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Owls in urban narratives: implications for conservation and environmental education in NW Patagonia (Argentina)

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ABSTRACT

In Argentinian Patagonia, the coexistence of owls and humans has a long and sometimes conflictive ethnobiological heritage. This paper presents a recent environmental situation which brought humans and owls together after massive fruiting of the native bamboo *Chusquea culeou* (Poaceae) in Los Alerces National Park, near Esquel city (Patagonia, Argentina). The event was followed by an increase in the population of native mice (e.g. *Oligoryzomys longicaudatus*, *Abrothrix longipilis*) which, in turn, caused an increase in the population of owls and other predators. This caused concern and fear in towns and homesteads close to the National Park. The objectives of our work were (a) to analyze the perceptions and attitudes of high school students and their families toward owls in Esquel city, after the rodent invasion and (b) to evaluate the effects on students of the integration of academic and traditional knowledge in teaching the ecological role of regional owls. We conducted workshops, interviews and laboratory classes. Our results show that a high percentage of the families interviewed know that owls feed primarily on rodents. Seventy four percent of people interviewed reported knowing at least one myth concerning owls; among these, 61% consider owls are diabolic birds, while 13% think they are good and wise. Both perceptions have behavioral implications ranging from some people wanting to protect owls or not interested in them, to some others who want to kill them. We believe that teaching through an intercultural approach increases the interest of students for owls' conservation. In Patagonian urban areas, state-run wildlife conservation programs should reinforce cultural and ecological values of these birds in order to minimize any conflict with humans.

RESUMEN

En la Patagonia Argentina, la coexistencia de búhos, lechuzas y humanos tiene una larga y, a veces, conflictiva herencia etnobiológica. Este artículo presenta una situación ambiental reciente en la que búhos, lechuzas y humanos se encontraron luego de la fructificación masiva del bambú nativo *Chusquea culeou* (Poaceae) en el Parque Nacional Los Alerces, próximo a la ciudad de Esquel (Patagonia, Argentina). El evento siguió con un incremento de la población de roedores nativos (e.g. *Oligoryzomys longicaudatus*, *Abrothrix longipilis*), lo que en consecuencia desencadenó un crecimiento de la población de búhos, lechuzas y otros predadores. Esto causó temor en pueblos y hogares cercanos al Parque Nacional. Los objetivos de nuestro trabajo fueron: a) analizar las percepciones y actitudes de estudiantes de una escuela secundaria y las de sus familiares, hacia los búhos y lechuzas en la ciudad de Esquel, luego de la invasión de roedores; y b) evaluar los efectos sobre los estudiantes de la integración de conocimientos académicos y tradicionales en la enseñanza del rol ecológico de los búhos y lechuzas. Realizamos talleres, entrevistas y clases de laboratorio. Nuestros resultados muestran que un alto porcentaje de las familias entrevistadas conoce que los búhos y lechuzas se alimentan principalmente de roedores. El 74% de las personas entrevistadas informaron conocer, al menos un mito sobre lechuzas y/o búhos; entre ellos, el 61% considera que los búhos y lechuzas son aves diabólicas, mientras que el 13% piensa que son buenas y sabias. Ambas percepciones tienen implicancias en las actitudes, que van desde algunas personas que desean protegerlas, o bien, que no están interesadas en ellas, hasta otras que quieren matarlas. Creemos que la enseñanza a través de un enfoque intercultural aumenta el interés de los estudiantes por la conservación de los búhos. En las áreas urbanas de la Patagonia, los programas estatales de conservación de la vida silvestre deberían reforzar el valor cultural y ecológico de estas aves para minimizar cualquier conflicto con los humanos.

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Introduction

In many cultures, birds are a common subject of popular narratives and form part of a range of folk and spiritual worldviews [1,2]. Throughout South America, various narratives include birds as main protagonists, which

play a key role in mediating between humans and the world of spirits [3,4]. Some of these stories have been orally transmitted from generation to generation and are told throughout many countries [5]. In Chile and Argentina, they spread from one country to another

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due to the migratory patterns of the aboriginal groups that have inhabited this region for years [4,6].

