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Extending the scope of voluntary marine park user fees to terrestrial conservation across coupled land-sea ecosystem boundaries

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Abstract

This research examines the potential for multi-use marine park areas to be financed by voluntary fees that fund coastal conservation issues. Many stressors faced by marine and coastal ecosystems are generated on land, such as pollution and sedimentation. Threats across coupled land-sea boundaries are pervasive in most coastal ecosystems, making their consideration essential for successful management. Marine parks are one principal strategy for protecting marine and coastal ecosystems, especially where coral reefs are present, but the primary mission of conservation and protection is often hampered by insufficient funds. Healthy coral reefs attract tourists from around the world that generate substantial economic revenue and failing to account for management across land-sea boundaries threatens reef protection, and, ultimately, human livelihoods dependent on reefs. The majority of studies examining user fees for financing marine conservation focus only on divers' willingness to pay (WTP) for marine conditions. However, relatively little is known about the willingness to pay for cross-boundary conservation activities from *all* recreational users of a marine park area (e.g. beachgoers, surfers, boaters, snorkelers) who benefit from and contribute to the quality of the ecosystem. We employ experimental methods to explore the optimal asking mechanisms that influence real voluntary payments for conservation from all types of users through four treatment conditions: control (write-in amount), default opt-in, default opt-out, and reference levels. To the authors' knowledge this is the first record of such combination of treatments being used in soliciting contributions for environmental conservation. The field experiment conducted with tourists on the island of Gili Trawangan, Indonesia revealed a significantly higher propensity to donate in all conditions compared to the control. The default opt-out condition represents the highest donation propensity at 68%. The average WTP, determined by the control (write-in) treatment and supported by the results of the reference level treatment, was 20,667IDR ($1.55USD) and 19,750IDR ($1.48USD) respectively. The results suggest that the optimal method of requesting a voluntary eco-fee is to set a default fee at the average WTP and require users to opt-out of the eco-fee if they do not wish to donate. Implementing an eco-fee in such a way represents a significant source of funding for both terrestrial and marine conservation, and illustrates the potential for user fees to be applied across ecosystem boundaries. We argue that expanding eco-fees to all visitors within a marine park area is a vital funding mechanism and an important avenue for future investigation in many connected systems.

Keywords

User fees, natural field experiment, funding, coupled ecosystems, voluntary contribution, opt-out, MPA management, conservation, coral reef, land-sea interaction

Content

I. Introduction

Coastal and near shore marine areas are invaluable to humankind. The coastal zone is generally accepted as the land-sea interface extending from the inland margin of the coastal plain to the continental slope waters offshore. This region, although it represents less than 10% of the earth's surface, is home to over 40% of the world's human population (CIESIN 2013), is as biologically diverse and productive as any system on Earth, and supports viable economic activities from fisheries to mining to tourism (Adger et al. 2005, Kummu et al. 2016, Moberg and Folke 1999). Despite global recognition of the importance of coastal ecosystems, they are often overexploited and misused (Cloern et al. 2016, Jackson et al. 2001). The unsustainable use and degradation of marine and coastal ecosystems threatens human development and well-being. These threats are driven by proximate local to regional human activity such as overfishing, pollution, and development. Simultaneously, distal anthropogenic stressors from climate change are threatening coastal systems with rising ocean levels, increased ocean temperatures, ocean acidification, and increased severe weather events (Cloern et al. 2016). Holistic and appropriately funded management of coastal systems that can account for the variety of human activities occurring on land and at sea is a key determinant in the resilience of an area to withstand stress and recover from threats (Dutra et al. 2015).

1.1 Management across land-sea ecosystem boundaries

Threats across coupled boundaries are pervasive in most coastal ecosystems, making their consideration essential for successful management. There has been a push for more integrated conservation management across land-sea ecosystem boundaries in the last decade; however, there are few examples of land-sea conservation projects in practice (Alvarez-Romero et al. 2011, Pittman and Armitage 2016, Reuter, Juhn, and Grantham 2016). Tallis, Ferdana, and Gray (2008) concede that if conservation planning ignores cross-system interactions it may (unintentionally) leave populations and ecosystems at high risk from external threats. Effective management can generate significant gains in environmental conservation, however, lack of funding to enforce regulations is a common issue shared across many protected areas throughout the world (Lundquist and Granek 2005, Rife et al. 2013). Additionally, the link between terrestrial-to-marine conservation and regulation is often non-existent (weak at best), even though many stressors faced by marine ecosystems are generated on land, such as sedimentation from land erosion, and pollution from waste run-off (Álvarez-Romero et al. 2013, Partelow, von Wehrden, and Horn 2015, Reuter, Juhn, and Grantham 2016, Roberts et al. 2002).

Generally speaking, the most vulnerable coastal systems tend to be in densely populated and poor countries in the tropics. According to the IUCN (2017), three quarters of the world's population living in vulnerable coastal zones call Asia home. Many of these people live on coastlines of the Coral Triangle, depending on healthy coastal ecosystems for their survival (for map see Figure 1). Coastal ecosystems within the Coral Triangle such as coral reefs, mangroves and seagrass beds provide food, building materials, coastal protection, industries such as fishing and tourism, and many other benefits for millions of people (Hoegh-Guldberg et al. 2009). However, tropical coastal research does not emphasize its research focus on all ecosystems and human impacts equally, with considerable gaps on social-ecological interactions and land-sea connectivity (Glaser et al. 2012, Partelow et al. 2017).

Indonesia, situated at the center of the Coral Triangle, represents some of the highest levels of marine biodiversity and is considered a strategic area for marine conservation efforts by international organizations such as The Nature Conservancy, Conservation International, and the World Wildlife Fund. Gross domestic product (GDP) from coastal- and marine-based tourism in Indonesia is increasing each year, suggesting that the economic incentives for conservation are becoming progressively more important for the national and local economy. Tourism helps to diversify local economies away from exploitation of natural resources. Ironically, the characteristics of pristine nature that attract tourists are also the most impacted by the unchecked growth in development (Arkema et al. 2015, Hampton and Jeyacheya 2015). The present state of coastal ecosystems in Indonesia and the rest of the Coral Triangle is bleak and immediate action is necessary to halt further degradation (Treml et al. 2015). Mobilizing adequate resources and capacity is essential for successful management plans that conserve the ecosystem (Sterling et al. 2017, Whitney et al. 2017).

Marine Protected Areas (MPAs) are the dominant management strategy employed for marine conservation; yet, MPAs rarely incorporate terrestrial-based regulations that have a direct impact on the marine environment (Adams et al. 2014, Gilby et al. 2016, Thur 2010). Additionally, many of these parks exist mostly as 'paper parks'[1] due to a lack of proper planning (Halpern 2014) and funding (Gelcich et al. 2013, Terk and Knowlton 2010). Some exceptions exist, including Komodo National Park where both terrestrial and marine resources are a major attraction for visitors, but generally terrestrial conservation issues are left out of MPA planning. Establishing MPAs for coral reef ecosystems brings additional challenges as the majority of the world's reefs are situated off coasts that are often characterized by high growth rates, intense development for tourism, weak state governance institutions, and a lack of sufficient funding for conservation.

1.2 Financing management through user fees

The management of MPAs can be financed through a combination of instruments, including government support, donor funding, and user fees. Due to insufficient and uncertain long-term funding for marine conservation, self-financing mechanisms that augment other types of funding are popular in protected areas (Gelcich et al. 2013, Nelson, Schlüter, and Vance 2017b). For example, environmental user fees are widespread across terrestrial National Parks to fund conservation (Bernard, de Groot, and Campos 2009, Dharmaratne, Sang, and Walling 2000). Marine Protected Areas that are frequented by divers, wildlife enthusiasts, travelers, and recreational anglers have also generated considerable income through user fees (Edwards 2009). However, marine park user fees are often imposed on one type of user (i.e. divers, whale watchers, etc.) and rarely incorporate a universal fee across multiple use types, including passive use (i.e. people staying in nearby hotels, golfers, beach-goers, and others that may not directly enter the marine space). The terrestrial coastal area of marine parks cannot be de-coupled from the sea area of the marine park. Expanding fees to all users is particularly important on many small island destinations as they transition from mostly marine-focused tourism to multiple-use tourism (Partelow and Nelson forthcoming).

Understanding how users value ecosystem services and benefit from ecosystem quality enables fees to reflect user preferences (Arkema et al. 2015). Few studies, however, have attempted to measure user preferences across ecosystem boundaries (Dharmaratne, Sang, and Walling 2000, Gelcich et al. 2013). One exception is a recent publication by Roberts, Hanley, and Cresswell (2017) which focuses on understanding divers' willingness to pay a user fee for terrestrial biodiversity conservation in

[1] The term "paper park" is defined as, "a legally established protected area where experts believe current protection activities are insufficient to halt degradation." (Dudley and Stolton 1999)

connection to an MPA and linked marine conservation. However, focusing solely on diver willingness to pay ignores the large and important population that frequent coastal travel destinations and impact the ecosystem considerably – all the other users that travel to the destination but may not dive. An area that hasn't received much attention in the literature is the scope for soliciting marine park user fees from *all* visitors regardless of their use-type based on the premise that all visitors to the area use and impact the coupled land-sea ecosystem boundaries and should therefore contribute to its maintenance. The concept of a designated park area imposing fees on all visitors regardless of use-type is not unique and is used extensively for terrestrial areas, such is the national park model. However, this is much less common in marine park areas and is especially important to consider as an area develops and transitions from mostly marine-focused tourism that can be sustained by single-use fees (i.e. diver fees) to multiple-use tourism as non-divers far outnumber divers (Partelow and Nelson forthcoming).

