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Who Gets to Know about Nature?
Biodiversity and Ecosystem Services through an Intersectional Lens

Abstract: Intersectionality originates in feminist critical theory as a perspective for analyzing categories of difference and relations of power. In this article we explore how the categories of 'human' and 'nature' are made meaningful in relation to each other and assemble an intersectional analytical lens drawing on theories from the fields of ecofeminism, critical animal studies and posthumanism. A common theme in these fields is the dualistic construction and representation of humans and nature as separate entities and we study how such dualism plays out in relation to issues of knowledge and subjectivity. The analytical lens is engaged to explore the concepts of biodiversity and eco-system services, which have emerged as keywords for conceptualizing human-nature relations in environmental research and policy. We assess debates around the concepts of biodiversity and eco-system services in scholarly publications, and how these reflect, reinforce, or contest dualistic and hierarchical constructions of human-nature relations. We look for principal tendencies, as well as challenging perspectives and voices.

Keywords: ecofeminism; critical animal studies; posthumanism; dualistic construction; knowledge.

Who Gets to Know about Nature?
Biodiversität und Ökosystemdienstleistungen in einem intersektionalen Blickwinkel

Zusammenfassung: Intersektionalität knüpft als Perspektive an die kritisch feministische Theorie an, um Differenzkategorien und dynamische Machtverhältnisse zu analysieren. In dem vorliegenden Aufsatz untersuchen wir, wie die Kategorien ‚Mensch' und ‚Natur' in Verbindung zu einander Bedeutung erlangen und entwickeln einen intersektional analytischen Blickwinkel, gestützt auf Theorien aus den Bereichen Ökofeminismus, critical animal studies und Posthumanismus. Eine weitverbreitete Thematik in all diesen Feldern ist die dualistische Konstruktion und Repräsentation von Menschen und Natur als separate Entitäten und wir untersuchen die Frage danach, wie solche Dualismen in Bezug auf Wissen und Subjektivität auftreten. Mit Hilfe des intersektionalen Blickwinkels analysieren wir Konzepte von Biodiversität und Ökosystemdienstleistungen, die sich als Schlüsselbegriffe der Konzeptualisierung von Mensch-Natur-Beziehungen in Umweltforschung und Politik herausgebildet haben. Hierzu werten wir die Debatten um die Konzepte von Biodiversität und Ökosystemdienstleistung in akademischen Publikationen aus und erläutern, wie dualistische und hierarchische Konstruktionen von Mensch-Natur-Beziehungen darin gespiegelt, bekräftigt oder bestritten werden. Dabei suchen wir nach den prominentesten Tendenzen ebenso wie nach kritischen Perspektiven und Stimmen.

Schlagwörter: Ökofeminismus; critical animal studies; Posthumanismus; dualistische Konstruktion; Wissen.

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Introduction

Feminist research and activism has a long tradition of destabilizing ideas of universal knowledge and objectivity, and of questioning whose voices are privileged over others as well as of showing how claims to knowledge and legitimacy are embedded in dynamic power relations linked to gender and other social categorizations. Intersectionality has been developed within feminist critical theory as an analytical tool for exploring how relations of power take form and play out on all levels of interaction, from individual encounters to societal structures. Intersectional analysis explores how categorizations – including gender, class, race, age and sexual orientation – are entangled and co-constructed, and form the basis for complex and shifting relations of dominance and marginalization. So far, intersectional research has focused on relations among humans with little attention to environmental issues and relations involving non-humans. Previously we suggested that intersectionality might be engaged in studies of climate change issues (Kaijser/Kronsell 2014) and here we draw on this work to discuss how intersectional analysis may be extended to also include human-nature relations.

Intersectionality is not a theory, it is an analytical perspective or a lens through which a phenomenon may be studied, engaging theories in relevant areas of research. In this article, we have chosen to draw on three fields that aspire to analyze human-nature relations: ecofeminism, critical animal studies, and post-humanism. After an introduction to intersectionality, we move on to introduce and discuss these theoretical fields. We identify a critical stance towards processes of dualistic construction in human-nature relations as a common theme. This theme – dualistic constructions – informs the intersectional analytical lens that we develop and we explore it by looking at constructions and representations of knowledge and subjectivity in relation to the concepts *biodiversity* and *ecosystem services*.

The UN Convention on Biological Diversity defines biodiversity – or biological diversity – as "…the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (UN CBD 1992). Biodiversity refers to all existing living organisms, including all animals and plants. Thus defined, we suggest that biodiversity is a concept that has potential to be inclusive of intersectional categories and relations, as the emphasis is on variability among living organisms, on various categories of species and their relationships with each other. The concept ecosystem services has gained popularity as a way to 'operationalize' biodiversity, and is defined as the benefits humans receive from biodiversity (cf. MEA 2005).

In the past decades the two concepts, biodiversity and ecosystem services, have spread from scientific to policy literature to become keywords in both science and

policy discourse on environmental issues. This motivates our pick of scholarly publications for review. In our analysis of publications concerned with the two concepts we used what we term an *overarching* and a *profound* intersectional analysis. The overarching analysis which encompassed a larger amount of material in order to show wider tendencies of representation, difference and/or injustice, asking questions like 'how often?' or 'how many?' served as the base for a profound analysis that covers a narrower material and asks questions regarding meaning making to understand, for instance, how and why particular subjectivities and perspectives gain privilege over others. These modes of analysis complement each other and have resulted in a selection of articles which are discussed using the themes drawn from the theoretical fields of ecofeminism, critical animal studies, and posthumanism.

We found that dualistic constructions of human-nature relations were predominant in the material and elaborate on this in the analysis. Exploring representations of knowledges and subjectivities, we found that a particular notion of universal scientific knowledge, focused on measuring and mapping nature, and associated with supposedly neutral and objective scientist knowers, was privileged. While alternative kinds of knowledge and different knowing subjects were sometimes recognized and called for, these were represented as 'other', at best complementing and informing the dominant scientific understanding.

