Exploring social values for marine protected areas: The case of Mediterranean monk seal

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Abstract

This study primarily attempts to understand people's beliefs towards marine protected areas considering as a case study the National Marine Park of Alonissos, Northern Sporades (NMPANS) in Greece. Specifically, it aims to identify people's opinion about the utility of the park investigating also their beliefs in relation to socio-economic characteristics. For this reason, a face-to-face survey of 200 respondents randomly selected residents of Volos was carried out. The research was structured according to the principles of the Contingent Valuation Method (CVM). According to the survey results, the majority of responders recognized the contribution of the Park to preserve the monk seal and the natural environment. Moreover, they want to maintain the park and specialise in the area of protection measures.

Keywords: Marine Park; CVM; WTP; Mediterranean monk seal; Socio-economic values; Environmental attitudes.

JEL classifications: C10; C52; Q20; Q51; Q56; Q57.

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1. Introduction

Marine ecosystems are under various pressures mainly due to human activities on the coastal zone. Marine Protected Areas (MPAs) are important in protecting biodiversity, natural habitats and are the best way to protect endangered species (Lester *et al.* 2009). MPAs could meet their goals only under an integrating management system. Marine ecosystems support life on our planet providing a series of goods and services including production of marine biodiversity and services for ecosystem health (Böhnke-Henrichs *et al.* 2013). One of the most important factors of success of these projects is to involve the local population in the decision-making process. Taking into account the attitudes of the local population is particularly important to a successful management program (Kottapalli *et al.* 2003; Trakolis 2001). Some of the most well-known examples of local community involvement in the design and choice of management practices include the Regional Natural Parks in France (Parcs Naturels, Council of Europe, 1987), the National Park of Richtersveld in North Africa (Steenkamp and Hughes 1997) and the National Park of Nepal (Hough 1988; Hough and Sherpa 1989).

Management strategies for biodiversity conservation could be more effective if based on assessments of biodiversity economic values. According to Pearce and Moran (1998), any attempt for valuing biodiversity is helpful for its conservation. Valuation of biodiversity should be part of every management plan of conservation biology because in this way we integrate environmental impacts to biodiversity policies making those well-targeted and effective to raise public and political awareness of biodiversity importance (OECD 2002). Many studies have proved that conservation policies of endangered species should include economic criteria (MEA 2005). Shogren *et al.* (1999) highlight that economic valuation of endangered species

could provide policy makers with important information about why they have to be protected as well as the economic benefits of any conservation program. For instance, Environmental Economics may endow with information conservation biologists and policy makers about why species are characterized as endangered, the opportunity costs of protection activities and the economic incentives for conservation (Shogren *et al.* 1999).

A number of studies focus on the relationship between noneconomic motives and people's WTP for environmental protection focusing on each attitude to the environment (Kotchen and Reiling 2000; Meyerhoff 2006; Cooper et al. 2004 among others). For this reason researchers investigate the relationship between people's conservation Willingness To Pay (WTP) with their environmental attitudes (Stern *et al.* 1993). Choi and Fielding (2013) refer to population heterogeneity problem of CVM studies which arise from different characteristics and preferences of the population. The use of a variety of explanatory variables (socio-demographic and attitudinal) could help to solve this problem (Louviere 2001).

CVM is one of the most popular methods of economic valuation of natural environment and the last decades is widely used (Mitchell and Carson 1989) for estimating use and non-use values. CVM tries to build hypothetical markets in which people place a value (mainly through their WTP) on a good, usually one that is not sold in markets. Beginning of the 1980s, economists used CVM for valuing endangered species (Mäler and Vincent 2005). According to Pearce and Moran (1994) CVM is an appropriate method for biodiversity valuation in general and the results reveal public preferences determining in this way conservation priorities.

The Mediterranean monk seal *(Monachus-monachus)* is the most endangered seal in Europe and it is also in the top 6 list of the most critically endangered

mammals on earth and in the top 12 most critically endangered animals worldwide. A large population of Mediterranean monk seal is living in Greece making them an important country for monk seal (Johnson *et al.* 2006). Its world population is estimated at 400-500 individuals, of which 200-250 are estimated to live in Greece (Reijnders *et al.* 1993), with best-known populations in NMPANS (HSSPMS 1995) and in the Ionian islands (Panou *et al.* 1993).

There are many studies which try to measure the economic value of endangered species or wildlife (Van Kooten 1993; Loomis and Larson 1994; Kotchen and Reiling 2000). In Greece Langford et al. (1998) carried out a CVM research to estimate the WTP for protecting the Mediterranean monk seal in the Aegean Sea. The results show that income, sex, age, and education influence people's decision to pay for protecting monk seal and median WTP was about 11.7€ per household yearly. Langford et al. (2001) using CVM estimated people's WTP to financially support a public fund for the Mediterranean monk seal protection. According to their results and using factor analysis, five factors are fount describing respondents' attitudes towards conserving the monk seal, labeled protection as moral responsibility, ambivalence, limited resources and tourist potential. Kaval et al. (2009) in a CVM research at Zakynthos Island in Greece explored the economic value of turtle and monk seal. According to their results residents were willing to pay about 30 € more than visitors pay for species protection. Other CVM studies in Greece examined conservation of an internationally important wetland site at Kalloni Bay on the island of Lesvos (Kontogianni et al. 2001), wastewater treatment plants for Thermaikos Bay, which is next to Thessaloniki (Kontogianni et al. 2003) and the influence of visitors' profile, information sources, environmental dispositions, and visit evaluation on visitors' WTP for the National Marine Park of Zakynthos. Matsiori et al. (2012) and Matsiori et al.