Myths, unlike other narratives, are considered true stories that have occurred in the remote past and continue to be told through tradition, which makes people believe in their veracity [5]. In societies that use the written form and/or those with urban and multicultural characteristics, myths have been literary reworked and have changed and become more diversified in different versions [7–9]. That is why these narratives are dynamic and depend on time and context in which they manifest: in traditional societies having long and direct relation with the resources of an inhabited environment, they constitute part of their cosmology, while in urban contexts they are part of a broader and hybrid cultural heritage [9,10].

These forms of symbolic beliefs often shape the way in which animals are socially perceived and could condition human attitudes toward them. On the one hand, according to the socio-environmental context, they could raise positive protection attitudes or, conversely, they could generate aggressive attitudes which affect biological conservation goals [10–12]. For example, in some rural communities, local people believe that certain nocturnal birds bring news (bad and good) when their song is heard in the village. As a result, people traditionally protect these birds, killing them being forbidden [6,11].

In nontraditional and urbanized contexts, there are factors other than symbolism and beliefs that mediate in the relationships between humans and other animals. Some studies show that people living in cities prefer to coexist with domesticated animals (pets, farm animals, work animals) and diurnal birds [13–15]. On the other hand, bats, reptiles, small rodents, and arthropods can be directly or indirectly associated with infection and unhygienic conditions and/or may have disgusting features such as those resembling mucus or fecal remains (worms, rats) [13]. Campbell and Lancaster [10] add that the rejection some big predators cause when going into cities could be interpreted as the response to risk of attack, to the disorder they cause, and to indignation for their intrusion into humanized space.

Prokop and Tunnicliffe [15] suggest that this rejection and dislike trigger fears (of a physical attack or of a disease spread). Dislike toward animals is dangerous for both people and animals because frightened people may take “irrational” decisions when facing an animal, often resulting in the animal’s death and, consequently, in an increasing risk of ecological and environmental problems (e.g. hunting and mortality of animals that help plague control) [7,16,17].

Conover [18] proposes the notion of “utilitarianism” when interpreting the cultural value of animals, suggesting that the positive perception of biological and ecological qualities of them and the resulting

protective attitudes would be in relation with their usefulness, which is then reflected in popular and symbolic narratives. Some authors suggest that this form of ethno-biological knowledge would have a strong impact on wildlife conservation at local level [2,10,19].

Although animal symbolic dimensions have normally been unattended by literature on biological conservation [8,9,11], in the last decades, many studies have shown that it is possible to achieve a synergy between popular ecological knowledge and scientific knowledge both for educational goals, and successful and innovative forms of biocultural conservation [e.g. 9,7,19,20,21]. Some researchers propose that reactivation of local environmental knowledge of urban children, in particular, may result in more positive pro-environmental attitudes, as children are more willing to replace concepts about frightening animals [19,22]. Participation in educational activities that involve asking questions, gathering data and their analyses, communicating the findings and reflections, may greatly improve children’s understanding of animals and their environment, possibly strengthening positive attitudes toward them [22].

Therefore, school students need to be taught by integrating both emotional and academic content. This would result in a more effective education method when teaching about nature and biological conservation [22,23]. Likewise, the analysis of popular narratives constitutes an appropriate strategy to understand the symbolic basis of the relationships between people and certain animals in their environment; this is very important for biologic conservation, and it is especially relevant for species that fall under an ideologically motivated protection or aversion [1] such as owls in Patagonia [24].

Ethnobiology can contribute to understand the aspects of culture that favor the conservation of wildlife, since this scientific discipline studies multiple relationships (i.e. symbolic, utilitarian) between humans and nonhuman elements in a given space and time, and it allows teachers and educators to gain information regarding how students relate to animals and their surrounding environment. This information can then be used to present a more accurate conservation and science education program that is also culturally sensitive [23].

Mapuche ethnobiological heritage about owls

In Argentinian and Chilean Patagonia, Mapuche aboriginal people have a valuable ethnobiological heritage associated with owls [24]. There are many oral stories, which have been transmitted by generations, in which predatory birds are seen as a projection of human behaviors that are unacceptable or rejected by society. In these stories, owls often symbolize human

fear of the unknown and what cannot be tamed [25]. In other stories, however, owls are beneficial and wise [26,27]. This cultural legacy, in which owls are strong symbolic animals, is still present today in the collective memory of rural people of this region, but the recognition of this cultural dimension of owls in urban areas is still unknown.