Intersectional Approaches to Environmental Matters

Intersectionality is grounded in feminist theorization of power and knowledge production, as a way to understand and shed light on how complex dynamics of power emerge and interact. Davis (2008: 68) defines intersectionality as "the interaction between gender, race and other categories of difference in individual lives, social practices, institutional arrangements, and cultural ideologies and the outcomes of these interactions in terms of power". The underlying ideas are not new. Feminist scholarship and activism have placed gender in relation to other structures of domination long before the concept of intersectionality was introduced (Brah/Phoenix 2004; Lykke 2005). Crenshaw (1991) who is accredited with first using the term, did so with sharp criticism of what she perceived as a white, middle class woman's perspective dominating the mainstream feminist movement. Anti-racist and postcolonial commentary continues to vitalize feminist studies and, together with queer, masculinity and disability studies, enriches the understanding of how norms are constructed and power relations interact. Intersectionality functions as a common platform for feminist theorizing (Lykke 2005; see also Davies 2008).

While intersectionality emerged within anti-racist feminism, related ideas have developed within various strands of feminist theorizing, including ecofeminism. The strands have developed in parallel but largely as divergent paths. Postcolonial and poststructural feminism have generally advanced a humanist focus

on intersections of, for instance, race, class and gender, while ecofeminism, animal studies and posthumanist feminism – on which we elaborate further below – have addressed human-nature power relations, particularly questioning human dominance and the idea of humans as exceptional, separated from nature and the single subject of knowledge and agency.

Intersections of power can be found in all relations, on all levels from institutional practices to individual actions (de los Reyes/Mulinari 2005). Social categorizations are co-constituted in relation to each other (e.g. working-class man, indigenous woman), and serve as grounds for inclusion and exclusion, and for defining what is to be considered normal or deviant. Yet, these categories are not necessarily explicit: there is a need to look for invisibilities and silences as intersectional categories are not necessarily referred to because they reflect underlying and implicit power patterns often depicted as 'natural' or 'given' differences (Winker/Degele 2011). Intersectionality is not by default associated with any specific methodology but attempts have been made at outlining methods for applying intersectionality empirically (see e.g. McCall 2001; Winker/Degele 2011). For further analysis, an intersectional approach – not being in itself a theory – relies on a range of social theories about identity formation and power relations. Theories relating to nature, non-humans and the environment have had less influence on intersectional research than those focusing on social aspects. We argue that for intersectionality to be useful for studying environmental and sustainability issues, it needs to be informed also by theories generated in research fields that look at the relationship between the contested binary categories of society and nature. Thus, in the following we explore the theoretical fields of ecofeminism, critical animal studies and posthumanism to develop an analytical lens that allows us to trace and interrogate intersectional power relations in conceptualizations of biodiversity and ecosystem services in scholarly literature.

Intersectionality in Environmental Research: How Can Nature Be Included?

In this section we review three areas of scholarship, ecofeminism, critical animal studies and posthumanism, for their contribution to understanding intersectional power dynamics. We ask what they provide in terms of understanding power relations between humans and nature and how these relations can be conceptualized. Through the review we find themes that provide the lens used to guide our analysis. While we here, for increased clarity, divide the fields in three different sections, it should be noted that they often overlap, and some authors can be placed in all of the three scholarships.

Ecofeminism

Ecofeminist scholarship makes a substantial contribution to the conceptualization of intersectional power relations. As nicely summarized by Mallory (2013: 251) ecofeminism's main argument is that

> …not all groups of humans are situated equally in regard to ecological degradation and exposure to environmental toxins, as a direct result of histories of inequality and oppression. These histories are linked through processes of dualism, in which nature/humans, Anglo-European 'whites'/people of color, and masculinity/femininity are placed into opposition. Such conceptual pairings are gendered, as well as raced, classed, and specied. Ecofeminism directly interrogates the sources and effects of these pairings, exposing the ways in which sexist ideologies are connected to 'naturism'.

Ecofeminism emerged from a rich variety of scholarly disciplines and political contexts. Many of the first ecofeminist contributions (e.g. Daly 1978; Griffin 1980) appeared in arts and theology, often focusing on the spiritual development of the human self in relation to the environment, not unlike the approach of eco-philosophical scholars (e.g. Devall/Sessions 1985; Naess 1989). Empirically, many early studies concerned women's experiences of environmental degradation in or close to the home (Gibbs 1997) and later work continues to focus on women's local activism (Moore 2015).

Ecofeminist scholarship in history, social sciences and among philosophers and theorists with an interest in power relations is what we find most relevant for developing intersectionality to embrace relations with nature and non-humans. In general, ecofeminists conceptualize the body as simultaneously biological and social and shaped by material as well as social relations and structures (Cudworth 2005: 134). In what follows we briefly outline ecofeminist contributions. From this diverse literature we focus on the concept of dualism introduced by Merchant and developed most comprehensively by Plumwood as one of the most important contributions from ecofeminism in understanding intersectional power relations. Thereby we exclude valuable ecofeminist contributions that engage with power relations, such as systems theorist Cudworth (2005), as well as contributions that deal with political institutions (Sandilands 1999) and with human political agency in relation to nature (MacGregor 2004, 2006).

Plumwood (1993) suggests that human-nature relations be conceptualized as reproduced through dualism(s). For one, she builds on a central tenet in Bookchin's (1990) social ecology, that domination of nature is closely tied to the domination of humans by humans. Secondly, she builds on the work of Merchant who established that the domination of humans by humans developed historically in relation to nature and gender. Dualism is "a key factor in Western civilization's advance at the expense of nature" writes Merchant (1980: 143). The move from an organic to a mechanical world order based on a nature-cultural

dualism constructed culture superior to nature. The mechanist construction includes understanding the human self as a rational master rendering nature as vegetative matter, inert and controllable, open to human manipulation and management (Merchant 1980: 214, 245f.). Merchant and later Plumwood provide structural interpretations of how the gender power order is implicated in the exploitation and destruction of nature, across intersectional categories and through a logic of dualism.

