RESEARCH / INVESTIGACIÓN

Multi-criteria tourist reception analysis (MTRA): study case Haynes Cay, located in the San Andrés Archipelago, Colombia (biosphere world reserve - "seaflower")

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Abstract: In the search for a better tourism planning that allows reducing socio-ecological impacts, a new carrying capacity methodology called Multi-criteria Tourist Reception Analysis - MTRA is proposed. This model decreases the subjectivity of traditional carrying capacities methods, by including in the methodology to determine the maximum number of visits, the Analytical Hierarchical Analysis (AHP), which in turn has an element of mathematical analysis that allows the verification of the process. Additionally, the validation by means of the 3s technique provides greater objectivity to the calculation made, allowing the decision makers to have a more reliable result applicable to the studied territory. This new methodology was applied successfully in Haynes Cay, which is located in the San Andrés archipelago, which is part of the world biosphere reserve - called "Seaflower", obtaining a value of 149 people who can visit the Cayo daily, without this place being degraded by the pressure of tourism.

Keywords: Carrying capacity, sustainable tourism, tourist planning.

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INTRODUCTION

About 30 years ago, the term sustainable development appeared, whereas the concern for sustainability became fashionable, understanding the "unsustainability of the economic model that industrial civilization has led to us" (Naredo, J. M. 1996. p. 129). This concern has permeated the tourism sector since its sustainability was defined, as mentioned by Cardoso 2006 p.8, who mentions that such moment occurred in the 41 Congress of the International Association of Scientific Experts in Tourism (AIEST), where it was coined as "a tourism that maintains a balance between social, economic and ecological interests, integrating economic and recreational activities in order to seek the conservation of natural and cultural values" (AIEST, 1991, p.46).

Subsequently, the principle 1 of the Charter for Sustainable Tourism, which was the result of the World Conference of Sustainable Tourism held in Lanzarote, Canary Islands, Spain states that "The tourism development should be based on sustainability criteria, that is it must be ecologically long-term sustainable, economically viable and equitable from an ethical and social perspective for local communities (paragraph 13).

This new way of conceiving tourism is of the utmost importance, as mentioned by Roberto Boullón: "although its essence is the provision of services (accommodations, food, transport and tourist activities), their consumption is closely related to the territory, since hotels, restaurants, roads, trails or viewpoints (all elements of the tourist plant) are physical facts that with their presence modify the place chosen to built them" (p. 20).

This concept of territory and tourism is what gives way to the entry of carrying capacity in the sector, which is a "concept widely used in the field of ecology" (Eciiamendi, P. 2001. p12). This concept was first used by O'Reilly in 1986 and in Latin America by Miguel Cifuentes in 1992. Since then, it has been used by authors such as Amador et al, (1996); Acevedo, E. (1997); Maldonado, E., & Montagnini, F. (2001); Roig i M. & Francesc X. (2003); Segrado, R. et al (2008); Gutiérrez, F & Sierra, S. (2015); Mayorga, C., & Yomira, K. (2018); and Guerrero Rea, F. A. (2018), among others.

Other methodologies also used to plan the flow of visitors that an attraction can withstand is that of the Limits of Acceptable Change written by Stankey et al. (1985) and subsequently used by authors such as Gómez, E. G. (2011); Gutiérrez J. A. (2015) and Gutiérrez, F & Sierra, S. (2015. However, the methodology of the tourism carrying capacity that is simple, has been mostly used, but in recent years, due to its own simplicity has been falling into disuse.

In the present study, a review of the articles that have been published about carrying capacity issues is carried out, with the proposal by Cifuentes (1992) or with methodologies such as: management of visitor flow and limits of acceptable change. Thus, a new tool that has been called Multi-criteria Tourist Reception Analysis (MTRA) will be proposed. This is formulated by consulting third parties and incorporating elements of multi-criteria analysis, specifically through the analytical hierarchy Process (AHP).

METHODOLOGY

The first process to be carried out was a review with Google scholar search engine, by considering that this is where the greatest number of typologies of scientific documents can be found, being freely accessible or commercial databases.

Previous data allow affirming in the first instance what was said by Shelby & Heberlein (1986) and cited by Hernández, M. G. et al, in 2011, who state that the works on carrying capacity "reached about 2,000 publications until mid-eighties" (2000:134). Although the articles of tourism carrying capacity are numerous, their application has been modified, giving way to other methodologies or adaptations of the same, which allow multisector and multidimensional nature be given to tourism development, planning or administration of tourism (Jurado et al., 2012).

The tourism carrying capacity as mentioned, presents a simple methodology. However, the selection of the correction factors to calculate the actual load capacity is quite subjective and depends largely on the knowledge and preferences performed by the researcher. Therefore,

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other definitions and perspective of the carrying capacity have emerged (Simón, F. J. G., et al 2004; Saarinen, 2006; Jurado et al., 2012). Fore example, some definitions are more behavior-oriented and reflect the quality of the recreational experience, whereas others are focused on biophysical and resources thresholds (Saveriades, 2000; Jurado et al., 2012).

Additionally, the application of a large number of correction factors in the Cifuentes proposal decreases the carrying capacity to levels of zero visitors, or the existence of a zero (0) value in some of them. On the other hand, the result that the number of tourists is zero (0) is an inconvenient for the same tourist planning.

Another of the problems identified, is that the methodology proposed by Cifuentes is not capable to allow valuing within the global reception capacity of a tourist destination, as Hernandez points out:

"Interrelation of the different dimensions of the concept depending on the nature of the resources and characteristics of the space in which the tourist activity takes place is such, that the maximum levels allowed for each type of recreational use depend on the characteristics of each of the subsystems that make up a tourism system (social, functional, economic, ecological and other dimensions)" (2000, p138)).

The above can be overcome with the use of the analytical hierarchy process proposed by Thomas Saaty, who published in 2008 his model in the article entitled Decision making with the analytic hierarchy process, which to date has received more than 400,000 citations. This shows the strength of what is proposed by the researcher and the diversity of possible applications.

As noted by Figuera et al., 2005 and quoted by Saaty: "the decision making for which we collect most of our information, has become a mathematical science today" (p.84), and the initial tourism carrying capacity lacks a solid mathematical structure. Additionally, authors such as Sagredo & Arroyo in 2008 have mentioned that the model is at the time of establishing the indicators that will determine the maximum carrying capacity of the destination, since they

must be defined according to each tourist destination and the preferences of the person who develops the research. With the application of the multi-criteria AHP analysis technique and the weighting of the variables or correction factors taken into account, subjectivity is subtracted to the final result and a greater number of variables can be used.

For the present research, weighting of the variables (correction factors) was performed through the 3's methodology proposed by Cloquell-Ballester, V. A. et al, in 2006 and subsequently tested on tourism issues by Gutiérrez-Fernández, et al. in 2012. This is a validation technique proposed in three levels, namely:

Level 1: *Sui Validatio* or self-validation, which must be carried out by the study tea, itself. Its purpose is to perform an internal reflection of the proposal.

Level 2: *Scienciatis Validatio* or scientific validation is intended to provide objectivity and vigor to what is established by the editorial team through the integration of the judgments of independent experts.

Level 3: *Societatis Validatio* or social validation, with which public participation is incorporated as a very important element that allows the demolition of some barriers involved in the proper management of the tourism.

With the incorporation of the 3's technique, the process is given greater transparency and greater probability of success. It should be noted that once the weighs of the variables or correction factors have been obtained, a geometric average was performed for each of the levels (1, 2 and 3) in order to obtain a unique and final value, reducing even more the subjectivity by including an exercise of judgment of several experts. Likewise, the involvement of people from the academia and society allows MTRA to acquire a greater degree of suitability for its use.

Finally, MTRA is tested in Haynes Cay, which is part of the San Andres Archipelago. This place was declared on November 10, 2000 as a Biosphere Reserve by the Man and Biosphere Program (MAB) of UNESCO and from then, it is part of the World Network of Biosphere Reserves, with the name of Seaflower.

FORMULATION OF THE MTRA MODEL - MULTI-CRITERIA TOURIST RECEPTION CAPACITY

Physical carrying capacity (PCC)

"It is the maximum limits of visits that can be performed to the site during a day. It is given by the relation between visit factors (schedule and visit time), the available space and the need for space per visitor" (Cifuentes et al., 1999 p16). No adjustments are made to this carrying capacity in the MTRA model.

Actual Carrying Capacity (ACC)

"It is the limit of visits, determined from the PCC of a site, after being subjected to the correction factors defined according to the particular characteristics of the site" (Cifuentes, 1999, p11). In this capacity is where adjustments are made for the weighting of correction variables/ correction factors through the use of AHP and 3's.

