

Article

# Sustainability and Multispecies Studies: Perspectives and Challenges for Building Sustainable Societies

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## ABSTRACT

This article analyzes the intersection between Sustainability Studies and Multispecies Studies, investigating how the multispecies approach has been incorporated into academic debates on sustainable development, biodiversity, and community maintenance. Based on an integrative review of scientific literature published between 2012 and 2022 in the Capes Journals database, this study identifies conceptual links and tensions between the two fields, considering epistemological and methodological implications. Sustainability, historically guided by an anthropocentric bias, has been challenged by approaches that emphasize the ontological interdependence between humans and non-humans. In this context, Multispecies Studies contribute to a reframing of sustainability by proposing a relational and decentralized view of ecological agency. The results point to the need to develop socio-environmental management strategies that integrate approaches that go beyond the anthropocentric view in the formulation of sustainable policies.

**Keywords:** sustainability; multispecies studies; anthropocentrism.

## ABSTRACT

This paper analyzes the intersection between Sustainability Studies and Multispecies Studies, investigating how the multispecies approach has been incorporated into academic debates on sustainable development, biodiversity, and community maintenance. Based on an integrative review of the scientific literature published between 2012 and 2022 in the Capes Journals database, this study identifies conceptual articulations and tensions between the two fields, considering epistemological and methodological implications. Sustainability, historically guided by an anthropocentric bias, has been challenged by approaches that emphasize the ontological interdependence between humans and non-humans. In this context, Multispecies Studies contribute to a redefinition of sustainability by proposing a relational and decentralized view of ecological agency. The results highlight the emergence of an interdisciplinary paradigm that expands the frontiers of environmental knowledge and suggests the need for new socio-environmental management strategies that integrate multiple agents in the formulation of sustainable policies.

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## Introduction

In the context of conceptual construction and reflective contributions on socio-environmental crises (Ávila Romero, 2021), sustainability studies are challenging due to politically constructed articulations and choices around the notion of sustainability. These studies represent one of the most recent chapters in the consolidation of Environmental Sciences. This movement began in the 19th century, but from the end of the 20th century onwards, it increasingly presented evidence-based results, building consensus and overcoming the speculative exercises that gave rise to it (Hughes, 2013).

As we enter the 21st century, sustainability studies are still controversial. On the one hand, there is consolidated knowledge from fields with increasing practical demand, such as sustainability linked to the operations of law and management studies; on the other hand, there are those that respond and construct



Submission: March 14, 2025



Accepted: July 2, 2025



Publication: 09/04/2025





alternatives and point to "nature-based" strategies, such as hydrology. From a critical point of view, there are equally emerging fields such as Environmental Humanities.

In these fields, sustainability is a disputed notion. This is because talking about sustainability implies understanding political dimensions (derived from the dialogue between development and environmental issues, which led to the Sustainable Development Goals in 2015), moral (the idea of intergenerational justice and ethical concern for the future of the planet), and scientific dimensions (institutionalization/internationalization built on the tension between criticism, description, analysis, problem solving, and transformation) (Scarano, 2019, pp. 60–62).

This has been more widely noticeable since the 2000s. Renzo Tadei (2022) points out that successive appropriations (careful or not) of the notion of the Anthropocene have favored a period more sensitive to environmental issues, updating concepts, creating others, and multiplying epistemological challenges around sustainability.

One of the challenges has been to reflect on the extent to which new fields of knowledge that appropriate sustainability for the elaboration of their reflections—our case of interest, Environmental Humanities—are being invited to the debate table, with representation and recognized authority, in relation to topics of interest.

Among these fields, multispecies studies stand out for their critical intensity and for promoting, at the same time, the decentralization of humans in the analysis of the agency of change and the proposal of both concepts and the politicization of biodiverse communities. This field proposes that the problems of the environmental crisis can only be addressed based on the notion of the co-constitution of phenomena from the agency of humans and non-humans (objects, fauna, and flora), understanding them in the horizontality and relationality of agencies, with ethical repercussions on the community of living beings (O'Gorman, 2019).

We understand this field as emerging from readings derived from the problems identified in the search for sustainability, while considering that its provocations generate epistemological challenges to the very notion of sustainability. If the abstract notion of sustainability brings together initiatives that have sought to identify elements, promote actions for change, and construct indicators of environmental change, as is the case with the Sustainable Development Goals (SDGs), perceiving different lives and their processes of change from a multispecies perspective means thinking more slowly and carefully about the horizontal relationships between human and non-human agents in the search for more sustainable societies.

In this article, we seek to identify multispecies studies related to sustainability studies and to what extent they are being perceived or taken into account by the latter when it comes to community maintenance, community development, and biodiversity. To this end, we conducted an integrative review (Souza et al., 2010; Mendes et al., 2008) aimed at extracting what has been published on the multispecies dimension in the context of sustainability studies, considering the Brazilian repository Periódicos Capes and adopting the PICO strategy (acronym for Patient, Intervention, Comparison, Outcomes) (Garcia, 2016).

