delivers—nothing less than philosophy's
flective being in the world. What is most
mbled in this volume is that they would
over many purely technical philosophical
ing their philosophical skills to the greater

Steve Fuller, University of Warwick

re been made in various quarters of the
munity to break free from the Western
nd detachment. This volume adds new
eper in conceptualization (the theory of
from science and engineering to design,
king), and more expansive in participants
nd Europe)."

Carl Mitcham, Renmin University of China

A GUIDE TO FIELD PHILOSOPHY

Case Studies and Practical Strategies

Edited by Evelyn Brister and Robert Frodeman

Routledge
Taylor & Francis Group
NEW YORK AND LONDON

First published 2020
by Routledge
52 Vanderbilt Avenue, New York, NY 10017

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

Library of Congress Cataloging-in-Publication Data
A catalog record for this title has been requested

ISBN: 978-0-8153-4755-2 (hbk)
ISBN: 978-0-8153-4757-6 (pbk)
ISBN: 978-1-351-16908-0 (ebk)

Typeset in Bembo
by Wearset Ltd, Boldon, Tyne and Wear

CONTENTS

15

ECOTOURISM WITH A HAND-LENS

A Field Environmental Philosophy Experience from the South of the World

Ricardo Rozzi, María Teresa La Valle, Shaun Russell, Bernard Goffinet, and Francisca Massardo

1 The Biocultural Ethic Conceptual Framework

Earth is not only a biophysical entity; it is also a word that influences the way we understand and relate to the biophysical reality of the planet. Scientists often forget the gravity of words and focus on the biophysical reality. Conversely, philosophers often focus on examining the language of cultural reality, ignoring the biophysical realm. Biocultural ethics unites biological and cultural realities in one conceptual framework (Rozzi, 2001). In addition, it promotes a contextual and systemic approach that shows consideration for the vast biophysical and cultural diversity found in different regions of the world.

In this chapter, we focus on a transdisciplinary endeavor launched in 1999. This long-term project advocates for a biocultural perspective at the southern end of the American continent, in the Cape Horn County of Chile. A team of philosophers, scientists, artists, members of the Yahgan indigenous community, government authorities, Navy officers, schoolteachers, and members of the local community in the world's southernmost city, Puerto Williams, created the Omora Ethnobotanical Park.[1] This endeavor has resulted in changes in the local sciences, arts, and humanities curricula and educational activities at all levels of formal education, as well as with tourists, members of the public, and policy-makers from inside and outside Chile.

The research, education, and conservation program at Omora Park was organized using the conceptual framework of a biocultural ethic. This ethic values biological and cultural diversity, the indissoluble links among specific habitats, the diverse co-inhabitants (human and other-than-human),[2] and their life habits (Rozzi et al., 2008a). This biocultural integration contrasts with the main schools of modern ethics, e.g., utilitarian ethics (Palmer, 2013) and deontological ethics

(Aguirre, 2015). These schools focus on presumed universal human habits without considering the diversity of co-inhabitants and habitats where they take place, "as if" societies and individuals, their well-being and identities, could exist in isolation from their biocultural environments. Consequently, mainstream modern ethics has been both anthropocentric and Eurocentric. This philosophical blindness to the full diversity of co-inhabitants and the complexity of their habitats promotes educational programs and development policies that drive losses of biological and cultural diversity as well as processes of biocultural homogenization and socio-environmental injustice (Rozzi, 2013).

Biocultural ethics counteracts this philosophical blindness by explicitly valuing the vital links among specific *habitats*, *co-inhabitants* and their life *habits*. These "3Hs" of the biocultural ethic involve, in turn, three interrelated dimensions of socio-ecosystems: biophysical, cultural–linguistic, and institutional–socio-political–technological (see Figure 15.1). In 2000, to build on these three dimensions, we established the Subantarctic Biocultural Conservation (SBC) Program at Omora Park, Puerto Williams, capital of the Antarctic Province of Chile. Today, this program is co-coordinated by the Institute of Ecology and Biodiversity (IEB) and the University of Magallanes (UMAG) in Chile and by the University of North Texas (UNT) in the USA (www.chile.unt.edu). At a regional scale, it seeks to better understand, value, and protect biological and cultural diversity, and their interrelationships, in southwestern South America. Using the conceptual framework of the biocultural ethic, the SBC Program seeks to make visible and protect:

- A *habitat* that before 2000 lacked its own name: the subantarctic ecoregion of Magallanes (Rozzi et al., 2012);
- The *life habits* of subantarctic co-inhabitant (human and other-than-human) animals that are much less known than those of the subarctic regions in the Northern Hemisphere (Contador et al., 2012);
- *Co-inhabitants* that live in a region that was considered poor in its biodiversity and is now recognized as a world hotspot for non-vascular plants and other small organisms (Rozzi et al., 2008b).

2 The Field Environmental Philosophy Methodological Approach

After two decades of continuous research, educational, and service activities at Omora Park, researchers have developed innovative methodological approaches that integrate sciences, arts, policy, and ethics (understood in a broad sense) into biocultural research, education, and conservation. In order to better relate basic biocultural principles to human affairs, in 1998 the lead author of this chapter developed the methodological approach of *field environmental ethics* (Rozzi, 2001). However, ethics is often understood in a narrow, normative sense, and