In order to define variables/correction actors to be taken into account, it was started from what was said in the sustainable tourism charter. Here it is established that the sustainability of a sector must be ecologically tolerable in the long term, economically viable and socially equitable for local communities. Based on the above, it was defined that the variables/correction factors should be organized in three categories: environmental, social and economic.

According to the above, three (3) categories and eleven (11) variables/correction factors were established (Table 1).

Table 1: Categories and variables (correction factors)

Environmental category	Social category	Economic category
Erodability	Temporary site closures	Tourist/visitor spending perception
Accessibility	Satisfaction of the tourist/visitor	Resident income perception
Precipitation	Satisfaction of the resident	
Sunshine		
Disturbance to wildlife		
Disturbance to flora		

Source: own

Once all the correction factors were obtained. The values were weighted according to the AHP model in each of its categories and each of the levels of validation proposed by the 3's methodology.

With the priority values obtained, the consistency test was performed to verify the judgment of the people who participated. The consistency ratio is designed so that values higher than 0.10 indicate that there may be an inconsistency in the judgments of the participants. Therefore, reassessment is recommended.

For each of the levels of validation, a geometric average was obtained, using the weights given by each of the participants (2 people in level 1 -- *Sui Validatio*, 3 in Level 2 - *Scienciatis Validatio* and 3 for Level 3- *Societatis Validatio)* to subsequently obtain an average of the values of the three levels. The final values were obtained as follows:

Level 1 - *Sui Validatio*

Tables 2, 3 and 4 show the results obtained for level 1 —Sui validation, as well as the consistency ratios for the judgments of two experts.

Table 2: Weights of the environmental category at level 1 — sui validatio

Environmental category			
Correction factor	Expert 1	Expert 2	Average weight
Erodability	3.5%	6.1%	4.8%
Accessibility	7.2%	7.6%	7.4%
Precipitation	3.9%	5.5%	4.7%
Sunshine	5.1%	3.1%	4.1%
Disruption to wildlife	40.1%	31.2%	35.7%
Disturbance to flora	40.1%	46.5%	43.3%
Inconsistency ratio	0.05	0.09	

Source: own

Table 3: Weights of the social category at level 1 — sui validatio

Social category			
Correction factor	Expert 1	Expert 2	Average weight
Temporary site closures	54.8%	65.5%	60.2%
Tourist/visitor satisfaction	21.1%	15.8%	18.5%
Resident satisfaction	24.1%	18.7%	21.4%
Inconsistency ratio	0.02	0.03	

Source: own

Table 4: Weights of the economic category at level 1 — sui validatio

Economic category			
Correction factor	Expert 1	Expert 2	Average weight
Tourist/visitor spending perception	75.0%	33.3%	54.2%
Resident income perception	25.0%	66.7%	45.9%
Inconsistency ratio	0.00	0.00	

Source: own

Level 2 - *Scienciatis Validatio*

Tables 5, 6 and 7 show the results obtained for level 2 — scientis validatio for the environmental, social and economic categories respectively, as well as the inconsistency ratios for the judgments of three experts who were selected for having publications in indexed journals about carrying capacity.

Table 5: Weights of the environmental category at level 2 - scienciatis validatio.

Environmental category				
Correction factor	Expert 1	Expert 2	Expert 3	Average weight
Erodability	3.8%	6.0%	3.9%	4.6%
Accessibility	9.1%	5.7%	8.1%	7.6%
Precipitation	4.9%	6.7%	3.9%	5.2%
Sunshine	4.9%	10.4%	4.7%	6.7%
Disruption to wildlife	35.5%	35.5%	38.9%	36.6%
Disturbance to flora	41.9%	35.5%	40.4%	39.3%
Inconsistency ratio	0.09	0.06	0.08	

Source: own.

Table 6: Weights of the social category at level 2 - scienciatis validatio.

Social category				
Factor de Corrección	Expert 1	Expert 2	Expert 3	Average weight
Temporary site closures	65.5%	41.1%	60.0%	55.5%
Tourist/visitor satisfaction	15.8%	26.1%	20.0%	20.6%
Resident satisfaction	18.7%	32.8%	20.0%	23.8%
Inconsistency ratio	0.04	0.05	0.00	

Source: own.

Table 7: Weights of the economic category at level 2 - scienciatis validatio.

Economic category				
Correction factor	Expert 1	Expert 2	Expert 3	Average weight
Tourist/visitor spending perception	50.0%	50.0%	50.0%	50.0%
Resident income perception	50.0%	50.0%	50.0%	50.0%
Inconsistency ratio	0.00	0.00	0.00	

Source: own.

Level 3: *Societatis Validatio*

Tables 8, 9 and 10 show the results obtained for the Societatis validatio level for the environmental, social and economic categories respectively, as well as the inconsistency ratios for the judgments of three experts, whose selection was made taking into account that they were people who knew very well the current situation of Haynes Cay (either because they have worked there or were working in some institution with jurisdiction on the area). Additionally, it was considered that they had environmental or tourism training, so that their valuations were supported by their training and their knowledge about the area.

Table 8: Weights of the environmental category at level 3 - societatis validatio.

Environmental category				
Correction factor	Expert 1	Expert 2	Expert 3	Average weight
Erodability	4.4%	5.6%	4.7%	4.9%
Accessibility	8.0%	5.6%	4.7%	6.1%
Precipitation	4.3%	5.6%	10.4%	6.8%
Sunshine	5.8%	5.6%	4.7%	5.4%
Disruption to wildlife	35.6%	38.9%	37.8%	37.4%
Disturbance to flora	42.0%	38.9%	37.8%	39.6%
Inconsistency ratio	0.09	0.00	0.07	

Source: own.

Table 9: Weights of the social category at level 3 - societatis validatio.

Social category				
Correction factor	Expert 1	Expert 2	Expert 3	Average weight
Temporary site closures	11.0%	33.3%	33.3%	25.9%
Tourist/visitor satisfaction	30.9%	33.3%	33.3%	32.5%
Resident satisfaction	58.1%	33.3%	33.3%	41.6%
Inconsistency ratio	0.00	0.00	0.00	

Source: own.

Table 10: Weights of the economic category at level 3 - societatis validatio.

Economic category				
Correction factor	Expert 1	Expert 2	Expert 3	Average weight
Tourist/visitor spending perception	75.0%	50.0%	50.0%	58.3%
Resident income perception	25.0%	50.0%	50.0%	41.7%
Inconsistency ratio	0.00	0.00	0.00	

Source: own.

Once the averages for each validation level in each category were obtained, the geometric average was performed. In order to achieve this, thee three levels (per category) were used, in order to provide a balance and that the greater participation of the experts in one of the levels of validation will not influence the final weight.

Table 11: Average of the three levels of validation for the environmental category

Environmental category				
Correction factor	Level 1 (Sui Validatio)	Level 2 (Scienciatis Validatio)	Level 3 (Societatis Validatio)	Average weight
Correction factor	4.8%	4.6%	4.9%	4.8%
Erodability	7.4%	7.6%	6.1%	7.0%
Accessibility	4.7%	5.2%	6.8%	5.6%
Precipitation	4.1%	6.7%	5.4%	5.4%
Sunshine	35.7%	36.6%	37.4%	36.6%
Disruption to wildlife	43.3%	39.3%	39.6%	40.7%

Source: own.

Table 12: **Average of the three levels of validation for the social category.**

Social category				
Correction factor	Level 1 (Sui Validatio)	Level 2 (Scienciatis Validatio)	Level 3 (Societatis Validatio)	Average weight
Temporary site closures	60.2%	55.5%	25.9%	47.2%
Tourist/visitor satisfaction	18.5%	20.6%	32.5%	23.9%
Resident satisfaction	21.4%	23.8%	41.6%	28.9%

Source: own

Table 13: **Average of the three levels of validation for the economic category**

Economic category				
Correction factor	Level 1 (Sui Validatio)	Level 2 (Scienciatis Validatio)	Level 3 (Societatis Validatio)	Average weight
Tourist/visitor spending perception	54.2%	50.0%	58.3%	54.17%
Resident income perception	45.9%	50.0%	41.7%	45.87%

Source: own

Manageable carrying capacity

The optimum management of the carrying capacity is defined as the best state or conditions that the administration of a protected area should have to develop its activities and achieve its objectives. To measure it, three types of variables can be used: staff, infrastructure and equipment (Cifuentes et al., 1999).

Effective carrying capacity

It is referred to the maximum number of visits that can be allowed, in this case the Haynes Cay.

MTRA calculation result in Haynes Cay

The tourism carrying capacity was computed with the MTRA methodology and it was calculated for Hanes Cay. It should be noted that the complete data that allowed the application of the model are in the field work found in the document by Sandra Rodriguez, 2018.

