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Evaluation of the Territorial Potentials for the Practice of Birdwatching Tourism in the Carrizal-Chone Water Corridor (Ecuador)

Abstract

The main objective of this paper is to study the territory and environmental resources to identify the potential for the development of birdwatching tourism in the Carrizal-Chone water corridor, located in the province of Manabí, Pacific Coast region (Ecuador). To this end, the environmental and social characteristics of the territory were analyzed with the support of a literature review, fieldwork, direct observation techniques and a series of interviews with local stakeholders. An inventory of the most representative birdlife species was also carried out to subsequently systematize the information in a sustained registration matrix, using a series of tools such as bird inventory sheets, binoculars, Global Positioning System equipment, and photographic surveys. Through the final evaluation of the results, 126 bird species and 37 families have been identified; it has been possible to verify that 70% of the managers are familiar with birdwatching tourism and, in addition, there are natural and cultural tourist services and attractions with significant ecotourism potential.

Keywords: birdwatching, local development, conservation, ecotourism, wetlands, Ecuador

1. Introduction

Birdwatching tourism is an emerging sub-sector of the nature-based tourism industry and ecotourism, where tourist travel motivations focus on birdwatching (Steven et al., 2015). Not only does it contribute to economic diversification and the generation of new sources of employment around the natural areas, but it also promotes public awareness of the necessary proactive conservation of ecosystems and habitats in countries such as Ecuador, Peru, Brazil or Colombia. Since the start of this tourism trend, there has been a notable increase in the number of birdwatchers and tourism related to this hobby (Mora & Ramírez, 2019). Even though this is not a homogenous demand, we can identify three clusters of interest: specialized birdwatchers, deeply motivated by knowledge and study of birdlife (Jácome et al., 2019); enthusiasts, who know and come into direct contact with nature; and casual ecotourists, which are much less specific and with a lower level of loyalty to ecotourism destinations (National Audubon Society [Audubon], 2016).

Ornithological tourism is aligned with current global trends of diversification and the emergence of new tourism forms reflected in a series of products based on biodiversity. Destinations with a lot of diversity, such as Central America and South America, where attempts are made to find new models of more sustainable tourism development that allow socio-economic revitalization of the areas of influence of protected natural spaces in a way compatible with the preservation of the natural environment (Castillo et al., 2015).

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As a result, there is a need to implement the appropriate governance tools and systems for the sustainable management of these protected areas. Among the new trends in international tourism demand, birdwatching tourism has turned out to be a form of ecotourism and responsible tourism in nature destinations that is useful not only as an instrument for the conservation of ecosystems. (Mugiarti et al., 2022; Barreira & Cesário, 2024).

To understand more generally the importance of ecotourism and birdwatching at an international level, Gonzales and Panduro (2017) state that birdwatching represents a great potential and constitutes the most significant sector within nature tourism, mainly practised in the United States, Canada, Japan, Australia and South Africa, which is why countries like Ecuador that have high levels of biodiversity and endemism, especially in terms of birdlife, motivate ornithologists, researchers and enthusiasts to visit them. Sustainable practices allow the adequate development of any activity, especially those involving natural and faunal resources. (Watson et al., 2019). Perdomo et al. (2018) state that management must fully integrate conservation, ecotourism and environmental education in birdwatching tourism. On the other hand, it states that in the field of environmental education, this information on local biodiversity could be used in the training of local professional tourist guides as an element of good birdwatching practices. (Perdomo et al., 2018)

The practice of birdwatching considers the economic benefits for locals. It thus promotes the conservation of the local ecosystem, using methods of environmental diagnosis and adequate territorial planning considering all regional stakeholders. (Rivas, 2018). Based on these considerations, authors such as Andrade et al. (2018) argue that new forms of tourism with a more sustainable approach, such as ecotourism (and, within this, Birdwatching), can facilitate a more appropriate integral development for the host local communities. For Carrillo et al. (2017), this makes them feel more motivated to conserve the environment and natural heritage. For the World Tourism Organization (2020), this must be a fundamental support and qualification for tourism activity through innovative and experiential products and services.