The “ratada” phenomenon in Subantarctic forests and how this mice plague is associated to owls and urban people

“Ratada” is a term in Spanish describing a rodent epidemic, usually after massive bamboo flowering and seeding event. “Ratadas” have been recorded in South America since the Spanish conquest in the sixteenth century [28].

In north-western Chubut province, massive flowering of the native bamboo *Chusquea culeou* occurred in late 2012 to early 2013 in Los Alerces National Park (LANP), 50 km from Esquel city [29]. This has been the first massive flowering and seeding event for the native bamboo in LANP in over 70 years [30]. The amount of seed available brought about an increase in natural rodent number (April 2013, ending in April 2014), including *Oligoryzomys longicaudatus*, a carrier of hantavirus pulmonary syndrome which is a severe, sometimes fatal, respiratory disease in humans [31].

Along with the rodent epidemic, there was an increase in owl number as well as other predators [30]. Studies have shown that rodent outbreaks increase predators’ number only the year after the event [32]. During 2014–2015, owl sightings in Esquel city were more frequent. In addition, the authors identified owl corpses in peri-urban green areas, possibly killed with slingshots or other rustic weapons (Figure 1). Campbell and Lancaster [10] discuss how substantial growth of populations of predators and scavengers could foster exacerbate magical beliefs in urban areas.

The objectives and hypotheses of the study

Our goals were (a) to study the perception and attitudes that school-aged students and their families have toward endemic North Patagonian owl species, during the months after the massive flowering of *C. culeou* and (b) to integrate academic and traditional knowledge in the teaching of ecological and cultural roles of regional owls, and then analyze changes in students’ conservation attitudes toward the species. Our argument is that popular narratives about owls, encoded in the urban ethnobiological knowledge, influence local people’s perception and attitudes toward these birds. Our second assumption is that integration of academic and ethnobiological contents in school plans influences the interest of schoolchildren for ecology and conservation issues.



Figure 1. Dead *Tyto alba* owl found in Esquel (Patagonia, Argentina) during the “ratada,” a rodent epidemic after massive flowering of *Chusquea culeou*, Chubut, Patagonia, Argentina. April 2014.

Material and methods

Study area

This study was conducted in a high school located in Esquel city (42°55’S, 71°19’W), Chubut province, Argentinian Patagonia (Figure 2). Esquel is located in the Andes Cordillera at 560 masl. and in the transition area between the Patagonian steppe and the Subantarctic forest [33].

Esquel (32,758 inhabitants) is a multicultural city where people have immigrated from other parts of Argentina and Chile, most of them having European ancestry, though the main ethnic background is aboriginal Mapuche. The Mapuche is the largest native aboriginal group in Chubut province, and it is estimated that about 78.6% of them are settled in urban areas [34].

The education system in the city includes all levels, from pre-primary education to high schools and a national university. There are 10 state public high schools and most students are permanent city residents, only a minority of them come from the surrounding rural areas and reside in the city during the school season (from March to December), living either in state shelters or at a family member’s place.

The city has also a few official institutions dedicated to science, technology, and livestock and agricultural activities, as well as forestry organizations.

