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Towards informed and responsible environmental management: A case study of economic valuation of natural resources in Croatia

Abstract

Public goods, specifically the environmental amenities and natural resources, are often a primary factor in attracting tourism demand. As tourism activity is gaining its importance in transition economies of Western Balkan countries, estimating the value of natural resources could increase the need for their protection and sustainable management. While there is a plenty of application of valuation techniques in Western European countries, the application of such methods is scarce in Western Balkan countries. The coastal area of Croatia is particularly affected by intense tourism pressure, raising concerns for the population of vulnerable marine species. A Contingent Valuation Method (CVM) was applied to estimate the value of environmental amenities associated with the preservation of a bottlenose dolphin population that lives in the Cres-Lošinj archipelago. The nautical tourists having berth/moored in two marinas in the archipelago were surveyed in 2016. An environmental tax per mooring/berth day was used as a payment vehicle for eliciting the willingness to pay (WTP). A Tobit regression model was estimated to identify the main predictors of WTP. The nautical tourists were on average willing to pay 1.8 Euro per day in order to better preserve the dolphin population. Loyal nautical guests, i.e. those with more previous visits to the Cres-Lošinj archipelago, those who would like to learn about dolphins, those with a mooring/berth at the island of Lošinj, as well as female guests were willing to pay significantly higher day tax for the dolphin preservation. Nautical tourists staying longer in the area as well as domestic ones were willing to pay less. Our findings suggest that developing differential payment scheme for the marine environment, and increasing environmental awareness of nautical tourists through better communication, education and integration with the local culture and an authentic local experience would contribute to sustainable marine management in the area.

Key words: environmental valuation; contingent valuation method; willingness to pay; marine environment; Western Balkan countries

Introduction

The environmental amenities and natural resources are often a primary factor in attracting tourism demand (Marcoulier, 1998). Both can be categorized as public goods, i.e. goods that can be characterized by the two main features: (i) there is no way to prevent the use of public goods (non-excludible) and (ii) use of a public good does not diminish its value for other users (non-rival). Estimating the value or benefits provided by public goods, such as air or water quality or scenic beauty is difficult, and requires careful consideration of estimation techniques (Lindsey, Paterson & Luger, 1995). The most frequently used method to value environmental amenities and other public goods is the Contingent

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Valuation Method (CVM) (Mitchell & Carson, 1989; Bateman & Willis, 1999; Carson, 2000; Venkatachalam, 2004; Liu, Liu, Zhang, Qu & Yu, 2019). It is a stated-preference method of estimating the value that a person places on a good by directly asking respondents to report their willingness to pay (WTP) to obtain a specified good, or their willingness to accept (WTA) to give up a good. The CVM is able to comprehensively measure a value attached to a good, by considering both use and non-use values. Use values of natural settings include direct use values (e.g. recreation, tourism, education and research), indirect use values (e.g. watershed protection, climatic stabilization and carbon sequestration) and option values (e.g. valuing sites for the potential of future use), while non-use values include bequest values (the benefit of knowing that future generations may benefit from the protected area) and existence values (benefit of knowing that the protected area exists even though one is unlikely to visit it or use it in any other way) (MEA, 2005).

While there is a plenty of application of valuation techniques for public goods in Western European countries (e.g. Howley, Hynes & Donoghue, 2012; López-Sánchez & Pulido-Fernández, 2017; Stigka, Paravantis & Mihalakakou, 2014), the application of techniques valuing public goods benefits is scarce in Western Balkan countries (WBC), which may reflect the state of general environmental awareness. This is quite concerning due to the intensive pressure on environmental resources already observed in WBC, and often driven by increasing tourism activity. A flagship in the tourism development is Croatia, where tourism directly contributed 10.4% to gross domestic product in 2011, while 9% of all employed persons had worked in tourism industry (Ivandić & Marušić, 2017; Ivandić, Marušić, Šutalo & Vuglar, 2014). In 2016, the total tourist expenditures in Croatia amounted to 10.5 billion Euro (Ivandić, Marušić, Sever & Kos, 2017). Besides the obvious economic benefits induced by tourism activity, more than 78 million tourist overnights recorded in 2016 raises concerns for the state of underlying natural resources, and the need for their protection and sustainable management.