To this end, we conducted a scan of articles that bring together multispecies and sustainability studies on the aforementioned portal between 2012 and 2022, understanding it as an exercise in visualizing a bibliographic production that circulates in a way that is situated in the contemporary reflection on environmental crises in an accessible way in the Brazilian academic community and may be linked to the emergence of another meta-category explaining these crises that arose in 2000, the Anthropocene (although this reflection is not part of the article).

Thus, we have divided this article into four parts, which revisit a necessary and nuanced reading of the notion of sustainability and multispecies studies. Based on the articles identified in the survey, we then discuss possible and probable (dis)articulations between these two fields of reflection.

## Sustainability

The notion of sustainability that became hegemonic between the end of the 20th century and the beginning of the 21st century began to be publicized and incorporated internationally after the United Nations Conference on the Environment in Stockholm in 1972. There, the conditions for the normalization of the notion of eco-development (later called sustainable development) gained *momentum*, amid the presence of different approaches to the reconciliation between development and environmental protection that were at stake, including in events parallel and simultaneous to the official conference (Pereira, 2022). In this scenario, the contributions of Canadian oil entrepreneur Maurice Strong (2003), British business consultant John Elkington (2012), and Polish development theorist Ignacy Sachs (1986) stand out in building the pillars of sustainability, which encompass not only environmental issues, but also economic, cultural, social, and ethical issues and notions of participatory management, with an obviously white and global northern perspective.



With the developments that took place from 1972 onwards, the UN established a consolidated notion of sustainability in 1987 with the publication of the Brundtland Report. Since then, sustainability has become "meeting the needs of current generations without compromising the ability of future generations to meet their own needs," and based on this premise, it is possible to reflect on the anthropocentric and economic nature that underpins the concept. The anthropocentric perspective was the main objective of sustainable development (Ferreira; Bomfim, 2010) and, in this sense, environmental concerns came to be internationally based on human needs and well-being (Silva; Rech, 2017).

In the 1980s, there were already many challenges surrounding the idea of sustainability, with intense debates in forums across different regions, while an ecological political agenda was consolidating internationally. Brazilian environmentalist José Lutzenberger argued that, in view of the voracious processes of capital on natural resources and people, it was urgent to build an ethic of sustainable coexistence (Pereira, 2020).

In an effort to synthesize, Sartori *et al.* (2014) related the challenges of sustainability, as a notion and objective, to the following criteria: the need for global coordination; relevance to decision-makers; and leverage. Silva and Rech (2017) state that for environmentally responsible praxis to occur, anthropocentric paradigms must be overcome (Silva; Rech, 2017). Roos and Becker (2012) argue that for sustainable development to occur, it is necessary to modify the current model of development: the capitalist-industrial model, where environmental education is considered the tool that will make this transition process possible.

Concerns about sustainability were amplified with the emergence of another concept in 2000, the Anthropocene. The term arose to signal/suggest/provoke reflection on the possibility of a new geological moment for the planet in which human action interferes with natural systems (Torres, 2017). Specifically, since the first industrial revolution (mid-18th century), the changes have been more noticeable, with significant milestones causing a kind of rupture in the Earth's balance. Such interference is not limited to climate change, but also includes the emergence and proliferation of materials such as plastic, concrete, aluminum, fertilizers, pollutants, among others (Silva; Arbilla, 2018). Activities such as the use of fossil fuels, the development of agriculture, livestock farming, and deforestation were largely responsible for the increase in greenhouse gas emissions (IPCC 2014; Lewis; Maslin, 2015), thus marking a periodization of the history of human presence on the planet that has come to be conceived, since the year 2000, as the Anthropocene (Crutzen *et al.*, 2000), and which remains widely debated and has repercussions, especially in the humanities. The loss of biodiversity, which has caused changes in the integrity of the biosphere, increasing the vulnerability of ecosystems, has been redefined in this debate, as well as the two-way relationships established between humans and other beings and factors in a collective of humans and non-humans. The impact of human activities has transformed the landscape and caused the extinction of many species, as Artaxo (2014) points out, but based on the anthropocentric interpretation of these asymmetrical power relations between humans and other beings, it is essential to consider reciprocities, relationalities, and situationalities that allow us to say that it is no longer possible to construct one-way approaches when talking about human actions and the rest of nature, as pointed out by different authors (McNeill, 2003; Buell, 2011).

The environmental crisis is also a civilizational crisis that shakes epistemological assumptions (Jungues, 2021). Thus, Fritjof Capra (2002) proposes a broader reading of the concept of sustainability, which relates five distinct variables: interdependence, recycling, partnership, flexibility, and diversity. Environmental issues are often involved in conflicts of interest and polarization between worldviews, where ethical values and the strengthening of the complex interrelationship between society and nature are necessary (Jacob, 2003).