Physical carrying capacity (PCC)

The access to Haynes Cay is only by sea, since it is located approximately one mile from the western coast of San Andres. In the cay there are two clearly defined areas: to the north the main tourist activities are developed and equipment and facilities are located (4,788 m2). To the south there is an arboreal and shrubby area that covers approximately the total area of the cay (11,172 m2), which is exclusively destined to conservation. Therefore, the development of tourist activities is not allowed (Rodríguez, S. 2018).

To determine this capacity, the area used by one person (2m2) is considered.

$$PCC = \frac{S}{sp} * NV$$

$$NV = \frac{7\ Horas}{1,5\ horas} = 4,66$$

$$PCC = \frac{4.788\ m^2}{2m^2} * 4,66 = 11.156$$

Physical carrying capacity = **11,156 people**

Actual carrying capacity (ACC)

As mentioned, in this capacity the adjustments for the weighting of correction factors were made, through the use of AHP and the 3's technique, in order to obtain the weights. These were multiplied by the calculation of the correction factors.

Environmental category
In this category there are six (6) variables/correction factors shown below:

Erodability

Taking into account the definition of this correction factor, slopes and texture of the soil are measured to determine how much susceptible it may be or the erosion risk that the terrain may have, that is sectors or surfaces that present high or medium susceptibility, with slopes higher than 10%. In this case, as the cay is located in a flat area with hillsides of low slopes and the texture of the soil is sand or gravel and mostly covered by vegetation, the value to calculate the factr is zero (0):

$$Fc\ erod. = 1 - \frac{Ml \left(\begin{array}{c} \Sigma\ \text{of the longitudes of sectors of} \\ \text{medium and high susceptibility} \end{array} \right)}{Mt\ \text{(total of the area)}}$$

$$\textbf{\textit{Fc erod.}} = 1 - (0) = 1$$

Accessibility

For this correction factor, the slopes that could generate difficulties to the visitors were measured, that is, slopes that are exclusively in sectors of medium and high difficulty (slopes greater than 10%). The study case is located in a flat area or with hillsides of low difficulty slopes (less than 10%).

$$Fc\ acces. = 1 - \frac{Ml \left(\begin{array}{c} \Sigma\ \text{of the longitudes of sectors of} \\ \text{medium and high susceptibility} \end{array} \right)}{Mt\ \text{(total of the area)}}$$

$$\textbf{\textit{Fc acces.}} = 1 - (0) = 1$$

Precipitation

The average total annual rainfall in the cay is 1,881 mm, with a dry season and a rainy season. The dry seasons extends from January to April and in these months it rains between 0 and 5 days a month, and May and December are the transition months, with moderate rains. The rainy season is presented from June to November; the frequency of rainy days in these months is 20 to 24 days (Instituto de Hidrología, Meteorología y Estudios Ambientales [IDEAM], s.f.).

$$\text{Fc precp.} = 1 - \frac{\text{Ml (Of limiting rain months)}}{\text{Mt (N° of months open to public)}}$$

$$\textbf{\textit{Fc precp.}} = 1 - \frac{\textbf{\textit{6 months}}}{\textbf{\textit{12 months}}} = \textbf{0,5}$$

Sunshine

The average values of greater sunshine are presented in March and April, with 282 and 277 hours/month, respectively. The months with less sunshine are June and October, with 187 and 185 hours/month; whereas the rest of the year the sunshine ranges from 189 and 252 hours/month (Centro de Investigaciones Oceanográficas e Hidrográficas de Colombia [CIOH], 2018).

$$\text{Fc Brill.} = 1 - \frac{\text{MI (N° sunshine hours per year)}}{\text{MI (N° Mt (N° of @ total hours open to the public)}}$$

$$\textbf{\textit{Fc Brill.}} = 1 - \frac{\textbf{2.443 \textit{hours}}}{\textbf{2.555 \textit{hours}}} = \textbf{0,043}$$

Disturbance to wildlife

In order tot calculate this correction factor, the most important invertebrate species present in the study area was chosen. This is the black crab Gecarcinus ruricola, of sea origin, inhabiting the forest and shrubby vegetation above 250 m.a.s.l and "... Plays a very important role as detritivorous and food resource" (Archbold, 2001, p.78).

This crustacean species has a breeding season from April to June (Hartnoll, et al., 2007), understanding that in this period is when they are more sensitive to disturbances of anthropic activity, especially tourism. For this reason, it was decided to choose this period as a correction factor.

$$\textit{Fc pertfa.} = 1 - \frac{\text{MI (N° MI (N° months of the life stage)}}{\textit{Mt (\# total months)}}$$

$$\textbf{\textit{Fc pertfa.}} = 1 - \frac{\textbf{4}}{\textbf{12}} = \textbf{0,66}$$

Disturbance to flora

This correction factor was determined taking into account that presence of existing seagrass in the cay. "Seagrasses are found in sectors of Rocky Cay, Honda Bay, Cotton Cay, Acuario (Rose and Haynes Cay), Hansa Point, Bolivar and Alburquerque cays. The predominant species are: Turtle grass (Thalassia testudinum), manatee grass (Syringodium filiforme and Halodule wrihtii)" (Meisel, 2016, cited by Rodríguez S, 2018).

In the case of Haynes Cay, seagrasses that grow in nearby areas lack good health or have disappeared, and this has a significant consequence for biodiversity. Aas Ogden points out in 1997, cited by González-Ferrer, Martínez-Daranas & Cano and subsequently by Rodríguez S, 2018, "In the Car4ibbeanm seagrasses and mangroves work as nurseries of a variety of fish and invertebrates that spend their adult lives in the coral reefs" (2006, p. 201).

To perform this inventory of the area of seagrasses, different methodologies can be found, although due to the scope of the research it was not possible to compare results of previous dates. In order to analyze the percentage of loss in this ecosystem, it was decided to ask the natives, about the perception of disappearance of grasses in recent years, using the following scale:

0 = No disappearance
1 = There is very little disappearance
2 = There is little disappearance
3 = There is a high disappearance
4 = There is a very high disappearance
5 = No more seagrass left

The application of this survey averaged 3.1.

With this data, the correction factor was calculated:

$$\text{Fc pertfl.} = 1 - \frac{\text{MI (Ecosystem loss percentage)}}{\text{Mt (Maximum possible value)}}$$

$$\textbf{\textit{Fc pertfl.}} = 1 - \frac{\textbf{3,1}}{\textbf{5}} = \textbf{0,38}$$

Social category

In this category, there are three (3) variables/correction factors shown below:

Temporary site closures

It was calculated taking into account that the cay is open for tourist use from 9:00 a.m. to 4:00 p.m. For this reason, it remains closed 17 hours a day.

$$\text{Fc citemp.} = 1 - \frac{\text{MI (N° of hours per year in which the attraction is closed}}{\text{Mt (\#N° of total ours per year)}}$$

$$\textbf{\textit{Fc citemp.}} = 1 - \frac{\textbf{6.205} \; hours}{\textbf{8.760} \; hours} = \textbf{0,29}$$

Satisfaction of the tourist/visitor

To establish the tourist/visitor correction factor, a survey was designed, in which the tourist offer of the key was evaluated. On the other hand, to determine the size of the representative sample the Simple Random Sampling Technique (SRST) was used. Subsequently, the survey was applied to 50 people on February 18, 2017 obtaining a value of 69.1% satisfaction. This is the same as 30.9% to reach total satisfaction.

$$Fc\ satur. = 1 - \frac{MI\ (Necessary\ percentage\ to\ reach\ 100\%\ satisfaction)}{Mt\ (\#100\%\ satisfaction)}$$

$$Fc\ satur. = 1 - \frac{30,9\%}{100\%} = 0,69$$

Resident satisfaction

To establish the resident satisfaction correction factor, a survey was designed; containing 5 questions with a scale of 1 to 5 (being 5 the maximum value) (see Table 13). The survey was applied on February 18, 2017 to the 10 people who work in the business of Haynes Cay.

Table 14: Resident satisfaction survey results.

Questions	Surveys applied to locals	
	Total average	% total
How about tourism in your region?	4.1	82
On what scale has tourism allowed you to preserve the culture and costumes of your community?	3.9	78
What do you think about the generation of employment and other opportunities to your community for tourism?	3.4	68
How about the arrival of visitors to your community?	4.4	88
How is the treatment of tourists and tour operators with your community?	4.3	86
Total average		80.4

Source: Rodríguez, S (2018).

$$Fc\ sares. = 1 - \frac{MI\ (Necessary\ percentage\ to\ reach\ 100\%\ satisfaction)}{Mt\ (\#100\%\ satisfaction)}$$

$$Fc\ sares. = 1 - \frac{19,6\%}{100\%} = 0,8$$

Economic category

In this category there are two variables/correction factors shown below:

Tourist/visitor spending perception

To calculate this factor, surveys to 50 tourists were applied, where they were asked to rate prices 0 to 2 the in relation to the service received (see Table 14), using the following scale:

Table 15: Valuation scale of the tourist/visitor spending perception.