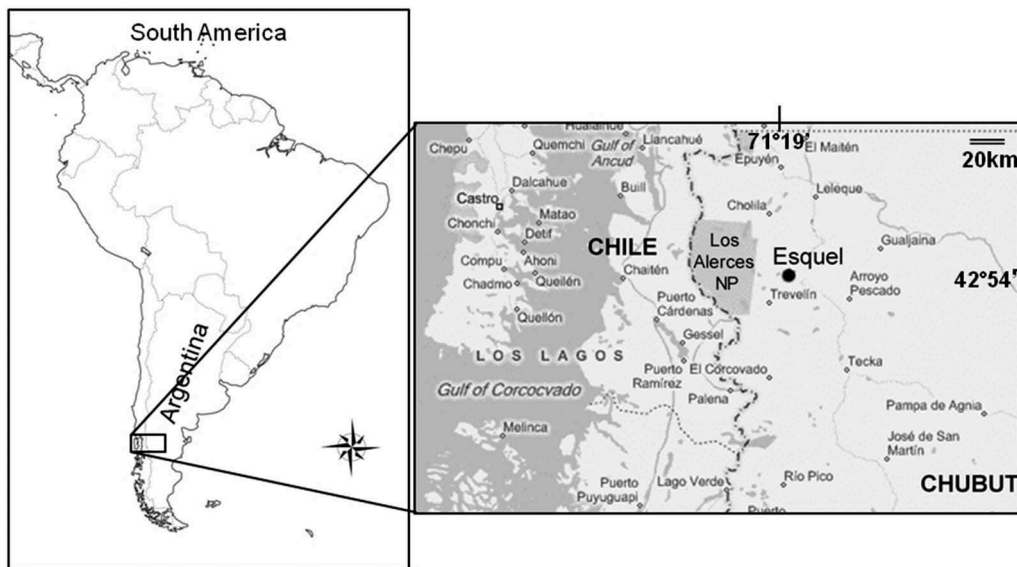


Figure 2. Map of the study area: Esquel, Patagonia, Argentina, South America.

The main economic activities are related to trade and small businesses, public administration, tourism, and forestry production. The family unit includes parents and children but, sometimes, the family structure is more complex including elderly grandparents, aunts and uncles, the latter is especially true to people with Mapuche heritage [35].

Data collection, analysis, and interchange of information

Data collection occurred in the second half of 2014. This work was carried out in Public School No. 767, authorized by the principal of the institution. We also had prior consent of teachers and adults responsible for each student [36].

As a preliminary instance, we conducted two workshops with 60 students aged from 15 to 18 years, in order to discuss the ideas related to the project. We were informed by the school's administrative staff that around 50% of the students had surnames of Mapuche origin; however, the institution did not have official data on the ethnic ancestry of its students. These workshops were coordinated by biology and social science teachers and consisted of a power point presentation (15 minutes), which included general taxonomic and ecological information about the owl species found in Esquel and surrounding areas (*Strix rufipes*, *Asio flammeus*, *Bubo virginianus*, *Athene cunicularia*, *Glaucidium nanum*, *Tyto alba*), as well as images of dead owls found around the city during 2014.

After this presentation, semi-guided debates on the topic were conducted. Most students said they had never seen owls, and only a few said they had found some owl pellets (balls formed by remnants of undigested food) in the past. Most of the opinions brought forth by these students were focused on

magical-symbolism ideas on these birds, mainly related to science fiction films. Some students who commented about their behavior and Mapuche rural legends were teased by other students. The general opinion reflected little interest for the presence of dead birds in open spaces or for their ecological role (i.e. pest control, etc.).

A key finding that emerged spontaneously from most students was that in their homes, older family members (parents, grandparents) retained traditional knowledge, which they did not know or could not transmit to others. With this in mind, and through a participatory methodology, we designed a semi-structured questionnaire related to regional owls. The students would then use these questions to interview older members of their household. Twenty-nine students agreed to participate in this stage of the project.

The main questions asked were as follows: What owls do you know living in Esquel and around the city? What do these birds eat? Do you know about the remains that are left behind after the bird eats? Have you seen an owl this year? If so, where have you seen it? What stories (myths or other narratives) do you know about owls? How do you react when you see one? Given the exploratory nature of the work, the questions were open ones. The informants presented their ethnobiological knowledge in free listing form, except for the last two questions, for which the answers were local narratives. In order to carry out the quali-quantitative analysis of the information, the discourses were analyzed and data were organized into discrete and mutually exclusive categories of analysis: data on diet and sighting environments were classified according to the authors' criteria, while the categories and the linguistic labels of cultural perceptions (positive and negative) were established according to the informants' criteria [37].

All participating students were able to interview a family member (15 women, 14 men; mean age = 42 years). All of the interviewees live in the city, but about 40% are native to rural adjacent towns and still retain strong links with them because they spend a large part of the year doing small-scale economic activities (mainly goat and sheep breeding) in small farms around the city, or due to social commitments. All answers were written down and some of the interviews were filmed. During interviews, the birds cited by informants were identified at species level using field guides [38], and the owl pellets by photographs by YG. The students were accompanied by teachers and/or the main author of this work (SM) and helped during the recording of information and identification of species.