(2013) estimated the conservation value of urchin *Paracentrotus lividus* and Mediterranean monk seal using a CVM study. Halkos and Jones (2012) investigated how social factors influence people decision to pay for biodiversity protection.

In this context, this paper focuses on protection values of NMPANS based on public preferences for Mediterranean monk seal conservation due to its importance. The last goal of the research is to explore the relationships between people environmental attitudes and economic values of endangered species, and it tries to underline the motives of Contingent Valuation Method (CVM) responses. This is important because environmental attitudes are used as predictors of environmentally based actions and participation decisions.

The specific goals are to investigate public awareness, attitudes, and behaviors towards Marine Park protection as well as how environmental attitudes influence people's decisions to pay for Mediterranean monk seal protection. Additionally, we aim to estimate people's WTP for Marine Park protection identifying the main factors that affect their choice.

2. Materials and methods

2.1. Study area and survey design

The NMPANS was the first designated Marine Park in the country and is the largest marine protected area in Europe (about 2.260 Km^2). A contingent valuation survey was carried out to 200 randomly selected residents of Volos city[4]. Face-to-face interviews conducted on-site. Volos is a coastal port city in Thessaly in the middle of

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[4] The present study is part of a greater research which designed from the authors and tries to investigate the non-economic motives behind the willingness to pay for biodiversity conservation. The present sample was collected using the Cluster Sampling formula. The entire population was divided into groups or clusters and a random sample of these clusters is selected (Aaker et al. 2009). At the present survey as cluster units were assumed the city blogs. The sample consists of 200 valid questionnaires and we could take that as sufficient to perform statistical analysis. The questionnaires that were not completed were excluded from the analysis of our research.

the Greek mainland and is built along the Pagasitikos Gulf and much closed to NMPANS. The questionnaire was drawn up for this survey and contained 36 questions.

In order to measure the economic value of the Marine Park, we used a CVM section which was constructed and tested according to guidelines established by the NOAA panel (Arrow et al. 1993). For this reason, a hypothetical market was developed in which an individual reveals his/her WTP for NMPANS protection. Next, we give background information with the hypothetical CVM scenario and respondents after that had to express their WTP for Marine Park protection.

The structure of hypothetical market involved three elements: (1) description of NMPANS and the related hypothetical scenario; (2) the form and frequency of payment and (3) the WTP question format which was a voter referendum to approve this effort[5]. Respondents were asked, before the WTP question, if they would support a Marine Park protection program. Implementation of the program would cost them a specified amount of money (in €) in a one-time payment. Only the respondents that had replied positively were faced with the WTP question. WTP amounts were randomly assigned to respondents according to previous studies (Matsiori et al. 2013). Bid step amounts were based on the results obtained in the pilot (at an earlier stage) study and ranged from 1 € to 50 € (bit step 3 €). Next, respondents not accepting the CVM scenario had to justify their answers. This question helps us to distinguish the

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[5] First respondents were face with a worst scenario for the future of NMPANS and the population of monk seals. After that they had to decide to support (or not) a Marine Park Protection Program. The participation to this program was related with a one-time payment. Respondents were asked to decide to pay for NMPANS protection taking into account mainly the importance that have for them the conservation of *Monachus monachus* population that lives in the park. In this way we try to elect people's WTP for NMPANS protection and the main reasons behind such an establishment and not for the other benefits derived from the park.

protest zeros from true zeros answers. Protest responses were considered those rejecting some feature of the hypothetical CV scenario[6].

When the dependent variable (WTP) is a dichotomous one (yes/no), a binary logistic regression model should be used (Hosmer and Lemeshow 2000; Halkos, 2006, 2011). It is necessary to formulate a function, which describes the relationship between a person's WTP (dependent variable) and a number of socioeconomic characteristics (independent variables) that influence this choice (Hanley *et al.* 1997) as well as the variables reflecting the responders' pro-environmental behavior and attitudes towards marine biodiversity economic value (Kotchen and Reiling 1999). For this reason, we try to explore the reasons for which respondents assign economic value to marine biodiversity.

The questionnaire also includes a set of questions on environmental respondent's attitudes and to their opinions about the NMPANS (utility, future etc.). Individuals' beliefs about their relationship to the natural world were measured with the help of New Ecological Paradigm (NEP). In the literature, the NEP scale is referred as the most widely used for measuring environmental attitude (Hawcroft and Milfont 2010). The NEP scale constructed by Dunlap *et al.* (2000) allows exploring people's environmental attitudes to a set of 15 Lickert scale items which are grouped on the basis of 5 factors (limits to growth, antianthropocentrism, the fragility of nature's balance, rejection of exceptionalism, and the possibility of an eco-crisis). The validity and reliability of NEP scale have been tested by many studies and has been proved as a valid tool to measure environmental values (Olli *et al.* 2001).

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[6] As protest responses were considered the answers which were given from respondents' who do not accept some aspects of the hypothetical scenario described in the survey (Ready *et al.* 1996) expressing their objections to survey (Boyle 2003) or trying to influence surveys results (Meyerhoff and Liebe 2006). Sometimes protest answers are due to lack of information about the good in question. True zeros are those who actually have a zero marginal utility of environmental quality and reflect individual preferences for a public good (Bowker 2002).