Contingent valuation studies are widespread and well accepted in determining the willingness to pay for park fees (Asafu-Adjaye and Tapsuwan 2008, Mathieu, Langford, and Kenyon 2003, Peters and Hawkins 2009, Togridou, Hovardas, and Pantis 2006). However, these studies rarely focus on the method of asking for payment which can have a strong influence on effectiveness of payment systems. This is especially important when the user fees are voluntary payments (Dharmaratne, Sang, and Walling 2000, Rivera-Planter and Muñoz-Piña 2005, Stithou and Scarpa 2012). Many protected areas function without formal governance wherein community-based institutions lead conservation efforts and require funding to do so (Alexander, Andrachuk, and Armitage 2016, Maliao, Pomeroy, and Turingan 2009). This funding can come from voluntary donations for use of protected areas (Alpizar, Carlsson, and Johansson-Stenman 2008). Understanding human behavior in relation to voluntary fund raising or payments for environmental use is important to determine the most effective way to request a donation and how much to ask for (i.e. reference amounts) which affects total contribution amounts. There is a need for more studies that provide empirical evidence of voluntary contributions for environmental conservation, and from the broader social sciences to better understand human dimensions of marine and coastal management (Bennett et al. 2017, Chan et al. 2007). Behavioral field experiments provide a powerful methodological tool to vary the donation conditions using controlled methods with actual users and real payments to observe the variation in and degree of participation in fundraising schemes.

The purpose of this research is to gather evidence for the most effective method to solicit voluntary contributions from tourists to support land-sea conservation in MPAs which struggle to finance community-based efforts. This study provides practical results for how to increase conservation financing, with direct implications at a local-level and at a broadscale. Using a case study in Indonesia, we provide a novel examination of voluntary land-sea conservation financing through engaging all types of users visiting a small tropical island. A natural field experiment reveals price preferences under four treatments based on real contributions to a conservation organization. The treatments have been designed based on the literature that empirically investigates methods for encouraging pro-social behavior, such as charitable donations and organ donations (Bekkers and Wiepking 2011, Johnson and Goldstein 2003, Johnson, Bellman, and Lohse 2002, Johnson and Goldstein 2004, Briers, Pandelaere, and Warlop 2007). To the authors' knowledge this is the first record of such combination of treatments used in soliciting contributions for environmental conservation. Each participant was exposed to one of the four treatments displayed in Table 1. The results provide evidence for an acceptable donation amount to inform the implementation of a tourist eco-fee and the best method to introduce this fee to encourage the highest amount of total contributions. Although the amounts

are case specific, the treatments are generalizable given the variation indicating differences in solicitation success.

Table 1 Field experiment treatment conditions and descriptions

Treatment	Description
Control	Open-ended write-in amount
Reference price levels	Choice of four suggested contribution amounts or write-in
Default opt-in	Check box to contribute set amount
Default opt-out	Check box NOT to contribute set amount

1.3 Fundraising Literature Review

When faced with a request for donation, typically two decisions are made. A person must decide whether to donate at all, followed by the decision about the amount to be donated. The effectiveness of any campaign to solicit voluntary contributions depends upon the ratio of those giving as well as the magnitude of the donations (De Bruyn and Prokopec 2013). Many mechanisms can influence the ratio and magnitude of donations (Bekkers and Wiepking 2011). We use the assimilation–contrast theory (Sherif, Taub, and Hovland 1958) and heuristic decision making (Gigerenzer 2008) to establish predictions about the effects of the treatment conditions. The assimilation-contrast theory states that individuals evaluate a new stimulus using a reference point that is based on other experiences. An amount that is close to their reference point is then accepted, whereas an amount that is far from their reference point is rejected. Thus, a donor decides to donate depending on whether she finds the suggested amounts acceptable or not (De Bruyn and Prokopec 2013). Similarly, heuristic decision making employs the concept that less can lead to more and, in this case, less thinking about giving leads to more giving. Providing a set default donation amount removes the need to decide how much to give and situating the amount close to a widely accepted reference point will lead to more people accepting the request (Gigerenzer 2008).

Open-ended condition (Control)

The control condition is an open-ended approach which requires the participant to write-in an amount they will pay for the eco-fee. Cooperating participants then actually donate their own money as an eco-fee. Although the open-ended write-in method has been criticized in hypothetical willingness to pay studies (Donaldson, Thomas, and Torgerson 1997, Arrow et al. 1993), it is a widely used and accepted method in understanding valuation and it has been shown to be 'valid' in terms of the relationship of WTP to prior preferences and to factors indicative of ability to pay, such as income (Bateman, Willis, and Garrod 1994, Loomis 1990). Additionally, open-ended valuation method surveys combined with real contributions reduce strategic bias overcoming many of the cognitive limitation problems noted in the literature, including anchoring bias (Prince et al. 1992).

Reference price levels

A standard practice in donation requests is to present a set of suggested amounts, sometimes referred to as 'anchors', 'reference levels', or 'close-ended' (Briers, Pandelaere, and Warlop 2007, Smith and Berger 1995). Anchoring is a well-known cognitive bias that affects decision making based on a heavy reliance on the information offered (Van Exel et al. 2006). Affecting donation amounts through the use of different reference levels is an extremely robust phenomenon that appears in many

contexts (De Bruyn and Prokopec 2013). Tversky and Kahneman (1975) suggest that people are influenced by the presentation of specific values, or reference levels, to help make decision judgments. They noted that people make heuristic judgments relative to specific reference points to reduce decision processing and mental effort. Brockner et al. (1984) found that when a specific dollar amount was mentioned in telephone and face-to-face fundraising, subjects were more likely to comply and make a pledge than when no amount was mentioned. Alpízar and Martinsson (2010) found that exposing potential National Park donors to donation amounts of other visitors significantly increased the number of donors, but did not increase the average individual gift compared to the control. Total average donations increased due to the increase in share of donors. This is consistent with the conceptualization that suggested reference points serve as decision heuristic anchors that allow donors to quickly infer a range of reasonable gift amounts. Hence we propose that the presence of reference levels will yield a greater ratio of donors compared to the control (H_1) but there will be no difference in the average amounts donated between the reference and control treatments (H_2) (see table 2).

Default amount and opting-in versus opting-out

Default amounts act as single reference points, compared to the previous option where participants receive a variety of recommended amounts. In direct marketing fundraising, it is generally accepted (Brockner et al. 1984) that asking for a specific amount results in increased donation ratios compared to not mentioning an amount.

If transaction costs are small, standard economic theory would suggest that defaults should have little impact on economic outcomes. People with well-defined preferences will opt-out of any default that does not maximize their utility, regardless of the nature of the default. In practice, however, defaults can have quite sizeable effects on economic outcomes. For example, switching from a non-participation default (opt-in) to a participation default (opt-out) can increase retirement saving participation rates by more than 50 percentage points (Choi et al. 2003, Madrian and Shea 2001). This property of default options has been documented in a wide range of other settings: organ donation decisions (Abadie and Gay 2006, Johnson and Goldstein 2004), public goods (Altmann and Falk 2009), car insurance plan choices (Johnson et al. 1993), car option purchases (Park, Jun, and MacInnis 2000), and consent to receive e-mail marketing (Johnson, Bellman, and Lohse 2002).

Hence we propose that the ratio of donors will be higher in the opt-in default treatment compared to the control (H_3). And the opt-out default treatment will generate a higher ratio of donors than the opt-in default (H_4) (see table 2).

Table 2 Hypotheses

H_1	The proportion of donors will be higher with the presence of reference levels compared to the control.
H_2	There will be no difference between the average amount donated in the reference level and control treatments.
H_3	The proportion of donors will be higher in the opt-in default treatment compared to the control.
H_4	The proportion of donors will be higher in the opt-out default treatment compared to the opt-in default treatment.

II. Materials and methods

2.1 Study location

In choosing a location to study the willingness to pay a user fee for coupled land-sea ecosystem conservation, we selected a site with high marine biodiversity and multiple-use criteria in a limited area with clear boundaries and threats (Groves et al. 2000, Margules and Pressey 2000, Tallis, Ferdana, and Gray 2008). The Gili Matra Marine Park is comprised of three islands lying just off the Northwest coast of Lombok, Indonesia with Bali to the west (see Figure 1). The islands are situated in the 'Indonesian Throughflow' (see inset from Figure 1). This is an ocean current pathway that connects the Pacific to the Indian Ocean and hosts an immense amount of biodiversity.