In a broader view proposed by authors such as Capra (2002), all forms of life are considered to be of equal importance. Lovelock (1990) pointed to a considerable paradigm shift with his studies on Gaia, whose theory, with contributions from Lynn Margulis, advocates an intimate connection around the chains of life on the planet. Capra (2006) also shares this vision of a living and integrated system, where humans are just one of many links in a nonlinear network pattern, where each species lives interdependently. The author also highlights the perception of deep ecology, which does not separate humans from the natural environment and recognizes the interdependence between all phenomena in the cyclical processes of nature. According to him, "deep ecology recognizes the intrinsic value of all living beings and conceives of humans as just one particular thread in the web of life" (Capra, 1996). From an environmental history perspective, authors such as Donald Hughes (2013) point to the importance of ecology both as a field of knowledge and as an appropriate language for problematizing and describing the interrelationships between humans and the rest of the natural world, considering both the organic dimensions of the tangible world and the characteristic of humans as bio-historical entities.



## The multispecies perspective

In this context, multispecies studies comprise an interdisciplinary field where taxonomic research enables the exploration of a complex "ecology of beings" (Khon, 2013). It seeks to understand the relationship between human and non-human species, in which the key concerns the multiplicity of perspectives and possible influences (Pereira, 2018), removing the focus from the exclusivist and monospecific conceptual baggage of the social sciences, which have delimited the field of ethnography in predominantly anthropocentric terms. The term multispecies does not define life in the exclusivist terms of human social life and does not take nature as an objective external reality shared by any culture or any organism (Süssekind, 2018). As Anna Tsing (2015, p.180) states: "Human nature is an interspecies relationship." According to her, in the Anthropocene it is important to consider the process of historicity of non-humans, since they also make history with humans, and the timelines are entangled. These are more-than-human histories (Tsing, 2021). It is necessary to know the stories that humans have made by transforming landscapes, as well as to know the stories of non-human participants. She also points out that landscapes are not mere settings, they are dynamic and have active agency (Tsing, 2015a).

For Haraway (2021), "beings constitute each other and themselves in their relationships." The author proposes the constitution of relational thinking, focusing on relationships, multiple interferences, overlaps, and symbiogenesis between nature and culture, which she calls "nature-culture," where thousands of historical, biological, and natural-cultural connections intertwine. Massumi's (2017) work is also important in this sense, as it rethinks evolutionary biology, deconstructing the idea of evolution based on the instincts of competition and survival. The process of evolution comes to be seen from the perspective of symbiosis, mutual collaboration, and cooperation as an adaptive strategy, as Lynn Margulis (1997) had already proposed with the idea of symbiogenesis. Tsing (2015b) argues that, for all species, living requires collaboration, that is, living with differences, and this causes constant transformations: "we are mixed with others even before we begin any new collaboration."

Interdisciplinary research on the relationship between human culture and the natural environment has been conducted to verify how this interaction reveals the nature/culture dichotomy with all its various implications. Thus, the duality between nature and culture is discussed through environmental history (Gerhardt *et al.*, 2017). Understanding how such histories unfold through multiple relationships, between encounters and misunderstandings, and how different species shape each other, interfere with each other, and interact with each other is an important step (Haraway, 2021) in rethinking and proposing new discussions about sustainability and environmentally viable futures. Thus, the objective of this article is to investigate what has been studied about the multispecies dimension in the context of environmental history, considering sustainability, and to present the current state of the art of scientific productions on this theme.

## What is written and where it is written

This review identified 150 articles in the Capes Journals database, 30 of which met the inclusion criteria we established. Of the 30 articles selected, 15 are in Portuguese (50%), 12 in Spanish (40%), and 3 in English (10%). The time frame was set between 2012 and 2022, with publications distributed as follows: 1 publication in 2013 (3.33%), 4 in 2018 (13.33%), 3 in 2019 (10%), 5 in 2020 (16.66%), 11 in 2021 (36.66%), and 6 in 2022 (20%). Most of the research was conducted from 2018 onwards, with a peak in 2021. It is also possible to note that this is, in fact, a very current and expanding field (Table 1).



Table 1. Number of articles considered in the research inclusion criteria, according to language and year of publication

LANGUAGE	QUANTITY	YEAR					
		2013	2018	2019	2020	2021	2022
Portuguese	15 (50%)		1		5	8	1
Spanish	12 (40%)	1	2	2		2	5
English	3 (10%)		1	1		1	
<b>TOTAL</b>	<b>30</b>	<b>1 (3.33%)</b>	<b>4 (13.33%)</b>	<b>3 (10%)</b>	<b>5 (16.66%)</b>	<b>11 (36.66%)</b>	<b>6 (20%)</b>

Source: Prepared by the authors (2022).

The themes within the multispecies dimension are quite diverse, with many ways in which humans and nonhumans relate to each other. Some of the studies analyzed present interactions between humans and animal and plant species such as trees, insects, dolphins, fish, sharks, crabs, rodents, other mammals, among others. Almost all articles mention in their discussions names of relevance in the contemporary scenario in this area of study: Anna Tsing, Donna Haraway, Bruno Latour, and Isabelle Stengers.

The information extracted from the 30 articles analyzed is presented in the following table, organized by source, title, authors, journal, objective, and main considerations (Table 1).





Table 1. Summary of the studies considered in the integrative review on the multispecies theme in the context of environmental history and sustainability in the time frame 2012-2022.