Simultaneously with this part of the project, all students (60) performed laboratory work during school hours, which consisted of dissection and identification of bone remains present in samples of owl pellets from LANP which were collected during the “ratada”. Before handing out the owl pellets, they were heat-sterilized in an autoclave at 120°C for 2 hours. This assured that any microbes normally associated with owls or rodents were killed. Students were provided with latex gloves, masks, and dissection equipment in compliance with health and safety standards provided by the school and laboratory work standards.

Finally, an oral and visual presentation was organized by the students and teachers who had participated in the workshops and laboratory work. This was organized at school, as part of the activities of “Science Day” and was open to the general public.

Results and discussion

The knowledge of school families about owls of Esquel and surroundings: species, food and habits

The results of the interviews demonstrate that all the family members interviewed by the students knew and recognized at least one owl species. The most

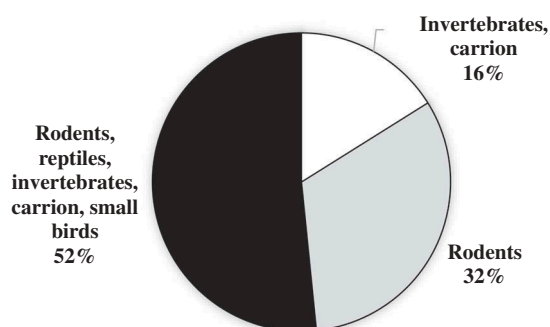


Figure 3. Percentage of records of owls' feeding types, indicated by the students and their families of an urban school in Esquel, Patagonia, Argentina.

frequently mentioned ones were *Tyto alba* (“lechuza blanca”) and *Glaucidium nanum* (“palomita”) (both of them making up 38% of records). These species stood out in the results for four main reasons: color, shape, size, and behavior.

Tyto alba has a heart-shaped white facial disc and white plumage, these features making it more noticeable in the dark than other species. The austral pygmy owl (*Glaucidium nanum*) is one of the smallest owls of southern South America; it is a confident bird and shows little fear, even of approaching humans, and it is active during the day [39]. The small size of *G. nanum* turns out to be relevant to such a degree that when informants referred to it, it was described as “looking like a dove” (*Columbina picui*). Also both, *Tyto alba* and *G. nanum*, are adapted to live close to human populations. They are known to build nests in man-made structures and are resilient to increasing human-induced environmental changes [40].

Regarding the question related to owl diet, 52% of the respondents answered that they are generalist and feed on rodents, reptiles (lizards and small snakes), invertebrates, carrion, and small birds; 32% answered that their diet is only based on rodents at night; and 16% indicated that they feed on carrion and invertebrates (spiders, insects, worms, etc.). Informants did not distinguish among owl species (Figure 3). Out of all the people interviewed, 45% expressed that they had seen pellets, without specifying where.

Most respondents who mentioned to have seen owls noted that before the “ratada” in 2014, owls were seen in native forests, particularly in LANP, and in rural areas near Esquel. To a lesser extent, they indicated having seen them in abandoned warehouses in urban areas and in peri-urban forestation of *Pinus* spp. During the “ratada,” sightings increased sharply in the forests and in LANP, as well as in urban areas, according to informants (Figure 4). This suggests that the “ratada” exposed members of the local community to encounter with a greater rate not only of rodents but also of the owls that prey heavily on them.

Perceptions and attitudes towards owls

Encoded in narratives, particularly in myths, local people perceive owls in an antagonistic manner: as wise and benign animals (13% of all interviews) or as diabolic creatures (61%). The remaining 26% of the results corresponds to respondents who preferred not to talk about the issue. Analysis of the discourse allowed us to distinguish that the factors which generate greater aversion to owls are an anthropomorphic face, broad movement of the neck (about 270°), nocturnal habits, and diet based on rodents and amphibians. Behavioral implications and attitudes toward these owls ranged from people wanting to protect owls' nests from predators such as dogs and cats, to not being interested at all in

