.

Conservation biology is a transdisciplinary field which has succeeded in incorporating environmental economics and ecological restoration into its research and practice.³ However, it has been less successful thus far in including insights from environmental philosophy. The main objective of the March 2007 workshop was to develop a conceptual framework and an experimental approach to integrate environmental ethics and ecological sciences not as a purely theoretical exercise, but focusing on the conservation concerns of a specific region of the world: the temperate sub-Antarctic ecosystems of southern South America (fig. 1).

Today, just one fifth of the world's original forest cover remains in relatively large tracts of undisturbed land. These areas have been called frontier forests.⁴ Only three percent of the world's frontier forests are found in temperate zones. The temperate regions of North and South America and the rest of the world have suffered more intense and prolonged modern industrial impacts than their tropical counterparts.⁵ In this context, the temperate sub-Antarctic region of South America is one of the twenty-four most pristine areas in the world.⁶ It contains the largest span of continuous temperate forests in the Southern Hemisphere, including the world's southernmost forest ecosystems, which reach 56°S at Cape Horn. During the first decade of the twenty-first century, however, the remote character of southwestern South America is being rapidly transformed by the opening of new terrestrial and navigational routes, damming of major rivers for hydroelectric power generation, mining, expanding salmon farming, increasing tourism, the spreading of exotic invasive species, and global climate change.

Revista Chilena de Historia Natural 71 (1998): 9–21. The abstracts of the papers presented at the two symposia are available at: <http://eco.confex.com/eco/2007/techprogram/S1199.HTM> (2007), and <http://eco.confex.com/eco/2008/techprogram/S2755.htm> (2008).

³ See Laura Nahuelhual, Pablo Donoso, Antonio Lara, Daisy Nuñez, Carlos Oyarzun, and Eduardo Neira, "Valuing Ecosystem Services of Chilean Temperate Rain Forests," *Environment, Development and Sustainability* 9 (2007): 481–99.

⁴ For definitions of frontier forests, and their world distribution, see Dirk Bryant, Daniel Nielsen, and Laura Tangle, *The Last Frontier Forests: Ecosystems and Economies on the Edge* (Washington D.C.: World Resources Institute, 1997). For a critical assessment of the term, see John L. Innes and Kenneth B. Er, "Questionable Utility of the Frontier Forest Concept," *BioScience* 52 (2002): 1095–109.

⁵ In the Americas, temperate regions represent the primary places of colonization by European immigrants, involving the most intensive exploitation of natural resources and land-use changes during the industrial age. Consequently, these are the most threatened forest biomes. This situation highlights the significance of the frontier temperate sub-Antarctic forests of South America. See John Silander, Jr., "Temperate Forests: Plant Species Biodiversity and Conservation," in S. A. Levin, ed., *Encyclopedia of Biodiversity* (New York: Academic Press, 2000), pp. 607–26.

⁶ See Russell Mittermeier, Christine Mittermeier, Thomas M. Brooks, John D. Pilgrim, William R. Konstant, Gustavo A. da Fonseca, and Cyril Kormos, "Wilderness and Biodiversity," *Proceedings of the National Academy of Science of the United States* 100 (2003): 10309–13. For biodiversity and conservation of South American temperate forests, see Juan J. Armesto, Ricardo Rozzi, Cecilia Smith-Ramírez, and Mary Kalin-Arroyo, "Conservation Targets in South American Temperate Forests," *Science* 282 (1998): 1271–72. For the sub-Antarctic Magellanic ecosystems, see Ricardo Rozzi, Juan J. Armesto, Bernard Goffinet, William Buck, Francisca Massardo, John Silander, Jr., Mary Kalin-Arroyo, Shaun Russell, Christopher B. Anderson, Lohengrin Cavieres, and J. Baird Callicott, "Changing Biodiversity Conservation Lenses: Insights from the Sub-Antarctic Non-Vascular Flora of Southern South America," *Frontiers in Ecology and the Environment* 6 (2007): 131–37.