2.2 The proposed model and its specification

Here we adopt an ordinal logistic regression model. In such a specification the regression coefficients measure the association between the explanatory variables and the dependent variable entailing the parameter called the Odds Ratio (Halkos, 2006, 2011). These odds are defined as the ratio of the probability that respondents are willing to pay divided by the probability that they will not be willing to pay. That is

$$\text{Odds} (E \mid X_1, X_2, \ldots, X_n) = \frac{\Pr(E)}{1 - \Pr(E)} \quad (1)$$

Where $X_1, X_2, \ldots, X_k$ the k explanatory variables. In logistic regression specifications the likelihood that WTP will take place is maximized. That is the probability (Pr) of wiling to pay given the independent variables $X_1, X_2, \ldots, X_k$ is of the form

$$\Pr = \frac{1}{1 + e^{-(\beta_0 + \sum_{i=1}^{k} \beta_i X_{ij})}} \quad (2)$$

The logistic form of the proposed model is a transformation of the probability Pr(Y=1) defined as the natural log odds of the event E(Y=1). That is

$$\text{logit } [\Pr(Y=1)] = \log_e[\text{odds } (Y=1)] = \log_e \left[\frac{\Pr(Y=1)}{1 - \Pr(Y=1)} \right] \quad (3)$$

The first model for evaluating WTP includes various variables (like age, gender, marital status, ecological behaviour and people's opinion about marine park uses). After testing the statistical significance of the model, the final specification model is as follows:[7]

logit[Pr(Y=1)] = β_0 + β_1 BID + β_2 AGE + β_3 Education + β_4 Income + β_5 Income^2

+ β_6 NEP + β_7 KNOW_PARK + β_8 Ecol_Value_PARK + ε_i

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[7] Before estimating binary-choice models of yes/no responses all protest responses and observations with missing data were excluded. Other polynomial forms in income were also tested but were insignificant.

where *Y* is our dichotomous-choice dependent variable (the response to the WTP question as Yes=1 and No=0), *BID* is the specified amount (in €) respondents were asked to pay, *AGE* refers to the age of the respondent, *Education* is the education level of respondents (in years), *Income* is respondent's income either (in €), NEP is the corresponding scale, *KNOW_PARK* refers to the knowledge of NMPANS establishment and *ECOL_VALUE_PARK* refers to biocentric values of NMPANS (Table 3). ε_i is the disturbance term with the usual properties (Halkos 2006, 2011).

3. Empirical results and discussion

The main socioeconomic characteristics of the sample are presented in Table 1[8].

Table 1: Socioeconomic characteristics of the sample

|	Number of observations	Mean/Percent	Standard Deviation
Gender (%)	200	Woman (51%)	
Age (years)	200	39.72	13.25
Education level (years)	200	13.39	2.542
Marital Status (%)	200	Married (49%)	
Family members	200	2.72	1.789
Mean monthly personal income (€)	196	684.38	215.252
Mean monthly family income (€)	192	1423.47	684.38

3.1 Environmental value attitude

Many times, people's attitude will help to predict their behavior. We examined the correlation between attitudes and behavior for defining the strength and direction between them (Wright and Klÿn 1998). In this case, we use the improved version of

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[8] The sample is much closer to data of The Hellenic Statistical Authority (mean age: 43.3 years, gender: 51.4 women, family status: 55.2 married, education: 44.3% secondary school and mean (yearly) income 14.602 (www.elsta.gr).

NEP scale which was used to investigate people's ecological consciousness (Kotchen and Reiling 1999).

NEP mean score is the average of all individuals' scores in scale items. The mean score for the full NEP scale in this study was 3.29. According to Rideout et al. (2005), a NEP mean score about 3 shows a behavior between an anthropocentric and a pro-ecological worldview. The NEP scale items were designed to represent the five hypothesized facets of an ecological worldview (Table 2).

