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## Highlights

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## **A coexistence of Paradigms: Understanding Human–environmental Relations of Fishers Involved in the Bycatch of Threatened Marine Species**

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### **Abstract**

In this article, we study a fishing community and its relationship with non-human species, including threatened marine mammals and turtles incidentally captured by fishers. We focus on the interaction between this fishing community and a group of conservation experts who seek to protect these vulnerable species by proposing the testing of alternative fishing gear. This conservation practice, however, ignores the fishing community's worldview – which includes its relationship with animal species and the links and negotiations established with other stakeholders. Through an interdisciplinary ethnographic approach, we find that although fishers classify species according to their capacity to be exploited as a resource, they may also be willing to become strategic conservationists by negotiating with conservation experts to protect some of these species. The coexistence of strategic conservation and resource exploitation practices in this fishing community does not preclude the existence of an 'implicit communalism', in which resource exploitation is rooted in daily intimacy with various species. A comprehensive reconstruction of local perspectives and practices is a first step towards a democratic exchange between local and expert knowledge in pursuit of the conservation of biodiversity.

**Keywords:** interdisciplinary, artisanal fishing, bycatch reduction, human–environmental relations, sea turtles, dolphins, Argentina

### **INTRODUCTION**

The conservation of threatened species has traditionally been addressed from the natural sciences perspective. Predominantly, disciplines such as physiology, historical biogeography, and population genetics have provided the scientific information supporting biodiversity protection (Soulé 1985). Less attention, however, has been paid to the much wider context that includes social, cultural, economic,

and political factors (Balmford and Cowling 2006; Campbell 2010; Jacobson and McDuff 1998; Robinson 2006). Frequently, this imbalance results in both the failure of policies to protect the threatened species (Knight et al. 2008; Mascia et al. 2003) and misunderstandings regarding human needs and demands (Blaser 2009a; Campbell 2007; Ingold 1993; Nygren 1999; Robinson 2011). Accounting for this variety of factors, however, requires engagement with other disciplines in the social sciences, an endeavour which has proved methodologically and epistemologically challenging (Campbell 2003; Fox et al. 2006; Moon and Blackman 2014; Pooley et al. 2014).

The management of the bycatch of threatened species could be significantly improved by an interdisciplinary approach (Reynolds et al. 2009; Hamann et al. 2010; Jenkins 2010; Whitty 2014). When bycatch reduction techniques are proposed as solutions, researchers frequently make

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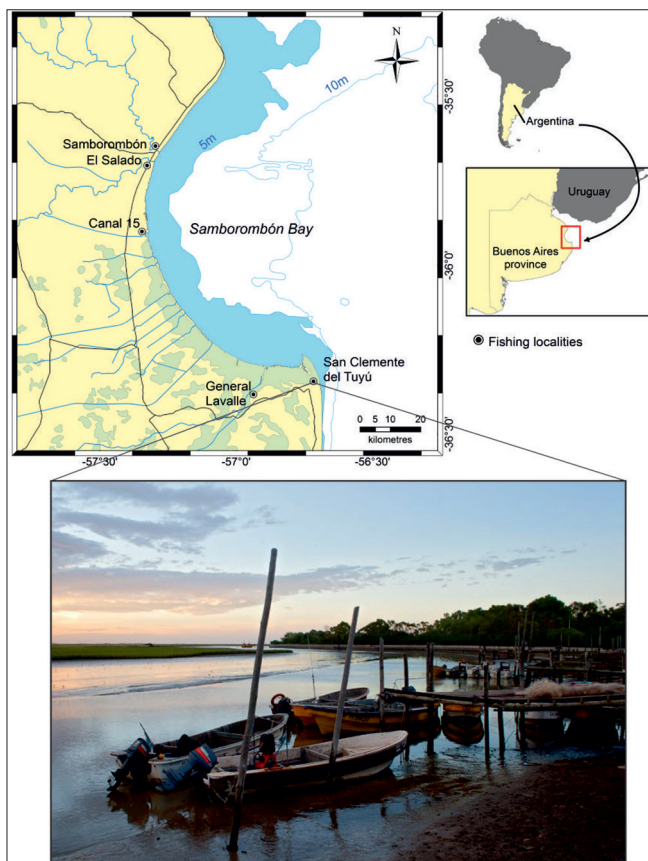
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unsubstantiated assumptions regarding fisher behaviour (Campbell and Cornwell 2008), sometimes the result of pre-existing bias. One deep-rooted presumption supposes fishers to be economically rational individuals who only seek to maximise profits and/or minimise risks (Campbell and Cornwell 2008; St Martin 2007), implying that bycatch solutions are only viable if fishers' profit is not affected. In our opinion, however, this reductionist attitude towards the fisher worldview, especially in small-scale fisheries, could hinder successful management policies and the establishment of true cooperation between researchers and fishers in pursuit of the conservation of biodiversity. Thus, we propose a holistic approach to the bycatch of threatened species, especially one which considers the fisher worldview.

In this paper, we summarise the study of a fishing community and its relationship with several non-human species, some of conservation concern. We focus on a group of artisanal fishers of San Clemente del Tuyú (Province of Buenos Aires, Argentina, Figure 1) to explore their individual and shared worldviews, particularly regarding their relationship with the animal species (mainly fish) they encounter during their work at sea: e.g., whitemouth croaker (*Micropogonias furnieri*), striped weakfish (*Cynoscion guatucupa*), mullet (*Mugil* sp), as well as dolphins and turtles. Specifically, these latter, non-

target species –the Franciscana dolphin (*Pontoporia blainvillei*) and three species of sea turtles (*Chelonia mydas*, *Caretta caretta*, *Dermochelys coriacea*)– are prone to bycatch, the accidental entanglement in fishers' gillnets, leading either to death or severe injury (Figure 2; Bordino et al. 2002; González Carman et al. 2011). Given that these species are classified as either 'vulnerable', 'endangered', or 'critically endangered' by the International Union for Conservation of Nature (IUCN 2017), their interaction with fishing activities is of concern to a group of conservation experts, mostly composed of biologists working in government agencies, non-governmental organisations (NGOs), as well as biology students doing volunteer work. Conservation experts seek to protect these charismatic, vulnerable animals of no commercial value through the testing of alternative fishing equipment intended to replace or modify gillnets. Although conservation experts are exploring technical solutions to bycatch, they are not sufficiently considering the fishers' perspective in order to develop successful conservation strategies.