Through the application of sustainability criteria, the empowerment of local actors and achieving conservation-development goals by promoting initiatives that reconcile the use and management of heritage resources with respect for their natural and cultural values and the search for the general interest of local communities (Cabanilla & Garrido, 2018; Mulero & Rivera, 2018). Even though, as recently warned by the Ministry of Tourism of Ecuador (MINTUR, 2021), there are many challenges and needs that the tourism sector must face after the pandemic, the moments of crisis such as those we are experiencing have been an opportunity for the segments of nature tourism and ecotourism. These destinations have proven to perform better during the pandemic than the segments most linked to urban tourism and the coast. The tourist activity of observation of fauna and flora has experienced, in recent decades, rapid growth, resulting in some modalities such as Birdwatching, which must be considered as an ecotourism activity based on the observation of birdlife and the enjoyment of their habitats by studying their species using different tools (Cantú & Sánchez, 2011). Likewise, birdwatching can be considered an instrumental and interactive means of promoting a broader and deeper understanding of bird species. (Watson et al., 2019) Promoting environmental education and greater awareness of its conservation would minimize adverse effects and maximize socioeconomic and environmental benefits for nature tourism destinations. For that purpose, sustainable actions and a system of governance and planning of the affected natural spaces must be implemented from an inclusive and holistic approach that considers both biogeographical and socio-environmental variables (Steven et al., 2017).

To promote ecotourism and Birdwatching products, it is necessary to establish conscientious measures to protect biodiversity. (Barros, 2021). Ecuador has shown great potential in this tourism segment, as it is among the 17 most megadiverse countries in the world with exceptional biodiversity and numerous bird endemism. (MINTUR, 2021). According to Birdlife International (2021) in Ecuador, 109 Important Birds Areas (IBAS) have been identified, with antecedents of older studies of Aves & Conservation (a partner of Birdlife International

in Ecuador). Also, in 2003, thanks to an alliance formed by Birdlife International, its social organisations and Conservation International, the so-called "Program of Areas of Importance for the Conservation of Birds in the Tropical Andes" was carried out, comprising the countries of Venezuela, Colombia, Ecuador, Peru and Bolivia. Ecuador registers approximately 1.680 species of birds, representing 17% of the world total, according to data from the Ecuadorian Committee of Ornithological Records (Freile & Poveda, 2019) and according to the Military Geographical Institute (2020), the country has 35 endemic species, 6 of them are found in mainland Ecuador and 29 in the Galapagos Islands. Furthermore, 133 species of hummingbirds, more than 120 tanagers and 300 regional species have been identified. This shows that the country is an internationally recognized destination for its diversity and endemism in bird species. (García et al., 2014).

IBAS in Ecuador and other South American countries have been an essential step in the recognition and administrative awareness for the protection of natural areas, which is fundamental for the sustainability of the native and migratory populations of avifauna. (MINTUR, 2021). These areas lack adequate and substantive territorial planning in Ecuador. Hence, many socio-environmental problems that affect them at the level of use are incompatible with their conservation (Doumet, 2020). Furthermore, we must add that these local agents have low interest and lack of professional training for implementing ornithological tourism services and products.

2. Methodology

2.1. Territorial contextualization of the study area

The Carrizal-Chone water corridor, located in the province of Manabí Pacific coast (Ecuador) and the subject of this study, irrigates productive areas, which includes productive zones and conservation areas in the cities San Vicente, Bahía de Caráquez, Tosagua, Bolívar and Chone. It has an extension of 71 km and runs from the wildlife refuge Isla Corazón y Fragatas to the Sixto Durán Ballén dam (La Esperanza) along the following stretches: La Esperanza to La Segua 46 km and from La Segua to the Isla Corazón y Fragatas wildlife refuge 23 km. In these areas, there are significant transits of migratory and native birds that find shelter and food in different ecosystems of the territory (tropical dry and humid forests, mangroves, and inland rivers and wetlands). However, there is a solid biological connectivity between them. The study area is in the Chocó biogeographic region and the neotropical zone influenced by the Tumbes bioregion, Themboldt, war, and El Niño marine currents.