NEP total score was ranging from 41 to 67 with mean score 49.41 ($\pm$4.22). According to Rideout *et al.* (2005) a NEP score greater than 45 indicates a pro-ecological attitude. Figure 1 presents the distribution of NEP total scores.
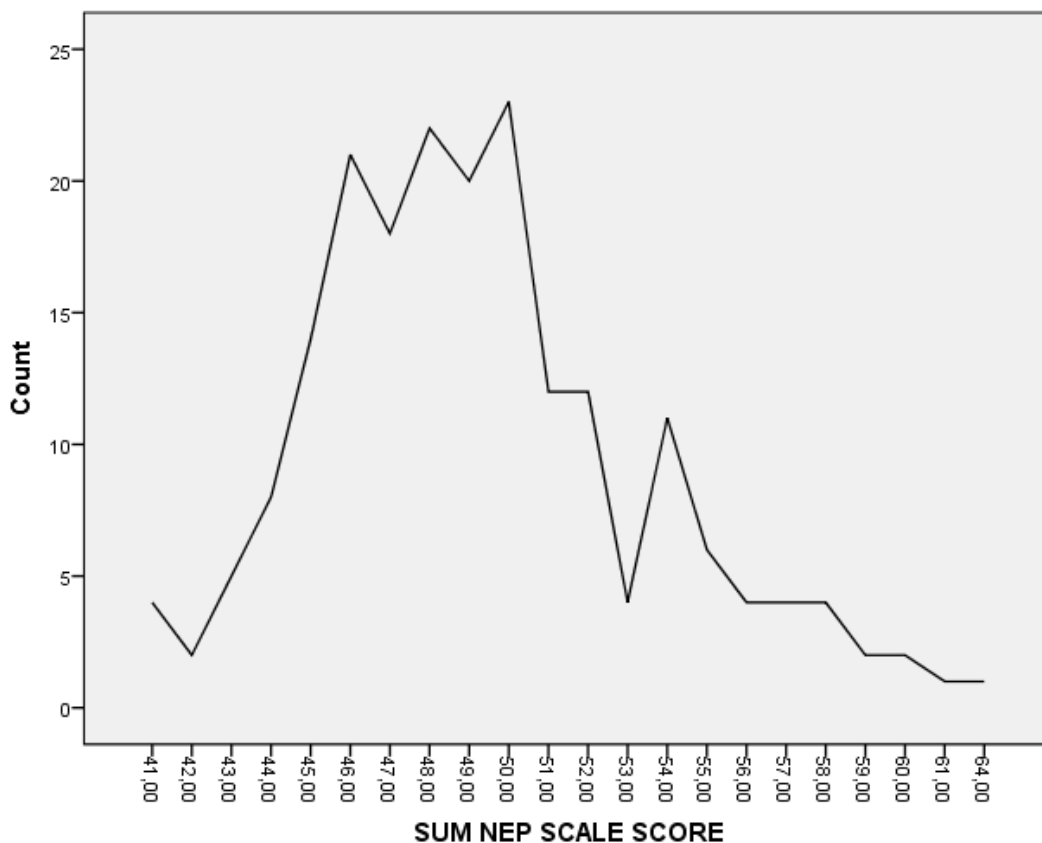
Figure 1: Distribution of total NEP scale scores

Cronbach's coefficient alpha (α) and corrected item-total correlation (r_{i-t}) allow testing the internal consistency of the NEP constructs (Dunlap *et al.* 2000; Clark et al., 2003). The value of the corrected item-total correlation (Table 2) ranges (absolute value) from 0.007 for NEP10 to a high of 0.405 for NEP4. In the literature, the accepted level of r_{i-t}, is higher of 0.3 (Dunlap et al. 2000). Cronbach's coefficient alpha is 0.692. According to previous studies a value around and greater than 0.7 can be taken as "acceptable" reliability (Clark *et al.* 2003; Dunlap *et al,* 2000)[9].

3.2 Attitudes toward NMPANS

As we have mentioned above a part of the questionnaire of the survey includes attitudinal questions (except for the NEP scale) for having information about respondents' environmental behaviour and attitudes against NMPANS. First participants to the survey were asked if they take part in activities for marine biodiversity protection. Only 11% of respondents have participated in activities to protect marine biodiversity while 4% are members of non-government organizations. The large majority (98%) of respondents' stated that they knew the general term of «protected area» while only 85.5% answered that knew the term "marine protected area".

Next, testing respondents' answers we provided them with three definitions (one true and two false) of the term "marine protected area" to choose the right one. Only 36% of them chose the correct definition. Then respondents were asked whether they know about the NMPANS and why this was established. Although 48% of the respondents replied that they knew that NMPANS is under special protection

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[9] Cronbach alpha value is in line with previous studies which referred as accepted value for Cronbach's alpha coefficient the 0.6 value (Kaiser 1974; Hair et al. 2006). Possible low values of Cronbach's Alpha raise the need of scale modification because it is probably not understood by the people of our country.

conditions, they were not able to name why this takes place[10]. Only 37% of respondents knew the operation of NMPANS management body. On the contrary, 97.5% of respondents believe that the area should continue under special protection.

Table 2: Percentage distributions, corrected item-total correlations for NEP Scale items

NEP scale	Scale items	Responses (%)					Mean	SD	r_{i-t}
		SD	D	N	A	SA			
Reality of limits to growth	We are approaching the limit of the number of people the earth can support	7.5	18.5	29.0	26.0	19.0	3.31	1.191	0.167
	The earth has plenty of natural resources if we just learn how to develop them	0.5	11.0	29.0	31.0	28.5	3.76	1.004	0.231
	The earth is like a spaceship with very limited room and resources	6.5	27.5	40,5	15	10.5	2.96	1.053	0.026
Antianthro-pocentrism	Humans have the right to modify the natural environment to suit their needs	13.0	23	35	25	4	2.84	1.068	-0.405
	Humans were meant to rule over the rest of nature	29.5	26.0	26.5	12,5	5.5	2.39	1.189	-0.149
	Plants and animals have as much right as humans to exist	2.5	5.0	23.0	29.0	40.5	4.00	1.032	-0.027
Fragility of Nature's balance	When humans interfere with nature it often produces disastrous consequences	0.5	2,5	16,5	44	36,5	4.14	0.812	0.353
	The balance of nature is strong enough to cope with the impacts of modern industrial nations	18.5	29.5	38.5	10.5	3.0	2.50	1.008	-0.252
	The balance of nature is very delicate and easily upset	1.0	12.5	30.5	29.5	26.5	3.68	1.031	0.272
Rejection of exceptionalism	Human ingenuity will insure that we do not make the earth unlivable	4.5	19.5	52.0	19.0	5.0	3.01	0.877	-0.014
	Despite our special abilities, humans are still subject to the laws of nature	0.5	5.0	28.0	38.5	27.5	4,12	3,448	0.007
	Humans will eventually learn enough about how nature works to be able to control it	4.5	31.5	39.5	15.0	9.5	2.93	1.013	0.280
Possibility of an ecocrisis	Humans are severely abusing the environment	-	1,5	24	44	30,5	4.04	0.779	0.214
	The so-called 'ecological crisis' facing human kind has been greatly exaggerated	26.5	27.5	34.0	8.0	4.0	2.35	1.079	-0.102
	If things continue on their present course, we will soon experience a major ecological catastrophe	0.5	15.0	37.5	24.5	22.5	3.53	1.017	0.320