The price paid by you in relation to the service received	
Adequate or fair	2
Expensive or cheap	1
Very expensive or very cheap	0

Source: own

An average value of 2 was obtained.

$$\text{Fc gastur.} = 1 - \frac{\text{MI (value for an adequate or fair price reception)}}{\text{Mt (\#adequate or fair value for price)}}$$

$$\boldsymbol{Fc\ gastur = 1 - \frac{2}{2} = 0}$$

Resident income perception

This perception was calculated through the application of surveys to the residents. They were asked to rate from 0 to 3 the incomes received for the tourist services offered, using the following scale:

Table 16: Valuation scale of the incomes received by residents for tourist services.

The value received for tourist services is:	
Excellent	3
Good	2
Regular	1
Bad	0

Source: own

The average income perception result was 2.

$$\boldsymbol{Fc\ ingres = 1 - \frac{\textit{MI (survey average)}}{\textit{MI (Maximum possible value)}}}$$

$$\boldsymbol{Fc\ ingres = 1 - \frac{2}{3} = 0,33}$$

Finally, the calculated correction values are multiplied by the weights of each of them, as follows:

Table 17: Weights by value of the correction factors of the environmental category

Correction factor	Value	Weight	Value by weight
Erodability	1	4.8%	0.05
Accesibility	1	7.0%	0.07
Precipitation	0.5	5.6%	0.03
Sunshine	0.04	5.4%	0.00
Disturbance to wildlife	0.66	36.6%	0.24
Disturbance to flora	0.38	40.7%	0.15
		Total	0.54

Source: own

Table 18: Weights by value of the correction factors of the social category.

Correction factor	Value	Weight	Value by weight
Temporary closures	0.29	47.2%	0.14
Tourist satisfaction	0.69	23.9%	0.16
Resident satisfaction	0.8	28.9%	0.23
		Total	0.53

Source: own

Table 19: Weights by value of the correction factors of the economic category.

Correction factor	Value	Weight	Value by weight
Tourist/visitor spending perception	0	54,17%	0
Resident income perception	0,33	45,87%	0,15
		Total	0,15

Source: own

Total correction factor = Environmental cf * social cf * economic cf
Total correction factor = 0.54 * 0.15 * 0.0429

Finally, the actual carrying capacity is found by replacing the value obtained in the following formula:

ACC = PCC * total correction factor
ACC = 1,156 * 0.0429 * 478.93

Actual carrying capacity = 478 people.

Manageable carrying capacity (MCC)

To calculate the carrying capacity, the evaluation of the variables equipment, infrastructure and personnel was taken into account.

The selected variables were valued under four criteria: quantity, status, location and functionality. However, for the personnel variable, only the criteria of quantity and location were evaluated due to the lack of necessary information for the remaining criteria. Thus, the following results were obtained:

$$CM = \frac{\text{Equioment} + \text{infrastructure} + \text{personnel}}{3} * 100$$

$$CM = \frac{56+20+19}{3} * 100 = 31,66$$

Capacidad de Carga de Manejo = 31,66%

Capacidad de Carga Efectiva (CCE)

Effective carrying capacity = 149 people.

CONCLUSIONS

The division of the correction factors in the environmental. Social and economic categories allow that the tourism carrying capacity effectively contributes to the development of sustainable tourism and not only to the ecological variable.

The weighting of correction factors through the multi-criteria analysis tools allows obtaining a result that does not completely reduce the value of the carrying capacity and provides a more adjusted value to the conditions of the territory in which the methodology is being applied.

The MTRA proposal has five correction factors that have an economic and social nature, such as tourist satisfaction, resident satisfaction, tourist spending perception, and resident income perception. They are useful because it includes within the carrying capacity variables that allow improving the conditions in which a service is provided without generating negative impacts on the ecosystem.

The MTRA methodological proposal goes beyond the application of formulas and serves to make decisions regarding the planning and ordering of the place around a sustainable tourism. This is achieved by weighting the variables included within in a different way.

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Sighting of southern elephant seals in Peninsula Valdes, Argentina: Importance and satisfaction from the tour guide and tourist perspective

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Abstract: *Nature-based tourism is increasing in recent decades. In Peninsula Valdes, Patagonia Argentina, Natural World Heritage area, the tourism is one of the main economic activities of the region, based on watching marine wildlife. The southern elephant seal (Mirounga leonina) colony in Peninsula Valdes is the only continental in the southern hemisphere. The objectives of this study were to evaluate two bout groups of social actors linked to tourism (tourists and tour guides) the interest and their perception a watching elephant seals. Structured interviews to tour guides and tourists were used and developed a workshop for tour guides. Both groups agreed that watching wildlife is the main goal for the visit, and the southern right whale is the species that generates more interest, whereas the elephant seal is secondary. The expe-rience of watching seals in their habitat was satisfactory in the different observation areas, being observation distance and number of animals, decisive factors in tourist satisfaction. Due to size, sexual dimorphism and behavior that characterizes to elephant seal it generates feelings of wonder and curiosity to the visitors and is an important resource during the guided tour. However, it is not sufficiently exploited as an opportunity to communicate conservation problems of the species or the marine habitat. The results are key tool to designing future management and planning strategies of tourism in Peninsula Valdes and adjacent areas.*

Keywords: *Nature-based tourism, tourist satisfaction, tourism perception, southern elephant seals, Peninsula Valdes*

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INTRODUCTION

In recent decades, there has been a demand and increasing interest on the part of the society in participating of experiences related to the observation of animals that are in their natural habitat, within natural protected areas (Ceballos-Lascurain, 1996; Gauthier, 1993; Granquist & Nilsson, 2016). Consequently, this demand has allowed that in many countries, tourism based on nature and wildlife sighting to represent a significant proportion of the general tourism, providing significant economic benefits to the local population (Ballantyne, Packer, & Hughes, 2009; Higginbottom, 2004; Wilson & Tisdell, 2003). The economic contribution of this industry demands the creation of new protected areas or to maintain and improve existing ones (Higginbottom, 2004; Johannesen & Skonhoft, 2005; Reynolds & Braithwaite, 2001). Likewise, some authors suggest that if this type tourism is carefully designed and managed, and at the same time has a strong focus aimed to environmental education and the development of interpretative programs, it will have the potential to become a useful tool for the conservation of species and their environment. What the tourist watched and observed during a visit will then promote pro-environmental behaviors, greater environmental awareness and support for the protection of species and their habitat (Ballantyne & Packer, 2005; Ballantyne, Packer, & Bond, 2007; Finkler & Higham, 2004; Lück, 2003; Wilson & Tisdell, 2003). To reach that goal, the educational and interpretative activities should cover biology, ecology and behavior of the species involved, as well as recommendations of best practices and inform about existing threats to wildlife (Zeppel & Muloin, 2008).

In the case of Peninsula Valdes, in the Province of Chubut, Argentina, tourism during the 60s was related to nautical and aquatic activities (diving and underwater hunting). Subsequently and until today, wildlife sighting, especially marine, became the most prominent attraction both nationally and internationally (Kuper, 2009) with a strong focus on conservation.

During this time, the Province has generated different tools for the care of its natural resources: between 1967 and 2001 laws have passed on the creation on provincial wildlife reserves (1967) and particularly in coastal areas of the Peninsula Valdes, and in 1974 the creation of the Golfo San Jose Provincial Marine Park, where the artisanal seafood restaurant was regulated. Then, with a more integrative concept that pretends to reconcile the ecological security with economical development, an Integral Management Plan for Peninsula Valdes and adjacent areas is put into effect and registered with UNESCO as Natural World Heritage Plan (1999). In 2001, new boundaries of Peninsula Valdes natural areas were defined by incorporating a buffer area, accompanying the creation of protected areas. Thus, the tourist use of these has had a sustained growth. As a consequence, in Peninsula Valdes it was recorded a total of 316,350 tourists in 2018 (data provided by the Administration of the Peninsula Valdes Protected Natural Area).

Peninsula Valdes is a tourist destination that offers a unique experience, since it is developed in a natural environment with distinctive qualities; it constitutes a marine and terrestrial ecosystem, including breeding colonies of sea lions and elephant seals, penguins, cormorants; and charismatic species such as southern right whales, killer whales and dolphins. This biodiversity has allowed developing a tourism based on nature observation, resulting on a memorable experience that generates in tourists various emotions and that represents one of the main economic activities of the region (Curtin, 2010; Higginbottom, 2004; Lian Chan & Baum, 2007; Reynolds & Braithwaite, 2001).