Our goal is to account for the fisher worldview –the discourses and practices in relation to their occupation, the animal species with which they interact, and the exchanges with other stakeholders such as conservation experts and larger fishing fleets. We use an ethnographic approach rooted in interdisciplinary fieldwork, along with a theoretical framework provided by some contemporaneous authors within the Anthropology of Nature. To analyse the ethnographic material, we draw primarily on Pálsson's schema of human–environment relations (Pálsson 2001) because it accounts for the dialectic process of understanding and interacting with the environment. In other words, different depictions of the environment shape the different ways of interacting with it, and vice versa. It also provides a clear typification of the particular ways of understanding and interacting with the environment, allowing us to problematise one of the major assumptions made by researchers when studying the bycatch of threatened species—the idea that fishers merely exploit natural resources.



**Figure 1**

Artisanal port of San Clemente del Tuyú and main fishing localities of the Samborombón Bay (Province of Buenos Aires, Argentina) (Ph: Gabriel Battaglia)



**Figure 2**

Dead green sea turtle (*Chelonia mydas*) entangled in an artisanal gillnet (Ph: Roberto Ubieta)

Pálsson (2001) characterises three different paradigms— orientalism, paternalism, and communalism (Figure 3a). The paradigm of environmental orientalism includes all the relations of exploration, conquest, and exploitation of the environment for the diverse purposes of production, consumption, sport, and display. According to this paradigm, nature is overflowing and problematic and thus must be systematised and domesticated; hence, a negative reciprocity dominates this paradigm (Pálsson 2001). In this way, nature is seen exclusively as a natural resource, whose sole purpose is to be exploited to exhaustion (Santos 2001). In this paradigm, people are the masters of nature, in charge of the world. The characteristics of environmental orientalism can be seen in the industrial exploitation of ‘wild’, undomesticated species. In contrast, relations of protection—not exploitation— characterise the paternalist paradigm (Figure 3a). This paradigm involves a balanced reciprocity in which humans have a particular responsibility towards members of other species, fellow inhabitants of the animal kingdom, and the world ecosystem. Paternalism is clearly perceptible in the discourse regarding protective measures and stricter regulations on the management of natural resources, warning against the ‘ecological consequences of human activities’ (Pálsson 2001).

Despite their differences, the orientalist and paternalist paradigms share the view that humans are masters of nature while perpetuating the nature–society dichotomy characteristic of western culture. Communalism, however, rejects the radical separation of nature and society, emphasising the

notion of dialogue with nature and other non-human species (Pálsson 2001). Under the communalist paradigm, humans and animals establish tight cooperation and generalised reciprocity often found in hunter–gatherer societies, for example (Figure 3a). These societies become familiar with their environment while dwelling in it, though without the distance required by exploitation. For hunter–gatherers, animals are treated as equals and considered ‘persons’ belonging to a society containing all beings. Under the communalist paradigm, humans engage with non-humans in an intimate relation of interdependence (Ingold 2000; Pálsson 2001).

We also analyse derivations of our findings according to the framework of other related concepts, such as ‘political ontology’ (Blaser 2009a,b) and ‘intellectual coproduction’ (Viveiros de Castro 2010). The term ‘political ontology’ refers to the conflicts generated when different worldviews strive to maintain their own existence as they interact and mingle with others. These different worlds or ontologies involve discursive and non-discursive aspects that do not forego mundane practices, rather, they are shaped through the practices and interactions of both humans and non-humans (Blaser 2009a,b). As we will see throughout this article, the ontologies of conservation experts and fishers come into conflict during the testing of alternative fishing equipment. The concept of ‘intellectual coproduction’ (Viveiros de Castro 2010) offers one method of dealing with these different ontologies in a fair and democratic fashion. This notion aims to undermine the belief that the intellectual practices of low-income groups, such as

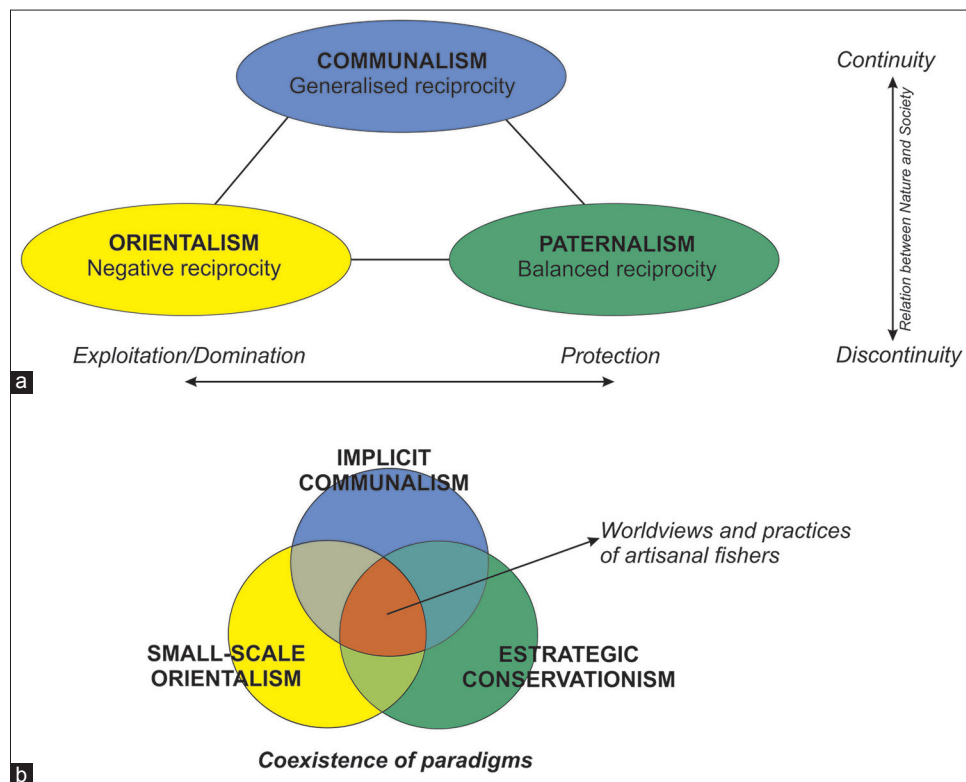


Figure 3

(a) Paradigms of human–environmental relations modified from Pálsson (2001). (b) Coexistence of paradigms of human–environmental relations in artisanal fishers of San Clemente del Tuyú (Province of Buenos Aires, Argentina)

fishers, are secondary with respect to scientific knowledge. We believe the incorporation of an anthropological perspective to the issue of the bycatch of threatened species—specifically one that highlights complexities in human–environmental relations and challenges researchers’ assumptions—would enrich management policies for both the conservation of biodiversity and the exploitation of fish resources by local communities.