Procedência	Título do artigo	Autores (as)	Periódico (vol. nº, pág, ano)	Objetivo	Considerações
Periódicos Capes	Comidas del Zopilote	Dominique Raby	Amérique Latine Histoire et Mémoire. Les Cahiers ALHIM [Online], 25, 2013.	Analisar a comida ritual no contexto de uma oferenda anual ao abutre, durante a cerimônia de "pedido de chuva" na região de Alto Balsas Nahua, México. Utilizando a perspectiva da etnografia multispecies.	A relação homem-abutre culmina na oferenda anual, que concentra em um ritual impressionante esses conceitos e o papel da ave no ciclo agrícola do qual o povo Nahua era tradicionalmente dependente.
Periódicos Capes	Examining the relationship between local extinction risk and position in range	Elizabeth Boakes et al.	Conservation Biology, Volume 32, No. 1, p. 229–239, 2018.	Examinar a posição de extinções locais recentes dentro das áreas geográficas das espécies consideradas e influência de fatores ambientais.	Os resultados sugerem que fatores locais e regionais superam os padrões espaciais gerais de extinção local recente dentro das áreas de distribuição das espécies e destacam a dificuldade de prever as partes da distribuição de uma espécie mais vulneráveis à ameaça.
Periódicos Capes	Familias-más-que-humanas: sobre las relaciones humanos/ no-humanos y las posibilidades de una etnografía interespecies en Colombia	Jorge Sánchez-Maldonado	Desenvolvimento E Meio Ambiente (49) p. 305-317, 2018.	Explorar as possibilidades obtidas em uma etnografia inter-espécies que nos permitam questionar as formas dominantes do pensamento que faz a separação da natureza e cultura.	A diversidade de relações permite oportunidades de estudos etnográficos importantes entre humanos e não-humanos.
Periódicos Capes	Escuchando El Llamado Del Bosque": Explorando Las Dimensiones Afectivas De La Conservación Ambiental Desde La Etnografía Multispecies. Santuario El Cañi, Chile	Martín Fonk e Daniela Jacob	Revista Austral de Ciencias Sociales 35: p. 221-238, 2018.	Compreender as relações interespecies em torno da conservação em uma região do Chile conhecida como Santuário da Natureza El Cañi.	A afetividade tem sido cultivada nas relações com certas espécies de árvores, insetos e aves, que revelam uma multiplicidade de relações de afeto entre espécies que exigem que a floresta seja cuidada.
Periódicos Capes	Sobre a vida multispecie	Felipe Sússekind	Rev. do Instituto de Estudos Bras. Nº 69, p. 159-178, abr, 2018.	Discutir sobre a ideia de uma vida multispecie em função do aparato conceitual fundado no exclusivismo do humano e na ideia da natureza como um pano de fundo para as ações humanas.	As alianças entre grupos humanos, animais, plantas, fungos, microrganismos ou fenômenos climáticos, é o desafio que a experiência da vida multispecie nos apresenta.



Periódicos Capes	"El campesino nació para el campo": un enfoque multispecies hacia la paz territorial en Colombia	Angela Lederach	Maguaré (Bogotá, Colombia) 33.2, p. 171-207, 2019.	Explorar práticas de construção da paz na Colômbia rural, por meio da lente multispecies.	A análise antropológica multispecies possibilita o reconhecimento de mundos complexos enquanto procuram reconstruir e recriar o tecido social e ecológico de suas comunidades.
Periódicos Capes	Measured Chaos: EcoPoet(h)ics of the Wildin Barbara Kingsolver's Prodigal Summer	Bénédicte Meillon	Ecozon, Vol. 10, N1, p. 60-80, 2019.	Propor que a linguagem humana procura inspiração na aparente aleatoriedade e nos desenhos subjacentes que motivam a evolução dos complexos sistemas do universo.	Co-orquestrando o caos medido que desenha a teia da vida, ela própria enredada na teia de línguas humanas e não humanas, o eco-poético de Kingsolver responde às multidões que habitam dentro de Gaia simbólica.
Periódicos Capes	El mosquito-oráculo y otras tecnologías	Jean Segata	Tabula Rasa, 32, p. 103-125, 2019.	Compreender o modo das relações humano-mosquito e suas materialidades e como os discursos e instituições são mobilizadas para performar riscos e epidemias, e como estas são convertidas em instrumentos de governabilidade.	A vida de pessoas, mosquitos e ambientes são produzidas, cruzadas e governadas pelas tecnologias, incertezas e recalcitrâncias do universo das doenças tropicais na América Latina.
Periódicos Capes	Uma antropologia que dança: algumas notas sobre paisagens de conceitos em Anna Tsing	Gabriel Holliver	Anuário Antropológico v. 45, n. 3, p. 189-202 .setembro-dezembro, 2020.	Tecer alguns comentários acerca dos artigos presentes no livro Viver nas ruínas: paisagens multispecies no Antropoceno (2019), de Anna Tsing.	Prestar atenção nos movimentos de destruição e regeneração é uma necessidade para quem pratica antropologia no Antropoceno, pois se há algo que este novo tempo nos coloca, é a urgente mudança de paradigmas tanto no plano das teorias como no de nossas práticas.
Periódicos Capes	A seleção natural como narrativa sobre o grande divisor, a biossemiótica e as etnografias das pessoas humanas e não-humanas	Gláucia Silva	Rev. de Estudos Interdisciplinares Vol.22 (2), p. 300-329, 2020.	Discutir sobre o neodarwinismo, perspectivismo e a etnografia multispecies.	É importante a busca da recomposição (epistemológica e ontológica) da dualidade natureza/cultura, rompida pelo ideário racionalista.