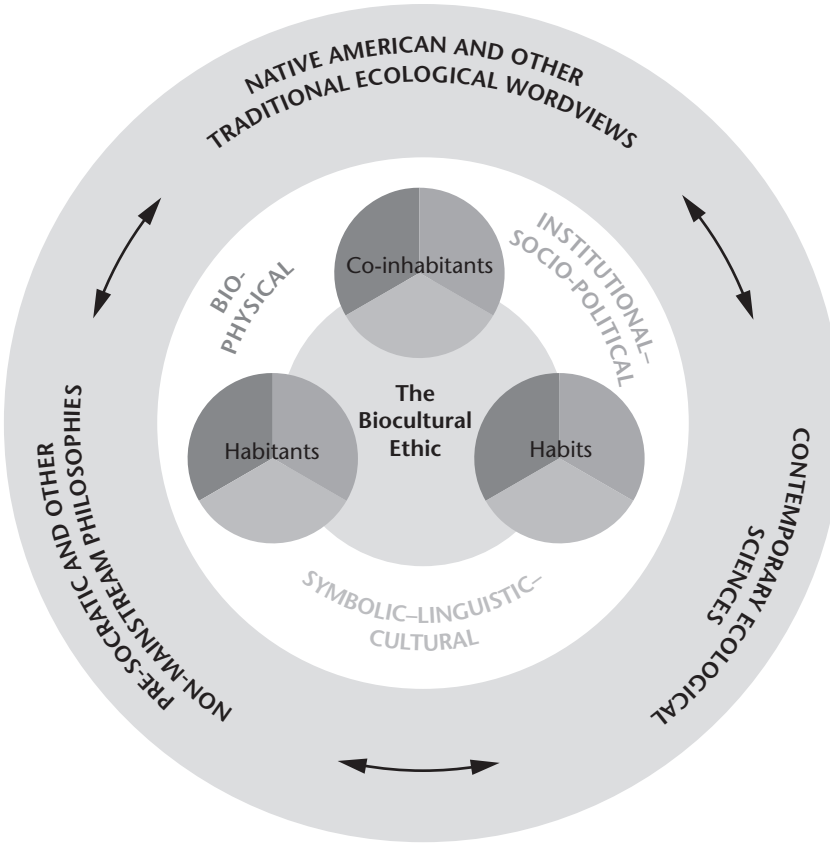

Figure 15.1 The Links among Specific *Habitats*, *Co-inhabitants* and Their Life *Habits* ("3Hs")

Source: Figure modified from Rozzi (2013)

Note
The sectioned circles show that each of the "3Hs" includes biophysical dimensions, symbolic–linguistic–cultural dimensions, and institutional–socio-political dimensions. For example, with regard to habitats, the biophysical dimensions scale up from local ecosystems to the global biosphere, the symbolic–linguistic–cultural dimensions scale up from vernacular languages to the global logosphere, and institutional–socio-political dimensions scale up from local institutions to the global technosphere. The external circle makes explicit the value of the ecological worldviews of Native American and other non-Western cultures, of pre-Socratic and non-mainstream Western philosophies, and of contemporary sciences.

for that reason we subsequently decided to call it *field environmental philosophy* (FEP) (Rozzi et al., 2010).

Since 2000, FEP's methodological approach has been adopted in formal education at preschool, elementary, and middle school and the university level, as well as in informal educational activities with members of local communities (members of indigenous communities, park rangers, tour operators, tourists,

Navy personnel, and other citizens). Over 1000 workshops with government authorities and decision-makers have applied FEP's methodological approach. It has been included in; (a) undergraduate and graduate curricula at the University of Magallanes, five other universities in Chile and over ten universities in Brazil, Mexico, Japan, Italy, Germany, and the USA; and (b) annual elective courses at elementary and high schools in the Magellanic Region of Chile.

FEP's methodological approach comprises a multi-directional four-step cycle (see Figure 15.2).

Step 1: Interdisciplinary ecological and philosophical research. Participants conduct philosophical, ecological, and ethno-ecological research. This includes research on the diversity of values and perceptions about biocultural diversity held by participants from different disciplines, institutions, and socio-cultural groups, who speak different languages and have different forms of ecological knowledge and practices.

Step 2: Composition of metaphors and communication through narratives. Participants compose metaphors and narratives with two complementary intentions. First, they integrate ecological and philosophical findings (Step 1) through *analogical thinking* that leads to a conceptual synthesis of facts, values, and action in biocultural education or conservation. Second, they establish an engaging and clear dialogue with the general public. For example, the composition of

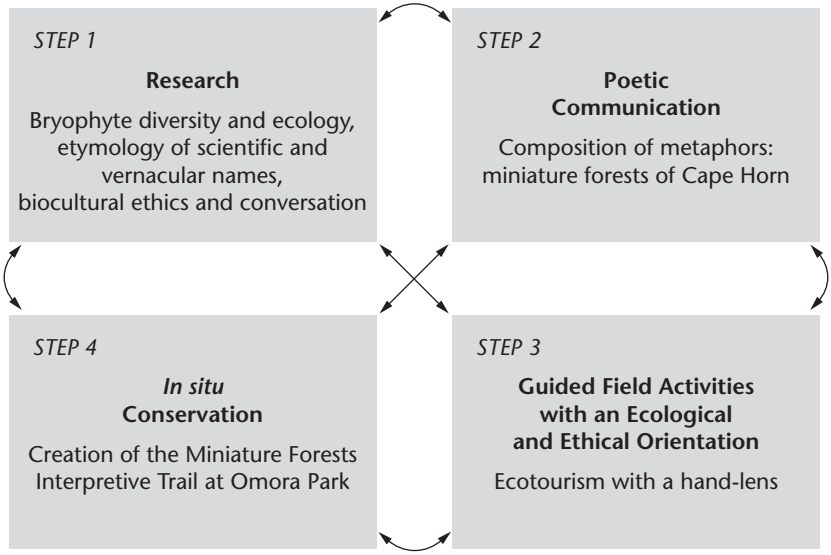

Figure 15.2 The Four-Step Methodology of Field Environmental Philosophy

Note
The methodology integrates ecological and evolutionary sciences and biocultural ethics into conservation, adapted to develop the educational and special interest tourism activity of "ecotourism with a hand-lens." The four steps are based on the conceptual model of the biocultural ethic (see Figure 15.1).

metaphors such as "miniature forests of Cape Horn" facilitates the understanding that the diverse communities of mosses, hepatics, lichens, and other associated organisms form small ecosystems, and that mosses and other organisms are living beings. As such, they can be considered as co-inhabitants with human beings, rather than only as "natural resources" freely available for use without regulation or care.