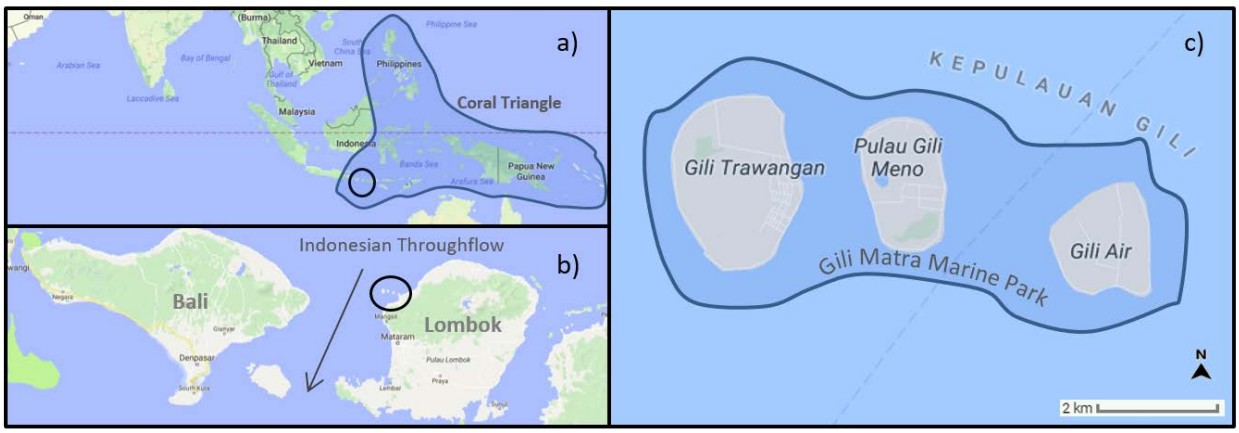

Figure 1 (a) Map of Indonesia with Coral Triangle highlighted in blue and Bali and Lombok area circled in black, (b) Gili Islands circled and Indonesian Throughflow marked, (c) map of Gili Islands and Gili Matra Marine Park highlighted. Source: Google maps 2017.

The study took place on Gili Trawangan, the largest and most populated of the three Gili Islands (Figure 1). The island receives heavy tourist traffic, up to 2000 new visitors per day and approximately one million tourists visit annually. Although the island is only six square kilometers, it has more than 750 businesses and is the most the most developed of the three islands. The Gili Islands have long been a backpacker destination, and over the last decade the islands have grown into a major destination for tourists of all budgets and interests. Gili Trawangan is the second most frequented destination in South East Asia for SCUBA diving certification (second only to Koh Tao in Thailand). The increase in tourism is resulting in rapid development, challenging the infrastructure on the island to keep up with the growth (Partelow and Nelson forthcoming). All food, drinks, consumable goods, and amenities must be imported and the daily waste generated by the thousands of tourists, restaurants, hotels, dive shops, and other businesses remains on the island and ends up in the landfill. The landfill is currently far over capacity with no current plans by the local government to address waste reduction, develop collection or recycling infrastructure or to finance its management. Solid waste pollution and air pollution from burning waste are a major environmental issue for the island and surrounding marine habitat, creating an impending crisis.

The marine park does not currently have a government sanctioned fee for entry. At present, an eco-fee is imposed only on divers as a collective agreement between dive shops. Each diver pays a voluntary one-time fee of 50,000IDR (approximately $3.75USD). The fees support the community-based conservation organization, Gili Eco Trust. The Gili Eco Trust is a non-governmental organization (NGO) that was created in 2000 by a group of local dive shops to protect and restore the coral reefs from destructive fishing. At the time it was founded, dynamite and cyanide fishing proliferated and the funds were used to pay for local patrols and reef restoration. Over the years, destructive fishing

practices decreased as tourism rapidly increased and environmental threats shifted to terrestrial generated issues such as erosion from coastal development and solid waste pollution.

Although only divers are currently paying for the eco-fee, which represent about 15% of all tourists on the island, all visitors contribute to the impact on the ecosystem and benefit from its quality. Recognizing the waste problem, the Gili Eco Trust expanded their services to land-based conservation through provision of the only sustainable waste management services available on the island. They established a 'rubbish bank' which provides payment for selected recyclable waste, thereby creating incentives for properly disposing waste while reducing the environmental impact of waste. Additional services they provide include: training to local businesses on sorting garbage for recycling; distributing recycle bins; collecting recyclables and organic compost; transporting recyclable material off the island; sourcing sustainable materials for local businesses; organizing weekly island clean-ups; and producing communication materials for eco-friendly tourism. Recently, in April 2017, they acted as the de facto waste collection service during a collapse of the local waste company due to allegations of corruption. This much needed transition into land conservation has not been matched by a transition to a universal eco-fee paid by all tourists, which reflects the magnitude of services the EcoTrust now provides beyond the marine realm. Many of the dive shops and hotels are supportive of a universal eco-fee paid by all tourists but there is disagreement on how to implement the eco-fee and how much to charge. This issue motivated the research in this paper.

2.2 Methods

Sampling

There is no central daily record of tourists visiting Gili Trawangan so a random sampling method was not possible. Therefore, a convenience sampling method was employed. This method does, however, capture a representative sample of the tourist population on the island. Tourists gather in the harbor area on Gili Trawangan as they wait for boats departing the island on an hourly basis throughout the day. The harbor area provides the best possibility for a natural semi-random sample. The overwhelming majority of tourists arrive and depart the island from the harbor area (except the few (<1%) that arrive directly to the resort by private boat) representing a wide variety of ages, nationalities, budgets, and interests.

592 tourists were surveyed from March 2017 to May 2017. We partnered with the local NGO, the Gili Eco Trust, to design the survey and recruit research assistants. The trained research assistants would visit the harbor daily to conduct the donation surveys. They identified themselves as students interning at Gili Eco Trust and working on a research project. They notified all people that participation was completely voluntary. If people agreed to participate, they were provided with a survey printed on the front and back of a half sheet of A4 paper (see Appendix 1). There was a wooden box painted with the logo of Gili Eco Trust with a slit in the top that the research assistant used to collect the surveys and any donations the participants wished to give to the Gili Eco Trust. Although respondents were aware they were participating in a research study, they were unaware that there were randomly assigned treatment groups. Requests for further information regarding the activities and purpose of the Eco Trust were responded to by providing a pre-printed one-page guide on efforts of the organization to avoid bias in explaining more in-depth to some tourists and not others which might have influenced donations.

Survey Design

The survey instrument was refined following exploratory research and open-ended interviews with several hotel and dive managers as well as the staff of Gili Eco Trust providing feedback on the fee amounts and survey questions. In addition, fifty-two pilot surveys were conducted between March 25 and March 30, 2017 enabling further refinement of the questions, survey design, and payment amounts. Specifically, we lowered the default amounts from 50,000IDR to 10,000IDR based on feedback from the pilot surveys. To maintain anonymity, no identifying information was collected from participants. The survey instrument was comprised of a combination of multiple choice and questions based on a Likert ordinal response scale. Additionally, basic sociodemographic and travel information was collected.

We employed a between-subjects randomized design meaning that each participant was subjected to only one randomly-selected treatment. There were four treatments which we refer to as: control, reference levels, default opt-in, and default opt-out. The control treatment required the respondent to write-in an amount they wished to contribute to the Gili Eco Trust. Participants that failed to write anything in the control were automatically appointed as giving zero. The reference level condition consisted of three suggested contribution amounts: 10,000IDR, 20,000IDR, 50,000IDR and a blank write-in option. The default was set at 10,000IDR (approximately $0.75USD), informed by our pilot study. The default opt-in required that the participant check the box that they wished to contribute the set amount of 10,000IDR. The default opt-out condition required that the participant check the box if they did not want to contribute the set amount of 10,000IDR.

III. Results

3.1 Descriptive statistics of sample

The descriptive statistics of the sample population are shown below in Table 1. The sample was comprised of slightly more females (58%) than males (42%). The majority of participants (62%) were from the European continent (including UK and Scandanavia). Sixty-nine percent of respondents were between the ages of twenty-one and thirty-two. The average number of days spent on Gili Trawangan was 4.4 days with a standard deviation of 6.8 and a minimum of one day and maximum of one hundred days. Given the wide range of nationalities traveling to Gili Trawangan, collecting information on monthly or annual income was avoided due to confusion in recording the data based on different currencies that may have been reported. Rather, we use the hotel price and type as a proxy for traveling style and income. The majority of respondents (>65%) stayed in hotels that we have identified as either 'High-end' or 'Luxury'. 'High-end' was defined as hotels that cost between 400,000-700,000IDR per night (approximately $30-$50USD/night) and 'Luxury' was defined as hotels that cost more than 700,000IDR/night (more than $50USD/night). Only 15% of the total sample went diving on Gili Trawangan which means they would have already paid the 50,000IDR voluntary eco fee for conservation.

Table 3 Descriptive characteristics of sample population

Category	Descriptor	% of sample
N	592	
Gender	Female	58%
	Male	42%
Nationality	Australia/NewZealand	7%
	Asia (excl. Indonesia)	5%
	Europe (excl. UK and Scandanavia)	32%
	Indonesia	8%
	North American	9%
	Scandanavia	10%
	South America	4%
	UK	20%
	Other (Africa, Middle East, Russia, India)	5%
Age range	15-20	13%
	21-26	38%
	27-32	31%
	33-40	11%
	41-60	7%
	>61	0.3%
Hotel type	Budget ≤120,000IDR/night	1%
	Inexpensive 121,000-200,000IDR/night	12%
	Intermediate 201,000-400,000IDR/night	20%
	High-end 400,000-700,000IDR/night	42%
	Luxury ≥701,000IDR/night	25%
Marine tourism	Divers	15%
	Snorkelers	67%

Figure 2 shows participants' responses regarding their perception of who should be responsible for financing conservation on Gili Trawangan, as well as their perceptions of the main problems on the islands. It is clear from Figure 2a that tourists believe the government should take more responsibility in providing environmentally sustainable services on the island, but, interestingly, 23% and 17% respectively of the total responses perceive hotels and tourists should also be responsible for financing environmentally sustainable services. In Figure 2b, waste sorting and recycling garnered the most attention as problems on the island. Pollution was also perceived to be a problem on the island, and, if these are combined, waste issues make up 39% of the perceived issues on Gili Trawangan - far more than any other issue. Issues pertaining to terrestrial conservation (including beach erosion, pollution, and waste build-up due to lack of recycling services) make-up 46% of the perceived problems on the island while marine conservation makes up 15% of the perceived problems.