2.2. Working method and tools

A tourist or recreational and socio-environmental characterization of the territorial environment that integrates the Carrizal Chone water corridor was initially carried out to achieve the study's objectives. We also identified and catalogued each protected area's most representative bird species in this territorial diagnosis. The research has followed a descriptive methodology, using diverse instruments such as in-depth bibliographic and documentary reviews, fieldwork outputs, direct observation, and the survey of a species inventory. The bibliographic and documentary review has considered various sources, research, and concrete projects of tourist-recreational enhancement of areas of ornithological interest.

A profuse bibliographic and literature review was carried out as the first phase of the methodological process, consulting digital repositories and specialised scientific papers. In this review, we have considered the methodological contributions of Birdlife International of Ecuador (2021) and the studies of Freile and Poveda (2019) on birds of Ecuador, as well as the considerations of authors such as Rivas (2018) and Almeida (2015), where we were able to determine in case studies the potential of birdwatching tourism. Similarly, we have the contributions of Steven et al. (2017) and Cajas et al. (2021).

For the development of the next stage (socio-environmental characterisation), three main points were considered that were registered as potentially of most significant interest for the conservation and refuge of native and migratory birds (Sixto Durán Ballén dam, La Segua wetland and the Isla Corazón y Fragatas Wildlife Refuge). In these places, it was first necessary to record the different ecosystems using field trips and direct observation. For this purpose, all the information collected was systematised in a summary matrix (Table 1). In addition, during these technical visits, the main points of interest for the observation and study of the birdlife avifauna were geo-referenced (Table 2), which were then integrated into a route and itinerary that we considered to be of greatest tourist-recreational interest.

To record the local and migratory avifauna, the E-Bird application was used as a technological tool, as well as conventional instruments such as binoculars, bird check-list cards, notebooks and Global Positioning Systems (GPS) equipment, to then proceed with the systematisation using a checklist of the most representative species to be observed. This sheet contains the names of the species with their local, scientific and English name (Table 3). Subsequently, the representative species with vulnerability problems were also systematised (Table 4).

For a more precise diagnosis of the potential of birdwatching tourism in the study area, in-depth interviews were conducted, and ten questionnaires were applied to various local actors directly or indirectly involved in the supply and demand of nature tourism in the province of Manabí. These interviews were carried out using an agenda and visits to the offices and workplaces of each of the ten actors belonging to the institutions mentioned above. It is essential to highlight that the questionnaire contained five questions related to the managers' level of knowledge about birdwatching activity and the diversity of birdlife in the area. The information resulting from the interviews was finally organized into a criteria matrix (Table 5). A table with the different conservation initiatives organized by the various national and international organizations is also presented (Table 6).

3. Results and analysis

After diagnosing and studying the Carrizal-Chone water corridor, we can affirm that this territory has a high potential for birdwatching since it presents a great diversity of ecosystems, refuge areas, feeding and reproduction of the native and migratory bird species. In addition, it has a high landscape quality and a relatively acceptable offer of tourist-recreational services in its area of influence. Next, in Table 1, the main socio-environmental characteristics of this territory that must be considered for evaluating these potentialities for ornithological tourism are evidenced.

Table 1
Environmental and tourism characteristics of the Carrizal-Chone water corridor