Step 3: Field activities with an ecological and ethical orientation. For participants in FEP, the experience of direct or face-to-face encounters with living beings in their habitats has been essential for understanding biocultural diversity not only as a concept, but also as an awareness of co-inhabiting with diverse human and other-than-human beings. Ecologically and philosophically, guided field activities transform not only the knowledge about biocultural diversity, but also the ethics of living together with the diverse inhabitants with whom we coexist in regional ecosystems. For example, through field activities guided by philosophers, artists, and ecologists, the field activity of "ecotourism with a hand-lens" (EHL) was created to appreciate the aesthetic, ecological, economic, and ethical values of the "miniature forests of Cape Horn." Today, EHL helps citizens, teachers, and decision-makers discover the beauty, diversity, and socio-ecological importance of this small flora that regularly goes unnoticed. EHL not only amplifies the view of mosses and other organisms in the miniature forests of Cape Horn, but also provides a conceptual hand-lens that broadens our mental, perceptual, and affective image of biodiversity and our relationship with it. Through this activity, participants are able to understand scientific concepts of the diversity and unity of life, and the ethical implications that broaden the narrow economic vision that currently prevails in the relationship of contemporary society with nature.

Step 4: Implementation of areas for in situ biocultural conservation. FEP requires participants to contribute to biocultural conservation actions: for example, the implementation of *in situ* conservation areas. This conservation fieldwork fosters a sense of responsibility as citizens who are ecologically and ethically educated proactively participate in care of the diversity of habitats and their various forms of life. For example, participants have contributed to the creation of the "Miniature Forests of Cape Horn Interpretive Trail" at Omora Park. Today, this trail allows visitors to observe and enjoy the diversity of habitats, species, and ecological interactions. In addition, during guided visits to the trail FEP participants invite various institutions and members of society to join initiatives to protect the diversity of habitats and their multifaceted communities of small and large co-inhabitants in Cape Horn and/or other regions of the world. In this way, FEP has helped to establish an institutional platform at Omora Park that integrates scientific research, education, and ecotourism, at the same time that it (re-)integrates philosophy with sciences, arts, and humanities.

As illustrated in the description of the 4-step cycle, a particular formal and non-formal education activity created with FEP's methodological approach is

EHL. In 2001, former President of Chile Ricardo Lagos visited Omora Park and experienced FEP and EHL, accompanied by researchers who explained the relevance of the little plants and biota he was looking at, and highlighted their beauty and rarity. Later, President Lagos supported the Omora Park research team in their proposal to establish the Cape Horn Biosphere Reserve (CHBR), which was created by UNESCO in 2005 to protect nearly five million hectares of marine and terrestrial ecosystems.

FEP's methodological approach has allowed philosophers to participate in transdisciplinary projects to integrate the biocultural ethic with ecology and sustainable economics. The 2010 Development Plan of Chile identified "Tourism of Special Interest" as a priority economic area. In order to contribute to this sustainable area of the country's economy using the FEP methodological approach, Omora Park's research team focused on ecotourism as a major thematic area that encompasses cultural, social, and economic dimensions. In the following section, we examine how this approach has been developed for the design and implementation of EHL.

3 Ecotourism with a Hand-Lens (EHL): A Field Environmental Philosophy Experience

FEP's methodological approach aims to integrate research, values, and conservation of cultural and biological diversity, from the planetary macro-scale to the micro-scale of small living beings, which are frequently overlooked by global and national research and education as well as environmental decision-making processes. EHL first emerged as a research focus as a result of an accident in the field, experienced by the lead author of this chapter.

In March 2000, Ricardo Rozzi accompanied an expedition of 'bryologists' (scientists who study mosses and liverworts) to the Cape Horn Islands at the southern tip of the Americas. The team, led by Bernard Goffinet, was searching for specialized mosses ('Splachnaceae') that were rumored to grow on the bones of beached whales in the southern parts of the archipelago. The group experienced severe storms while navigating in their tiny fishing boat—the "Maroba"—but they eventually made it ashore and began trekking across an area of peatland in search of plant specimens. Ricardo became separated from the group and accidentally slipped into one of the numerous scattered pools. Despite intense exertion, he could not extricate himself from the cold, dark water, and he resigned himself to his fate. But, as Ricardo sank slowly down, he began to notice the billowing and colorful cushions of mosses growing all around the edge of the pond, and thought: "I am a biologist, yet I had no former knowledge of the abundance and diversity of these small plants in my own country. How unaware might educators and decision-makers also be of this rich natural heritage in Chile?" Some years earlier, he had participated in committees charged with identifying priority sites for conservation in Latin

America, based on vertebrate and vascular plant diversity. The Magellanic subantarctic ecoregion was classified as "unknown," and was therefore accorded low priority for biodiversity conservation. Fortunately, Bernard Goffinet and his team found Ricardo in the swamp after a couple of hours, just in time before he completely disappeared. Ricardo survived the episode, but that image of the exuberant diversity of mosses became fixed in his mind. He began systematically to compile a bibliographic review of bryophytes in Chile, and a full floristic inventory was initiated with Bernard, William Buck, and other bryologists in the Cape Horn archipelago. It was not long before, in a 'eureka' moment, they realized that the Magellanic subantarctic ecoregion constitutes a world hotspot for moss and liverwort diversity.