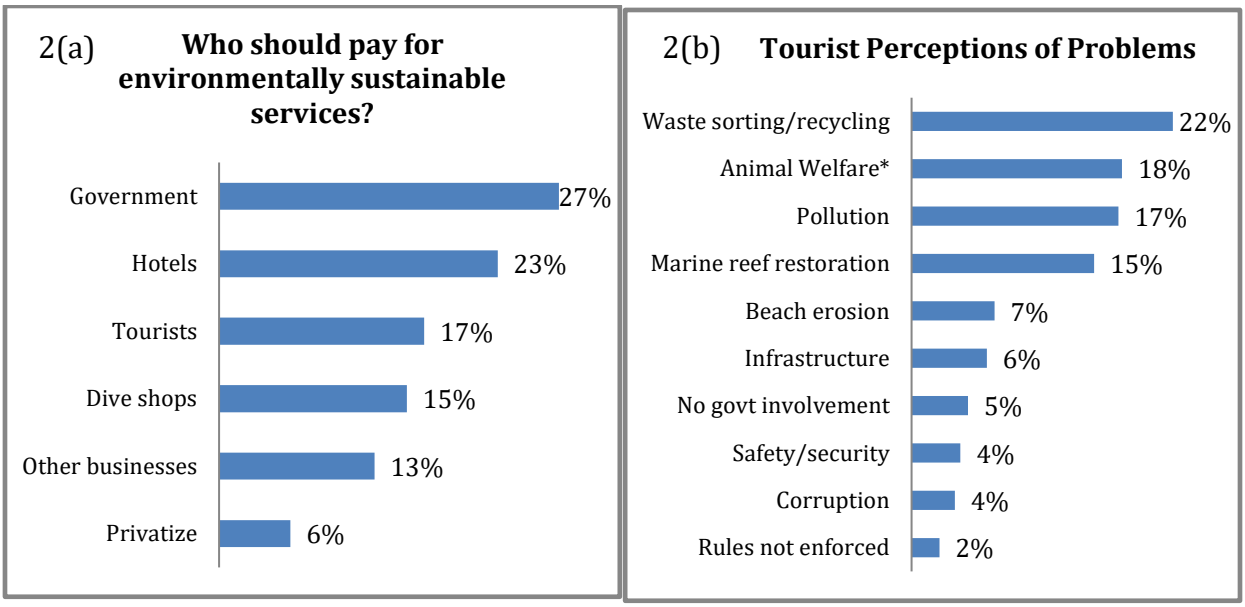

Figure 2 Tourist perceptions of 2(a) of who should pay for environmentally sustainable services, and 2(b) problems on Gili Trawangan. Note: *Motorized vehicles are prohibited on the island and therefore traditional horsecarts provide transportation and hauling of materials around the island, hence the perception of animal welfare as an issue.

Figure 3 provides descriptive statistics based on tourists' personal experiences and perceptions of environmental management on Gili Trawangan. Although the overwhelming majority (89%) of respondents had a positive overall experience and would recommend the island to a friend (Figure 3a) most disagreed that the island is environmentally sustainable. Figure 3b shows that more than half of respondents disagreed that the businesses on the island were environmentally conscious offering alternatives to single-use plastic. Sixty-nine percent of respondents disagreed that the current system of waste collection and recycling is functioning (Figure 3c) and 61% disagreed that the streets, beaches, and public areas are clean and free of pollution (Figure 3d). Fifty-seven percent of respondents disagreed that the marine ecosystem and marine pollution are effectively managed compared to the 37% of respondents that agreed the marine ecosystem is effectively managed (Figure 3e). We observe that 77% of participants agree there should be a tourist eco-fee to ensure that environmental sustainability is practiced on Gili Trawangan (3f).

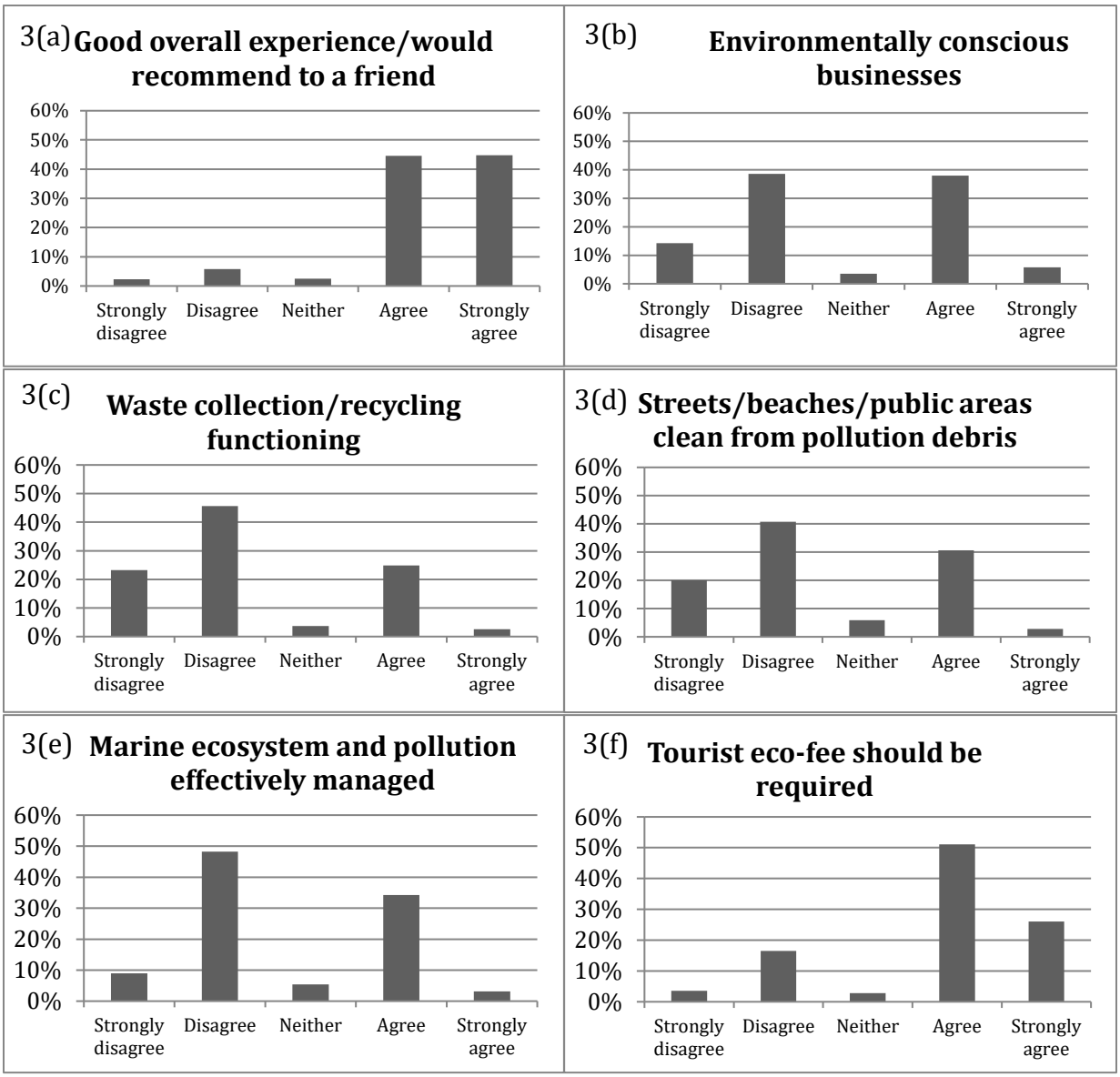

Figure 3 Perceptions of environmental management and personal experience on Gili Trawangan

3.2 Treatment comparisons

We find that the willingness to contribute to the conservation organization increases significantly with the treatments (see Figure 4a). Using a two-sided binomial probability test, the data show that the probability of making a donation is significantly higher at $p<0.01$ in all treatments (default opt-in, default opt-out, and reference levels) compared to the control condition. When comparing the default options to each other, the opt-out treatment results in significantly higher compliance compared to opt-in ($p<0.01$). The default opt-in and the default opt-out both have significantly higher compliance rates than the reference level condition ($p<0.01$).

Using a Fisher's exact test, we analyze gender differences in the decision of whether or not to donate under the treatment conditions (see Figure 4b). The 'reference level' treatment is the only treatment in which we observe significant differences ($p<0.01$) between men and women in the decision to donate. Only 24% of females chose to donate under the 'reference level' treatment compared to 44% of males that donated. The probability of compliance between females in the control treatment (21%)

and the reference level treatment (24%) are not significantly different using the binomial probability test.