Croatia features a typical "sun and sea" tourism model, including a diversity of activities that take place in both coastal zones and coastal waters. Besides a numerous facilities such as hotels, campsites and rooms/apartments in households available for tourist accommodation along the coast and on the islands, Croatia is also very attractive destination for nautical (both, yacht and cruise) tourists. With more than 17,000 moorings in about 60 marinas and, in addition, moorings/berths available in numerous ports along the coast and on the islands, Croatia offers more than 5,000 vessels in bare boat yacht charter fleet, the biggest in the world. There were more than 3,000,000 overnights realized in 2016 in yacht charter only. In addition, 1.1 million foreign passengers, mostly same day visitors, arrived on 825 international cruise ships to Croatian ports in 2016. There are also more than 200 cruise vessels/ships cruising within Croatian sea waters, so called 'domestic' cruising, with 30 beds per ship on average. All this puts a high pressure on the marine environment. However, the nautical tourists might not be aware of the value and fragility of marine environment and the importance of its protection (Institute for Tourism, 2018).

This study investigated nautical (yachting) tourists' environmental awareness and WTP associated with the marine preservation on the case study of a bottlenose dolphin population that lives in the Cres-Lošinj archipelago in Croatia. The overall aim of the study was to increase awareness for environmental regulation and preservation in WBC by applying the state-of-the-art environmental valuation methods, and to discuss their potential in providing high-quality information base for decision making, thus contributing to the responsible environmental management strategies. This is pursued through three specific research objectives: (i) estimating the nautical tourists' WTP for marine conservation of bottlenose dolphin population in the Cres-Lošinj archipelago in Croatia, (ii) examining what are

the main predictors of WTP, and (iii) examining to what extent the nautical tourists' WTP would be different from that obtained for tourists staying in stationary accommodation facilities (i.e. hotels, camp sites and private households).

Following the brief introduction, next chapter is reviewing the literature on valuation of environment/ natural resources in WBC. Methods chapter sets the scene by brief description of the study area, followed by detailed description of CVM survey regarding the target population, sample size and design, research instrument and statistical analysis applied. Results chapter presents the results of the univariate and regression analysis of the WTP, followed by discussion and conclusion.

Literature review of valuation studies in Western Balkan countries

The literature review was focused on the application of the three most commonly used valuation techniques – CVM, Travel Cost and Hedonic Pricing – in valuing natural resources in WBC. Scientific articles available through on-line databases: Google Scholar, ScienceDirect, Cambridge Journals Online, Springer Journals Online, C.I.R.E.T (International center for research and study on tourism), EBSCO, SCOPUS and WEB OF SCIENCE were reviewed. Extensive and thorough literature review of the published valuation studies in WBC focused on evaluation of public goods through tourism revealed a total of 22 studies conducted in the period between 1998 and 2016 (Table 1). The majority of them (16 of 22) were published in the 2010-2016 period.

Table 1
Studies on valuation of natural resources in WBC

Country	Year	Method	Natural resource valued	Authors
Albania	2013	CVM	Water quality	Grazhdani (2013)
	2015	CVM	Water quality	Grazhdani (2015)
Bosnia and Herzegovina	2010	CVM	Endemic species	Dautbasic et al. (2010)
	2013	CVM	Endemic species	Ioras et al. (2013)
Croatia	1998	CVM	Forests	Horak, S. (1998)
	2002	CVM	Forests	Weber, Horak & Marušić (2002)
	2004	HP	Forests	Horak & Marušić (2004)
	2005	CVM, HP, expert assessment	Forests	Marušić, Horak & Navrud (2005)
	2010	HP	Urban forests	Lovrić & Posavec (2010)
	2012	CVM	Water quality	Kountouris, Nakic & Sauer (2012)
	2012	CVM	Forests	Posavec et al. (2012)
	2013	Literature review of valuation studies	Urban forests	Krajter Ostoić et al. (2013)
	2014	CVM	Marine conservation for bottlenose dolphins	Batel, Basta & Mackelworth (2014)
	2015	Tree evaluation Danish model	Urban forests	Beljan, Posavec & Jerčić (2015)
FYRM*	–	–	–	–
Kosovo	2016	CVM	Food safety (certification)	Sopi (2016)
Montenegro	2011	CVM	Rare and endangered fauna and flora	United Nations Development Programme (2011a, b)

Table 1 **Continued**

Country	Year	Method	Natural resource valued	Authors
Serbia	2004	BT	Environmental degradation	Jantzen & Pesic (2004)
	2014	TC	Natural protected areas (national park)	Poduška, Ranković & Keča (2014)
Turkey	2008	CVM, TC	Beach maintenance and improvements	Blakemore & Williams (2008)
	2010	CVM	Food safety/food quality	Akgüngör, Miran & Abay (2010)
	2013	CVM, TC	Recreational fishing	Aydın et al. (2013)
	2015	CVM	Forests (reforestation)	Tolunay & Başsüllü (2015)

*Former Yugoslav Republic of Macedonia
Note: CVM = Contingent Valuation Method; TC = Travel Cost; HP = Hedonic Pricing; BT = Benefit Transfer.