Plumwood proposes dualism as a way to understand power relations between humans and nature. Dualism, she argues, "results from a certain kind of denied dependency on a subordinated other" (1993: 41). Rather than focusing on masculinity per se as the site of domination, she refers to a "master identity" defined by the multiple exclusions inherent in Western culture where otherness is constructed not only in terms of gender, but also along binaries such as culture/nature, reason/emotion, and civilized/primitive which naturalize, for instance, "gender, class, race and nature oppressions" (1993: 43). Plumwood suggests that master practices, or processes of dualistic conceptualization, establish hierarchical ranking and justifies subordination (see also Warren 1990: 129). Dualistic construction happens through processes of *backgrounding*, *exclusion*, *incorporation* and *objectification* (Plumwood 1993: 47-60). Backgrounding denies the master's material and symbolic dependence on the other and marks the other as different and deviant from the perspective of the master, which is set up as universal. Exclusion is another way of denying association whereby characteristics of the self and the other are magnified, essentialized, and polarized, so that the dualistic categories are depicted as being different and having nothing in common. This, in turn, serves to naturalize hierarchies and oppression. Incorporating the other with the self is another process of dualistic construction. This means that the other is defined as a lack or an absence in regard to the self. Thus, "the other is recognised only to the extent that it is assimilated to the self, or incorporated into the self and its systems of desires and needs" (Plumwood 1993: 52), and there can be no reciprocal relation between the self and the other. Finally, objectification is a process whereby the needs, wishes, and rights of the other are only considered in terms of the instrumental values the other has to the master subject, and has provided the argument that natural resources are there for (particular, intersectionally situated) humans to use as they please. Through these master practices of dualistic construction, domination is established and maintained. According to Plumwood, this leads not only to a distorted understanding of human-nature relations (see Gaard 2015 on climate change), but also to unjust relations because master identities are privileged by and in control of these processes.

Critical Animal Studies

The field of critical animal studies also offers valuable insights to the inclusion of non-human subjects in analyses of power by problematizing the strict categorizations of 'human' and 'animal', and the hierarchical relations that these imply. Humans and non-human animals have always co-existed in close interaction with each other: such interactions play important roles in human societies and cultures, in both symbolic and material senses. Human-animal relations are often characterized by oppression, forced labor, and violence (Andersson et al. 2014). Throughout the history of knowledge production, much thought has been dedicated to theorizing human-animal relations and how such relations ought to be organized. The broad category of 'animal' is generally posed in opposition to the category of 'human'. Thus, all kinds of animals are grouped into a category of absolute others. Scholars in critical animal studies attempt to deconstruct this binary and to illuminate how it serves to establish and justify a relationship of hierarchy and domination, with violent consequences for non-human animals. For instance, Calvo explores how, through processes of othering and objectification, animals 'become meat' in industrial farming, involving violent, oppressive practices. These practices are also gendered, as the reproductive capacities of female animals are exploited for instance in dairy and egg production (Calvo 2008), thus exemplifying intersections of sexism and speciesism.

Best points out that "the discourse of the 'human' has been constituted in dualistic, speciesist, racist, patriarchal, and imperialist terms" (Best 2009, para. 11). The system of human domination over animals, in which human supremacy is rendered unquestionable, is interlinked with other hierarchies based on, for instance, race, gender, function, and class (Wolfe 2009; Twine 2010), so that women, people of color, people with disabilities, or the working class are, in different ways in different times and societies, considered 'less human' and closer to animals. Following the dualistic categorization of animals as different from and inferior to humans, being likened to animals, means being degraded. There are overlaps in the focus and motivation between critical animal studies and other fields of critical social theory, including feminism, queer theory, postcolonialism, and poststructuralism. Feminist researchers have for decades paid attention to such interconnections, and many have engaged feminist theory to address human-animal relations (see Adams/Donovan 1995; Plumwood 1995; Birke et al. 2004; Haraway 2008; Twine 2010). Several scholars have called for – and attempted – inclusion of non-human animals in analysis of intersecting power relations (Twine 2010; Birke 2012). This is a very important contribution both to feminist research and to the theorization of relations between 'humans' and 'nature' more generally.

Various difficulties have been identified regarding the inclusion of non-human animals in intersectional analysis. First, as several scholars have remarked, mainstream feminism has often been hesitant to engage in studies of animals and nature. This hesitance may be explained by fear of association with essentia-

list notions of women being – by biological determination – closer to nature, and therefore less human, than men (Twine 2010; Gaard 2011; see Kaijser/Kronsell 2014 for elaboration). A second challenge is of a more epistemological kind, and relates to what kinds of knowledge we, as humans, can produce about, and together with, animals, especially considering the violence and oppression that often characterizes human-animal relations, and the fact that 'animal studies' are carried out from a human, and thus anthropocentric, point of view (Wolfe 2009; Birke 2012; Pedersen 2014). Birke asks: "How good are our theories, intersectional or otherwise, at recognizing our situation and experiences as one species among many?" (2012: 154). Given the repression and suffering that animals experience in their interaction with humans, this question has deep implications for ethics and justice (see Pedersen 2014). It connects closely to a long history of theorizing oppression related to, for instance, gender, race and sexuality, where important though often painful debates have taken place regarding what can be known, how, and by whom, and who is to be considered a legitimate subject of knowledge (e.g. Alcoff/Potter 1993; Harding 1986, 1991).