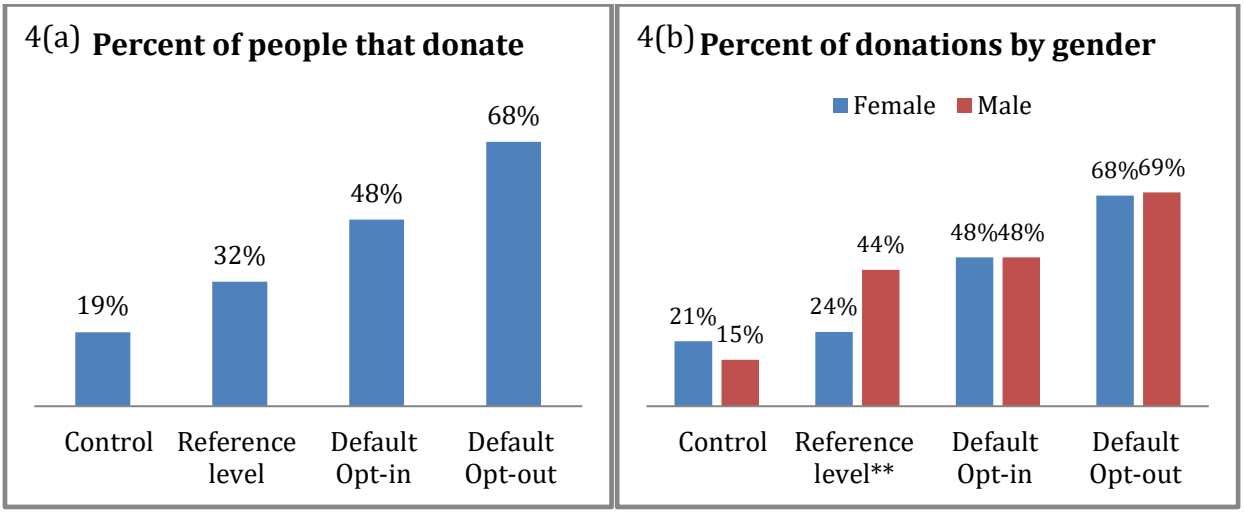

Figure 4(a) Percentage of sample that donated by treatment, and 4(b) percentage of men and women that donated by treatment. Note: **p<0.01 difference between percentage of men and women donating in the reference level condition

Using bootstrapped t-tests, we compare the average donation amount (including those that gave nothing) given under the different treatment conditions (see Figure 5a). The average amount donated was higher in the default treatments compared to the control but the difference is only significant in the opt-out treatment ($p<0.05$). The mean amount donated in the default opt-in and default opt-out conditions are significantly different from each other ($p<0.01$). The average donation amount in the control compared to the reference level treatment is weakly significant at $p<0.10$. There are no differences between the mean amounts donated in the default opt-in or opt-out treatments compared to the reference level condition.

Similarly, we compare the average donation amounts conditional on giving (see Figure 5b). When we analyze mean amounts based only on those that donated something, we observe higher average donation amounts in the control and reference level treatments compared to the set default amount ($p<0.01$). There are no significant differences in the mean amounts given between the control and reference level conditions when analyzed conditionally on giving a donation. Likewise, there are no differences in the mean default amounts conditional on donating but this is to be expected considering the default was set at 10,000IDR in both the default opt-in and default opt-out. Therefore, the differences observed in the total mean donations (5a) between the default treatments are driven solely by a difference in propensity to donate.

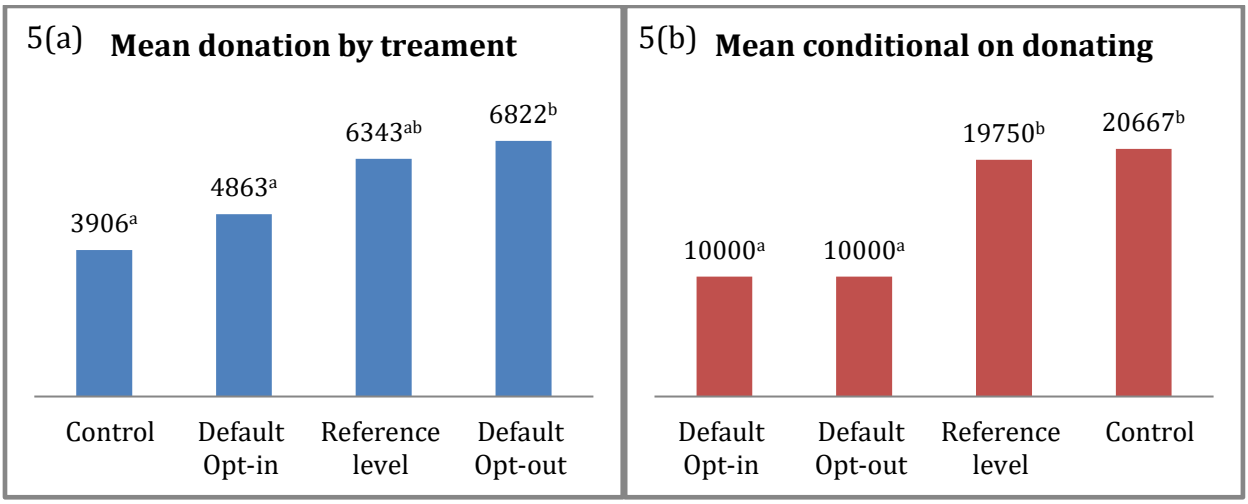

Figure 5(a) Mean amounts donated by treatment, and 5(b) mean amounts donated based on donating a non-zero amount. Note: [a,b] superscript letters denote significance between treatments. Treatments that share the same superscript letter do not significantly differ from each other at p<0.05.

The total donations received by the Gili Eco Trust were highest in the default opt-out treatment (see Figure 6). When analyzing only those that donated, even though the average amount donated in the default treatments was about half of the average amount donated in the control and reference levels, the total amount received by the Gili Eco Trust was highest in the default opt-out condition due to the increased propensity to donate in the default opt-out treatment. Simply put, more people give but they give smaller amounts on average. The smaller average amounts are explained by the fact that the default amount was set at 10,000IDR so the respondent only had to make one decision of whether to donate or not. Although the default methods prove to be more successful in ensuring donation compliance, the set default amount may be too low based on the higher mean donation amounts observed in the control and reference level treatment. Although 20% fewer respondents donated, the total amount received in the reference level treatment is comparable to the default opt-out treatment.

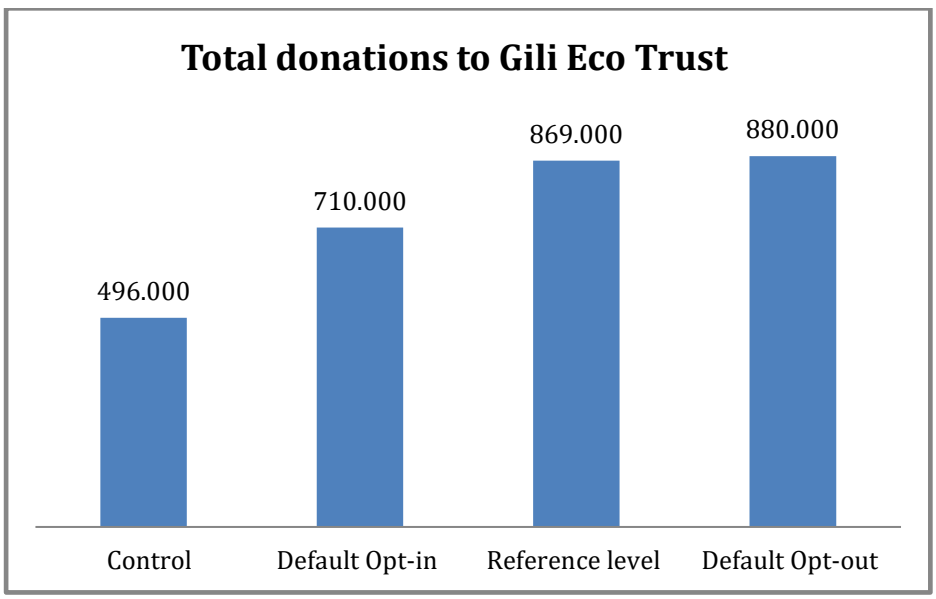

Figure 6 Total donations received by Gili Eco Trust. Note: Amounts reported in Indonesian Rupiah (1000IDR=$0.07USD)

3.3 Two-part model: Probit and Ordinary Least Squares Regression

To assess whether the above findings are robust to the inclusion of control variables, we analyze the data using a two-part model developed by Cragg (1971). The first part of the model employs a probit analysis to define what factors determine whether a person will donate, while the second stage of the model uses an ordinary least squares (OLS) regression to identify which factors are responsible for how much a person donates – once they have made the decision to donate.

The first column in Table 4 excludes the treatment variables so we may observe if any of the control variables are relevant. We analyzed several models including a variety of demographic variables as independent variables with the decision to donate as the dependent variable. We controlled for age, gender, continent of nationality, price of hotel (as a proxy for income), number of days on the island, and activities. The only control variables that are statistically significant determinants of the discrete donation decision are the continent of nationality and activities. Therefore, we dropped insignificant variables and compared the fit of the models with and without the aforementioned variables. The likelihood ratio test does not indicate a statistically significant improvement ($p=0.08$) over the model that includes the entire suite of control variables, therefore, for simplicity we have left all control variables except the continent of nationality and activities out of the model in Table 4.

With Europeans serving as the base category, two nationality dummies have positive and statistically significant coefficients - those respondents from North America and Asia. We thereby find that respondents from North America and Asia are more likely to donate than Europeans. Those respondents that went biking on the island were also more likely to donate than those who did not bike. We do not find any statistical significance effecting the donation decision if the respondents engaged in snorkeling or diving activities. The model in the second column includes the treatment dummies with the control serving as the base category. Confirming the results of the binomial probability test, all treatments have statistically significant and positive coefficients compared to the control thereby indicating that there is a strong treatment effect determining the discrete donation decision.