The majority of the studies have been conducted in Croatia (10 out of 22), followed by Turkey (4). Forests (excluding urban forests) were the most common environmental good that was valued in those studies (6 out of 22 studies dealt with forests), followed by urban forests (3), water quality (3) and endemic species (3). The most common method used in the studies was a CVM, used in 16 studies, while the travel cost method and the hedonic pricing method were used in three studies. The literature review revealed not only a scarce use of valuation of non-market goods in WBC, but also a narrow range of environmental goods/benefits valued in those studies. Only one study was focused on the valuation of marine environment and its preservation (Batel, Basta & Mackelworth, 2014). The study investigated WTP for marine conservation of the Cres-Lošinj archipelago in Croatia, focusing on tourists staying in hotels, camp sites and private households on island of Lošinj. We extended their research on WTP for dolphin preservation to the other important segment of tourism demand in the area – the population of nautical (yachting) tourists. Due to their stronger interaction with marine wildlife and greater exposure to dolphin watch experience, their willingness to support marine preservation programs could be expected to be different in comparison to other segments of tourism demand.

Methods

Study area

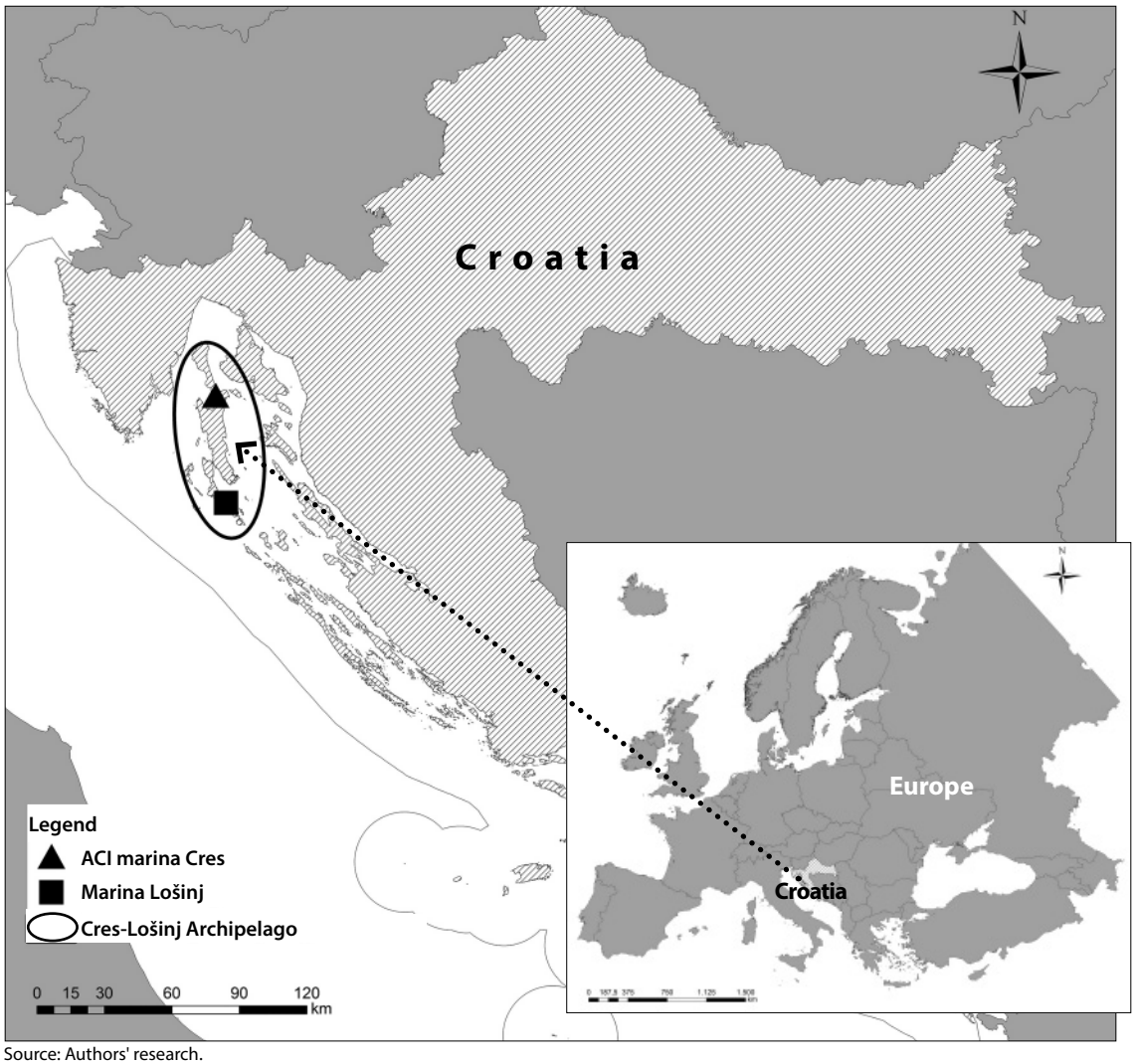
Croatia is a Mediterranean country (Fig. 1), internationally recognized for its long rugged Adriatic coastline. The length of the coastline is 6.3 thousand km, of which 30% in on the mainland and 70% on 1,246 islands, islets and rocks (Duplančić Leder, Ujević & Čala, 2004) of which 47 are inhabited. The tourism attractiveness of the coastal area is additionally boosted by a number of preserved medieval towns, several with UNESCO world heritage sites, national parks, with four of them accessible by boat, a great variety of landscape, a mostly pristine environment and proximity to major tourist generating markets. The attractiveness of the Croatian coast is already highly recognized by the Croatian tourism demand. According to a longitudinal TOMAS survey on visitor profile, satisfaction and consumption in Croatia (Marušić, Čorak & Sever, 2017), visiting natural attractions is one of the main motives to visit Croatia. Specifically, natural attractions motivated between 20% and 26% of tourists to visit Croatia during 2004-2014 period. At the same time, 'the scenic and natural beauty' is evaluated by tourists as the best element of the Croatian tourism supply among 28 to 30 different elements (depending on the survey year). Furthermore, the beauty of landscape and ecological preservations are the main Croatian competitive advantages in comparison to other Mediterranean competitor countries, as stated by Croatian tourists.