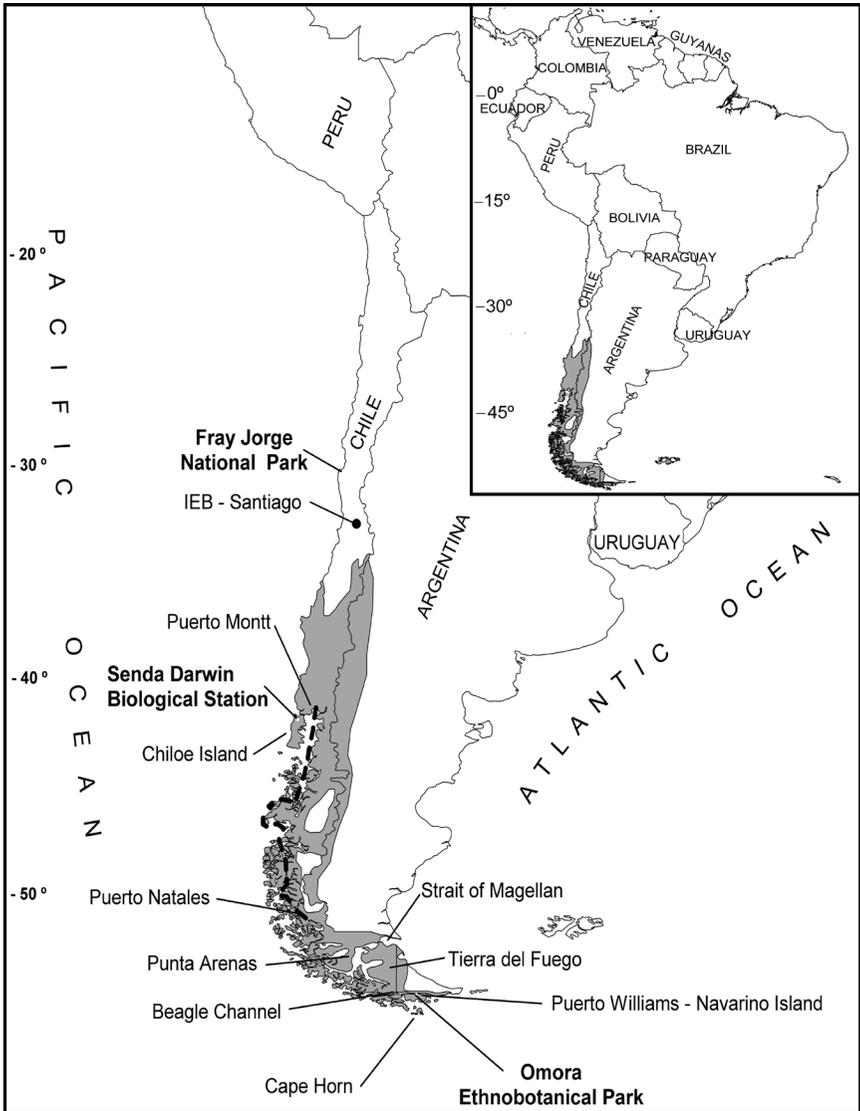


Figure 1. The temperate sub-Antarctic region of southwestern South America (gray area), where the workshop “Integrating Ecological Sciences and Environmental Ethics: New Approaches to Understanding and Conserving Frontier Ecosystems” was held in March 2007. The dashed line indicates the navigation route through the archipelago. In bold, the three sites of the Chilean Long-Term Socio-Ecological Research (LTSER) network—Fray Jorge National Park (30°S), Senda Darwin Biological Station (42°S), and Omora Ethnobotanical Park (55°S)—are shown. The map also shows the locations of places in Chile frequently mentioned in this issue. The gray shading shows the distribution of the temperate sub-Antarctic forests.

It is against this backdrop of rapid cultural, social, economic, and ecological transformation in this unique area of the world that a group of Chilean and U.S. philosophers and ecologists proposed the workshop that gave origin to this special issue of *Environmental Ethics*. Developing sustainable scenarios for the future of frontier ecosystems demands innovative, transdisciplinary, inter-institutional approaches implemented through local, regional, and international collaborations. This collection of articles provides complementary perspectives that build on an integration of philosophy and ecology, to better understand the challenges of conserving frontier ecosystems, especially in temperate sub-Antarctic South America. We hope that the papers included in this volume will catalyze further development of transdisciplinary approaches for ecological-philosophical research, education, and conservation, as well as nurturing collaborative efforts associated with the goals of the temperate sub-Antarctic biocultural conservation program jointly coordinated by IEB and UNT.⁷

II

Instead of the single-authored articles usually found in this journal, in the current issue, the reader will find multiple-authored papers, which are the result of biocultural research and conservation demanding teamwork at regional and international scales. Consequently, half of the articles are co-authored by Latin American, European, and U.S. philosophers and ecologists working together to enhance biocultural conservation in the temperate sub-Antarctic region of South America. In addition, some articles modify the usual format of this journal by including figures and tables, which aim to facilitate reading by decision makers. Figures and tables also reflect the transdisciplinary nature of this volume.