The third and fourth columns in Table 4 reveal the estimates from the OLS model of the amount donated, contingent on donating a non-zero amount. None of the demographic control variables (including the full suite of demographics: gender, age, hotel price, number of days on island) have a statistically significant effect on the amount donated unless we include the treatment dummies (fourth column) wherein respondents from Asia are revealed to donate a significantly lower amount than Europeans. We analyzed the OLS models including all the control variables and with the limited version using only the continent of nationality and activities. The likelihood ratio test comparing the OLS regression models does not indicate a statistically better fit ($p=0.3$) when the aforementioned suite of control variables are included, therefore, they have been eliminated from the final models. When we include the treatment dummies, we observe statistically significant and negative coefficients for both the default opt-in and default opt-out conditions in comparison to the left out control variable.

Table 4 Probit and Ordinary least squares regression model

	Probit Donation Decision	Probit Donation Decision	OLS Donation Amount	OLS Donation Amount
N	546	530	230	224
Europe	0.000	0.000	0.000	0.000
North America	**0.623**	**0.632**	-1,244.689	-733.096
	(3.20)**	**(3.03)****	(0.62)	(0.41)
South America	-0.119	0.046	-3,474.084	-5,081.511
	(0.41)	(0.15)	(0.89)	(1.49)
Asia	**0.349**	**0.456**	-1,540.390	**-3,931.840**
	(2.19)*	**(2.65)****	(0.85)	**(2.28)***
Oceana	-0.272	-0.392	2,891.757	4,569.442
	(1.21)	(1.63)	(0.94)	(1.71)
Biking	**0.241**	**0.246**	1,265.543	791.334
	(2.15)*	**(2.04)***	(0.90)	(0.63)
Snorkel	0.159	0.220	2,283.165	1,405.407
	(1.34)	(1.73)	(1.53)	(1.05)
Dive	0.042	0.089	2,357.205	2,288.281
	(0.28)	(0.55)	(1.27)	(1.41)
Control		0.000		0.000
Default opt-in		**0.904**		**-9,971.401**
		(5.23)**		**(4.63)****
Default opt-out		**1.460**		**-10,675.376**
		(8.14)**		**(4.96)****
Reference level		**0.519**		160.709
		(2.92)**		(0.07)
Constant	-0.539	-1.359	10,627.389	18,914.914
	(4.24)**	(7.18)**	(6.10)**	(7.39)**
R^2			0.03	0.26

z statistics in parentheses, * $p<0.05$; ** $p<0.01$

IV. Discussion and recommendations

4.1 Fund raising options and potential on Gili Trawangan

The results from this study reveal important information at a crucial time in the development of Gili Trawangan. As recent as September 2017, the government discussed plans to impose a tourist fee of 100,000IDR per person per day ($7.40USD). Our results provide evidence that an appropriately priced and executed tourist eco-fee could have immense positive benefits but the suggested fee of 100,000IDR per day could deter tourists from visiting the island if faced with choices of many other islands with no fee. This may additionally undermine fund raising efforts by local institutions, such as the Gili EcoTrust, who rely on self-organized financing to directly invest in finding solutions to problems facing the island. Based on the results from our survey, we find strong evidence that the majority of tourists do not perceive the island to be environmentally sustainable under current management practices and that they are willing to pay an eco-fee that is used to manage sustainable practices on Gili Trawangan. Tourists who biked around the island were more likely to donate and this may be explained by the fact that biking around the island exposes them to more of the

challenges facing the island beyond comparatively well-kept main tourist beach area. Thus more exposure to environmental problems may increase the willingness to donate.

When respondents were given the choice to either write-in a donation amount or select an amount from choices ranging from 10,000IDR to 50,000IDR, the average donation amount was approximately 20,000IDR (~$1.50USD). However, a higher percentage of respondents selected the 10,000IDR level in the reference treatment, such that the total revenue earned for conservation was the same under the 10,000IDR level and the 20,000IDR level (see Figure 7). The default donation price was set at 10,000IDR and both the opt-in and opt-out treatments sustained higher willingness to donate compared to the control and reference level conditions. However, the opt-out condition generated the highest percentage of donors resulting in the highest overall revenue across all treatments (Figure 6). With the estimated number of around 1 million tourists visiting Gili Trawangan annually, a properly imposed eco-fee of 10,000IDR-20,000IDR per person would result in a reliable and significant financing mechanism for both terrestrial and marine conservation.

Figure 7 shows the potential cumulative annual conservation revenue based on the control and reference treatments. At 10,000IDR, more people are willing to donate and therefore the revenue is the same as giving at the 20,000IDR level. Although fewer people donate as the donation amount increases, the total potential for fund raising does not drop off drastically until after 50,000IDR. These results could inform government ambitions to impose a fee of 100,000IDR, which may actually raise less than a fee of 50,000IDR, if these results are interpreted as an upper threshold for willingness-to-pay, or as an anchor point for decision making on whether to visit the island if a fee was imposed.

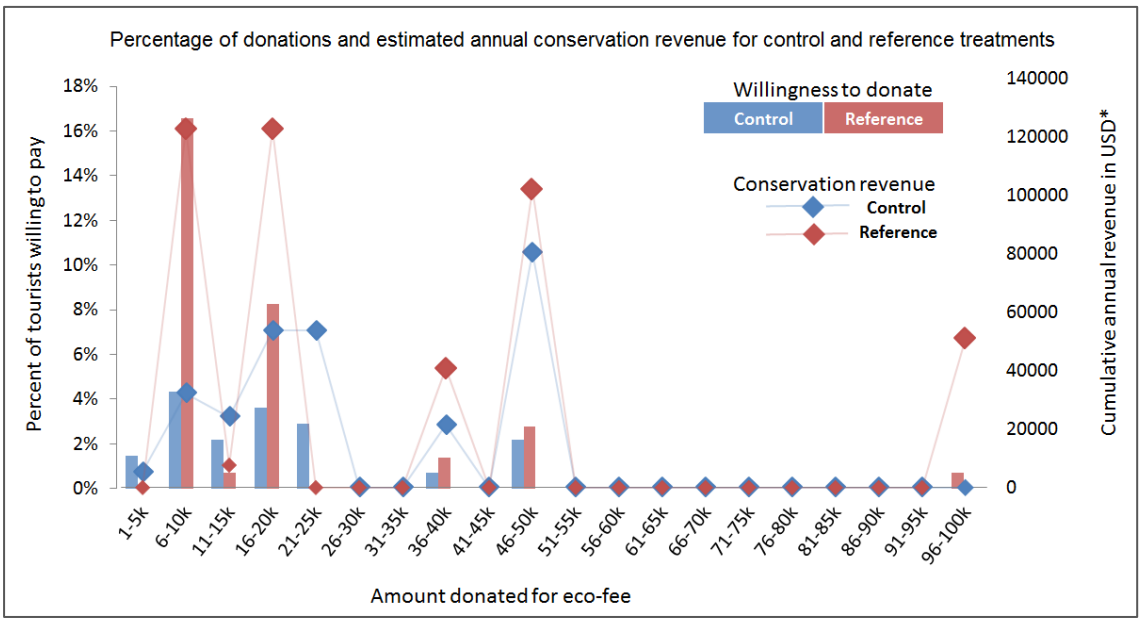

Figure 7 The bars indicate the percent of tourists willing to donate at the amount indicated on the X axis in Indonesian Rupiah and the markers indicate the estimated cumulative annual conservation revenue in USD based on the ratio and magnitude of giving. *Estimate based on 1mil tourists visiting Gili Trawangan annually.

Given that the eco-fee is a voluntary payment and not a government imposed tax (at the present time), our results indicate the most effective way to implement a voluntary eco-fee would be to include the payment as a default opt-out condition. This option could be added to the cost of accommodation or to the transport cost to the island. Given the hundreds of accommodation options on the island and third-party payment sites (i.e. Booking.com), attaching the payment to accommodations would

introduce complicated logistical and regulatory requirements and the potential for corruption. There are about ten to fifteen boat transport companies operating on Gili Trawangan which are already regulated by a centralized transportation organization that requires the daily manifest for all boats arriving and departing the Gili Islands. We would suggest that each purchase of a boat transfer from the Gili Islands includes a default opt-out condition of a 10,000IDR eco-fee. This amount would be automatically added to the cost of the trip unless the traveler specifically opts out of paying the eco-fee.

Interestingly, we observe significant gender differences in willingness to donate but only under the reference level treatment (Figure 4b). Croson, Handy, and Shang (2010) find similar results that men are more influenced by suggestion amounts than are women. Croson, Handy, and Shang (2010) find that men are influenced by temporarily created social norms more so than women. This gender difference, however, disappears in the default conditions when only one reference amount is suggested providing further support of our recommendation to use the default opt-out method for requesting donations.

4.2 Expanding the scope of financing for land-sea conservation

While the results from this study provide critical information for Gili Trawangan, this study can additionally inform future research and practical approaches for financing land-sea management by exemplifying the role that social science research can play in advancing conservation. We show that extending community-based fees to all users of a land-sea area has the potential to generate substantial revenue to finance conservation while keeping the price at a low enough level to stay within what users are willing to pay. We also show that tourists are observant of environmental impacts and are willing to contribute to mitigating them and that tourists are willing to finance both NGOs and governmental organizations to do the work.