Yachtsmen sailing in Croatia are also the most satisfied with the beauty of nature and scenery, but also with a clean sea, according to a longitudinal survey on Attitudes and Expenditures of Yachting

Tourists in Croatia, most recently conducted in 2017 (Institute for Tourism, 2018). The majority of nautical tourists are foreign tourists, while the average daily expenditure of nautical tourists (excluding travel expenditures to/from departing port) amounts to 126 Euro per person. This form of tourism generates about 10% of total inbound tourism expenditure in Croatia.

Despite its huge ecological and economic importance for Croatia, less than 2% of Adriatic Sea is under protection (Batel et al., 2014). The Cres-Lošinj Marine Protected Area was established in 2006 for the preventive protection of the population of bottlenose dolphins (Tursiops truncatus) found in the archipelago. This area is also a part of the Natura 2000 network. Intensive tourism industry combined with its high economic importance for the residents of the islands of Cres and Lošinj require monitoring and management of the natural resources to protect the potentially vulnerable environment (Batel et al., 2014).

Figure 1
Study area - Cres-Lošinj archipelago, Croatia



Source: Authors' research.

Survey population, sample design and sample size

Survey population are nautical tourists having berth/moored in marinas in the Cres-Lošinj archipelago (i.e. in ACI marina Cres and Marina Lošinj, the only two marinas in the area) during summer 2016 (August-September). Both, nautical tourists having permanent berth in the two marinas and those in transit were surveyed.

In order to obtain a sample representative for nautical tourists' population, a stratified quota sample has been used in the research. As all visitor surveys are facing the issue of questionable availability of a sample frame, data recorded the previous year usually serve as a proxy for the sample frame. Therefore, stratums were defined according to the main population characteristics in the previous year (2015): (i) country of permanent residence of nautical tourist, (ii) type of vessel (motor boat or sailing boat), (iii) type of berth/mooring (permanent berth and transit mooring), and (iv) marina (ACI marina Cres and Marina Lošinj). Sample size by stratum was proportional to the number of vessels in stratum for each marina recorded in 2015. Such mixed sampling method is, by many authors, a good approximate of stratified random sample (Teddlie & Yu, 2007; Groves, Fowler, Couper, Lepkowski, Singer & Tourangeau, 2009). A total sample size was determined based on the literature review and the obtained variances in WTP in the previous CVM studies, as well as on the resources available for this study. A planned sample size was 200 respondents, and a total of 210 questionnaires were collected. The obtained sample was almost equally distributed between the two islands (52% of all interviews was conducted on the island of Cres, and 48% on the island of Lošinj).