One aspect brought up by scholars in critical animal studies, is the fact that even though humans make great efforts to separate ourselves physically and discursively from (other) animals, our lives are closely intertwined with theirs on terms that are far from equal. Through the consumption of meat, dairy, eggs, wool and leather – produced under more or less industrialized, and very often oppressive, conditions – humans live through and with the bodies and lives of animals, although in the daily lives of Western, urban people this is generally not recognized as production takes place somewhere else, out of sight. In a very physical sense, humans are to a great extent constituted by non-human matter – through the abovementioned eating and using of animals and animal products, or considering that our 'own' bodies by nature consist of more bacteria and other micro-organisms than of human genomes (Haraway 2008; Andersson et al. 2014). As Haraway puts it: "I am vastly outnumbered by my tiny companions; better put, I become an adult human being in company with these tiny messmates" (Haraway 2008: 4). Recognition of such (inter)dependence and co-becoming with non-human others has led to calls for altered approaches to the meanings and implications of notions like care, ethics, and responsibility (see Haraway 2008; Rossini 2014). While intersectional perspectives from feminist social/cultural approaches have a related aim to connect several lines of discrimination and hierarchizing, critical animal studies provide motivation for intersectional explorations with the normative aim to challenge hierarchical constructions and to recognize different perspectives and agencies than those of a particular kind of humans.

Posthumanism

Entanglement with, and responsibility towards, the non-human is a key concern also of the broad research field that is labeled posthumanism. Contributions to this field are diverse but share the ambition to extend analysis to perspectives and agency of non-humans, including animals, plants, microorganisms, and matter. The label posthumanism indicates a challenge to the centering of humans as the single subject of knowledge within the humanities, and to what has been depicted as an exaggerated focus among scholars in social sciences and the humanities on discourses and symbolic representations, leaving the material world aside (see Barad 2003; Hekman 2010). The increasingly severe environmental destruction and climate change, and the intensified control over bodies and lives, are often brought up as motivations for this attention to non-human subjects and matter (see Tuana 2008; Bennett 2009; Hekman 2010).

Feminist research plays a central role in this field (see Alaimo/Hekman 2008; Alaimo 2010; Hekman 2010; Åsberg et al. 2011). As for ecofeminism and critical animal studies addressed above, some posthumanist feminist scholars have pointed to a hesitance among feminists to engage with bodies and the material environment. Many feminists, they argue, harbor a fear of talking about 'nature' as this may indirectly reinforce essentialist notions that associate 'women' with 'nature', 'matter' and 'animality' and thereby question the position of women as rational, thinking, human subjects (Alaimo/Hekman 2008; Hekman 2010). Feminist posthumanist scholars seek to challenge this reluctance by placing human-nature relations at the heart of feminist inquiry. They draw on insights from poststructural and postcolonial feminism, queer theory, and ecofeminism, and strive to bring these insights into analyses that include non-human subjects and environments. For instance, feminist posthumanist work is concerned with exploring the instability of subject positions and categorizations, and with challenging dualistic binaries such as man/woman and human/nature, and instead focuses on relationality and co-becoming (Alaimo/Hekman 2008). Such ideas are not novel. The gendered body as a site of both oppression and specific knowledges along with gendered material practices, such as the division of labor and resources, have been at the center of attention and critical analysis within feminist scholarship and activism since its inception (see Ahmed 2008 for a critical discussion). However, set aside the debate about novelty, posthumanist work offers insights regarding human-nature relations that are important for the purpose of this article.

Similar to – and in dialogue with – critical animal studies, many posthumanist feminists stress the interdependence and unbounded physical interrelations among humans and non-human subjects and matter. Alaimo proposes the term 'trans-corporeality' to account for the continuous flow between human bodies and material surroundings – through, for instance, breathing, intake of food and liquid, and circulation of chemicals and particles – and how these two cannot be distinguished as separate entities (Alaimo 2010). Trans-corporeality, Alaimo

argues, "brings the human body back into focus", but also "denies the human subject the sovereign central position" (ibid: 15-16) through emphasizing our physical interconnectedness with the environment. She hopes that awareness of this entanglement may incite new and different kinds of environmental ethics that are "not circumscribed by the human but [are] instead accountable to a material world that is never merely an external place but always the very substance of our selves and others" (2010: 158). Posthuman becoming through trans-corporeality challenges constructed boundaries and advances intersectional analysis way beyond binary constructions of human-nature.

Analytical Themes and Research Design

Above, we have briefly introduced three theoretical fields – ecofeminism, critical animal studies, and posthumanism – that relate to and offer highly relevant input to an intersectional analysis of *human-nature relations*. In this section, we return to a few recurring themes that we look to in our subsequent empirical analysis.

A common theme in the fields reviewed above is that they all problematize binary categories and *dualistic constructions* as key in how power relations among humans and between humans and non-humans are constructed and maintained. They also offer alternative conceptions, challenging dualistic models. Drawing on the work of Plumwood (1993) we employ the conceptualization of dualistic constructions as master practices. This helps us recognize the processes by which nature is rendered as 'other' in debates around biodiversity and ecosystem services. As a means to further specify our analysis, we explore how dualistic constructions play out in relation to *knowledge* and *subjectivity* – both of which are central concerns of many scholars in the theoretical fields presented above, and found highly relevant as we demonstrate in the empirical analysis.

Knowledge is a crucial theme when exploring human-nature relations, and we found that it was a main topic of contention in the scholarly work dealing with biodiversity and ecosystem services. Which knowledge is regarded as valid and legitimate, and thus informs action and decision-making, is a topic on which feminist theorists have offered valuable contributions. Here, Harding's work on standpoint theory (Harding 1986) and Haraway's work on situated knowledges (Haraway 1988) may be mentioned, as they put into question the assumption that scientific knowledge is neutral and objective, and suggest that scientists, like everyone else, are situated subjects coming from particular positions, which need to be recognized rather than ignored. How nature and non-humans are 'known', or made meaningful, has great bearings on environmental policy and practices. In the debates around biodiversity and ecosystem services, which we will discuss in the next section, certain knowledges are given a more prominent position than others. As biodiversity has emerged as a key concept in environmental scientific and policy discourse, mapping and categorization of species

has been assigned great importance as a means of understanding nature – and defining its value, as in the notion of ecosystem services. Here, scientific, and supposedly universal, knowledge is given privilege over other kinds of knowledge about nature, including more local and practice-based knowledge.