## METHODOLOGY

### Research location and stakeholders

We conducted fieldwork in San Clemente del Tuyú (hereafter San Clemente, Figure 1), a small touristic seaside village with an artisanal port. Landings are mainly of whitemouth croaker that is exported fresh or tinned to Asian and African markets (Carozza 2010) along with other species such as striped weakfish, black drum (*Pogonias cromis*), Brazilian menhaden (*Brevoortia aurea*), and mullet which are used for fishmeal.

The number of artisanal fishers in San Clemente is highly variable due to the intrinsic variation of fish stocks driven not only by climatic conditions but also by external factors. For example, after the 2001 economic crisis that led to an unemployment rate of more than 20% in Argentina,<sup>1</sup> many locals resorted to fishing as their livelihood despite a complete lack of experience at sea.<sup>2</sup> Fishers’ economic activities also cover a broad spectrum: from ex-fishers who now manage their own fish market and fleet to those who must offer their fishing services daily. Few come from a fishing tradition within their family (i.e. a fisher father or grandfather who immigrated to Argentina from Italy or Spain at the end of the 19<sup>th</sup> century), but most have at least one relative who fished or hunted for a living. In fact, during their youth, many fishers hunt otters, wild pigs, and deer, especially during the winter (Carman and González Carman 2016).

Fishers from San Clemente operate in the waters of the Samborombón Bay, using a variety of fishing gear and frequenting different areas depending on the season. The austral winter (June to September) is the most important fishing season due to the large biomass of fish available. During this season, most fishers move to distant fishing grounds (50–100 km from San Clemente) located along the coast of the Samborombón Bay (Samborombón, Canal 15, Figure 1) where they fish with their own boats or are employed in larger (more than 10 m) bottom-trawling vessels. In the austral summer (December to March), some fish with bottom gillnets in the shallow coastal waters (1–3 nautical miles from the coast) of San Clemente from small inflatable or fiberglass boats (5–8 m) with outboard engines (40–100 HP) while others work as taxi-drivers, lifeguards, or employees in rural areas or for small businesses to supplement their income (Bordino et al. 2002; Carman and González Carman 2016).

A larger fleet called the *rada o ría*<sup>3</sup> (category of vessels established by the Argentinian Coast Guard) also fishes in the Samborombón Bay, arriving from distant industrial ports (more than 200 km away) and harbouring temporarily at

General Lavalle and El Salado. These vessels range from 9 to 28 m in length, and also target whitemouth croaker (Figure 1). This fleet utilises the technique of bottom trawling and has greater engine power (30–650 HP), holding capacity, and autonomy than the artisanal gillnet fleet (Carozza et al. 2004; Lasta et al. 2001). Despite these differences, both fleets are considered artisanal according to the law, which defines artisanal fishing as a human-powered activity performed from open boats of unlimited length or cabin boats up to 13 m long.<sup>4</sup> This inequality in the access to resources is a source of profound conflict between the fleets (Carman and González Carman 2016). For example, in June 2014, artisanal fishers of San Clemente blocked road access to the port of General Lavalle as a response to a restriction of the fishing of whitemouth croaker in the Samborombón Bay implemented by the Ministry of Agricultural Affairs of the Province of Buenos Aires. According to artisanal fishers, only they were affected by the measure, whereas foreign trawling vessels enjoyed unrestrained exploitation of the resource since their greater autonomy allowed them to fish outside the restricted area. With a combination of impotence and fury, a San Clemente fisher recalls: ‘*We were not allowed to fish for a month and ten days; in the meantime, foreign ships came, fished, and left while we were starving to death*’ (NOVA 2014).

Meanwhile, the threatened conservation status of dolphins and turtles is a major cause for concern for conservation experts acting in accordance with national and international conservation policies.<sup>5</sup> One of these groups is AquaMarina, a small marine conservation NGO supported by larger national and international NGOs such as Fundación Vida Silvestre Argentina, the World Wildlife Fund, and the Wildlife Trust. Between 2004 and 2010, AquaMarina evaluated the performance of various alternative fishing equipment to reduce the bycatch of dolphins in bottom gillnets through controlled trials which measured the efficiency of different fishing gear. AquaMarina’s main focus was the Franciscana dolphin, though the effects of the equipment on other species such as marine turtles were simultaneously monitored. Some of the fishing equipment tested included reflective and stiffer gillnets as well as artisanal longlines; each type functions according to different mechanisms than traditional gillnets. For example, the enhanced acoustic reflectivity or increased stiffness of gillnets achieved through certain chemical substances increases the target strength of the nylon mesh, thus making the net more detectable to dolphins (Bordino et al. 2013). Artisanal longline gear, on the other hand, is even more selective than gillnets because it only captures the commercially harvested fish that bite the baited hooks and thus avoids catching non-target species.

The trials were conducted in collaboration with fishers from San Clemente and other neighbouring localities. Participating fishers in return received modest stipends and some benefits, such as fuel or navigation equipment. They were required to take an on-board observer, typically a biology student doing volunteer work, who quantitatively and qualitatively recorded catches of both target and non-target species with conventional

gillnet and alternative equipment. The work aboard was complemented by visits to the port of San Clemente when the catch of the day arrived. Other fishers not directly involved in the trials also provided information regarding bycaught turtles, which were brought to port upon request by the experts. As their only profit, these last fishers requested to keep the dead turtles' shells to use for artisan crafts.

During the trials, reflective and stiffened gillnets did not significantly reduce the incidental capture of dolphins and turtles in comparison with traditional gillnets (Bordino et al. 2013). The opposite was the case for artisanal longline, with which dolphin and turtle bycatch rates were significantly reduced at least according to the scale tested in the experiment (Bordino pers. comm. 2012). Artisanal longline also captured species highly valued commercially such as the whitemouth croaker, the stripped weakfish, and the Brazilian codling (*Urophycis brasiliensis*) while avoiding other species of little commercial value usually destined for fishmeal. However, the main drawback was that longlines caught lower overall fish biomass than gillnets (Bordino et al. 2006).