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[10] This variable was coded as KNOW_PARK and was used in the logistic model specification together with the component of NMPANS utility that are given at Table 3. None of the others was proved to be statistically significant and were omitted from the regression analysis.

Next we explored respondents' familiarity with NMPANS and Mediterranean monk seal. According to people responses 21.8% of the sample have visited the NMPANS, mainly for recreational purposes (62.85) and much less (32.6%) because they wanted to protect the biodiversity which lives there. 46.5% of the respondents have seen seal closely and 84.8% felt delighted. On the other hand, 97.5% of respondents have no personal benefits from the marine park. However, when respondents were faced with the question concerning the utility of the NMPANS they ranked its ecological values as more important (Table 3). According to De Groot (1992) ecological values contains conservation and existence values.

Table 3: Opinions about the utility of NMPANS

	Number of responses (YES)	Percent %
Economic values (ECON_VALUE_PARK	65	32.5
Recreational values (RECR_VALUE_PARK	98	49.0
Biocentric values (ECOL_VALUE_PARK	125	62.5
Social values (SOC_VALUE_PARK	51	25.5
Cultural values (CULT_VALUE_PARK	48	24.0

Exploring people's opinions about the future of NMPANS respondents were asked about what they would like to happen to it in the next 5-10 years. As it can be seen from Table 4, there is a general interest in the future of the Marine Park and almost all respondents consider necessary some improvements, especially for better information management services.

Table 4: Opinions about the future of NMPANS

Opinions	Number of responses	Percent %
No change and keep things as they are today	6	3,0
Development of information about the NMPANS to attract more visitors	70	35,0
Sensitization of local community in order to understand the need to maintain the seal	55	27,5
Better organization of the management of the area	56	28,0
Development of environmental education programs	33	16,5
Indifference to what will happen	5	2,5

3.3 Willingness to pay

Since the aim of the percent study was mainly to investigate the determinants factors of people's WTP the CVM scenario was based on dichotomous choice question format. CVM studies are based on the dichotomous choice method it is easier for respondents to react to the questions (Flachairea and Hollardb 2007). According to Carson and Groves (2007) the single binary discrete choice question, with one of the alternatives is one of the most popular preference elicitation formats. With this format households could respond keeping some budget constraint in view (i.e., the upper bounds on bids could be controlled), and they minimize any incentive to strategically over-stated or understated WTP (Loomis 1988). Single formats are easier to implement and respondents need less information (Pinuccia and Strazzera 2000). On the contrary Carson and Groves (2007) point out that an appropriately expressed binary discrete choice question can represent considerable economic behaviour similar to those of a binding ballot proposition.

Before estimating any binary-choice model (yes/no responses), all protest responses and observations with missing values were excluded. All negative answers to WTP question are given in Table 5.

Table 5: Reasons for not paying in percentages (number of respondents in parentheses)

Reasons	Number of responses	%
We pay through taxation	18	20.9
Natural Environment protection is state responsibility	26	30.2
Environment is a public good	21	24.4
I refuse to put an economic value to biodiversity	7	8.1
Lack of information about the program	6	7
Lack of confidence for the success of the program	11	12.8
I cannot afford it	46	53.5

Dichotomous-choice models of CVM responses show how environmental attitude is one of the most significant determinants of yes/no responses. The coefficients of the model have the expected signs (Table 6). According to the extracted empirical results BID has a negative significant relation with people's response to CVM scenario; with the rest of the variables (Age, Education, Income, NEP scale, KNOW_PARK and ECOL_VALUE_PARK) having positive relation.

Relying on the estimated model we can calculate the odds ratios (OR), that is the probability that respondents will be willing to pay relative to their socio-economics characteristics as well as their attitudes towards the environment. For instance the odds ratio in the case of the education variable equals to approximately 1.24 implying that the odds of WTP is about 1.24 times higher for a more educated person. In these lines and by estimating the percentage change in the odds for every 1 unit in X_i holding the other X's fixed then $e^{\hat{\beta}_1}$ -1=-0.24. This indicates that the odds of education increase by 24 per cent holding all the rest fixed. Similarly, the coefficient of Age is $\hat{\beta}_2$=0.043, which implies that $e^{\hat{\beta}_2}$ =1.043748 and $e^{\hat{\beta}_2}$ -1=0.044. This shows that for each added year of age the odds of WTP increase by only 0.44 per cent holding constant all the rest. Similarly, looking at the BID and NEP scale we expect

the odds of WTP to decrease 0.06 and increase by 0.091 respectively; while looking at the variables knowledge of NMPANS establishment and *Ecological value of the park then* we expect the odds of WTP to increase by 154 and 126 percent respectively, all the other remaining constant in each case.