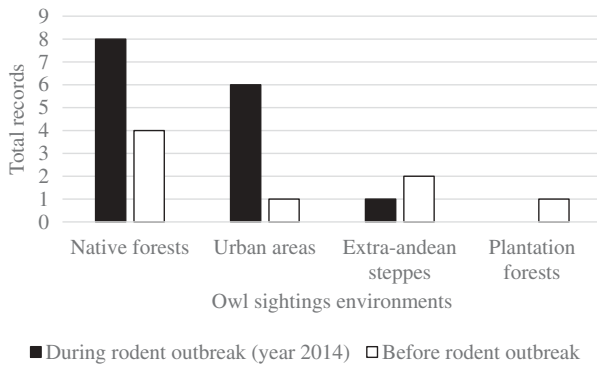


Figure 4. Total records of owl sighting environments before and during the rodent epidemic (year 2014) according to students of an urban school of Esquel and their families, Chubut, Patagonia, Argentina.

owls and even having a direct desire to kill these birds with slingshots or air rifles. However, it has not been evident that the positive perceptions toward owls expressed in the narratives relate to owls' diet, particularly regarding consumption of rodents as an important role in this plague's control in the city. This topic still requires further studies.

Binary oppositions are very common in myth analysis [1]. However, the conceptualization and representation of this binary view depend on the worldview. In many traditional societies, such as in the Mapuche, nature is a space where all beings are regulated by social rules, whereby humans can become or be transformed into animals and *vice versa*, and differences between animals and humans are gradual [24]. In these societies, holistic thinking is the norm (e.g. our own actions are reflected in how birds act), or the complementary dual view (e.g. good-bad, natural-supernatural), that is, opposite states are recognized but they are complementary [41]. Instead, in pluricultural and nontraditional societies, as in the urban population addressed in this study, collective thinking is usually categorized by opposite positions that are not complementary. Thus, beliefs are in a permanent confrontation in an unbridgeable way, and humans and nonhumans are different domains in potential conflict [42].

According to Rozzi [24], for Mapuche people, birds share a common evolutionary origin with humans and, therefore, they are linked through a familiarity notion, then bird life could be subject to moral considerations equal to the ones for human life. Possibly, these facts suggest that prevalence of negative perceptions and attitudes toward owls may be more related to western influence than to the original Mapuche culture.

Western culture has been imposed for, at least, 300 years in this region of Patagonia, where nature is seen as a subject to exploit for resources [43]. In this sense, it is important to note that present ethnonomenclature has a greater similarity with common names in Spanish ("lechuzas", "palomitas"), than with indigenous languages of Patagonia [27]. It is probable

that owl myths arrived in South America from Europe since the Spanish colonization hybridizing with local narratives and then gradually extending south to Patagonia [1].

The confrontational view of nature is also associated to a socio-historical by-product of the sedentary lifestyle [43,44] and to some nontraditional religions such as Christianity which was also imposed to the Mapuche and other aboriginal communities during the colonization processes [7,9]. The change from a nomad hunter-gatherer small-scale farmers' society to a modern one where humans are limited to an environment which has drastically changed has brought about deep cultural fluctuations at a symbolic level among the Mapuche. As a consequence, wild environments are now places which threaten culture, where there are supernatural powers which cannot be controlled by humans [45]. Conover [18] adds that when owls advance into humanized-domesticated areas, "they transgress the culturally established limits, violating the space that is only allowed for species which are subject to human management" (pets and work animals according to the urban logic), and thus bring about a dysfunction in the established order of nature, and even more, projecting in them despised human traits [44].

Laboratory experience and presenting results to the community

Dissection of owl pellets was an activity which seemed to be enjoyed by the students, who were especially interested in learning about anatomy as well as to identify the owls' diet. Some of the rodent species found were *Oligoryzomys longicaudatus* and *Abrothrix longipilis* which are considered hantavirus reservoirs.

Finding rodent remains in owl pellets helped support what had been presented by respondents in the interviews about owl diet, supported and indicated in the literature sources. This data intersection was a point of inflection, where the birds began to be perceived as useful elements for rodent control in the city, and also as part of the Mapuche bio-cultural heritage of the region, which generated a positive attitudinal change toward them.