This accident triggered a biocultural research program, which later incorporated social experiences that demonstrated that the local community had a marked lack of knowledge and appreciation of the most diverse flora, with the highest degree of endemism in the area of the subantarctic region of Chile (Rozzi et al. 2008a). We will describe the problem we tackled and the solutions we developed by integrating work in the three socio-ecosystem realms of the biocultural ethic: (a) biophysical, (b) cultural, and (c) institutional.

3.1 A Biocultural Problem

a Biophysical Realm

Until the year 2000, the biodiversity of the Magellanic region was poorly valued because it has low numbers of species of vascular plants and terrestrial vertebrates (mainly mammals, reptiles, and amphibians) compared to the Mediterranean Temperate Valdivian forest regions of Chile (Armesto et al., 1998). However, fieldwork changed this valuation because we discovered an exuberant diversity of non-vascular plants (Rozzi et al., 2008b) and of freshwater invertebrates (Contador et al., 2012), abundant cover of macroalgae in coastal ecosystems, and unique ecological attributes (Rozzi et al., 2012).

b Cultural Realm

Since 2000, at the single school in Puerto Williams, studies have been carried out with schoolchildren and teachers who are given structured and semi-structured surveys about their knowledge, assessment, and preference of flora and fauna species (Rozzi, 2001). Unexpectedly, since they are embedded in an archipelago with exuberant flora and native fauna, most of the respondents have shown significantly greater knowledge about vascular flora, vertebrate fauna, and cosmopolitan exotic species not found in the archipelagoes of Cape Horn—such as roses and apple trees (Rozzi et al., 2008a). In the surveys, 91 percent of the responses included species (e.g., larch) native to other regions of Chile or of

the planet (roses, apple trees, daisies, eucalyptus, lettuce, and orange trees). Furthermore, 78 percent of the plant species most named by students are not present in the region of Cape Horn.

Thus, the most diverse and idiosyncratic flora of Cape Horn were excluded from the knowledge and biocultural mindsets of local inhabitants. However, in complementary surveys we found that members of the indigenous Yahgan Community as well as older residents mostly named plant species that are native to Cape Horn. Therefore, lack of knowledge about native biota is a recent phenomenon, which particularly concerns formal education and recently arrived professionals from the public or private sectors. However, the latter are responsible for making development decisions in the Cape Horn County.

c Institutional Realm

We examined the curricula and textbooks used by public education in Chile, including the Magellanic Region, between 2000 and 2010 and found that the examples of plants and animals they contained were almost exclusively vascular flora and vertebrate fauna. In addition, most examples were of species, such as roses and apple trees, from other regions. Examples of non-vascular plants and invertebrates were almost completely excluded (Rozzi et al., 2008a). These results illustrate how universal concepts and content in formal education, which are also present in development policies, mask local cultural and biological diversity. Roses and apples are essential plants in Western Christian culture. In addition, roses and apples now occupy a central place in the world and in the Chilean economy. Roses represent more than 66 percent of the flowers sold throughout the world, and Chile ranks fifth in the world among apple exporters. Therefore, the predominant presence of roses and apples in the mindsets of the inhabitants of Cape Horn expresses the central place these plants occupy in Christian-European culture and the globalized market that today reaches even remote regions of the world.

3.2 A Biocultural Solution

a Biophysical Realm

In the research and education programs associated with EHL, philosophers and scientists at Omora Park have focused on the uniqueness of the subantarctic habitats, the life habits of non-vascular and vascular plant species, as well as their abundance and distribution patterns. This focus contributed to the discovery, through the long-term research program of Omora Park, that the subantarctic ecoregion of Magallanes (less than 0.01 percent of the Earth's terrestrial surface) includes more than 5 percent of the species of non-vascular plants (mosses and liverworts) that have been described worldwide (Goffinet et al., 2012). This

discovery of a 'hotspot' or world center for the diversity of non-vascular plants stimulated a "change of lenses" to assess biodiversity at the austral end of America (Rozzi et al., 2008b). With a philosophical perspective, we have not only underscored the uniqueness of the subantarctic biota, but also the meaning and implications of the fact that this uniqueness has been ignored by prevailing education and policymaking processes that lead to biocultural homogenization, which undervalues, ignores, and often eliminates native and endemic biological species. Analogously, biocultural homogenization also entails elimination of vernacular forms of knowledge and oppression of indigenous and other local communities.

b Cultural Realm

The philosophical "change of lenses" had implications not only for research but also for conserving biodiversity. The high diversity of subantarctic non-vascular plants was one of the strongest arguments for UNESCO to create the Cape Horn Biosphere Reserve in 2005 (Rozzi et al., 2008b). This is the most extensive biosphere reserve in the Southern Cone of America, and its creation was a novelty worldwide: this is the first time that a protected area has been designated in Chile, or around the world, based on the diversity of mosses and liverworts. These small organisms have been little appreciated not only in the Magellanic Region of Chile but also in international conservation. The "change of lenses" to investigate and conserve biodiversity thus leads to a change in the valuation of subantarctic biodiversity.

c Institutional Realm

Omora Park philosophers, working with researchers, educators, and authorities in the Ministry of Education, introduced the FEP methodological approach in the curricula of schools (in 2000), preschools (in 2002), and the public university of the Magellanic region (in 2003). FEP has offered a 'fine filter' biocultural approach that incorporates methods and themes focusing on local biocultural diversity, including different forms of ecological knowledge as well as less conspicuous groups of organisms such as non-vascular flora, freshwater invertebrates, and marine algae. This represented a reorientation that departed from prevailing formal education programs developed by the Chilean Ministry of Education during the last decades of the twentieth century, and which intensified during the military dictatorship; these focused on a few biological species, mostly exotic species of commercial interest (e.g., salmon, eucalyptus, and pine trees) (Rozzi, 2012).