Periódicos Capes	Transformações antropogênicas, mito, música e os coletivos xamanísticos Ka'apor: experimentações preliminares a caminho de uma etnomusicologia de multiespécies	Hugo Maximino Camarinha	Anuário Antropológico v.45 n.3, p.1-22 2020.	Mesclar enunciados relativos ao "Antropoceno" e à floresta antropogênica e refletir sobre algumas categorias vigentes na antropologia, com o objetivo de experimentar alguns cruzamentos com uma possível etnomusicologia de multiespécies.	Os Ka'apor têm delimitado estratégias para a defesa de seu território, de forma autônoma e politicamente organizada, para que as invasões dos madeireiros sejam travadas de alguma forma, e seu território salvaguardado.
Periódicos Capes	"Vetores epistemológicos": ratos, fronteiras e o Antropoceno	André Luis de Lima Carvalho	Cadernos do CEOM, v. 33, n. 52, p. 75-92 Jun, 2020.	Apresentar resultados preliminares de um estudo que lança mão das duas espécies de ratos urbanos cosmopolitas para conduzir a exploração de problemas de pesquisa ligados ao conceito de Antropoceno.	A plasticidade adaptativa e identitária dos ratos, assim como suas características de organismos de fronteiras, credenciam esses animais como "vetores epistemológicos" capazes de conduzir leitores e pesquisadores pela teia viva e labirintos narrativos do Antropoceno.
Periódicos Capes	A vida e a morte dos guaiamuns: antropologia nos limites dos manguezais	Pedro Castelo Branco Silveira e Rafael Palermo Buti	Anuário Antropológico v. 45, n.1, p. 117-148, janeiro-abril, 2020.	Explorar as malhas relacionais da coexistência dos caranguejos conhecidos como guaiamuns com os grupos humanos que os capturam em manguezais do litoral nordeste do Brasil.	São necessárias novas estratégias de assegurar o bem-viver de coletivos multiespécies que conformam os ambientes litorâneos, relacionando tal necessidade com a reivindicação da regulamentação do que as organizações de pescadores têm denominado de territórios pesqueiros.
Periódicos Capes	Águas de Dançar Juntos: Coordenação e Sintonização Multiespécies na Pesca com os Botos em Laguna (SC – Brasil)	Brisa Catão	Ilha, Florianópolis, v. 23, n. 1, p. 30-49, 2021.	Narrar uma história de encontros entre tainhas em migração pela Costa Sul brasileira, golfinhos nariz-de-garrafa que habitam a Lagoa Santo Antônio dos Anjos e pescadores artesanais.	Analisando o desenvolvimento de habilidades interespecíficas, o texto explora complementarmente os conceitos de etnoetologia, etoetnologia e etoecologia.
Periódicos Capes	O desamparo da ciência na transição para sociedades sustentáveis	Alci Albiero Júnior	Rev. Interd. em Cult. e Soc. (RICS), v. 7, n. 2, p. 1-13, jul./dez, 2021.	Aproximar o campo psicanalítico do reconhecimento das dimensões multiespécie da antropologia contemporânea.	A transição para a sociedade sustentável considera o humano e o não-humano.