Baird Callicott opens the debate by asking: "What is the concept of wilderness?" Is this even a word that can be translated from English into other languages? Through his analysis, Callicott critically revises the wilderness concept with regard to the actual inhabitation of wild landscapes by Amerindians. After contrasting the Puritan and transcendentalist perspectives on wilderness tradition, he refers to the emergence of U.S. twentieth-century conservation within the Ecological Society of America (ESA). This process confronted two challenges that are still relevant for twenty-first-century conservation: (1) the tension between recreational and strictly scientific approaches, and (2) the resistance of members of the ESA to become involved in advocacy, because they feared that this involvement would undermine their scientific legitimacy and credibility. Callicott's perspective offers a conceptual framework for a scientific conservation approach that incorporates natural disturbances and better integrates humans and protected areas.

⁷This volume will be complemented by a set of essays to be published in a Chilean ecological journal, *Revista Chilena de Historia Natural*, including papers presented at the March 2007 workshop, and in a subsequent workshop in June 2008 (see <http://www.chile.unt.edu/ltses/index.htm>). See also Robert Frodeman, "The Policy Turn in Environmental Ethics," *Environmental Ethics* 28 (2006): 3–20.

In the next essay, Sergio Guevara and Javier Laborde emphasize that Latin American—and the Caribbean region—hosts most of the world's biodiversity. This region requires a conservation model that integrates people and protected areas. For this purpose, biosphere reserves offer the best model.⁸ The authors propose a “centrifugal” model for biosphere reserves which aims to facilitate the movement of native plants and animals out from the strictly protected core zones into transition zones of the reserves, and even outside protected areas into anthropogenic landscapes. This fluent and dynamic model is proposed to overcome a prevailing “fence” model of protected areas that excludes humans.

Christopher Anderson and collaborators highlight the incorporation of the human dimension of ecology into a new international concept of Long-Term Socio-Ecological Research (LTSER). They offer an overview of long-term ecological research programs in the U.S., Latin America, and worldwide, and describe initial steps of a nascent LTSER network of study sites in Chile. For international environmental monitoring programs, this Chilean LTSER network not only adds a new and understudied remote region to the map of global monitoring of ecosystems, but also offers a platform for an integration of environmental philosophy and ecological sciences embedded in the temperate sub-Antarctic region through international field courses, research, and conservation actions.

Long-term research conducted by Uta Berghoefer and collaborators demonstrate that even in a very small and remote place—Puerto Williams, the southernmost town in the world—we find a diversity of contrasting human relationships with nature. These findings help us overcome the dichotomous labels of “local” and “global” ecological knowledge. Their approach emphasizes the need for specificity regarding ecological perceptions held by specific persons or socio-cultural groups, at specific localities and historical moments.

In turn, Robert Frodeman explores what is pertinent knowledge and argues that a de-disciplined notion of philosophy is central to achieving transdisciplinary understanding. He underlines that interdisciplinary knowledge is “slow, inefficient, and painful.” In order to advance in this direction, the joint research teams from UNT and IEB are conducting what can be called “field philosophy” in the sub-Antarctic region of Chile.

Gene Hargrove recalls that environmental ethics is a discipline which provides a conceptual foundation for environmental education that goes beyond the prevailing economic approach to valuing nature. Hargrove identifies three roots for economic thinking: positivism, pragmatism, and utilitarianism. He concludes by emphasizing the need to find conceptual foundations for sound environmental ethics and education in the cultural and historical contexts of each region. This view is compatible with

⁸ Biosphere reserves include a gradient of human influence arranged in three concentric zones: strictly protected core zones at the center, surrounded by buffer zones admitting low impact human activities, which are in turn surrounded by transition zones where more intensive development can take place. See fig. 3a in Guevara and Laborde, “The Landscape Approach,” p. 261, in this issue.

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