The issue of knowledge is closely related to questions of *subjectivity*. What is foregrounded as relevant knowledge relates to who counts as a knowing subject with agency. In post-Enlightenment scientific discourse, humans – and very particular humans (predominantly white, Western, highly educated males) – are regarded as the primary subjects of knowledge, able to look at the world from a supposedly neutral position; thus the situatedness of these knowing subjects is made invisible. Scholars within the three theoretical fields introduced above have all made efforts to challenge this idea of abstract neutrality, and to extend the position of knower beyond the sphere of scientific research and scholars as 'master subjects' of knowledge, and beyond the human, to include, for instance, animals.

A crucial step in any intersectional analysis of environmental matters and human-nature relations is to ask questions about how nature is represented in the analyzed material. In our study, social scientific scholarly literature discussing biodiversity and ecosystem services has been analyzed through two steps: first an *overarching* and then a *profound* intersectional analysis (see Henriksson/Kaijser 2016). As our study has as its focus how the concepts biodiversity and ecosystem services are discussed in the literature, in the first step we asked how the literature understands nature through these two concepts. We began by conducting an overarching bibliometric study[1] to identify scholarly literature that potentially could help us answer these questions. Through our overarching analysis we established that certain subjectivities were more frequent and certain kinds of knowledge were dominant, e.g. numerically the natural science articles were significantly more frequent than social science contributions and that the majority of articles came from western academic institutions. To be able to say more about what has been backgrounded and excluded in the scholarly debate a more profound intersectional analysis was necessary. We searched for tendencies of intersectional thinking across human-nature boundaries and looked for recognition of diverse subject positions and knowledges, and of transcorporeal relations. We chose articles that focused on biodiversity and ecosystem services and in their abstracts indicated that they were theoretically driven, and/or problematized these concepts somehow. The analysis revealed only a few examples representing, in this way, intersectional thinking and as we were keen to include as broad a range of perspectives as possible, we asked peers to recommend literature. We ended up with 39 articles for the in-depth analysis. This helped us outline how the understanding of nature, through the conceptualization of biodiversity and ecosystem services, was related to dualistic conceptualizations, what knowledge was dominant, and what resistances and contestations of dominant knowledge were present. These questions and themes are further elaborated in the remainder of the article.

Intersectional analysis of Biodiversity and Ecosystem Services

Biodiversity: an Intersectional Concept Turns Instrumental

The concept of biodiversity has proliferated in academic and policy discourse since the 1990s, when species extinction as a threat to biodiversity gained attention as one of the top environmental issues (Hill et al. 2013; Väliverronen 1998). The UN Convention on Biological Diversity presented at the Rio Earth Summit in 1992 helped spread the concept to larger audiences (Turnhout et al. 2013). Here, biodiversity was defined as "…the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems." (UN CBD 1992). This definition of biodiversity is the one most referred to in the articles that we analyze. As it refers to all existing living organisms, including all animals and plants as well as their relations in ecosystems, biodiversity can encompass intersectional categories and relations. The concept covers a great span: biodiversity "is about almost anything that is good and under a threat in our natural environment" (Väliverronen 1998: 31) and "the variety of life on Earth" (Mayer 2006: 109). The breadth of the concept is part of its popularity – similar to the concept of sustainability, biodiversity may mean almost anything (see also Takacs 1996). This broad character implies a potential for intersectional consideration and inclusion and, as Haila argues, biodiversity offers the possibility "to cope with the nature-culture dualism" (1999: 166), which presumes that humans dominate nature. He understands biodiversity as processual and embodied, which resonates with Alaimo's (2010) notion of trans-corporeality. Ecosystems comprise particular organisms mediated through metabolic processes and a continuous flow of energy and nutrients, which are self-organized (cf. Cudworth 2005). Hence, Haila argues, biodiversity conservation should not be about the protection of 'external' biological entities but about the respect of recurring self-organization in eco-social complexes that are 'internal'. Biodiversity is thus not to be seen as an external necessity for fulfilling human needs but as integrating human lifecycles: "human induced change is not essentially different from change in nature due to nonhuman factors" (Haila 1999: 176). This approach, he continues, requires transgressing dualistic conceptualizations.

Like Haila, Turnhout et al. (2013) argue that the concept of biodiversity has been attuned to a particular, distanced and simplified way of relating to nature, drawing on a certain kind of scientific knowledge (see also Bowker 2000). On a similar note, Escobar asks: "[D]oes 'biodiversity' exist? Is there a discrete reality of 'biodiversity' different from the infinity of living beings, including plants, animals, microorganisms, homo sapiens, and their interactions, attraction and repulsion, co-creations and destructions?" (1998: 54). He suggests that biodiversity may be approached not as "a true object that science progressively uncovers", but as "an historically produced discourse", which responds to "the problematization of survival motivated by the loss of biological diversity" (Escobar 1998: 54). Thereby

he points to the privileged role of a particular kind of scientific knowledge in defining and making sense of the concept of biodiversity, reflecting a specific articulation of the relation between humans and nature.

Ecosystem Services: Valuing Biodiversity

Similar to biodiversity, the concept of ecosystem services has spread from scientific to policy literature in the past decades. The concepts are tightly linked; in some cases ecosystem services has replaced biodiversity. A commonly cited definition of ecosystem services comes from the 2005 Millennium Ecosystem Assessment: "the benefits humans receive from ecosystems" (MEA 2005). Beyond the usefulness of ecosystem services to humans, human-nature relations are here made invisible and nature is seen as a lack or an absence in relation to human subjects. When nature is framed as ecosystem services it opens up for objectification which is, using Plumwood's terminology (1993), when the needs, wishes, rights of the other turn into instrumental values in relation to a particular, intersectionally situated master subject, and provides the grounds for the idea that biodiversity is there for humans to use as they please. In line with Escobar (1998), and inspired by the work of Latour (2004), Turnhout et al. (2013) suggest that the entwined discourses of biodiversity and ecosystem services should be read as part of 'the project of modernity', in which humans are conceptually separated from nature (cf. Merchant 1980). This means that ecosystems can be studied and managed as if human were not part of them – neglecting the close entanglement of humans with non-humans, and also neglecting aspects of nature that are not perceived as needed by humans.