Understanding how tourists, and resources users more broadly, engage with and perceive environmental problems is key for designing effective mechanisms for conservation, including financing. The social sciences, which have historically been less influential in informing conservation research and practice (Chan et al. 2007, Bennett et al. 2017, Partelow et al. 2017) need to play a more substantial role in the future if land-sea conservation efforts aim to be more effective. Behavioral economics, in combination with other social and natural sciences, can make a key contribution to advancing conservation by better understanding human behavior and decision making in relation to multi-use areas, such as the coast, where preferences for donating and engaging with conservation efforts may vary by activity (Nelson, Schlüter, and Vance 2017a). Creating more sustainable interactions between people and nature on the coast will be in part dependent on how well we understand the role of human behavior in relation to what people do, how they perceive potential problems and the solutions they believe are viable and would be willing to support.

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References

Abadie, Alberto, and Sebastien Gay. 2006. "The impact of presumed consent legislation on cadaveric organ donation: a cross-country study." *Journal of Health Economics* 25 (4):599-620.

Adams, Vanessa M, Jorge G Álvarez-Romero, Josie Carwardine, Lorenzo Cattarino, Virgilio Hermoso, Mark J Kennard, Simon Linke, Robert L Pressey, and Natalie Stoeckl. 2014. "Planning across freshwater and terrestrial realms: cobenefits and tradeoffs between conservation actions." *Conservation Letters* 7 (5):425-440.

Adger, W Neil, Terry P Hughes, Carl Folke, Stephen R Carpenter, and Johan Rockström. 2005. "Social-ecological resilience to coastal disasters." *Science* 309 (5737):1036-1039.

Alexander, Steven M, Mark Andrachuk, and Derek Armitage. 2016. "Navigating governance networks for community-based conservation." *Frontiers in Ecology and the Environment* 14 (3):155-164.

Alpizar, Francisco, Fredrik Carlsson, and Olof Johansson-Stenman. 2008. "Anonymity, reciprocity, and conformity: Evidence from voluntary contributions to a national park in Costa Rica." *Journal of Public Economics* 92 (5):1047-1060.

Alpízar, Francisco, and Peter Martinsson. 2010. "Don't Tell Me What to Do, Tell Me Who to Follow!-Field Experiment Evidence on Voluntary Donations." *Working Papers in Economics 452*.

Altmann, Steffen, and Armin Falk. 2009. "The impact of cooperation defaults on voluntary contributions to public goods." *University of Bonn*.

Alvarez-Romero, Jorge G, Robert L Pressey, Natalie C Ban, Ken Vance-Borland, Chuck Willer, Carissa Joy Klein, and Steven D Gaines. 2011. "Integrated land-sea conservation planning: the missing links." *Annual Review of Ecology, Evolution, and Systematics* 42:381-409.

Álvarez-Romero, Jorge G, Robert L Pressey, Natalie C Ban, Jorge Torre-Cosío, and Octavio Aburto-Oropeza. 2013. "Marine conservation planning in practice: lessons learned from the Gulf of California." *Aquatic Conservation: Marine and Freshwater Ecosystems* 23 (4):483-505.

Arkema, Katie K, Gregory M Verutes, Spencer A Wood, Chantalle Clarke-Samuels, Samir Rosado, Maritza Canto, Amy Rosenthal, Mary Ruckelshaus, Gregory Guannel, and Jodie Toft. 2015. "Embedding ecosystem services in coastal planning leads to better outcomes for people and nature." *Proceedings of the National Academy of Sciences* 112 (24):7390-7395.

Arrow, Kenneth, Robert Solow, Paul R Portney, Edward E Leamer, Roy Radner, and Howard Schuman. 1993. "Report of the NOAA panel on contingent valuation." *Federal Register* 58 (10):4601-4614.

Asafu-Adjaye, John, and Sorada Tapsuwan. 2008. "A contingent valuation study of scuba diving benefits: Case study in Mu Ko Similan Marine National Park, Thailand." *Tourism Management* 29 (6):1122-1130.

Bateman, Ian, Ken Willis, and Guy Garrod. 1994. "Consistency between contingent valuation estimates: a comparison of two studies of UK National Parks." *Journal of the Regional Studies Association* 28 (5):457-474.

Bekkers, René, and Pamala Wiepking. 2011. "A literature review of empirical studies of philanthropy: Eight mechanisms that drive charitable giving." *Nonprofit and Voluntary Sector Quarterly* 40 (5):924-973.

Bennett, Nathan J, Robin Roth, Sarah C Klain, Kai Chan, Douglas A Clark, Georgina Cullman, Graham Epstein, Michael Paul Nelson, Richard Stedman, and Tara L Teel. 2017. "Mainstreaming the social sciences in conservation." *Conservation Biology* 31 (1):56-66.

Bernard, Florence, Rudolf S de Groot, and José Joaquín Campos. 2009. "Valuation of tropical forest services and mechanisms to finance their conservation and sustainable use: A case study of Tapantí National Park, Costa Rica." *Forest Policy and Economics* 11 (3):174-183.

Briers, Barbara, Mario Pandelaere, and Luk Warlop. 2007. "Adding exchange to charity: a reference price explanation." *Journal of Economic Psychology* 28 (1):15-30.

Brockner, Joel, Beth Guzzi, Julie Kane, Ellen Levine, and Kate Shaplen. 1984. "Organizational fundraising: Further evidence on the effect of legitimizing small donations." *Journal of Consumer Research* 11 (1):611-614.

Chan, Kai, Robert M Pringle, JAI Ranganathan, Carol L Boggs, Yvonne L Chan, Paul R Ehrlich, Peter K Haff, Nicole E Heller, Karim Al-khafaji, and Dena P Macmynowski. 2007. "When agendas collide: Human welfare and biological conservation." *Conservation Biology* 21 (1):59-68.

Choi, James J, David Laibson, Brigitte C Madrian, and Andrew Metrick. 2003. "Optimal defaults." *The American Economic Review* 93 (2):180-185.

CIESIN. 2013. Low Elevation Coastal Zone: Urban-Rural Population and Land Area Estimates Version 2. edited by Center for International Earth Science Information Network (CIESIN) of Columbia University. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC).

Cloern, James E, Paulo C Abreu, Jacob Carstensen, Laurent Chauvaud, Ragnar Elmgren, Jacques Grall, Holly Greening, John Olov Roger Johansson, Mati Kahru, and Edward T Sherwood. 2016. "Human activities and climate variability drive fast-paced change across the world's estuarine–coastal ecosystems." *Global Change Biology* 22 (2):513-529.

Cragg, John G. 1971. "Some statistical models for limited dependent variables with application to the demand for durable goods." *Econometrica: Journal of the Econometric Society*:829-844.

Croson, Rachel TA, Femida Handy, and Jen Shang. 2010. "Gendered giving: the influence of social norms on the donation behavior of men and women." *International Journal of Nonprofit and Voluntary Sector Marketing* 15 (2):199-213.

De Bruyn, Arnaud, and Sonja Prokopec. 2013. "Opening a donor's wallet: The influence of appeal scales on likelihood and magnitude of donation." *Journal of Consumer Psychology* 23 (4):496-502.

Dharmaratne, Gerard S, Francine Yee Sang, and Leslie J Walling. 2000. "Tourism potentials for financing protected areas." *Annals of Tourism Research* 27 (3):590-610.

Donaldson, Cam, Ruth Thomas, and David J Torgerson. 1997. "Validity of open-ended and payment scale approaches to eliciting willingness to pay." *Applied Economics* 29 (1):79-84.

Dudley, N, and S Stolton. 1999. "Conversion of paper parks to effective management: developing a target. Report to the WWF-World Bank Alliance from the IUCN/WWF Forest Innovation Project." *The World Conservation Union (IUCN), Gland*.

Dutra, Leo XC, Rodrigo H Bustamante, Ilva Sporne, Ingrid van Putten, Catherine M Dichmont, Emma Ligtermoet, Marcus Sheaves, and Roy A Deng. 2015. "Organizational drivers that strengthen adaptive capacity in the coastal zone of Australia." *Ocean & Coastal Management* 109:64-76.

Edwards, Peter ET. 2009. "Sustainable financing for ocean and coastal management in Jamaica: The potential for revenues from tourist user fees." *Marine Policy* 33 (2):376-385.

Gelcich, Stefan, Francisca Amar, Abel Valdebenito, Juan Carlos Castilla, Miriam Fernandez, Cecilia Godoy, and Duan Biggs. 2013. "Financing marine protected areas through visitor fees: Insights from tourists willingness to pay in Chile." *Ambio* 42 (8):975-984.

Gigerenzer, Gerd. 2008. "Moral intuition= fast and frugal heuristics?" In *The cognitive science of morality: intuition and diversity*, 1-26. MIT Press.

Gilby, Ben L, Andrew D Olds, Rod M Connolly, Tim Stevens, Christopher J Henderson, Paul S Maxwell, Ian R Tibbetts, David S Schoeman, David Rissik, and Thomas A Schlacher. 2016. "Optimising land-sea management for inshore coral reefs." *PloS one* 11 (10):e0164934.

Glaser, Marion, Patrick Christie, Karen Diele, Larissa Dsikowitzky, Sebastian Ferse, Inga Nordhaus, Achim Schlüter, Kathleen Schwerdtner Mañez, and Christian Wild. 2012. "Measuring and understanding sustainability-enhancing processes in tropical coastal and marine social–ecological systems." *Current opinion in environmental sustainability* 4 (3):300-308.

Groves, Craig, Laura Valutis, Diane Vosick, Betsy Neely, Kimberly Wheaton, Jerry Touval, and Bruce Runnels. 2000. "Designing a geography of hope: a practitioner's handbook for ecoregional conservation planning." *The Nature Conservancy, Arlington, VA*.