To achieve a biocultural education reorientation, collaborative work with institutions from both public and private sectors has been essential to include more broadly diverse forms of knowledge about less conspicuous groups of organisms into programs of school education, ecotourism activities,

and territorial planning (Rozzi et al., 2006). In contrast to the results obtained in interviews conducted in the year 2000, school students in Puerto Williams today name, recognize, and value a diversity of native non-vascular and vascular plant species, as well as those of commercial interest. Students at Chile's southernmost school have also won over ten regional and national awards in Chilean National Science Foundation (CONICYT) annual school science conferences, created art exhibitions, acted in theater plays, and developed a subantarctic cuisine based on seaweeds—a practice that had not previously been implemented in Magallanes or other regions of Chile.

The results show that the degree of knowledge and appreciation of subantarctic biodiversity can be positively reoriented in favor of biocultural conservation. This reorientation has been attained under the guidelines of the philosophical contextual and systemic approach of biocultural ethics, which interrelates specific habitats with specific life habits that encompass specific coinhabitants. To achieve this aim, philosophers have worked collaboratively *in situ* with schoolteachers, students, scientists, representatives of the local indigenous community, artists, Navy officers, and personnel from various public institutions, as well as working as advisors to government authorities and leaders of citizen organizations.

4 Outcomes and Lessons Learned

The experiences of FEP and EHL, as described above, show the importance of fieldwork for observing and valuing biodiversity at both macro and micro scales. The outcomes associated with biophysical dimensions addressed by our biocultural approach are nowadays widely understood in regional formal and nonformal education, as well as the media, culture, and ecotourism programs, due to the clearer identification of the unique attributes of the subantarctic ecoregion of Magallanes, which explains the singularities of its biodiversity (Rozzi et al., 2012). Remarkably, wool, wood, and metal handicrafts of moss and lichen species have become popular in the cities, and even in stores at the airports.

The outcomes associated with the cultural and institutional dimensions of our biocultural approach are also significant. First, the integration of these dimensions has been linked to the coining of new names for an ecoregion that was previously 'invisible' and subsumed under the label 'Patagonia' (a region in southeastern South America characterized by its flat arid steppe and gaucho [horsemen] culture). Today, the rainy archipelagoes, fjords, forests, and glaciers, with cultural habits based on navigation (including bark canoes used by Native Americans, as well as fishing boats, Navy vessels, and, since the 1990s, cruise ships), is now amply recognized as the subantarctic Magellanic ecoregion (*sensu* Rozzi et al., 2012). Second, we can see success in the establishment of new educational methodologies, conservation policies, and institutions, such as the UNESCO Cape Horn Biosphere Reserve, the Omora Ethnobotanical Park,

and more recently the new Diego Ramírez Islands—Drake Passage Marine Park and the Subantarctic Cape Horn Center in Puerto Williams.

Based on our work, we can identify three methodological principles that contributed to establishing effective collaborations between philosophers and scientists, policymakers, and other actors to integrate science and philosophy into biocultural conservation. These principles could be adopted in other regions of the world.

Principle 1: Interdisciplinary and Inter-Institutional Integration

The first level of academic interdisciplinary work involves the integration of methods, perspectives, and data from natural and social sciences, as well as from the humanities. The second level of collaboration involves transdisciplinarity, strengthening interactions among academic and nonacademic actors, including governmental and nongovernmental agencies, and other public and private sector representatives involved in policymaking and decision-making (Frodeman et al., 2010).

Complementing interdisciplinary knowledge with transdisciplinary decision-making involving multiple national and international partners (e.g., UNESCO) was essential to achieving the creation of the CHBR. For example, including diverse professionals and institutions that possess the knowledge and authority to administer terrestrial, coastal, and ocean areas permitted the integration of land and, for the first time, marine ecosystems in a Chilean biosphere reserve. The principle of reciprocal illumination that has been effectively used by evolutionary biologists since the 1960s (Brower, 1996) can be adapted to understand the value of combining the findings of scientists and philosophers. At Omora Park, philosophers have acted as facilitators and have catalyzed teamwork to generate new metaphors, names, narratives, and activities for special interest tourism and policies.

Principle 2: Overcoming the Linear Sequence from Research to Policy

Systematic and continuous teamwork to integrate knowledge production and policymaking has relied on an iterative process conducted by an inter-institutional team. Philosophers, scientists, policymakers, and authorities have worked together, not to deliver a product, but to co-produce publications, policy documents, and recommendations through field teamwork conducted within various institutions.[3] This participatory process of co-production of knowledge and decision-making stands in marked contrast to the prevailing approach of hired consultancies led by professionals who deliver reports produced through a linear sequence of steps (beginning with the production of

knowledge, followed by its communication to policymakers and/or other users, and the eventual use by them).

Synchronic co-production of knowledge and policy documents significantly increases decision-makers' involvement and commitment to the goals. For example, synchronic teamwork was critical to achieving a consensus on zoning and defining the core, buffer, and transition areas of the Cape Horn Biosphere Reserve. In consultation with multiple local and national stakeholders, and with technical advice from UNESCO, a shift was achieved from prioritizing salmon farming toward favoring ecotourism in most coastal areas of the CHBR. Moreover, cooperation on the sensitive decision-making task of zoning allowed the incorporation of indigenous and other local populations for the first time in a Chilean protected area. Participation of philosophers enhanced understanding of the value of multiple knowledge forms and of inter-cultural, inter-institutional, and international processes that take place simultaneously in territorial planning.

Principle 3: A Multiple-Scale Approach

In parallel with biophysical processes, biocultural research and decision-making processes take place simultaneously at local and national levels as well as at the global scale. Consequently, we have to work at multiple scales to enhance the knowledge base in order to manage the extensive subantarctic territory and to monitor impending changes resulting from socioeconomic and conservation projects. To implement a multiple-scale approach at Omora Park, we defined three working scales:

1 *Local scale*, which includes a specific research site and the Sub-Antarctic Cape Horn Center in Puerto Williams in association with regional universities, national parks, and a UNESCO biosphere reserve;
2 *National scale*, which was achieved through the establishment at Omora Park of the Chilean Long-Term Socio-Ecological Research network (Chile-LTSER);
3 *International scale*, which is being implemented by linking the Chilean LTSER with the International Long-Term Ecological Research network (ILTER) and by the SBC Program co-coordinated by IEB and the University of Magallanes in Chile and the University of North Texas in the USA (www.chile.unt.edu).