Redford and Adams point out that there are many ecosystem processes that do not immediately benefit humans, for example fires or floods that may have an important regulatory function but can be disastrous for human societies particularly in the short term. They argue that

> [t]here is a danger that an economically driven focus on those "services" that are valuable to humans in their nature, scope, and timing may lead to calls to "regulate" ecosystem services to times and in flows that match human needs. Such regulation may be highly detrimental to long-term survival of the nonhuman parts of the ecosystems. (Redford/Adams 2009: 786)

Redford and Adams problematize the relation between ecosystem services and biodiversity, emphasizing that efforts to sustain specific ecosystem services may not serve to protect biodiversity. Despite what might have been the intention when introducing the ecosystem services concept, replacing existing species with other species – alien to the particular ecosystem – may maintain and even improve the provision of particular ecosystem services, while it may threaten biodiversity (Redford and Adams 2009). Thinking intersectionally, there is also a need to address how the concept ecosystem services relates to species that

are domesticated and/or highly useful to humans, but extensively exploited for example in industrial farming. None of our articles address significant questions raised in critical animal studies (Andersson et al. 2014; Pedersen 2014) about how to include ethics and responsibility towards structurally oppressed non-human species in the discussion of ecosystem services.

In the literature analyzed we also find evidence of a more pragmatic approach to biodiversity and ecosystem services, which considers these concepts as part of global environmental policy and governance. According to Meinard et al. (2014: 102) biodiversity is a concept able to unite different scientific traditions and public discourses opening for the possibility to bridge different interpretations and meanings. The 2005 Millennium Ecosystem Assessment is seen as an influential document whereby the idea of ecosystem services was transferred from academic writing to high-level environmental and conservation policy (Redford/Adams 2009; Seppelt et al. 2011; Dempsey/Robertson 2012). Market based instruments have long been preferred environmental and climate policy tools but it was only with MEA's advanced of ecosystem services that the idea that economic value can be attached to biodiversity became widespread (Lapeyre et al. 2015: 125). Addressing the popularity of the concept in environmental governance, Redford and Adams write that "[e]cosystem services have now become the central metaphor within which to express humanity's need for the rest of living nature" (Redford/Adams 2009: 785, see also Seppelt et al. 2011).

This approach is focused on the governance of biodiversity. Here the concept ecosystem services is intended as a means to account for the values of the environmental functions that humans are dependent upon, such as pollination, flood control and natural purification of water: useful because it makes these functions and their value to humans visible. Thereby it is a way to encompass what in mainstream economy terms is referred to as externalities (Kosoy/Corbera 2010). According to this logic, recognition of ecosystem services also makes it possible to assign a price to the use of a particular ecosystem service – in policy lingo referred to as payment for ecosystem services (PES) (see Redford/Adams 2009). We note how the dualistic construction is reproduced here: biodiversity is objectified into exclusionary categories, i.e. specific ecosystem services. These components can then be associated with a specific monetary value. What is in high demand then is a way to map and delineate ecosystem services, and as we noted in the overarching study, a major part of the scholarly articles were engaged in making biodiversity mapable and manageable, and to develop methods and techniques for doing so.

The wish to govern and map is complicated by the fact that an ecosystem does not lend itself to be compartmentalized, simplified and narrowed down to exchangeable units – its whole is always more than its parts. It is difficult to distinguish a particular ecosystem service from others, as ecosystems by definition are complex and integrated (Kosoy/Corbera 2010). Among human individuals and communities, perspectives vary greatly regarding which ecosystem

functions are valuable and which need to be regulated, and there may be several contrasting ideas among, for instance, scientists, policy makers, commercial users and local communities, respectively. Thus, since ecosystem services cannot possibly represent the entire complexity of ecosystems, their functions, and all contrasting human perspectives and needs, the risk here is that certain elements of biodiversity, which someone is willing and able to pay for, are brought into economic markets, while other elements, with less direct economic value, are neglected and destroyed in silence (Turnhout et al. 2013: 155).

A substantial part of the critique against the concept ecosystem services is related to the idea of assigning economic value to the environment, which commodifies nature and incorporates it into a capitalist logic (Sullivan 2009; Robertson 2012) and places it as part of the neoliberal order, with its faith in and strong emphasis on market solutions (Fairhead et al. 2012). However, these arguments are also criticized for being too simplistic (elaborated in Corbera 2015; Dempsey/Robertson 2012; Hahn et al. 2015). While the idea of ecosystem services can generally be placed within a neoliberal approach to nature and environmental governance, there are multiple varieties of market-based conservation of ecosystems (Corbera 2015: 156; Froger et al. 2015: 160; Lapeyre et al. 2015) and different types and degrees of commodification as well (Hahn et al. 2015). The concept is mobilized in diverse contexts with varying meanings and implications (Dempsey/Robertson 2012), and notions of justice vary across contexts (Corbera 2015: 156). Daw et al. (2011) offer an intersectional touch, albeit human centered, as they argue that the concept can only function if it includes the well-being of the poorest in society and by asking which humans derive benefits from these ecosystem services. On a similar note, Diaz et al. offer a methodology that connects "the specific components of biodiversity with the specific interests and priorities of social actors" (Diaz et al. 2011: 900). They argue for a greater differentiation in understanding biodiversity and ecosystem services, in different situations and to different social actors. Power and wealth determines which groups have access to what ecosystem services. This recognition of social differences can be read as a call for more intersectionally informed research and policies. But however insightful, the analysis of Diaz et al. (2011) applies strictly to human-to-human relations and furthermore includes only material interests (see also critique by Romero/Agrawal 2011).

A focus on human perspectives and interests seems strengthened through the use of ecosystem services, which may be seen to entail "a paradigm shift in the ethical and political foundations of biodiversity conservation, from conserving nature due to its intrinsic value to an emphasis on anthropocentric use values" (Loft et al. 2015: 150). The concept ecosystem services as so far applied, seems to further distance humans from nature, biodiversity and ecosystems and denies dependency on these 'others', rather than protecting nature's diversity (cf. Plumwood 1993: 41).