The quality of the tourist experience depends on many factors, such as authenticity, intensity, duration, number of people present, design, comfort, and maintenance of the facilities, information obtained and treatment received, among others (Braithwaite, Reynolds, & Pongracz, 1996; Lian Chan & Baum, 2007). Each of these characteristics will be perceived, interpreted and valued by each visitor in a certain way (Bennett, 2016). The perception is a bio-cultural process, since on the one hand it depends on physical stimuli and sensations received, and on the other hand, the meaning that those stimuli will have will depend on the cultural and ideological referents of each person (Tapella, 2012).

The guide plays a key role in this experience, since is the

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person responsible of transmitting information about the sector to the tourists in an interesting and entertaining way and, at the same time, promotes environmentally favorable attitudes related to the conservation of the environment (Ap & Wong, 2001; Huang, Hsu, & Chan, 2010; Hughes & Ballantyne, 2001; Randall & Rollins, 2009). In addition, during the excursions the guide resolves difficulties, seeking the security and satisfaction of the tourists (Gronroos, 1978). In the process of perception of the tourists come into play and combine other factors such as: pat experiences that each person had, their preferences, gender, age, educational level, motivations, prior knowledge and beliefs. Contextual factors such as the political and socioeconomic situation will also have an influence on the interpretations each person makes of the experience and meaning that it will be assigned to it (Melgarejo, 1994; Monn & Blackman, 2014;Tapella, 2012). The degree of tourist satisfaction is relevant to carry out an increasingly efficient design of tourism, since on the one hand it represents a measure of quality and the performance of the activity; and on the other hand, it allows knowing which are the most influential variables during the visits, the needs and demands of the visitor (Devesa, Laguna, & Palacios, 2010; García & Picos, 2009; Reynolds & Braithwaite, 2001; Torres-Sovero, González, Martín-López, & Kirkby, 2012; Ziegler, Dearden, & Rollins, 2012).

Based on the importance that the tourist activity in Peninsula Valdes represents for the provincial economy, the present work is aimed to evaluate the interests of two groups of social actors linked to the tourist activity (tourists and tour guides) and their perception about the visit, taking as a model the sighting of a particular marine mammal species. The southern elephant seal Mirounga leonina was selected because in its annual cycle there is a marked seasonality in the coast that allows predicting the time and place to develop sightings. This is due to the fact that the species is distributed along the entire coast, with a dispersion dynamic that evidenced changes in the area and because its reproductive cycle coincides with the reproductive cycle and care of an emblematic species, the southern right whale (species protected and declared National Natural Monument in 1984).

Southern elephant seals have a life cycle characterized by two fasting terrestrial stages (one for reproduction and one for molting) and two pelagic stages of sea feeding (Le Boeuf & Laws, 1994; Lewis, 1996). In Peninsula Valdes, the reproductive season begins from the third week of August and ends Between November and December (Campagna, Lewis, & Baldi, 1993). This Patagonian population represents the only continental colony of the species that has increased (Lewis, 1996; Lewis, Campagna, Quintana, & Falabella, 1998). Such population growth has had evident changes in the density pattern within the colony, with relative expansion of the distribution area (Ferrari, Lewis, Pascual, & Campagna, 2009).

Southern elephant seal is one of the species that frequently can be on an excursion to Peninsula Valdes, regardless of the modality of the visit. Tourists can travel in their own vehicles, can take a private excursion (exclusive for a passenger or a group previously conformed) or hire a regular excursion (where different passengers and nationalities coincide). The hiring is performed in both cases through a tourism and travel agency, and it is characterized by having departures at specific days and times, as well as pre-established stops. The excursion is led by a qualified tour guide who accompanies a 360 km tour during which, information about the environment and its historical and cultural attractions is provided. During the journey, observation of wildlife is performed in enabled viewpoints and on-board sighting. Time is also set aside for lunch in places where gastronomic and sanitary services are available (Piramides Port, North Point, Punta Delgada and Caleta Valdes).

There are three main areas enabled for the sighting of marine wildlife in the continental front of Peninsula Valdes Punta Norte, Caleta Valdes and Punta Delgada and Punta Delgada (Figure 1). The sites present differences among themselves in terms of number of elephant seals, services and observation modality. For instance, in Caleta Valdes the animals are observed in public viewpoints and from the cliffs. In Punta Delgada where a hotel operates, different services are offered and the people in charge manage/regulate the visits that are carried out. There is the possibility of descending to the beach where the animals are, but the access is only allowed in the company of a tour guide. On the other hand, outside the peninsula, Ninfas Point, Lion Point and Isla Escondida are places that represent another alternative for the observation of elephant seals, being places with free access to the coast, without regulation regarding the modality of wildlife sighting.

The specific objectives of this work are to know: 1) how the wildlife sighting activity is organized in Peninsula Valdes and outside the peninsula in Ninfas Point; 2) the expectations of tourists to observe southern elephant seals; 3) the degree of satisfaction of the tourist during the sighting of elephant seals in sites with different observation modalities; and 4) the importance that tour guides given to the southern elephant seal during regular excursions.

METHODOLOGY

The study was carried out in Peninsula Valdes, located northeast of the Province of Chubut (Argentina), surrounded to the north by San Jose and San Matias gulfs and to the south by New Gulf, and extended over the coastline up to 100 km south of the aforementioned peninsula (Figure 1). This work was developed between September and December, period where the greatest influx of tourists, high coastal biodiversity and the breeding season of the southern elephant seal coincide.

Data collection

Interviews with tourists

Structured interviews were conducted and distributed to the tourists in three study periods: October and November 2014, between August and December 2015 and October 2016. The 2014 interview was a pilot test from which modifications were made for those conducted in 2015 and 2016. The interviews were distributed during regular excursions organized by tourism agencies, where previously trained tour guides gave the questionnaire to each tourist at the end of the tour. Thos corresponding to 2016 were conducted exclusively in the routes that guides make in Punta Delgada. The questions were responded by people over 18 years of age. In total, 202 interviews were conducted in 2014, 245 in 2015 and 38 in 2016.

Interview questions were open and close, and were related to: a) reasons to visit Peninsula Valdes, b) expectations for observing wildlife, c) rating of the sighting, d) observation distance, duration of the sighting, and the number of people in the site (only in 2014), e) degree of satisfaction during the activity in relation to the observation distance, number of elephant seals observed and information re-

ceived, f) the level of agreement with certain statements about feelings generated during the sighting (in 2015-2016), and g) suggestions to improve the experience.

To know the reasons of the visit and the expectations for observing different species, a range of options was offered that the visitors selected in order of importance. The rating of the sighting was evaluate on a 1 to 10 scale (10 being the highest score), and with the option to explain the reasons of the score awarded. The degree of satisfaction was evaluated for two observation sites: Caleta Valdes and Punta Delgada on a three-level scale (satisfactory, regular and unsatisfactory). In the interviews of 2015-2016 in order to deepen the understanding of the degree of satisfaction of the tourists, a 5-scale valuation scale was used (Very satisfactory, satisfactory, indifferent, unsatisfactory and very unsatisfactory).

Workshop with tour guides

In June 2015 a workshop was held involving 29 tour guides. During the activity, each guide responded a structured interview in two parts: one consisted of questions related to their perception about the interest and perception of the tourist, and the other was related to their own perception about the sighting of elephant seals. Two of them wee related to their beliefs about reasons and expectations of the tourists who visit Peninsula Valdes and the species they would like to observe. Two other questions with options were related to what the guides believe about the tourist satisfaction and what the sighting of elephant seals generates. An open-ended question was also included to justify their responses, add other comments and improvements suggested by the visitors to the activity. Questions regarding the opinion of the guides themselves about the resource were also related to the priority given to each species during the tour, what represents the elephant seal in their work, as well as the experience in the different sites where the observation is performed.

In a group, maps were generated that describe how the wildlife sighting activity is organized within Peninsula Valdes, or the most usual route(s) that are carried out in a regular excursion, and the time they remain in each site. On the other hand, cards were written with advantages and disadvantages presented by elephant seal as a tourist resource. These were grouped into thematic categories arising from the same workshop.

Data analysis

Regarding the interviews with tourists, given that the modality of the visit, number of elephant seals, precedence and ages of the tourists were similar during the three years of the study, responses to the questions that not experienced modifications between the years were analyzed as a single dataset. The analysis was carried out through descriptive statistics and the comparisons between Caleta Valdes and Punta Delgada were performed through the Mann-Whitney U test and Chi-square test (significant differences: p<0.05. Responses to the open-end questions were grouped in ad hoc categories and their frequency was calculated. Regarding the analysis of the interviews with tour guides, this was carried out through descriptive statistics. The number of responses obtained for each question may differ in relation to the number of tourists and guides interviewed since some of them left without answering questions.

RESULTS

Tourist circuit in Peninsula Valdes and adjacent areas (Punta Ninfas and Escondida Island)

During the regular excursions, different routes were identified in and out of Peninsula Valdes, depending on factors such as schedules for on-board whale sighting (priority activity, whose schedule is defined by the operator of the boat and informed to the tourism agency previously), the site selected for food services (previously determined by the agency and decided by the guide during the tour), the condition of the tide and the wildlife present according to the time of the year.