Periódicos Capes	"Ataques de tubarões": Relações multiespécies e gêneros nas praias de Pernambuco-Brasil	Rayana Mendonça do Nascimento e Ana Cláudia da Silva Rodrigues	Revista Nanduty Vol.9 (13), p. 254-71, 2021.	Pesquisar sobre os incidentes ocorridos com ataques de tubarões, considerando as relações multiespécies.	É cruzando gênero, desenvolvimento, economia, classe e geração que percebe- se a complexa relação entre humanos e tubarões em Pernambuco.
Periódicos Capes	Agroecología y relaciones multiespecies para la coproducción de alimentos en la región pampeana de Argentina	Romina Cravero	Revista Nanduty Vol.9 (13), p. 64-93, 2021.	Explorar formas de fazer agroecologia e as relações multiespécies que ocorrem numa área da região dos Pampas na Argentina.	A análise etnográfica permitiu identificar como um grupo de agricultores concebe formas de co-produção de alimentos juntamente com outras espécies e entidades não-humanas.
Periódicos Capes	A multispecies assessment of wildlife impacts on local community livelihoods	Rocio Pozo et al.	Conservation Biology 35.1, p.297-306, 2021.	Caracterizar os padrões espaço-temporais de impactos de várias espécies co-ocorrentes nos meios de subsistência agrícolas no leste do Panhandle do Delta do Okavango, no norte de Botsuana.	A avaliação multiespécies tem implicações importantes para o desenho de intervenções de conservação destinadas a abordar os custos de viver com a vida selvagem e mitigar o conflito de conservação subjacente.
Periódicos Capes	Ensaio sobre a Zarza: Monocultura e colonialidade vistas do Wajmapu (território Mapuche)	Lucas da Costa Maciel	Revista Nanduty Vol.9 (13), p.45-63, 2021 .	Pesquisar sobre a Zarza, planta que tira proveito das perturbações produzidas pelos seres humanos para levar a cabo intencionalidades próprias.	Os bosques nativos estão cheios, são complexos: sua extensividade múltipla equivale à intensidade complexa de seus componentes.
Periódicos Capes	Humanos e Caranguejos nos Manguezais do Delta do Parnaíba: histórias da paisagem	Lucas Coelho Pereira e Pedro Castelo Branco Silveira	Revista Antropológicas, Ano 25, 32(1), p.1-36, 2021.	Evidenciar a constituição de paisagens multiespécie frente a processos históricos, e também narrativos, que insistem em eclipsar as diversidades biológicas e culturais.	As histórias desses sujeitos evidenciam ambientes que se constituem a partir das práticas. Mostram como processos de biointeração formam paisagens de emaranhamentos multiespécies cotidianamente.
Periódicos Capes	Imponderável da vida e o imponderável do rio: o rio São Francisco como um palco em movimento	Pâmilla Vilas Boas Costa Ribeiro	Revista de pesquisa i formació en antropologia, 26(2), p. 197-224, 2021.	Refletir sobre a teatralidade dos ribeirinhos no porto da cidade como uma forma de manejar as incertezas de uma vida em constante remodelação tal qual o movimento do rio São Francisco.	Nesse mundo em constante transformação, os ribeirinhos nos ensinam também a respeitar a natureza de cada ser e a interagir com as diferentes espécies que habitam os territórios.



Periódicos Capes	Guia de relações multiespécies na Baía de Florianópolis – SC	Ivan Tadeu Gomes de Oliveira	Cadernos de Campo, São Paulo, vol. 30, n. 1, p.1-18, USP, 2021.	A partir de métodos etnográficos em movimento, descrever histórias de assembleias multiespécies perturbadas por infraestruturas antropocênicas na baía de Florianópolis – SC, Brasil.	É preciso recuperar as paisagens perturbadas na baía de Florianópolis. Mais que dar ouvidos aos seus habitantes tradicionais – humanos e não humanos: é preciso reconhecer sua voz, seus saberes, suas estratégias de resurgência.
Periódicos Capes	Efeito dos regimes de manejo na ocupação de animais em um corredor de conservação no sudeste da Amazônia peruana	José L. Mena et al.	Mastozoología Neotropical, Vol.28 (1), p. 1-13, 2021.	Analisar a ocupação de espécies de mamíferos ao longo do corredor de conservação de Manu-Tambopata, localizada na Amazônia meridional do Peru.	Os resultados sugerem que em regimes gerais de gestão não tiveram um efeito à escala comunitária, mas efeitos específicos de co-variáveis para algumas espécies.
Periódicos Capes	Aclimatando humanos y plantas. La propagación de colonos ecologistas en Misiones (Argentina)	Gabriela Schiavoni	Mana Vol.27 (1), Rio De Janeiro, Brazil, p. 1-33, 2021.	Descrever as ações de estabilização da diversidade por meio de uma aliança com a natureza e gestão das tensões inter-espécies com uma bordagem ecológica.	As ações humanas sobre a natureza são frutos de uma relação interespecie. As mudanças de meio favorecem experiências onde são necessárias estabelecer tais relações.
Periódicos Capes	Mapeo ecopolítico: una metodología de investigación multiespecie para la comunicación ambiental	Jens Benöhr et al.	CS (Universidad Icesi. Facultad De Derecho Y Ciencias Sociales) 36, p. 317-43, 2022.	Utilizar o mapeamento ecopolítico enquanto metodologia para mapear relações entre diferentes espécies.	A abordagem metodológica proposta compreende um instrumento de educação ambiental, comunicação e ativismo.
Periódicos Capes	"Tinanica", Un Enredo Multiespecie: Apuntes Sobre El Cuidado Y La Defensa De Un Humedal En El Sur De Bogotá	Claudia Maria Vargas Aldana	Trabajo Social (Bogotá, Colombia) 24, p.61-85, 2022.	Abordar, a partir da interface entre a etnografia multi-espécies, o feminismo e os estudos sociais da ciência, os emaranhados enredos multiespécies que emergem das práticas de cuidado do a área úmida de pantanal Tibanica no município de Bosa em Bogotá.	Por meio das descrições etnográficas de "Tinanica" e do processo de germinação na água, que estes enredos que emergem dos cuidados permitem a apropriação do território e a defesa da zona húmida.
Periódicos Capes	As vespas que caçam com seus dentes: Artefatos multiespécies, ritual e relações entre humanos e não humanos entre os Karitiana (Rondônia)	Felipe Vander Velden	Mana (Rio De Janeiro, Brazil) 28(2), p. 1-34, 2022.	Analisar um ritual masculino entre os Karitiana, povo indígena Tupi-Arikém no sudoeste da Amazônia brasileira por meio das relações humano-animais e os estudos sobre artefatos indígenas.	Artefatos multiespécies tornam-se expressões materiais privilegiadas para a investigação das interações dos Karitiana com muitos outros seres humanos com os quais partilham o mundo.