South America plays a critical role in the context of global climate change and, more broadly, of global socio-environmental change. In 2018, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) launched an assessment on "Nature, People, and Values" that is examining how prevailing global discourses do not adequately include the diversity of languages, and their ontologies, metaphysics, epistemologies, and ethics,

which are rooted in the heterogeneous biocultural mosaic of planetary regions. With the Omora Park research team we are now completing the establishment of the Subantarctic Biocultural Center in Puerto Williams, where philosophers are invited to play a key role in overcoming the limited inter-linguistic and intercultural dialogue among philosophers and other thinkers in environmental ethics that resides in different regions of the world. To reorient trends of global change that threaten the sustainability of life, we consider that it is essential to develop philosophical work that can re-establish a hierarchy of values that ranks the value of life above solely economic values.

In sum, the success of this project as a form of field philosophy has depended on collaborative teamwork, with kindness and respect for differing people and institutions. Collaborators are valued as colleagues, including members of indigenous communities, policymakers, educators, artists, government authorities, and Navy officers, as well as academic researchers. Over the years, academic collaborators have come from a number of research areas, from philosophy to the arts, tourism, journalism, and the social and natural sciences. Our collaborators, in the broadest sense, have ranged in age from preschool children to community elders. The success of the project has relied on people with a wide range of abilities and skills working together toward the common goal of conserving and valuing biological and cultural diversity, and the well-being of diverse socio-cultural communities. It has also depended on long-term *in situ* teamwork, with persistence as the project has grown and changed through two decades. And, finally, creativity has been expressed by broadening our philosophical conceptions of environmental ethics, by including biocultural diversity, socio-environmental justice, and horizontal teamwork to develop an effective conservation policy, and by expanding the scales in which we work.

5 Future Opportunities to Integrate FEP and Earth Stewardship

For 20 years, philosophers working in a remote area of South America have succeeded in working on a transdisciplinary biocultural initiative to establish continuous long-term programs linking academic research with local cultures, social processes, and decision-making. Through collaboration with the Chilean Government and local, national, and international communities, researchers, artists, writers, students, volunteers, and friends experience dynamic and innovative ways to better integrate academia and society. To consolidate this initiative, the Omora Park research team was awarded 20 million dollars by the Chilean Government in 2017 to build an iconic center in Puerto Williams: the Sub-Antarctic Biocultural Center. This facility will allow us to conduct transdisciplinary research and education linked to sustainable development and long-term socio-ecological research at a critical geographical location in the context of global change. It will be inaugurated in 2020, as the first international

subantarctic conservation and research platform to monitor climate change and its impact on biodiversity, as well as to mitigate and adapt to global change.

In 2015, philosophers working with the Omora Park research team also undertook a complex policy process as well as multiple-stakeholder negotiations for the preparation of the scientific-technical proposal to create a 15 million hectare marine park to conserve one of the few (and the largest) terrestrial and marine wilderness areas remaining on the planet in the twenty-first century. In 2017, we succeeded in negotiating with both artisanal and industrial fisheries, the Ministry of Economy and the Ministry of Environment, and the regional government. In 2018, the Chilean President signed a decree creating the Diego Ramirez—Drake Passage Marine Park, and the official document was published in 2019. This marine park will protect critical nesting sites for endangered albatrosses, penguins, and other marine species, conserve ecosystems with abundant seaweeds and phytoplankton that represent a critical 'blue lung' for the planet, and conserve a unique range of biodiversity hosted by major seamounts in the Drake Passage between South America and Antarctica.

During these 20 years, in light of the rapid cultural, socioeconomic, and ecological transformations taking place both in the remote austral region of South America and around the globe, philosophers and other researchers have hosted a series of interdisciplinary workshops at Omora Park. Leading international scholars (importantly, environmental philosophers and ecologists) have worked together with government authorities and concluded that there is an urgent need to develop Long-Term Socio-Ecological Research (LTSER) rather than merely Long-Term Ecological Research (LTER) networks. LTSER network sites go beyond LTER sites in their capacity to link biophysical processes to governance and science communication. In answer to this need, we co-founded the Chilean LTSER network at Omora Park in 2008 (Rozzi et al., 2010). LTSER networks provide an institutional platform to explore decision-making processes at multiple scales and to understand conflict as a basis for reconciling divergent goals among stakeholders, thus enhancing the resilience of local communities, places, and ecosystems (Haberl et al., 2006). As a significant contribution toward this mission, Omora Park has introduced FEP's methodological approach at multiple LTSER sites by closely collaborating with the International LTER (ILTER) network and the Earth Stewardship Initiative launched by the Ecological Society of America (ESA) in 2009 (see Rozzi et al., 2015).

Earth Stewardship implies a paradigm shift that links facts and values with multiple forms of ecological knowledge and practice. Thus, it broadens the mission of the ecological sciences. To confront global environmental change it is necessary, but not sufficient, to conduct long-term socio-ecological research. It is also necessary to act. As a means of engaging science and society in rapidly reducing the rates of anthropogenic damage to the biosphere, the Earth Stewardship Initiative launched a call for action that appeals not only to ecologists, but also to anthropologists, sociologists, engineers, economists, religion scholars,

and conservation biologists, as well as to other professionals, decision-makers, and citizens.