Regular excursions depart from the city of Puerto Madryn between 7:30 and 8:00 in the morning and from there, they go to the interpretation center located on the Carlos Ameghino Isthmus, approximately between 9:00 and 9:30 hours (Figure 1). Then, the circuit continues in general to Piramidees Port, where the whale sighting is carried out, activity that usually lasts about two hours. From Puerto Piramides is where different alternatives for the tour in Peninsula Valdes arise: a) north circuit that includes Caleta Valdes (observation of elephant seals and penguins) and North Point (observation of sea lions, killer whales and penguins), where the stay is usually 45 minutes; and b)

south circuit, which includes Punta Delgada (observation of elephant seals) and Caleta Valdes. This place is visited for the presence of services and the permanence time may vary between 15 and 30 minutes, depending on the other places that are part of the route. In Punta Delgada lunch is usually organized, and the stay there is two hours. In all cases, the permanence time is extended if whale sighting is not performed. The circuit ends by returning to Madryn Port, approximately at 18:00 or 18:30 hours.

The guides expressed that outside Peninsula Valdes, tourism agencies started to offer Punta Ninfasand Isla Escondida(south of Madryn Point) as other alternatives to observe elephant seals. The tour consists of departing from Madryn Port and heading toward: a) Punta Ninfasand return to Madryn Port, or b) Escondida Island, continue towards Tombo Point to observe penguins and then visit the Egidio Feruglio paleontological museum in the city of Trelew and the valley area, finishing in Madryn Point (Figure 1).

Figure 1: Main sites included in the tourist circuits to perform wildlife sighting in and out of Peninsula Valdes.
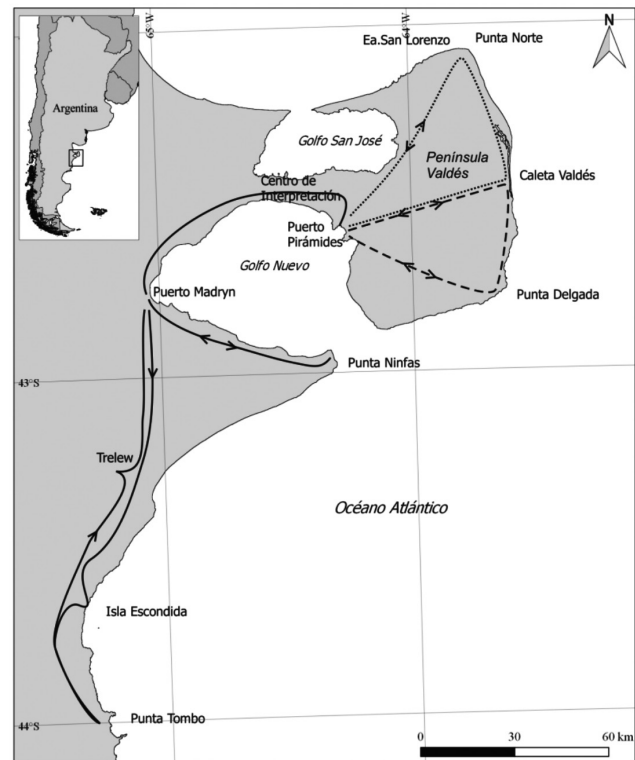
Reasons and expectations to visit Peninsula Valdes

The average age of the tourists who visited Peninsula Valdes was 44 years (DE=15.5, N=457). 58% of the people interviewed belonged to the age stripe of 18 to 30 and 61 to 92 (24% and 18% respectively). Regarding the origin, 33% of the interviewed were national tourists, whose place of origin was a province different from Chubut, 44% of them were foreigners and 1% were residents of Chubut (N=427).

The main reason for tourists to visit Peninsula Valdes was the wildlife sighting (79%, N = 349). In second and third order of importance, knowing the landscape (59%, N=288) and knowing the protected area (42%, N=288) were mentioned. This result coincided with the opinion of tour guide: most of them (88%, N=25) mentioned that wildlife sighting was the main reason why tourists visited Peninsula Valdes, whereas the second and third reasons were related to the landscape (56%, N=25) and know a protected area (39%, N=23), respectively.

Tourists selected the southern right whale as the main species they wished to observe (79%, N=387), whereas the penguin and elephant seal took second and third place in their expectations (44%, N=387 and 32%, N=353 respectively). The guides agreed that tourists expected to observe first the southern right whale (96%, N=24) and penguin in second (67%). However, in third place they prioritized the killer whale (63%) above the elephant seal (38%). Depending on the importance that tour guides gave to the different species in Peninsula Valdes as resource during the excursions, the southern right whale was the most relevant species (90%, N=21), elephant seal was in second place (52%, N=21) and penguin in third place (52%, N=21).

Elephant seal sighting activity within Peninsula Valdes

In Caleta Valdes, 54% of the tourists observed the elephant seals at more than 50 m (N=125), whereas in Punta Delgada did it between 10 m and 50 m (N=46) ($X^2_{0.05; 2}$ = 7.15, p=0.03). The duration of the sighting was half an hour, regardless of the site visited ($X^2_{0.05; 2}$ = 4.15, p=0.12, Caleta Valdes 74% N=119, and Punta Delgada 58% N=45). In Caleta Valdes, 39% of the tourists performed the sighting with less than 25 people (N=124), whereas in Punta Delgada, 56% did it with less than 25 people (N=46) ($X^2_{0.05; 2}$ =5.26, p=0.07).

The experience of observing elephant seals was better valued by tourists in Punta Delgada (median=10, N=178) than in Caleta Valdes (Median=8, N=220) Mann-Whitney U test: W=42,361.5; p < 0.0001). For Caleta Valdes, of a total of 150 responses by tourists explaining the reasons of the score awarded, 64% of these were negative and most were related to the fact of observing elephant seals from afar and observing few animals. On the other hand, a smaller percentage of responses were positive (36%, N=150), and highlighted the fact of observing animals without disturbing them, in their habitat, as well as the beauty of the place. For Punta Delgada, most responses were positive (84%, N=122) and were related to the proximity and the possibility of observing many elephant seals

The experience of the guides when showing elephant seals in Punta Delgada was valued differently respect to Caleta Valdes (Mann-Whitney U test: W=415; p < 0.0001), being the value of the median 9 (range=6-10, N=26) for Punta Delgada and 6 (range=1-10, N=26) for Caleta Valdes. For the latter, when evaluating the reasons for the ratings given by the guides, all responses were negative (N=25) and were due to distance to show the animals (68%) and the low number of them (24%). On the contrary, the responses obtained for Punta Delgada were all positive (N=28) and were related to the fact of being able to observe many elephant seals and from a short distance.

The degree of satisfaction during the sighting in relation to the number of elephant seals observed and the distance was different between Caleta Valdes and Punta Delgada, both from the perception of tourists and guides (Table 1). In 2014, 66% of the tourists indicated that they were satisfied with the observation distance in Punta Delgada (N=44), whereas in Caleta Valdes it was less than half (45%, N=120). This difference was maintained in 2015-2016. The percentage of very satisfied tourists was higher in Punta Delgada (47%, N=134) than in Caleta Valdes (9%, N=100). On the other hand, 77% (N=26) of the tour guides mentioned that in Punta Delgada the tourist were satisfied with the observation distance, whereas only 14% (28%) thought that the visitors would be satisfied in Caleta Valdes.

In 2014, the percentage of tourists who were satisfied with the number of elephant seals observed was higher in

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Punta Delgada than in Caleta Valdes (Punta Delgada=76%, N=38, Caleta Valdes=59%, N=111). In 2015-2016, in Punta Delgada 64% of the tourists were very satisfied (N=120), whereas in Caleta Valdes it was only 22% (N=86). A similar proportion was presented by the guides. 88% (N=25) thought that the tourists would be satisfied with the number of elephant seals that can be observed in Punta Delgada, whereas only 31% (N=26) expressed that this situation would be satisfactory in Caleta Valdes (Table 1).

In 2014, regarding the number of people that shared the sighting, most tourists, both in Caleta Valdes (73%, N=113) and Punta Delgada (80%, N=40) indicated that they were satisfied (Table 1). In 2015-2016, the percentage of very satisfied tourists was equal to 33% (N=85) y 46% (N=122) in Caleta Valdes and Punta Delgada, respectively. A total

of 60% (N=27) of the guides thought that tourists would be satisfied in Punta Delgada according to the number of people, whereas only 25% (N=28) thought that this experience was satisfactory in Caleta Valdes (Table 1).