The Wald Statistics (Chi-square) of the β estimates are provided in Table 6 with the associated significance levels of the individual statistical tests (i.e. the P-values) presented in the column Sig (Significance) corresponding to Pr>Chi-square. Note that the constant term and the variables BID, Age, income and income squared are significant in all statistical levels. The variables Education, knowledge of NMPANS establishment and biocentric values of NMPANS are statistically significant at the 0.05 while variable NEP is statistically significant at the 0.1 significance level. Finally, in our model specification income has a turning point at a level of around €3358 (a quite high monthly family income) where respondents' WTP changes leading to an inverted U-shaped behaviour.

The overall significance of the model is given by $X^2=59.11$ with a significance level of P=0.000 and 9 degrees of freedom. Relying on this value we reject H_0 (H_0: $\beta_0=\beta_1=\beta_2=\beta_3=\beta_4=\beta_5=\beta_6=\beta_7=\beta_8=\beta_9=0$) concluding that at least one of the β coefficients is statistically significant ($X^2_{0.05,9}=16.919$). The Hosmer and Lemeshow value equals to 13.51 (with significance equal to 0.960) indicating a good model fit in the correspondence of the actual and predicted values of the dependent variable.

The mean WTP was calculated by assuming no negative values for protection of monk seal and using the formula suggested by Hanemann (1989):

$$E(WTP) = \left(\frac{1}{|\beta_1|}\right) * ln\left(1 + exp^{\beta_0}\right)$$

The mean WTP was about equal to €21.85 per person

Table 6: Econometric results of the proposed logistic model specification

Regressors	Coefficients	Wald Statistic (Chi-sq)	Sig.	$e^{\beta i}$	95% CI for EXP(B)	
					Lower	Upper
Constant	-11.0099	-3.66	0.000	0.0000165	4.52e-08	0.0060475
BID	-0.0624	-4.45	0.000	0.9395	-0.08991	-0.034934
Age	-0.049	2.76	0.006	1.04375	1.012445	1.07602
Education	0.216002	2.58	0.010	1.24113	1.05349	1.462182
Income	0.00325	3.58	0.000	1.003255	1.00147	1,005044
Income^2	-.000000484	-2.70	0.007			
NEP	0.0872182	1,.84	0.066	1.091135	0.9941745	1.197551
Know_Park	0.931	2,51	0.012	2.5371	1.225278	4.838761
Ecol_Value_Park	0.814779	2.10	0.036	2.258676	1.054323	4.838761
Turning Point	3357.44					
McFadden R^2	0.23					
LR statistic	59.11		0.000			
Hosmer-Lemeshow	13.507		0.960			

.   Figure 2 represents the sensitivity of mean WTP to different levels of environmental attitudes calculating the expected values of WTP at each NEP score increment. As expected, mean WTP increases with increases in pro-environmental attitudes.
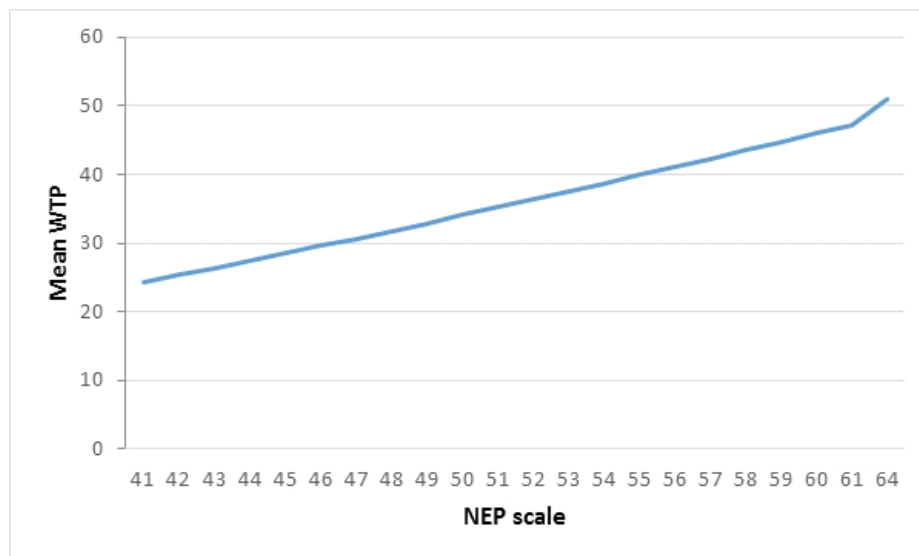
Figure 2: Environmental attitudes and predicted mean WTP

According to Kotchen and Reiling (2000) practice, we categorize all respondents its NEP score as having weaker (NEP scores ≤45), moderate (NEP between 46 and 59), or stronger (NEP scores ≥59), pro-environmental attitude. Rideout et al. (2005) a NEP point out that score above of 45 indicates a pro-ecological attitude. Above classification was used to explore the relationship between environmental attitude and respondents responses to CV survey.

We try to investigate how environmental attitude influences respondent's correspondence to CVM scenario and protest answers. People's score of NEP scale was significantly related to their correspondence to CV scenarios (H=5.688 df=2, P<0.05). This is harmony with other studies which have shown that people's environmental attitude influence their responses to CVM dichotomous-choice models (Kotchen and Reiling 2000). According to the results of the chi-square test, environmental attitude is significantly related to protest answers. Respondents with strong environmental attitude are less willing to pay because they are insecure for the success of the program (χ^2=12.199, df=2 and p<0.05).