At Omora Park we proposed to the ESA that, for an Earth Stewardship that values biocultural diversity, it is indispensable that ecologists also collaborate with philosophers, policymakers, and artists. Scientists need to engage not only in the production of knowledge, but also in public discourse and understanding, as well as in decision-making, education, and governance. Philosophical inquiry—by professionals as well as laypersons—adds to the aim of advancing the FEP's methodological approach and the Earth Stewardship Initiative at a planetary scale. Inter-hemispheric, intercultural, and transdisciplinary collaborations have helped us to address (a) *biophysical–geographical gaps* and (b) *conceptual–philosophical gaps* in the coverage of ILTER at Omora Park.

With regard to (a) *biophysical–geographical* gaps, more than 90 percent of ILTER sites are located in the Northern Hemisphere (Rozzi et al., 2012). Furthermore, within the Northern Hemisphere 89 percent of ILTER publications are generated in temperate regions, and only 1 percent in equatorial regions (Li et al., 2015). Consequently, the distribution of ILTER sites and ILTER research efforts are more associated with political and economic resources than with the geographic distribution of biodiversity.

With regard to (b) *conceptual–philosophical* gaps, until now the social component considered in socio-ecological studies worldwide has been primarily economic (Rozzi et al., 2012). ESA's Earth Stewardship call gives special consideration to both ecological and *socioeconomic* facts (Chapin et al., 2011). Similarly, the European LTSER platform was designed as a research infrastructure to support integrated *socioeconomic* and ecological research (Haberl et al., 2006). Socio-ecological studies are subsumed by 'socioeconomic' ones, and it is striking how the fields of philosophy, including ethics, have been ignored. For example, Singh et al. (2013) prepared a comprehensive review of long-term socio-ecological research in the USA and Europe, but in the whole review the words 'philosophy' and 'ethics' are not included at all. The Omora Park research team has criticized this omission. We are contributing to solve it by incorporating philosophy and ethics into the theory and practice of long-term socio-ecological research. Interestingly, as documented by Li et al. (2015), over 99 percent of all ILTER publications in the arts and humanities are generated by researchers working in the Southern Hemisphere, and most of these publications have been generated by researchers at Omora Park.

Conclusion

This chapter has called attention to the opportunities for stronger partnership and complementarity in long-term socio-ecological research and stewardship initiatives across the planet. The southern regions can demonstrably add to the integration of social, ethical, and artistic dimensions to transdisciplinary socio-ecological

research at ILTER and other networks, providing a broader intercultural and participatory foundation for Earth Stewardship. Earth stewardship requires that global phenomena and regional biocultural heterogeneity be linked. To fulfill this goal, LTSER networks should aim to forge appropriate 'conceptual lenses' in the same way that these networks aim to forge appropriate technological sensors to research and monitor socio-ecological systems. In this mission, environmental philosophy and ethics undertake a task that is as relevant as that undertaken by environmental engineering and the environmental sciences.

For LTSER sites such as the one we have created in Cape Horn, FEP offers a methodological approach for integrating philosophy with the sciences through transdisciplinary fieldwork. Philosophers learn from other researchers, members of indigenous and other local communities, authorities, and other participants. In turn, philosophers help members of these teams not only to gain ecological knowledge, but also to become aware of ethical, economic, aesthetic, and ecological values through an active, situated practice immersed in habitats and communities of co-inhabitants. Participation of philosophers in research, education, and policymaking teams has also enriched intercultural dialogues involving complementary local and global forms of ecological knowledge and practice. In FEP, philosophers act as 'Socratic facilitators' who enhance the expression of diverse habits of Earth Stewardship in a bioculturally heterogeneous and rapidly changing world.

Notes

1 'Omora' means hummingbird in the Yahgan Native American language (Rozzi et al., 2006).
2 The concept of co-inhabitants is central to the biocultural ethic. Just as the concept of companion alludes to sharing bread (from Latin, *cum* = with; *panis* = bread), the term co-inhabitant refers to sharing a habitat. Sharing the habitat involves ecological–evolutionary processes, as well as an ethical duty and taking care of the habitat. Therefore, the concept of co-inhabitant has a double meaning; it is both descriptive and normative (Rozzi, 2012).
3 Produced documents include white papers, legal proposals, governance and management plans for protected areas, territorial planning, recommendations for the Chilean Antarctic Law to incorporate the subantarctic region, the successful proposal to CONICYT to create a special research division for funding both Antarctic and subantarctic research, as well as numerous academic publications that have been prepared through fieldwork and teamwork involving philosophers along with policymakers, educators, representatives from indigenous communities, as well as academic researchers from multiple disciplines.

References

Aguirre Sala, Jorge. 2015. Hermeneutics and field environmental philosophy: integrating ecological sciences and ethics into earth stewardship. In R. Rozzi, F.S. Chapin, J.B. Callicott, S.T.A. Pickett, M.E. Power, J.J. Armesto, and R.H. May Jr. (eds.), *Earth*

Stewardship: Linking Ecology and Ethics in Theory and Practice. Dordrecht: Springer, pp. 235–247.

Armesto, Juan J., Ricardo Rozzi, Cecilia Smith-Ramírez, and Mary Kalin-Arroyo. 1998. Conservation targets in South American temperate forests. *Science* 282: 1271–1272.

Brower, Andrew. 1996. Three steps of homology assessment. *Cladistics* 12: 265–272.

Chapin, Stuart, Steward T.A. Pickett, Mary E. Power, Robert B. Jackson, David M. Carter, and Clifford Duke. 2011. Earth stewardship: a strategy for social-ecological transformation to reverse planetary degradation. *Journal of Environmental Studies and Sciences* 1: 44–53.

Contador, Tamara, James H. Kennedy, and Ricardo Rozzi. 2012. The conservation status of southern South American aquatic insects in the literature. *Biodiversity and Conservation* 21(8): 2095–2107.