Halpern, Benjamin S. 2014. "Conservation: Making marine protected areas work." *Nature* 506 (7487):167-168.

Hampton, Mark P, and Julia Jeyacheya. 2015. "Power, ownership and tourism in small islands: evidence from Indonesia." *World Development* 70:481-495.

Hoegh-Guldberg, Ove, Hans Hoegh-Guldberg, JEN Veron, Alison Green, Edgardo D Gomez, A Ambariyanto, and L Hansen. 2009. "The Coral Triangle and climate change: ecosystems, people and societies at risk."

IUCN. 2017. "Coastal and marine ecosystems." International Union for Conservation of Nature, accessed August 29. https://www.iucn.org/regions/asia/our-work/coastal-and-marine-ecosystems.

Jackson, Jeremy BC, Michael X Kirby, Wolfgang H Berger, Karen A Bjorndal, Louis W Botsford, Bruce J Bourque, Roger H Bradbury, Richard Cooke, Jon Erlandson, and James A Estes. 2001. "Historical overfishing and the recent collapse of coastal ecosystems." *Science* 293 (5530):629-637.

Johnson, Eric J, Steven Bellman, and Gerald L Lohse. 2002. "Defaults, framing and privacy: Why opting in-opting out." *Marketing Letters* 13 (1):5-15.

Johnson, Eric J, and Daniel Goldstein. 2003. "Do defaults save lives?" *Science* 302 (5649):1338-1340.

Johnson, Eric J, and Daniel G Goldstein. 2004. "Defaults and donation decisions." *Transplantation* 78 (12):1713-1716.

Johnson, Eric J, John Hershey, Jacqueline Meszaros, and Howard Kunreuther. 1993. "Framing, probability distortions, and insurance decisions." *Journal of Risk and Uncertainty* 7 (1):35-51.

Kummu, Matti, Hans De Moel, Gianluigi Salvucci, Daniel Viviroli, Philip J Ward, and Olli Varis. 2016. "Over the hills and further away from coast: global geospatial patterns of human and environment over the 20th–21st centuries." *Environmental Research Letters* 11 (3):034010.

Loomis, John B. 1990. "Comparative reliability of the dichotomous choice and open-ended contingent valuation techniques." *Journal of Environmental Economics and Management* 18 (1):78-85.

Lundquist, Carolyn J, and Elise F Granek. 2005. "Strategies for successful marine conservation: integrating socioeconomic, political, and scientific factors." *Conservation Biology* 19 (6):1771-1778.

Madrian, Brigitte C, and Dennis F Shea. 2001. "The power of suggestion: Inertia in 401 (k) participation and savings behavior." *The Quarterly Journal of Economics* 116 (4):1149-1187.

Maliao, Ronald J, Robert S Pomeroy, and Ralph G Turingan. 2009. "Performance of community-based coastal resource management (CBCRM) programs in the Philippines: a meta-analysis." *Marine Policy* 33 (5):818-825.

Margules, Chris R, and Robert L Pressey. 2000. "Systematic conservation planning." *Nature* 405 (6783):243.

Mathieu, Laurence F, Ian H Langford, and Wendy Kenyon. 2003. "Valuing marine parks in a developing country: a case study of the Seychelles." *Environment and Development Economics* 8 (2):373-390.

Moberg, Fredrik, and Carl Folke. 1999. "Ecological goods and services of coral reef ecosystems." *Ecological Economics* 29 (2):215-233.

Nelson, Katherine M., Achim Schlüter, and Colin Vance. 2017a. "Distributional preferences and donation behavior among marine resource users in Wakatobi, Indonesia." *Ocean & Coastal Management*. doi: 10.1016/j.ocecoaman.2017.09.003.

Nelson, Katherine, Achim Schlüter, and Colin Vance. 2017b. "Funding Conservation Locally: Insights from Behavioral Experiments in Indonesia." *Conservation Letters*. doi:10.1111/conl.12378.

Park, C Whan, Sung Youl Jun, and Deborah J MacInnis. 2000. "Choosing what I want versus rejecting what I do not want: An application of decision framing to product option choice decisions." *Journal of Marketing Research* 37 (2):187-202.

Partelow, Stefan, and Katherine Nelson. forthcoming. "Social networks, collective action and the evolution of governance for sustainable tourism on the Gili Islands, Indonesia." *Marine Policy*.

Partelow, Stefan, Achim Schlüter, Henrik von Wehrden, Manuel Jänig, and Paula Senff. 2017. "A Sustainability Agenda for Tropical Marine Science." *Conservation Letters* doi: 10.1111/conl.12351.

Partelow, Stefan, Henrik von Wehrden, and Olga Horn. 2015. "Pollution exposure on marine protected areas: a global assessment." *Marine Pollution Bulletin* 100 (1):352-358.

Peters, Howard, and Julie P Hawkins. 2009. "Access to marine parks: A comparative study in willingness to pay." *Ocean & Coastal Management* 52 (3):219-228.

Pittman, Jeremy, and Derek Armitage. 2016. "Governance across the land-sea interface: A systematic review." *Environmental Science & Policy* 64:9-17.

Prince, Raymond, Michael McKee, Shaul Ben-David, and Mark Bagnoli. 1992. "Improving the contingent valuation method: Implementing the contribution game." *Journal of Environmental Economics and Management* 23 (1):78-90.

Reuter, Kim E, Daniel Juhn, and Hedley S Grantham. 2016. "Integrated land-sea management: recommendations for planning, implementation and management." *Environmental Conservation* 43 (2):181-198.

Rife, Alexis N, Brad Erisman, Alexandra Sanchez, and Octavio Aburto-Oropeza. 2013. "When good intentions are not enough… Insights on networks of "paper park" marine protected areas." *Conservation Letters* 6 (3):200-212.

Rivera-Planter, Marisol, and Carlos Muñoz-Piña. 2005. "Fees for reefs: economic instruments to protect Mexico's marine natural areas." *Current issues in tourism* 8 (2-3):195-213.

Roberts, Callum M, Colin J McClean, John EN Veron, Julie P Hawkins, Gerald R Allen, Don E McAllister, Cristina G Mittermeier, Frederick W Schueler, Mark Spalding, and Fred Wells. 2002. "Marine biodiversity hotspots and conservation priorities for tropical reefs." *Science* 295 (5558):1280-1284.

Roberts, Michaela, Nick Hanley, and Will Cresswell. 2017. "User fees across ecosystem boundaries: Are SCUBA divers willing to pay for terrestrial biodiversity conservation?" *Journal of Environmental Management* 200:53-59.

Sherif, Muzafer, Daniel Taub, and Carl I Hovland. 1958. "Assimilation and contrast effects of anchoring stimuli on judgments." *Journal of Experimental Psychology* 55 (2):150.

Smith, Gerald E, and Paul D Berger. 1995. "The Impact of Framing, Anchorpoints, and Frames of Reference on Direct Mail Char Contributions." *Advances in Consumer Research* 22 (1).

Sterling, Eleanor J, Erin Betley, Amanda Sigouin, Andres Gomez, Anne Toomey, Georgina Cullman, Cynthia Malone, Adam Pekor, Felicity Arengo, and Mary Blair. 2017. "Assessing the evidence for stakeholder engagement in biodiversity conservation." *Biological Conservation* 209:159-171.

Stithou, Mavra, and Riccardo Scarpa. 2012. "Collective versus voluntary payment in contingent valuation for the conservation of marine biodiversity: an exploratory study from Zakynthos, Greece." *Ocean & Coastal Management* 56:1-9.

Tallis, Heather, Zach Ferdana, and Elizabeth Gray. 2008. "Linking terrestrial and marine conservation planning and threats analysis." *Conservation Biology* 22 (1):120-130.

Terk, Elizabeth, and Nancy Knowlton. 2010. "The role of SCUBA diver user fees as a source of sustainable funding for coral reef marine protected areas." *Biodiversity* 11 (1-2):78-84.

Thur, Steven M. 2010. "User fees as sustainable financing mechanisms for marine protected areas: An application to the Bonaire National Marine Park." *Marine Policy* 34 (1):63-69.

Togridou, Anatoli, Tasos Hovardas, and John D Pantis. 2006. "Determinants of visitors' willingness to pay for the National Marine Park of Zakynthos, Greece." *Ecological Economics* 60 (1):308-319.

Treml, Eric A, Pedro IJ Fidelman, Stuart Kininmonth, Julia A Ekstrom, and Örjan Bodin. 2015. "Analyzing the (mis) fit between the institutional and ecological networks of the Indo-West Pacific." *Global Environmental Change* 31:263-271.

Tversky, Amos, and Daniel Kahneman. 1975. "Judgment under uncertainty: Heuristics and biases." In *Utility, probability, and human decision making*, 141-162. Springer.

Van Exel, NJA, Werner BF Brouwer, Bernard van den Berg, and Marc A Koopmanschap. 2006. "With a little help from an anchor: discussion and evidence of anchoring effects in contingent valuation." *The Journal of Socio-Economics* 35 (5):836-853.

Whitney, Charlotte, Nathan Bennett, Natalie Ban, Edward Allison, Derek Armitage, Jessica Blythe, Jenn Burt, William Cheung, Elena Finkbeiner, and Maery Kaplan-Hallam. 2017. "Adaptive capacity: from assessment to action in coastal social-ecological systems." *Ecology and Society* 22 (2).

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