Regarding satisfaction, in 2014 the information received by the guide in Caleta Valdes y Punta Delgada was similar ($X^2_{0.05; 2} = 1.01$, p=0.6); 84% and 88% of the tourists mentioned being satisfied in Caleta Valdes (N=117) and Punta Delgada (N=43), respectively. In 2015-2016, in both sites the tourists reported being very satisfied with the information received through the tour guide ($X^2_{0.05; 4} = 1.91$, p=0.75) (Table 1).

Both guides and tourists mentioned that the level of satisfaction was similar between sites in relation to the time spent (Table 1).

Table 1: Comparison of the degree of satisfaction between Caleta Valdes y Punta Delgada in relation to different aspects of the sighting. The responses for the categories satisfactory (2014) and very satisfactory (2015-2016) are described from the perspective of the tourosts and guides.

	Caleta Valdés % of responses (N)	Punta Delgada % of responses (N)	X^2 (degrees of freedom)*	p
Observation distance				
Tourists 2014	44 (120)	66 (44)	6,14(2)	0,046
Tourists 2015-2016	9 (100)	47 (134)	60,4(4)	<0,0001
Guides	14 (28)	77 (26)	**	
Number of elephant seals observed				
Tourists 2014	59 (111)	76 (38)	**	
Tourists 2015-2016	22 (86)	64 (120)	46 (4)	<0,0001
Guides	31 (26)	88 (25)	**	
Number of people who shared the experience				
Tourists 2014	73 (113)	80 (40)	7,71 (2)	0,02***
Tourists 2015-2016	33 (85)	46 (122)	4,48 (4)	0,34
Guides	25 (28)	60 (27)	**	
Information received from the guide				
Tourists 2014	84 (117)	88 (43)	1,01(2)	0,6
Tourists 2015-2016	63 (99)	70 (131)	1,91(4)	0,75
Time in the place of observation				
Tourists 2014	74 (114)	85 (41)	2,62 (2)	0,27
Tourists 2015-2016	42 (86)	47 (122)	12,47 (4)	0,01****
Guides	54 (26)	70 (23)	**	

*Value of X^2 according to the degrees of freedom of the study (indicated in parenthesis).
** Amount of insufficient responses to perform the Chi square test.
*** Significant differences could be given by the percentage of tourists with regular or unsatisfactory satisfaction.
**** Significant differences could be given by the percentage of indifferent or unsatisfactory tourists

Other particularities that according to the guides made that the guide have had a satisfactory experience were: here accompaniment during the excursion, being able to observe different behaviors of the elephant seals, the landscape itself, and the possibility of sharing the same space with the elephant seals in a respectful manner and at an adequate distance. This was exemplifies by the following textual responses provided by the guides: "many times, the particular aspect of the experience is highlighted when the tourist is accompanied by the guide to the site, in terms of the interesting interpretation of their behavior"; "verify what is explained by the guide on the beach (well explained". Likewise, some guides mentioned that the fact of observing an animal like the elephant seal is already something satisfactory for the tourist, both for its size and for the different behaviors that can be observed (intercourse, birth and fights between males among others, as well as the presence of other species such as killer whales and seabirds.

Sighting activity outside Peninsula Valdes

Punta Ninfas and Isla Isla Escondida represented alternative sites to perform alternative circuits in order to observe elephant seals, though unlike Peninsula Valdes, these are unprotected natural areas. The amount of information obtained for both sites in regular excursions was much less than that referred to Peninsula Valdes: in 2014 and 2015 only 7 tourists visited Punta Ninfas, whereas a group of 23 tourists performed a guided excursion in Isla Escondida in 2015. However, although the proportion was lower, the information allowed having some approximation about the experience in these sites and how was their degree of satisfaction.

The experience of observing elephant seals in Punta Ninfas and Isla Escondida was rated by tourists with a value of 10 (scale from 1 to 10). In general terms, in both stes the tourists were satisfied with the distance between them and the elephant seals with the information received from the guide, the number of tourists present simultaneously, the number of elephant seals observed, and the observation time. The landscape was another attribute that favorably influenced the experience of the tourists.

### Feelings generated by the sighting of elephant seals

A total of 50% of the tourists that they fully agree with the idea that the sighting of elephant seals generated interest in knowing more about the biology and behavior of this species (N=276). 53% of the interviewees totally agree with the fact that when observing elephant seals they felt astonished and attraction to them (N=277). In relation to the statement that considered that observing elephant seals generates concern for their conservation, 40% of the tourists totally agreed and 33% partially agreed (N=272). Finally, half of the interviewed totally agreed on the fact that elephant seals generated an interest in them for environmental conservation (N=272).

From the perspective of the tour guides, 56% of them totally agreed with the fact that elephant seals cause interest in them for knowing more about their biology and behavior (N=27). 76% indicated they totally agreed with the fact that elephant seals cause attraction in he visitor (N=26) and 55% totally disagreed with the idea that tourists are indifferent to elephant seals generate little interest in visitors (N=22).

More than half of the guides (63%, N=27) responded partially agree that when observing elephant seals, tourists fell concern for their conservation (56%, N=27) believe that they are interested in sea conservation problems.

Regarding what elephant seals represent for the guides as a resource for their work, 93% (N=28) expressed their total agreement that this species from which they can provide information about biology and behavior of pinnipeds during the excursion. 79% of the guides (N=28) agreed with the idea that elephant seal is a species that attracts tourists, 41% (N=29) said it is a resource that allows visitors to approach environmental problems to visitors, and 50% totally agreed that the species allows treating marine conservation problems. A majority of the guides (96%, N=24) totally disagreed with the idea that elephant seal is an uninteresting species and 52% (N=27) strongly disagreed with the idea that it is difficult to access updated information about this species. On the other and, 52% (N=19) totally agreed that the elephant seal represents an opportunity for the tourist to know the conservation status of the species. Finally, 52% (N=29) of the guides mentioned fully agreed with the need for informational signage.

Figure 2: Degree of approval according to what represent the elephant seal for the work of the guides in relation to the following statements: A.- A species that allows talking about biology and behavior of the pinnipeds, B.- An attractive species for visitors, C.- A resource to bring environmental problems to visitors, D.- An uninteresting species, E.- A species on which it is difficult for me to obtain updated information, F.- An opportunity for tourists to know the conservation status of the species, G.- A species on which it would be useful for me to interpretative signage in observation points, H.- A species that allows me to deal with problems of marine conservation.
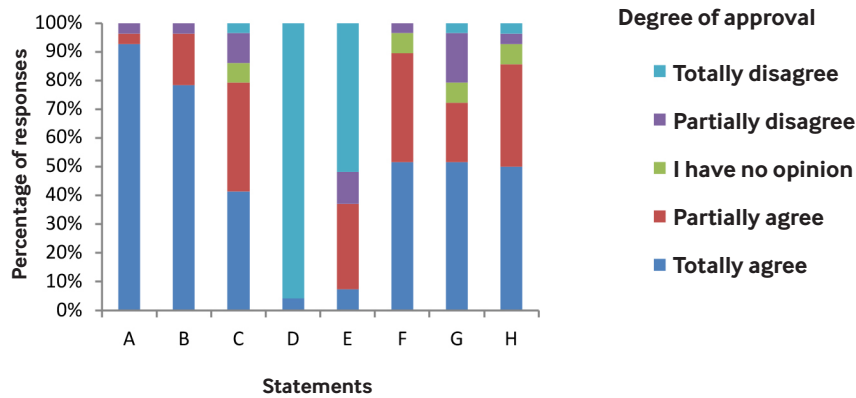
Although in the surveys the guides reflected that the elephant seal is a resource to address conservation issues, of the 28 advantages identified at the workshop, 14 were referred to aspects of the biology of this species (its attractive size and morphology, reproductive and diving behavior). However, there were no advantages related to the use of this species as a resource to discuss about conservation issues or problems of the sea and the environment in general. With regard to showing elephant seals in Punta Ninfas and Isla Escondida, one of the main advantages (and mentioned most frequently) was the possibility of being very close to the animals, sharing their space. Faced with this possibility, the guides raised the need to visit Punta Ninfas and Isla Escondida, with a tour guide, since both sites lack park guards. Likewise, the guides highlighted as other favorable qualities of these places, how pristine they are, their beauty, the absence of other people and, in the case of Punta Ninfas, the presence of other species.

Of the 24 disadvantages identified, the main ones were related to the lack of promotion of this species in the face of whale or penguin sighting, and with the structure of Peninsula Valdes to perform the observation (scarce observation centers, viewpoints far from the animals, restricted accesses). In Punta Ninfas, the accessibility to the beaches was mentioned as a disadvantage, though this is different in Isla Escondida, where the beach reaches to the beach itself. However, for this latter site, the guides mentioned the presence of too much garbage.