As we have mentioned above respondents had to decide for paying for NMPANS protection according to the importance that has Mediterranean monk seal for theirs. For this reason and for understanding better the motives behind their decision we asked them to characterize (using a five Likert scale) six motives for holding economic to monk seal (Table 7). Every motive represents a type of the total economic value of Mediterranean monk seal (use and non-use values).

According to the results, all motives were "not important" or "slightly important". First, we investigate how NEP score affects on their answers to the question. Respondents' environmental attitude (as measured by NEP scale) was significantly related to the motive: "I may want to see monk seal in the future"

($\chi^2=25.365$, df=8 and $p<0.05$) (option value of monk seal). People with strong environmental attitudes tend to characterize as 'very important' the above motive. On the contrary, for respondents with moderate attitudes the ecological substance of Mediterranean monk seal is not important ($\chi^2=35.742$, df=8 and $p<0.05$).

Table 7: Means and percentages of the importance for different motivations for protecting monk seal

Motivating reasons	Mean	Attitude strength	VI	I	MI	SI	NI	% of Total
I may want to see monk seal in the future	1.58	Weak	0.0%	0.0%	1.0%	3.9%	7.8%	12.7%
		Moderate	0.0%	2.0%	4.9%	23.5%	52.9%	83.3%
		Strong	1.0%	0.0%	0.0%	1.0%	2.0%	3.9%
		% of Total	1.0%	2.0%	5.9%	28.4%	62.7%	
I enjoy knowing monk seal exist even if no one ever sees one	1.37	Weak		0.0%	2.0%	1.0%	10.9%	13.9%
		Moderate		2.0%	5.0%	15.8%	60.4%	83.2%
		Strong		0.0%	0.0%	1.0%	2.0%	3.0%
		% of Total		2.0%	6.9%	17.8%	73.3%	
I enjoy knowing future generations will be able to enjoy monk seal	1.26	Weak			0.0%	1.0%	12.0%	13.0%
		Moderate			5.0%	15.0%	64.0%	84.0%
		Strong			0.0%	0.0%	3.0%	3.0%
		% of Total			5.0%	16.0%	79.0%	
Because monk seal has significant ecological importance	1.48	Weak	0.0%	0.0%	2.0%	6.9%	4.0%	12.9%
		Moderate	1.0%	0.0%	5.0%	17.8%	59.4%	83.2%
		Strong	0.0%	1.0%	1.0%	1.0%	1.0%	4.0%
		% of Total	1.0%	1.0%	7.9%	25.7%	64.4%	
All endangered species have a right to exist	1.09	Weak			1.1%	1.1%	10.5%	12.6%
		Moderate			0.0%	6.3%	77,9%	84.2%
		Strong			0.0%	0.0%	3,2%	3.2%
		% of Total			1.1%	7.4%	91.6%	
Because monk seal may (in future) have extra value that can be gained from better information about its uses	1.13	Weak				10.8%	0.0%	10.8%
		Moderate				72.3%	12.0%	84.3%
		Strong				3.6%	1.2%	4.8%
		% of Total				86.7%	13.3%	

VI=Very Important, I=Important, MI=Moderately Important, SI= Slightly Important and NI=Not important

4. Discussion

In this paper except for the estimate of the monetary WTP values for NMPANS (one of most important marine protected area), we attempted to explain the sensitivity of a CV study to people's environmental attitude, awareness or knowledge

about natural resources in combination with their demographic characteristics. For these reasons for the present study, we used a variety of variables to explain people's decision on the NMPANS protection. Variables that used were significant to other studies (Kontogianni et al. 2003; Togridou et al. 2006; Langford et al. 1998). According to results, respondents pay for marine park protection even if you do not expect personal benefit. This decision underlines the existent values of the marine park. On the other hand, though people recognize of environmental benefits arising from the NMPANS almost nobody participates in actions to protect it.

Then a CVM study was applied for exploring people's motives for their decision to pay for marine park conservation. The results of CV show that the 59% of respondents were willing to pay an amount for NMPANS protection. According to the obtained empirical results, all the independent variables selected to explain the WTP have the expected sign. Bid amount (BID) was negative and significant, confirming that respondents are sensitive to the price they faced for paying. Age has negative significant relation to response to CVM scenario this is in line with other studies (Carson et al. 1998; Martìn-Lopez et al. 2007; Matsiori et al. 2013). For many researchers, younger people are more interested in protecting natural environment either why are more sensitive (Whitehead 1991) or why older people have higher expenditure on health, economic dependence after their retirements (Halkos and Matsiori 2016). According to Whitehead (1991), older people may are not interesting to pay for the environment because sometimes they feel unable to live and to enjoy the long-term benefits of its conservation.

The education level plays an important role to respondents decision pay for the NMPANS protection. The positive importance of education to people's WTP is in accordance with many studies (Stithou and Scarpa 2012; Bhandari and Heshmati,

2010; Wang and Jia 2012). According to Langford et al. (1998) people with higher education level understand easier the needs of management and protection programs of the natural environment. This people's category is more awareness about natural resources, which would result in a higher WTP (Brennan et al. 2007).