Biodiversity Knowledges and Subjectivities

As feminist scholarship has taught us, scientific knowledge is never neutral or objective, and researchers are situated subjects coming from particular positions. The scholarly discussion on biodiversity and ecosystem services that we try to make sense of can be viewed as an attempt to shape a universal knowledge about nature, rendering nature an object of science and control. This may be understood as a way to "distance the knowing subject from everybody and everything" (Haraway 1988: 581). Through the scientific vision, the all seeing eye of western positivist science comes to dominate – simultaneously distant and omnipresent – performing what Haraway calls the "God trick" (Haraway 1988: 582). The scholarly literature we reviewed suggested a dominant status of the environmental, agricultural, and biological sciences and scientists mainly in the rich North. In reviewing the history of the concept ecosystem services Ernstson and Sörlin claim that it reflects "the hegemonic role of ecologists, and of environmental and ecological economists" (2013: 275; see also Escobar 1998: 61-62). Failure to recognize that knowledge is situated extends also to critical social sciences according to Melathopoulos and Stoner (2015: 178). Haila (1999) draws on Foucault's ideas of the relationship between knowledge and social power as he problematizes the primacy of science in the biodiversity discourse. Here, scientific knowledge "is taken as an independent factor" and even "becomes something of a 'master-mind'", which, Haila argues, reinforces dualistic constructions of both human-nature relations and of reliable vs. false knowledge (Haila 1999: 169).

Efforts to govern biodiversity through an ecosystem services approach privilege a particular kind of scientific knowledge about nature, while silencing other scientific knowledges as well as localized ways of knowing nature (Ernstson/Sörlin 2013: 282). The ecosystem services approach, according to Ernstson/Sörlin, "performs a remarkable gesture, as coming from no-where, a non-place, but arranging itself so as to be able to talk to all places, claiming to have the tools to correctly measure the values of nature for any part of the world" (ibid: 281), thus enacting the 'God trick' and laying claims to a master position of legitimacy. However, as Fairhead et al. (2012: 254) suggest, ecological dynamics and an unruly, complex nature may jeopardize these efforts as ecological dynamics do not work according to market logic. The heterogeneity and changeability of ecosystems means that a variety of knowledges are needed for human-nature interaction – knowledges that are often marginalized. Sullivan asks, "what knowledges and experiences are being othered and displaced through the parlance and practice of ecosystem services markets?" (Sullivan 2009: 23). People living in areas identified as crucial for the provision of ecosystem services may find their livelihoods constrained by new markets for ecosystem services – and themselves left out to market mechanisms and management according to 'expert' knowledge. People belonging to a diversity of cultural settings with rich knowledges are often simply portrayed as 'local', 'marginalized', or 'poor', while these people and cultures often carry rich knowledges and perspectives that signal

alternative ways of relating to nature and may be valuable in addressing environmental problems (Sullivan 2009: 24).

Yet, while a particular kind of (supposedly neutral and objective) scientific knowledge is clearly privileged in the literature, there is also an emerging recognition that 'alternative' kinds of knowledge are useful and need to be included in the master story. Broadening the types of knowledge that constitute the foundation for policy making has in recent years come to be perceived as pertinent. Most policy instruments used in biodiversity governance rely on some type of evaluation (Hahn et al. 2015) and often incorporate 'local knowledge', although this notion is seldom defined. Through a study of how ecosystem services are expected to be relevant in order to enhance nature protection and sustainability in cities, Ernstson and Sörlin demonstrate that "the purportedly universal nonplace from which the ESS [ecosystem services] approach aims to speak, is … highly embedded in social and place-specific relations" (Ernstson/Sörlin 2013: 279) and dependent on local and different knowledges.

'Local' communities are thus evoked as knowing subjects with special abilities to care for and repair nature, which scientists and policymakers may learn from. Especially, the knowledge of indigenous people is often brought up as valuable (Fairhead et al. 2012: 251). McNeely and Schroth focus on the potential of traditional agroforestry practices to support biodiversity conservation via the inclusion of "non-scientific knowledge of indigenous people" (2006: 552) and argue that valuable traditional knowledge should be shared in ecosystem management and in the cooperation between local people and scientists.

While recognizing the value of 'alternative' forms of knowledge, this and other articles (see Hill et al. 2013; Pert et al. 2015) risk perpetuating a dualistic representation of knowledge about biodiversity, or nature: on one hand, a uniform scientific knowledge, and, on the other hand, indigenous and/or local knowledge derived from practices and tradition. A clear hierarchy is established in the literature between a universal scientific knowledge, and a generalized idea of indigenous/local knowledge. While the former is expected to provide the foundation for policy, the latter is recognized as the 'other' kind of knowledge that might offer some valuable insight only if it is incorporated in the canon of proper scientific knowledge (Escobar 1998; Turnhout et al. 2013). We have noted elsewhere that such a dualistic representation of scientific and local/indigenous knowledge as separate spheres is problematic, since these have developed in close interaction and dialogue with each other for centuries (Kaijser 2014; see also Agrawal 2005). Such dualistic notions, moreover, ignores the diversity and situatedness of both 'scientific' and 'local' knowledges about nature, as they emerge in specific settings and environments. Various articles called for a broader scientific knowledge base when discussing and applying ecosystem services. For instance, Alves et al. (2013) and Mann et al. (2015) argue for the integration of social sciences and local knowledges into biodiversity science, and Froger et

al. (2015) for more ecological knowledge to inform economic calculations in provisions of ecosystem services.