## Fieldwork

This ethnographic research summarises one author's (VGC) 10-year relationship with artisanal fishers of San Clemente, in addition to three years of ethnographic work as a team. VGC first became involved with fishers as a biology student working as a volunteer in the testing of alternative fishing gear equipment between 2004 and 2007. From 2008 to 2012, she continued her work with fishers recovering sea turtles from gillnets during her doctoral and post-doctoral research.<sup>6</sup>

This long-term relationship with fishers allowed us to begin interdisciplinary fieldwork in order to assess their discourses and practices in relation to their job, to animal species, and to other stakeholders, such as the conservation experts of AquaMarina and the members of larger fishing fleets. From November 2013 to July 2015, we conducted open and in-depth interviews and kept observation records –with and without participation (Rockwell 2009; Drury et al. 2011; Guber 2011). A total of 22 fishers were interviewed alone and in groups, depending on the circumstances. When we visited them at their homes, we had the possibility to talk privately with them whereas when we visited the port or a fish market, we would meet more than one fisher at a time. Some fishers were also interviewed multiple times in successive trips, which allowed us to delve deeply into some topics, repeat some questions, and perform cross-examinations.

In order to decide when we had collected enough data to achieve our objectives, we relied on the concept of theoretical saturation (Glaser and Strauss 1967) — when the researcher reaches the point where no further information to develop properties of the categories identified can be found (Jones et al. 2007: 55). To determine the point of saturation, we used a combination of empirical data limits, theory integration and density, and theoretical sensitivity of the researcher (*ibid.*).

Interviews were audio-recorded, transcribed, and

systematised by grouping fragments related to the same topic. We also recorded field notes addressing the specific circumstances of the interviews or any other thoughts regarding the context at the moment the interviews were conducted. Quotations were used to illustrate fishers' exact words. The names of the fishers interviewed were modified out of respect for their desire for anonymity. Data collected are presented and grounded sequentially to develop our argument. Our findings are structured following the schema of Pálsson's three paradigms (Pálsson 2001).

## ARGUMENT

### Small-scale exploitation of resources

In this section, we will see how fishers' understanding of the species as a resource corresponds to the orientalist paradigm described by Pálsson (2001) (Figure 3a), albeit with some nuances. During our fieldwork, we observed that a considerable proportion of San Clemente fishers classified the animals they interact with as either 'useful' or 'non-useful' species. The interviewees expressed that their favourite fish to catch was the one with highest economic value. For the same reason, they consider the unintentional bycatch of dolphins and turtles essentially to be a waste since neither can be exploited commercially. Gabriel (2014), an artisanal fisher who was interviewed said, "I like fishing the most valued fish of the moment. Now, it is the whitemouth croaker. They buy a lot in China." To quote Adolfo (2014), another artisanal fisher, "if the turtle is alive, I release it. If it is dead, I bring it to port. I won't eat it, but I might make a wall clock with the shell or varnish it. At least, since it is dead, it works for something."

They also stated that decades ago local fishers sold dolphin meat to a Korean community, and currently, the sporadic sale of turtle carapaces as artisan crafts has allowed them to use what otherwise would have been discarded at sea or washed up rotten on the beach.

The San Clemente fishers' stance is somewhat similar to the one observed by Einarsson (1993) in Iceland. The outlook of Icelandic fishers regarding the animal species with which come into contact (e.g., cod, whales, seals) can be summarised as follows: animals exist for man's benefit. This does not necessarily indicate indifference or a lack of affection for animals, but rather implies that their emotional considerations are usually subordinate to more practical concerns (Kellert in Einarsson 1993). In the case of San Clemente fishers, these practical concerns can be seen in the repurposing of otherwise 'useless' turtle carapaces for artisan crafts, for example. As with Icelandic fishers, the right to use animals in order to ensure one's own survival is self-evident within the fisher worldview and does not require further explanation (Einarsson 1993).

However, artisanal fishers embody what we might call 'small-scale orientalism', which differs from the intensive exploitation carried out by larger fleets such as the *rada o ría* (category of vessels established by the Argentinian Coast Guard). Although both artisanal fishers

and the *rada o ría* fleet use less selective fishing gear than the longline technique proposed by conservation experts (Carman and González Carman 2016), fishers affirm that in comparison to the trawling fleet, the damage inflicted by artisanal fishing on fish populations and their habitats can be considered insignificant. Says Alberto (2013), an artisanal fisher, “the foreign trawlers damage the bottom; they remove the mud where small fish live.”

They also explained that by regulating the size of the gillnet webbing or carefully choosing the fishing location, they can avoid capturing young fish. In this sense, the concept of ‘killing for eating’ (Århem 2001: 232) is compatible with the pursuit of the regeneration of those predated lives through practices that avoid the capture of very small fish or through the use of more sustainable fishing gear.

In our opinion, San Clemente fishers’ ‘small-scale orientalism’ is evident even among those who practice bottom trawling in the winter, as mentioned in section 2.1. Although bottom trawling appears to be an advantageous technique for fishers, it has its drawbacks. There is a delicate balance between several factors. On one hand, employment on a bottom trawling vessel represents a guaranteed income regardless of the day’s catch and is also a relief from the physical exhaustion induced by gillnet fishing thanks to the trawlers’ automated mechanisms to retrieve capture. On the other hand, being employed in the trawling fleet means sacrificing potentially larger earnings as captains while living in precarious camps far from family during the fishing season, returning only sporadically to San Clemente to deliver their income.

Another distinctive feature of this ‘small-scale orientalism’ is that San Clemente fishers also view their own bodies as a resource to be exploited similarly to the fish or turtles they catch. As Mariana (2014), an artisanal fisher says, “work your socks off [in fishing] for ten years, and then work in something else.” Bernardo (2014), another artisanal fisher adds, “[when you fish] you exploit your body to the limit, and in the long run you’re going to feel it.”