Frodeman, Robert, Julie Thompson Klein, and Carl Mitcham (eds.). 2010. *The Oxford Handbook of Interdisciplinarity*. New York: Oxford University Press.

Goffinet, Bernard, Ricardo Rozzi, Lily Lewis, William Buck, and Francisca Massardo. 2012. *The Miniature Forests of Cape Horn: Eco-Tourism with a Hand-Lens* [Los Bosques en Miniatura del Cabo de Hornos: Ecoturismo con Lupa] [bilingual English–Spanish edition]. Punta Arenas, Chile: University of North Texas Press and Ediciones Universidad de Magallanes.

Haberl, Helmuth, Verena Winiwarter, Krister Andersson, Robert U. Ayres, Christopher Boone, Alicia Castillo, Geoff Cunfer, Marina Fischer-Kowalski, William R. Freudenburg, Eeva Furman, Rüdiger Kaufmann, Fridolin Krausmann, Ernst Langthaler, Hermann Lotze-Campen, Michael Mirtl, Charles L. Redman, Anette Reenberg, Andrew Wardell, Benjamin Warr, and Harald Zechmeister. 2006. From LTER to LTSER: conceptualizing the socioeconomic dimension of long-term socioecological research. *Ecology and Society* 11(2): 13. www.ecologyandsociety.org/vol11/iss2/art13/.

Li, Ben, Terry Parr, and Ricardo Rozzi. 2015. Geographical and thematic distribution of publications generated at the international Long-Term Ecological Research Network (ILTER) sites. In R. Rozzi, F.S. Chapin, J.B. Callicott, S.T.A. Pickett, M.E. Power, J.J. Armesto, and R.H. May Jr. (eds.), *Earth Stewardship: Linking Ecology and Ethics in Theory and Practice*. Dordrecht: Springer, pp. 195–216.

Palmer, Clare. 2013. Introduction to environmental philosophy: ethics, epistemology, justice. In R. Rozzi, S.F. Chapin, J.B. Callicott, S.T.A. Pickett, M.E. Power, J.J. Armesto, and R.H. May Jr. (eds.), *Earth Stewardship: Linking Ecology and Ethics in Theory and Practice*. Dordrecht: Springer, pp. 187–190.

Rozzi, Ricardo. 2001. Ética ambiental: Raíces y ramas latinoamericanas. In R. Primack, R. Rozzi, P. Feinsinger, R. Dirzo, and F. Massardo (eds.), *Fundamentos de la Conservación Biológica: Perspectivas Latinoamericanas*. Mexico City: Fondo de Cultura Económica, pp. 311–359.

Rozzi, Ricardo. 2012. Biocultural ethics: the vital links between the inhabitants, their habits and regional habitats. *Environmental Ethics* 34: 27–50.

Rozzi, Ricardo. 2013. Biocultural ethics: from biocultural homogenization toward biocultural conservation. In R. Rozzi, S.T.A. Pickett, C. Palmer, J.J. Armesto, and J.B. Callicott (eds.), *Linking Ecology and Ethics for a Changing World* (Ecology and Ethics, Vol. 1). Dordrecht: Springer, pp. 9–32.

Rozzi, Ricardo, Francisca Massardo, Christopher Anderson, Kurt Heidinger, and John A. Silander Jr. 2006. Ten principles for biocultural conservation at the southern tip of

the Americas: the approach of the Omora Ethnobotanical Park. *Ecology and Society* 11: 43.

Rozzi, Ricardo, Ximena Arango, Francisca Massardo, Christopher Anderson, Kurt Heidinger, and Kelli Moses. 2008a. Field environmental philosophy and biocultural conservation: the Omora Ethnobotanical Park educational program. *Environmental Ethics* 30: 325–336.

Rozzi, Ricardo, Juan J. Armesto, Bernard Goffinet, William Buck, Francisca Massardo, John Silander, Mary Kalin, Shaun Russell, C. Anderson, Lohengrin A. Cavieres, and J. Baird Callicott. 2008b. Changing biodiversity conservation lenses: insights from the sub-Antarctic non-vascular flora of southern South America. *Frontiers in Ecology and the Environment* 6: 131–137.

Rozzi, Ricardo, Christopher Anderson, Cristóbal Pizarro, Francisca Massardo, Yanet Medina, Andrés O. Mansilla, James H. Kennedy, Jaime Ojeda, Tamara Contador, Verónica Morales, Kelli Moses, Alexandria Poole, Juan J. Armesto, and Mary T. Kalin. 2010. Field environmental philosophy and biocultural conservation at the Omora Ethnobotanical Park: methodological approaches to broaden the ways of integrating the social component ("S") in long-term socio-ecological research (LTSER) sites. *Revista Chilena de Historia Natural* 83: 27–68.

Rozzi, Ricardo, Juan J. Armesto, Julio Gutiérrez, Francisca Massardo, Gene E. Likens, Christopher B. Anderson, Alexandria Poole, Kelli P. Moses, Eugene Hargrove, Andres O. Mansilla, James H. Kennedy, Mary Willson, Kurt Jax, Clive G. Jones, J. Baird Callicott, and Mary T. K. Arroyo. 2012. Integrating ecology and environmental ethics: earth stewardship in the southern end of the Americas. *BioScience* 62(3): 226–236.

Rozzi, Ricardo, Stuart F. Chapin, J. Baird Callicott, Steward T.A. Pickett, Mary Power, Juan J. Armesto, and Roy H. May Jr. (eds.). 2015. *Earth Stewardship: Linking Ecology and Ethics in Theory and Practice*. Dordrecht: Springer.

Singh, Simron J., Helmuth Haberl, Marian Chertow, Michael Mirtl, and Martin Schmid (eds.). 2013. *Long Term Socio-Ecological Research* (Studies in Society–Nature Interactions Across Spatial and Temporal Scales). Dordrecht: Springer.