An influential initiative that explicitly links biodiversity and ecosystem services is the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), established in 2012 with the mission to assess "the state of the planet's biodiversity, its ecosystems and the essential services they provide to society" (IPBES), and thereby offer "scientifically credible and independent information" in the form of reports to decision-makers, authored by a multidisciplinary group of researchers (ibid.). A deeper engagement with the approaches and operations of IPBES is outside the scope of this article. However, IPBES is discussed at length in several of the articles that we include in our analysis (see Hill et al. 2013; Turnhout et al. 2014; Vadrot 2014; Borie/Hulme 2015). Borie and Hulme explore how different kinds of knowledge were handled in the IPBES process. While different knowledge systems were recognized and incorporated, the distinction between scientific and indigenous knowledge was essentialized (Borie/Hulme 2015). Scientific knowledge was here represented as measurement and monitoring of nature through mapping and categorization. Turnhout et al. (2014) place this view of science in a context of neoliberal, result-oriented New Public Management approaches to the science-policy interface that is the rationale behind the IPBES. The debate regarding the conceptual framework to be used in the IPBES has been highly polarized and politicized particularly between proponents of 'scientific western knowledge' and 'indigenous and local' knowledge. It is notable that this is recognized in the framework, with the two positions both reflected in IPBES's conceptual analytical framework through different color codes, blue for indigenous concepts and green for scientific, but also black for concepts that were viewed as consensual, such as nature and good quality of life (Diaz et al. 2015). In the debate leading up to the framework, the premises for the different knowledge claims were foregrounded and became visible (Borie/Hulme 2015). While the IPBES is not there yet, the fact that the contestation between knowledge claims has come to influence the framework may open up for critical and more nuanced discussion of diversities in 'scientific knowledge' as well as in the understanding of 'indigenous and local knowledge' in the future, with a prospect to go beyond dualistic constructions of knowledge.

Concluding Discussion

We have now discussed a selection of scholarly publications seen through the intersectional analytical lens that we presented in the section *Analytical Themes and Research Design*. Thus, we have explored how dualistic constructions come forward in the assessed publications, and how knowledges and subject positions are represented, or not represented. While highlighting dominant tendencies in the material, we have also looked for alternative and challenging approaches to human-nature relations within scholarly discussions of biodiversity and ecosystem services.

As mentioned above, we see a potential in the idea of biodiversity for encompassing intersectional human-nature relations, as the concept opens up for representing diversity and differences among subjectivities and knowledges. However, as it has become popular in the field of policymaking, biodiversity has generally come to be understood in a more technical manner, corresponding to a view of nature as something to be mapped and managed through a science-policy interface, in a spirit that Turnhout et al. (2014) would call measurementality. This tendency is further accentuated when biodiversity is coupled with the notion of ecosystem services, with the aspiration to split biological diversity in measurable segments that provide particular services, and add an element of (economic) valuation.

Several scholars call for recognition of intersectional differences and power relations among humans (see Escobar 1998; Sullivan 2009; Daw et al. 2011; Díaz et al. 2011; Fairhead et al. 2012). For instance, Sullivan (2009) notes that people from a diversity of cultural settings are in policy lingo often simply portrayed as 'local', 'marginalized', or 'poor', in relation to what, with Plumwood's terminology, may be called a 'master identity' (Plumwood 1993). While there is awareness in the assessed literature of differences and power imbalances among humans, this awareness is generally not extended beyond the human. The scholarship on biodiversity has become increasingly policy-oriented, reflecting a managerial approach in which humans are not regarded as being part of biodiversity, but in an outside, distanced position, and in charge of measuring and managing it. Such dualistic representations of human-nature relations are dominant in the assessed material. These two categories are treated as separated from each other, and placed in a hierarchical relation where nature is set as background, subject to mapping and management, and valued for the ecosystem services it may provide to humans rather than in itself. Also, the agency of non-humans is not recognized. Here, all of the processes of dualistic construction described by Plumwood (1993) – backgrounding, exclusion, incorporation and objectifications – are at play.

Inspired by the theoretical fields from which we draw our analytical lens, along with the assessed literature, we would like to end this article by asking, how could biodiversity be approached in ways that are sensitive to intersectional relations among and between humans and non-human subjects, or nature?

Turnhout et al. (2013) offer serious engagement with this question, and sketch out an alternative approach. They suggest that we "look more carefully at the diversity of human relations with biodiversity" (Turnhout et al. 2013: 158), which involve much more than measuring and commodifying. Recognition of the fact that humans are already, and have always been, entangled with biodiversity in countless and contextual ways, may inspire altered ways of 'living with' nature, as part of biodiversity (ibid.). Haila takes a similar stance as he discusses ways of overcoming human-nature dualisms and regarding humans as always encompassed in biodiversity (1998).

The positions taken by both Turnhout and Haila resonate with Alaimo's work of trans-corporeality, and more broadly with key concerns and stances in post-humanism, critical animal studies and ecofeminism, where the entanglement and interrelatedness of 'humans' and 'nature' is theorized. In a recent article, Haraway playfully and seriously explores possible paths for avoiding major ecological disaster by learning to live with – as physically integrated with – non-humans in "myriad temporalities and spatialities and myriad intra-active entities-in-assemblages – including the more-than-human, other-than-human, inhuman, and human-as-humus" (Haraway 2015: 160). For achieving "multi-species ecojustice", she calls on feminists to "exercise leadership in imagination, theory, and action" (ibid: 161). This is where we see the place for intersectional engagement with human-nature relations, conceptualized as biodiversity or otherwise. In the present text, we have drawn on previous feminist work of human-nature relations in order to assemble an intersectional lens, through which we have looked at notions of biodiversity and ecosystem services. We believe that an intersectional approach, profoundly rooted in feminist theorization, offers valuable possibilities for re-thinking – and, hopefully, re-enacting – human-nature relations, with attention to the diversity and changeability of such relations, without claims to universal truths, and with room for multiple knowledges, knowers, and voices.

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Remarks

1 Our empirical analysis begun with an overarching analysis where we scoped scholarly work through a word search for ecosystem services and biodiversity in articles and book chapters. Through this SCOPUS search (December 22, 2015) we found 4000 publications mainly in the environmental, agricultural, and biological sciences. We analyzed the abstracts from 460 articles categorized as social science in some more depth. The objective of the bibliometric overarching study was to identify scholarly literature that potentially could help us in our profound analysis and from this search we selected 34 articles.

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