Since there is a limited ‘time for fishing’ and seasons are not always profitable, the body must be incessantly exploited, leading to bone and joint injuries. The conceptualisation of the body as a tool that must be pushed to the limit or even as a resource to be exploited, is frequent among low-income groups. This perspective was meticulously analysed in Boltanski’s (1975) classic work on the social uses of the body. He asked questions such as— how can one resist pain? how can one make the body ‘function’ for as long as possible and at the highest possible intensity? In a similar line of study, Bourdieu (1986) observed that the body speaks even when one does not want it to; it not only designates a social group’s current position but also defines its trajectory.<sup>7</sup> Accordingly, fishers expose their bodies daily to harsh weather conditions and subject it to the extreme physical demands of their work. In the same way fishers often describe their relationship with animal species in instrumental terms; they establish their “relationship” with their own body as an exploitable resource.

### Strategic conservationism: the protection of threatened species from the fishers’ perspective

Let us now consider how fishers’ exploitation of resources—defined here as ‘small-scale orientalism’—relates to what we will call ‘strategic conservationism’, closely associated with the paternalist paradigm described by Pálsson (2001) in section 1 (Figure 3a). We observed that upon contact with the conservation experts, dolphins and turtles acquired symbolic potential for the fishers, through which they gained conservationist credentials.

During the testing of alternative fishing equipment (described above) carried out by biologists and fishers, we observed two different positions. According to the expert’s point of view, the implementation of longlines signified a less aggressive relationship with the vulnerable species. On the contrary, for fishers, using longlines resulted in a reduction in their personal safety and economic profit and thus only shifted aggression towards the fishing community. To quote Manuel (2014), an artisanal fisher—

“the longline works for large catfish, but you have to enjoy longline fishing and you need the specific tools. You can never stop using gillnets, because gillnet and longline do not catch the same fish. Here, [at Samborombón Bay] you have to catch a lot in order for it to be worthwhile.”

Esteban (2014), an artisanal fisher adds, “the longline doesn’t work because it puts the sailor’s life at risk, and that’s no good.” Says Alberto (2013), an artisanal fisher, “Reflective nets are not good because they don’t catch as much as others do.”

What led San Clemente fishers to accept, and eventually acquiesce to expert knowledge, despite perceiving this ‘new’ fishing gear as potentially hazardous not only to their livelihoods but also to their own bodies? Our hypothesis is that fishers assigned new meanings to the conservation practice in which they were involved. They were neither driven by an *a priori* conservation belief nor by simple economic interest for the occasional compensation that they received. Although their participation did generate some form of immediate economic benefit, their involvement can be better understood in terms of reciprocity: ‘what I give today will be returned to me tomorrow, perhaps to a greater degree.’ More specifically, if restrictions to artisanal fishing are eventually established (as exemplified in section 2.1), it might be useful for fishers to have the support of conservation experts who could defend their interests vis-a-vis powerful stakeholders that define the rules of the game, such as the Ministry of Agricultural Affairs of the Province of Buenos Aires, the Federal Fishery Council, or the Ministry of Agriculture, Livestock, and Fisheries. When asked about why they participated in the trials, the fishers explained— “we saw that it was a good thing to do for the [Samborombón] Bay, as well as for us... if they [fishing authorities] want to ban us, we are already working in favour of the animals” (Bernardo, artisanal fisher, 2014).

Our interviews revealed the fishers’ logic—by cooperating in the protection of these charismatic species, fishers can achieve

visibility before the authorities in regards to issues which currently affect them, such as the alleged overexploitation of resources by larger fleets, or those that might affect them in the future, such as the establishment of restricted areas or a total ban of artisanal fishing.

Therefore, during the testing of this ‘new’ and controversial fishing equipment, fishers learned about the high value other stakeholders assign to turtles and dolphins, species with which the fishers have daily contact. Some fishers projected what the experts wanted to hear, carefully weaving such commonplace notions of sustainability into their discourse as the ‘collapse of the resource’, the ‘preservation of a species’, or the ‘bycatch of dolphins’. These stories fit experts’ expectations about what an artisanal fisher—one who ‘honours his profession’—should be. In addition, some fishers had the opportunity to attend scientific conferences to share their experiences working with protected species with fishers from other countries such as Uruguay and Brazil and to participate in conservation projects abroad—in the capture of dolphins for scientific purposes held in Sarasota Bay (Florida, USA) and in Baía da Babitonga (Santa Catarina, Brazil), for example.

The union of fishers with conservationism was far from unanimous, however. When conservation experts began testing the longline, some fishers clearly expressed their dissent—“what do they expect? that we stop fishing with gillnets for the sake of turtles and dolphins?” (Manuel, artisanal fisher, 2014).

In spite of these differences, most fishers attempted wholeheartedly to convey a self-image linked to environmental duty. In the same way any of us would, they downplayed negative aspects while accentuating what the experts would hope to find.

The display of this kind of ‘strategic conservationism’ is not exclusive to San Clemente fishers; other low-income groups flagged as anti-ecological eventually incorporate environmental jargon in their struggle for territories (Carman 2011). For example, Hames (2007) addresses how in the United States Native Americans use the concept of “ecological nobility”—coined from the very heart of academia to portray natives as lay-ecologists—to articulate claims of sovereignty and property rights. For low-income groups, exclusion from environmental claims would ultimately imply exclusion from what is at stake and from one of the main languages in which their disputes are settled (Carman 2011).

Nevertheless, the conservation value placed on vulnerable species never holds the same meaning for all the stakeholders. Laura (2014), a volunteer of AquaMarina says, “our understanding of animals is different from the fishers. I think it has to do with a relationship of affection. For them, fishing is working with a dead animal; so, they are used to it. They pick up a fish, and it’s dead—and if it’s alive, it’s going to die. On the other hand, we do everything possible so the animal lives. That is what conservation is about. Maybe we are the ones who are mistaken and not them.”

For the volunteers involved in the trial, fishers appear almost irredeemable due to their ‘unholy’ past as hunters of otters,

wild pigs, or deer, as well as the fact that their livelihoods are tied to marine resources. As one of the volunteers expressed with a certain resignation—“they don’t feel the same way about it as we do: THE dolphin or THE turtle. To them it’s just work, and that’s okay.” (Laura, AquaMarina volunteer, 2014).