Periódicos Capes	El giro multispecies: representación geohistórica del puma desde una perspectiva interdisciplinar (siglos XVI-XXI)	Fernando Venegas Espinoza, Andrés Moreira-Muñoz e Pablo Mansilla-Quifones	Diálogo Andino 67, p.326-45, 2022.	Compreender as representações da natureza na sociedade chilena, a partir de uma perspectiva geohistórica e a atual discussão de multispecie nas humanidades e ciências sociais.	O avanço da temática multispecie promove a necessidade de preservação das espécies, como é o caso do puma, com o intuito de uma compreensão mais profunda acerca de tais interrelações.
Periódicos Capes	Ciudades multispecies: Integrar justicia socialecológica para diseñar soluciones basadas en la naturaleza	Melissa Pineda-Pinto	Ambientico 281, p. 74-80, 2022.	Propor considerar os processos, funções ecológicas e elementos naturais, enquanto soluções para problemas relacionados às alterações climáticas e a perda de biodiversidade.	É por meio da natureza e das relações multispecies que podemos encontrar novas relações de cuidado e governança, novas formas de governança e novas formas de revalorizar os nossos espaços urbanos.
Periódicos Capes	Agroecología o Agricultura más que humana?: La coordinación con las plantas como técnica agrícola	Gabriela Schiavoni	Anuário antropológico, V.47 N.1   p.150-169, 2022.	Descrever as várias formas de ligação entre o homem e as plantas.	A noção de agricultura mais que humana engloba os aspectos não intencionais da domesticação, colocando a operação técnica sobre um organismo misto humano-vegetal.

Source: Prepared by the authors (2022).



## (Dis)articulations between Sustainability Studies and Multispecies Studies

Multispecies studies lead to the construction of plural worlds, where boundaries between humans and non-humans are crossed in order to recognize ontological interdependence. Thus, lives are intertwined in various ways (Aisher; Damodaran, 2016; Carvalho, 2020). In addition to the field of environmental history, the multispecies dimension has also stood out in the field of ethnography.

Carvalho (2020) addresses the issue of “epistemological vectors” in his study of rodents associated with anthropic environments. Species of *Rattus rattus* (roof rat) and *Rattus norvegicus* (brown rat) play multiple roles as agents and articulators in relations with humans during the Anthropocene, including demands related to urbanization that cut across the areas of public health, overpopulation, and environmental imbalance. Segata (2019), in researching the *Aedes aegypti* mosquito, also encompasses such issues.

Catão (2021) narrates a story of encounters between mullet, dolphins, and fishermen in a relationship of coexistence and collaboration. These are stories of multispecies life and temporalities that connect on the beach of Laguna (SC). It is very interesting to see how such synchronicity, bonds, and movements occur, in addition to the presence of a situation of multi-agency, in which agency is no longer concentrated in just one species but is shared. A co-responsive attunement and coordination is built.

The work of Nascimento and Rodrigues (2021) discusses the well-known relationship between humans and sharks in the state of Pernambuco. The authors bring intersectionalities to the fore as they traverse the complex relationships of gender, class, generation, and environment. According to them, relationships with non-human animals occur in different ways between men and women.

Espinoza *et al.* (2022) examined the relationship between Chilean society and non-human lives, in the form of pumas, through reports and analysis of historical moments from traditional peoples to the present day. According to the authors, in the past there was a certain hierarchy that sought to demonstrate man's domination over big cats. However, over time, society has become more sensitive to environmental issues, while also becoming more fearful of the wild world (Espinoza *et al.*, 2022).

In studies conducted with plants by Schiavoni (2021), the author emphasizes that the environment is no longer seen as a mere static backdrop where human actions take place. The environment has come to be understood as a dynamic medium, a constant set of human and non-human agents that make history together. Cravero (2021) observed a web of reciprocal interdependencies in motion, realizing that in the field of agroecology it is possible to produce and reproduce rural life in a dynamic of multispecies coexistence, which recreates its own existence.

Known as the Parnaíba Delta, the landscape composed of the Parnaíba River and the sea forms a set of brackish water channels. This area was chosen by Pereira and Silveira (2021) to highlight the constitution of multispecies landscapes in the face of historical processes. The heterogeneous environment and the formation of mangroves allow the coexistence of marine and freshwater animals. The region is inhabited by residents who live alongside the other elements of the landscape: animals, plants, tides, soils, etc. This relationship between humans and non-humans has undergone transformations over time, as the landscape has also changed. The authors describe experiences highlighting the relationships between mangroves, crabs, and crab catchers, which persist due to the historicity of the Delta landscape. It is an environment constituted by interactions evidenced in the pulse of the mangrove forests that form a large multispecies tangle. The banks of the São Francisco River, in the great hinterland of Minas Gerais, were also the subject of a study of multispecies relationships in research conducted by Ribeiro (2021), with the aim of understanding how beings perform and act with the dynamics and cycles of water.