Sixto Durán Ballén Dam	La Segua Wetland Ramsar Site
It is in the parish of Quiroga, 12 kilometres from Calceta city. Coordinates 00°53'25" Lat. S. 80°04'06" Long. 0. Its reservoir area has an extension of 2,250 Ha and is built at the headwaters of the Carrizal watershed and stores 450 million cubic metres. The annual rainfall is 1.800 mm and 900 mm, and the average temperature is 18ºc to 25ºc. In the reservoir area, there are few remnants of protected native forests, which share spaces for agricultural activities, artisanal fishing, and tourism. It offers facilities for different recreational activities: canoeing, kayaking, and mountain biking. Three lodges provide tourist services such as food, lodging and camping. The city of Calceta is the centre of tourist operations. It is a resting place for migratory birds and a feeding place for aquatic species. Approximately 120 species of birds can be observed.	It is located at the confluence of the Carrizal and Chone rivers, between the cities of Chone and Tosagua in the province of Manabí. The main access area is the parish of San Antonio. It covers an area of 1.745 hectares. In the dry season, the water body is reduced to about 525 hectares, with an average depth of 67 cm. Its altitude is 10-12 meters above sea level, with a temperature of 26 to 27Cº (IUCN, PMRC, MTA and UNEP, 2000). Geographically, it is located between the coordinates: north (594001-9992713), south (589840-9918887), east (592729-9922070) and west (585302-9922568). Most of the wetland is open water, but there are also floodplains. Agricultural and livestock activities are carried out on the banks and traditional fishing and shrimp ponds. Some public services include the environmental interpretation centre, observation tower, canoes and life jackets. Another essential tourist resource is the traditional gastronomy based on the Chame fish species (Dormitator latifrons). The wetland does not have infrastructure for lodging; due to its proximity to the city of Chone, visitors can access its tourist offers. There are 164 species of birds (22 migratory and 63 aquatic).

Table 1 ***(continued)***

Isla Corazón y Fragatas Wildlife Refuge
It is part of Ecuador's National System of Protected Areas "SNAP". Its territory comprises estuarine islands covered with mangrove swamps. It is in the estuary of the Chone River, between the city of Bahía de Caráquez and San Vicente in the province of Manabí. The two islands have an extension of 800 and 2.811 hectares. This area is a resting and breeding ground for seabirds and shorebirds, including a large colony of frigate birds (Ministry of the Environment [MAE], 2016). The community of Portovelo (San Vicente) is the administrative headquarters of the protected area; there are facilities for entry to the wildlife refuge, which are offered by the local community. Established trails and routes allow you to tour part of the islands through walkways through the mangrove ecosystem of the mangrove swamp. Activities include fauna and flora observation, aquatic tours and landscaping. A total of 136 species of migratory and native birds have been recorded. It is the habitat of a large colony of frigate birds (Fregata magnificens).

Source: Own elaboration.

Birdwatching tourism is understood to be feasible for the economic diversification of the area if it addresses substantive planning, both tourist and environmental and territorial and of an integral nature, of the entire Carrizal-Chone water corridor, which allows a sustainable management model for its natural and sociocultural resources. It draws attention as an exceptional territorial resource for the practice of birdwatching tourism, the diversity of ecosystems and the attractive landscape, to which the permanent presence of migratory and, so the results of the studies of Freile and Poveda (2019) are verified. They already considered this space like an exceptional habitat for nesting, reproduction and refuge of birdlife, even when we must show the practical lack of adequate and substantive measures to safeguard the ecosystems of the area since there are essential territorial impacts, unsustainable and disorderly land uses, growth of shrimp harvesting pools and intensive agriculture with overuse of chemicals and pollutants.

The two-year registration of the points of most significant interest for bird watching, carried out at different times and days to detect changes in the behaviour and activity of birdlife, has served to identify the territorial resources with the most significant eco-tourism potential and to elaborate a field guide checklist. Works such as those of McMullan and Navarrete (2013) and Field Book of the Birds of Ecuador have been instrumental. As part of the bird register, the main observation and counting points were first identified and geo-referenced, for which the geographical coordinates and meters above sea level were noted (Table 2).

Table 2
Coordinates and location points

Reference point	Coordinates	Meters above sea level
Isla Corazón and Fragatas Wildlife Refuge, Puerto Portovelo, MAE administrative headquarters.	0o 37' 59" Sur (-0.63o) 80o 20' 24" West (-80.34o)	0-10
La Segua wetland, La Segua community, San Antonio, administrative headquarters of the protected area.	00°42' North 80°12' Oeste	10-12
Sixto Durán Ballén Dam, Puerto La Esperanza, Quiroga parish.	0°52´56,99´´ S 80°03´51.09´´ O	22 - 105
Calceta City, Carrizal riverbanks.	0°50´56,56´´ S 80°09´51,73´´ O	12-20

Source: Own elaboration.