Volunteers believed fishers to be incapable of maintaining an ecological commitment over time, not only because of their alleged ignorance of the ‘biodiversity crisis’ in general—and of the vulnerable conservation status of dolphins and turtles in particular—but also because of the apparent opportunism motivating their actions. Also, hunter–gatherer groups are often pejoratively dubbed as opportunistic: they supposedly take what they want when they want it (Ingold 2000). However, the term opportunism in this case is a misnomer because their philosophy is not about taking what is wanted, but rather about accepting what is given (*ibid.*).

In spite of the so-called ‘conversion’ of many fishers, volunteers still view them as unauthentic conservationists: fishers will never feel the selfless love toward nature that the volunteers developed at university, during campaigns, activism, or even throughout their childhood. “There is a willingness on the part of the fishers because they get something in return, not because of an emotional attachment to the species.” (Juan, AquaMarina volunteer, 2015).

From the volunteers and experts’ perspective, artisanal fishers are involved in the death of the vulnerable species and are thus usually defined as ‘*part of the problem*’. According to conservation experts, in important areas for biodiversity protection such as the Samborombón Bay, causing the deaths of protected animals represents, if not a sacrilege, an indulgence. In other words, experts believe that fishers do not have the right to do what they wish with vulnerable species because of the regulations established by current laws and treaties. Nonetheless, they remain aware of the daily incidental contact that fishers have with these species just for ‘*being there*’, at sea, in their everyday obligations. Experts feel a constant tension: though they consider fishers as a threat, at the same time, they depend upon fisher expertise in order to gain physical access to the animals. Recovering turtles and dolphins without fishers’ skilled use of boats and fishing equipment would be both logistically difficult and excessively expensive, if not impossible.

In summary, San Clemente fishers can be defined as strategic conservationists in at least three ways. First, through a large repertoire of jests, provocations, and sarcasm, fishers contested the purism of the experts and their particular concern for the vulnerable species—turtles and dolphins. Their banter included joking about buying new boats in order to kill all the turtles or planning to set endless meters of gillnets. The fishers’ incorporation of an environmental ‘ethos’, however, maintains a discrete distance due to their use of irony—Bernardo (2014), an artisanal fisher says, “if it [the turtle] had been alive I would have let it go..., but I’m not about to burst into tears every time I see a turtle, you know?”

Second, the notion of conservation is different for fishers and experts. The former consider the influence of human action on

natural forces to be negligible or even non-existent. Fishers respect the natural forces as powers of nature that should not be challenged and believe that humans should maintain an appropriate balance in their relationship with those forces.

As Adolfo (2014), artisanal fisher, says, “if the wind picks up in San Clemente and I’m at Samborombón, I know that it will reach me in an hour. So, I have to seek refuge, or I shouldn’t load a lot of fish. My life and the life of the person with me are worth more than all the fish.” In contrast, in the expert’s conservation practices human–animal relations are centred on the belief that humans are responsible for the fate of threatened species and that scientific rationality is the only way to control and preserve nature.

Third, for some fishers, interaction with conservation experts represents the possibility of increasing their social and symbolic capital. Through working with the experts, they can better control the reports made to fishing and wildlife authorities. “A judge can take anything said by the biologists<sup>8</sup> and do whatever he wants to.” (Adolfo, 2015).

In relation to this, fishers criticised experts’ inaction regarding one of the issues which most affects their livelihood: the alleged predatory practices of the larger *rada o ría* fleet in the Samborombón Bay. “The small fleet is always being questioned, despite the fact that it has always cooperated [in relation to the trials to reduce the bycatch of threatened species].” (Adolfo, artisanal fisher, 2015).

### **Implicit communalism**

What are the limits of the ‘strategic conservationism’ displayed by San Clemente fishers? Though in their discourse with outsiders, fishers exaggerate their pragmatic attitude, they do not perceive the sea and the animals as part of a neutral stage for slaughter. On the contrary, we will demonstrate how some aspects of fishers’ relationship with the environment account for an intimate, unending dialogue with the sea which gives and takes and with the animals that come and go. In accordance with Pálsson’s three-paradigm scheme (Figure 3a), this practical experience of fishers could be defined as communalism. More precisely, we believe ‘implicit communalism’ is a more precise denomination because this experience is mainly expressed through actions rather than words.

Under the communalism paradigm, humans become intimately familiar with their environment while dwelling in it (Ingold 2000; Pálsson 2001). In this sense, fishers’ accounts of the process of learning to fish frequently evoke memories of ‘hunting to eat’ or ‘hunting out of necessity’ in the past. When the availability of fish was low, especially during winters, they used to resort to hunting or ‘trapping’ animals such as otters, wild pigs, and deer. In both hunting and fishing, the learning process can be defined as an ‘education of attention’ (Gibson in Ingold 2000: 22): “If you want to learn how to fish you have to get beaten up. It’s not a job you learn by reading a book.” (Alberto, artisanal fisher, 2014).

In a similar way, other fishers expressed that you learn ‘only from watching’, ‘on deck’, or ‘doing things’. This job

is developed over a lifetime, beginning in childhood in some cases: “You don’t learn [to fish] overnight. It takes years.” (Luciano, artisanal fisher, 2014).

When oar boats were still used for artisanal fishing –and gillnets and fish scaler brushes were handmade–, some fishers used to spend the night on the boats:

“We used to row for 12 hours straight; we walked a lot along the coast, tramping in the mud (...). If the wind was blowing from the north in the morning, then we would fish in the east, and if the wind was blowing from the east in the afternoon, we would go fishing in the north.” (David, artisanal fisher, 2014).

Communalism also implies the existence of a dialogue, a silent conversation between humans and their environment (Pálsson 2001). When fishers refer to the importance of understanding wind direction in order to maximise productivity while minimising risks, this kind of dialogue becomes evident: “You do the same things every day, but each day is different. In one hour the wind might change four times.” (Alberto, artisanal fisher, 2014).

We observed that fishers have detailed knowledge regarding their natural surroundings, including each season’s particular difficulties and potential surprises (e.g., wind, storms, fishing opportunities). They also have practical knowledge of local species. For example, they know that seagulls searching for shelter in the canals indicates that there will be wind, the sound of drums at the port announces the presence of large schools of black drum fish, and mullets can ‘see the net and jump over it’ thanks to their large eyes.