Income also had a positive influence, people with higher incomes were more likely to say "yes" to CV scenario as in many others (Kotchen and Reiling 2000; Togridou et al. 2006; Reynisdottir et al. 2008; Bhandari and Heshmati 2010; Halkos and Matsiori 2017). However, Jacobsen and Hanley (2009) proved that income level is not statistically significant in all cases. Schläpfer (2006), also using a meta-analysis, explores the effect of income in a sample of 64 CV only in 30 (of 83) valuation scenarios was present with significant effects.

According to the results, people who know NMPANS are more likely to pay for its protection a result consistent with others studies (LaRiviere et al. 2014). According to López-Mosquera et al. (2014) knowledge and attitudes toward the environment, seem to influence people's willingness to pay. Martìn-Lopez *et al.* (2007) argue that the motives behind people's WTP for biodiversity conservation depend on the degree to which individuals: i) are familiar with the specific species and ii) understand the importance of the species in the ecosystem.

The "ECOL_VALUE_PARK" variable which refers to existence and conservation values of NMPANS has positive influence to people WTP. Kyle *et al.*, (2002) value point out that values orientations may also influence people WTP for environment protection and Trainor and Norgaard (1999) underline that spiritual and intrinsic values of wilderness influence expressed WTP. According to Subade (2005), the main motives of people WTP were bequest, existence, altruistic values. Kontogianni *et al.* (2003) and Kontogianni *et al.* (2012) refer use and nonuse values

as determinant factors of people's WTP for endangered species. Maharana *et al.* (2000) claim that nonuse values could influence WTP more than use values. On the contrary, Kontogianni *et al.* (2003) have relate high WTP with bequest values. Jacobsen and Hanley (2009) argue that non-use values play a major role in biodiversity conservation. Many conservation biologists believe the best ethical basis of conserving natural entities is their claimed intrinsic value (Justus et al 2009). According to Kontogianni et al. (2012) existence values do not related to specific species but are solid preferences associated with people beliefs. For many researchers it is important to understand and measure people's value orientations because influence their decision to support and take part in management programs (Needham 2010).

According to our results, environmental attitude (as measured with the help of NEP scale) has positive statistical retaliation with people WTP for NMPANS protection. The empirical results of the present study confirm findings of other researchers (Kotchen and Reiling 2000; Carson et al. 2001; Lopez and Cuervo - Arango 2008). Moreover, our results are in line with Kotchen and Reiling (2000) who point out that environmental attitude is significant motives for conservation values especially when the surveys concern endangered species. Also, the results agree with those of Cooper et al. (2004) according to which this relationship exists only in cases of public goods (such as conservation of endangered species) which relating with the existence or intrinsic values.

Finally, the results give answers about the way people evaluate a marine protected area which is habitat for the Mediterranean monk seal. Respondents were asked to give money for NMPANS protection taking account only how the Mediterranean Monk seal is important to them. People were willing to pay for

protecting NMPANS; however, people were willing to pay about 22€. From a policy and management aspect, this significant amount of WTP makes possible an internal funding and sustainable management of the NMPANS. This is more crucial when we think the uncertainty conservation of funding resources (Stithou 2009). The calculated WTP s very close to the other studies in Greece related to Mediterranean monk seal (Langford et al.2001; Kaval et al. 2009; Stithou 2009; Matsiori et al. 2013) and about double form WTP calculate by Langford et al. (1998), Stithou and Scarpa (2012) and Matsiori et al. (2013). The differences between WTP are due to the formulation of CV scenario or to survey which asked respondents for their economic value of two species in the same questionnaire.

5. Conclusions

The present paper aimed to estimate the WTP by local communities for the improvement in the protection of NMPANS of Greece. A sample of residence faced with a CV scenario which includes a protecting proposal for the NMPANS especially because is habitat for a significant population of Mediterranean Monk seal. The results suggest that WTP estimations based both on people social economic characteristics and non-economic motives. According to responses, the highest intention to pay have the respondents with strong environmental attitude which measured with the help of NEP scale. The results confirm the suggestion for using attitudinal questions in CV studies in particular when we value public goods. These data are determinant variables of people's responses. While, NEP scale does not influence the specific amount which people accept to pay.

In addition, a number of knowledge questions were used trying to explore people's opinion for Mediterranean Monk Seal because it is necessary to put in evidence the main factors that conduct respondents to pay for the park protection.

Also, a number of social and economic factors influencing the environmental attitude of individuals were examined. It appears that respondents with different behavior, characteristics, and environmental attitude declare different levels of WTP for the NMPANS protection. Our results confirm other studies which show that the decision financial support for biodiversity conservation influenced by the knowledge about species. This information may help the design of effective environmental policies taking into consideration the benefits and costs of the proposed actions and their alternatives. The lack of environmental ethics and knowledge of people about biodiversity have determined the influence on the success of environmental protection programs and public environmental education policies must aim in this direction.

Also, the study explains why people place values on NMPANS according to monk seal importance for the participants to study. The results can help the management body of NMPANS to design effective management programs according to people's orientations. The results confirm the option that knowledge and familiarity can influence the decision for its economic valuation. If the objective is to improve people's opinion for NMPANS and their participation in programs for its protection, educational programs have to be implemented in order to diffuse information about the utility of NMPANS and to make stakeholders more environmental awareness.

Finally, our results underline the need of various factors (anthropomorphic and anthropocentric) in conjunction with WTP data for understanding how people take their decisions for biodiversity conservation.

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