The fieldwork finally identified 126 bird species and grouped 37 families, listed in Table 3, where we offer a schematic summary of the species with the most significant presence and tourist attraction. The species are organized according to their scientific, local, and English names.

Table 3
Bird record Carrizal Chone water corridor

Local name	Scientific name	English name
	TINAMIDAE	
Tinamu Chico	*Crypterellus soul*	Little tinamou
	ANATIDAE	
Pato Salvador Canelo	*Dendrocygna bicolor*	Fulvous whistling duck
Pato Salvador negro	*Dendrocygna autumnalis.*	Black-Bellied whistling duck
Pato real	*Cairina moschata*	Muscovy duck
Anade cariblanco	*Ana babamensis*	White-cheeked pintail
Anade aliazul	*Anas discors*	Blue-winged teal
	PODICIPEDIDAE	
Zambullidor chico	*Tachyubaptus dominicus*	Least grebe
	CRACIDAE	
Pava de monte	*Penelope purpurascens*	Crested guan
Guacharaca	*Ortalis erythroptera*	Rufous-headed chachalaca
	ANHINGIDAE	
Aninga/Pato-aguja.	*Anhinga anhinga*	Anhinga
	PHALACROCORACIDAE	
Cormorán/Pato cuervo	*Phalacrocorax-brasilianus*	Neotropical Cormorant
	PELECANIDAE	
Pelicano café	*Pelecanus occodentalis*	Brown pelican
	FREGATIDAE	
Fragata	*Fregata magnificens*	Magnificent frigatebird
	ARDEIDAE	
Mirasol	*Botaurus pinnatus*	Pinnated bittern
Mirasol chico	*Ixobrychus exilis*	Least bittern
Garza nocturna cabeza negra	*Nyctanassa nycticorax*	Black- crowned / Nigth- heron
Garza nocturna/Guaco	*Nyctanassa violácea*	Yellow- crowned / Nigth- heron
Garceta bueyera	*Bubulcus ibis*	Cattle egret
Garza Cocoi	*Ardea cocoi*	Cocoi heron
Garzon azul	*Ardea herodias*	Great blue heron
Garza grande	*Ardea alba*	Great egret
Garza nívea	*Egretta thula*	Snowy egret
Garza azul	*Egretta caerulea*	Little blue heron
Garza tigre	*Tigrisoma lineatum*	Tiger heron
Garcilla Estriada	*Butorides striatus*	Striated heron
	THRESKIORNITHIDAE	
Ibis Blanco	*Eudocimus albus*	White Ibis
	CATHARTIDAE	
Gallinazo negro.	*Coragyps atratus*	Black vulture
Gallinazo cabeza roja.	*Cathartes aura*	Turkey vulture
	PANDIONIDAE	
Águila pescadora	*Pandion haliaetus*	Osprey
	ACCIPITRIDAE	
Elanio tijereta	*Elanoides forficatus*	Swallow- tailed kite
Gavilán Caracolero	*Rhostrhamus sociabilis*	Snail kite
Gavilán sabanero	*Buteogallus meridionalis*	Savanna hawk
Gavilán campestre	*Buteo magnirostris*	Roadside hawk
	FALCONIDAE	
Halcón reidor/ Valdivia.	*Herpetotheretes cachinnans*	Laughing falcon
Esmerejón	*Falco columbarius*	Merlin
Halcón peregrino	*Falco peregrinus*	Peregrine falcon