Research instrument and data collection method

A structured questionnaire was used as the research instrument. The recommendations of the NOAA panel from 1993 were followed in the design of the questionnaire (Arrow, Solow, Portney, Leamer, Radner & Schuman, 1993). The questionnaire consisted of the introductory part (general information about the survey and questions describing the current trip), CVM task and questions on socio-demographic characteristics of respondents. Data were collected by a personal interview with only one person per travel party, i.e. boat. The questionnaire was printed in Croatian, English, German and Italian languages, and pilot tested prior to data collection in a form of personal interview. The expected length of the interview was estimated to 15 minutes.

Contingent valuation task

Following a detailed description of the bottlenose dolphin preservation scenario, an environmental tax per mooring/berth day was used as a payment vehicle for eliciting the WTP. The payment vehicle represents a way of collecting money amounts asked for in WTP question. It is an important part of CV survey, and the choice of payment vehicle may affect elicited WTP (Venkatachalam, 2004). There are four main types of payment vehicle: general taxes (income tax or similar), special taxes (utility tax or similar), increased price on goods related to environmental good or service and different funds for provision of the environmental good or service. Ecological taxes and entry fees to sites are particularly popular hypothesized payment methods in estimating visitors' WTP for management and conservation of nature areas (Batel et al., 2014). Since the population of interest in this study were nautical tourists, entrance fees were not a feasible payment method and an environmental tax per mooring/berth day was deemed the most appropriate payment method. Furthermore, CV studies differ in the method used for elicitation of WTP. The elicitation method represents a way to ask WTP question. Two of the most common techniques are open-ended question (with or without payment card) and

discrete-choice question. In an open-ended WTP question respondents are directly asked to state the amount for the good, while using the payment card technique an array of potential WTP amounts is presented to the respondents. In the discrete or dichotomous choice WTP question different respondents are asked whether they would pay a specified amount or not to get the specified improvement (or to avoid a specified decrement and thus preserve status quo). The amount asked usually varies across the respondents. In the literature there are "pro et contra" for both of the techniques and so far none of them has proven superior to another. In this study we have used an open-ended question in which respondents were directly asked how much they would be willing to pay for the preservation scenario. Follow-up questions were used to identify protest responses.

Statistical methods

Descriptive statistics include number of observations, relative frequencies for qualitative variables, and mean and standard deviations for quantitative variables. In comparison of two or more groups chi-square test (or Fischer exact test where appropriate) was used for qualitative variables and Wilcoxon-Mann-Whitney test (or Kruskal-Wallis test in the case of comparison between more than two groups) for quantitative variables. Spearman correlation coefficient was used to test the correlation of WTP with other quantitative variables. A Tobit regression model was used for assessing important determinants of nautical tourists' WTP for dolphin preservation program. This model is appropriate for modelling WTP because elicited amounts are 0 or higher, that means left censored. Due to a large number of answers with no willingness to pay (amount is 0 Euro) often observed in environmental valuation studies, Tobit regression is considered more appropriate than traditional linear regression model (Yu, Cai, Jin & Du, 2018). The estimation of the model is undertaken by maximum likelihood method that is better suited for analyzing censored data than the ordinary least squares method used in the linear regression models. In the regression analysis, p-values for entry into the model and for stay in the model were set to 0.15, in accordance with Mitchell and Carson (1993, pp. 232-233). All tests were performed at significance level α=0.05. Statistical analysis was performed using SAS System.