Explaining the relationships that are embedded in the landscape, the lives that interact with each other, and where humans are part of this multiplicity of beings requires that the (false) idea of human hierarchy over a subjugated nature be debunked (Holliver, 2020). A more-than-human agency brings the idea of a multispecies connection and the idea of emerging new types of non-hierarchical relationships and alliances (Kirskey; Helmreich, 2010).

Research conducted by Velden (2022) presents the use of multispecies artifacts by the Karitiana indigenous people in the Brazilian Amazon, illustrating one of the many aspects that can occur in relationships between humans and what the author calls other-than-humans, considering symbolism and issues that go beyond expressions of such relationships.

Still in the field of anthropology, the multispecies dimension plays a significant role in the interdisciplinary field, also contributing to conflict resolution, as it considers multiple forms of life and their social and ecological relationships (Lederach, 2019). Lederach (2019) analyzed the interconnected lives of peasants in a conflict-





ridden region of Colombia: avocado plantations, traditional crops, and animals, which form a distinct and particular niche of territorial harmony in search of pacification. An ecological notion, which recognizes the environment not as static but as emerging in the process of life, contributed to a more harmonious coexistence in that region, where the community recognizes the relationships between humans and non-humans and considers them central to their own identity. The multispecies lens revealed the construction of a more relational, processual, and dynamic behavior valued for peace.

According to Meillon (2019), the so-called "ecopoetic language" is a form of human expression of the cultures of nature, a form of mediator between multiple voices that intertwine in the environment, which is much more than a mere backdrop. She addresses the novel by writer Barbara Kingsolver, which relates to ecofeminist themes and the field of ecopsychology. Kingsolver's work contributes to awakening the human, collective, unconscious environment, which is our "ecological unconscious," and draws on chaos theory, inviting readers to change interpretive paradigms. She considers a language that attempts to reconnect us with the animal, plant, and elemental wildlife that we humans come from and depend on. An integrated context that forms an ecological design that humans cannot free themselves from or control.

We can cite environmental psychology, which proposes another way of perceiving the relationship between humans and their surroundings, a matrix formed by different species and the environment, a collective and diverse approach that encompasses the concept of a web. The biocentric principle is intertwined with the complexity of existence (Ferreira and Bomfim, 2010). Here, too, it is plausible to insert perspectives from the modern era, which argued that living beings have the capacity to experience sensations and feelings such as pain, pleasure, joy, and sadness (Silva and Rech, 2017). Species are capable of affecting and being affected by others, by the environment, and this implies our constitution (Aldana, 2022). It is possible that we are holobionts (Gilbert, 2017), an ecological fusion formed by symbiosis, connection, interaction, including emotions, with other species. Affective and ethical relationships with nature are recognized and guide the challenges of preserving ecosystems (Fonk and Jacob, 2018).

Albiero Junior (2021) believes that sustainable societies are those that recognize the agency of both humans and non-humans in coordinating skills in the (re)construction of worlds. He brings in the ideas of Anna Tsing (2019) to add that such societies "will be those that allow the (re)emergence of coordination for multispecies habitability" (Albiero Jr., 2021 p. 4).

## Final considerations

In light of these studies, it is possible to see that a network of relationships between different species can contribute to the sustainability of ecosystems. The differences between species make more equitable life scenarios possible (Aldana, 2022). Reflecting on this process and the formation of this immense mosaic of interactions contributes to our awareness that we are part of it. Thus, it is also our responsibility, each and every one of us, to chart a more sustainable future for a multispecies world.

As Tsing (2015a, 2015b) points out, the landscape is not merely a backdrop against which human activities take place; the landscape comprises a multispecies assembly, composed of the intertwining of diverse forms of life. The environment is part of all of us, and we all belong to it.

In this context, interdisciplinarity across various areas of knowledge is extremely important so that society can effectively promote the practice of sustainability. To this end, one of the fundamental principles that guides this complex understanding of the interdependence of elements is ecology and all its aspects. We must understand the ways in which ecosystems are organized and incorporate other areas in order to implement actions that are effectively socio-environmentally responsible. This implies knowledge, awareness of environmental issues, consciousness-raising, and changes in habits. Human beings have transformed ecosystems, causing many negative impacts. It is our duty to seek to reverse this situation and, in addition to minimizing such damage, to provoke and amplify positive impacts.

This study explored the intersections between sustainability and multispecies studies, offering perspectives and outlining challenges for building truly sustainable societies. Although the approach allowed for a comprehensive analysis of potential contributions and conceptual obstacles, it is important to recognize some limitations. The thematic breadth of sustainability and multispecies studies made it impossible to delve exhaustively into all its ramifications, resulting in a more panoramic than detailed discussion in certain areas. Future research should focus on an in-depth analysis of initiatives and communities that already integrate, or seek to integrate, the welfare of non-human species into their sustainability practices.





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