Table 3 ***(continued)***

RALLIDAE		
Gallareta	*Gallinula chloropus*	Common gallinule
Gallareta azul	*Porphyrula martinica*	Purple gallinule
CHARADRIIDAE		
Chorlo semipalmado	*Charadrius semipalmatus*	Semipalmated plover
Chorlo callarejo	*Charadrius collaris*	Collared plover
RECURVIROSTRIDAE		
Cigüeñuela	*Himantopus mexicanus*	Black-necked stilt
LARIDAE		
Patiamarillo mayor	*Tringa melanoleuca*	Greater yellowlegs
Patiamarillo menor	*Tringa flavipes*	Lesser yellowlegs
ESCOLOPACIDAE		
Patillo andarríos	*Actitis macularius*	Spotted sandpiper
Andarríos solitario	*Tringa solitaria*	Solitary sandpiper
JACANIDAE		
Jacana	*Jacana jacana*	Wattled jacana
ESTERNIDAE		
Gaviotin aretico	*Sterna paradisaea*	Arctic tern
Gaviotin real	*Sterna máxima*	Royal tern
COLUMBIDAE		
Tortolita ecuatoriana	*Columbina buckleyi*	Ecuadorian ground dove
Tortolita roncadora	*Columbina cruziana*	Croaking ground-dove
Tortolito azul	*Claravis pretiosa*	Blue ground-dove
Paloma ventripálida	*Patagioenas cayennensis*	Pale-vented pigeon
Paloma rojiza	*Patagioenas subvinacea*	Ruddy pigeon
Tórtola aliblanca	*Zenaida meloda*	West peruvian dove
Tortola común	*Zenaida auriculata*	Eared dove
Paloma apical	*Leptotila verreauxi*	White-tipped vove
PSITTACIDAE		
Perico carrirojo	*Aratinga erythrogenys*	Red-masked parakeet
Periquito pacifico	*Forpus coelestis*	Pacific parrotlet
Loro cabeza azul	*Pionus menstruus*	Blue-headed Parrot
CUCULIDAE		
Garrapatero piquiliso	*Crotophaga ani*	Smooth-billed ani
Garrapatero piquiestriado	*Crotophaga sulcirostris*	Groove-billed ani
Cuclillo crespin	*Tapera naevia*	Striped cuckoo
TYTONIDAE		
Lechuza de campanario	*Tyto alba*	Barn owl
ESTRIGIDAE		
Mochuelo pacifico	*Glaucidium peruanum*	Peruvian pygmy owl
Búho terrestre	*Athene cunicularia*	Burrowing owl
NYCTIBIIDAE		
Nictibio (Punta de estaca)	*Nictibius griseus*	Commonn potoo
TROGONIDAE		
Trogon ecuatoriano	*Trogon mesurus*	Ecuadorian trogon
Trogon coliblanco del oeste	*Trogon chionurus*	Western White-tailed trogon
CERYLIDAE		
Martin pescador grande	*Megaceryle torquata*	Ringed kingfisher
Martín pescador amazónico	*Chloroceryle amazona*	Amazon kingfisher
Martin pescador verde	*Chloroceryle americana*	Green kimgfisher
Martin pescador pigmeo	*Chloroceryle aenea*	Pygmy kimgfisher
MOMOTIDAE		
Momoto coroniazul	*Momotus momota*	Blue- crowned motmot

Table 3 ***(continued)***

GALBULIDAE		
Jacamar colirrufo	*Gálbula ruficauda*	Rufous-tailed jacamar
RAMPHASTIDAE		
Tulcan mandíbula negra	*Champhastos ambiguus*	Black- mandibled toucan
Arasari collarejo	*Pteroglossus torquatus*	Collared aracarí
TYRANNIDAE		
Pájaro brujo	*Pyrocephalus rubinus*	Vermillion flycatcher
Tirano de agua	*Fluvicola nengeta*	Masked water- tyrant
Mosquero alirrufo	*Myiozetetes cuyanensis*	Rusty-margined flycatcher
Tirano tropical	*Tyrannus melancholicus*	Tropical kingbird
Mosquero social	*Myiozetetes similis*	Social flycatcher
Elenita del pacífico	*Myiopagis subplacens*	Pacific elaenia
Mosquero alirufo	*Myiozetetes cayanensis*	Rusty-margined Flycatcher
HIRUNDINIDAE		
Golondrina azuliblanca	*Pygochelidon cyanoleuca*	Blue- and White swallow
Golondrina arenera	*Riparia riparia*	Bank swallow
Martin pechigris	*Progne chalybea*	Gray-breasted martin
TROGLODYTIDAE		
Sotorrey criollo	*Troglodytes aedon*	House wren
ICTERIDAE		
Cacique lomiamarillo	*Cacicus cela*	Yellow-rumped cacique
Negro matorralero	*Dives warszewiczi*	scrub blackbird
Vaquero mayor	*Malothrus oryzivorus*	Giant cowbird
Vaquero brilloso	*Molothrus bonariensis*	Shiny cowbird
Pastoreo peruano	*Sturnella bellicosa*	Peruvian meadowlark
THRAUPIDAE		
Tangara azuleja	*Thraupis episcopus*	Blue-gray tanager
Tangara palmera	*Hraupis palmarum*	Palm tanager

Source: Own elaboration.