Results

The majority of the respondents came from Germany (26%), Italy (21%), Austria (18%), Croatia (8%) and Slovenia (8%), in accordance to the overall nautical tourists' population in the Cres-Lošinj archipelago. The majority of respondents were males (80%), 51 years old on average. Almost half (47%) of all respondents had a university or higher degree. There were no statistically significant differences in gender, age, education level and monthly household income of the respondents between the two marinas where the study was conducted. However, although the respondents on sailing yachts prevailed at both islands, there were significantly more respondents on motor boats at the marina Cres (33%) in comparison to marina Lošinj (20%, p = 0.037). The distribution of vessel's ownership also differed between the two marinas. While the respondents in marina Cres were mostly (63%) on own vessels and 23% were on chartered vessels, the relationship between the owned and chartered vessels in marina Lošinj was opposite (48% chartered and 41% in ownership). The majority of all respondents (78%) were in transit, with no differences between the two islands/marinas. About 43% of all respondents already sailed in the archipelago for five or more times, while slightly less than a quarter (23%) were 'newcomers', sailing in the Cres-Lošinj archipelago for the first time. The majority (89%) knew that dolphins live in the Cres-Lošinj archipelago, while about 40% were aware that the Cres-Lošinj archipelago is a part of Natura 2000 site for dolphins (44% at Cres and 35% at Lošinj, with no significant differences recorded). Almost three quarters of respondents have already seen dolphins in

the Cres-Lošinj archipelago, while about a third have heard about the Blue World Institute of Marine Research and Conservation on the island of Lošinj.

Univariate analysis of WTP

The nautical tourists were on average willing to pay 1.8 Euro per day in order to better preserve the dolphin population in the Cres-Lošinj archipelago. While 40% of them were willing to pay to support the dolphin conservation through the Adriatic dolphin project, 40% were not willing to pay to support this project, and every fifth nautical tourist was not sure about it. Belief that government or local community should pay was most often mentioned as a primary reason for not willing to pay (47%), followed by the support of other environmental projects (18%) and not being able to afford it (11%). Respondents were quite certain in their answers to WTP question. Four out of five specified a rating of six or more on a ten-point choice certainty scale ranging from 1='Very uncertain' to 10='Very certain', with a rating of ten recorded by 41% of respondents. The results of univariate analysis of WTP are presented in Tables 2 and 3.

Table 2
Univariate associations between background variables and WTP

Variable	WTP			p-value*
	N	Mean	St. dev.	
Country of permanent residence				0.548
Germany	52	1.7	2.8	
Italy	44	1.6	3.2	
Austria	35	2.1	3.0	
Croatia	15	0.6	1.0	
Slovenia	16	1.8	2.7	
Other	42	2.2	4.3	
Gender				0.488
Male	161	1.7	2.8	
Female	41	2.3	4.5	
Education				0.267
Primary school	3	0.5	0.5	
Secondary school	31	1.9	3.5	
Two or three year college	71	1.4	2.2	
University or higher	94	1.9	2.9	
Household monthly income				0.055
Up to 1,000 €	12	1.8	3.0	
1,001 - 2,000 €	25	0.8	1.2	
2,001 - 3,000 €	31	1.6	3.0	
3,001 - 5,000 €	37	2.9	4.7	
5,001 - 10,000 €	23	2.7	3.1	
10,001 € and more	15	1.9	3.9	
Marina				0.108
ACI Marina Cres	107	1.0	1.6	
Marina Lošinj	97	2.6	4.2	
Type of the vessel				0.517
Motor-boat	55	1.9	2.8	
Sailing yacht	149	1.8	3.3	

Table 2 **Continued**

Variable	WTP			p-value*
	N	Mean	St. dev.	
The vessel is:				0.700
Owned/co-owned by me	106	1.7	2.9	
Owned by friends/relatives	24	2.1	5.4	
Chartered	72	1.8	2.7	
Something else	1	0.5	.	
The vessel in this marina:				0.748
Has a permanent mooring	38	1.8	2.8	
Is in transit	157	1.7	2.8	
Something else	8	3.8	8.7	

* p-value from Wilcoxon-Mann-Whitney or Kruskal-Wallis test

Table 3
Univariate associations between environmental awareness indicators and WTP