The closing activity carried out during "Science Day" was to present the laboratory results as well as the results of the interviews to the wider community. Representatives of Museum of the Original People (Mapuche) of Esquel were specially invited to this workshop. Some students showed audiovisual presentations which included the interview process, photos of activities carried out in the laboratory, and explanation of relevant aspects of the ecology of the owl species. The audience asked many questions and a discussion arose related to the importance of owls in urban society to help keep rodent number down. This workshop also allowed students to fill in the role of "teachers" and to transmit what

they had learned during this project to the rest of the community.

Why is a new strategy of learning about endemic owls important to Patagonian schools?

We believe this is a unique and important study in Patagonia because it was carried out right after a “ratada,” which has only been known to occur every 60–70 years or so [29,30] after massive flowering of native bamboo. It is necessary for urban students and their families to be more conscious about what happens during and after a rodent epidemic and how to decrease the chance of being infected by the devastating hantavirus, and students can be disseminators of this information.

It also demonstrates that it is possible to approach the symbolic dimension of animals, at a school level, including students’ families as key informants. This work showed that elderly people (parents and grandparents) and/or people related to rural knowledge hold beliefs that younger people (students, inserted in institutions of formal education), do not have. Likewise, we believe studies like this one, seeking to integrate ethnobiological data and curricular concepts of the school, are essential to promote the cultural and ecological values of predatory animals, especially in urban populations close to protected natural areas [46]. These teaching strategies can tend to a better coexistence and to more respectful cohabiting between humans and wildlife [47–50].

Conclusions

The results of this work confirm the general hypotheses stated. During the period immediately after massive flowering of *Chusquea culeou* in Argentinian Patagonia and subsequent explosive increase of rodents and predators, students and their families reported aspects of the regional ecological and symbolic knowledge of owls.

The positive point of views related to owls expressed through interviews, as well as the negative perceptions, were addressed through culturally sensitive educational techniques such as learning about the family’s ethnobiological knowledge encoded in myths and stories. The ecological importance that is derived from the diet of owls was corroborated by activities carried out during this study through double triangulation of techniques (laboratory-interviews-lessons) and also by agents (researches-teachers-family). This multidisciplinary approach enabled a positive change of attitudes amongst the students, regarding the importance of owls for urban local population in relation to cultural heritage, ecology, and rodent control.

The approach to teaching about these environmental issues in the classroom using the narratives reflected in the interviews as mediation devices between sociocultural attitudes and natural and social

subjects taught allowed to discuss knowledge from different sources (academic and traditional knowledge). It has also contributed to an assessment and critical review of the popular views and attitudes in relation to ethnicity and intrinsic values of birds.

Still, it is necessary to deepen these participatory methodologies to revive the exchange of academic and non-academic knowledge amongst students, teachers, researchers, and the rest of society, to promote reflections and provide decision-making tools to help community members when facing predatory birds. In our view, applied ethnobiology can help strengthening and respecting different modes of thinking about animals in a school environment. This type of studies offers resources for teachers to include cultural knowledge from students.

Encouraging a cultural exchange at school is especially important where there is an aboriginal heritage. Western science is actually a cross-cultural event, the students move from their everyday cultures to western school education [48]. To enable students to have a successful and positive experience in biology and conservation, they need to be able to navigate across science based in culture and culture based in science [49].

Our observations demonstrate that the ethnobiological approach in schools favors respect toward cultural and symbolic differences, which results in better comprehension about the natural world as well as conservation of local biocultural heritage. So, we consider that this information is fundamental for the construction of intercultural plans of education and conservation of wild predatory birds in urban contexts of Patagonia.

Undoubtedly, many questions arise from this work. For example, other studies could compare the ways of perceiving predators in different socio-environmental contexts (populations inside and outside national parks, small towns and cities, etc.), also considering demographic factors. In this way, we consider that our contribution is a starting point toward addressing other urban conflicts between humans and wildlife in Patagonia.

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Authors’ contribution

SM and YG designed the study and collected field data; SM analyzed and interpreted results; SM and YG wrote the manuscript; both authors read and approved the final manuscript.

Disclosure statement

No potential conflict of interest was reported by the authors.

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