The area of the Sixto Durán Ballén dam (La Esperanza) is one of the bioregions that has diverse characteristics that bring together essential avifauna habitats, allowing the concentration of different native and migratory species in its ecosystems of tropical rainforest. The region of the La Segua wetland and the Chone River estuary in the Bay of Caráquez form a connectivity zone and a bioregion with similar geographical and environmental characteristics. (Freire et al., 2019). It allows them to nest, refuge, and feed centers for native and migratory species with a central water mirror and floodplains. In this regard, the main species that are in vulnerable (VU) and endangered (EN) status, according to Freire et al. (2019), are presented below (Table 4).

Table 4
Endangered and vulnerable species of the Carrizal Chone water corridor

Species	Conservation status	Location
Cairina moschata (Pato Real) Muscovy duck	Endangered (EN)	Sixto Durán Ballén Dam, La Segua wetland and Wildlife refuge Isla Corazón y Fragatas
Sarkidiornis melanotos (Pato Crestudo) Comb duck	Endangered (EN)	La Segua wetland and Wildlife refuge Isla Corazón y Fragatas
Rallus longirostris (Rascón Manglero) Mangrove Rail	Endangered (EN)	Wildlife refuge Isla Corazón y Fragatas
Anhima cornuta (Gritador Unicornio, Canclón) Horned Screamer	Vulnerable (VU)	Sixto Durán Ballén Dam, La Segua wetland and Wildlife refuge Isla Corazón y Fragatas
Botaurus pinnatus (Mirasol Neotropical) Pinnated Bittern	Vulnerable (VU)	La Segua wetland

Source: Own elaboration based on Freire et al. (2019).

With the territorial diagnosis carried out along the area of influence of the Carrizal Chone water corridor and the conservation areas with which it interconnects, it was possible to observe a diversity of ecosystems ranging from wetlands (marshes, estuaries, dams, rivers) to dry and humid tropical forest, where native and migratory species were identified, which use these territories as feeding and breeding grounds.

In analyzing the perception and opinions of local agents on the potential of birding tourism in the area, the principal results reflected in Table 5 below have been collected.

Table 5
Perception of local stakeholders

Local stakeholders	Key questions	Highlights of the results
-Manager of the Isla Corazón and Fragatas Wildlife Refuge (MAE). -Chone Department of Tourism. -San Vicente Department of Tourism. -Sucre Department of -Tourism. -ASOHUMEDAL and La Segua Fishermen's Association.	Do you know what birdwatching is? Do you think that the Carrizal-Chone water corridor is a tourist attraction? Do you think the Carrizal-Chone water corridor has diverse bird species? What are the main problems and needs that affect local tourism development? Do you think this region has sufficient tourist infrastructure and facilities?	It stands out that 70% of the managers have knowledge about birdwatching tourism and, in addition, 100% of those interviewed recognise the importance of tourism and its modalities for the diversification of the local economy; they express that it is necessary to implement facilities, tourism promotion and quality services. 100% are aware of the natural and cultural resources of the water corridor, but there is a lack of knowledge and undervaluation of the fauna resource. Socio-environmental problems are evident throughout the territory, such as poor land use, poor compliance with environmental regulations, limited essential services, deforestation, uncontrolled growth of shrimp farms, the introduction of exotic species and the decline of native fish species such as the Chame (Dormitator latifrons).

Source: Own elaboration.