Another important aspect of communalism is that animals are treated as equals, or almost equals, because they belong to a society which contains all beings (Ingold 2000; Pálsson 2001). In our opinion, this can be seen in the way fishers challenge Linnaean classifications of the iconic species of the Samborombón Bay: the black drum and the whitemouth croaker, both of which they have christened with an abundant set of names. According to their size or morphological features, fishers identify the whitemouth croaker as ‘*roncadora*’, ‘*perita*’, and ‘*carbonera*’ while the Black drum are called ‘*mora*’ and ‘*morita*’. As indicated by Hviding (2001), the degree of taxonomic complexity appears to be strongly related to the diverse ways people imagine their own various interactions with the living and non-living components of the environment.

Furthermore, we previously demonstrated how fishers’ narratives establish an equivalence between the resources they exploit –the different fish species and their own bodies. In the same way the physicality of fish and fisher share a semantic field, so does the interiority of humans and vulnerable species. The latter are described through human metaphors to establish proximity to the enunciating agent. For example, when asked why the animals get trapped in gillnets, fishers unanimously responded: “The Franciscano [dolphin] comes along, not paying any attention, and gets caught in the net”. While experts emphasise the dolphin’s intelligence, fishers simply

say, they're really dumb; they die quickly. Conversely, turtles 'are tougher' because they are often found alive, with their head or fins caught in the net. Only the trawling nets seem to present more of a threat to turtles, because the animals are caught while 'sleeping on the bottom'. On the other hand, sea lions are represented as fishers' 'number one enemy' because 'they show up and there's no fish' or, 'they destroy everything' and 'bankrupt you.'. Despite their feelings of hatred toward these animals, fishers do not cease to admire their cleverness and intelligence.

The familiarity and metaphors employed by fishers in reference to fish, turtles, dolphins, and sea lions –which, as noted by Einarsson (1993), are conditioned by the paradigms of nature and reflects the perceived interests of the stakeholders– necessarily indicate that fishers' knowledge of species is gained through the practice itself, i.e., while fishing or hunting. Whereas conservation experts aspire to create pristine reserves free of all human intervention, fishers do not consider being part of an environment and exploiting it as mutually exclusive. Much of the literature on the Anthropology of Nature has demonstrated that according to the perspective of small subsistence communities such as hunters and gatherers, conservation and participation in an environment are not incompatible; a mutual engagement exists between people and animals (Ingold 2000).

Thus, these tacit aspects of San Clemente fishers' relationship with the world and the animal species in it –incomprehensible from an outside observer's perspective– display reciprocity between humans and nature, a metaphorical exchange represented in terms of intimacy and communion (Pálsson 2001). Many indigenous communities studied by anthropologists also can be identified with this communalist paradigm when the members perceive themselves and their environment as part of an interminable holistic system (Ingold 1994; Descola 1996; Ingold 2000: 112; Århem 2001: 234; Hornborg 2001; Rival 2001). However, we are not suggesting that fishers maintain a non-western relationship with nature, one of mutual understanding, similar to the one idealised by environmentalists in regard to certain aboriginal groups (Nygren 1998; Little 1999; Leff 2005; Hames 2007). In making such a conclusion, we would be mistakenly believing that '...only "some" segments of humanity properly belong to nature, those reported to love animals and take care of their environment, variously called 'primitives', the 'children of nature', or "*Naturvölker*"' (Pálsson 2001: 70). Rather, we aim to highlight certain similarities, previously unrecognised, between the communalist paradigm and the conception that San Clemente fishers have of their environment and the animal species with which they exist. Although fishers belong to a western capitalist society, they do not necessarily perceive nature as external. Ellen (1996), Latour et al. (1991) and Milton (2000) have already demonstrated the multidimensional and highly contradictory nature of the western conception of nature. In a general sense, any society that has various ways of interacting with the environment will also have multiple and complex views of it (Milton 1997: 10).

## A coexistence of paradigms

So far, we have determined that though San Clemente fishers classify animal species according to their potential to be exploited as a resource, they also might negotiate the protection of some animal species with the conservation experts of AquaMarina. Fishers do not perceive collaborating in conservation projects –i.e. returning caught dolphins and turtles to the sea, procuring turtles for biology research, or testing bycatch reduction technologies– while making use of dead animals, as in the use of turtle shells for artisan crafts to be sold for profit, as a contradiction. San Clemente fishers adopt a strategic conservationist role in regard to these prestigious animals through an understanding of their symbolic potential value. At the same time, they raise the conservationist flag recognising that the same prestige accorded to the animals could potentially be extended to them as fishers. In other words, fishers' 'small-scale orientalism' coexists with a 'strategic conservationism' which challenges the purism of conservation experts that keeps fishers at a distance. At the same time, the coexistence of resource exploitation and conservation practices among artisanal fishers does not preclude the existence of an 'implicit communalism'. Since we believe the fisher discourse on resource exploitation to be rooted in daily intimacy through their coexistence with various animal species, the universe of fisher discourses and practices can be defined as the coexistence of the three paradigms described by Pálsson (2001) (Figure 3b).

This concurrence of orientalism, paternalism, and communalism can be conceptualised as a kind of 'continuum' between reciprocity and exploitation' (Brightman in Pálsson 2001: 96). The fishers in our study can be placed somewhere along this continuum: at one extreme we find the staunch conservationist, while at the other rests the fisher focused exclusively on the exploitation of fish as a resource, though most fishers actually fall somewhere in between.<sup>9</sup> These particular methods of understanding and interacting with the environment –far from restricted regimes or discursive islands in time or space–, appear in people's discourses and practices to varying degrees, thus highlighting the complexity of human–environmental relations.

The life trajectories of many of our interviewees account for this coexistence of paradigms. For example, Alberto, a fisher we have known for ten years, has participated in various conservation programmes led by AquaMarina. He, like many other San Clemente fishers, has been incorporating not only a set of conservationist practices but also the corresponding jargon into his daily life. Even though his participation in the conservation projects has ended, Alberto continues to release turtles and dolphins from nets, photographing them, and later sharing these events via social networks. Simultaneously, Alberto bottom trawls in the Samborombón Bay during the winter, a seemingly incompatible situation for which he is condemned by conservationists as well as by his peers. Alberto, nevertheless, does not believe that his conservationist convictions, consolidated over the course of the last decade, contradict his subsistence fishing practices, even though they include trawling.