Variable	WTP			p-value*
	N	Mean	St.dev.	
Excluding your present stay, how many times have you already sailed in the Cres-Lošinj archipelago?				0.341
Never	47	2.0	4.2	
Once	25	0.8	1.3	
Two to five times	44	2.1	3.3	
More than five times	85	1.7	2.8	
Do you know that there are dolphins in the Cres-Lošinj archipelago?				0.624
Yes	181	1.8	3.3	
No	21	1.5	1.9	
Do you know that the eastern part of the Cres-Lošinj archipelago is a Natura 2000 site for dolphins?				0.925
Yes	79	1.6	2.6	
No	125	1.9	3.5	
In your opinion, to what extent do the dolphins make the Cres-Lošinj archipelago a more attractive sailing destination on the scale from 1-'not at all' to 5-'very much'?				0.116
1	7	3.6	9.4	
2	21	1.7	2.6	
3	54	1.4	2.7	
4	46	1.8	3.0	
5	75	1.9	2.8	
Have you ever seen dolphins in the Cres-Lošinj archipelago?				0.236
Yes	151	1.8	2.9	
No	53	1.7	3.9	
Have you heard about Blue World Institute of Marine Research and Conservation (BWI) on the island of Lošinj?				0.106
Yes	63	2.0	3.1	
No	140	1.7	3.2	
Would you like to learn more about dolphins?				< 0.001
Yes	103	2.2	3.0	
No	85	1.4	3.5	

* p-value from Wilcoxon-Mann-Whitney or Kruskal-Wallis test

A statistically significant association with WTP was observed only for the willingness to learn more about the dolphins and household monthly income (the latter at the 10% level of statistical significance). Elicited WTP was generally higher for those who would like to learn more about dolphins compared to those who would not ($p < 0.001$), with the average WTP of 2.2 Euro and 1.4 Euro, respectively. Nautical tourist with monthly household income above 3,000 Euro generally elicited a higher WTP compared to those with lower income. Other background variables were not significantly associated with the marginal WTP of nautical tourists. Furthermore, correlation analysis did not show any correlation of WTP with length of sailing and age of respondents (Table 4).

Table 4
Correlation analysis of length of sailing and age with WTP

Variable	N	Spearman correlation coefficient	p-value
Total number of overnights planned for this cruise/ sailing in Croatia	197	0.01	0.874
Number of these spent in the Cres-Lošinj archipelago	181	–0.06	0.442
Age	206	–0.01	0.937

Tobit regression analysis of WTP

Starting from all independent variables included in the regression model, by backward selection we obtained the model with two significant variables, the location of marina and the willingness to learn about dolphins. Since the household monthly income was not a significant predictor of WTP and, thus, not retained in the model, the procedure was repeated starting from the same set of variables, but excluding the household income. The gain of this procedure is more observations in the regression model, since household income had 64 missing values. The final model included four additional variables: the number of visits to the Cres-Lošinj archipelago, the number of overnights in the Cres-Lošinj archipelago, country of permanent residence (Croatia or foreign) and gender (Table 5).

Table 5
Results of Tobit regression

Variable	Coefficient	p-value
Marina Lošinj[a]	2.1085	0.004
Number of times sailing in the Cres-Lošinj archipelago	0.6646	0.040
Number of nights spent in the Cres-Lošinj archipelago	–0.0833	0.050
Willing to learn more about dolphins[b]	2.5668	< 0.001
Local tourists[c]	–2.4680	0.098
Female tourists[d]	1.8154	0.040

Number of observations in the model: 162
[a] Reference level = Marina Cres.
[b] Reference level = Not willing to learn more about dolphins.
[c] Reference level = Foreign tourists.
[d] Reference level = Male tourists.

The results of Tobit regression suggest that the guests of marina Lošinj were on average willing to pay significantly more than guests of marina Cres. More previous visits/sailing experience in the Cres-Lošinj archipelago, and willingness to learn more about dolphins were also associated with a higher willingness to pay for the preservation program of bottlenose dolphins. On the other hand, guests with more overnights in the Cres-Lošinj archipelago were willing to pay less, as well as guests from Croatia compared with foreign guests. Female guests were on average willing to pay more than their male counterparts.

Discussion

Marine ecosystems generate a range of services that have substantial benefits in terms of human well-being (Yu et al., 2018). Failing to recognize the benefits obtained from ecosystems is considered a primary reason for the loss and degradation of ecosystems (Douglas, 2018). Marine protected areas are considered an effective management tool for promoting the conservation of marine ecosystems and enabling long-term provision of benefits provided by those areas (Carr, 2000). However, the effectiveness of MPAs can be impeded by insufficient funding. People who obtain environmental benefits are expected to be willing to pay a certain amount of money to support ecosystem protection strategies and sustainable development.