In general terms, positive results have been evidenced about the interest in developing new alternative products such as birdwatching tourism. Still, the agents consulted significantly impact the need for a better management mentor in a planned way of existing natural and socio-cultural resources, as Rivera and Doumet (2021) have already pointed out. In addition, there are many limitations and inadequacies in public investments, infrastructure and equipment for public use, accessibility, environmental education programs and tourism promotion and marketing actions (Castro, 2014).

It is interesting to note that in the study territory, specifically in the Isla Corazón y Fragatas Wildlife Refuge and in the La Segua wetland Ramsar Site, there are at least some initiatives for the conservation of ecosystems and birdlife carried out by the local Governments, as well as a particular trajectory in the participation of the different international Organization for the bird's conservation. A summary of these initiatives, which should be promoted and evaluated, is presented in Table 6 below.

Table 6
Birdlife conservation initiatives

Initiative/event	Organization	Location
Designation and participation in the Important Bird Areas (IBAs) programme	Aves & Conservation; Birdlife International; Ministry of Environment of Ecuador, Conservation International Ecuador.	Isla Corazón y Fragatas Wildlife Refuge; La Segua Wetland Ramsar Site (Sucre, San Vicente and Chone).
Ramsar site designation	International Secretariat of the Ramsar Convention/Ministry of Environment Ecuador	La Segua wetland Ramsar site (Chone, Tosagua).
Global Big Day (GBD)	Aves & Conservation	La Segua wetland Ramsar site (Chone, Tosagua).
Neotropical Waterbird Census	Aves & Conservation	Isla Corazón y Fragatas Wildlife Refuge; La Segua Wetland Ramsar Site (Sucre, San Vicente and Chone cantons).
Christmas bird counts	Audubon, ASOHUMEDAL, ASOHUMEDAL, La Segua Fishermen's Association; GAD Canton Chone - Department of Tourism.	La Segua wetland Ramsar site (Chone, Tosagua).
Western Hemisphere Shorebird Network WHSRN/WHSRN Site of Regional Importance.	Birds & Conservation; Ministry of Environment Ecuador, WHSRN/WHSRN	Isla Corazón and Fragatas Wildlife Refuge (Sucre, San Vicente).

Source: Own elaboration.

In general, and based on the discussion of the results finally obtained in this case study, we can affirm that birdwatching can be considered one of the alternatives that could provide the much-desired economic diversification in the Carrizal-Chone water corridor, provided that a planning strategy can be implemented, which does not currently exist, that takes into account the sustainable management of natural and cultural resources. In this sense, the diversity of ecosystems and landscape attractiveness is striking, as is the permanent presence of migratory and native birds. Freile et al. (2019) recognize this geographical space as a place for nesting, reproduction, and refuge for critical birdlife.

4. Conclusions

This study has identified several points of interest for birdwatching: the Sixto Durán Ballén dam (La Esperanza), the Isla Corazón and Fragatas Wildlife Refuge and the La Segua wetland. They all present ecosystems of environmental and landscape interest for birdwatching, so they present ample potential for this ecotourism practice. However, we must add the practical absence of strategic planning for this activity, in addition to the minimal budget of the competent public administrations for actions in terms of tourism development in general and even in terms of conservation and environmental education, which is limiting the sustainable development of the natural spaces.

The Carrizal Chone water corridor is an area of ecological transition and ecosystem interaction, being a route of passage and refuge for migratory birds, which generates a constant concentration and flow of bird species. In this sense, through technical visits and extensive fieldwork carried out over two consecutive years in marine-coastal and estuarine ecosystems, marshes, artificial wetlands, and wet/dry tropical forests, 126 species of birds representing 37 families have been identified.

The results of the diagnosis and territorial evaluation, both environmental and tourism-recreational, have allowed us to design a bird tourism product that contributes to the economic diversification of this territory of the water corridor and to raise awareness about the conservation and management of existing territorial resources, which can serve as a fundamental support and qualification for ecotourism tourism practices from a sustainable approach. Finally, it can be stressed that knowing this natural area's current market trends and territorial potential is essential. As proposed strategic actions, there is a need for the design of interactive, experiential, and innovative products and the implementation of adequate promotion, communication, and marketing channels based on digital media and social networks, predominantly, in addition to the direct connection of demand.

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