In the case of the San Clemente fishers, the complexity of their worldview is not sufficiently accounted for by conservation experts. Here, the bycatch of threatened species is approached from a reductionist perspective that ignores fishers' motives for participating in the experts' trials, disregards their understanding of the conservation of threatened species, and does not heed their concerns regarding confrontations with the larger fleet. In fact, the conservation practice suggested by the experts does not address one of the fishers' most urgent problems: the conflict with the *rada o ría* fleet and the alleged disparities in state regulation. From a traditional conservationist perspective, humans are considered external to the ecosystem, and their destructive actions upon nature are responsible for the environmental crisis. As a result, insufficient attention is paid to the social inequalities evident in the use of natural resources (Nygren 1999).

Furthermore, though the conservationist status quo might defend artisanal fishers' subaltern knowledge, the truth is that fishers can never alter the core of expert understanding. Conservation experts perceive class difference expressed in a combination of capital, trajectories, opportunities, and competences— simply as cultural difference. According to certain conservation experts, only elite specialists are able to truly value the treasures hidden beneath the sea's waves or in its dark depths. Thus, the complexity of artisanal fishers' conservation practices must be analytically re-established, weaved into a broader worldview, so as to prevent it from being disregarded or reduced to a mere cultural exoticism.

What conservation experts interpret as an imbalance of fishers or an 'ecological disagreement' can be better understood from a broader perspective as a contradiction between the worldviews of stakeholders with unequal power; i.e. social groups that have different material and symbolic resources to impose their point of view as the legitimate one. Blaser (2009a) refers to these apparent 'cultural misunderstandings' as the contact between different, yet asymmetrically connected worlds or ontologies: 'these misunderstandings happen not because there are different perspectives on the world but rather because the interlocutors are unaware that different worlds are being enacted (and assumed) by each of them'.

One possible risk of these so-called 'cultural misunderstandings'—in the case of the conservationists and artisanal fishers—is that what is not understood from the conservationist perspective is simply considered the mere exploitation of resources or 'inauthentic conservationism'. This kind of generalisation exempts conservation experts from attempting to understand the actions of fishers without going beyond their own ontology, ignorant to the existence of other possible worldviews. A dominant trend in conservation practices is the uncritical conversion of local knowledge and environmental practices into 'discrete packages of knowledge that can be integrated into the toolkit of conservation practitioners' (Blaser 2009a).

In this ontological conflict, a comprehensive reconstruction of local perspectives and practices is necessary in order to ensure a democratic exchange between local and expert knowledge in

pursuit of 'intellectual coproduction' (Viveiros de Castro 2010: 15–18). Here, 'intellectual coproduction' refers to the desire for a true exchange, a dialogue between conservation experts and fishers, in which expert voices are not the only ones heard, but rather a discussion which takes the practices, feelings, opinions, and taxonomies of fishers into consideration.

## CONCLUSIONS

Throughout this article, we have argued that to work in cooperation with other social sectors in pursuit of biodiversity conservation, their worldview must be taken into consideration. Through an ethnography closely examining artisanal fishers' life experiences, we challenged the widespread belief that defines human–environmental relations based on trust—defined here under the paternalist paradigm—as moral and intrinsically 'good' and those based on domination—'small-scale orientalism'—as intrinsically 'bad' (Ingold 2000). We also questioned the assumption that low-income groups, fishers in this case, can only establish an instrumental relationship with nature since their only goal is survival. On the contrary, fishers' *ad hoc* taxonomies and their extraordinary knowledge of the environment actually demonstrate the relative symbolic autonomy of these sectors.

We have also suggested that the consideration of different social sectors' worldview should be nurtured in an ontological opening towards the other, thus avoiding the exclusive acceptance of expert knowledge about species as the only possible option and preventing it from acting as a type of sieve that subsumes local knowledge. In the testing of alternative fishing gear, conservation experts assumed a set of prejudices regarding fishers, as well as assuming an allegedly superior epistemological position. In contrast, the ethnographic research undertaken throughout our interdisciplinary fieldwork inverts the aforementioned approach by consciously attempting to leave behind preconceived notions about who the fishers are, how they perceive themselves and other stakeholders, and how they interact with their environment and the animals in it. By establishing a thorough ethnographic dialogue with locals in contact with vulnerable species, conservation experts were able to build a reciprocal relationship and a basis for a fruitful cooperation in pursuit of the conservation of biodiversity.

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## NOTES

1. Ministry of Economics and Production, <http://www.economia.gob.ar/secretarias/politica-economica/programacion-macroeconomica/apendice3a.xls>
2. At the time of this research, there were *ca.* 150 artisanal fishers in San Clemente del Tuyú, including captains, boat owners and sailors.
3. The Argentine Coast Guard states that the *rada o ría* fleet is composed of open boats or boats up to 9 m long that are allowed to navigate up to 15 nm from coast (Argentine Coast Guard resolution N°2/1981).
4. Ministry of Agricultural Affairs of Buenos Aires province, resolution N°379/2000.
5. Argentina is a Party in several international treaties regarding biodiversity conservation, such as the Inter-American Convention for the Protection and Conservation of Sea Turtles (IAC), the Convention on the Conservation of Migratory Species of Wild Animals, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). As signatory of these international agreements, Argentina recognises the vulnerable status of marine mammals and turtles and carries out actions for their management and protection. For example, hunting of marine mammals and turtles is forbidden in Argentina (National Wildlife Law N°22.421). The exchange of these species or any part of their bodies, carapaces, bones, or leather for international commercial purposes is also prohibited (CITES Adoption Law N°22.344). Moreover, the monitoring of the bycatch of marine turtles and mammals along with the use of selective fishing gear to reduce the potential negative impacts on these species is promoted by national wildlife agencies in compliance with current national legislation (e.g., IAC Adoption Law N°26.600, Federal Fishery Council resolution N°3/2001).
6. For further details on this kind of research see González Carman et al. (2012a,b, 2014a,b, 2015, 2016).
7. A similar notion regarding the similarities between how people treat themselves, others, and animals has been expressed by leading contemporary authors within the field of the Anthropology of Nature (Descola in Chaplier 2005; Douglas 1996; Ingold 1994, 2000; Rival 2001).
8. We recorded the native expression '*the biologists*' since artisanal fishermen use this term to refer to conservation experts working with fragile species.
9. A first analysis of the coexistence of the three paradigms proposed for fishers from San Clemente del Tuyú can be found in a previous article Carman and González Carman (2016).

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