This case study has examined nautical tourists' willingness to economically support marine conservation in the Cres-Lošinj archipelago and its flagship species, the bottlenose dolphins. The CVM design followed the best research practice. By applying the appropriate valuation techniques in the assessment of environmental goods, decision-makers can increase their understanding of the range of benefits provided by ecosystems. However, estimating visitors' WTP and using this information to increase economic benefits is not the final step. It is important that a firm relationship has been established between payment and environmental improvement, and that this relationship can be observed by visitors (Batel et al., 2014). Otherwise, if they do not find a protected area management credible, their support could decrease and they might displace to other areas. Therefore, it is crucial that protected area managers set firm objectives of the protected area's pricing strategy, considering both the environment and the users of the area when allocating collected funds. Better communication and improved general awareness of environmental amenities and their valuation can help in reaching the synergy between policymakers and users.

Batel et al. (2014) conducted a similar study in the Cres-Lošinj archipelago, but focused on the population of land visitors (i.e. tourists in stationary accommodation facilities like hotels, camp sites and private households). They found that over 80% of visitors were willing to pay more for their holiday in support of marine conservation. Their study revealed that WTP for marine conservation was positively correlated with ecological interest (interest in seeing wild dolphins and interest in learning about the dolphins of the area), environmental knowledge and a positive opinion on environmental issues, while education, nationality or income were not the relevant determinants of WTP, thereby mainly supporting the findings of our study. The authors concluded that introduction of an ecological tax of approximately 1 Euro per person per day would be appropriate, which is similar to our estimates and managerial recommendations. The authors also argued that a greater public awareness for environmental conservation in the Cres-Lošinj archipelago should be established, supporting the conclusions of this study.

Other studies have found that sociodemographic characteristics such as gender, income, culture and residency have an important influence on WTP. Furthermore, perception, environmental awareness, regional location, previous experience and payment vehicle were also identified as important factors (Carson, Flores & Meade, 2001; López-Sánchez & Pulido-Fernández, 2017; Yu et al., 2018). This demonstrates that the decision on whether to contribute to the environment could be affected by multiple factors. To provide effective advice on the design of marine protection strategies, it is important to identify those factors and heterogeneous preferences of visitors.

Our findings indicate that adding an additional environmental tax to the fees for mooring/berth in the Cres-Lošinj archipelago is feasible policy option that could raise substantial funds for marine environmental conservation and management. Developing differential payment scheme for the marine

environment, and increasing environmental awareness of nautical tourists through better communication, education and integration with the local culture and an authentic local experience would contribute to sustainable marine management. Encouraging visitors to make emotional bond with a place by providing authentic experiences may play an important role in general awareness and support for environmental protection. This is supported by our findings, since the nautical tourists more loyal to the Cres-Lošinj archipelago generally revealed a significantly higher WTP.

Finally, this study has some limitations. Despite our efforts to produce as valid WTP estimates as possible, they should be treated with some caution. Stated preference techniques often overestimate true WTP due to their hypothetical nature (Venkatachalam, 2004). The external validity of WTP estimates could not be tested due to the unavailability of revealed preferences, which is a common limitation in similar studies. Furthermore, our analysis would benefit from a larger sample size, especially due to a limited number of observations for some of the background variables, such as income (Carson, 2000). Since the WTP elicitation methods are not directly comparable between our study and the study of Batel et al. (2014), further research is needed for more robust comparison of WTP between the land based and nautical tourists. Finally, due to the scarcity of environmental valuation studies in WBC, additional valuation contexts should be considered in future work, to stimulate sustainable, responsible and, above all, informed environmental management practices in the whole region.

Conclusions

As the intensive pressure on environmental resources, often driven by increasing tourism activity, is already observed in the region, the scarce use of natural resource valuation techniques in WBC, as confirmed by the literature review, is quite concerning. This study contributes to introduction and spread of informed and responsible environmental management strategies in WBC. By exercising CVM and assessing users' WTP for marine conservation in the Cres-Lošinj archipelago, Croatia, our study provides important information for understanding the value of marine ecosystems and their preservation. The findings indicate that nautical tourists were willing to economically support (1.8 Euro per day, on average) the conservation of bottlenose dolphins, the flagship species in the archipelago. Nautical tourists with broad previous experience with sailing in the Cres-Lošinj archipelago, those having a mooring/berth at the island of Lošinj, those eager to learn about dolphins, as well as female nautical guests were willing to pay significantly higher day tax for the dolphin preservation. Adding an additional environmental tax to the fees for mooring/berth in the Cres-Lošinj archipelago, and applying a differential payment scheme is feasible policy option that could raise substantial funds for marine environmental conservation and management. Better communication, education and encouraging visitors to make bonds with the local culture and an authentic local experience may contribute to sustainable marine management in the area.

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