Suggestions of tourists and tour guides to improve the sighting of elephant seals

A total of 213 responses were registered by the tourists in relation to eventual improvements in the sighting of elephant seals. Of that total, 25% proposed that there is

better proximity to observe elephant seals (as long as this does not affect the animals of this species or their environment), 14% suggested not making changes, since they were satisfied with the way in which the sighting was performed, and 11% of the tourists suggested an improvement in the access to the observation sites (especially for minors and older people, or people with disabilities). Other registered suggestions, although less frequently were related to the need to provide information about elephant seals (new posters, videos and brochures); and about the proper behavior of the tourist in front of these animals, the duration of the sighting and the cost of the excursions. Regarding Isla Escondida and Punta Ninfas, suggestions proposed by the tourists covered aspects of infrastructure and accessibility, because they are sites that lack services. Regarding the sighting of elephant seals, the suggestions of the tourists were that it must be carried out in reduced groups, avoiding disturbing the elephant seals and having informational signage. With regard to conservation of the elephant seal and its habitat, one of the suggestions was to create a management plan for Isla Escondida.

The guides agreed with tourists that in order to improve the quality of sighting of elephant seals, there improvements in the infrastructure in the observation site should be made. For instance, 30% of the responses (N=37) were related to increasing the viewpoints. In addition, among others they suggested that the time in the site should be increased (88%), to perform visits in small groups of visitors (5%). They also expressed their interest in having the possibility of performing trainings with updated information about elephant seals, as well as referring to group management.

DISCUSSION

Results obtained in this study allowed understanding how the experience of sighting elephant seals in two sites within Peninsula Valdes (Caleta Valdes and Punta Delgada) is, from the perception of tourist and tour guides, knowing their general interests and the importance and meaning that the elephant seal has for each of these social actors.

In general terms, the view of tourists and guides coincide with the motivations o visit Peninsula Valdes. Both believe that wildlife sighting is the main reason of the visit, being

the whale the species that generates the most interest. This result is in accordance with the research carried out by Cibeyra (2016), who interviewed tourists who were performing the sighting of the southern right whale in the Province of Chubut (Argentina), specifically in the localities of Doradillo and Puerto Piramides. The interest and expectations of tourists are surprising, given the fact that it is the emblematic species of this place, with a great significance both for its biological characteristics and for its conservation status, to which tourist promotion strategy of Peninsula Valdes y is added. This is presented as an ideal and unique place to observe whales together with their young in their natural habitat. Such characteristics make it the main attraction for tourists, even when the high season coincides with the reproductive season of elephant seals (Le Boeuf & Campagna, 2013), leaving them in second place within the expectations of the tourists. For the tour guides, elephant seals also have a secondary place as a resource during regular excursions in Peninsula Valdes, where the available time is determined by the duration of the whale sighting navigation in Puerto Piramides. On the other hand, elephant seal becomes protagonist when the guides perform excursions outside Peninsula Valdes, specifically in Punta Ninfas, two sites that offer the possibility of observing them in a different context from that of the Peninsula.

Although the sighting of elephant seals was not the main reason for the visit of tourists to Peninsula Valdes, the experience of observing these animals in their habitat was satisfactory and in this sense, both actors agree on the factors that influenced the satisfaction of that experience. Some were directly related to the species (number of elephant seals and observed behaviors), whereas others were linked to the development of the activity and the context in which it was carried out. Tourists expressed greater satisfaction with the number of elephant seals and the observation distance in Punta Delgada than in Caleta Valdes, argument that was repeated for Isla Escondida and Punta Ninfas. In addition, tour guides expressed that for the tourists is a more satisfactory experience to observe elephant seals in Punta Delgada than in Caleta Valdes. According to Curtin (2010), who investigated what are the aspects that make wildlife sighting a memorable experience, this author described the number of animals observed and the degree of proximity as the main attribu-

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tes of the wildlife - human encounter. This author explains that observing the animals from a short distance provides the tourist the opportunity of having a more intimate encounter with the animals. Thus, a more detailed view of them is possible, resulting in a better interpretation of the experience.

The degree of satisfaction of tourists during wildlife sighting is influenced not only by aspects directly linked to the species itself, but by various factors that are part of the context of such experience. According to Mannell (1989), there is a diverse range of influences on human satisfaction, as well as the perception regarding the experienced lived (Bennett, 2016). Studies conducted on sighting activities of pinnipeds, cetaceans, and whale sharks indicate that some factors affect the degree of satisfaction of the experience are the degree of activity of the animals, observation distance, number of animals present, the possibility of observing them in their natural habitat, the duration of the activity, the number of people that conform the groups, knowing more about the species and the presence of facilities (for example, sanitary) (Barton, Booth, Ward, Simmons, & Fairweather, 1998; Davis, Banks, Birtles, Valentine, & Cuthill, 1997; O'Neill, Barnard, & Lee, 2004; Orams, 2000; Orsini & Newsome, 2005; Torres-Sovero et al., 2012; Ziegler et al., 2012).

Wildlife sighting is an interesting activity that generates different emotions, such as the feeling of calm, peace and freedom (Davis et al., 1997), inspiration, admiration, connection with nature (O'Neill et al., 2004). These feelings could increase the empathy towards animals, making visitors are more willing to support studies related to conservation of species in question or the ecosystem. Elephant seal is a species against which tourists are not indifferent, but generates astonishment and interest in them in order to know more about its biology and behavior. These feelings towards the species could be due, in part, to the fact that it is an unusual animal to be seen for its periantarctic distribution. In Argentina, this species can only be found on the coasts of Peninsula Valdes and adjacent areas.

The encounters of tourists with elephant seals for the first time become a novel experience (Curtin, 2010). This differs, for example, with the species of sea lions (Arctocephalus australis and Otaria flavescens) whose colonies are distributed along the coasts of South America (Brazil, Uruguay, Peru and Argentina) (King, 1983; Riedman, 1990; Rosas, Pinedo, Marmontel, & Haimovici, 1994) and it is common to observe them in fishing piers. Likewise, the marked sexual dimorphism of the elephant seal (females measure 3 m and males, 5 m approximately) (Le Boeuf & Laws, 1994) could cause tourists to perceive it as attractive and interesting.

As a tourist resource, elephant seals allow the guides to address, during excursions, several issues, among which aspects of the biology can be mentioned (large size of individuals, morphology of males, reproductive behavior and behavior in the sea). This fact, together with the landscape and the possibility of sharing the same space with the elephant seals in a respectful way and at an adequate distance, makes the tourist have different emotions and feelings that transform the visit into a memorable experience (Curtin, 2010; Higginbottom, 2004; Lian Chan & Baum, 2007; Reynolds & Braithwaite, 2001). However, this moment of awareness is not sufficiently exploited by the guides to discuss conservation issues, thus promoting environmentally favorable attitudes (Ap & Wong, 2001; Huang et al., 2010; Hughes & Ballantyne, 2001; Randall & Rollins, 2009).

Consequently, if tourism is considered a useful tool through which the tourist develops environmental awareness, this lack of information could affect this tourism potential (Ballantyne & Packer, 2005; Ballantyne et al., 2007; Finkler & Higham, 2004; Lück, 2003; Wilson & Tisdell, 2003; Ziegler et al., 2012). Thus, it could be relevant to reflect about what type of information is being provided to tourists, especially in the context of a protected natural area, and incorporate this theme or give greater emphasis to the current educational and interpretative programs. Moscardo & Saltzer (2005) and Lück (2003) among others, have shown that the tourist is receptive and shows great interest in receiving information, either about the species that are observing in their habitats and the protected natural area where they are performing their visit. Even, they identify the lack of protection/regulations in those areas with a lack of them, as demonstrated in the answers obtained in Isla Escondida.

The evaluation of the perception of tourists and tour

guides regarding the elephant seal and the experience of observe it in its natural habitat allowed understanding that this species is an important tourist resource inside and outside Peninsula Valdes. The perception of different social actors improves the understanding of the realities where multiple perspectives about certain issues coexist, and also represent a form of evidence or indispensable information, which deserves a central place when improving the management of recreational ecosystem services (Bennett, 2016; Daily et al., 2000; Tapella, 2012).

The present work, which studies the perceptions of tourists and tour guides, two different actors, but equally key, allowed reaching a better and more objective understanding, not only for the importance of elephant seal as a tourist resource, but also allowed: 1) to know wha are the most influential aspects on the degree of satisfaction of the tourists and what are their expectations about the sighting of elephant seals; 2) understand how the sighting of elephant seals in relation to that of other species is organized; and 3) understand interests and expectations of the guides about the sighting of this species. It would be significant in the future to carry out studies that incorporate the view of other social actors of the tourism field and outsider the whale Season. This information would provide a solid basis on which future management and tourism planning strategies in Peninsula Valdes and adjacent areas could be based. These should be adequate to the sustainability and protection criteria, particularly for Isla Escondida and Punta Ninfas, where the development of activities opens new challenges for its conservation.

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